UNITED STATES OF AMERICA 138 FERC ¶ 62,093
FEDERAL ENERGY REGULATORY COMMISSION

Duke Energy Carolinas, LLC Project No. 2692-032

ORDER ISSUING NEW LICENSE

(February 8, 2012)

INTRODUCTION

1. On February 20, 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 Nantahala Hydroelectric Project No. 2692. The project's authorized capacity being licensed is 43.2 megawatts (MW). The project is located on the Nantahala River and two tributaries, Dicks Creek and White Oak Creek, in Macon and Clay Counties, North Carolina.[3] The project occupies 41 acres of the

[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 Nantahala River is a tributary of the Little Tennessee River, a navigable waterway of the United States. *See Nantahala Power and Light Company*, 2 FPC 753 (1940). Pursuant to section 23(b)(1) of the FPA, 16 U.S.C. § 817(1) (2006), the project is required to be licensed because it occupies federal lands and 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).

Nantahala National Forest administered by the U.S. Forest Service (Forest Service). As discussed below, this order issues a new license for the Nantahala Project.

BACKGROUND

2. The Commission issued the original license for the project on February 6, 1981, and the license expired on February 28, 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 Nantahala Cooperative Stakeholder Team Settlement Agreement (Nantahala 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 Nantahala Project, and the license surrender and removal of the Dillsboro Project No. 2602.[6]

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[4] 14 FERC ¶ 62,127 (1981). The license was issued on February 6, 1981, 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. February 28, 2006.

[5] Signatories to the Nantahala agreement are: Duke, American Whitewater, Big Choga Homeowners Association, Carolina Canoe Club, Eastern Band of Cherokee Indians, Mountain Shadows Homeowners Association, Nantahala Community, Nantahala Gorge Association, Nantahala Highlands Estates Property Owners Association, Nantahala Outdoor Center, Nantahala Racing Club, Natural Resources Conservation Service, North Carolina Council of Trout Unlimited, North Carolina Department of Environment and Natural Resources, North Carolina Wildlife Federation, North Carolina Wildlife Resources Commission, Southwestern North Carolina Resource Conservation & Development, Swain County Economic Development Commission, Swain County Soil & Water Conservation District, U. S. Fish and Wildlife Service, and the Forest Service.

A copy of the Nantahala agreement is included in Volume IV of Duke's License Application (filed February 20, 2004). On January 8, 2004, Duke also filed a copy of the Nantahala agreement in the Nantahala Project public records.

[6] The surrender and removal of the Dillsboro Project, located on the Tuckasegee River downstream of the East Fork Project and the West Fork Project, 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 July 9, 2004, setting September 7, 2004, as the deadline for filing protests and motions to intervene. Motions to intervene were filed in the proceeding by the Western North Carolina Alliance (Alliance), Forest Service, U.S. Department of the Interior (Interior), North Carolina Wildlife Resources Commission (North Carolina WRC).[7] In addition, late motions to intervene were filed jointly by Macon County, North Carolina, and the Town of Franklin, North Carolina, and by North Carolina Department of Environment and Natural Resources (North Carolina DENR).[8] The late motions to intervene were granted.[9] 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.[10] In response, timely comments, recommendations, and terms and conditions were filed by Interior, U.S. Fish and Wildlife Service (FWS), North Carolina WRC, North Carolina DENR, and the Forest Service. On June 16, 2005, a group of municipal and local entities (community commenters) jointly filed untimely comments and recommendations.[11]

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[7] Timely, unopposed motions to intervene are granted by operation of Rule 214(c) of the Commission's Rules of Practice and Procedure. 18 C.F.R. § 385.214(c) (2011).

[8] On January 14, 2005, Duke filed an answer opposing the untimely motions to intervene by Macon County and the Town of Franklin, North Carolina.

[9] *See* unpublished notice issued January 25, 2006.

[10] Commission staff held scoping meetings on December 7, 2004, in Bryson City, North Carolina.

[11] 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 Association, Inc., Glenville Community Development Club, Cullowhee Falls, Inc., and Cullowhee Forest Property Owners Association, Inc.

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'

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6. On February 9, 2006, the Commission staff issued a draft multiple-project Environmental Assessment (EA) for the relicensing of the Nantahala Project, Franklin Project No. 2603,[12] and Mission Project No. 2619.[13] The FWS, Forest Service, North Carolina WRC, North Carolina DENR, American Whitewater, Jackson County and Local Governments, and Duke filed comments on the draft EA. A final EA was issued on July 12, 2006.[14]

7. The interventions, comments, and recommendations have been fully considered in determining whether, and under what conditions, to issue this license for the Nantahala Project.

PROJECT DESCRIPTION

A. Project Area

8. The Nantahala Project is located in western North Carolina on the Nantahala River and on two tributaries, Dicks Creek and White Oak Creek. The headwaters of the Nantahala River are south of the project in the Nantahala Mountains, with elevations exceeding 5,000 feet above mean sea level (msl).[15] Approximately 8 miles downstream of the project, the Nantahala River flows into the Tennessee Valley Authority's Fontana Lake on the Little Tennessee River, a tributary of the Tennessee River.

B. Project Facilities

9. The Nantahala Project consists of a reservoir, an earth and rock fill dam, power conduits,[16] a surge tank, and a powerhouse containing a single 43.2 MW generating unit.

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recommendations were considered in the EA for the project, and are discussed in this order, *infra*, as they relate to the Nantahala Project.

[12] 136 FERC ¶ 62,200 (2011).

[13] 137 FERC ¶ 62, 090 (2011).

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

[15] *See* EA at 32-33.

[16] Power conduit refers to water conveyance features which include tunnels, steel

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The project also includes three small diversion dams that provide additional water for generation and flows into the bypassed reaches. The Diamond Valley dam and Dicks Creek dam are located on Dicks Creek and the White Oak Creek dam is located on White Oak Creek.

Nantahala Development

10. The Nantahala development consists of: (1) a 1,605-acre reservoir at maximum normal reservoir elevation 3,012.2 feet msl with a usable storage capacity of 126,000 acre-feet; (2) a 1,042-foot-long, 250-foot-high, earth and rockfill dam consisting of: (a) at the east end of the dam, an emergency spillway consisting of two erodible fuse plug sections;[17] (b) a spillway, excavated in rock, controlled by four 25-foot-wide by 19-foot-high Tainter gates; and (c) at the west end of the dam, a gated intake at elevation 2,872.2 feet msl that includes nine steel trashracks with 1.25-inch clear-bar spacing; (3) a 16-foot diameter bypass tunnel controlled by two motor operated sluice gates; (4) a 5.6-mile-long power conduit leading from the dam to the powerhouse consisting of: (a) a 27,633-foot-long section that varies from 12 to 14 feet in diameter; (b) a 19.75-foot-diameter, 230-foot-high surge tank; (c) a 10-foot-diameter steel penstock beneath the surge tank that leads to a 600-foot-long unlined tunnel; and (d) a 1,221-foot-long steel penstock that decreases from 8.5 to 8 feet in diameter; (5) an 88-foot-long by 51-foot-high reinforced concrete powerhouse containing one generating unit with an installed capacity of 43.2 MW; (6) a 450-foot-long tailrace section extending from the base of the Nantahala powerhouse to the Nantahala River; and (7) appurtenant facilities. No primary transmission lines are included as part of the Nantahala Project.

11. The Nantahala development bypasses a 9.3-mile-long stream reach (bypassed reach) of the Nantahala River between the Nantahala dam located at river mile (RM) 22.6 and the Nantahala powerhouse located at RM 13.3.

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pipes, and penstocks of varied dimensions and diameters, which pass water to the Nantahala powerhouse.

[17] 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.

Dicks Creek Development

12. The Dicks Creek development consists of: (1) a 39-foot-long, 4-foot-high concrete gravity Diamond Valley dam which maintains a negligible size reservoir at elevation 3,048 feet msl; (2) a buried 300-foot-long, 12-inch-diameter pipeline leading from Diamond Valley dam to the Dicks Creek reservoir; (3) a 109-foot-long, 16-foot-high Dicks Creek concrete gravity dam with a crest elevation at 3,027.6 feet msl topped by 3-foot-high flashboards; (4) a 0.2-acre Dicks Creek reservoir with no usable storage; and (5) a 3,870-foot-long, 24-inch-diameter steel conduit extending from Dicks Creek dam to a junction with the Nantahala power conduit.

13. Although the Dicks Creek development bypasses a 1-mile-long section of Dicks Creek between Dicks Creek dam and the Nantahala River, flows are no longer diverted. Rather, flows impounded by the Dicks Creek dam are passed downstream of the dam through Dicks Creek and into the Nantahala River bypassed reach.

White Oak Creek Development

14. The White Oak Creek development consists of: (1) a 115-foot-long, 16-foot-high concrete gravity dam with a spillway section forming the crest of the dam at elevation 3,025.2 feet msl topped by 7-foot-high flashboards; (2) a 1.1-acre reservoir with no usable storage; and (3) a 2,045-foot-long tunnel connected to a 9,400-foot-long, 52-inch-diameter steel pipeline that conveys water to the Nantahala power conduit.

15. The White Oak Creek development bypasses a 2.2-mile-long section of White Oak Creek from the White Oak dam to the Nantahala River.

Recreation Facilities

16. There are two project recreation sites located at the Nantahala reservoir. These sites are: (1) the Rocky Branch Access Area that has a boat ramp and parking for approximately 50 to 60 vehicles with trailers; and (2) the Big Choga Creek Access Area that has a boat ramp and parking for approximately 30 to 40 vehicles. There are no project recreation sites at Dicks Creek or White Oak Creek developments.

C. Project Boundary

17. The Nantahala 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 2,203.69 acres.

18. The project boundary includes four dams with reservoirs (Nantahala, Dicks Creek, Diamond Valley, and White Oak Creek), and two project recreation sites. The project boundary around the Nantahala development encloses a reservoir, dam, spillway, intakes,

partial sections of a 5.6-mile-long power conduit, a surge tank, a powerhouse, a 450-foot-long tailrace, and a 9.3-mile-long Nantahala River bypassed reach. The project boundary around the Nantahala reservoir is generally located at contour elevation 3,022.2 feet msl, which is 10 feet above the maximum pool elevation 3,012.2 feet msl. The project boundary around the Dicks Creek development encloses the Diamond Valley dam, Dicks Creek dam and reservoir, the Diamond Valley and Dicks Creek pipelines, and a 1-mile-long section of Dicks Creek. The project boundary around the White Oak Creek development encloses the White Oak Creek dam and reservoir, and the White Oak Creek pipeline.

19. The Nantahala Project occupies 41 acres of federal lands administered by the Forest Service. Duke proposes no change to the project boundary.

D. Current Project Operation

20. The Nantahala Project generates an average of 215,159 megawatt hours (MWh) of energy annually. Duke operates the Nantahala Powerhouse to provide generation during peak power demand periods. The project uses natural inflow from the drainage area upstream of the Nantahala dam, and diverted water collected at the White Oak Creek and Dicks Creek dams. Water is passed from the Nantahala reservoir, through a 5.6-mile-long power conduit, into the Nantahala powerhouse, after which it re-enters the Nantahala River. The Nantahala reservoir is maintained within a normal operating range above or below target elevations which change throughout the year.[18] The Nantahala reservoir is drawn down to its lowest level in December and January and refilled to its highest level in May, June, and July. The minimum elevation during the year can range from a low of 73 feet local datum (LD) to a high of 99.5 feet LD, resulting in maximum annual drawdown of 26.5 feet. However, the project would typically maintain target elevations during the year which range from a low of 78 feet LD to a high of 97 feet LD, resulting in an annual drawdown of 19 feet.

[18] The Nantahala agreement specifies normal minimum elevations, normal target elevations, and normal maximum elevations for the Nantahala reservoir for each month of the year. Reservoir elevations are based on a local datum (LD) in which 100 feet equals approximately 3,012.2 feet U.S. Geological Survey datum. The LD is relative to the top of the dam, with 100.0 feet being the Normal Full Pond Elevation. The agreement also states that the reservoir elevations would be implemented beginning January 1, 2004, to the extent permitted by the current license. The details of the reservoir operation curve are specified in Article 401 of this license.

21. Water from White Oak Creek development is passed through the White Oak Creek bypassed reach and White Oak Creek power conduit. There currently is no minimum flow required in the White Oak Creek bypassed reach. The 8 cubic feet per second (cfs) minimum flow is provided from the White Oak Creek power conduit into Dicks Creek from July 1 through November 15.[19] All flows from the Dicks Creek development are passed downstream via Dicks Creek into the Nantahala River bypassed reach.

22. Under normal flow and water conditions, the Nantahala generating unit is operated to provide power during peak demand periods, generating power for a number of hours per day. Under high flow conditions, the generating unit operates 24 hours a day. Daily flow releases are based on estimated inflows, established operating ranges for reservoir levels**,** and system load and voltage support needs.

23. Under a 1998 settlement, Duke releases 606 cfs from the Nantahala Project powerhouse to accommodate downstream whitewater boating (April to October), except during project maintenance, an emergency, or drought.

E. Relicensing Proposal

24. Duke proposes no new capacity for the project. Duke proposes to operate the Nantahala Project according to the terms of the Nantahala agreement, which contains proposed license articles[20] with measures for the protection, mitigation, and enhancement of resources affected by the project.[21]

25. As provided in Section 1.0 of the Nantahala agreement, Duke proposes to establish as license requirements the reservoir levels and operating ranges for the Nantahala reservoir that it has been voluntarily implementing. The proposed reservoir levels and operating ranges are described in Section D, Current Project Operation, of this order.

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[19] In 1999, the license for the Nantahala Project was amended to require the licensee to release this 8-cfs minimum flow, consistent with a 1998 settlement agreement that Nantahala Power and Light Company filed for Commission approval. *See Nantahala Power and Light Company*, 87 FERC ¶ 62,138 (1999).

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

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

26. Section 1.0 includes a proposed article that incorporates by reference Attachment B (Low Inflow Protocol) and Attachment C (Hydro Project Maintenance & Emergency Protocol) of the Nantahala 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 Nantahala Project under various emergency and equipment failure and maintenance situations.

27. Duke proposes several recreation enhancement measures, as provided in Sections 2.0 and 3.0 of the Nantahala agreement. Duke proposes to continue to provide for operation and maintenance of the two existing project recreation sites, and to make a number of improvements to these recreation sites and other non-project recreation sites.[22] Duke also proposes to continue to provide public information on reservoir levels and flows for angling and boating on its website and telephone system, and a link on its website to U. S. Geological Survey (USGS) gage No. 03505500 located in the Nantahala River gorge,[23] or a suitable replacement gage in the vicinity as determined by the USGS, to provide public information on river flows.[24]

28. Duke proposes to reimburse the USGS on an annual basis for its cost to maintain USGS gage No. 03505500, located on the Nantahala River downstream of the Nantahala powerhouse, as provided in the Nantahala agreement (Section 3.0).

29. Duke proposes to release a minimum flow of 8 cfs from the White Oak Creek power conduit into Dicks Creek from November 1 through May 31, and a total of 16 cfs into Dicks Creek from June 1 through October 31. The proposed measure would require Duke to continue maintaining a flow valve, which currently releases 8 cfs, and install a second flow valve at the White Oak Creek power conduit that is capable of releasing an additional 8 cfs as calibrated and metered at the valve. Duke proposes to release from the White Oak Creek dam a minimum flow of 8 cfs, or the inflow into the White Oak Creek

[22] The Nantahala 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).

[23] *See* EA at 166 and 173. The Nantahala River gorge is located downstream of the Nantahala powerhouse. The Nantahala River gorge is managed by the Forest Service and provides anglers and whitewater boaters with eight access sites, of which five are public and three are commercial. The North Carolina WRC stocks this section of the river with trout.

[24] The Nantahala agreement, Section 3.0.

reservoir, whichever is less, into the White Oak Creek bypassed reach year-round. The proposed measure would require Duke to install a flow valve, or alternative release device, at the White Oak Creek dam.[25] Duke proposes to develop a Minimum Flow Plan to modify the project facilities in order to provide the minimum flows and to monitor the recreation flows.

30. Duke proposes to continue to maintain Dicks Creek as free-flowing with outflow from Dicks Creek dam being equal to inflow into Dicks Creek reservoir, as provided in the Nantahala agreement (Section 4.0).

31. As discussed in more detail later in this order, Duke proposes to operate the Nantahala Project according to the Normal Generation Schedule to Support Recreation and provide flow releases from the powerhouse at or above the best generation efficiency flow into the Nantahala River. Duke also proposes to provide up to 70 hours of additional flow releases per year for whitewater boating (Section 5.0).

32. Duke proposes to use a Tainter gate at the Nantahala dam to release target flows into the Nantahala River bypassed reach for whitewater boating ranging between 250 cfs and 425 cfs according to the following schedule: one weekend (Saturday and Sunday) between April 15 and April 30; four afternoons between June 15 and August 31; and one weekend (Saturday and Sunday) between September 15 and September 30. The target flows would be measured immediately below the confluence of White Oak Creek with the Nantahala River (Section 5.0).

33. During the first 2 years of recreation flow releases into the Nantahala River bypassed reach, FWS, North Carolina WRC, North Carolina Division of Water Resources (North Carolina DWR), and the Forest Service would monitor the fishery in the bypassed reach and identify any adverse effects on the fishery resource due to the flow releases. Then, based on the monitoring results, Duke would convene a meeting with FWS, North Carolina WRC, North Carolina DWR, Forest Service, American Whitewater, Carolina Canoe Club, Nantahala Gorge Association, and Trout Unlimited to discuss any modifications to the scheduled recreation flow releases (Section 5.3).

34. As provided in the Nantahala 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

[25] *Id*., Section 4.0.

(Section 10.0);[26] and an annual report for the resource agencies on compliance monitoring and reporting requirements (Section 13.0).

35. Other sections of the Nantahala agreement include agreements among the signatories that are not intended to be incorporated into a new license for the project.[27]

36. In the EA,[28] staff recommended adopting most of the proposed license articles of the Nantahala agreement, with the exception of providing funds and reimbursements to various entities for measures not tied to effects associated with the Nantahala Project. As explained in more detail below, I agree with staff recommendations and the recommended measures are included as conditions of the Nantahala Project license.

WATER QUALITY CERTIFICATION

37. Under section 401(a)(1) of the Clean Water Act (CWA),[29] 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.[30]

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[26] 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 Nantahala agreement. Because proposed Article 410 is not necessary to satisfy any project purposes, it is not required as a part of this license, and therefore, it is intentionally left blank herein.

[27] Sections 11.0, 12.0, and 14.0 through 17.0 do not contain proposed articles and are thus intended to not be requirements of the license. *See* License Application, filed February 20, 2004, Vol. IV, NCST Settlement Agreement, pages 20 through 22, and pages 23 through 30.

[28] *See* EA at 220-236.

[29] 33 U.S.C. § 1341(a)(1) (2006).

[30] 33 U.S.C. § 1341(d) (2006).

38. On February 28, 2004, Duke applied to the North Carolina DENR, Division of Water Quality (North Carolina DWQ) for water quality certification (certification) for the Nantahala 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,[31] North Carolina DWQ issued a 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).

39. 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 DWR existing and proposed consumptive uses of Nantahala 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 Nantahala agreement, specifically, Sections 1.0 (Reservoir Level), 4.0 (Minimum Flow), 7.0 (Shoreline Management), 9.0 (Sediment Management), and 13.0 (Compliance Monitoring and Reporting), Attachment B (Low Inflow Protocol), and Attachment C (Hydro Project Maintenance & Emergency Protocol).

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

COASTAL ZONE MANAGEMENT ACT

41. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),[32] 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

[31] On June 9, 2010, North Carolina DWQ issued certification for the Nantahala Project that included nine conditions. However, that certification was superseded by the July 30, 2010 certification.

[32] 16 U.S.C. § 1456(c)(3)(A) (2006).

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.

42. 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).

43. Pursuant to the National Oceanic and Atmospheric Administration's regulations implementing the CZMA, 15 C.F.R. § 930.53 (2011), 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 (2011). 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.[33]

44. The Nantahala 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 July 15, 2004.[34] In addition, North Carolina DENR was provided with a copy of the February 9, 2006 draft EA and the July 12, 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 4(e) FINDINGS AND CONDITIONS

45. Section 4(e) of the FPA[35] provides that the Commission can issue a license for a project located within any reservation only if it finds that the license will not interfere or be inconsistent with the purposes for which such reservation was created or acquired.

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[33] Notice may be constructive, if it is published in the *Federal Register*. 15 C.F.R. § 930.54(a)(2) (2011).

[34] 24 Fed. Reg. 3465 (July 15, 2004).

[35] 16 U.S.C. § 797(e) (2006).

46. Staff has reviewed the Organic Administration Act of 1897,[36] which established the purposes for forest reservations, and the presidential proclamation that created the Nantahala National Forest.[37] There is no evidence or allegation in this proceeding to indicate that relicensing of the Nantahala Project would interfere with the purposes of the Nantahala National Forest within which the project is located. Therefore, I find that this license, as conditioned, will not interfere or be inconsistent with the purposes for which the Nantahala National Forest was created.

47. FPA section 4(e) further requires that Commission licenses for projects located within federal reservations must include all conditions that the Secretary of the department under whose supervision the reservation falls shall deem necessary for the adequate protection and utilization of such reservation. A portion of the Nantahala Project is located in the Nantahala National Forest which is under the Forest Service's supervision.

48. The Forest Service filed its final section 4(e) conditions on April 14, 2006. The filing contains five conditions, which are set forth in Appendix B of this order and incorporated into this license by Ordering Paragraph E, and summarized below.

49. Forest Service minimum streamflow condition requires Duke to: (a) provide minimum flows into the bypassed reaches, as follows: from the White Oak Creek power conduit, 8 cfs into Dicks Creek from November 1 through May 31, and after installation of a second valve, 16 cfs into Dicks Creek from June 1 through October 31; and from White Oak Creek dam, 8 cfs or the inflow into White Oak Creek reservoir, whichever is less, into White Oak Creek from January 1 through December 31; (b) maintain Dicks Creek as free-flowing with outflow from the base of Dicks Creek dam being equal to inflow into Dicks Creek reservoir; (c) develop a Minimum Flow Plan; (d) temporarily modify the minimum flows if required by conditions beyond the licensee's control or by operating emergencies; and (e) calibrate flow valves and meter minimum flows from the White Oak power conduit.

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[36] 16 U.S.C. § 473 *et seq.* (2006).

[37] The Nantahala National Forest was created by presidential proclamation on January 29, 1920. *See* Presidential Proclamation, 41 Stats. 1785 (1921). At that time, the Organic Administration Act of 1897, 16 U.S.C. § 475 (2006), stipulated that all national forest lands were established and administered only for watershed protection and timber production.

50. The Forest Service Nantahala River recreational boating flow condition requires Duke to operate the Nantahala Project in accordance with the Normal Generation Schedule to Support Recreation for the Nantahala River, which includes: (a) providing up to 70 hours of additional flow releases per year for whitewater boating; (b) temporarily modify the Normal Generation Schedule to Support Recreation for special event requests; and (c) temporarily modify the recreation flow releases if required by conditions beyond the licensee's control. The Forest Service Nantahala River bypassed reach condition requires Duke to provide recreational flows into the Nantahala River bypassed reach using a Tainter gate at the Nantahala dam, beginning at the latter of: (1) on February 28, 2006, (2) upon development and submittal of a traffic management plan by the Forest Service and completion of improvements to the Forest Service parking areas near RM 16.5 at the Nantahala River bypassed reach, or (3) within 1 year of license issuance, whichever is later.

51. The Nantahala River bypassed reach condition also requires the actual release dates for bypassed reach recreation flows to be determined annually by the parties to the Nantahala agreement.[38] Further, the Nantahala River bypassed reach condition requires Duke to convene an annual meeting to discuss any proposed changes to the recreation flow releases based on the monitoring results that the Forest Service and resource agencies find during their monitoring of the fishery in the Nantahala River bypassed reach.

SECTION 18 FISHWAY PRESCRIPTION

52. Section 18 of the FPA[39] 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.

53. By letter filed March 14, 2005, the Secretary of the Interior requested that the Commission reserve authority to prescribe fishways. Consistent with Commission policy, Article 413 of this license reserves the Commission's authority to require fishways that may be prescribed by Interior for the Nantahala Project.

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[38] Section 5.0, Article 407 of the Nantahala agreement , provides for a recreation planning meeting among Duke and the interested parties to define the recreation flow schedule, and a meeting among Duke and the interested parties to discuss any proposed changes to the recreation flow releases after 5 years of releases into the Nantahala River bypassed reach.

[39] 16 U.S.C. § 811 (2006).

THREATENED AND ENDANGERED SPECIES

54. Section 7(a)(2) of the Endangered Species Act (ESA) of 1973[40] requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of their designated critical habitat.

55. There is one federally listed plant species located within the Nantahala River bypassed reach: the threatened Virginia spiraea (*Spiraea virginianu*). In the EA,[41] staff determined that with their recommended measures, relicensing the Nantahala Project is not likely to adversely affect Virginia spiraea and its habitat. The FWS concurred with this finding by letter filed June 2, 2010. As discussed in this order, *infra*, Article 415 requires Duke to file with the Commission for approval, a Virginia spiraea Management Plan to protect the Virginia spiraea.

NATIONAL HISTORIC PRESERVATION ACT

56. Under section 106 of the National Historic Preservation Act (NHPA)[42] and its implementing regulations,[43] 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.

57. To satisfy these responsibilities, the Commission executed a Programmatic Agreement (PA) with the North Carolina SHPO and invited Duke, Forest Service, and the Eastern Band of Cherokee Indians,[44] to concur with the stipulations of the PA. Duke

[40] 16 U.S.C. § 1536(a) (2006).

[41] *See* EA at 147.

[42] 16 U.S.C. § 470 *et seq*. (2006).

[43] 36 C.F.R. Part 800 (2011).

[44] 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.

and the Forest Service concurred. The PA requires the licensee to implement its Historic Properties Management Plan (HPMP) for the term of any new license issued for this project. Duke's "Historic Properties Management Plan, Nantahala Hydroelectric Project No. 2692" filed August 7, 2006, is approved in Ordering Paragraph F. 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

58. Section 10(j)(1) of the FPA[45] requires the Commission, when issuing a license, to include conditions based on recommendations by federal and state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act,[46] to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the project.

59. In response to the January 21, 2005 public notice that the project was ready for environmental analysis, Interior filed 13 recommendations under section 10(j).[47] 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 the Nantahala reservoir levels within the agreed normal operating range, and adhere to the Low Flow Protocol and the Hydro Project Maintenance & Emergency Protocol during temporary variance (Article 401); (2) provide minimum flows from the project into the Nantahala River bypassed reach; install a minimum flow valve in the White Oak Creek power conduit; install a minimum flow device in the White Oak Creek dam; and develop a Minimum Flow Plan (Article 404); (3) operate the project reservoir in accordance with the Low Inflow Protocol during periods of low flow (Appendix A); (4) operate the project reservoir in accordance with the Hydro Project Maintenance & Emergency Protocol during emergency and equipment failure and maintenance situations (Appendix A); and (5) pass all woody debris downstream (Article 412).

60. On March 17 and March 21, 2005, respectively, North Carolina WRC and North Carolina DENR responded to the January 21, 2005 public notice, stating that the

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[45] 16 U.S.C. § 803(j)(1) (2006).

[46] 16 U.S.C. §§ 661 *et seq*. (2006).

[47] *See* Interior filing of March 22, 2005.

conditions contained in the Nantahala agreement encompass the resource agencies' recommendations under section 10(j) of the FPA. The measures contained in the Nantahala agreement are addressed in this section and the next section.

SECTION 10(a)(1) OF THE FPA

61. Section 10(a)(1) of the FPA[48] 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 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.

62. 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.

63. The Forest Service made 12 section 10(a)(1) recommendations[49] and the community commenters made 12 recommendations in its community proposal, including a license term for the Nantahala 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

64. Interior recommended Duke develop a mitigation plan that includes provisions for flow regimes and a sediment management process for bedload transport of sediment through the watershed, and maintaining reservoir levels to protect and conserve fish and wildlife resources.

[48] 16 U.S.C. § 803(a)(1) (2006).

[49] *See* Forest Service filing of April 14, 2006.

65. In the EA,[50] staff did not recommend adopting Interior's recommendation for a mitigation plan because the measures contained in the Nantahala agreement would accomplish the purposes of Interior's recommended measures. Staff, however, found that if it should become necessary for Duke to draw down the Nantahala reservoir for maintenance purposes lower than its routine annual drawdown, sediment in the drawdown zone could be subject to erosion and resuspension. Since the certification incorporates by reference the Nantahala agreement, specifically, Sections 1.0 (Reservoir Level) and 9.0 (Sediment Management) that address this issue, there is no need to require Duke to develop a mitigation plan.

66. The community commenters recommended Duke develop a sediment removal plan for the Nantahala Project which includes dredging the Nantahala reservoir. The EA[51] did not recommend the community commenters' recommendation. In the EA,[52] staff determined that the need for sediment removal is unlikely from the Nantahala reservoir because the depth of the reservoir 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 reservoir. Although dredging would increase the sediment trapping ability of the dam, in the EA[53] staff concluded that dredging is not required to maintain the existing operation of the Nantahala Project. Therefore, I am not requiring Duke to regularly remove sediment as requested by the community commenters, but I am requiring a Sediment Management Plan in Article 409 should sediment need to be mechanically removed.

B. Recreation

67. As discussed in the EA,[54] the Nantahala reservoir provides ample opportunities for boating at two project recreation sites: the Rocky Branch and Big Choga Access Areas. Project lands, the Nantahala River downstream of the powerhouse, and a 9.3-mile-long bypassed reach of the Nantahala River are used by hikers, anglers, and whitewater boaters. Of the approximate 250,000 whitewater boaters that annually use an 8.5-mile-

[50] *See* EA at 280.

[51] *Id.* at 223.

[52] *Id*. at 60.

[53] *Id*. at 61.

[54] *Id*. at 164-69.

long section of the Nantahala River downstream of the powerhouse, 210,000 whitewater boaters use the services provided by commercial operators, including Duke's commercial boat launch site located at RM 13.8, at the head of Nantahala gorge, on the Nantahala River.[55]

1. Recreation Flow Releases

68. Duke proposed to provide scheduled recreation flow releases into the Nantahala River below the powerhouse, as set forth in the Nantahala agreement, and required by the certification and the Forest Service section 4(e) condition. The recreation flow releases from the Nantahala Project would enhance whitewater boating by providing flows for the week, including the weekends and holidays.[56] The recreation flow releases are described in the certification's Low Inflow Protocol (Appendix A). Therefore, Article 405 requires Duke to operate the Nantahala Project according to the Normal Generation Schedule to Support Recreation, as required in the certification and the Forest Service section 4(e) condition.

69. Duke proposed to release flows between 250 and 424 cfs into the Nantahala River bypassed reach for whitewater boating, according to the following schedule: one weekend (Saturday and Sunday) between April 15 and April 30; four afternoons between June 15 and August 31; and one weekend (Saturday and Sunday) between September 15 and September 30. Further, Duke would time bypassed reach recreation flows from the Tainter gate at the Nantahala dam to arrive at the confluence of White Oak Creek and the Nantahala River bypassed reach at either 10:00 am, for spring-time flows, or 4:00 pm for summer-time releases, as required in the certification and the Forest Service section 4(e) condition. Article 406 requires Duke to provide recreation flow releases from the Nantahala dam.

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[55] Duke's commercial boat launch site is a fee-based, non-project facility for the use of commercial whitewater outfitters. Non-commercial public use of this facility is not allowed. Public access is provided at the Forest Service Nantahala river launch site also located at the head of Nantahala gorge.

[56] The EA (pages 170-74) notes that a Nantahala River Paddling Recreational Instream Flow Study, conducted in the bypassed reach, and a Nantahala River Angling Flow Study, conducted in the bypassed reach and downstream of the powerhouse, were evaluated during the relicensing process to determine how flows affect whitewater boating and angling opportunities. The studies concluded that Duke's proposed flow schedule created acceptable flows for whitewater boating and additional pools for angling.

70. Under the certification's Hydro Project Maintenance & Emergency Protocol (Appendix A), Duke is required to make appropriate changes in flows from the powerhouse or Tainter gates in the event of scheduled or unscheduled outages at the project. In addition, Duke would avoid scheduling unit outages during the recreation season (April through October), the commercial whitewater boating period (Memorial Day through September), and the critical flow period for fisheries (June 1 through October 31).

2. Recreation Facilities

71. Duke proposed, and the Forest Service recommended, improving two existing project recreation sites located at the Nantahala reservoir. These sites are: (1) the Rocky Branch Access Area that has a boat ramp and parking for approximately 50 to 60 vehicles with trailers; and (2) the Big Choga Access Area that has a boat ramp and parking for approximately 30 to 40 vehicles. New recreation measures at these two access areas include bank fishing areas, toilets, installation of lighting to minimize effects on fish and wildlife resources, and paving the parking areas. These measures would enhance fishing opportunities in the Nantahala reservoir by enhancing night fishing opportunities and generally improving the recreation sites' desirability for user. Article 402 requires Duke to file for Commission approval a Recreation Plan for Duke's two existing project recreation sites, including the new recreation measures.

72. Duke proposed, and the Forest Service recommended, constructing a barrier-free fishing access site on Duke's land along the Nantahala River bypassed reach near RM 14.0. The proposed location of the barrier-free fishing access site is outside the current project boundary. In the EA,[57] staff recommended Duke's proposal for a barrier-free fishing access site to improve accessibility at the project and that it be made a project facility. This license requires Duke to develop the barrier-free fishing access site as a project facility (Article 402) and modify the current Nantahala Project boundary to enclose this new project facility (Article 203).

73. Duke proposed, and the Forest Service recommended, either (1) constructing a wildlife viewing platform at either the Big Choga Access Area, the Rocky Branch Access Area, or on Forest Service land located adjacent to the Nantahala reservoir or (2) reimbursing the Forest Service for the cost of constructing the platform on Forest Service land, if needed, at a cost not to exceed $5,000. In the EA,[58] staff recommended

[57] *Id*. at 267.

[58] *Id*. at 267.

construction of, or provision of funds to the Forest Service for, the wildlife viewing platform. However, the Commission has made clear, a licensee cannot satisfy the obligation to perform certain tasks by a simple payment to another party, nor can the obligation be limited to a particular dollar figure.[59] Therefore, Article 402 includes a requirement for Duke to include in its Recreation Plan a wildlife viewing platform at either the Big Choga Access Area or the Rocky Branch Access Area because the measure would enhance recreation resources at the project.

74. The community commenters recommended Duke: (1) develop specifications for construction, budgets, and schedules for installing all of the recreation facilities identified in the Nantahala agreement, and to the extent that monies are not expended for a particular facility, apply unspent monies toward the costs of the other recreation facilities; (2) provide information via Duke's telephone and website systems about the Nantahala reservoir and recreation flow releases; and (3) provide interpretive signage at two sites on Duke's land and one site on National Forest System land.

75. In the EA,[60] staff addressed the community commenters' recommendations and found that Duke developed its proposed recreation measures with the above stated recommendations in mind. Except for the distribution of unspent monies, the community commenters' recommendations are similar to those proposed in the Nantahala agreement and included in the license. With respect to the unspent monies, the Commission requires the licensee to undertake a particular measure, not to spend a specified amount of money. Therefore, this measure is not included in the license.

3. Recreation Facilities on Forest Service Lands

76. Duke proposed, and the Forest Service recommended, constructing the following recreation facilities on Forest Service lands: (1) parking for 5 vehicles and a trail to the Nantahala River bypassed reach along State Road 1310 near RM 16.5; (2) parking for 5 vehicles and a wildlife viewing platform along State Road 1310 near RM 17.0; (3) parking for 3 vehicles along Forest Service Road 308 near RM 17.6; (4) parking for 5 vehicles along Forest Service Road 308 near RM 17.8; and (5) parking for 3 vehicles along Forest Service Road 308 near RM 19.0. In the EA,[61] staff recommended adopting

[59] *See Settlements in Hydropower Licensing Proceedings Under Part I of the Federal Power Act*, 116 FERC ¶ 61,270, at P 21 (2006).

[60] *See* EA at 181.

[61] *Id.* at 267.

the Forest Service's recommendations to provide additional parking on Forest Service lands and minimize the effects of dispersed recreational use.

77. As discussed in this order, *infra*, Article 402 requires Duke to install a wildlife viewing platform within the Nantahala Project boundary. In the EA,[62] staff noted Forest Service Road 308, a one-lane gravel road, parallels a 3.2-mile-long section of the Nantahala River from the mouth of Dicks Creek to the mouth of White Oak Creek. Along Forest Service Road 308, public access is maintained by the Forest Service at 10 to 15 roadside pull-offs and at informal campsite areas. Upon further review, it appears that, with the measures included in this license, sufficient public access for fishing and hiking occur and there is no compelling reason to require Duke to construct these parking facilities on Forest Service lands. Therefore, this measure is not included in the license. However, Duke is free to enter into any off-license agreement with the Forest Service for the parking areas and a trail.

4. Meetings

78. The Forest Service recommended Duke schedule an annual meeting with the resource agencies to coordinate all environmental protection and enhancement aspects of the Nantahala agreement including evaluating the potential effects of flow releases for angling and whitewater boating on aquatic resources. The community commenters recommended Duke convene: (1) a recreation planning meeting with interested parties to define the recreation flow schedule; and (2) a meeting with interested parties to evaluate the recreation flow releases after 5 years.

79. Interior recommended Duke convene a meeting with FWS, North Carolina WRC, North Carolina DWR, Forest Service, American Whitewater, Carolina Canoe Club, Nantahala Gorge Association, and Trout Unlimited to evaluate the recreation flow releases into the Nantahala River bypassed reach as a result of the parties' monitoring the fishery in the bypassed reach.

[62] *Id.* at 164.

80. In the EA,[63] staff recommended adopting the Forest Service's recommendation for annual meetings and the community commenters' measures. Staff recommended adopting Interior's recommendation for Duke to convene a meeting with the resource agencies and nongovernmental organizations in order to discuss any modifications to the recreation flows after 5 years of making the releases. Additionally, staff recommended Duke file with the Commission a report that summarizes the meeting and include recommendations for Commission approval to modify the scheduled recreation flow releases prior to implementation.[64]

81. Duke's proposal to continue to convene periodic meetings to discuss the recreation flow schedule for whitewater boating in the 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 recreation, as well as coordinate the various aspects of the Nantahala agreement. Because Duke and the parties are free to convene periodic meetings, the Commission does not need to be notified. The Commission, however, should be notified of and approve any flow modifications, if proposed. Article 407 requires Commission approval of any modifications to the recreation flows prior to implementation.

5. Funds for Recreation Facilities

82. Duke proposed, and the Forest Service recommended, reimbursing the Forest Service up to $50,000 for construction of primitive campsites on National Forest System lands if further evaluation by Duke after consultation with the Forest Service and North Carolina Division of Parks and Recreation indicates a need for these facilities; or, if the evaluation indicates no need for these facilities or if the Forest Service requires reimbursement of less than $50,000, then Duke would reimburse the Forest Service with the remaining funds for the Forest Service's construction costs of the Forest Service facilities. In the EA,[65] staff recommended adopting this measure to increase the diversity of the recreation experience.

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[63] *See* EA at 185-86. Staff notes that Duke, in 2004, convened the first annual meeting with the parties, and has continued the annual meetings thereafter.

[64] *Id.* at 265.

[65] *See* EA at 228.

83. This measure is contingent upon a future evaluation to determine whether a need exists for primitive campsites at an unidentified site or sites. Neither Duke nor the Forest Service explained how the primitive campsites are related to project purposes or project effects. As the Commission has made clear, a licensee cannot satisfy the obligation to perform certain tasks by a simple payment to another party, nor can the obligation be limited by a particular dollar figure.[66] Therefore, there is no compelling reason to require Duke to reimburse the Forest Service for the cost of constructing primitive campsites on National Forest System lands. However, Duke is free to enter into any off-license agreement with the Forest Service for this measure.

C. U.S. Geological Survey Stream Gage Maintenance

84. Duke proposed, and Interior recommended, reimbursing the USGS annually for its cost to maintain USGS gage No. 03505500, located downstream of the Nantahala powerhouse near RM 11 on the Nantahala River.[67] The community commenters recommended Duke provide (1) telephone information on Nantahala reservoir levels and recreational flows into the Nantahala River bypassed reach and (2) information on Duke's website for Nantahala reservoir, recreational flows, and a link to USGS gage No. 03505500.

85. In the EA,[68] staff found maintenance of a gage on the Nantahala River for the public would provide anglers and boaters with timely and specific flow information. As the Commission has made clear, a licensee cannot satisfy the obligation to perform certain tasks by a simple payment to another party, nor can the obligation be limited by a particular dollar figure.[69] Therefore, I am not requiring Duke to reimburse the USGS annually for its cost to maintain USGS gage No. 03505500. However, Article 403 requires Duke to continue to provide information on reservoir levels and recreation flows on its website and link on its website to USGS gage No. 03505500, or a suitable replacement gage in the vicinity as determined by the USGS.

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

[67] The Nantahala agreement, Section 3.0.

[68] *See* EA at 185.

[69] *See Settlements in Hydropower Licensing Proceedings Under Part I of the Federal Power Act*, 116 FERC ¶ 61,270, at P 21 (2006).

D. Dicks Creek and White Oak Creek Minimum Flow Plan

86. Duke proposed to provide a total of 8 cfs from the White Oak Creek power conduit into Dicks Creek from November 1 through May 31, and a total of 16 cfs into Dicks Creek from June 1 through October 31. In so doing, Duke proposed to modify the project facilities by installing an additional minimum flow valve capable of releasing up to 8 cfs from the White Oak Creek power conduit into Dicks Creek and install a minimum flow device capable of releasing up to 8 cfs from the White Oak Creek dam into White Oak Creek. Duke also proposed to develop a Minimum Flow Plan.[70]

87. In the EA,[71] staff found the proposed minimum flow regime for Dicks Creek and White Oak Creek would enhance aquatic resources and therefore, result in a beneficial effect on aquatic species and associated habitat. In order to provide the minimum flows specified above, as well as to monitor compliance with recreation flows as discussed in this order, *infra*, staff recommended[72] a Minimum Flow Plan. Article 404 requires Duke to file with the Commission for approval a Minimum Flow Plan to modify the project facilities in order to provide the minimum flows.

E. Annual Compliance Report

88. Duke proposed to provide the FWS and other resource agencies an annual report containing (1) a table of elevations of Nantahala reservoir 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,[73] staff recommended adopting the measure with a report to be filed no later than May 31 of each year as provided by the Nantahala agreement. Article 411 requires Duke to implement a compliance monitoring program, including development of an annual report, for the Nantahala Project, to be filed with the Commission by May 31 of each year.

F. Shoreline Management Plan

89. Duke, as part of its license application, filed a draft Project Reservoir and Land Management Plan with Shoreline Management Guidelines that include provisions for

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[70] The Nantahala agreement, Section 4.0.

[71] *See* EA at 103-106.

[72] *Id*. at 279.

[73] *Id*. at 256-57.

eight projects, including the Bryson, Dillsboro,[74] Franklin, Mission, East Fork, West Fork, and Nantahala projects, as well as the Queens Creek Project No. 2694.[75] The Shoreline Management Guidelines also are attached to the Nantahala agreement. The plan and guidelines establish a framework to protect environmental resources at the project, and enhance public access to the project's lands and waters.

90. Interior recommended Duke implement its Shoreline Management Guidelines as drafted. In the EA,[76] staff recommended adopting the guidelines. 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 Nantahala Project.

91. Condition 6 of the certification requires Duke to develop a Shoreline Management Plan for the Nantahala Project, but does not include any details. Therefore, Article 408 requires Duke to file for Commission approval a Shoreline Management Plan that incorporates the provisions of Duke's Shoreline Management Guidelines that specifically pertain to the Nantahala Project.

92. Additionally, Article 408 requires Duke to review, every 5 years, the adequacy of its approved Shoreline Management Plan. Because the Nantahala Project boundary encompasses 2,203.69 acres of land and recreational use is projected to increase at, and adjacent to, the project throughout a new license term, the 5-year review is intended to examine whether or not implementation of the approved Shoreline Management Plan is effectively meeting the goals and objectives of the plan and whether or not any changes are needed.

G. Funding Contribution for the Sicklefin Redhorse

93. Interior recommended Duke provide a one-time contribution of at least $40,000, in-kind services, or a combination of the two, to support FWS and North Carolina WRC studies to determine the habitat, movement, ecology, and distribution of the sicklefin redhorse, a freshwater fish species. However, Interior did not identify where this funding or services would be used.

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[74] 120 FERC ¶ 61,054 (2007).

[75] 98 FERC ¶ 62,214 (2002).

[76] *See* EA at 274-75.

94. Duke proposed, and the Nantahala agreement provides for, the contribution of $40,000 to support FWS and North Carolina WRC studies to determine the range and distribution of the sicklefin redhorse in the Little Tennessee, Hiwassee, and Tuckasegee Rivers. In the EA,[77] staff noted the Nantahala Project is located on the Nantahala River and two tributaries, Dicks Creek and White Oak Creek, and concluded that neither life history characteristics nor habitat requirements specific to the sicklefin redhorse have been identified in the Nantahala River or the Nantahala Project area. Nor has Interior explained how this species is related to project purposes or project effects. Therefore, this license does not include a funding requirement of $40,000, as recommended by Interior.[78] However, Duke is free to enter into any off-license agreement for this measure.

H. Funding Contribution for Brook Trout

95. Duke proposed, and the Nantahala agreement provides for, a one-time contribution of at least $40,000, in-kind services, or a combination of the two, to support efforts by the FWS, the North Carolina WRC, and the Forest Service to restore brook trout to a selected stream in the vicinity of the Tennessee Creek development. The Tennessee Creek development is a project work at the East Fork Hydroelectric Project No. 2698-033[79] and has no relationship to the Nantahala Project. Moreover, Duke and the signatories to the Nantahala agreement have not explained how the measure is related to project purposes or project effects. Therefore, this license does not include a funding requirement of $40,000.[80] However, Duke is free to enter into any off-license agreement for this measure.

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[77] *Id.* at 292.

[78] 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).

[79] *See Duke Energy Carolinas, LLC*, 135 FERC ¶ 62,108 (2011).

[80] *See Settlements in Hydropower Licensing Proceedings Under Part I of the Federal Power Act*, 116 FERC ¶ 61,270, at P 8 (2006).

I. Riparian Habitat Enhancement Fund

96. 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 Nantahala 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.[81] Therefore, I am not requiring a riparian habitat enhancement fund as part of the license.[82] However, Duke is free to enter into any off-license agreement for this measure.

J. Funds for Macon and Clay Counties

97. The community commenters ask that the Commission require Duke to provide the following funds to Macon County: (1) $40,000 for resources the county asserts it spent in participating in the Commission consultation process, and additional payments every 5 years of $20,000 to consult; (2) $150,000 to the Macon County Soil and Water Conservation District for the improvement of soil and water conservation programs; and (3) $350,000 to Macon County for any Duke project located in the county and thereafter, $2,500 per year for each MW of the authorized capacity for project located in the county.

98. Duke proposed, and the Nantahala agreement provides for, $40,000 each to Macon County and Clay County Soil and Water Conservation Districts for the improvement of soil and water conservation programs.

99. 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.[83] 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. For the above reasons, this license does not require the payments to Macon County or Clay County. However, Duke is free to enter into any off-license agreement for this measure.

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[81] *See* EA at 292.

[82] *See* n. 78, *supra.*

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

K. Donation of Tracts of Land

100. Duke proposed, and the Forest Service recommended, conveying or leasing to the Forest Service three tracts of Duke-owned non-project land, totaling up to 9.0 acres. A 3-acre tract, located at the confluence of Rowland Creek and the Nantahala River bypassed reach, would be for expanded parking at the Forest Service boat launch. A 2-acre tract would be conveyed to the Forest Service and up to 4-acre additional acres would be leased to the Forest Service to improve Duke's commercial boat launch site located at RM 13.8 on the Nantahala River.[84] Additionally, Duke proposed, and the Nantahala agreement provides for, purchasing and conveying 150 acres of land outside of the project boundary to the Forest Service.[85]

101. The EA[86] noted that the Forest Service would operate and maintain (1) the additional parking area at the Forest Service's boat launch, and (2) Duke's commercial boat launch site. Staff recommended adopting the Forest Service's recommendations to address a need for additional parking at the Forest Service's boat launch, and improve Duke's commercial boat launch site by expanding its parking area for commercial outfitters. In so doing, Duke would need to convey or lease land to the Forest Service and the project boundary would need to be modified to include the lands.[87]

102. Although the EA indicates that additional parking may be needed, this license does not require Duke provide additional parking at the Forest Service access sites or Duke's commercial access site. There are six sites, located on Forest Service lands, providing public access to the Nantahala bypassed reach and three additional commercial access sites. There is no shortage of access areas along the Nantahala bypassed reach, and as a result, the aforementioned lands are not needed for project purposes or to access projected-related recreation opportunities. In addition, Duke provides sufficient recreation facilities at the Nantahala reservoir, such as the Rocky Branch Access Area and the Big Choga Access Area, and a barrier-free fishing site in the Nantahala River bypassed reach.

103. The community commenters recommended, for any license issued for the

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[84] The Nantahala agreement, Section 2.0.

[85] The Nantahala agreement, Section 6.9.

[86] See EA at 177-78 and 182.

[87] *Id*. at 182-83.

Nantahala Project or the Franklin Project No. 2603,[88] Duke donate three separate tracts of land, totaling 35.33 acres, to Macon County for recreation purposes and conservation. The EA[89] noted that the community commenters did not describe how the donation of land would be tied to project purposes or project effects nor did the community commenters provide any information to support their recommendation. Therefore, staff did not recommend the community commenters' measures.[90] Further, the disposition of Duke-owned lands, located outside the project boundary is beyond the Commission's jurisdiction. Therefore, this license does not require Duke to donate tracts of land, as recommended by the community commenters.

L. Project Boundary

104. 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. Duke filed a project boundary drawing which includes the Nantahala River bypassed reach; which this license requires. However, some features of the project were omitted. Only parts of the 5.6-mile long power conduit were included in the project boundary. The entire 5.6-mile-long power conduit is necessary to provide flow to the Nantahala powerhouse, thus it should be included in the project boundary drawings. An abandoned bypass tunnel at the West abutment of the Nantahala dam was not clearly labeled, thus could not be discerned within the project boundary. Although no longer used, the abandoned bypass tunnel, originally used during construction of the dam, should be included in the project boundary because it provides a potential alternate route for flow releases from the Nantahala dam, and is subject to periodic inspections for purposes of dam safety. As discussed in this order, *infra*, the drawings do not show the existing and proposed recreation facilities and do not clearly delineate the 41 acres of federal lands administered by the Forest Service. This license requires Duke to file revised Exhibit G drawings that will clearly identify the project boundary and project features, discussed herein, within the project boundary (Article 203).

M. Virginia spiraea

105. Interior recommended Duke consider how the proposed project operations will

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[88] *See Duke Energy Carolinas, LLC*, 136 FERC ¶ 62,200 (2011).

[89] *See* EA at 199.

[90] *Id*. at 233-34.

affect the federally threatened plant, Virginia spiraea (*Spiraea virginiana*), because the species is known to occur within the project boundary.

106. In the EA,[91] staff found Duke's proposed flow releases into the 9.3-mile-long bypassed reach of the Nantahala River is not likely to adversely affect the Virginia spiraea. The EA noted that Duke conducted initial reconnaissance surveys in September 2004; however, high water events precluded completion of the surveys. In 2005, Duke conducted, after consultation with the FWS, a survey for Virginia spiraea within the project boundary, which documented the presence of the species. Duke proposes to conduct additional Virginia spiraea surveys within the project boundary, during the blooming season, to monitor project-related effects on the species.

107. In the EA,[92] staff found Duke's proposal to develop a management plan for the Virginia spiraea would identify any effects of project-related flow releases on the species, as well as measures to protect the species. To ensure that Virginia spiraea is monitored, Article 415 requires Duke to file for Commission approval a Virginia spiraea Management Plan. The plan provides for, among other items, a schedule for implementing additional Virginia spiraea surveys and measures to protect the species.

N. Project Operation

108. This license requires, in Article 401, that Duke maintain, to the extent practicable, target elevations for the Nantahala reservoir and keep any deviations from the targets within a normal minimum and normal maximum operating range established for the reservoir, except during droughts or emergency situations. 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, minimum flows at the White Oak Creek dam as follows: (1) 8 cfs, or inflow, year-round minimum flow from the White Oak Creek dam into White Oak Creek at the base of the dam January 1 through December 31; (2) an 8 cfs release from the White Oak Creek power conduit into Dicks Creek November 1 through May 31; and (3) a 16 cfs release from the White Oak Creek power conduit into Dicks Creek June 1 through October 31. The minimum flows would necessitate that Duke install flow valves at the White Oak Creek dam and the White Oak Creek power conduit. Article 404 requires that Duke file for Commission approval a plan to install the flow valves. In addition,

[91] *Id*. at 147.

[92] *Id.* at 147.

Article 404 requires a plan to monitor these flow releases, as well as the recreation flows required in Article 405 and Article 406.

109. Maintaining the project reservoir within the normal operating ranges would protect fish and other aquatic organisms that rely on near-shore habitat for feeding, spawning, and cover, as well as aquatic vegetation near the shoreline. Providing an 8 cfs year-round minimum flow from the White Oak Creek dam would assure adequate flows to protect aquatic habitat and an established trout fishery in a 2-mile-long segment of White Oak Creek downstream of the dam. Providing seasonal 8 cfs or 16 cfs flows into Dicks Creek would help maintain aquatic habitat and an established trout fishery in the Nantahala River bypassed reach. Compliance within these flow provisions could be assured by including additional detail on the mechanisms and protocols to be used to gather and report compliance monitoring data. A compliance report is required in Article 411, as discussed in this order, *infra* (Section F, Annual Compliance Report). Further, Articles 401, 404, and 411 are consistent with the conditions of the certification.

ADMINISTRATIVE PROVISIONS

A. Annual Charges

110. 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 and use and occupancy of United States lands.

B. Exhibit F and G Drawings

111. 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 dated November 24, 2004, do not show the existing and proposed recreation facilities, do not clearly delineate 41 acres of federal lands (the Nantahala National Forest) within the project boundary, [93] do not enclose the entire length of the 5.6-mile-long power conduit, and do not clearly label and identify the abandoned bypass tunnel (originating at the west abutment of the Nantahala dam) within the project boundary. The Exhibit G drawings must show all approved project features and the federal lands; therefore, I am not approving the project boundary drawings.

[93] Detailed information on the location and acreage of federal lands is required for the purpose of determining annual charges. *See* 18 C.F.R. § 11.2 (2011).

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

112. 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

113. 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

114. Requiring a licensee to obtain prior Commission approval for every use or occupancy of project land would be unduly burdensome. Therefore, Article 416 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

115. Duke proposes changes in project operation, including higher reservoir elevations at the Nantahala development, that have been implemented since 2004 and would be required as part of this license. Article 301 requires the licensee 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 at the Nantahala development. Article 301 requires the licensee to develop a plan and schedule for remedial measures, if necessary, to ensure continued safe operation at the Nantahala development.

116. Article 302 requires the licensee to provide the Commission's Division of Dam Safety and Inspections - Atlanta Regional Engineer (D2SI-ARO) with final contract drawings and specifications, together with other pre-construction documents, prior to the construction of the new minimum flow devices.

117. Article 303 requires the licensee to provide the Commission's D2SI-ARO with cofferdam and deep excavation construction drawings.

118. Article 304 requires the licensee to revise its Public Safety Plan prior to operation of the minimum flow release valves.

119. Where new construction or modifications to the project are involved, the Commission requires licensees to file revised drawings of project features as-built. Article 305 provides for the filing of these drawings.

STATE AND FEDERAL COMPREHENSIVE PLANS

120. Section 10(a)(2)(A) of the FPA[94] 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.[95] Under section 10(a)(2)(A), federal and state agencies filed 37 comprehensive plans that address various resources in North Carolina. Of these, the staff identified and reviewed 10 comprehensive plans that are relevant to this project.[96] No conflicts were found.

APPLICANT'S PLANS AND CAPABILITIES

121. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA,[97] 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 findings in each of the following areas.

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[94] 16 U.S.C. § 803(a)(2)(A) (2006).

[95] Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2011).

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

[97] 16 U.S.C. §§ 803(a)(2)(C) and 808(a) (2006).

A. Conservation Efforts

122. 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

123. 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

124. Staff has reviewed Duke's management, operation, and maintenance of the Nantahala 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

125. 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 unit to ensure it continues 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 concludes that Duke is capable of operating the project to provide efficient and reliable electric service in the future.

E. Need for Power

126. 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 43.2-MW Nantahala Project generates an average of 215,159 MWh annually.

127. The Nantahala 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. The Nantahala Project, as licensed, will continue to provide about 43.2 MW of this demand. Staff concludes that the project's power, low cost, and contribution to the region's diversified energy mix will help meet the need for power in the region.

F. Transmission Services

128. The project's transmission facilities include the generator leads, station transformers, buses, and switchyard located at the powerhouse. Duke proposes no changes that would affect its own or other transmission services in the region.

G. Cost Effectiveness of Plans

129. Duke proposes to make the following minor operational modifications to enhance environmental resources affected by the project: (1) install a minimum flow valve or release device at the White Oak Creek dam; (2) install a minimum flow valve at the White Oak Creek power conduit; and (3) calibrate the reservoir stage level gage to monitor the actual level of the Nantahala reservoir. Based on Duke's record as an existing licensee, staff concludes that these proposals are likely to be carried out in a cost-effective manner.

H. Actions Affecting the Public

130. Duke provided extensive opportunity for public involvement in the development of its application for a new license for the Nantahala 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 Nantahala River. Duke uses the project to help meet local power needs.

PROJECT ECONOMICS

131. 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.*,[98] 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.

132. In applying this analysis to the Nantahala Project, staff has considered two options: Duke's proposal, and the project as licensed herein. As proposed by Duke, the levelized annual cost of operating the Nantahala Project is $2,083,010, or $9.68/MWh. The project would generate an estimated average of 215,159 MWh of energy annually. When the estimate of average generation is multiplied by the alternative power cost of $32.72/MWh, [99] the result is a total value of the project's power of 7,040,800 in 2005 dollars. To determine whether the project is economically beneficial, staff subtracts the project's cost from the value of the project's power.[100] Therefore, in the first year of operation, the project would cost would cost $4,957,790, or $23.04/MWh, less than the likely alternative cost of power.

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[98] 72 FERC ¶ 61,027 (1995).

[99] The alternative power cost of $32.72 per MWh is based on information obtained from Duke.

[100] Details of staff's economic analysis for the project, as licensed herein, and for various alternatives are included in the EA at 219-236.

133. As licensed herein with the mandatory conditions and staff measures, the levelized annual cost of operating the project would be about $2,047,170, or $9.51/MWh. The 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 $4,993,630, or $23.21/MWh, less than the likely alternative cost of power.

134. 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 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

135. Sections 4(e) and 10(a)(1) of the FPA[101] 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 will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to relicense this project, and the terms and conditions included herein, reflect such consideration.

136. The EA for the Nantahala Project contains background information, analysis of effects, and support for related license articles. We conclude based on the record of this proceeding, including the EA and the comments thereon, that relicensing the Nantahala 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.

137. Based on our 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 have selected the proposed Nantahala Project, with the staff-recommended measures, and find that it is best adapted to a comprehensive plan for improving or developing the Nantahala River.

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[101] 16 U.S.C. §§ 797(e) and 803(a)(1) (2006).

138. I 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, water quality, recreational resources, and historic properties; and (3) the 43.2-MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution.

LICENSE TERM

139. Section 15(e) of the FPA[102] provides that any new license issued shall be for a term that the Commission determines to be in the public interest, but not less than 30 years or more than 50 years. 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.[103] This license authorizes a minor amount of construction, no new capacity, and only a minor amount of new environmental mitigation and enhancement measures. Consequently, a 30-year license term for the Nantahala Project is appropriate.

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 Nantahala 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:

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[102] 16 U.S.C. § 808(e) (2006).

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

Nantahala Development

The Nantahala development consisting of: (1) a 1,605-acre reservoir at maximum normal reservoir elevation 3,012.2 feet mean sea level (msl), with a usable storage capacity of 126,000 acre-feet; (2) a 1,042-foot-long, 250-foot-high earth and rockfill dam consisting of; (a) at the east end of the dam, an emergency spillway consisting of two erodible fuse plug sections; (b) a spillway, excavated in rock, controlled by four 25-foot-wide by 19-foot-high Taintor gates; (c) at the west end of the dam, a gated intake at elevation 2,872.2 feet msl that includes 9 steel trashracks with 1.25-inch clear bar spacing; (3) a 16-foot diameter bypass tunnel controlled by two motor-operated sluice gates; (4) a 5.6 mile-long power conduit leading from the dam to the powerhouse consisting of: (a) a 27,633-foot-long section that varies from 12 to 14 feet in diameter; (b) a 19.75-foot-diameter, 230-foot-high surge tank; (c) a 10-foot-diameter steel penstock beneath the surge tank that leads to a 600-foot-long unlined tunnel; and (d) a 1,221-foot-long steel penstock that decreases from 8.5 to 8 feet in diameter; (5) an 88-foot-long by 51-foot-high reinforced concrete powerhouse containing one generating unit with an installed capacity of 43.2 megawatts (MW); (6) a 450-foot-long tailrace section extending from the base of the Nantahala powerhouse to the Nantahala River; and (7) appurtenant facilities. No primary transmission lines are included as part of the Nantahala Project.

Dicks Creek Development

The Dicks Creek development consisting of: (1) a 39-foot-long, 4-foot-high concrete gravity Diamond Valley dam which maintains a negligible size reservoir at elevation 3,048 feet msl, (2) a buried 300-foot-long, 12-inch-diameter pipeline leading from the Diamond Valley dam to the Dicks Creek reservoir; (3) a 109-foot-long, 16-foot-high Dicks Creek concrete gravity dam with a crest elevation at 3,027.6 feet msl surmounted by 3-foot-high flashboards; (4) a 0.2-acre Dicks Creek reservoir with no usable storage; and (5) a 3,870-foot-long, 24 inch diameter steel conduit extending from Dicks Creek dam to a junction with the Nantahala power conduit.

White Oak Creek Development

The White Oak Creek development consisting of: (1) a 115-foot-long, 16-foot-high concrete gravity dam with a spillway section forming the crest of the dam at elevation 3,025.2 feet msl surmounted by 7-foot-high flashboards; (2) a 1.1-acre reservoir with no usable storage; and (3) a 2,045-foot-long power tunnel connected to a 9,400-foot-long, 52-inch-diameter steel pipeline that connects to the Nantahala power conduit.

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

Exhibit A: The following sections of exhibit A filed on February 20, 2004:
Exhibit A - Description of Project, pages A-1 through A-4.

Exhibit F: The following sections of exhibit F filed on November 26, 2004:

Exhibit F Drawing	FERC No. 2692-	Description
Sheet F-1	1001	General Plan Nantahala Development
Sheet F-2	1002	Nantahala Dam –Plan of Dam and Spillways
Sheet F-3	1003	Nantahala Dam – Dam Sections
Sheet F-4	1004	Nantahala Dam – Spillway Sections
Sheet F-5	1005	Nantahala Dam – Power Tunnel Intake Plan and Sections
Sheet F-6	1006	Nantahala Dam – Penstock and Tunnel Plan and Sections
Sheet F-7	1007	Nantahala Powerhouse – Powerhouse Plan
Sheet F-8	1008	Nantahala Powerhouse – Powerhouse Sections
Sheet F-9	1009	Nantahala Powerhouse– Plot Plan
Sheet F-10	1010	Dicks Creek Dam – Plan and Sections
Sheet F-11	1011	White Oak Creek Dam – 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) This license is subject to the conditions submitted by the U.S. Forest Service under section 4(e) of the FPA, as those conditions are set forth in Appendix B to this order.

(F) The Historic Properties Management Plan, Nantahala Hydroelectric Project No. 2692, 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.

(G) This license is also subject to the articles set forth in Form L-1 (Oct. 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Lands of the United States," (*see* 54 F.P.C. 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 the 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:

(a) 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 43.2 megawatts; and

(b) recompensing the United States for the use, occupancy, and enjoyment of 41 acres of its lands (other than for transmission line right-of-way).

Article 202. *Exhibit F Drawings*. Within 45 days of the date of issuance of the license, the licensee shall file the approved Exhibit F 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-2692-1001 through P-2692-1011) 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 Energy Infrastructure Information (CEII) material under 18 C.F.R. § 388.113(c) (2011). 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-2692-1001, 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 Rocky Branch Access Area, the Big Choga Access Area, the Nantahala River bypassed reach barrier-free fishing site, the entire length of the 5.6-mile-long power conduit, the abandoned bypass tunnel (originating at the west abutment of the Nantahala dam), and delineating the 41 acres of federal lands administered by the U.S. Forest Service. 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 shall 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 Nantahala 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 Nantahala 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. *Contract Plans and Specifications*. At least 60 days prior to the start of construction of new minimum flow release devices, the licensee shall submit one copy of its plans and specifications 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). The submittal to the Commission's D2SI-Atlanta Regional Engineer shall also include as part of preconstruction requirements: a Quality Control and Inspection Program, Temporary Construction Emergency Action Plan, and Soil Erosion and Sediment Control Plan. The licensee may not begin any land-disturbing activities until the Commission's D2SI-Atlanta Regional Engineer has reviewed and commented on the plans and specifications, determined that all preconstruction requirements have been satisfied, and authorized start of construction.

Article 303. *Cofferdam Construction Drawings and Deep Excavations*. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction and shall make sure construction of cofferdams and deep excavations are consistent with the approved design. At least 30 days before starting construction of any cofferdams or deep excavations, 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 copies shall be a courtesy copy to the Commission's Director, D2SI), of the approved cofferdam and deep excavation construction drawings and specifications, and the letters of approval.

Article 304. *Public Safety Plan*. At least 60 days prior to the operation of new minimum flow release devices, the licensee shall determine if changes are needed to the project's Public Safety Plan and, if so, 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 copies shall be a courtesy copy to the Commission's Director, D2SI) of the revised plan for review and comment.

Article 305. *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 Nantahala Project according to the reservoir level management provisions, as required by Condition 6 of the North Carolina Department of Environment and Natural Resources, Division of Water Quality water quality certification to protect the aquatic and recreation resources in the Nantahala River and to provide downstream flows.

The licensee shall use the existing float-operating gage or suitable replacement gage to monitor the actual levels of the Nantahala reservoir. The licensee shall calibrate the reservoir stage level gage within 60 days of license issuance and at least once every 2 years thereafter.

The licensee shall maintain the elevation of Nantahala reservoir between the Normal Minimum and Normal Maximum Elevations (Normal Operating Range) indicated in the table below, except when the licensee is permitted to temporarily modify the Normal Operating Range as established in the Low Inflow Protocol (Appendix A to this order) and in the Hydro Project Maintenance & Emergency Protocol (Appendix A to this order). All elevations are relative to the top of each dam, including the flood gates and fuse plugs, 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 Nantahala Reservoir shall be as follows:

*Normal Full Pond Elevation = 100.0 feet = approximately 3,012.2 feet (*USGS datum)*

Month	Normal Minimum Elevation (feet)	Normal Target Elevation (feet)	Normal Maximum Elevation (feet)
Jan	73	78	83
Feb	76	83	88
Mar	78	88	93
Apr	85	93	98
May	93	97	99.5
Jun	93	97	99.5
Jul	93	97	99.5
Aug	91	96	99.5
Sep	88	93	98
Oct	83	88	93
Nov	78	83	88
Dec	73	78	83

*U.S. Geological Survey (USGS)

The licensee shall, to the extent possible, manage reservoir levels to follow the normal target elevations for the Nantahala 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 Nantahala 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) Installation of a wildlife viewing platform at either the Big Choga Access Area or the Rocky Branch Access Area; (2) installation of two kiosks to inform the public about public access and safety; (3) a description of soil erosion and sediment control measures to be used where ground-disturbing activities are proposed; (4) a provision for trash removal from the project recreation sites; (5) a discussion of how the needs of the disabled were considered in the planning and design of the recreation facilities; (6) an evaluation of the existing signage at the recreation sites for accuracy of information and a description of any proposed revisions to the existing signage and any proposed new signage; (7) a schedule for construction of the new facilities; and (8) 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. Rocky Branch Access Area

At the Rocky Branch Access Area: (1) continue to provide a boat ramp; (2) develop a bank fishing area; (3) install a toilet; (4) install lighting to minimize effects on fish and wildlife resources; and (5) pave the parking area for approximately 50 to 60 vehicles with trailers.

C. Big Choga Access Area

At the Big Choga Access Area: (1) continue to provide a boat ramp; (2) develop a bank fishing area; (3) install a toilet; (4) install lighting to minimize effects on fish and wildlife resources; and (5) pave the parking area for approximately 30 to 40 vehicles.

D. Nantahala River Bypassed Reach

At the Nantahala River Bypassed Reach, construct a barrier-free fishing site with parking on licensee-owned land near river mile 14.0.

The Recreation Plan shall be developed after consultation with the U.S. Fish and Wildlife Service, North Carolina Wildlife Resources Commission, the North Carolina Division of Parks and Recreation, North Carolina Natural Heritage Program, and the U.S. Forest 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 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 licensee shall develop the Recreation Plan in coordination with the Virginia spiraea Management Plan required under Article 415, so that recreation enhancements do not conflict with the species and its associated habitat.

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 Nantahala Project*. The licensee shall continue to provide information on reservoir levels and recreation flows on its website for the Nantahala reservoir and the Nantahala River bypassed reach, as well as a link on its website to U.S. Geological Survey (USGS) Gage No. 03505500 in the Nantahala River gorge, or a suitable replacement gage in the vicinity as determined by the USGS to provide information on river flows.

The licensee shall continue to provide information on reservoir levels for the Nantahala reservoir and recreation flows for the Nantahala River bypassed reach and special messages on its telephone system.

Article 404. *Minimum Flows and Minimum Flow Plan.* Upon completing the project modifications required in the Minimum Flow Plan described below, the licensee shall provide the following minimum flows: (1) from the White Oak Creek power conduit, a total of 8 cubic feet per second (cfs) into Dicks Creek from November 1

through May 31 and, after installation of the second valve required in this Article, a total of 16 cfs into Dicks Creek from June 1 through October 31; and (2) from the White Oak Creek dam, after installation of the minimum flow device required by this Article, 8 cfs, or the inflow into White Oak Creek reservoir, whichever is less, into White Oak Creek at the base of the dam from January 1 through December 31.

The licensee shall continue to maintain Dicks Creek as free flowing with outflow from the base of Dicks Creek dam being equal to inflow into Dicks Creek Pond.

The minimum flows may be temporarily modified if required by conditions beyond the control of the licensee, for short periods during annual inspection and repair events, or operating emergencies and 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 above Protocols.

The licensee may modify the 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 Division of Water Quality (North Carolina DWQ), the U.S. Fish and Wildlife Services (FWS), and the 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 Plan

Within 180 days of license issuance, the licensee shall file with the Commission for approval, a Minimum Flow Plan to modify the project facilities in order to provide the minimum flows as specified above, and monitor the recreation flows required in Article 405 and Article 406. The plan shall include the following provisions: (1) maintain the existing minimum flow valve capable of releasing up to 8 cfs, as calibrated and metered at the valve, from the White Oak Creek power conduit into Dicks Creek; (2) install an additional minimum flow valve capable of releasing up to 8 cfs, as calibrated and metered at the valve, from the White Oak Creek power conduit into Dicks Creek; (3) install and maintain a minimum flow device capable of releasing up to 8 cfs, as calibrated and metered at the device, from the White Oak Creek dam into White Oak Creek; (4) a method to measure the best efficiency flow releases (approximately 525 cfs) as required in Article 405; and (5) install and maintain a flow gage to measure flows, as required in Article 406, immediately below the confluence of White Oak Creek with the Nantahala River.

The plan shall be developed after consultation with the North Carolina WRC, the North Carolina DWR, the North Carolina DWQ, 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 licensee shall complete the modifications of project facilities, as identified above, within 1 year following Commission approval of the plan. The licensee shall file with the Commission documentation that the modifications have been completed.

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 for the Nantahala River*. Within 1 year of license issuance, the licensee shall operate the Nantahala Project to provide the following Normal Generation Schedule to Support Recreation, at or above the best efficiency flow (approximately 525 cubic feet per second), at the Nantahala Project powerhouse:

Period	**Schedule**
2nd Monday in March through March 31	10:00 a.m. to 3:00 p.m., 7 days per week
April	10:00 a.m. to 4:00 p.m., 7 days per week
May through Labor day, except as noted below	9:00 a.m. to 5:00 p.m., 7 days per week
Saturday and Sunday preceding Memorial Day	9:00 a.m. to 6:00 p.m.
Saturday and Sunday preceding Labor Day	9:00 a.m. to 6:00 p.m.
September after Labor Day (Sunday through Friday)	10:00 a.m. to 4:00 p.m., 6 days per week
September after Labor Day (Saturday)	9:00 a.m. to 5:00 p.m., 1 day per week
October (Sunday through Friday)	10:00 a.m. to 3:00 p.m., 6 days per week
October (Saturday)	9:00 a.m. to 5:00 p.m., 1 day per week

Provided the sponsoring or requesting organization has consulted, at a minimum, 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. Forest Service (Forest Service), and Nantahala Gorge Association and has integrated their needs with the Normal Generation Schedule to Support Recreation as much as possible, the licensee shall operate the Nantahala powerhouse to provide up to 70 hours annually of additional flow releases to support whitewater boating races, and consider on a case-by-case basis additional releases to support other special events.

Provided the sponsoring or requesting organization has consulted, at a minimum, with the North Carolina WRC, the North Carolina DWR, the FWS, the Forest Service, and Nantahala Gorge Association and has integrated their needs with the Normal Generation Schedule to Support Recreation as much as possible, the licensee shall 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 shift the hours of generation to different times or reduce the total hours of releases to conserve the available water supply, but is not required to consider requests that add additional hours to the Normal Generation Schedule to Support Recreation for the month.

The licensee may temporarily modify the flow releases 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 and shall provide the reason for the change in the flow releases.

Article 406. *Recreation Flow Releases at Nantahala Dam*. Within 1 year of license issuance, the licensee shall operate the Nantahala Project to provide the following recreation flows using a Tainter gate at the Nantahala dam. The target recreation flows and times shall be for flows and flow arrival times as measured immediately below the confluence of White Oak Creek with the Nantahala River:

When	**Dates**	**Target Flow (cfs)**	**Hours**	**Times**
One Spring Saturday	One Weekend Between April 15 and 30	250	6	10 a.m. to 4 p.m.
One Spring Sunday		350	6	
Four Summer Afternoons	Between June 15 and August 31	250	3	4 p.m. to 7 p.m.
		250	3	4 p.m. to 7 p.m.
		250	3	4 p.m. to 7 p.m.
		250	3	4 p.m. to 7 p.m.
One Fall Saturday	One Weekend Between September 15 and 30	300	7	10 a.m. to 5 p.m.
One Fall Sunday		425 250 (These flows shall occur as a single event)	5 2	10 a.m. to 3 p.m. 3 p.m. to 5 p.m.

The actual release dates shall be determined annually after consultation with the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Resources, the U.S. Fish and Wildlife Service, the U.S. Forest Service, American Whitewater, Carolina Canoe Club, Nantahala Gorge Association, and Trout Unlimited.

The licensee may temporarily modify 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 and shall provide the reason for the change in the recreation flow releases.

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. Forest Service, American Whitewater, Carolina Canoe Club, Nantahala Gorge Association, and Trout Unlimited to discuss any modifications to the recreation flow releases, after 5 years of releases into the Nantahala River bypassed reach. By October 31 of year 6 of the license, the licensee shall file with the Commission a report that summarizes the meeting. The report shall include recommendations for Commission approval of any modification to the scheduled recreation flows prior to implementation. Thereafter, every 6 years during the term of the license, the licensee shall file the report with the Commission, including any modifications to the recreation flows for Commission approval.

The Commission reserves the right to require modifications to the scheduled recreation flows. Upon Commission approval of any recommendations the licensee shall implement the revised 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 Nantahala Hydroelectric Project to protect the scenic quality and environmental resources at the project. The plan shall incorporate the Shoreline Management Guidelines filed on February 20, 2004, Nantahala Hydroelectric Project license application, Volume IV, Attachment D, that specifically pertain to the Nantahala 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 Nantahala 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 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 409. *Sediment Management Plan.* The licensee shall minimize the drawdown of the Nantahala Project reservoir 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 reservoir 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 or reservoir drawdown, the licensee shall file with the Commission for approval, a plan to remove and dispose of accumulated sediment from Nantahala reservoir to minimize environmental effects on downstream aquatic resources, including riparian habitat, sensitive to sedimentation. The licensee shall identify the disposal site and measures that shall be implemented to control runoff from the site.

The Sediment Management Plan shall include, but not be limited to, the following items: (1) a provision for best management practices to control sedimentation in the reservoir just upstream of the Nantahala dam, White Oak Creek dam, Diamond Valley dam, or Dicks Creek dam 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 the North Carolina Wildlife Resources Commission, the U.S. Fish and Wildlife Service, the U.S. Forest 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. *Operation 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 documents compliance with the following during the previous calendar year: (1) the Reservoir Level Management provisions required in Article 401 that includes a table of the elevations of Nantahala reservoir on a daily basis 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 and any deviations of the minimum flow release requirements; and (3) the recreation flow releases from the Nantahala Project required by Article 405 and Article 406 were met and any deviations of the recreation flow releases.

The licensee's compliance filing 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 and measures implemented to prevent a recurrence.

Article 412. *Woody Debris and Trash 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 Nantahala dam to improve aquatic habitat in the Nantahala 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; (3) a provision to remove man-made trash from the intake racks and properly dispose of the trash; and (4) an implementation schedule.

The Woody Debris and Trash 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, the U.S. Fish and Wildlife Service, and the U.S. Forest 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 Nantahala Hydroelectric Project No. 2692 in Macon and Clay Counties, 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 authority to require changes to the HPMP at any time during the term of the license.

Article 415. *Virginia spiraea Management Plan.* Within 1 year of license issuance, the licensee shall file with the Commission for approval, a Virginia spiraea Management Plan to protect the species at the Nantahala Hydroelectric Project. The plan shall include, but not be limited to, the following items: (1) a schedule for conducting

additional Virginia spiraea surveys within the project boundary; (2) a description of reporting methods to disclose the information obtained from the surveys; (3) a description of the monitoring protocols and any measures identified to protect the Virginia spiraea; and (4) a provision to eliminate or control the growth of invasive species, such as Japanese knotweed, adjacent to, or near, the Virginia spiraea within the project boundary.

The Virginia spiraea Management Plan shall be developed after consultation with the U.S. Fish and Wildlife Service, the U.S. Forest Service, the North Carolina Wildlife Resources Commission, and the North Carolina Natural Heritage Program. 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 416. *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 5 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.

(H) 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.

(I) 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 (2011). 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-1 (October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION
TERMS AND CONDITIONS OF LICENSE
FOR CONSTRUCTED MAJOR PROJECT AFFECTING
LANDS OF THE UNITED STATES

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. Timber on lands of the United State cut, used, or destroyed in the construction and maintenance of the project works, or in the clearing of said lands, shall be paid for, and the resulting slash and debris disposed of, in accordance with the requirements of the agency of the United States having jurisdiction over said lands. Payment for merchantable timber shall be at current stumpage rates, and payment for young growth timber below merchantable size shall be at current damage appraisal values. However, the agency of the United States having jurisdiction may sell or dispose of the merchantable timber to others than the Licensee: Provided, That timber so sold or disposed of shall be cut and removed from the area prior to, or without undue interference with, clearing operations of the Licensee and in coordination with the Licensee's project construction schedules. Such sale or disposal to others shall not relieve the Licensee of responsibility for the clearing and disposal of all slash and debris from project lands.

Article 22. The Licensee shall do everything reasonably within its power, and shall

require its employees, contractors, and employees of contractors to do everything reasonably within their power, both independently and upon the request of officers of the agency concerned, to prevent, to make advance preparations for suppression of, and to suppress fires on the lands to be occupied or used under the license. The Licensee shall be liable for and shall pay the costs incurred by the United States in suppressing fires caused from the construction, operation, or maintenance of the project works or of the works appurtenant or accessory thereto under the license.

Article 23. The Licensee shall interpose no objection to, and shall in no way prevent, the use by the agency of the United States having jurisdiction over the lands of the United States affected, or by persons or corporations occupying lands of the United States under permit, of water for fire suppression from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license, or the use by said parties of water for sanitary and domestic purposes from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license.

Article 24. The Licensee shall be liable for injury to, or destruction of, any buildings, bridges, roads, trails, lands, or other property of the United States, occasioned by the construction, maintenance, or operation of the project works or of the works appurtenant or accessory thereto under the license. Arrangements to meet such liability, either by compensation for such injury or destruction, or by reconstruction or repair of damaged property, or otherwise, shall be made with the appropriate department or agency of the United States.

Article 25. The Licensee shall allow any agency of the United States, without charge, to construct or permit to be constructed on, through, and across those project lands which are lands of the United States such conduits, chutes, ditches, railroads, roads, trails, telephone and power lines, and other routes or means of transportation and communication as are not inconsistent with the enjoyment of said lands by the Licensee for the purposes of the license. This license shall not be construed as conferring upon the Licensee any right of use, occupancy, or enjoyment of the lands of the United States other than for the construction, operation, and maintenance of the project as stated in the license.

Article 26. In the construction and maintenance of the project, the location and standards of roads and trails on lands of the United States and other uses of lands of the United States, including the location and condition of quarries, borrow pits, and spoil disposal areas, shall be subject to the approval of the department or agency of the United States having supervision over the lands involved.

Article 27. The Licensee shall make provision, or shall bear the reasonable cost, as determined by the agency of the United States affected, of making provision for avoiding inductive interference between any project transmission line or other project facility constructed, operated, or maintained under the license, and any radio installation, telephone line, or other communication facility installed or constructed before or after construction of such project transmission line or other project facility and owned, operated, or used by such agency of the United States in administering the lands under its jurisdiction.

Article 28. The Licensee shall make use of the Commission's guidelines and other recognized guidelines for treatment of transmission line rights-of-way, and shall clear such portions of transmission line rights-of-way across lands of the United States as are designated by the officer of the United States in charge of the lands; shall keep the areas so designated clear of new growth, all refuse, and inflammable material to the satisfaction of such officer; shall trim all branches of trees in contact with or liable to contact the transmission lines; shall cut and remove all dead or leaning trees which might fall in contact with the transmission lines; and shall take such other precautions against fire as may be required by such officer. No fires for the burning of waste material shall be set except with the prior written consent of the officer of the United States in charge of the lands as to time and place.

Article 29. The Licensee shall cooperate with the United States in the disposal by the United States, under the Act of July 3l, 1947, 61 Stat. 681, as amended (30 U.S.C. sec. 601, et seq.), of mineral and vegetative materials from lands of the United States occupied by the project or any part thereof: Provided, That such disposal has been authorized by the Commission and that it does not unreasonably interfere with the occupancy of such lands by the Licensee for the purposes of the license: Provided further, That in the event of disagreement, any question of unreasonable interference shall be determined by the Commission after notice ad opportunity for hearing.

Article 30. 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 31. 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 32. 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 Nantahala Hydroelectric Project Issued By the North Carolina Department of Environment and Natural Resources, Division of Water Quality (DWQ) Issued 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 Nantahala 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 Nantahala 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 Nantahala Project appropriate 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 NCST 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 for Bypassed Reaches); Section 7.0 Shoreline Management; Section 9.0 (Sediment Management Agreements); Section 13.0 (Agreements on Compliance Monitoring and Reporting Requirements) as well as Attachment B – Low Inflow Protocol (LIP) for the Nantahala Project and Attachment C – Hydro Project Maintenance and Emergency Protocol (HPMEP) for the Nantahala Project. 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 Nantahala Project

Introduction

This Low Inflow Protocol (LIP) provides trigger points and procedures for how the Nantahala Project (FERC # 2692) will be operated by the Licensee during periods of low inflow (i.e. periods when there is not enough water flowing into Nantahala Lake 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 needs of whitewater boaters in the main stem of the Nantahala River, in addition to providing minimum flows in bypassed stream reaches, scheduled Tainter gate releases 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 Nantahala Lake, Whiteoak Creek Pond or Dicks Creek Pond 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 Nantahala Lake level returns to its Normal Operating Range.

Key Facts and Assumptions

1. Dicks Creek – Dicks Creek will continue to be free-flowing with inflow into the pond formed by Dicks Creek Diversion Dam being equal to the outflow at the base of the dam. No water will be diverted into the penstock at Dicks Creek Diversion Dam.

2. Minimum Flows in Bypassed Stream Reaches – Assume the new license for this project will include the following requirements for minimum releases from hydro project works into bypassed stream reaches to enhance water quality and/or aquatic species habitat (except during periods of low inflow covered by a low inflow protocol):

   a. **Nantahala River Bypassed Reach**

      i) Minimum Flow Valve #1 - Maintain the existing minimum flow valve capable of releasing up to 8 cfs from the Whiteoak Creek Penstock into Dicks Creek to provide flows in the Nantahala River Bypassed Reach.

      ii) Minimum Flow Valve #2 - Install an additional minimum flow valve capable of releasing up to 8 cfs from the Whiteoak Creek Penstock into Dicks Creek to provide flows in the Nantahala River Bypassed Reach.

      iii) From the two minimum flow valves located on the Whiteoak Creek Penstock, provide a total of the following releases into Dicks Creek to provide flows in the Nantahala River Bypassed Reach:

         1. From November 1 through May 31, 8 cfs.

2. From June 1 through October 31, 16 cfs.

b. **Whiteoak Creek Bypassed Reach**

i) Whiteoak Creek Diversion Dam - Provide 8 cfs or inflow into Whiteoak Creek Pond, whichever is less, from the Whiteoak Creek Diversion Dam into the Whiteoak Creek Bypassed Reach from January 1 through December 31.

3. Normal Generation Releases for Recreation – Assume the new license for this project will include the following requirements for a Normal Generation Schedule to Support Recreation at the Nantahala Powerhouse, with all releases being at or above the Best Efficiency Flow for the Nantahala Hydro Unit:

a. 2nd Monday in March through March 31 – 10:00 am to 3:00 pm, seven days per week

b. April – 10:00 am to 4:00 pm, seven days per week

c. May through Labor Day – 9:00 am to 5:00 pm, seven days per week, plus provide one additional hour to the schedule (i.e. 9:00 am to 6:00 pm) on both the Saturday and Sunday before Memorial Day and Labor Day

d. September after Labor Day – 10:00 am to 4:00 pm Sunday through Friday, 9:00 am to 5:00 pm Saturday

e. October – 10:00 am to 3:00 pm Sunday through Friday, 9:00 am to 5:00 pm Saturday.

4. Other Prescribed Generation Releases – Assume the new license for this project will also include the following requirements for prescribed generation releases in addition to the above Normal Generation Schedule to Support Recreation:

a. **Whitewater Races** - Provide up to 70 hrs per calendar year of generation releases (all at or above the Best Efficiency Flow for the Nantahala Hydro Unit) to support major whitewater races. 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.

b. **Other Special Events** – Other non-race 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 this project will include the following requirements for scheduled releases from Nantahala Dam into the Nantahala River Bypassed Reach to enhance downstream recreation:

   a. **Spring Weekend** - Release water for six hours per day for one weekend (Saturday and Sunday) per year, scheduled between April 15 and April 30. Target flowrates will be approximately 250 cfs on Saturday and approximately 350 cfs on Sunday. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 10:00 am.

   b. **Summer Afternoons** - Provide four total afternoon releases per calendar year for three hrs each at a target flowrate of approximately 250 cfs, scheduled between June 15 and August 31. Releases will be

timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 4:00 pm.

c. **Fall Weekend** - Release water for seven hours per day for one weekend per year, scheduled between September 15 and September 30. Releases will be for seven hours at a target flowrate of approximately 300 cfs on Saturday; and five hours at a target flowrate of approximately 425 cfs followed by two hours at a target flowrate of approximately 250 cfs on Sunday. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 10:00 am.

d. **Target Flowrates** - The target flowrates stated above are for flowrates immediately below the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam). Actual release amounts from the Tainter gates need to be large enough that when combined with other tributary and accretion flows, the total is at or above the approximate target flowrates.

6. 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. For Nantahala Lake, Normal Full Pond Elevation is at 3012.2 ft above Mean Sea Level. 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.

7. 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.

8. 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 17 below for special drought storage considerations).

9. 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.

10. 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 17 below for special drought storage considerations). Assume the new license for this project will include requirements for the following Normal Operating Range:

Month	Normal Minimum Elevation (ft)	Normal Target Elevation (ft)	Normal Maximum Elevation (ft)
Jan	73	78	83
Feb	76	83	88
Mar	78	88	93
Apr	85	93	98
May	93	97	99.5
Jun	93	97	99.5
Jul	93	97	99.5
Aug	91	96	99.5
Sep	88	93	98
Oct	83	88	93
Nov	78	83	88
Dec	73	78	83

Note: The above are the Normal Maximum, Normal Minimum and Normal Target Elevations for the first day of each month. The Normal Maximum, Normal Minimum and Normal Target Elevations for any other day of the month can be determined by linear interpolation.

11. 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.

12. 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 Nantahala Project:

Period	Normal Minimum Generation Volume (ac-ft / week)	Corresponding Energy Production (MWH / week)
May – Feb	2430	2324
Mar	1519	1453
Apr	1822	1743

Note: The above water volumes and generation amounts assume that the new runner at Nantahala Hydro Station is operating at its Best Efficiency Point and is producing 41.5 MW and releasing 525 cfs for eight hrs per day, seven days per week from May through February; five hrs per day, seven days per week in March and six hrs per day, seven days per week in April**.** The above water volumes and generation amounts include both the energy produced by the hydro turbine 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.

13. 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. **Whiteoak Creek Bypassed Reach -** 2 cfs or inflow into Whiteoak Creek Pond, whichever is less, released from Whiteoak Creek Diversion Dam into the Whiteoak Creek Bypassed Reach.
b. **Nantahala River Bypassed Reach** – The following combined flowrates released from the two Spill Valves on the Whiteoak Creek Penstock:
    i) From November 1 through May 31 – 2 cfs
    ii) From June 1 through October 31 – 5 cfs.

14. Priority of Reducing Minimum Flows – when making reductions in minimum flows in the bypassed reaches, the following priority will be used, reducing each release point to its Threshold Minimum Flow value before moving to the next release point:
    a. Reduce the spill at Whiteoak Creek Diversion Dam
    b. Reduce the flowrates from the Spill Valves on the Whiteoak Creek Penstock

15. 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.

16. 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.

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

18. Threshold Bypass Whitewater Recreation Release – the duration and target flowrate below which Tainter gate releases in the Nantahala River 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 175 cfs (target flowrate immediately below the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam)) for 2 hours duration.

19. Priority of Reducing Tainter Gate Releases for Whitewater Recreation – when making reductions in Tainter gate releases for whitewater recreation in the Nantahala River 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. 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. For days where the scheduled release included

hours at two different target flowrates, the reduction should be made in the following order:

a. Reduce duration of the release for the lower scheduled flowrate in steps until the duration equals the above stated threshold duration (see Item 18 above).
b. Reduce duration of the release for the higher scheduled flowrate in steps until the duration equals the above stated threshold duration (see Item 18 above).
c. Reduce targeted flowrate of the release for the lower scheduled flowrate in steps until it equals the above stated threshold flowrate (see Item 18 above).
d. Reduce targeted flowrate of the release for the higher scheduled flowrate in steps until it equals the above stated threshold flowrate (see Item 18 above).

20. 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. Except for an outage of the Whiteoak Creek Penstock or Diversion Dam or a stuck-open Tainter gate on Nantahala Dam, lowering levels of Nantahala Lake 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.

a. 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), American Whitewater Affiliation (AW), United States Geological Survey (USGS) and the Nantahala Gorge Association (NGA).

b. 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 regarding adjustments to generation amounts, minimum flow releases, Tainter gate releases from Nantahala Dam 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 elevation cannot be maintained at or above the Normal Minimum Elevation for the time of year specified above, the Licensee will reduce minimum generation volume to a lower amount (referred to as the Stage 1 Minimum Generation Volume and expressed in MWH/wk) as determined below:

Period	Normal Min. Generation Volume (MWH/wk)	Stage 1 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
May 1 – Feb 29	2324	2034	12.5
Mar 1 – Mar 31	1453	1162	20
Apr 1 – Apr 30	1743	1452	16.7

Note: The above reductions represent a one-hour per day reduction in generation from the normal schedules. This reduction will be split equally between the Licensee's dispatch periods and the scheduled generation releases to support downstream recreation. If any additional hours of generation releases were scheduled to support whitewater races or other special events, then

those uses will be required to use the modified releases as noted above. The average water volume reduction for the 12-month period represented above is 13.2%.

2. At the same time, the Licensee will reduce the minimum flow release from Whiteoak Creek Diversion Dam to a new flowrate (referred to as the Stage 1 Whiteoak Creek Diversion Dam Minimum Flow and expressed in cfs) as determined below:

Period	**Normal Total Min. Flows in the Bypassed Reaches (cfs)**	**Normal Min. Flow at Whiteoak Creek Diversion Dam (cfs)**	**Stage 1 Whiteoak Creek Diversion Dam Min. Flow (cfs)**	**% Reduction From Normal Water Volume Used**
Nov 1 – May 31	16	8 cfs or inflow to Whiteoak Creek Pond, whichever is less	6	12.5
Jun 1 – Oct 31	24	8 cfs or inflow to Whiteoak Creek Pond, whichever is less	5	12.5

3. At the same time, if recreation releases from the Nantahala 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	Sat. – 6-hr release @ 250 cfs Sun. – 6-hr release@ 350 cfs	Sat. – 5-hr release @ 250 cfs Sun.- 5-hr release@ 350 cfs	16.7
Summertime Afternoons between June 15 and August 31	3-hr release @ 250 cfs	2-hr release @ 250 cfs	33.3
Fall Weekend between September 15 and September 30	Sat. – 7-hr release @ 300 cfs Sun. – 5-hr release @ 425 cfs, 2-hr release @ 250 cfs	Sat. – 6-hr release @ 300 cfs Sun. – 4-hr release @ 425 cfs, 2-hr release @ 250 cfs	15.3

Note: * Target flowrates are just below the confluence of Whiteoak Creek and the Nantahala River.

4. At the same time, the Licensee will reduce the reservoir's Normal Minimum Elevation by three feet for the relevant time period as shown above. The newly modified minimum elevation is referred to as the Stage 1 Minimum Elevation. (Note: Three feet represents 11% of the total 26.5-ft bandwidth provided by the Normal Operating Range).

5. The Licensee will directly notify NCDWR, NCWRC, USFWS, USFS, the NGA President and the AW representative when Stage 1 reductions are implemented. If additional generation releases were scheduled to support whitewater races or other special events, the Licensee will

include the event sponsor in this direct notification. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

6. 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 elevation cannot be maintained at or above the Stage 1 Minimum Elevation for the time of year 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. Generation Volume (MWH/wk)	Stage 2 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
May 1 – Feb 29	2324	1743	25
Mar 1 – Mar 31	1453	872	40
Apr 1 – Apr 30	1743	1162	33.4

Note: The above reductions represent a two-hour per day reduction in generation from the normal schedules. This reduction will be split equally between the Licensee's dispatch periods and the scheduled generation releases to support downstream recreation. If any additional hours of generation releases were scheduled to support whitewater races or other special events, then those uses will be required to use the modified releases as noted above. The average water volume reduction for the 12-month period represented above is 26.4%.

2. At the same time, the Licensee will reduce the minimum flow release from Whiteoak Creek Diversion Dam to a new flowrate (referred to as the Stage 2 Whiteoak Creek Diversion Dam Minimum Flow and expressed in cfs) as determined below:

Period	**Normal Total Min. Flows in the Bypassed Reaches (cfs)**	**Normal Min. Flow at Whiteoak Creek Diversion Dam (cfs)**	**Stage 2 Whiteoak Creek Diversion Dam Min. Flow (cfs)**	**% Reduction From Normal Water Volume Used**
Nov 1 – May 31	16	8 cfs or inflow to Whiteoak Creek Pond, whichever is less	4	25.0
Jun 1 – Oct 31	24	8 cfs or inflow to Whiteoak Creek Pond, whichever is less	2 (*)	25.0

Note: * 2 cfs is the Threshold Minimum Flow for this location.

3. At the same time, if recreation releases from the Nantahala Dam are scheduled during Stage 2 reductions, then the releases will be reduced as noted below:

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@ 350 cfs	Sat. – 4-hr release @ 250 cfs Sun.- 4-hr release@ 350 cfs	33.3
Summertime Afternoons between June 15 and August 31	3-hr release @ 250 cfs	2-hr release @ 250 cfs	33.3
Fall Weekend between September 15 and September 30	Sat. – 7-hr release @ 300 cfs Sun. – 5-hr release @ 425 cfs, 2-hr release @ 250 cfs	Sat. – 5-hr release @ 300 cfs Sun. – 3-hr release @ 425 cfs, 2-hr release @ 250 cfs	28.6

Note: * Target flowrates are just below the confluence of Whiteoak Creek and the Nantahala River.

4. At the same time, the Licensee will reduce the reservoir's minimum elevation by an additional three feet (six feet total below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevation is referred to as the Stage 2 Minimum Elevation. (Note: Six feet represents 23% of the total 26.5-ft bandwidth provided by the Normal Operating Range).

5. The Licensee will directly notify the NGA President and the AW representative when Stage 2 reductions are implemented. If additional generation releases were scheduled to support whitewater races or other special events, the Licensee will include the event sponsor in this direct

notification. If these Stage 2 reductions occur in June through October, the Licensee will also notify the NCDWR, NCWRC, USFWS and the USFS that the minimum flow from Whiteoak Creek Diversion Dam is at its Threshold Level. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

6. 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 elevation cannot be maintained at or above the Stage 2 Minimum Elevation for the time of year 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. Generation Volume (MWH/wk)	Stage 3 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
May 1 – Feb 29	2324	1453	37.5
Mar 1 – Mar 31	1453	581	60
Apr 1 – Apr 30	1743	871	50.1

Note: The above reductions represent a three-hour per day reduction in generation from the normal schedules. This reduction will be split equally between the Licensee's dispatch periods and the scheduled generation releases to support downstream recreation. If any additional hours of generation releases were scheduled to support whitewater races or other special events, then

those uses will be required to use the modified releases as noted above. The average water volume reduction for the 12-month period represented above is 39.5%.

2. At the same time, the Licensee will reduce the minimum flow release from Whiteoak Creek Diversion Dam to its Threshold Minimum Flow value of 2 cfs or inflow to Whiteoak Creek Pond, whichever is less.

3. At the same time, the Licensee will reduce the minimum flow release from the spill valves located on the Whiteoak Creek Penstock to a new combined flowrate (referred to as the Stage 3 Whiteoak Creek Penstock Combined Valve Flow and expressed in cfs) as determined below:

Period	**Normal Total Min. Flows in the Bypassed Reaches (cfs)**	**Normal Combined Min. Flow From the Whiteoak Creek Penstock Spill Valves (cfs)**	**Stage 3 Whiteoak Creek Penstock Combined Valve Flow (cfs)**	**% Reduction From Normal Water Volume Used (*)**
Nov 1 – May 31	16	8	8	37.5
Jun 1 – Oct 31	24	16	13	37.5

Note: * % reductions include the 6 cfs minimum flow reduction implemented at Whiteoak Creek Diversion Dam.

4. At the same time, if recreation releases from the Nantahala Dam are scheduled during Stage 3 reductions, then the releases will be reduced as noted below:

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@ 350 cfs	Sat. – 3-hr release @ 250 cfs Sun.- 3-hr release@ 350 cfs	50
Summertime Afternoons between June 15 and August 31	3-hr release @ 250 cfs	2-hr release @ 175 cfs (**)	46.7
Fall Weekend between September 15 and September 30	Sat. – 7-hr release @ 300 cfs Sun. – 5-hr release @ 425 cfs, 2-hr release @ 250 cfs	Sat. – 4-hr release @ 300 cfs Sun. – 2-hr release @ 425 cfs, 2-hr release @ 250 cfs	46.0

Notes: * Target flowrates are just below the confluence of Whiteoak Creek and the Nantahala River.

** The Threshold Bypass Whitewater Recreation Release is 2-hr @ 175 cfs.

5. At the same time, the Licensee will reduce the reservoir's minimum elevation by an additional three feet (nine feet total below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevation is referred to as the Stage 3 Minimum Elevation. (Note: Nine feet represents 34% of the total 26.5-ft bandwidth provided by the Normal Operating Range).

6. The Licensee will directly notify the NGA President and the AW representative when Stage 3 reductions are implemented. If additional generation releases were scheduled to support whitewater races or other special events, the Licensee will include the event sponsor in this direct notification. The Licensee will also notify the NCDWR, NCWRC, USFWS and the USFS of these Stage 3 reductions and that the

minimum flow from Whiteoak Creek Diversion 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 4 Reductions

1. Upon a determination by the Licensee that the reservoir elevation cannot be maintained at or above the Stage 3 Minimum Elevation for the time of year 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. Generation Volume (MWH/wk)	Stage 4 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
May 1 – Feb 29	2324	1162	50
Mar 1 – Mar 31	1453	290	80
Apr 1 – Apr 30	1743	580	66.8

Note: The above reductions represent a four-hour per day reduction in generation from the normal schedules. This reduction will be split equally between the Licensee's dispatch periods and the scheduled generation releases to support downstream recreation. If any additional hours of generation releases were scheduled to support whitewater races or other special events, then those uses will be required to use the modified releases as noted above. The average water volume reduction for the 12-month period represented above is 52.8%.

2. At the same time, the Licensee will maintain the minimum flow release from Whiteoak Creek Diversion Dam at its Threshold Minimum Flow value of 2 cfs or inflow to Whiteoak Creek Pond, whichever is less. (Note: This is the same as the Stage 3 Whiteoak Creek Diversion Dam Minimum Flow).

3. At the same time, the Licensee will reduce the minimum flow release from the spill valves located on the Whiteoak Creek Penstock to a new combined flowrate (referred to as the Stage 4 Whiteoak Creek Penstock Combined Valve Flow and expressed in cfs) as determined below:

Period	**Normal Total Min. Flows in the Bypassed Reaches (cfs)**	**Normal Combined Min. Flow From the Whiteoak Creek Penstock Spill Valves (cfs)**	**Stage 4 Whiteoak Creek Penstock Combined Valve Flow (cfs)**	**% Reduction From Normal Water Volume Used (*)**
Nov 1 – May 31	16	8	6	50.0
Jun 1 – Oct 31	24	16	9	54.2

Note: * % reductions include the 6 cfs minimum flow reduction implemented at Whiteoak Creek Diversion Dam.

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@ 350 cfs	Sat. – 2-hr release @ 250 cfs Sun.- 2-hr release@ 350 cfs	66.7
Summertime Afternoons between June 15 and August 31	3-hr release @ 250 cfs	2-hr release @ 175 cfs (**)	46.7
Fall Weekend between September 15 and September 30	Sat. – 7-hr release @ 300 cfs Sun. – 5-hr release @ 425 cfs, 2-hr release @ 250 cfs	Sat. – 3-hr release @ 300 cfs Sun. – 2-hr release @ 425 cfs, 2-hr release @ 175 cfs (**)	55.6

Notes: * Target flowrates are just below the confluence of Whiteoak Creek and the Nantahala River.

** The Threshold Bypass Whitewater Recreation Release is 2-hr @ 175 cfs.

4. At the same time, if recreation releases from the Nantahala Dam are scheduled during Stage 4 reductions, then the releases will be reduced as noted below:

5. At the same time, the Licensee will reduce the reservoir's minimum elevation by an additional three feet (twelve feet total below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevation is referred to as the Stage 4 Minimum Elevation. (Note: Twelve feet represents 45% of the total 26.5-ft bandwidth provided by the Normal Operating Range).

6. The Licensee will directly notify the NGA President and the AW representative when Stage 4 reductions are implemented. If additional generation releases were scheduled to support whitewater races or other special events, the Licensee will include the event sponsor in this direct notification. 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 elevation cannot be maintained at or above the Stage 4 Minimum Elevation for the time of year 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. Generation Volume (MWH/wk)	Stage 5 Min. Generation Volume (MWH/wk)	% Reduction From Normal Water Volume Used
May 1 – Feb 29	2324	872	62.5
Mar 1 – Mar 31	1453	290	80
Apr 1 – Apr 30	1743	290	83.4

Notes: The above reductions represent a five-hour per day reduction in generation from the normal schedules in Apr – Feb, with only a four-hour reduction in Mar. March generation was kept at one hour per day to ensure some continued generation and flow in the main stem of the river. These

reductions will be split equally between the Licensee's dispatch periods and the scheduled generation releases to support downstream recreation. If any additional hours of generation releases were scheduled to support whitewater races or other special events, then those uses will be required to use the modified releases as noted above. The average water volume reduction for the 12-month period represented above is 64.8%.

2. At the same time, the Licensee will maintain the minimum flow release from Whiteoak Creek Diversion Dam at its Threshold Minimum Flow value of 2 cfs or inflow to Whiteoak Creek Pond, whichever is less. (Note: This is the same as the Stage 3 Whiteoak Creek Diversion Dam Minimum Flow).

3. At the same time, the Licensee will reduce the minimum flow release from the spill valves located on the Whiteoak Creek Penstock to a new combined flowrate (referred to as the Stage 5 Whiteoak Creek Penstock Combined Valve Flow and expressed in cfs) as determined below:

Period	**Normal Total Min. Flows in the Bypassed Reaches (cfs)**	**Normal Combined Min. Flow From the Whiteoak Creek Penstock Spill Valves (cfs)**	**Stage 5 Whiteoak Creek Penstock Combined Valve Flow (cfs)**	**% Reduction From Normal Water Volume Used (*)**
Nov 1 – May 31	16	8	4	62.5
Jun 1 – Oct 31	24	16	6	66.7

Note: * % reductions include the 6 cfs minimum flow reduction implemented at Whiteoak Creek Diversion Dam.

4. At the same time, if recreation releases from the Nantahala Dam are scheduled during Stage 5 reductions, then the releases will be reduced as noted below:

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@ 350 cfs	Sat. – 4-hr release @ 175 cfs (**) Sun. - No release.	80.6
Summertime Afternoons between June 15 and August 31	3-hr release @ 250 cfs	2-hr release @ 175 cfs (**)	46.7
Fall Weekend between September 15 and September 30	Sat. – 7-hr release @ 300 cfs Sun. – 5-hr release @ 425 cfs, 2-hr release @ 250 cfs	Sat. – 4-hr release @ 175 cfs (**) Sun. - No release.	85.2

Notes: * Target flowrates are just below the confluence of Whiteoak Creek and the Nantahala River.

** The Threshold Bypass Whitewater Recreation Release is 2-hr @ 175 cfs.

5. At the same time, the Licensee will reduce the reservoir's minimum elevation by an additional three feet (fifteen feet total below the Normal Minimum Elevation) for the relevant time period as shown above. The newly modified minimum elevation is referred to as the Stage 5 Minimum Elevation. (Note: Fifteen feet represents 57% of the total 26.5-ft bandwidth provided by the Normal Operating Range).

6. The Licensee will directly notify the NGA President and the AW representative when Stage 5 reductions are implemented. If additional

generation releases were scheduled to support whitewater races or other special events, the Licensee will include the event sponsor in this direct notification. 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 elevation cannot be maintained at or above the Stage 5 Minimum Elevation, the Licensee will continue with the conditions as established by the Stage 5 reductions, except for Stage 6 and beyond:
   a. All Tainter gate releases for whitewater recreation in the Nantahala River Bypassed Reach are cancelled
   b. The Whiteoak Creek Penstock Combined Valve Flow will be maintained at the Threshold Minimum Flow of 2 cfs (November 1 through May 31) or 5 cfs (June 1 through October 31)
   c. The minimum generation volume for the May 1 through February 29 period will be reduced by an additional hour per day for each stage until it reaches 290 MWH/wk (i.e. one hour per day of generation, seven days per week). This reduction will be split equally between the Licensee's dispatch periods and the scheduled generation releases to support downstream recreation.
   d. The minimum lake elevation will be reduced by an additional three feet for each stage.

2. Once the minimum generation volume has been reduced to one hour per day, seven days a week for all parts of the year (i.e. 290 MWH/wk), all recreation releases in the Nantahala River Bypassed Reach have been cancelled and all minimum flows are being maintained at their Threshold Minimum Flow values, the minimum lake elevation requirement will no longer apply.

3. The Licensee will directly notify the NGA President and the AW representative when Stage 6 reductions and each successive stage reductions are implemented. If additional generation releases were scheduled to support whitewater races or other special events, the Licensee will include the event sponsor in this direct notification. When the Threshold Minimum Flow values are reached for the Whiteoak Creek Penstock Combined Valve Flow (i.e. 2 cfs (November 1 through May 31) or 5 cfs (June 1 through October 31)), the Licensee will also notify the NCDWR, NCWRC, USFWS and the USFS of the reductions and that the minimum flow from the Whiteoak Creek Penstock Combined Valve Flow is at its Threshold Level. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

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.

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 project 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 directly notify the NGA President and the AW representative as the LIP stages are transitioned. If additional generation releases were scheduled to support whitewater races or other special events, the Licensee will include the event sponsor in this direct notification. The Licensee will endeavor in good faith to provide at least 24 hours advance notification.

3. The Licensee will directly notify the NCDWR, NCWRC, USFWS, USFS, the NGA 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 in the Nantahala River Bypassed Reach. If additional generation releases were scheduled to support whitewater races or other special events, the Licensee will include the event sponsor in this direct notification.

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 Nantahala Project

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 Nantahala Project (FERC # 2692), 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. .Dicks Creek – Dicks Creek will continue to be free-flowing with inflow into the pond formed by Dicks Creek Diversion Dam being equal to the outflow at the base of the dam. No water will be diverted into the penstock at Dicks Creek Diversion Dam.

2. Minimum Flows in Bypassed Stream Reaches – Assume the new license for this project will include the following requirements for

minimum releases from hydro project works into bypassed stream reaches to enhance water quality and/or aquatic species habitat (except during periods of low inflow covered by a low inflow protocol):

a. Nantahala River Bypassed Reach

i) Minimum Flow Valve #1 - Maintain the existing minimum flow valve capable of releasing up to 8 cfs from the Whiteoak Creek Penstock into Dicks Creek to provide flows in the Nantahala River Bypassed Reach.

ii) Minimum Flow Valve #2 - Install an additional minimum flow valve capable of releasing up to 8 cfs from the Whiteoak Creek Penstock into Dicks Creek to provide flows in the Nantahala River Bypassed Reach.

iii) From the two minimum flow valves located on the Whiteoak Creek Penstock, provide a total of the following releases into Dicks Creek to provide flows in the Nantahala River Bypassed Reach:

1. From November 1 through May 31, 8 cfs.
2. From June 1 through October 31, 16 cfs.

b. Whiteoak Creek Bypassed Reach

i) Whiteoak Creek Diversion Dam - Provide 8 cfs or inflow into Whiteoak Creek Pond, whichever is less, from the Whiteoak Creek Diversion Dam into the Whiteoak Creek Bypassed Reach from January 1 through December 31.

3. Normal Generation Releases for Recreation – Assume the new license for this project will include the following requirements for a Normal Generation Schedule to Support Recreation at the Nantahala

Powerhouse, with all releases being at or above the Best Efficiency Flow for the Nantahala Hydro Unit:

a. 2nd Monday in March through March 31 – 10:00 am to 3:00 pm, seven days per week
b. April – 10:00 am to 4:00 pm, seven days per week
c. May through Labor Day – 9:00 am to 5:00 pm, seven days per week, plus provide one additional hour to the schedule (i.e. 9:00 am to 6:00 pm) on both the Saturday and Sunday before Memorial Day and Labor Day
d. September after Labor Day – 10:00 am to 4:00 pm Sunday through Friday, 9:00 am to 5:00 pm Saturday
e. October – 10:00 am to 3:00 pm Sunday through Friday, 9:00 am to 5:00 pm Saturday.

4. Other Prescribed Generation Releases – Assume the new license for this project will also include the following requirements for prescribed generation releases in addition to the above Normal Generation Schedule to Support Recreation:

a. Whitewater Races - Provide up to 70 hrs per calendar year of generation releases (all at or above the Best Efficiency Flow for the Nantahala Hydro Unit) to support major whitewater races. 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.
b. Other Special Events – Other non-race 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 this project will include the following requirements for scheduled releases from Nantahala Dam into the Nantahala River Bypassed Reach to enhance downstream recreation:

   a. Spring Weekend - Release water for six hours per day for one weekend (Saturday and Sunday) per year, scheduled between April 15 and April 30. Target flowrates will be approximately 250 cfs on Saturday and approximately 350 cfs on Sunday. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 10:00 am.

   b. Summer Afternoons - Provide four total afternoon releases per calendar year for three hrs each at a target flowrate of approximately 250 cfs, scheduled between June 15 and August 31. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 4:00 pm.

   c. Fall Weekend - Release water for seven hours per day for one weekend per year, scheduled between September 15 and September 30. Releases will be for seven hours at a target flowrate of approximately 300 cfs on Saturday; and five hours at a target flowrate of approximately 425 cfs followed by two hours

at a target flowrate of approximately 250 cfs on Sunday. Releases will be timed to reach the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam) at approximately 10:00 am.

d. Target Flowrates - The target flowrates stated above are for flowrates immediately below the confluence of Whiteoak Creek with the Nantahala River (i.e. approximately 5.8 river miles downstream of Nantahala Dam). Actual release amounts from the Tainter gates need to be large enough that when combined with other tributary and accretion flows, the total is at or above the approximate target flowrates.

6. Normal Operating Range for Lake Levels – Assume the new license for this project will include the following requirements for a Normal Operating Range of lake levels:

Month	Normal Minimum Elevation (ft)	Normal Target Elevation (ft)	Normal Maximum Elevation (ft)
Jan	73	78	83
Feb	76	83	88
Mar	78	88	93
Apr	85	93	98
May	93	97	99.5
Jun	93	97	99.5
Jul	93	97	99.5
Aug	91	96	99.5
Sep	88	93	98
Oct	83	88	93
Nov	78	83	88
Dec	73	78	83

Note: The elevations above are for the 1st day of the month. Elevations for other days of the month can be determined by linear interpolation.

7. 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 Whiteoak Creek Penstock or Diversion Dam	Maintenance will require partial or full dewatering of the Whiteoak Creek Penstock or interruption of scheduled continuous minimum releases from Whiteoak Creek Diversion Dam	X			
Outage of Tainter Gates at Nantahala Dam	Maintenance will require rendering one or more Tainter gates inoperable.			X	X
Dam Safety	Condition A or B (i.e.	X	X	X	X

		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**
Emergency	Nantahala Dam failure has occurred, is imminent or a potentially hazardous situation exists) is declared per Emergency Action Plan or other dam safety concern is identified.				
Voltage or Capacity Emergency	Voltage or capacity conditions on the electric grid in the DPNA system or the larger regional electric grid cause instability and electric system failure has occurred or is imminent.	X		X	X

8. Returning to Normal - All of the above situations can impact the Licensee's ability to operate the hydro project in its 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.

9. 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 Range 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.

10. 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.

11. 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 Range 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 Range for lake levels does not provide adequate flexibility, this protocol will be revised to account for the high inflow event preparation situation.

12. 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 Range for lake levels when water demands on Nantahala Lake substantially exceed its net inflow. Except for an outage of the Whiteoak Creek Penstock or Diversion Dam or a stuck-open Tainter gate on Nantahala Dam, lowering levels of Nantahala Lake 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.

13. 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.

14. 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 the hydro project. 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 (1) any weekend period (Saturday and Sunday plus any holidays that fall on Friday or Monday) between 9 am and 5 pm from Memorial Day weekend through September, (2) any period of seven or more consecutive days from June through September, and (3) any period between 9 am and 5 pm from July 1 through August 15.

15. Critical Flow Period for Stream Fish – the portion of the year when fish in the streams affected by the hydro project most need minimum flows or can be most impacted by higher temperature water releases from the Tainter gates at Nantahala Dam. For the purposes of this protocol, the Critical Flow Period for Stream Fish is defined as June 1 through October 31.

16. 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. Whiteoak Creek Bypassed Reach - 2 cfs or inflow into Whiteoak Creek Pond, whichever is less, released from Whiteoak Creek Diversion Dam into the Whiteoak Creek Bypassed Reach.
b. Nantahala River Bypassed Reach – The following combined flowrates released from the two Spill Valves on the Whiteoak Creek Penstock:
    i) From November 1 through May 31 – 2 cfs
    ii) From June 1 through October 31 – 5 cfs.

17. 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 Nantahala Gorge Association (NGA), United States Geological Survey (USGS) and the American Whitewater Affiliation (AW).

18. 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 Power's System Operating Center or Transmission Operating Center.

19. 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 Flow Period for Stream Fish and the Critical Commercial Whitewater Recreation Periods), 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 at least some releases from the Tainter gates at Nantahala Dam. If replacement releases will be provided from a Tainter gate at Nantahala Dam and the water temperature in Nantahala 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 the Nantahala River Bypassed Reach during the releases from Nantahala Dam.

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 Nantahala Lake – To minimize the impacts to its electric customers, the Licensee may choose to draw down Nantahala Lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the outage. If the lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will contract with a licensed archeologist to survey the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002.

4) Augmenting Stream Flow – If the outage impacts generation releases during the Critical Flow Period for Stream Fish, the Licensee will open the sluice gate at the Whiteoak Creek Diversion Dam and allow all the inflow into Whiteoak Creek Pond to flow into the Whiteoak Creek Bypassed Reach. This will prevent the excess inflow into Whiteoak Creek Pond from going through the penstocks and tunnels to Nantahala Lake and increase the stream flow in the Nantahala River downstream of its confluence with Whiteoak Creek.

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 at least some releases from the Tainter gates at Nantahala Dam. If replacement releases will be provided from a Tainter gate at Nantahala Dam and the water temperature in Nantahala 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 the Nantahala River Bypassed Reach during the releases from Nantahala Dam.

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) Augmenting Stream Flow – If the outage impacts generation releases during the Critical Flow Period for Stream Fish, the Licensee will open the sluice gate at the Whiteoak Creek Diversion Dam and allow all the inflow into Whiteoak Creek Pond to flow into the Whiteoak Creek Bypassed Reach. This will prevent the excess inflow into Whiteoak Creek Pond from going through the penstocks and tunnels to Nantahala Lake and increase the stream flow in the Nantahala River downstream of its confluence with Whiteoak Creek.

2. Communication with Resource Agencies and Affected Parties

a. Planned Unit Outages

1) Direct Consultation - The Licensee will consult with the NCDWR, USFWS, NCWRC, USFS, the NGA President and AW as soon as approximate schedule dates are determined, but at least 10 days prior to beginning the draw down of Nantahala Lake or the unit outage (if a drawdown of the lake will not be performed). If Nantahala Lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will also consult with the NCSHPO and the EBCI concerning additional archaeological surveys of the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002. 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 the draw down of Nantahala Lake 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, NCWRC, USFS, the NGA President and AW as soon

as possible after the forced outage begins, but no longer than five days afterwards.

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, NCWRC, USFS, the NGA President and AW as soon as possible after the forced outage begins, 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.

B. Whiteoak Creek Penstock & Diversion Dam Outages

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 in the Bypassed Reaches - If the outage cannot avoid impacting minimum flows in bypassed stream reaches 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 bypassed reaches.

This can be accomplished by allowing additional spillage at the Whiteoak Creek Diversion Dam (if the outage will be for Whiteoak Creek Penstock repairs), allowing additional flows through the spill valves that release water from the Whiteoak Creek Penstock to Dicks Creek Bypassed Reach (if the outage will be for the sluice gate at Whiteoak Creek Diversion Dam) or by partially opening a Tainter gate at Nantahala Dam.

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 in the Bypassed Reaches - If the outage cannot avoid impacting minimum flows in bypassed stream reaches 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 bypassed reaches. This can be accomplished by allowing additional spillage at the Whiteoak Creek Diversion Dam (if the outage will be for Whiteoak Creek Penstock repairs), allowing additional flows through the spill valves that release water from the Whiteoak Creek Penstock to Dicks Creek Bypassed Reach (if the outage will be for the sluice gate at Whiteoak Creek Diversion Dam) or by partially opening a Tainter gate at Nantahala Dam. (Note: If

minimum flows in bypassed reaches are to be supplemented by partially opening a Tainter gate at Nantahala Dam and the water temperature in Nantahala 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, NCWRC and the USFS 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 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, NCWRC and the USFS as soon as possible after the forced outage begins, but no longer than five days afterwards. (Note that this communication with resource agencies is also required for Incidental Outages (see definitions) that impact minimum flows). If minimum flows in bypassed reaches are to be supplemented by partially opening a Tainter gate at Nantahala Dam and the water temperature in Nantahala 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 Nantahala River Bypassed Reach just upstream of its confluence with the Nantahala Powerhouse Tailrace
   c) The approximate continuous release coming from the Whiteoak Creek Diversion Dam
   d) The approximate continuous release coming from the spill valve(s) installed in the Whiteoak Creek Penstock
   e) The targeted amount of the Tainter gate release.
2) Direct Consultation – The Licensee will consult with the NCDWR, USFWS, NCWRC and the USFS as soon as possible after the forced outage begins, 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 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 gates that conflict with dates scheduled for Tainter gate releases for whitewater boating in the Nantahala River 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 Gates – If the outage cannot avoid a loss of scheduled whitewater releases from the Tainter gates, then the Licensee will endeavor in good faith to reschedule the releases from the Tainter gates during the current Peak Recreation Season at Nantahala Dam to replace the missed releases that are normally scheduled for recreation.

3) Drawing Down Nantahala 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 Nantahala Lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the outage. If the lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will contract with a licensed archeologist to survey the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002.

b. Forced Outages

1) Replacing Lost Whitewater Releases from the Tainter Gates – If the outage will cause a loss of scheduled whitewater releases from the Tainter gates, then the Licensee will endeavor in good faith to reschedule the releases from the Tainter gates during the current Peak Recreation Season at Nantahala 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 Nantahala 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 C.2.b below before making the rescheduled Tainter gate release).

2) Drawing Down Nantahala 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 Nantahala Lake using the hydro unit to a point where spillage from the dam is expected to be minimized during the outage. If the lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will contract with a licensed archeologist to survey the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002.

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 Nantahala River Bypassed Reach, the Licensee will consult with the NCDWR, NCWRC, USFWS, USFS, the President of the NGA and AW as soon as approximate schedule dates are determined, but at least 10 days prior to beginning the outage. If Nantahala Lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will also consult with the NCSHPO and the EBCI concerning additional archaeological surveys of the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002. 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 gates, 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 gates for whitewater boating in the Nantahala

River Bypassed Reach, the Licensee will notify the NCDWR, USFWS, NCWRC, USFS, the NGA 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 Nantahala 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 Nantahala River Bypassed Reach just upstream of its confluence with the Nantahala Powerhouse Tailrace
c) The approximate continuous release coming from the Whiteoak Creek Diversion Dam
d) The approximate continuous release coming from the spill valve(s) installed in the Whiteoak Creek Penstock
e) 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 gates for whitewater boating in the Nantahala River 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 gates for whitewater boating in the Nantahala

River Bypassed Reach, the Licensee will consult with the NCDWR, NCWRC, USFWS, USFS, the President of the NGA and AW as soon as possible after the outage occurs, but no longer than 10 days afterwards. If Nantahala Lake will be drawn down more than 60 ft below full pond and maintained at or below that elevation for 30 consecutive days or more, the Licensee will also consult with the NCSHPO and the EBCI concerning additional archaeological surveys of the lakebed at or below 60 ft of drawdown in the two locations where archaeological resources were identified in the relicensing cultural resource studies performed from 2000 – 2002. 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 Nantahala River Bypassed Reach if taking those actions is necessary to maintain the water inventory in Nantahala Lake.

c. *Replacing Lost Whitewater Releases from the Tainter Gates* – If scheduled whitewater releases from the Tainter gates are lost, then

once the emergency is over, the Licensee will endeavor in good faith to reschedule the releases from the Tainter gates during the current Peak Recreation Season at Nantahala 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, NCWRC and the USFS as soon as possible following a deviation from license conditions for voltage or capacity emergency reasons (add the NGA President and AW if Tainter gate releases for recreational purposes are impacted), 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.

c. *Direct Consultation* – The Licensee will consult with the NCDWR, USFWS, NCWRC and the USFS as soon as possible following a deviation from license conditions for voltage or capacity emergency reasons (add the NGA President and AW if Tainter gate releases for recreational purposes are impacted), 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.

APPENDIX B

The conditions filed by the U. S. Forest Service on April 14, 2006, pursuant to section 4(e) of the Federal Power Act, for a new license for Project No. 2692-032.

Minimum Streamflows

(A) The Licensee shall provide the following minimum flows in bypassed reaches: (1) From the Whiteoak Creek Penstock: a total of eight (8) cfs into Dicks Creek from November 1 through May 31 and, after installation of the second valve required by subparagraph (C)(2) of this Article, a total of 16 cfs into Dicks Creek from June 1 through October 31; and (2) From the Whiteoak Creek Diversion Dam after installation of the minimum flow device required by subparagraph (C)(3) of this Article: eight (8) cfs or the inflow into Whiteoak Creek Pond, whichever is less, into Whiteoak Creek at the base of the dam from January 1 through December 31.

(B) The Licensee shall continue to maintain Dicks Creek as free flowing with outflow from the base of Dicks Creek Diversion Dam being equal to inflow into Dicks Creek Pond.

(C) The Licensee shall, within six months following its acceptance of this license, consult with the North Carolina Wildlife Resources Commission, North Carolina Department of Environment and Natural Resources, U.S. Fish and Wildlife Service, and the U.S. Forrest Service (Forest Service) and file a plan ("Minimum Flow Plan") for Commission approval to modify project facilities to: (1) Maintain the existing minimum flow valve capable of releasing up to eight (8) cfs, as calibrated and metered at the valve, from the Whiteoak Creek Penstock into Dicks Creek; (2) Install an additional minimum flow valve capable of releasing up to eight (8) cfs, as calibrated and metered at the valve, from the Whiteoak Creek Penstock into Dicks Creek; and (3) Install a minimum flow device capable of releasing up to eight (8) cfs, as calibrated and metered at the device, from the Whiteoak Creek Diversion Dam into Whiteoak Creek. By February 28, 2006, or within one year following Commission approval of such plan, whichever comes later, the Licensee shall complete the modifications of project facilities identified in the plan and begin providing the minimum flows as specified in this Article.

(D) The Licensee may temporarily modify the minimum flows identified in Paragraph (A) if required by conditions beyond the Licensee's control or by operating emergencies or maintenance needs as defined in Attachments B and C of the settlement agreement. Such temporary variances shall be in accordance with the Low Inflow Protocol or the Hydro Project Maintenance & Emergency Protocol, incorporated into the

license as Attachments B and C, respectively.

(E) The Licensee will calibrate the meters used to monitor minimum flows within 60 days following installation of the additional minimum flow valves and devices identified in this Article and at least once every two years thereafter.

Recreational Boating Flows

Nantahala River

Beginning on February 28, 2006, or within one year following FERC issuance of the license, whichever is later and except for periods of temporary variance as noted herein, the Licensee shall:

(A) Operate the Nantahala Powerhouse to provide during the times set forth below ("Normal Generation Schedule to Support Recreation") instantaneous releases equal to or greater than the flow at which the project produces power most efficiently:

Period	Schedule
2nd Monday in March through March 31	10:00 am to 3:00 pm, 7 days per week
April	10:00 am to 4:00 pm, 7 days per week
May through Labor Day, except as noted below.	9:00 am to 5:00 pm, 7 days per week
The Saturday & Sunday immediately preceding Memorial Day	9:00 am to 6:00 pm
The Saturday & Sunday immediately preceding Labor Day	9:00 am to 6:00 pm
September after Labor Day (Sunday through Friday)	10:00 am to 4:00 pm, 6 days per week
September after Labor Day (Saturday)	9:00 am to 5:00pm, 1 day per week
October (Sunday through Friday)	10:00 am to 3:00 pm, 6 days per week
October (Saturday)	9:00 am to 5:00 pm, 1 day per week

(B) Provided the sponsoring or requesting organizations have consulted with the Nantahala Gorge Association (NGA) and have integrated their needs with the Normal

Generation Schedule to Support Recreation as much as possible, operate the Nantahala Powerhouse to provide up to 70 hours per calendar year of additional recreational releases from generation at or above the best efficiency flow to the main stem of the Nantahala River to support major whitewater races and consider on a case-by-case basis additional recreational releases from generation to the main stem of the Nantahala River to support other special events.

(C) Provided the sponsoring or requesting organizations have consulted with the Nantahala Gorge Association (NGA) and have 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 would 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 would add additional hours to the Normal Generation Schedule to Support Recreation for the month.

(D) The Licensee may temporarily modify the recreational releases from the Nantahala Powerhouse as identified above if required by conditions beyond the Licensee's control or by operating emergencies or maintenance needs as defined in Attachments B and C. Such temporary variances shall be in accordance with the Low Inflow Protocol or the Hydro Project Maintenance & Emergency Protocol, incorporated into the license.

Nantahala River Bypassed Reach

(A) Beginning at the latter of (1) on February 28, 2006, (2)(a) upon the development and submittal of a written and complete traffic plan to the Licensee by the Forest Service and (b) completion of construction of the improved parking areas immediately above and below the Cascades section near river mile 16.5 on the Nantahala River Bypassed Reach, or (3) within one year following issuance of the license by FERC, the Licensee shall provide the following recreational flow schedule using a Tainter gate at the Nantahala dam, except during periods of temporary variance as noted herein. The target flows and times are for flows and flow arrival times immediately below the confluence of White Oak Creek with the Nantahala River. Actual release amounts from the Tainter gates need to be large enough that when combined with other tributary and accretion flows, the total is at or above the approximate target flow rates.

When	Dates	Target Flow (cfs)	Hrs	Times
One Spring Saturday	One Weekend Between April 15 and 30	250	6	10 am to 4 pm
One Spring Sunday		350	6	
Four Summer Afternoons	Between June 15 and August 31	250	3	4 pm to 7 pm
		250	3	4 pm to 7 pm
		250	3	4 pm to 7 pm
		250	3	4 pm to 7 pm
One Fall Saturday	One Weekend Between September 15 and 30	300	7	10 am to 5 pm
One Fall Sunday		425 250 (These flows are to occur as a single event)	5 2	10 am to 3 pm 3 pm to 5 pm

The actual release dates shall be as determined annually by the interested parties per Article 407 of the Settlement Agreement.

(B) The licensee may temporarily modify the recreational releases from Nantahala Dam as identified above if required by conditions beyond the Licensee's control or by operating emergencies or maintenance needs as defined in Attachments B and C to the Settlement Agreement. Such temporary variances shall be in accordance with the Low Inflow Protocol or the Hydro Project Maintenance & Emergency Protocol, incorporated into the FERC license.

Monitoring

During the first two years of recreation flow releases in the Nantahala River, Bypassed Reach will monitor the existing fishery in the Nantahala River. Bypassed reach will be monitored in accordance with the Settlement Agreement, Section 5.3 (page 14), to identify any significant adverse impacts to fisheries callused by these recreation flow releases. In October, after the first and second seasons of releases, the licensee will convene a meeting to discuss any proposed changes that are based on the monitoring results. Notwithstanding paragraph 17.3 of the agreement, if the parties agree in writing to permanent schedule changes, the changes will take effect as agreed to by the aforementioned parties unless FERC approval is required; otherwise, the licensee shall develop and submit to FERC a request in whatever form is necessary to effect such

change and the change will take effect according to the FERC approval. Changes to the recreation flow release schedule that would change the total number of hours per month (for generation releases) or per calendar year (for Tainter gate releases) at the approximate target flows shall not be considered.

Document Content(s)