Appalachian Mountain Club
Zealand Falls Hydropower Project
Bethlehem, New Hampshire 03574

WATER QUALITY CERTIFICATION

In Fulfillment of

NH RSA 485-A: 12, III

WQC # 2013-FERCX-001

Activity Name	Zealand Falls Hydropower Project
Activity Location	Bethlehem, New Hampshire 03574
Affected Surface waters	Whitewall Brook NHRIV700010101-01
Owner/Applicant	James Wrigley Appalachian Mountain Club PO Box 298 Gorham, NH 03581
Appurtenant Permit(s)	US Forest Service Special Use Permit
DATE OF APPROVAL (subject to Conditions below)	October 18, 2013

A. INTRODUCTION

The Appalachian Mountain Club (Applicant) proposes to continue operation of a hydropower turbine for off-grid power generation at the Applicant's Zealand Falls Hut in Bethlehem, NH (the Activity). The project diverts water from Whitewall Brook adjacent to the Applicant's hut to a small hydropower generator. A detailed description of the proposed Activity is provided in item D-1 below.

This Water Quality Certification (WQC) documents laws, regulations, determinations and conditions related to the Activity for the attainment and maintenance of NH surface water quality standards, including the provisions of NH RSA 485-A:8 and NH Code of Administrative Rules Env-Wq 1700, for the support of designated uses identified in the standards.

B. WATER QUALITY CERTIFICATION APPROVAL

Based on the findings and conditions noted below, the New Hampshire Department of Environmental Services (DES) has determined that operation of the Activity will not violate surface water quality standards, or cause additional degradation in surface waters not presently meeting water quality standards. DES hereby issues this WQC subject to the conditions in Section E of this certification.

C. STATEMENT OF FACTS AND LAW

C-1 Section 401 of the United States Clean Water Act (CWA, 33 U.S.C. 1341) states, in part: "Any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate…that any such discharge will comply with the applicable provisions of sections 301, 302, 303, 306, and 307 of this title…..No license or permit shall be granted until the certification required by this section has been obtained or has been waived…No license or permit shall be granted if certification has been denied by the State..."

C-2 Section 401 further states, in part "Any certification provided under this section shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with any applicable effluent limitations and other limitations…and shall become a condition on any Federal license or permit subject to the provisions of this section."

C-3 RSA 485-A:12, III. No activity, including construction and operation of facilities, that requires certification under section 401 of the Clean Water Act and that may result in a discharge, as that term is applied under section 401 of the Clean Water Act, to surface waters of the state may commence unless the department certifies that any such discharge complies with the state surface water quality standards applicable to the classification for the receiving surface water body. The department shall provide its response to a request for certification to the federal agency or authority responsible for issuing the license, permit, or registration that requires the certification under section 401 of the Clean Water Act. Certification shall include any conditions on, modifications to, or monitoring of the proposed activity necessary to provide assurance that the proposed discharge complies with applicable surface water quality standards. The department may enforce compliance with any such conditions, modifications, or monitoring requirements as provided in RSA 485-A:22.

C-4 RSA 488:3 Registration Required

I. No person shall withdraw or discharge a cumulative amount of more than 20,000 gallons of water per day, averaged over any 7-day period, or more than 600,000 gallons of water over any 30-day period, at a single real property or place of business without registering the withdrawal or discharge with the department. Transfers of such volume of water shall also be registered. Registration shall be in addition to any required permits.

II. No registration shall be transferred to another person without written notification to the commissioner.

C-5 Env-Wq 1702.46 "Surface waters" means "surface waters of the state" as defined in RSA 485-A:2, XIV and waters of the United States as defined in 40 CFR 122.2.

C-6 Env-Wq 1703.01 **Water** Use Classifications.

(a) State surface waters shall be divided into class A and class B, pursuant to RSA 485-A:8, I, II and III. Each class shall identify the most sensitive use which it is intended to protect.
(b) All surface waters shall be restored to meet the water quality criteria for their designated classification including existing and designated uses, and to maintain the chemical, physical, and biological integrity of surface waters.
(c) All surface waters shall provide, wherever attainable, for the protection and propagation of fish, shellfish and wildlife, and for recreation in and on the surface waters.
(d) Unless the flows are caused by naturally occurring conditions, surface water quantity shall be maintained at levels adequate to protect existing and designated uses.

C-7 Env-Wq 1703.19 Biological and Aquatic Community Integrity. (a) The surface waters shall support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of similar natural habitats of a region. (b) Differences from naturally occurring conditions shall be limited to non-detrimental differences in community structure and function.

C-8 In 2010, DES published guidance (hereinafter called the 2010 instream flow guidance or 2010 ISF guidance) for estimating instream flow requirements for the protection of aquatic life for situations. The guidance is available at: http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-11-3.pdf

C-9 The Applicant is seeking a case-specific exemption from licensing by the Federal Energy Regulatory Commission (FERC) for a small hydroelectric power project under 18 CFR§ 4 Subpart K.

C-10 18CFR§ 4 Subpart K, provides procedures for exemption on a case-specific basis from all or Part I of the Federal Power Act, including licensing for small hydroelectric power projects as defined in § 4.30(b)(29).

C-11 Pursuant to Section 23(b)(1) of the Federal Power Act (FPA), §817(1), a non-federal hydroelectric project must (unless it has a still-valid pre-1920 federal permit) be licensed if it: (1) is located on a navigable water of the United States; (2) occupies lands of the United States; (3) utilizes surplus water or water power from a government dam; or (4) is located on a stream over which Congress has Commerce Clause jurisdiction, is constructed or modified on or after August 26, 1935, and affects the interests of interstate or foreign commerce.

C-12 18 CFR § 4.30(b)(29). Small hydroelectric power project means any project in which capacity will be installed or increased after the date of notice of exemption or application under subpart K of this chapter, which will have a total installed capacity of not more than 5 MW, and which:
(i) Would utilize for electric power generation the water power potential of an existing dam that is not owned or operated by the United States or by an

instrumentality of the Federal Government, including the Tennessee Valley Authority; or
(ii) (A) Would utilize for the generation of electricity a natural water feature, such as a natural lake, waterfall, or the gradient of a natural stream, without the need for a dam or man-made impoundment; and
(B) Would not retain water behind any structure for the purpose of a storage and release operation.

C-13 18 CFR § 4.106. Any case-specific exemption from licensing granted for a small hydroelectric power project is subject to the following standard terms and conditions: (b) The construction, operation, and maintenance of the exempt project must comply with any terms and conditions that the United States Fish and Wildlife Service, the National Marine Fisheries Service, and any state fish and wildlife agencies have determined are appropriate to prevent loss of, or damage to, fish or wildlife resources or otherwise to carry out the purposes of the Fish and Wildlife Coordination Act, as specified in exhibit E of the application for exemption from licensing or in the comments submitted in response to the notice of exemption application.

C-14 The Applicant holds a Special Use Permit for the operation of the Zealand Falls Hut and the Zealand Hydropower Project from the U.S. Forest Service.

C-15 The Applicant is responsible for the operation of the Activity.

C-16 On April 15, 2013, the Applicant submitted an application and associated supplemental information for Water Quality Certification to DES which included a completed DES Water Quality Certification Application Form and a draft application to the Federal Energy Regulatory Commission for a case-specific exemption from licensing for a small hydroelectric power project under 18 CFR § 4 Subpart K.

C-17 DES issued a draft certification for public comment from September 11, 2013 to October 11, 2013. No comments were received.

D. FINDINGS

D-1 The Activity reviewed for this Water Quality Certification includes the plans and information submitted with the Water Quality Certification application and, in general, includes the operation of the following:

b. The Activity includes a 3-inch withdrawal water pipe with a screen located within the brook at an elevation of approximately 2,647 feet. The drainage area for the brook upstream of the inlet is approximately 1.06 square miles. The withdrawal pipe collects a maximum of 0.029 cubic feet per second (cfs) (equivalent to approximately 13 gallons per minute) of flow. The coordinates of the inlet point are approximately 44° 11.73' N, 71° 29.687 W. The intake pipe is placed in a bedrock depression within the brook that forms a pool of water large enough to submerge the intake pipe. The intake pipe then feeds to a screening tank that filters debris from the water. The 3-inch penstock then travels 1,350 feet to the

turbine at which point the water is discharged to the brook. There is no dam or impoundment for the Activity.

c. The Activity occurs only during ice free conditions in the brook which is approximately May to October.

D-2 The Activity affects streamflow in the bypass reach of the Whitewall Brook. The bypass reach extends 1,350 feet from the intake point to the proposed discharge point below the turbine. The coordinates of the discharge point are 44° 11.742' N, 71° 29.662' W. Whitewall Brook flows from west to east past the Zealand Falls Hut operated by the Applicant and then merges with the outlet stream from Zealand Pond.

D-3 Named and unnamed, streams, rivers, lakes, ponds and wetlands, potentially affected by any Activity, are surface waters under Env-Wq 1702.46. DES has assigned Assessment Unit (AU) identification numbers to surface waters that appear on 1:24,000 scale hydrography. Consequently, not all surface waters currently have an AU number. Surface waters that do not have an AU number are still considered surface waters of the State in accordance with Env-Wq 1702.46. Surface waters that could be potentially affected by this Activity and their associated AU numbers (where available) include the following:

Surface Water Name and AU Numbers	Class	Description
Whitewall Brook NHRIV700010101-01	B	Tributary to the East Branch of the Pemigewasset River

D-4 According to the 2010 list of impaired waters, the following surface waters in the vicinity of the proposed Activity which have assigned AU numbers are listed as impaired. All impairments, with the exception of those highlighted in bold (which have approved TMDLs), are on the Section 303(d) List. With the exception of mercury, for which there is a state-wide fish consumption advisory, there are no data available for the assessment unit.

Assessment Unit (AU)	Water body Name	Cause of Impairment (Designated Use Impaired)
Whitewall Brook NHRIV700010101-01	Whitewall Brook	**Mercury (FC)**
Notes: AL = Aquatic Life, PCR = Primary Recreation, SCR = Secondary Recreation, FC = Fish Consumption, SFC = Shellfish Consumption Impairments highlighted in bold have approved TMDLs. All other impairments are on the Section 303(d) List.		

D-5 The Activity requires exemption from Federal Energy Regulatory Commission (FERC) licensing. Therefore, a Section 401 Water Quality Certification is required in accordance with RSA 485-A: 12, III.

D-6 The Activity does not have any wetland dredge or fill impacts. If the Activity were to change to include wetland dredge and fill impacts in jurisdictional areas or a permanent structure in the brook, a DES Wetlands permit will be required.

D-7 The proposed Activity includes diversion of water from Whitewall Brook through an intake pipe, screening tank, penstock, and turbine. This diversion of water will alter streamflow in the bypass reach. Streamflow is an important characteristic of habitat for the aquatic community. Therefore, the proposed diversion of water may cause the water quality criteria for biological and aquatic community integrity (Env-Wq 1703.19, item C-7) to be violated in the bypass reach.

D-8 The water quality criteria for biological and aquatic community integrity (Env-Wq 1703.19) can be met for the bypass reach if sufficient flow is maintained in the bypass reach. Ideally, the streamflow in the bypass reach should mimic natural flows as much as possible as outlined in the 2010 ISF Guidance (see item C-8).

a. Whitewall Brook is a tributary to the East Branch of the Pemgiwasset River, neither of which have regulated flow. USGS Gauging Station # 01074520 on the East Branch of the Pemigewasset River has a drainage area of 115 square miles. The lowest flow recorded at this gage between 1992 and 2012 was 26 cfs. Assuming the same cfs per square mile for Whitewall Brook, the lowest expected flows at the inlet would be 0.24 cfs. The Activity is estimated to withdraw a maximum of 0.029 cfs, which is approximately 12% of the expected lowest recorded flow for Whitewall Brook.

b. The Aquatic Base Flow for a 1.06 square mile watershed is 0.53 cfs. Aquatic Base Flow is a standard setting method to estimate minimum flows for bypass reaches. For rivers where inadequate flow records exist or for rivers regulated by dams or upstream diversions, the recommended minimum flow is 0.5 cubic feet per second per square mile of drainage (cfsm). Aquatic Base Flow is the simplest of the standard setting methods and is typically used for watersheds of 50 square miles or more. However, in the absence of site-specific flow studies, Aquatic Base Flow provides an approximation of the minimum flow needed in a bypass reach. The existing U.S. Forest Service Special Use Permit requires that the project allow 0.53 cfs of bypass flows to maintain Aquatic Base Flow. The Aquatic Base flow at the USGS Gauging Station # 01074520 on the East Branch of the Pemigewasset River is 57.5 cfs.

D-9 DES has determined that, because the withdrawal will use no more than 12% of the expected stream flow under worst case conditions and the existing US Forest Service permit requires that Aquatic Base Flow be maintained, violations of the water quality criteria for biological and aquatic community integrity (Env-Wq 1703.19) should not occur if the Activity operates under the conditions listed in Section E.

E. WATER QUALITY CERTIFICATION CONDITIONS

Unless otherwise authorized by DES, the following conditions shall apply.

E-1. The Activity shall not cause or contribute to a violation of surface water quality standards. DES may modify this Water Quality Certification to include additional conditions to ensure the Activity complies with surface water quality standards should DES determine that surface water quality standards are being violated as a result of the Activity.

E-2. The Applicant shall allow DES to inspect the Activity and its effects on affected surface waters at any time to monitor compliance with the conditions of this Water Quality Certification.

E-3. The Applicant shall consult with DES regarding any proposed modifications to the Activity, including construction or operation, to determine whether this Water Quality Certification requires modification in the future.

E-4. The Applicant shall comply with all other permits required for this Activity, including, but not limited to, any DES Wetlands permits and amendments.

E-5. Transfer of this Certification to a new owner shall require notification to and approval by DES.

E-6. The Activity shall operate only in the ice free season between May and October, shall withdraw no more than 0.029 cfs, and shall leave no less than the Aquatic Base Flow (0.53 cfs) or inflow (whichever is less) in the bypass reach at all times.

E-7. The intake pipe for the penstock shall be designed to allow a minimum of 0.53 cfs (or inflow if inflow is less than 0.53 cfs) to be passed in the brook at the point of withdrawal at all times. No withdrawals are allowed when inflow is less than or equal to 0.53 cfs in the brook.

E-8. Within 90 days from date of issuance of this certification, the Applicant shall submit a plan to DES for determining when flows in the Whitewall Brook are less than 0.53 cfs. The Applicant shall then implement the approved plan.

E-9. The intake pipe for the penstock and the return flow pipe shall be constructed from temporary piping that is inserted into the brook without any dredge or fill impacts to jurisdictional wetland areas, which include the bed and banks of the brook. The intake and return flow pipes shall not be permanently installed in the brook. The Applicant shall remove all portions of the intake and return flow pipes from the brook channel and any surrounding wetlands when ice conditions are present each year.

E-10. The intake and return flow pipes shall have screens so that aquatic life will not become entrained or impinged in the system. The Applicant shall consult with the New Hampshire Fish and Game Department (NHFG) on the specifications of the current intake screen to confirm that it meets NHFG standards.

E-11. The intake and return flow pipes shall not create impassable barriers to aquatic organisms in the brook.

E-12. The intake and return flow pipes shall not significantly increase bank erosion in the brook.

E-13. The Applicant shall register, measure, and report all withdrawals with the DES Water Use Registration and Reporting Program in accordance with RSA 488:3 and its supporting regulations, Env-Wq 2102.

E-14. The Applicant shall obtain DES approval of and begin implementation of a water conservation plan that meets the water conservation requirements set forth in Env-Wq 2101.

APPEAL

If you are aggrieved by this decision, you may appeal the decision to the Water Council. Any appeal must be filed within 30 days of the date of this decision, and must conform to the requirements of Env-Wq 200. Inquiries regarding appeal procedures should be directed to NHDES Council Appeals Clerk, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095; telephone (603) 271-6072.

If you have questions regarding this Certification, please contact Owen David at (603) 271-0699.

Harry T. Stewart
Director, DES Water Division

cc: John Warner, US Fish and Wildlife Service
Carol Henderson, NH Fish and Game
Claudia Brown, Town Clerk Bethlehem, NH
Derek Bennett, DES Drinking Water and Ground Water Bureau
Bob Easton, Federal Energy Regulatory Commission New England Branch