NH Department of Transportation
Charles Hood, Administrator
Bureau of Environment
1 Hazen Drive
P.O. Box 483
Concord, NH 03302-0483

WATER QUALITY CERTIFICATION

In Fulfillment of

Section 401 of the United States Clean Water Act (33 U.S.C 1341)

WQC # 2006-013

Activity Name	Newington - Dover, 11238, NHS-027-1(37)
Activity Location	Spaulding Turnpike, Newington and Dover, New Hampshire
Affected Surface waters	Paul Brook, Pickering Brook (including 2 unnamed ponds), Flagstone Brook, Railway Brook, 2 unnamed tributaries, Bellamy River, Piscataqua River, Little Bay, and several unnamed wetlands.
Owner/Applicant	State of New Hampshire Department of Transportation 7 Hazen Drive P.O. Box 483 Concord, NH 03302-0483
Appurtenant permit(s):	U.S. Army Corps of Engineers No. NAE-2004-3545 Wetlands Bureau Permit No. 2006-02007
DATE OF APPROVAL (subject to Conditions below)	February 3, 2010

A. INTRODUCTION

The State of New Hampshire, acting by the Department of Transportation (DOT) (Applicant), proposes to reconstruct and widen a 3.5 mile section of an existing highway facility (Spaulding Turnpike) from just north of Exit 1 in Newington to just south of the Dover Toll Plaza including rehabilitation and widening of the Little Bay Bridges to eight lanes (three general purpose lanes plus an auxiliary lane in each direction), rehabilitation of the General Sullivan Bridge (GSB) to continue to function as a pedestrian/bicycle/recreational facility and to accommodate emergency response and maintenance vehicles, and improvements to the interchange areas at Exits 2, 3, 4, 5 and 6 (generally defined as the Activity – see item D-1 below for a more complete definition).

The Activity is anticipated to consist of five major construction contracts with

an overall construction period that is expected to extend over 8 years starting in 2010 and ending in 2017. The operation period is indefinite after completion of construction. The following provides a breakdown of the anticipated major construction contracts.

The first contract involves the construction of the new Little Bay Bridge and the associated roadway approach work. This contract is anticipated to start in 2010 and conclude in 2013.

The second contract is expected to involve construction of the major roadway improvements in Newington. This contract is anticipated to start in 2012 and conclude in 2014.

The third contract is expected to involve the rehabilitation of the existing Little Bay Bridge and the associated roadwork. This contract is anticipated to start in 2014 and conclude in 2015.

The fourth contract is expected to involve the majority of the roadway improvements in Dover and the remaining minor work to be completed in Newington. This contract is anticipated to start in 2013 and conclude in 2015.

The fifth contract will involve rehabilitation of the General Sullivan Bridge. This contract is anticipated to commence in 2015 and conclude in 2017.

This 401 Water Quality Certification (401 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. 401 CERTIFICATION APPROVAL

Based on the findings and conditions noted below, the New Hampshire Department of Environmental Services (DES) has determined that any discharge associated with 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 401 WQC subject to the conditions defined in Section E of this 401 Certification, in accordance with Section 401 of the United States Clean Water Act (33 U.S.C. 1341).

C. STATEMENT OF FACTS AND LAW

C-1. Section 401 of the United States Clean Water Act (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. NH RSA 485-A:12, III, states: "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. NH RSA 485-A:8 and Env-Wq 1700 (Surface Water Quality Regulations, effective May 21, 2008) together fulfill the requirements of Section 303 of the Clean Water Act that the State of New Hampshire adopt water quality standards consistent with the provisions of the Act.

C-5. Env-Wq 1701.02, entitled "Applicability", states that:

"(a) These rules shall apply to all surface waters.

(b) These rules shall apply to any person who causes point or nonpoint source discharge(s) of pollutants to surface waters, or who undertakes hydrologic modifications, such as dam construction or water withdrawals, or who undertakes any other activity that affects the beneficial uses or the level of water quality of surface waters."

C-6. Env-Wq 1702.18 defines a discharge as:

"a. The addition, introduction, leaking, spilling, or emitting of a pollutant to surface waters, either directly or indirectly through the groundwater, whether done intentionally, unintentionally, negligently, or otherwise; or

b. The placing of a pollutant in a location where the pollutant is likely to enter surface waters."

C-7. Env-Wq 1702.39 defines a pollutant as: "pollutant" as defined in 40 CFR 122.2. This means "dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, (except those regulated under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.)), heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water."

C-8. Env-Wq 1702.46 defines surface waters as "perennial and seasonal streams, lakes, ponds and tidal waters within the jurisdiction of the state, including all streams, lakes, or ponds bordering on the state, marshes, water courses and other bodies of water, natural or artificial," and waters of the United States as defined in 40 CFR 122.2."

C-9. Surface waters are navigable waters for the purposes of certification under Section 401 of the Clean Water Act. Surface waters are jurisdictional wetlands for the purposes of wetlands permitting under RSA 482-A.

C-10. Env-Wq 1703.01 (c) states that "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."

C-11. Env-Wq 1703.14, entitled "Nutrients", states that

"a. Class A waters shall contain no phosphorous or nitrogen unless naturally occurring.

b. Class B waters shall contain no phosphorous or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring.

c. Existing discharges containing either phosphorous or nitrogen which encourage cultural eutrophication shall be treated to remove phosphorus or nitrogen to ensure attainment and maintenance of water quality standards.

d. There shall be no new or increased discharge of phosphorous into lakes or ponds.

e. There shall be no new or increased discharge(s) containing phosphorous or nitrogen to tributaries of lakes or ponds that would contribute to cultural eutrophication or growth of weeds or algae in such lakes and ponds."

C-12. Env-Wq 1703.19, entitled "Biological and Aquatic Community Integrity", states that

"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; and

b. Differences from naturally occurring conditions shall be limited to non-detrimental differences in community structure and function."

C-13. Env-Wq 1703.21 (a)(1) states that "Unless naturally occurring or allowed under part Env-Ws 1707, all surface waters shall be free from toxic substances or chemical constituents in concentrations or combinations that injure or are inimical to plants, animals, humans or aquatic life."

C-14. Env-Wq 1703.07 through 1703.11 contain standards relative to dissolved oxygen, bacteria, benthic deposits, oil and grease, and turbidity.

C-15. Env-Wq 1702.06 states ""Best management practices" means those practices which are determined, after problem assessment and examination of all alternative practices and technological, economic and institutional considerations, to be the most effective practicable means of preventing or reducing the amount of pollution generated by point or nonpoint sources to a level compatible with water quality goals."

C-16. Section 303(d) of the Clean Water Act (33 U.S.C. 1313(d)) and the regulations promulgated thereunder (40 C.F.R. 130.0 – 40 C.F.R. 130.11) require states to identify and list surface waters that are violating state water quality standards (i.e., Section 303(d) List) that do not have an approved TMDL. For these water quality-impaired waters, states must establish Total Maximum Daily Loads (TMDLs) for the pollutants causing the impairments and submit the list of impaired surface waters and TMDLs to EPA for approval. TMDLs include source identification, determination of the allowable load and pollutant reductions (by source) necessary to meet the allowable load. Once a TMDL is conducted, the pollutant/surface water is transferred to the list of impaired waters with approved TMDLs (known as Category 4A waters). The Section 303(d) List is, therefore, a subset of all impaired waters. The most recent Section 303(d) list of impaired waters is the 2008 Section 303(d) List. On August 14, 2009, DES submitted a letter to EPA requesting that the 2008 303(d) List be amended to include the following additional impairments in 36 of the Great Bay estuarine assessment units: nitrogen, chlorophyll a, clarity (light attenuation), estuarine bioassessment, and/or dissolved oxygen. On September 30, 2009, EPA approved New Hampshire's 2008 303(d) List with amendments. A list of all impaired waters (including the August 14, 2009 amendments) is available at http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm.

C-17. On December 20, 2007, EPA approved the Northeast Regional Mercury TMDL[1] which addressed mercury impairments in all New Hampshire fresh surface waters.

C-18. When a surface water does not meet water quality standards (i.e., when it is impaired), the addition of pollutants causing or contributing to impairment is prohibited in accordance with the following:

a. Env-Wq 1703.03 (a) states that "The presence of pollutants in the surface waters shall not justify further introduction of pollutants from point or nonpoint sources, alone or in any combination".
b. NH RSA 485-A:12 (I) (Enforcement of Classification) states that "After adoption of a given classification for a stream, lake, pond, tidal water, or section of such water, the department shall enforce such classification by appropriate action in the courts of the state, and it shall be unlawful for any person or persons to dispose of any sewage, industrial, or other wastes, either alone or in conjunction with any other person or persons, in such a manner as will lower the quality of the waters of the stream, lake, pond, tidal water, or section of such water below the minimum requirements of the adopted classification".

C-19. Antidegradation provisions are included in Env-Wq 1702 and Env-Wq 1708.

a. Env-Wq 1702.02 states that "Antidegradation" means a provision of the water quality standards that maintains and protects existing water quality and uses.
b. Env-Wq 1708.02 states that "Antidegradation shall apply to: (a) Any proposed new or increased activity, including point source and nonpoint source discharges of pollutants, that would lower water quality or affect the existing or designated uses;(b) Any proposed increase in loadings to a waterbody when the proposal is associated with existing activities; (c) Any increase in flow alteration over an existing alteration; and (d) Any hydrologic modifications, such as dam construction and water withdrawals."
c. Antidegradation applies to all parameters as evidenced by Env-Wq 1708.08 (a) (Assessing Waterbodies) which states " The applicant shall characterize the existing water quality and determine if there is remaining assimilative capacity for each parameter in question."
d. According to Env-Wq 1708.04 (b), "A proposed discharge or activity shall not eliminate any existing uses or the water quality needed to maintain and protect those uses".

---

1. Northeast Regional Mercury Total Maximum Daily Load. Connecticut Department of Environmental Protection, Maine Department of Environmental Protection, Massachusetts Department of Environmental Protection, New Hampshire Department of Environmental Services, New York Stated Department of Environmental Conservation, Rhode Island Department of Environmental Management, Vermont Department of Environmental Conservation, New England Interstate Water Pollution Control Commission. October 24, 2007.

e. Env-Wq 1702.03 states that "Assimilative capacity" means the amount of a pollutant or pollutants that can safely be released to a waterbody without causing violations of applicable water quality criteria or negatively impacting uses.
f. Env-Wq 1708.08 describes the process for assessing waterbodies to determine if there is remaining assimilative capacity for each parameter in question.
g. Determination of significant and insignificant discharges is described in Env-Wq 1708.09 which are, in part, based on the remaining assimilative capacity of pollutant.
h. Env-Wq 1708.01 (b) states: "For significant changes in water quality, where the quality of the surface waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected unless the department finds, after full satisfaction of the intergovernmental coordination and public participation provisions that, in accordance with Env-Wq 1708.10, allowing lower water quality is necessary to accommodate important economic or social development in the area in which the surface waters are located. In allowing such degradation or lower water quality, the department shall assure water quality adequate to fully protect existing uses. Further, the department shall assure that the highest statutory and regulatory requirements shall be achieved for all new and existing point sources and that all cost effective and reasonable best management practices for nonpoint source control shall be implemented".
i. Env-Wq 1708.01 (c) states: "For insignificant changes in water quality, where the quality of the surface waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality shall be maintained and protected. In allowing such degradation or lower water quality, the department shall assure water quality adequate to protect existing uses fully. Further, the department shall assure that the highest statutory and regulatory requirements shall be achieved for all new and existing point sources and that all cost effective and reasonable best management practices for nonpoint source control shall be implemented".
j. Significant discharges require 1) a demonstration that the Activity will provide an important economic or social development (Env-Wq 1708.10), 2) an alternative analysis to determine if it is possible to achieve the important economic or social development without lowering water quality or with a reduced degree of degradation (Env-Wq 1708.10 (b)), and 3) opportunity for public comment and intergovernmental coordination (Env-Wq 1708.11).

C-20. The Activity reviewed for this 401 Certification requires a federal wetlands permit under the federal Clean Water Act Section 404. The U.S. Army Corps of Engineers provided public notice for the Activity on August 21, 2006. On June 19, 2009, the U.S. Army Corps of Engineers issued a provisional permit for the Activity.

C-21. The Applicant is responsible for the Activity, including construction and operation.

C-22. The Applicant submitted documentation for 401 Certification to DES in February 2008, as follows:

a. An application for 401 Certification was submitted on February 7, 2008, which included a USGS topographic locus map of the project area and a copy of the August 2006 *Application for Department of the Army Permit/NH Wetlands Bureau Permit*.
b. A copy of the Final Environmental Impact Statement (FEIS) entitled "Spaulding Turnpike Improvements NHS-027-1(37)-11238", dated December 2007 and consisting of an Executive Summary and Volumes 1-4 was submitted on February 11, 2008. The environmental study was included in the application for 401 Certification and discussed surface water impacts and mitigation measures for water quality protection during construction. The FEIS includes comments raised by the public and the Applicant's response to comments.

C-23. A draft Environmental Impact Statement (EIS) was issued for public comment in 2006 by the Applicant and the Federal Highway Administration (FHA). A final EIS[2] was issued in December 2007. The final EIS included a summary of public comments received on the draft and responses by the Applicant and FHA.

C-24. On October 24, 2008, the Federal Highway Administration issued a Record of Decision (ROD) for the Activity (FHWA-NH-EIS-06-01-F).

C-25. On April 16, 2009, the DES Waste Management Division received a copy of a letter report dated December 30, 2008 from ATC Associates Inc. to the Applicant regarding marine sediment testing. The purpose of the soil/sediment sampling program was to determine the thickness of sediment / soil overlying the bedrock and the presence of oil and/or hazardous material (OHM) that might be encountered during the construction of piers in the Piscataqua River. Sediment samples were taken in September and October of 2008 in the river channel between the existing General Sullivan and Little Bay bridges.

C-26. On June 17, 2009 the DES Wetlands Bureau issued Wetlands Permit #2006-02007 for alterations or impacts to jurisdictional wetlands associated with the Activity. A Joint Public Hearing with the US Army Corp of Engineers, the Federal Highway Administration, and the NH Department of Environmental Services Wetlands Bureau was held on September 21, 2006.

---

2. Final Environmental Impact Statement, Spaulding Turnpike Improvements NHS-027-1(37), 11238, Newington to Dover New Hampshire. December 2007. Prepared for the NH Department of Transportation and the Federal Highway Administration by VHB/Vanesse Hangen Brustlin, Inc.

C-27. DES Alteration of Terrain regulations (Env-Wq 1500), effective January 1, 2009) include design criteria for stormwater best management practices (BMPs) as well as criteria for minimizing the hydrologic impacts of stormwater runoff both during and after construction. Further, BMP design details as well as guidance for preparing pollutant loading analyses using the "Simple Method" are provided in *The New Hampshire Stormwater Manual* (http://des.nh.gov/organization/divisions/water/stormwater/manual.htm). The pollutant loading guidance assumes all permanent stormwater practices (i.e., best management practices or BMPs) referenced in the loading analysis are designed in accordance with current Alteration of Terrain regulations (Env-Wq 1500).

C-28. DES maintains an Environmental Monitoring Database (EMD) for all environmental data collected and received by DES. The EMD is accessible to the public on the World Wide Web and is designed to accept data from sources outside of DES.

D. FINDINGS

D-1. The Activity reviewed for this 401 Certification is the "Selected Alternative" as described in the 2007 FEIS (see section C-22 of this Certification) and the FHWA ROD (see section C-23 of this Certification) and in general includes construction and operation of the following: Reconstruction and widening of a 3.5 mile section of an existing highway facility (Spaulding Turnpike) from just north of Exit 1 in Newington to just south of the Dover Toll Plaza , including: improvements to five interchange areas (Exits 2, 3, 4, 5 and 6), rehabilitation and widening of the Little Bay Bridges to eight lanes (three general purpose lanes plus an auxiliary lane in each direction), and rehabilitation of the General Sullivan Bridge (GSB) to continue to function as a pedestrian/bicycle/recreational facility and to accommodate emergency response and maintenance vehicles.

D-2. The Activity requires water quality certification under Section 401 of the federal Clean Water Act.

D-3. The Activity will result in a discharge and may cause the permanent alteration of, or temporary impacts to surface waters.

D-4. Storm water runoff, including snowmelt, and groundwater flow to surface waters from within the area affected by the Activity during warm and cold-weather conditions are discharges under the definitions of Env-Wq 1702.18.

D-5. The Activity includes dredge and fill of wetlands. The 401 Certification decision relies, in part, on an approved permit from the DES Wetlands Bureau for the potential construction-related impacts to jurisdictional wetlands. Through its processing and issuance, the DES wetlands permit will address the dredge and fill impacts to jurisdictional wetlands.

D-6. The named and unnamed fresh water and tidal rivers and streams, lakes and ponds, and wetlands, affected by the Activity, are surface waters under Env-Wq 1702.46. DES has assigned Assessment Unit (AU) identification numbers to surface waters that appear on 1:100,000 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 (see section C-8 of this Certification). Surface waters that could be potentially affected by the Activity and their associated AU numbers (where available) include the following: Paul Brook (NHRIV600031001-07), Pickering Brook (including 2 unnamed ponds) and Flagstone Brook (NHRIV600031001-01), Railway Brook (NHRIV600031001-08), 2 unnamed tributaries to the Piscataqua River, the tidal portion of the Bellamy River (NHEST600030903-01-02), Little Bay (NHEST600030904-06-13, NHEST600030904-06-14 and NHEST600030904-06-15), the Piscataqua River (NHEST600031001-02-01, NHEST600031001-01-02 and NHEST600031001-01-03), and several unnamed wetlands.

D-7. The potentially affected surface waters are Class B waterbodies; therefore Class B New Hampshire surface water quality standards apply to the Activity. Class B waterways are considered suitable for aquatic life, primary and secondary contact recreation, fish consumption, wildlife, and, after adequate treatment, as a water supply [3].

D-8. The Activity includes the addition of approximately 23.3 acres of impervious roadway, shoulders, and sidewalks to accommodate vehicular and bicycle traffic and pedestrians. The increase in impervious area and use of the roadway and associated facilities can result in increased deposition of pollutants such as chlorides, sediments, nutrients (phosphorus and nitrogen), various metals (i.e, lead, zinc, etc), bacteria and petroleum aromatic hydrocarbons (PAHs). These pollutants can then be mobilized and transported from impervious surfaces to surface waters and can potentially cause or contribute to violations of surface water quality standards.

D-9. The Activity may temporarily or permanently result in increased flow and volume of stormwater runoff and reductions in groundwater recharge due to increases in impervious surfaces. Such hydrologic alterations could violate the antidegradation provisions of the state surface water quality regulations (see section D-10 of this Certification). The current Alteration of Terrain regulations (Env-Wq 1500) include provisions to prevent degradation associated with hydrologic alterations. In specific, Env-Wq 1507.05 and Env-Wq 1507.06 address stormwater flow and Env-Wq 1507.04 addresses groundwater recharge. Requiring the Applicant to comply with these regulations is expected to prevent hydrologic related violations of the antidegradation provisions of the state surface water quality regulations.

---

3. 2008 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology. March 2008. NH Department of Environmental Services. NHDES-R-WD-05-29.

D-10. Since the Activity could include new discharges of pollutants and increases in flow alteration (i.e., due to increased impervious cover), the antidegradation provisions of Env-Wq 1708 apply (see section C-19 of this 401 Certification).

D-11. According to the 2008 list of impaired waters (see section C-16 of this Certification), the following surface waters in the vicinity of the proposed Activity 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:

Assessment Unit (AU)	Waterbody Name	Cause of Impairment (Designated Use Impaired)
NHEST600030903-01-02	Estuary - Bellamy River South	Estuarine Bioassesment, Total Nitrogen (AL) Mercury, PCB (FC) Enterococcus (PCR) Dioxin, Fecal Coliform, Mercury, PCB (SFC)
NHEST600030904-06-13	Estuary- Lower Little Bay	Clarity, Total Nitrogen, Estuarine Bioassesment (AL) Mercury, PCB (FC) Dioxin, Fecal Coliform, Mercury, PCB (SFC)
NHEST600030904-06-14	Estuary – Lower Little Bay Marina SZ	Clarity, Total Nitrogen, Estuarine Bioassesment (AL) Mercury, PCB (FC) Dioxin, Mercury, PCB (SFC)
NHEST600030904-06-15	Estuary – Lower Little Bay General Sullivan Bridge	Clarity, Total Nitrogen, Estuarine Bioassesment (AL) Mercury, PCB (FC) Dioxin, Mercury, PCB (SFC)
NHEST600031001-01-02	Estuary – Upper Piscataqua River – Dover WWTF SZ	Clarity, Total Nitrogen, Estuarine Bioassesment (AL) Mercury, PCB (FC) Enterococcus (PCR) Dioxin, Mercury, PCB (SFC)
NHEST600031001-01-03	Estuary – Upper Piscataqua River	Clarity, Total Nitrogen, Estuarine Bioassesment (AL) Mercury, PCB (FC) Dioxin, Mercury, PCB (SFC)
NHEST600031001-02-01	Estuary – Lower Piscataqua River North	Estuarine Bioassesment (AL) Mercury, PCB (FC) Enterococcus (PCR and SCR) Dioxin, Mercury, PCB (SFC)
NHRIV600031001-01	Pickering Brook (including 2 unnamed ponds) and Flagstone Brook	Aluminum, Iron (AL) **Mercury (FC)**
NHRIV600031001-07	Paul Brook	Benthic Macroinvertebrate Bioassessment, Chloride, Dissolved Oxygen (AL) **Mercury (FC)** Escherichia Coli (PCR)
HRIV600031001-08	Railway Brook	Iron (AL) **Mercury (FC)**

Assessment Unit (AU)	Waterbody Name	Cause of Impairment (Designated Use Impaired)
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-12. As stated in section C-18 of this Certification, when a surface water does not meet water quality standards (i.e., when it is impaired), the addition of pollutants causing or contributing to impairment is prohibited. That is, existing loadings must be held. Further, as stated in C-16 of this Certification, TMDLs must be conducted for any surface water listed on the Section 303(d) List. The TMDL includes source identification, determination of the allowable load and reductions (by source) necessary to meet the allowable load. For waters with an approved TMDL, pollutant reductions per the TMDL are required. For pollutants causing an impairment without a TMDL, loadings of the pollutant causing impairment must be held such that there are no increased loadings until such time as a TMDL is prepared.

For all other pollutants (i.e., those not known to be causing impairment) which are likely to be discharged from the Activity, Applicants can either hold existing loadings (i.e., no degradation), or request to degrade the water in accordance with the antidegradation provisions of Env-Wq 1700. As stated in section C-19 of this Certification, to satisfy antidegradation, Applicants must 1) determine the remaining assimilative capacity of the pollutant(s) of concern (which may require monitoring), 2) determine if the discharge is "significant " or insignificant (which will likely require modeling to predict the percent of the remaining assimilative capacity used by the Activity) 3), if "significant", provide justification that the Activity provides an important economic or social benefit including an alternative analysis to minimize the degradation, and 4) provide opportunity for public comment and intergovernmental agency coordination. This information is then submitted to DES for approval or denial of the requested degradation.

To demonstrate no additional loading for pollutants which can be removed by structural BMPs, DES allows Applicant's to submit loading analyses in accordance with guidance included in the DES Stormwater Manual (see section C-27 of this Certification). The guidance allows use of the "Simple Method" for calculating loads before and after construction. At this time, DES uses total suspended solids (TSS), total nitrogen (TN) and total phosphorus (TP) as surrogates for all other parameters. That is, if the loadings for TSS, TN and TP are held to pre-construction levels, it is assumed that loadings of all other parameters which can be removed by structural BMPs, are held as well. The pollutant loading guidance also assumes that all permanent stormwater practices (i.e., best management practices or BMPs) referenced in the loading analysis are designed and maintained in accordance with current Alteration of Terrain regulations (Env-Wq 1500).

Chlorides cannot be treated by structural BMPs because they are conservative and relatively untreatable substances that persist in the environment. De-icing chemicals containing chloride (i.e., road salt) are a primary source of chlorides in fresh surface waters. Because they cannot be treated by structural BMPs , chlorides cannot be addressed by typical loading analyses. In the FHWA ROD (see item C-23), it is stated that "NHDOT will continue to investigate various measures and technologies as a means of reducing overall salt use in the project corridor". Submittal of a road salt minimization plan to reduce chloride to the maximum extent practicable, can be required to address concerns associated with chloride.

D-13. As stated in section C-17 of this Certification, a TMDL was approved by EPA in 2007 for mercury impairments in New Hampshire fresh surface waters. All surface waters in New Hampshire are impaired because of a statewide fish consumption advisory due to levels of mercury in fish tissue. The vast majority of the mercury is believed to be due to atmospheric deposition. The TMDL calls for an 87% to 98% reduction in anthropogenic atmospheric deposition of mercury. The TMDL does not call for a specific reduction in stormwater loads due to activities such as those proposed in this Certification. Rather, reductions in stormwater mercury load are expected to be achieved through reductions in atmospheric deposition, which is believed to be the primary source of mercury in stormwater (page 36 of TMDL). Increased impervious area flowing directly to surface waters can increase the volume of stormwater runoff. Consequently, until atmospheric loadings are reduced, an increase in stormwater runoff can result in an increase in mercury loading reaching surface waters via stormwater runoff. It is expected, however, that the requirement to hold loadings for the surrogate pollutants discussed in section D-12 of this Certification, coupled with the requirements to satisfy peak flow and groundwater recharge requirements in the Alteration of Terrain regulations (see section D-9 of this Certification), will be adequate to prevent any increase in mercury loadings (as well as other pollutants which can be removed by structural BMPs) to surface waters due to stormwater associated with the Activity.

D-14. Section C-19 h and C-19 i of this Certification includes excerpts from Env-Wq 1708.01 regarding antidegradation which state that "the department shall assure that the highest statutory and regulatory requirements shall be achieved for all new and existing point sources and that all cost effective and reasonable best management practices for nonpoint source control shall be implemented". In addition to being cost effective and reasonable, best management practices must be selected to ensure attainment of water quality standards in receiving waters as evidenced by the following:

a. As stated in section C-15 of this Certification, "Best Management Practices" (BMPs) are defined in Env-Wq 1702.06 as "those practices which are determined, after problem assessment and examination of all alternative practices and technological, economic and institutional considerations, to be the most effective practicable means of preventing

or reducing the amount of pollution generated by point or nonpoint sources to a level *compatible with water quality goals"* (italics added).

b. Env-Wq 1708 (b) and (c) (see section C-19 h and C-19 i of this Certification) which states "In allowing such degradation or lower water quality, the department shall assure water quality adequate to fully protect existing uses".

D-15. During construction, the disturbance of earth, such as the placement of fill on the Activity site, may temporarily increase turbidity levels in surface waters adjacent to and downstream from the area affected by the Activity, particularly during wet weather events, and may contribute to long-term sediment retention in and/or transport through the surface water adjacent to and downstream from the Activity site. During construction, erosion control inspections and turbidity monitoring can be imposed to manage turbidity. DES, in consultation with NHDOT, has developed the following guidance for this purpose: Inter-Department Communication dated February 2, 2009 from Paul Currier, (DES) to Charles Hood (NHDOT) regarding Amendment of the November 16, 2006 Guidance for BMP Inspection and Maintenance, and Turbidity Sampling and Analysis Plans for I-93 Expansion Project Water Quality Certification.

D-16. Excavation associated with the construction and/or expansion of bridge piers on the Activity site, may temporarily suspend bottom sediments within the project area that may adversely impact water quality in the adjacent surface waters. During construction, sediment control inspections and sediment characterization monitoring can be imposed to manage sedimentation and any impacts from the suspension of contaminated sediments. In the December 2007 FEIS (see C-22 of this Certification and Volume 4, page S-7 of the FEIS), the following is stated: " The NHDOT and FHWA recognize the risk posed by the suspension of potentially contaminated marine sediments and the NHDOT will develop a sediment sampling and characterization program in consultation with the NHDES, the USACOE and other agencies. This sampling would typically occur in conjunction with the geotechnical investigations conducted during the final design phase. Even if the sediments are determined to not pose a contamination risk, stringent requirements will be incorporated into the final design plans to require the selected contractor to minimize any movement of sediment beyond the work area. It is anticipated that all work on the bridge piers will be conducted behind sealed cofferdams, which will substantially limit the movement of suspended sediments. The NHDOT will conduct regular inspections of the measures designed to minimize this risk. Additional measures will be developed if contaminants in the marine sediments exceed NOAA thresholds for ecological or human health. These requirements are typically a condition in the USACOE and NHDES Wetland Bureau permits, as well as a USEPA Remedial General Permit (RGP) which may be required for the project."

As stated in section C-25 of this Certification, ATC Associates Inc (ATC), conducted marine sediment analyses in the Piscataqua River between the General Sullivan and Little Bay bridges in September and October of 2008. A

total of 21 samples from 13 sites were sampled at various depths for oil and/or hazardous material (OHM). Samples were analyzed for volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (TPH) diesel range organics (DRO), total cyanide, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, copper, nickel and zinc. Results were compared to soil reuse thresholds in Env-Sw 900. According to ATC, "the sediment in the proposed work area is not significantly contaminated with OHM", and "the detected contaminant concentrations should not require special disposal options (i.e., the sediment may be disposed of at an approved landfill and/or recycling facility)".

To determine if sediments pose a risk to aquatic life, DES developed guidance[4] in 2005 for application of State surface water quality standards to freshwater, estuarine and marine sediments. According to the guidance, risk posed to sediment-dwelling organisms should be assessed according to the Sediment Quality Triad approach which consists of 1) sediment chemical analyses, 2) sediment toxicity bioassays (laboratory) and 3) community assessment (field). With regards to the sediment chemical analyses, sediment contaminant levels are compared to threshold effect concentrations (TEC) and probable effect concentrations (PEC), which are based on peer reviewed screening level contaminant lists from NOAA, EPA and others. TEC values are screening thresholds below which adverse effects are unlikely. PEC values are screening thresholds above which adverse effects are likely. Hazard Quotients (HQ) are equal to the contaminant detected in the sample divided by the threshold value. An HQ calculated with a TEC (HQ-TEC) of one or greater indicates the possibility the contaminant may adversely affect sediment organisms and is considered a moderate risk contaminant of concern (COC). An HQ calculated with a PEC (HQ-PEC) of one or greater indicates the likelihood that the contaminant will adversely affect sediment organisms and is considered a high risk COC. According to the 2008 CALM[5], assessment units with at least two samples that have an HQ-TEC greater than one, can be listed as impaired for the aquatic life designated use, provided there isn't any biological information (i.e., laboratory or field bioassays) that suggests otherwise (in such cases a weight of evidence approach is used to make an assessment).

In September 2009, DES compared the sediment data to HQ-TEC and HQ-PEC thresholds. As shown in the table, eight contaminants exceed the HQ-TEC and/or HQ-PEC thresholds. Of these, eight are considered moderate risk COCs and four (2-methylnaphthalene, naphthalene, mercury and nickel) are considered to be high risk COCs.

---

4. Draft Evaluation of Sediment Quality Guidance Document. NH Department of Environmental Services. April 2005. NHDES-WD-04-9.
5. 2008 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology. March 2008. NH Department of Environmental Services. NHDES-R-WD-05-29.

Naphthalene, 2-methylnaphthalene, fluoranthene and pyrene are polyaromatic hydrocarbons (PAHs) which are components of petroleum products. PAHs may be introduced to the environment through fuel spills and combustion of fuels (including automobiles). According to the 2009 Estuaries Indicator Report[6], total PAH concentrations in mussel tissue at station NHDP at Dover Point (which is located by Pier 8 under the Little Bay Bridge) have shown an increasing trend since 1993 whereas lead has exhibited a decreasing trend.

Table 1

Chemical	TEC (ppm)	PEC (ppm)	Highest Sediment Result (ppm)	HQ-TEC	Possibility of adverse effects based on TEC	No. of Stations over TEC Threshold	HQ-PEC	Likelihood of adverse effects based on PEC
2-methylnaphthalene	0.0202	0.201	0.3	14.9	Moderate	1	1.5	High
Fluoranthene	0.113	1.494	0.3	2.7	Moderate	1	0.2	Low
Naphthalene	0.0346	0.391	0.5	14.5	Moderate	1	1.3	High
Pyrene	0.153	1.398	0.3	2.0	Moderate	1	0.2	Low
Copper	18.7	108	59	3.2	Moderate	5	0.5	Low
Lead	30.2	112	67	2.2	Moderate	4	0.6	Low
Mercury	0.13	0.696	1.3	10.0	Moderate	1	1.9	High
Nickel	15.9	42.8	90	5.7	Moderate	10	2.1	High

Nickel exceeded the TEC threshold at 10 of the 13 stations, copper exceeded the threshold at 5 stations, and lead exceeded the threshold at 4 stations. The five remaining contaminants (which include the four PAHs mentioned above and mercury) exceeded TEC thresholds at only 1 station.

With the information provided it is difficult to determine if all 13 sampling stations are in the same assessment unit or if they are split into two assessment units. According to the 2008 CALM[7], assessment units with at least two samples that have an HQ-TEC greater than one, can be listed as impaired for the aquatic life designated use, provided there isn't any biological information (i.e., laboratory or field bioassays) that suggests otherwise (in such cases a weight of evidence approach is used to make an assessment). As shown in Table 1, there are eight contaminants that exceed the TEC threshold. Nine of the stations had two or more exceedances. Consequently, one or possibly two estuarine assessment units may be listed as impaired for aquatic life in the 2010 assessment unless there is biological evidence (i.e., laboratory bioassays or field community studies) that indicate the sediments are not toxic to aquatic organisms.

Requiring the Applicant to design, construct and maintain the Activity in a manner that will not result in an increase in pollutant loads to surface waters (see section D-12 of this Certification) is expected to prevent further degradation of the sediments associated with operation of the Activity.

---

6. 2009 Piscataqua Region Estuaries Partnership Environmental Indicators Report. Prepared by Phil Trowbridge of the Piscataqua Region Estuaries Partnership. June 2009.
7. 2008 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology. March 2008. NH Department of Environmental Services. NHDES-R-WD-05-29.

Development and implementation of a plan that includes 1) stringent measures to minimize the area of disturbed sediments and settling of contaminated sediments beyond the immediate work zone 2) monitoring to confirm that water quality standards are being met and that the method of sediment confinement is operating as intended, and 3) methods for disposal of dredged sediments and drain water in a manner that will not adversely impact surface waters, is expected to prevent water quality standard violations due to dredging and disposal of sediments associated with construction of the Activity.

D-17. To help ensure that best management practices (BMPs) will always function as intended, development and implementation of a BMP inspection and maintenance plan, in accordance with current Alteration of Terrain regulations (Env-Wq 1500), can be required.

D-18. The December 2007 FEIS includes concerns raised by the NH Fish and Game Department (see C-22, Volume 4, page S-5) with regards to bridge construction and impact on aquatic habitat and anadromous fish. In response NHDOT stated that "NHDOT and FHWA will coordinate design methods and anticipated schedule of the pier construction during the project's final design with NHF&GD's Durham office".

D-19. The December 2007 FEIS includes concerns raised by the NH Estuaries Project (now the Piscataqua Region Estuaries Partnership or PREP) (see C-22 of this Certification and Volume 4, section S-4 of the FEIS) with regards to the potential impact of the Activity on tidal water quality and on existing long term tidal sampling stations. PREP recommends that because the Activity may increase loadings to the estuary (especially if BMPs do not function as planned), the Applicant should contribute to the annual cost of sampling at the Little Bay, Bellamy River and Upper Piscataqua trend monitoring stations as well as at the mussel tissue monitoring station located by Pier 8. This is especially important in the tidal waters, many of which are currently listed as impaired for numerous pollutants including nitrogen (see item D-11). In their response to comments, the Applicant responded that "Since NHDES is responsible for monitoring pollutants in the Great Bay, the NHDOT and FHWA will coordinate with NHDES and as practicable will assist and facilitate with the monitoring effort." With regards to the mussel sampling station NHDOT responded with the following: "The NHDOT and FHWA will coordinate with the NH Estuaries Program to avoid any impacts to the sampling station located between Pier 8 and the Dover shoreline during construction. There will be no direct impacts to the station associated with the project and therefore mitigation is not warranted. The NHDOT and FHWA will work with NHDES to facilitate their monitoring efforts at the sampling station."

To ensure that construction and operation of the Activity will not impact the PREP long term sampling station located near Pier 8, and in accordance with representations made in the FEIS, it is appropriate to require development and implementation of a plan to prevent any impacts to the long term sampling station due to construction and operation of the Activity.

E. WATER QUALITY CERTIFICATION CONDITIONS

E-1. The Activity shall not cause or contribute to a violation of surface water quality standards. DES may modify this 401 Certification to include additional conditions to ensure the Activity complies with surface water quality standards, when authorized by law, and after notice and opportunity for hearing, 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 401 Certification.

E-3. The Applicant shall consult with DES regarding any proposed modifications to the Activity, including construction or operation, to determine whether this 401 Certification requires modification in the future.

E-4. The Applicant shall not use any surface waters (as defined in section C-8 of this Certification) for treatment of stormwater runoff unless otherwise permitted by the DES Wetlands Bureau and the DES Watershed Bureau.

E-5. Prior to advertising each contract for the Activity, the Applicant shall receive written approval from DES of documentation demonstrating that the Activity is in compliance with current DES Alteration of Terrain Regulations (Env-Wq 1500) regarding stormwater flow (Env-Wq 1507.05 and Env-Wq 1507.06) and groundwater recharge (Env-Wq 1507.04).

E-6. Prior to advertising each contract for the Activity, the Applicant shall obtain DES written approval of a pollutant loading analysis that demonstrates, with reasonable assurance, no increase in loading of pollutants that can be removed by structural best management practices, and which are likely to be discharged to surface waters as a result of operation of the Activity. This condition does not apply to chlorides as they cannot be removed by structural BMPs. Unless otherwise authorized by DES, the Applicant shall use the Simple Method described in section D-12 of this Certification for conducting the pollutant loading analysis and shall use the surrogate pollutants TSS, TN and TP to represent the pollutants of concern that can be removed by structural best management practices. Prior to conducting the loading analyses, the Applicant shall obtain DES written approval of the surface water locations (i.e., analysis points) where pollutant loading analyses will be conducted. Unless otherwise authorized by DES, all BMPs included in the loading analysis shall be designed and constructed in accordance with the current DES Alteration of Terrain regulations (Env-Wq 1500). Prior to advertising each contract for the Activity, the Applicant shall obtain DES written approval of the design of the BMPs used in the loading analysis.

E-7. The Applicant shall not increase chloride loading to Paul Brook, which is impaired for chlorides (see section D-11 of this Certification). Prior to

advertising contracts for the Activity, the Applicant shall obtain DES written approval of a plan to prevent any increase in loading of chloride from the Activity (i.e., no additional loading) to Paul Brook, The Applicant shall then implement the approved plan.

E-8. Within 180 days of the date of approval of this Certification, the Applicant shall prepare and submit a Road Salt Minimization Plan to DES for approval to minimize, to the maximum extent practicable, discharges of de-icing chemicals containing chloride (road salt) within the project corridor. As a minimum, the Road Salt Minimization Plan shall include the following:

1) A description of current DOT de-icing application practices and rates in the project corridor

2) An evaluation of alternative measures and technologies including use of brine for pre-wetting salt and for anti-icing, and pervious pavement;

3) A schedule for implementation of salt reduction measures; and

4) A method for tracking and reporting progress in reducing salt usage.

The Applicant shall than implement the approved plan.

E-9. To ensure the long-term effectiveness of approved permanent stormwater practices, the Applicant shall prepare an Inspection and Maintenance (I & M) manual. The manual shall include:

1) The names of the responsible party or parties who will implement the required reporting, inspection and maintentance activities;

2) The frequency of inspections;

3) An inspection checklist to be used during each inspection;

4) An I & M log to document each I & M activity;

5) A log to document road salt use and application rates and documentation showing the relationship between salt usage and the winter severity index

6) A plan showing the locations of stormwater practices described in the I & M manual; and

7) Actions to be taken if any invasive species begin to grow in the stormwater management practices.

All record keeping required by the I & M manual shall be maintained by the Applicant and made available to DES upon request.

The Applicant shall obtain DES's written approval of the I & M manual prior to operation of permanent stormwater practices. The Applicant shall then implement the activities described in the approved I & M manual.

E-10. The Applicant shall prepare and submit an erosion control inspection and maintenance plan and a turbidity sampling and analysis plan for soil erosion control during construction. The plans shall be in accordance with the following guidance developed by DES, in consultation with NHDOT: Inter-Department Communication dated February 2, 2009 from Paul Currier, (DES) to Charles Hood (NHDOT) regarding Amendment of the November 16, 2006 Guidance for BMP Inspection and Maintenance, and Turbidity Sampling and Analysis Plans for I-93 Expansion Project Water Quality Certification. The Applicant shall obtain DES' s written approval of the turbidity sampling locations prior to advertising each contract for the Activity, include the above mentioned memorandum in the Storm Water Pollution Prevention Plan (SWPPP) and file a Notice of Intent for coverage under the EPA National Pollutant Discharge Elimination System (NPDES) Construction General Permit. The Applicant shall then implement the approved plan.

E-11. The Applicant shall prepare and submit a plan to minimize movement of marine sediment during construction and to prevent water quality violations beyond the work area. The plan shall:

1) Detail how marine sediment disturbance will be minimized;

2) Have provisions for regular inspection and maintenance of protective measures;

3) Require sampling to determine compliance with water quality standards and to confirm that disturbed marine sediments are confined within the work area;

4) Describe additional protective measures that will be taken for sediments that exceed NOAA thresholds for ecological risk (as stated in the 2007 FEIS, see section D-16 of this Certification);

5) Specify methods for disposal of dredged sediments and drain water in a manner that will not cause surface water quality violations; and

6) Be compliant with the NPDES Remedial General Permit if discharges to surface waters occur.

The Applicant shall obtain DES's written approval of the plan prior to commencing any construction in tidal waters associated with the Activity. The Applicant shall then implement the approved plan.

E-12. The Applicant shall coordinate with the NH Fish and Game Department regarding final design, methods and anticipated schedule of the pier construction to minimize impact on valuable aquatic habitat and to lessen, to

the extent practicable the potential temporary effects that construction activities may have on anadromous fish. Prior to advertising contracts for bridge construction associated with the Activity, the Applicant shall provide evidence of such coordination to DES.

E-13. Prior to advertising contracts for bridge construction associated with the Activity, the Applicant shall obtain DES's written approval of a plan to minimize impacts to the Piscataqua Region Estuaries Partnership long term sampling station located in the vicinity of Pier 8 during construction. The Applicant shall then implement the approved plan.

E-14. The Applicant shall comply with the conditions of DES Wetlands Bureau Permit No. 2006-02007, including any amendments and shall comply with DES wetlands rules and regulations. The conditions shall become conditions of this 401 Certification upon issuance of this 401 Certification.

F. 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 Gregg Comstock at (603) 271-2983.

Harry T. Stewart
Director, DES Water Division

cc: Richard Roach, ACOE
Newington Board of Selectmen
J. Michael Joyal, Jr., Dover City Manager
John Warner, US Fish and Wildlife Service
Mark Kern, US Environmental Protection Agency
Gino Infascelli, DES Wetlands Bureau
Chris Williams, DES Watershed Management Bureau (Coastal Program)
Ridge Mauck, DES Alteration of Terrain Bureau
Carol Henderson, NH Fish and Game