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September 5, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
NOTICE OF PROJECT CHANGE

PROJECT NAME	: Central Artery/Tunnel Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 4325
PROJECT PROPONENT	: Massachusetts Turnpike Authority
DATE NOTICED IN MONITOR	: July 9, 2008

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62I) and Section 11.10 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Notice of Project Change (NPC) submitted for this project and hereby determine that it **does not require** a Supplemental Environmental Impact Report (EIR).

Project Change

The project change consists of redirecting stormwater and groundwater flows associated with the Central Artery/Tunnel Project tunnels from the sanitary sewer system. The Final Supplemental Environmental Impact Statement/EIR (FSEIR/EIS), submitted to MEPA in November 1990, and supporting plans and studies, included an assumption that wastewater would be generated primarily from tunnel washing, tunnel rinsing and firefighting operations with negligible amounts from stormwater, groundwater and seepage. Subsequent design and permitting of the tunnel drainage systems were predicated on this assumption. During permitting, the Massachusetts Department of Environmental Protection (MassDEP) classified the tunnel drainage as industrial wastewater consisting primarily of tunnel wash water and

firefighting flows and determined that it should be discharged into the Massachusetts Water Resources Authority (MWRA) sanitary sewer system. As a result, tunnel drainage systems discharge all flows through the Boston and Water Sewer Commission (BWSC) system to the MWRA sanitary sewer system for treatment and discharge at the Deer Island Treatment Plan.

Monitoring of tunnel flows over the past several years confirm that assumptions regarding wastewater flows were incorrect. The NPC indicates that significant volumes of stormwater flow into the tunnels during storm events and that the tunnels contain leaks through which significant volumes of groundwater enters the tunnels. Figure 7 indicates that approximately 25 million gallons of water was discharged to the MWRA system in 2007. The FSEIS/EIR estimated that tunnel washing would generate approximately 29,300 gallons per day (gpd) over a 12-day period for each wash event for a total of 1,100,000 gallons per year (gpy). The discharge of significant volumes of groundwater and stormwater to the sanitary sewer system violates the project's Sewer Use Discharge Permits issued by the MWRA. These permits prohibit the discharge of groundwater and stormwater to its system. In modified Sewer Use Discharge Permits issued on November 7, 2007, the MWRA directed the Massachusetts Turnpike Authority (MTA) to remove groundwater and stormwater from the sewer system.

MWRA, in cooperation with the BWSC and other member communities, is implementing a $925 million long-term Combined Sewer Overflow (CSO) control plan to bring CSO discharges into compliance with the federal Clean Water Act and State Surface Water Quality Standards. Design and construction of the 35 projects recommended in the long-term plan are subject to federally mandated schedule milestones. MWRA requires that all projects discharging to the BWSC and MWRA systems, at a minimum, direct stormwater runoff to the BWSC separate storm drainage system, where available, to ensure that increases in wastewater flow do not compromise CSO control goals, permit compliance or associated water quality improvement in Boston Harbor and to preserve the capacity of its system to handle municipal sewage. MWRA is concerned that flows from the CA/T Project tunnels may contribute to overflows at permitted CSO outfalls in the Inner Harbor and Fort Pont Channel.

The NPC includes an alternatives analysis that compares several alternatives to remove and divert groundwater and stormwater from the sanitary sewer system. These alternatives were developed through an interagency coordination process that includes MTA, MassDEP, BWSC, MWRA and the U.S. Environmental Protection Agency (EPA). The NPC indicates that the proponent's Preferred Alternative is to install a series of bypass valves at nine discharge locations. During normal non-washing conditions, stormwater flows would be bypassed at five of nine discharge locations. During extreme high flow events or emergency conditions, valves would be bypassed at all nine discharge locations to minimize contributions to CSOs. These valves will divert stormwater flows from the sewer system to a stormwater collection system for discharge to surface waters at existing outfall locations in Boston Harbor, the Fort Point Channel and the Charles River.

Project Site/Existing Infrastructure

The project site extends from the I-90/I-93 interchange to the Charles River and includes 81,200 linear feet of tunnels including the Ted Williams Tunnel (TWT), the I-90 Connector and

the I-93 tunnels. The tunnel collection systems consist of catch basins located along the tunnel roadway. Gravity flow carries water from the inlets to 12 Low Point Pump Stations (LPPS) that discharge to the sewer system at nine locations. Each of the pump stations consists of a separate sump and wet well with submersible pumps designed to settle out sand and grit prior to overflow into the wet well.

The stormwater system consists of inlets on at-grade highway sections, surface streets, medians, parking areas and ramps that lead to storm drains and, where necessary, to stormwater pumping stations. To minimize discharge of stormwater, the portal drainage system is designed to intercept all stormwater for storm events up to the 50-year storm. Stormwater is discharged at several permitted outfalls located within Boston Harbor, Fort Point Channel and the Lower Charles River.

Permitting and Jurisdiction

The project change requires modified Sewer Use Discharge Permits from the MWRA and a National Pollutant Discharge Elimination System (NPDES) Phase II Storm Water Permit/Individual MS4 permit which is issued jointly by MassDEP and the EPA. It may require a Groundwater Discharge Permit from MassDEP. In addition, it will require approvals from the City of Boston and Boston Water and Sewer Commission for alteration of existing infrastructure.

Based on the use of state funding for the project and the subject matter of permits required of the project as a whole, MEPA has broad scope jurisdiction extending to all issues that may cause Damage to the Environment. These include wastewater and water quality.

Review of the NPC

The NPC provides an assessment of the nature and extent of tunnel flows, compares these to information provided during previous MEPA review of the project and includes an alternatives analysis that explores a range of approaches to reducing and diverting non-wash water from the sewer system. The NPC includes several technical studies that address sources of water, water quality, safety issues and methods to reduce or divert non-wash water from the system. An interagency coordination process was convened to provide a forum for coordination and review and discussion of technical and permitting issues related to the removal of groundwater and stormwater from the system. The range of alternatives and supporting technical studies and assessments included in the NPC were developed through this process.

Alternatives Analysis

The NPC evaluates six alternatives which are summarized below. With the exception of *Alternative 1 – No Action* and *Alternative 4 – No Diversion Valve Plan*, all alternatives entail installing bypass diversion valves at existing LPPS discharge locations to redirect stormwater to surface waters during non-washing periods. The major difference between the diversion valve alternatives consist of the extent and operational parameters of the valve system. The analysis includes an estimate of the amount of flows that would be discharged to the sewer and the

stormwater systems for each alternative based on 2007 flow volumes. The NPC did not identify the capital costs of the various alternatives or identify how long they would take to construct.

Alternative 1 – No Action: All water continues to drain to the MWRA sewer system.

Alternative 2 – Five Discharge Locations Diversion Valve Plan: Valves are installed in five of the nine discharge locations (LPPS 1 and 2, LPPS 4 and 5, LPPS 6 and 7, LPPS 8 and LPPS 12) which account for more than 90% of the flow discharged to the MWRA system. Flows are bypassed during normal operating, non-washing conditions.

Alternative 3 – All Nine Diversion Valve Plan: Valves are installed in all nine discharge locations (LPPS 1 and 2, LPPS 3, LPPS 4 and 5, LPPS 6 and 7, LPPS 8, LPPS 9, LPPS 10, LPPS 11 and LPPS 12). Flows are bypassed during normal operating, non-washing conditions.

Alternative 4 – No Diversion Valve Plan: A comprehensive program of source controls is implemented consisting of redirection of the Dewey Square Tunnel southbound portal trench drains, enhancement of the portal drain facilities to provide more effective collection of stormwater and continued implementation of the MTA Infiltration Reduction Program.

Alternative 5 – Modified Diversion Valve Plan: Valves are installed in five of the nine discharge locations but flows are only bypassed during emergency conditions or extreme high flow events when significant volumes of water are entering or will enter the tunnel system.

Alternative 6 – Seasonal Diversion Valve Plan: Valves are installed in five of the nine discharge locations but flows are only bypassed during the non-wash season which generally extends from December through February and coincides with the highest flows.

All alternatives include continuation of an infiltration reduction program to find and remove leakage and seepage in the tunnels related to the construction phase. Subsequent to a breach in the southbound tunnel in September 2004, the CA/T Project conducted a comprehensive review and inspection of the MTA tunnel system to identify and repair tunnel leaks and developed an infiltration reduction program. The program consists of targeted leak sealing, soldier pile/tremie concrete (STPC) wall repairs, envelope waterproofing and the reduction of infiltration through piping and conduit systems. The NPC indicates that the work is approximately 20 percent complete and that the remaining work will extend into early 2009. MTA will review flow data in the spring of 2009 to assess the effectiveness of the program. As part of an enforcement action related to the non-disclosure of an emergency bypass operation on November 21, 2006, MassDEP has required MTA to implement an ongoing infiltration reduction program.

All alternatives include further exploration of the feasibility of infiltration of the non-wash water. The NPC includes an assessment of groundwater infiltration in Appendix 7 that concludes it is not feasible; however, based on subsequent consultation with the Boston Groundwater Trust, MTA will further evaluate the feasibility of infiltrating wastewater in three locations: the North End (LPPS #8), Chinatown (LPPS#12) and the Leather District (LPPS 4 & 5). Comments from the Boston Groundwater Trust identify the importance of addressing low groundwater levels and confirm this agreement. I note that any groundwater recharge system

will likely require a Groundwater Discharge Permit from MassDEP and MTA must demonstrate that it can achieve associated water quality standards.

In addition, the project may also include changes to surface trench drains and catch basins. The project will include either rerouting the trench drain outside of the Dewey Square Tunnel (DST) to a storm drainage system or bypassing these flows as part of one of the valve bypass alternatives. The NPC indicates that the MTA will continue to evaluate how the portal drain system can be improved through engineering and maintenance practices. The NPC includes the results of a Hydrologic/ Hydraulic Analysis (Appendix 9) that models stormwater flows at three portals. It concludes that the portal drainage system provides sufficient inlet capacity to intercept stormwater sheet flows from the road surface; however, during a significant rainfall event, stormwater accounts for a substantial amount of the total tunnel wet weather flow. For example, during a November 3, 2007 event, these contributions accounted for approximately 80 percent of the total tunnel flow. It indicates that minor reductions in the volume of stormwater entering the tunnel drainage system could be possible through redirection of flow from exposed areas such as the DST portal and modifying the structure and/or grade details at the trench drains and/or catch basins. There is an uncovered section of the I-93 roadway outside of the DST that drains to LPPS 12. This section of roadway has not been covered because the CA/T land use plan includes air rights development of this site (Parcel 25). The NPC does not include a schedule for redevelopment of the site and, to date, the MTA has not issued any requests for interest or proposals for development of the site. Appendix 8 includes a conceptual design for rerouting the trench drain.

The NPC indicates that the MTA Preferred Alternative is a combination of Alternative 2 and 3. It consists of installing bypass valves at all nine discharge locations; however, under normal non-washing conditions, stormwater flows would be bypassed at five of the nine discharge locations identified under Alternative 2. Under high flow events or emergency conditions, valves would be bypassed at all nine discharge locations to minimize contributions to CSOs.

Comments from the MWRA indicate its support for Alternative 3 because it will direct all flow from the sewer system on a regular basis except during tunnel washing. MassDEP comments, which it developed with input from EPA, indicate that the range of alternatives included in the NPC provide an appropriate universe of reasonably potential options to allow for a MEPA-level assessment of this issue. MassDEP comments support installation of diversion valves at all nine locations to allow for the diversion of non-wash water for either emergency conditions or extreme high flow events. MassDEP comments indicate that MTA must provide additional information before it can be determined whether, to what extent, and under what conditions, non-wash water can be diverted to storm drainage systems for general operational conditions. MassDEP and EPA will work with MTA, MWRA and BWSC to define each of these situations and potential conditions and/or mitigation requirements, one of which is that MTA will not perform tunnel washing during any of these diversion conditions. The frequency and duration of diversion will be evaluated by MassDEP and EPA based on additional data collection and analysis during the federal/state NPDES Permit process. MassDEP comments indicate that this process will provide opportunities for additional public review and comment.

MassDEP and MWRA comments indicate that the project should include remote operation of valves to simplify system operations, minimize the possibility of unintentional discharge of tunnel wash water to the stormwater system and facilitate rapid responses during emergencies. In addition, MTA must assess the volume of flow needed to fully flush the wash water to the sanitary sewer system prior to redirecting water to the stormwater system. Consistent with the agencies agreement that industrial wastewater belongs in the sewer system and stormwater and groundwater should be directed to the stormwater system, MassDEP and MWRA indicate that the project should include redirection of the Dewey Square Tunnel drain to the stormwater system.

Many comments express concern with the operational challenges of the proposed system and suggest that water continue to be discharged to the sanitary sewer system. BWSC and the Boston Environment Department appear to support Alternative 4 but suggest that the MTA offset its flows to the system by removing extraneous clean water (Infiltration/Inflow (I/I)) from the system on a 10:1 basis. I note that this alternative does not address the MWRA prohibition on discharging stormwater and groundwater to the sanitary sewer system. In addition, the NPC identifies the substantial work that was conducted during construction of the CA/T Project that diverted stormwater flows from CSOs and included major sewer separation work. All sewers, storm drains and CSOs along Atlantic Avenue and the South Bay corridors were replaced, over one mile of the New East Side Interceptor (NESI) was replaced, and hundreds of roof drains and other storm flow connections to the sanitary sewer and CSOs were eliminated. The NPC asserts that the NESI replacement eliminated approximately 17.5 billion gpy from the sewer system.

Comments from Save the Harbor/Save the Bay and the Charles River Watershed Association (CRWA) assert that the NPC does not provide sufficient information to demonstrate that the stormwater discharge will not impact receiving waters. STH/STB indicates that the flows should continue to be directed to the MWRA system for treatment and discharge. CRWA requests that the proponent file an ENF that fully addresses water quality as well as other issues identified in its letter.

Water Quantity

The NPC and supporting analysis, including the Hydrologic/Hydraulic Analysis (Appendix 9), identifies the nature and extent of sources of water flowing through the tunnel drainage system. Major sources of water include stormwater that either bypasses the tunnel entrance and exit portals or is carried in by vehicular traffic and groundwater/infiltration. Minor sources of water include tunnel wash water, firefighting water, tunnel lining subdrains, maintenance and construction discharges, snow brought in by snowplows, and standpipe testing.

MTA has been tracking average monthly outflow from the nine LPPS discharge locations since 2003. Most of the data for the I-90 Connector and I-93 tunnels were based on flow rate estimates that had not been verified until March 2008. Field verification has resulted in significantly different pumping rates. Data for the TWT is based on a flow meter. In the NPC, Figures 4 and 5 graph average outfall for the I-90 and I-93 tunnels since 2003. Figure 6 includes a chart and graph of outflow and precipitation from January 2007 to February 2008. In 2007, flows ranged from a low of 870,487 gallons per month (gpm) (August) to a high of 4,890,947 gpm (February). Based on its data, MTA has concluded that flows are cyclical in nature. Flows

peak in late winter and early spring due to both higher precipitation and colder temperatures (due in large measure to the contraction and expansion of the metal and concrete). Figure 6 clearly illustrates this trend.

The TWT Sewer Use Discharge Permit application indicated that the TWT tunnel washing would generate 165,000 gpd for each wash period for a total of 3,620,000 gpy. Total flows for 2007 was 25,409,201 gallons. Although total flows are significantly higher than those identified during the MEPA review and permitting processes, the NPC indicates that the Stem to Stern Safety Review (Appendix 5) concluded that the current leak rate in the CA/T Project tunnels is well below the generally accepted norm for leakage rates in rail transit tunnels.

The Tetra Tech Rizzo Final Water Quality Study (Appendix 6) provides a rough estimate of the contribution of each source of water (Table 1). It indicates that groundwater is the primary source during dry weather (95 percent), that stormwater is the primary source during wet weather (71 percent) and that vehicle carry-in represents a significant source (16%). Minor flows each contribute less than one percent. The Hydrologic/ Hydraulic Analysis (Appendix 9) provides additional analysis regarding stormwater flows. It indicates that the amount of precipitation carried into the tunnel by vehicles during heavy rainfall events is in the range of 58,240 to 116,480 gpd. The NPC indicates that these sources are unavoidable and that there are no feasible measures that MTA can implement to significantly reduce these flows.

MassDEP comments indicate that its independent review and assessment of MTA data support MTA findings regarding the correlation between higher precipitation and colder temperatures and increased flows. However, MassDEP questions the assumptions regarding the amount of stormwater carried into the tunnels in tires and on the vehicles. MassDEP suggests that the MTA should assess a range of figures to determine the potential impact on overall tunnel drainage flows and whether a smaller flow contribution, such as 0.12 gallons per hour, would significantly impact the alternatives assessment and/or feasible mitigation measures, in particular, the cost effectiveness of improvements to the portal drains. In addition, MassDEP indicates that the modeled results from the Hydrologic/Hydraulic Analysis should be verified in the field.

Water Quality

The NPC includes a water quality study and sampling data (Appendix 6) to assess the nature and extent of contaminants in the tunnel drainage discharges under dry and wet weather conditions and wash water operations. Sampling includes over 160 separate samples collected in 2006 and 2007. The report indicates that, due to the enclosed nature of the tunnel environment, airborne particulates, exhaust fumes, and other vehicle-related constituent mass have a tendency to collect in the tunnel or on the tunnel surfaces (walls, ceiling, roadway, etc.), unlike an open roadway network where fumes readily disperse. This may have the effect of concentrating the vehicle-related constituent mass relative to typical urban runoff conditions.

MassDEP comments indicate that the potential contamination of stormwater and groundwater that enters the tunnel drainage system has been and continues to be a major concern with regard to the selection of alternatives. MassDEP has performed an initial comparison of the sampling results to updated (2006) EPA Water Quality Criteria (WQC) and MS4 Stormwater

Permitting Benchmarks to determine whether there is a reasonable potential for the tunnel discharges to result in adverse impacts to receiving waters. MassDEP identifies Contaminants of Concern (COC) that must be examined in greater detail including total and dissolved Zinc, dissolved Silver, three Polycyclic Aromatic Hydrocarbons (PAHs), and Cyanide. MassDEP staff also reviewed the number of times that each COC actually exceeded one or more WQC/Benchmark. Of the over 160 samples included in the MTA compilation, the 3 PAHs and dissolved silver showed an exceedance in less than four of the samples, while dissolved and total Zinc exceeded a criteria/benchmark 28 and 102 times respectively. Cyanide was detected in numerous samples. All of the PAH, and dissolved Silver and Zinc exceedances were found in the non-wash water samples while they were all undetectable in the wash water samples. Total Zinc and Cyanide exceedances were found in both the non-wash and wash water samples. In addition, MassDEP has indicated that several other contaminants, including chromium, lead and copper, were found in significant concentrations in both the wash and non-wash samples.

Several comment letters express concern that polluted tunnel water will be redirected to surface discharges entering Boston Harbor, Fort Point Channel and the Charles River. MassDEP comments indicate additional targeted sampling must be performed to better understand the nature and extent of contaminants in the discharge flows. In addition, additional information must be provided during permitting to define operational parameters and precautions for high flow events/emergency events and assess effective water quality treatment for the pollutants identified. MassDEP comments indicate that EPA and MassDEP will assess whether the project can be permitted consistent with the Clean Water Act and the state Surface Water Quality Standards, including a determination that the discharges will have no adverse effect.

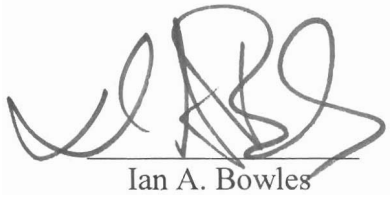
Conclusion

Based on a review of the NPC, consultation with state agencies and review of public comments, I find that outstanding issues can be addressed adequately through state and local review. The NPC adequately characterizes the project change and analyzes a range of alternatives to reduce and redirect non-wash water from the sewer system. Comments from MassDEP clearly identify outstanding issues that must be resolved, including additional assessment of pollutants and adequate water quality treatment, prior to allowing surface discharge of the non-wash water. I expect that MassDEP and EPA will ensure that the NPDES permitting process includes sufficient opportunities for public comment and review, including at least one public hearing prior to issuance of a draft permit and one public hearing on the draft permit. In addition, I expect MassDEP and EPA will consider the comments provided on this NPC.

I am sympathetic to concerns expressed by many commentors regarding discharge of additional stormwater flows to Boston Harbor, the Fort Point Channel and the Lower Charles River Basin; however these concerns must be balanced with concerns regarding CSO overflows to Boston Harbor and the preservation of capacity within the sewer system. MTA and state and local agencies have been engaged in a productive interagency process to forge consensus on an alternative that I expect will continue through permitting and will adequately balance interests. The following summarizes MTA commitments identified in the NPC and requirements I am establishing through this review:

- MTA will complete a targeted tunnel drainage sampling program to better assess the nature and extent of the COCs during project permitting.
- MTA will conduct a comprehensive review of the tunnel drainage collection, pretreatment and discharge systems and related operational procedures to determine if specific modifications and/or additions should be implemented to remove COCs and/or control system flows.
- MTA will model post-washing purge flows for each of the nine existing tunnel drainage discharge locations to determine the volume of water necessary to flush wash water from the system prior to redirecting water to the stormwater system.
- MWRA will analyze the impacts of groundwater and stormwater flows on CSO overflows.
- MTA will assess the effectiveness of improvements to the portal drainage systems including consideration of a lower volume of water associated with vehicle carry-in.
- MTA will analyze the cost-effectiveness of redirecting the Dewey Square Tunnel southbound portal trench drains to a separate storm drainage system including consideration of the volume of flow that will be removed and the schedule for development of the site.
- MTA will conduct additional analysis of the feasibility of groundwater recharge in the North End (LPPS #8), Chinatown (LPPS#12) and the Leather District (LPPS 4 & 5).
- MTA will complete the construction-period leak/seep control program and the preventive operation and maintenance procedures (consistent with conditions identified in the MassDEP's April 1, 2008 and April 17, 2008 correspondence).

Based on these commitments and requirements, I hereby find that a Supplemental EIR is not warranted and that no further MEPA review is required.



September 5, 2008
Date

Ian A. Bowles

Comments Received:

8/21/08	Department of Environmental Protection/Northeast Regional Office (MassDEP/NERO)
8/26/08	Massachusetts Water Resources Authority (MWRA)
8/25/08	Boston Water and Sewer Commission
8/8/08	Boston Groundwater Trust
8/26/08	Charles River Watershed Association
9/2/08	Save the Harbor/Save the Bay
8/26/08	Stephen H. Kaiser

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