

5.1-1 INTRODUCTION

Chapter 5 addresses the potential for operational impacts once the bypass tunnel is in operation, i.e., once Projects 1, 2A, and 2B are complete and water is flowing through the RWBT and bypass tunnel.

Operation of the bypass tunnel would require very little activity at the west and east connection sites. Very few additional workers or trucks would be required. Maintenance of the west connection site would generate only a minimal increase in on-site vehicular activity. These maintenance activities would include security inspections, maintenance of site landscaping, and annual visual inspections of the shaft. Levels of activity at the east connection site would be similar to conditions at the site prior to the construction that is underway as part of the DEP's tunnel and shaft rehabilitation of Shaft 6 (this effort, which will improve DEP's capability to unwater the tunnel, is expected to be complete in 2013). Therefore, most EIS analysis areas have been screened because the effects would be minimal during operation of the bypass tunnel.

This section provides the following:

- Section 5.1-2, "Methodology and Screening Assessments." This section discusses in more detail the post-construction conditions at the west and east connection sites and a screening assessment of environmental analysis areas that are screened.

Subsequent sections of Chapter 5 are organized as follows:

- Section 5.2, "Land Use, Zoning, Public Policy, and Open Space"
- Section 5.3, "Visual Character"
- Section 5.4, "Socioeconomic Conditions"
- Section 5.5, "Infrastructure"
- Section 5.6, "Public Health"

5.1-2 METHODOLOGY AND SCREENING ASSESSMENTS

5.1-2.1 POST-CONSTRUCTION CONDITIONS

As described above, operation of the bypass tunnel would result in very limited activity at both the west and east connection sites.

On the west connection site at the conclusion of Project 2B, the construction offices, storage trailers, and construction equipment and support facilities (e.g., the concrete batch plant, dewatering treatment plant) would be removed, and no above-grade structures would remain. At the entrance to the site, the traffic signal installed for construction would be removed. (Based on meetings conducted with NYSDOT before the DEIS was issued, it was determined that the southbound right- and left-turn lanes would remain in place after construction is complete; the northbound left-turn lane space would remain but would be converted to a painted median opposite the southbound left-turn lane. ~~The northbound left-turn lane and southbound turn lane would remain in place.~~) The majority of the interior roadway would be retained to provide future access to the shaft (Shaft 5B) should it be necessary; Shaft 5B itself would be capped and then covered with a concrete cover and soil. In the areas not occupied by the internal roadway and the shaft, the site would be restored. ~~It is anticipated that~~ The restoration plan would include a combination of planting meadow habitat, with shrubs and some trees. Tree species selected ~~may~~ would include species include those with the greatest potential to eventually provide Indiana bat summer roosting habitat, such as shagbark hickory. Vegetation planted as part of the restoration plan would include ~~only~~ native indigenous species to this area of New York to the maximum extent practicable.

Upon completion of construction (Project 1 and Project 2B), it is possible that DEP would sell tax parcel 8-1-15.3; it is assumed that the existing vacant house on this parcel would be re-occupied and used as a private residential property.

The dewatering pipeline and water main extension would no longer be in use by DEP. If suitable alternative purposes are found for use by the Town of Newburgh, a separate assessment would be conducted by the Town.

At the conclusion of Project 2B, Shaft 6B on the east connection site would be capped with a concrete cover and soil. The construction offices, storage trailers, and equipment would be removed. Both the lower parking area and the upper parking area would be removed, and areas, including the inundation plug area, regraded and replanted. The main site driveway would be retained and would continue to provide access to the Hudson River Pump Station at the lower portion of the site and the Shaft 6 superstructure on the upper portion of the site. Furthermore, the internal driveway providing access to the Shaft 6B area would be retained to allow for any future access to the shaft should it be necessary. Shaft 6B itself would be capped and covered with soil and would not be visible from the property line. A restoration program would be completed for portions of the site and would consist of areas of steep meadow with other areas

reforested. Certain areas in the vicinity of the Shaft 6B would be maintained as lawn area to allow for future access.

5.1-2.2 SCREENING ASSESSMENTS

In general, as described above, effects would be minimal during operation of the bypass tunnel, and most EIS analysis areas can be screened. This section provides those screening assessments.

NEIGHBORHOOD CHARACTER

Section 2.3, “Neighborhood Character,” presents the criteria and methodology for conducting a neighborhood character assessment.

Operation of the bypass tunnel would not result in significant adverse effects in any of the technical areas that are considered when analyzing neighborhood character (land use, zoning, and public policy; socioeconomic conditions; open space; historic and cultural resources; urban design and visual resources; shadows; transportation; or noise), nor would it result in a combination of moderate effects to several elements that cumulatively would affect neighborhood character. Therefore, no significant adverse impacts on neighborhood character would occur from operation of the bypass tunnel at either the west or east connection sites.

HISTORIC AND ARCHAEOLOGICAL RESOURCES

The potential for construction activities to affect archaeological and architectural resources has been addressed in Chapter 2, “Probable Impacts of Project 1, Shaft and Bypass Tunnel Construction,” Section 2.5, “Historic and Archaeological Resources.” Upon operation of the bypass tunnel, no above-grade structures would remain. There would be some permanent changes in site topography as a result of regrading at both the west and east connection sites during the construction period. However, these changes in topography are not anticipated to be substantial enough to result in a potential for contextual impacts on known or potential architectural resources. Therefore, operation of the bypass tunnel would not result in significant adverse impacts on historic and archaeological resources.

GROWTH INDUCEMENT

Growth-inducing effects include the potential for a proposed project to alter regional growth patterns, impact residential settlement patterns, or affect the growth in employment centers.

The purpose of the proposed program is to ensure that DEP can continue to reliably deliver drinking water to upstate and New York City consumers into the future. Operation of the bypass tunnel would not result in any increase in water delivery capacity, nor would it result in the provision of water to additional consumers beyond those already supplied by DEP. Therefore, operation of the bypass tunnel is not expected to induce development within the areas supplied with water through the RWBT.

Upon completion of Projects 1, 2A, and 2B, ~~this water main could potentially provide the town with a connection to the RWBT and a long-term source of potable water.~~ DEP would make available to the Town of Wappinger a connection to the RWBT. ~~This would consist of a tap only.~~ As noted in Chapter 1, “Program Description,” an alternate option to provide a reliable potable water supply to the east connection site would involve the potential installation of a water main between the site and the Town of Wappinger water supply (United Wappinger Water District [UWWD]) prior to construction of the east connection shaft under Project 1. This water main could potentially provide the town with a connection to the RWBT and a long-term source of potable water. The Town of Wappinger will conduct its own environmental analyses, including an analysis of the impact of construction and use of any distribution lines, additional piping, or treatment necessary for the distribution of water within the Town of Wappinger including the potential for growth inducement as a result of the use of this system, as appropriate.

In addition, it is expected that there would be no additional employees associated with bypass tunnel operation. Therefore, operation of the bypass tunnel would not generate significant secondary or induced effects, or induce any development activity that would otherwise not occur in the region or study area.

For these reasons, the operation of the bypass tunnel would not be expected to induce growth, and no further analysis is warranted.

COMMUNITY FACILITIES AND SERVICES

Operation of the bypass tunnel would not displace any public or publicly-funded community facilities, nor would it introduce any new residents or permanent workers to the area. Therefore, operation of the bypass tunnel would not adversely impact schools, libraries, hospitals, or day care centers. As a result, no potential significant impacts to community facilities are anticipated from the bypass tunnel during its operation, and no further analyses are warranted.

DEP Police would monitor the site using remote cameras and patrols to ensure the security of the site and the water supply facilities. DEP Police would coordinate with New York State Police and/or the Town of Newburgh Police on any response to illicit activity on the site.¹ It is not anticipated that calls for assistance to the New York State Police and/or the Town of Newburgh Police would constitute a significant impact on staffing or operations of either of these departments.

NATURAL RESOURCES AND WATER RESOURCES

During operation of the bypass tunnel, activities at both the west and east connection sites would be limited. As described above, both sites would be restored in accordance with site restoration

¹ The Town of Wappinger’s police protection is provided by the New York State Police.

plans. As such, operation of the bypass tunnel would not have the potential to result in significant adverse impacts on natural resources and water resources.

HAZARDOUS MATERIALS

Operation of the bypass tunnel would not require the use of any materials that would require special handling (e.g., hazardous chemicals). Furthermore, operation of the bypass tunnel would not involve any activities that could potentially generate or release hazardous materials, because no petroleum or chemical use would be introduced at either the west connection site or east connection site. Therefore, no analysis of potential hazardous materials impacts from bypass tunnel operation is warranted.

TRANSPORTATION

As discussed above, operation of the bypass tunnel would require very limited additional workers or trucks. Maintenance of the west connection site would generate only a minimal increase in on-site vehicular activity. Maintenance of the east connection site would be similar to conditions at the site prior to the construction that is currently underway as part of DEP's tunnel and shaft rehabilitation of Shaft 6. Therefore, no further analysis of operational impacts on the transportation network is warranted.

AIR QUALITY

As discussed above, operation of the bypass tunnel would require very limited additional workers or trucks, and, therefore, no further analysis of operational mobile source air quality impacts is warranted. In addition, operation of the bypass tunnel would not include any new stationary sources of air pollution, and, therefore, no further analysis of operational period stationary source impacts is warranted.

ENERGY AND GREENHOUSE GAS ANALYSIS

Operation of the bypass tunnel would not result in sources of greenhouse gas emissions requiring quantitative assessment. In addition, operation of the bypass tunnel would not result in increased energy needs since the system is a gravity-driven system. Therefore, an analysis of energy and greenhouse gas is not warranted for operation of the bypass tunnel.

NOISE

As discussed above, operation of the bypass tunnel would require very limited additional workers or trucks, and, therefore, no further analysis of operational mobile source noise impacts is warranted. In addition, operation of the bypass tunnel would not include any new stationary sources of noise, and, therefore, no further analysis of operational period stationary source noise impacts is warranted.

SOLID WASTE

The *CEQR Technical Manual* (January 2012) recommends an assessment of solid waste and sanitation services for projects that could significantly increase solid waste and demands for sanitation services, or include changes to solid waste management plans, or proposals for new solid waste management facilities. Operation of the bypass tunnel would not result in such conditions, and, therefore, no further analysis is warranted.

COASTAL ZONE CONSISTENCY

As described above, operation of the bypass tunnel would require very little activity at the west and east connection sites. Very few additional workers or trucks would be required. Maintenance of the west connection site would generate only a minimal increase in on-site vehicular activity. Levels of activity at the east connection site would be similar to conditions at the site prior to the construction that is underway as part of DEP's tunnel and shaft rehabilitation of Shaft 6.

On the west connection site at the conclusion of Project 2B, no above-grade structures would remain. Features that would remain on the site after construction include the interior roadway and the shaft (Shaft 5B). In the areas not occupied by the internal roadway and the shaft, the site would be restored, as described above. The dewatering pipeline and water main extension would be located underground and would no longer be in use by DEP. If suitable alternative purposes are found for use by the Town of Newburgh, a separate assessment would be conducted.

At the conclusion of Project 2B, Shaft 6B on the east connection site would be capped with a concrete cover and soil. The construction offices, storage trailers, and equipment would be removed. Both the lower parking area and the upper parking area and the inundation plug would be removed and areas regraded and restored. The main site driveway would be retained and would continue to provide access to the Hudson River Pump Station at the lower portion of the site and the Shaft 6 superstructure on the upper portion of the site. The internal driveway providing access to the Shaft 6B area would be retained to allow for any future access to the shaft should it be necessary. A tree replanting program would be completed for portions of the site, but certain areas would be maintained as lawn area and/or perennial meadow to allow for future access. Overall, conditions at the east connection site would be similar to conditions at the site prior to the construction that is currently underway as part of DEP's tunnel and shaft rehabilitation of Shaft 6, although, additional landscaping features, such as ground cover and shrubs, will be planted along River Road, along the entrance driveway, and in the vicinity of the Hudson River Pump Station, and the steep slopes will be seeded with steep meadow perennials.

Therefore, a Coastal Zone Consistency assessment of operation of the bypass tunnel is not warranted and it is expected that bypass tunnel operation would be consistent with coastal zone policies.

5.1-2.3 DETAILED ASSESSMENTS

Subsequent sections of Chapter 5 provide detailed analyses of the following:

- Land Use, Zoning, Public Policy, and Open Space (see Section 5.2)
- Visual Character (see Section 5.3)
- Socioeconomic Conditions (see Section 5.4)
- Infrastructure (see Section 5.5)
- Public Health (see Section 5.6)

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Chapter 5: Probable Impacts of Bypass Tunnel Operation
Section 5.2: Land Use, Zoning, Public Policy, and Open Space

5.2-1 INTRODUCTION

This section of Chapter 5 discusses the potential impacts to land use, zoning, public policy, and open space during operation of the bypass tunnel.

5.2-2 METHODOLOGY

The study area for this analysis is defined by a ¼-mile radius surrounding the west and east connection sites.

This analysis follows the same methodology that is presented in Chapter 2, Section 2.2, “Land Use, Zoning, Public Policy, and Open Space,” which describes land use, zoning, and public policy impacts during construction of Project 1, Shaft and Bypass Tunnel Construction. Information on existing conditions and conditions in the future without the bypass tunnel is also found in Section 2.2.

In addition to providing a discussion of potential land use and open space impacts associated with operation of the bypass tunnel, this section of the EIS discusses the sections of the zoning code that would apply to the bypass tunnel’s operational phase and potential impacts of any permanent structures on the sites. Public policy documents related to the bypass tunnel operations are also discussed.

5.2-3 WEST OF HUDSON

5.2-3.1 LAND USE AND OPEN SPACE

This section assesses whether operation of the bypass tunnel would be consistent with land uses in the study area. This section also assesses whether operation of the bypass tunnel would affect any area open spaces.

The long-term use of the west connection site is considered a public utility use and is allowed within both the AR and B zoning districts within which the west connection site is located. There are no planned above-grade structures that would remain on the west connection site following construction. The shaft would be capped with concrete, covered with soil, and enclosed in a secure, fenced area. A portion of the internal driveway would remain to allow for access to the

shaft, but limited activity would occur at the west connection site during operation of the bypass tunnel. The remainder of the site would be restored as described in Section 5.1.

The land use of the west connection site would change from vacant residential and commercial to a water supply use. Due to the low level of activity anticipated for this water supply use, it is considered a compatible use to the adjacent residential and commercial land uses. Operation of the property as a water supply use would not create any nuisance from noise, lighting, or odors. Therefore, while the physical appearance of the west connection site would change, there would not be any changes to land use trends or patterns within the study area, and there would be no impacts to surrounding land uses or open space.

Upon completion of construction (Project 1 and Project 2B), it is possible that DEP would sell tax parcel 8-1-15.3; in this instance, it is assumed that the existing vacant house on this parcel would be re-occupied and used as a private residential property. The continued use of the remaining properties as water supply use would not preclude the use of this tax parcel for residential use.

5.2-3.2 ZONING

Chapter 185 of the Newburgh Town Code pertains to Zoning. The west connection site is located in both the Business (B) and Agricultural Residence (AR) districts as discussed in Section 2.2. Permitted uses vary for each district, but “public utility structures and rights-of-way” are permitted in both districts.

The AR district permits uses consistent with low-density residential development and agricultural uses. Permitted uses include single-family dwellings (at a density of one dwelling unit per acre), agricultural operations, and municipal buildings and town activities. Additional non-residential uses are permitted subject to site plan review by the Planning Board, including membership clubs, places of worship, schools, hospitals, and public utility structures and rights-of-way. Minimum lot sizes for non-residential permitted uses range from approximately 1 to 20 acres.

The B district permits a variety of non-residential/commercial uses including retail, office, eating and drinking establishments, entertainment uses (indoor amusement and theaters), and public utility structures and rights-of-way. Single- and two-family homes are only permitted where they existed prior to establishment of the zoning district. Typical minimum lot sizes for non-residential permitted uses range from 15,000 square feet to 10 acres.

Neither the AR nor the B district has specifically defined dimensional parameters for “public utility structures and rights-of-way” for lot area, yards, and setbacks, but they do limit maximum lot coverage, building height, and surface coverage. **Table 5.2-1** outlines those maximums for each district. There are no proposed permanent structures on the west connection site; thus, proposed building coverage would be zero (0) percent and proposed height would be zero (0) feet. The total surface coverage from the internal driveway would be approximately 3.2 acres or 10 percent of the lot area. As such, the site layout on the west connection site during bypass tunnel operation would comply with the bulk requirements of both zoning districts.

**Table 5.2-1
Bulk Requirements for Public Utility Structures and Rights-of-Way**

Zoning District	Maximum Building Coverage	Maximum Building Height	Maximum Surface Coverage
AR	20%	35 ft	40%
B	20%	35 ft	50%

Sources: Town of Newburgh Zoning Code

5.2-3.3 PUBLIC POLICY

The operation of the bypass tunnel would not conflict with the Town of Newburgh’s Comprehensive Plan. Traffic along Route 9W is a documented concern in the plan but no additional traffic is anticipated during operation of the bypass tunnel.

In addition to local policies in Newburgh, the Smart Growth Public Infrastructure Act went into effect in New York on September 29, 2010. This act requires most state agencies and all state authorities, prior to approving or funding any public infrastructure project, to prepare and file a Smart Growth Impact Statement finding that the project is consistent with Smart Growth Criteria or justifying why it is not practicable to do so. This project is essential maintenance of existing infrastructure necessary for provision of water supply to all of New York City and many surrounding communities and there is no option for locating the improvement in an existing municipal center. See Section 2.2 for a more detailed discussion of the Smart Growth Public Infrastructure Act.

5.2-4 EAST OF HUDSON

5.2-4.1 LAND USE AND OPEN SPACE

During operation of the bypass tunnel, the east connection site would continue to be used as a water supply use, which is considered a “use of another governmental entity” and permitted within the R-80 zoning district. No new above-ground permanent structures would be constructed. The shaft would be capped with concrete and covered with soil. The internal driveway would remain to allow for access to the shaft but parking areas would be removed and restored to grass or meadow conditions. Areas to the north of the shaft would be reforested. Limited activity would occur at the east connection site during operation of the bypass tunnel. Activity levels during operation of the bypass tunnel would be very similar to activity levels during operation of the Shaft 6 property (prior to initiation of the shaft rehabilitation work that is currently underway at the site). Thus, the land use of the east connection site would not change. Therefore, while the physical appearance of the east connection site would change, there would not be any changes to land use trends or patterns, and there would be no impacts to surrounding land uses or open space during operation of the bypass tunnel.

As noted in Chapter 1, “Program Description,” DEP is currently in negotiations to purchase two residences on the east side of River Road (lot 6056-01-302882-0000 and lot 6056-01-319891) to

provide nighttime sleeping quarters for the project’s construction management staff during the construction period. Upon completion of construction (Project 1 and Project 2B), it is possible that DEP would sell these two parcels as private residential properties. The future use of these properties for residential uses would be compatible to the adjacent uses, and there would be no impacts to surrounding land uses or open space.

5.2-4.2 ZONING AND CODE COMPLIANCE

As noted in Section 2.2, the east connection site is located in the Town of Wappinger’s 1-Family Residence (R-80) zoning district. The stated rationale for the R-80 district is: “Sensitive areas to be developed only at low density, without central sewers, because of their scenic values, slopes or wetlands and floodplain complexes. Rigorous scenic buffers should be required along the Hudson River sites” (§240-7.A(1)). Permitted principal uses in the R-80 district are one-family dwellings, family day-care homes, and “buildings, structures, and uses owned or operated by the Town of Wappinger; buildings, structures and uses of any other governmental entity or district, excluding garages or dumps.” Additional residential uses, public and quasi-public uses, farm and animal related uses, recreation uses, and utility uses are permitted uses subject to Special Permit. The existing Shaft 6 facility is considered a “use of any other governmental entity” and a continuation of the water supply use. Thus, the existing facility and proposed modifications are a permitted use in the R-80 district.

Zoning districts within ¼-mile of the site include General Business (GB) and the R-20, R-40, and R-40/80 1-Family Residence Districts. The R-20, R-40, and R-40/80 1-Family Residence Districts are all intended to permit single-family residential development at varying intensity based on such factors as presence of municipal utilities, environmental sensitivity, and proximity to villages and higher-density areas. While the GB district does not have a stated intent, it permits a variety of uses including institutional uses, offices, retail, restaurants and personal service businesses.

Upon completion, the shaft structure would be completely below ground and covered with a concrete cap and soil cover. There would be no new permanent structures on the east connection site. **Table 5.2-2** provides the dimensional regulations of the R-80 District.

**Table 5.2-2
Dimensional Regulations of the R-80 District**

Minimum Lot Area (SF)	80,000 square feet
Minimum Lot Width	200 feet
Minimum Lot Depth	200 feet
Minimum Lot Frontage	50 feet
Minimum Front Yard	75 feet from street centerline and 50 feet from front lot line
Minimum Side Yard	40 feet
Minimum Side Yard (accessory buildings)	10 feet
Minimum Rear Yard	50 feet
Minimum Rear Yard (accessory buildings)	10 feet
Maximum Building Height	2.5/35 stories/feet
Maximum Lot Coverage	10 percent
Maximum Floor Area Ratio	0.1
Source: Town of Wappinger Town Code §240 Attachment 3.	

Existing buildings located on the east connection site do not currently comply with the front and rear setback requirements as they are located immediately adjacent to the property lines. These structures are considered pre-existing non-conforming structures. While the site driveways and parking areas currently cause the site to exceed the 10 percent maximum lot coverage, upon completion of the project the parking areas would be removed, regraded, and seeded to return the site to a landscaped meadow. The internal site driveway would be retained to allow access to the Shaft 6 superstructure and the Shaft 6B shaft site. Proposed future lot coverage would be approximately 13.4 percent; thus, an area variance from the Zoning Board of Appeals would be required to allow lot coverage of 13.4 percent instead of 10.0 percent.

5.2-4.3 PUBLIC POLICY

The Town of Wappinger Comprehensive Plan is described in detail in Section 2.2. Operation of the bypass tunnel would not conflict with the Town of Wappinger’s Comprehensive Plan. Upon completion of Projects 1, 2A, and 2B, DEP would make available to the Town of Wappinger a connection to the RWBT. ~~This would consist of a tap only.~~ As noted in Chapter 1, “Program Description,” an alternate option to provide a reliable potable water supply to the east connection site would involve the potential installation of a water main between the site and the Town of Wappinger water supply (United Wappinger Water District [UWWD]) prior to construction of the east connection site shaft in ~~would occur under~~ Project 1. This water main could potentially provide the town with a connection to the RWBT and a long-term source of potable water. The Town of Wappinger will conduct its own environmental analyses, including an analysis of the impact of construction and use of any distribution lines, additional piping, or treatment necessary for the distribution of water within the Town of Wappinger.

In addition to local policies in Wappinger, the Smart Growth Public Infrastructure Act went into effect in New York on September 29, 2010. This act requires most state agencies and all state authorities, prior to approving or funding any public infrastructure project, to prepare and file a Smart Growth Impact Statement finding that the project is consistent with Smart Growth Criteria or justifying why it is not practicable to do so. This project is essential maintenance of existing infrastructure necessary for provision of water supply to all of New York City and many surrounding communities and there is no option for locating the improvement in an existing municipal center. See Section 2.2 for a more detailed discussion of the Smart Growth Public Infrastructure Act.

5.2-5 CONCLUSIONS

5.2-5.1 WEST OF HUDSON

Operation of the bypass tunnel on the west side of the Hudson River would not result in any impacts to surrounding land uses, including open space, as limited activity is expected to occur on the site during the operation phase. Operation of the bypass tunnel would be consistent with the town’s zoning code and public policy.

5.2-5.2 EAST OF HUDSON

Operation of the bypass tunnel on the east side of the Hudson River would not result in any impacts to surrounding land uses, including open space, as the overall land use of the site would not change. Use of the site as the DEP Shaft 6 facility would continue. With the exception of an area variance relating to lot coverage, the project would be consistent with the Town of Wappinger's zoning code and comprehensive plan. The requirement of one area variance is not considered a significant adverse impact to zoning. *

5.3-1 INTRODUCTION

This section of Chapter 5 discusses the potential impacts to visual character from changes resulting from the operation of the bypass tunnel and assesses whether operation of the bypass tunnel would affect the visual character of east and west connections sites or the study areas using the *CEQR Technical Manual (January 2012)* and the NYSDEC Visual Impact Assessment Methodology, *Assessing and Mitigating Visual Impacts*. This section also assesses whether operation of the bypass tunnel would affect the 15 categories of state aesthetic and visual resources as well as the Hudson River and the locally significant resources that were evaluated in Chapter 2, “Probable Impacts of Project 1, Shaft and Bypass Tunnel Construction,” Section 2.4, “Visual Character.” The potential for lighting impacts during operation of the bypass tunnel is also considered.

The potential for significant adverse impacts on visual character during construction is discussed in Section 2.4, “Visual Character.”

This section is organized as follows:

- Section 5.3-2, “Methodology,” presents a discussion of the *CEQR Technical Manual* and New York State Department of Environmental Conservation (NYSDEC) guidelines used in the analysis.
- Sections 5.3-3, “West of Hudson,” and 5.3-4, “East of Hudson,” analyze the potential for the operation of the bypass tunnel to affect the visual character of the study areas.
- Section 5.3-5, “Conclusions,” summarizes the conclusions of the analysis.

5.3-2 METHODOLOGY

5.3-2.1 VISUAL CHARACTER

The visual impact analysis is based on the application of *CEQR Technical Manual* guidelines and NYSDEC Visual Impact Assessment Methodology, “Assessing and Mitigating Visual Impacts,” (DEP-00-2). Section 2.4, “Visual Character,” of Chapter 2, “Probable Impacts of Project 1, Shaft and Bypass Tunnel Construction,” describes CEQR and NYSDEC guidance (see sections 2.2-2.2 and 2.2-2.3) and lists the aesthetic and visual resources identified following the

guidance in NYSDEC Program Policy “Assessing and Mitigating Visual Impacts” (DEP-00-2, July 31, 2000) as well as any local applicable codes. The visual and contextual relationship of any changes resulting from the operation of the bypass tunnel to any nearby historic resources identified as part of the historic resources analysis is also assessed, as appropriate.

5.3-2.2 SHADOW SCREENING

The Final Scope of Work published on August 31, 2011, stated that while no significant adverse impacts from incremental shadows would be expected from bypass tunnel operation, a screening analysis for shadows would be conducted in the EIS (if the screening were to indicate that a detailed assessment is needed, further evaluation would be undertaken).

Upon completion of Projects 1 and 2B on the west and east connection sites, no new above-ground structures greater than 50 feet in height would remain on the sites; therefore, an assessment of shadows is not warranted. Furthermore, there are no open spaces, natural features, historic resources, or sunlight-sensitive architectural resources that could be affected by operation of the bypass tunnel. Therefore, shadows are not considered further in this EIS.

5.3-3 WEST OF HUDSON

5.3-3.1 WEST CONNECTION SITE

Upon completion of construction, DEP would restore the west connection site to a natural setting by removing all construction equipment and structures as well as any impervious surfaces including parking areas and roadways not needed for operation. A shaft cap would be installed at the top of Shaft 5B just below grade level, and would not be visible from the property lines. The immediate area surrounding the shaft cap would be topsoiled and seeded. In addition, a permanent chain link security fence would be installed around the Shaft 5B cap at the top of the hill. However, the fence would not be visible from Route 9W and the portions of the study area in the immediate vicinity of the site due to intervening topography, existing vegetation, and new site landscaping.

During operation of the bypass tunnel, portions of the west connection site would appear cleared with exposed slopes and retaining walls visible on parts of the site. Although the new landscaping installed during construction would remain, the site would be less forested than it is in the existing condition, and within the cleared areas a new internal roadway system with access from an entrance on Route 9W would be partially visible at the northern end of the site (see **Figure 5.3-1**). The existing driveway at the southern end of the site would no longer be used except for emergency access. An access gate would be installed at the site entrance and would be visible from Route 9W and portions of the study area in the immediate vicinity of the site. Because the west connection site has a large change in elevation between the eastern and western portions of the site, the internal roadway system would be configured to wind up the hill from the new entrance and through the site to Shaft 5B thereby allowing an acceptable grade change for



This Figure has Been Modified Since the DEIS

Figure 5.3-1
West Connection Site Post Construction Rendering: New Site Driveway

vehicles. The new road would provide access for site maintenance and portions of the new road would likely be, at least partially, visible from the study area when looking directly at the site. However, it is expected that the new road would largely be obscured by existing vegetation, new permanent landscaping and intervening topography. There would be no permanent above-ground structures on the site.

A stormwater detention basin management facilities surrounded by a split rail fence with mesh fabric would be partially visible from Route 9W immediately south of the new access drive. However, prior to the start of significant construction activity, trees, shrubs, and grasses would be planted along Route 9W to screen the site from the surrounding land uses. This landscaping ~~These trees~~ would remain during bypass tunnel operation and would be expected to partially obscure views of the stormwater facilities and the site from Route 9W (see **Figure 5.3-2**). In addition, the site restoration plan (described in Section 5.1) would include plantings that would provide additional screening of the stormwater facilities from Route 9W. Although portions of the site would be cleared and would appear less forested, the overall visual character of the site would not be expected to change significantly (see **Figure 5.3-3**). Therefore, no significant adverse impacts to visual character would result from bypass tunnel operation.

5.3-3.2 STUDY AREA

During operation, the visual character of the study area surrounding the west connection site is not expected to change significantly. The greatest change to the site's appearance would occur in the portion of the site along Route 9W. In this location, a new access drive, security fence, and stormwater basin would be partially visible. At the site's higher elevation beyond the Route 9W commercial corridor, the site would appear less forested overall with exposed slopes, but no buildings would be visible and the site would still retain a largely undeveloped character consistent with the residential uses and densely forested areas located in the study area beyond the Route 9W commercial corridor. Views of the site from the study area would be possible from a small number of properties in the immediate vicinity of the west connection site, but most would be visually buffered from the west connection site by the area's dense vegetation and steep change in elevation. In these locations, pedestrian traffic is limited to customers of the commercial uses on Route 9W; other viewers of the site include cars and trucks traveling along Route 9W directly in front of the site. Since the bypass tunnel would be located below-ground, operation of the bypass tunnel would not result in any visible activity on the site. Rather, any changes to views of the connection site from nearby areas would result from clearing, grading, and the demolition of existing buildings. ~~Since the~~ The properties surrounding the west connection site are primarily commercial in nature and do not contain any aesthetic or visually sensitive resources and the visual character of the study area is not expected to be significantly altered by the operation of the bypass tunnel. Therefore, operation of the bypass tunnel would not be expected to result in any significant adverse impacts to aesthetic or visual resources within the study area.



This Figure has Been Modified Since the DEIS

Figure 5.3-2
West Connection Site Post Construction Rendering: Overview of West Connection Site



This Figure has Been Modified Since the DEIS

Figure 5.3-3
West Connection Site Post Construction Rendering: Existing Site Driveway from 9W

5.3-4 EAST OF HUDSON

5.3-4.1 EAST CONNECTION SITE

During operation of the bypass tunnel, the east connection site would appear similar to the site under existing conditions without the construction activity that is underway as part of DEP's tunnel and shaft rehabilitation of Shaft 6 (this effort, which will improve DEP's capability to unwater the tunnel, is expected to be complete in 2013). The most visible change would occur within the eastern portion of the site adjacent to the substation. This area would be cleared for construction of the new shaft (Shaft 6B) and access road, and would appear slightly less forested than in the existing condition (see **Figure 5.3-4**). Since Shaft 6B would be a subsurface structure, it would not be visible above ground. At the top of Shaft 6B at grade level, a shaft cap would be installed. The shaft cap would be buried and would not be visible from the property lines. No new, permanent above-grade structures associated with the bypass tunnel would remain during bypass tunnel operation.

During site restoration, the immediate area surrounding the shaft cap would have a concrete cover installed, and would be covered with soil and seeded. The area immediately north of the Shaft 6B hatch and the area east of the hatch along the property line to River Road would be reforested (see **Figure 5.3-4**). A swale would be installed to direct stormwater to a catch basin along the roadway. The stormwater detention basin used during construction and located immediately west of the new access driveway to Shaft 6B would be converted to a bioretention facility. The underground detention and sand filter would remain, but would not be visible. In addition, some of the impervious surfaces installed for construction activities would be removed and the disturbed areas would be restored, including the parking area located in the southwest corner of the site. Some areas of the site would be reforested, others would be restored to meadow, and still others would be lawn areas. However, the new road providing access to Shaft 6B and the access road along the southern boundary of the site would remain in place. Some security measures, including black vinyl chain link fencing, would remain around the perimeter of the property, but noise curtains would be removed. New landscaping would be installed along River Road in front of the existing Shaft 6 building and along the southern edge of the site driveway. Landscaping would also be installed on the sloped portion of the site south of the existing Shaft 6 building (see **Figures 5.3-5 and 5.3-6**) as well as in the vicinity of the Hudson River Pumping Station. Although there would be a number of small changes to the site, the overall use and activity at the site would not be expected to change significantly. The site would appear similar to its appearance prior to the start of the construction that is currently underway as part of DEPs tunnel and shaft rehabilitation of Shaft 6 (see **Figure 5.3-5**).

5.3-4.2 STUDY AREA

The visual character of the study area surrounding the east connection site is not expected to change significantly during operation. Minor changes to the appearance of the east connection site would be visible from some locations in the study area, but the study area as a whole would not be significantly affected. As described in Section 2.4, "Visual Character," some locations



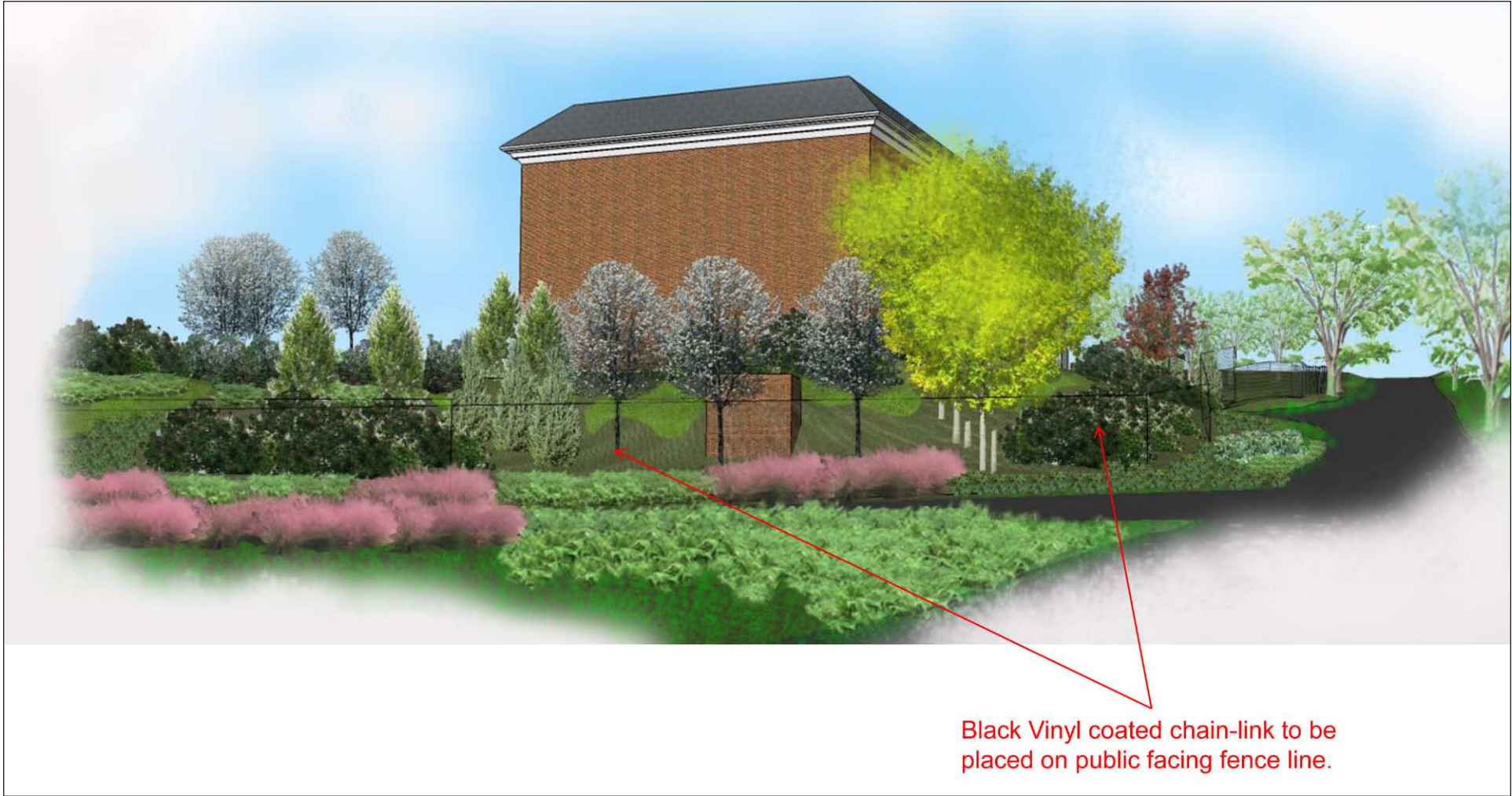
This Figure has Been Modified Since the DEIS

Figure 5.3-4
East Connection Site Post Construction Rendering: Overview of East Connection Site



This Figure has Been Modified Since the DEIS

Figure 5.3-5
East Connection Site Post Construction Rendering: View from River Road



This Figure is New to the FEIS

Figure 5.3-6
Visual Photographs

along River Road currently have partial views of the site when looking west toward the Hudson River. From these locations, the new access road on the site may be partially visible but would largely be obscured from most locations by vegetation and existing structures on the east connection site. Similarly, views of the site from pedestrians and vehicles traveling within the study area would be limited due to topography, vegetation, road trajectory, and existing buildings. Black vinyl chain link security fencing would be visible from River Road along the perimeter of the site and would be similar in appearance to the existing chain link fence.

As discussed in Section 2.4, “Visual Character,” the east connection site is visible from the Hudson River. During operation of the bypass tunnel, the site would appear similar to its appearance prior to the start of the construction that is currently underway as part of DEP’s tunnel and shaft rehabilitation of Shaft 6. The overall scenic qualities of the Hudson River and shoreline would not be affected by bypass tunnel operation.

Portions of the east connection site are partially visible from the potential historic resource located at 225 River Road. During operation, views of the east connection site from this location would be similar to the appearance of the site under existing conditions. In addition, views of the east connection site from Carnwath Farms and Our Lady of Mercy Church during operation would be the same as under existing conditions.

Therefore, operation of the bypass tunnel would not be expected to result in any significant adverse impacts to aesthetic or visual resources within the study area.

5.3-5 CONCLUSIONS

5.3-5.1 WEST OF HUDSON

During bypass operation, changes at the west connection site would be mainly due to changes in topography associated with site clearing and grading during Project 1; no permanent above-grade structures would be located on the site. A chain link security fence would be installed around the Shaft 5B cap at the top of the hill, but would not be visible from Route 9W due to intervening topography, existing vegetation, and new site landscaping. The site would be less forested than it is in the existing condition, and within the cleared areas a new internal roadway system with access from Route 9W would be partially visible at the northern end of the site. A new access gate would be installed at the entrance to the site on Route 9W and would be visible from Route 9W and portions of the study area in the immediate vicinity of the site. Stormwater management facilities would also be partially visible from Route 9W immediately south of the new site access. However, trees planted as part of a landscaping plan and site restoration plan would largely obscure views of the stormwater facilities and the site from Route 9W. Although portions of the site would be cleared and would appear less forested, the overall visual character of the site would not be expected to change significantly. The visual character of the study area surrounding the west connection site would also not be expected to change significantly.

Therefore, no significant adverse impacts to visual character would result from bypass tunnel operation.

5.3-5.2 EAST OF HUDSON

During bypass operation, changes at the east connection site would be mainly due to some site clearing and changes in topography associated with site clearing and grading during Project 1; no new permanent above-grade structures would be located on the site. During bypass tunnel operation the overall use and activity at the site would not be expected to change significantly. Although there would be a number of small changes to the site, the site would look similar to its appearance prior to the construction that is currently underway as part of DEP's tunnel and shaft rehabilitation of Shaft 6.

From some locations in the study area, the new access road on the site may be partially visible but would largely be obscured from most locations by vegetation and existing structures on the east connection site. Similarly, views of the site from pedestrians and vehicles traveling within the study area would be limited due to topography, vegetation, road trajectory, and existing buildings. Black vinyl chain link security fencing would be visible from River Road along the perimeter of the site and would be similar in appearance to the existing chain link fence.

During operation of the bypass tunnel, views of the site from the Hudson River would be similar to views from the Hudson River before the construction work that is currently underway as part of DEP's tunnel and shaft rehabilitation of Shaft 6. The overall scenic qualities of the Hudson River and shoreline would not be affected.

Therefore, no significant adverse impacts to visual character would result from bypass tunnel operation. *

5.4-1 INTRODUCTION

This section provides an evaluation of the potential incremental costs to New York City water and sewer rates and upstate water rates of users of New York City-provided water.

This section is organized as follows:

- Section 5.4-2, “Methodology,” describes the methodology for the socioeconomic conditions assessment.
- Section 5.4-3, “New York City Water Rates,” and Section 5.4-4, “Upstate Water Rates,” describe projected increases in water rates for New York City and upstate households related to the costs of constructing and operating the bypass tunnel.
- Section 5.4-5, “Conclusions,” presents the conclusions of the socioeconomic conditions analysis.

5.4-2 METHODOLOGY

As discussed in Section 2.6, a socioeconomic assessment should be conducted if a project may be reasonably expected to create substantial socioeconomic changes within an area that would not be expected in the future without the proposed project. Operation of the bypass tunnel would not be expected to create socioeconomic changes either west or east of the Hudson since the bypass tunnel would not result in any new development in the surrounding area that could lead to higher property values or rents. In addition, operation of the bypass tunnel would not result in any increase in employment. Therefore, no significant adverse impacts on socioeconomic conditions would result from operation of the bypass tunnel.

The potential for operation of the bypass tunnel to result in incremental changes to New York City water rates and upstate water rates of users of New York City-provided water is provided in this section. The methodology for this analysis follows.

As discussed in Chapter 1, “Program Description,” DEP is undertaking a two-part approach to the Environmental Impact Statement (EIS) for the proposed program. This first EIS provides a detailed analysis of the proposed program’s Shaft and Bypass Tunnel Construction project (Project 1). This EIS also provides, to the extent possible, a qualitative analysis of Project 2A, Water Supply System Augmentation and Improvement, and Project 2B, Bypass Tunnel

Connection and RWBT Inspection and Repair, including Wawarsing. DEP will undertake a second EIS or a subsequent environmental review, as appropriate, that will provide further details and will quantitatively assess the potential impacts resulting from Project 2 of the proposed program. The second EIS or a subsequent environmental review, as appropriate, will also evaluate the cumulative water rate impact of Project 1 and Project 2.

New York City finances construction of capital improvement projects by issuing bonds through the New York City Municipal Water Finance Authority and/or the New York State Revolving Fund Program (SRF). The Municipal Water Finance Authority is authorized to issue bonds to fund the construction of capital improvement projects. The SRF makes available to municipalities low-cost financing for capital improvement projects based on EPA and state matching grants.

The proceeds of both bonds are typically used to finance the cost of the capital improvement program, to fund certain reserves, and to pay the costs of issuance (including the premium for bond insurance). The majority of the proceeds are deposited in a construction fund, and smaller percentage of the proceeds are deposited in a debt service reserve fund and the operation and maintenance fund, or are used for various underwriting discounts.

The New York City water and sewer system is financially self-sustaining—i.e., the costs of paying for system costs and operations are supported by water and sewer charges. This self-sufficiency does not extend to funding for capital improvement projects. Costs include operating expenses and debt service on new and existing capital improvements and are estimated annually for the entire system. Each year water and sewer rates are adjusted accordingly to provide annual operating revenues equal to the costs. Therefore, residential, commercial, and industrial users of the water supply system would pay for the capital and operating costs of the proposed program, including the operation of the new bypass tunnel, through their water charges.

The incremental average annual water and sewer charge for residential households in New York City was calculated based on projected water rate (i.e., the rate for water and sewer service in New York City) increases through 2020 (after completion of funding for construction). Projected water rates are provided through 2020, the latest year for which projections from DEP are available and the year when construction financing would be complete, although the bypass tunnel would not be in operation until 2021 or 2022. The projected water rate (\$/ccf) for water and sewer usage, and was applied to average usage per household to determine the projected average annual water and sewer charge per household. The incremental average annual cost for water to residential households in upstate service areas is calculated based on the estimated increases through 2020 for wholesale rates that New York City charges upstate water suppliers, and average usage per household. Water rates for upstate service account for the cost of raw water only and do not include sewer service.

The projected increases in water rates with the bypass tunnel include the amortization of the capital costs (over 30 years), and do not include allowances for operating expenses, since the

incremental operating expenses, if any, would be minimal. The projected changes in water rates also take into consideration the estimated changes in the rental payment to New York City which changes in proportion to debt service.

5.4-3 NEW YORK CITY WATER RATE STRUCTURE AND WATER RATES

5.4-3.1 EXISTING CONDITIONS

The water and sewer rate for a household in New York City effective in fiscal year (FY) 2012 is \$8.21 per hundred cubic feet. This represents an annual water and sewer charge of approximately \$878 per single-family residence (based on 80,000 gallons/year per single-family residence). For multi-family residences, the annual charge is \$571 based on 52,000 gallons/year.

For the lowest income group in New York City (Tract 115.01), with a projected median household income of \$10,487 in 2012 (the base year for projected water rates), current water and sewer costs account for 8.4 percent of annual income for a single-family residence and 5.4 percent of annual income for a multi-family residence.¹

5.4-3.2 THE FUTURE WITHOUT THE BYPASS TUNNEL

In the future without the bypass tunnel, the rate for a household in New York City is projected to be \$13.85 per hundred cubic feet in 2020, which would represent an annual water and sewer charge of approximately \$1,359 per single-family residence and \$963 per multifamily residence (based on projected usage per household, which takes into account annual water consumption decline).² Note that these costs are inflated to 2020 dollars.

The anticipated projected water charge increases for a single-family residence without the bypass tunnel represent a 55 percent increase in water charges from FY 2012 to FY 2020. When inflated to 2020 dollars,³ household incomes of the lowest income group in New York City (Tract

¹ \$10,487 is the projected median household income of Census Tract 115.01 in the Hunts Point section of the Bronx, which was selected as a representative low-income housing area for City water users. This income was derived from the \$10,066 median household income in 2009 dollars as reported in the U.S. Census Bureau's 2005-2009 American Community Survey and inflated to 2012 dollars, the base year for projected water rates (see footnote below).

² In the future without the proposed bypass tunnel, projected water and sewer rate and single-family residence charge was based on DEP's projections of rates and charges in 2020, the latest year for which information was available and the year when construction financing would be complete. Water consumption is assumed to decline by 1 percent per year from 2013 through 2015, 2 percent per year in 2016 and 2017, and 0.5 percent per year each year thereafter.

³ For 2009-2010, median household income increase is based on the Congressional Budget Office's (CBO) Consumer Price Index (CPI) change from 2009-2010. For 2011-2015, median household income increases are

115.01) would increase to \$12,037 during the same period. The projected increase in rates would raise water and sewer costs for a single-family residence to 11.3 percent of annual household income for the lowest income group in New York City (Tract 115.01) in the future without the bypass tunnel.

The anticipated projected water charge increases for a multi-family residence without the bypass tunnel represent a 69 percent increase in water charges from FY 2012 to FY 2020. The projected increase in rates would raise water and sewer costs for a multifamily residence to 8.0 percent of annual household income for the lowest income group in New York City (Tract 115.01) in the future without the bypass tunnel.

5.4-3.3 POTENTIAL INCREASES IN WATER RATES DURING BYPASS TUNNEL OPERATION

In the future with the construction of the bypass tunnel (Project 1 and 2B), the rate for a household in New York City is projected to be \$14.06 per hundred cubic feet in 2020, which would represent an annual water and sewer charge of approximately \$1,380 per single-family residence and \$978 for multifamily residences.

The estimated increases in water rates would occur gradually over the duration of the estimated 10-year construction financing period (see **Table 5.4-1**). The cost of the bypass tunnel would result in a change to water rates of approximately \$21 per year per single-family household in New York City (or an approximately 1.5 percent increase by 2020 over the future without the bypass tunnel) and \$25 per year for multifamily residences (or an approximately 2.6 percent increase by 2020 over the future without the bypass tunnel).

This increase represents a very small percentage of rents and homeowner expenses and would not be expected to result in potential significant adverse displacement effects. The potential impact of the bypass tunnel was also evaluated for the lowest income groups in New York City. Average household income for City customers in the lowest income area in New York City (Tract 115.01) is projected to be \$10,487 in 2012, and was estimated to rise to \$12,037 in 2020. Water and sewer charges for a single-family household are anticipated to rise from approximately 8.4 percent of annual average household income in 2012 to 11.3 percent in 2020 without the bypass tunnel. The additional increase of approximately \$21 by 2020 for annual water and sewer costs resulting from the construction and operation of the bypass tunnel would raise the annual income that would go to water and sewer payments by approximately 0.2 percentage points, from the projected 11.3 percent in the future without the bypass tunnel to a projected 11.5 percent in the future with the bypass tunnel. This incremental increased expense of 0.2 percentage points of annual income to the lowest income group is not considered significant, and the relative impact to other users with greater income would be less.

based on the ratio of median household income change to the CBO's CPI change from 2006-2010. For 2016-2020, median household income increases are based on the CBO's CPI Forecast.

Water and sewer charges for a multi-family household are anticipated to rise from approximately 5.4 percent of annual average household income in 2012 to 8.0 percent in 2020 without the bypass tunnel. The additional increase of approximately \$25 by 2020 for annual water and sewer costs resulting from the construction and operation of the bypass tunnel would raise the annual income that would go to water and sewer payments by approximately 0.1 percentage points, from the projected 8.0 percent in the future without the bypass tunnel to a projected 8.1 percent in the future with the bypass tunnel. This incremental increased expense of 0.1 percentage point of annual income to the lowest income group is not considered significant, and the relative impact to other users with greater income would be less.

For this reason, the projected incremental costs from the bypass tunnel to New York City water rates are not expected to result in potential significant adverse socioeconomic impacts.

**Table 5.4-1
Estimated Average Water Charge for
New York City Households with the Bypass Tunnel**

Year	In-City Charge Estimate ¹ (\$)	Increase over Future Without the Proposed Project (\$)
2020	1,380	21
Note: ¹ In-City charge represents single-family water and sewer charge in 2020 dollars. Source: Amawalk Consulting, October 2011.		

5.4-4 UPSTATE WATER RATE STRUCTURE AND WATER RATES

5.4-4.1 EXISTING CONDITIONS

Water is provided to customers north of New York City on a wholesale basis. DEP delivers water to central locations, and municipalities or water districts subsequently distribute the water to their individual customers. Charges to municipalities or water districts north of New York City are established on the basis of actual total cost of water to New York City after deducting the capital and operating costs incurred within New York City limits for the distribution and delivery of water to New York City customers. The municipalities or water districts must pay for water use that exceeds the district's allowance quantities at a rate equal to the in-New York City metered rate. The cost of water upstate in FY 2012 is approximately \$121 per 100,000 gallons. It is important to note that this dollar amount represents the cost of New York City water only. The municipalities or water districts also assess charges for distribution and treatment, as applicable. In addition, customers north of New York City are responsible for sewer charges, when applicable.

5.4-4.2 THE FUTURE WITHOUT THE BYPASS TUNNEL

In the future without the bypass tunnel, the rate for a household upstate is projected to be \$205 per 100,000 gallons in 2020, which would represent an annual raw water charge of

approximately \$150 per household (based on average household usage).⁴ As discussed above under “Methodology,” water rates for upstate service account for the cost of raw water only and do not include sewer service.

5.4-4.3 POTENTIAL INCREASES IN WATER RATES DURING BYPASS TUNNEL OPERATION

In the future with the bypass tunnel, the rate for a household upstate is projected to be \$220 per 100,000 gallons in 2020, which would represent an annual raw water charge of approximately \$162 per household (based on average household usage).

The estimated increases in water rates would occur gradually over the duration of the estimated 10-year construction financing period (see **Table 5.4-2**). The cost of the bypass tunnel would result in a change to water rates of approximately \$12 in upstate raw water rates (i.e., raw water cost) by 2020 over the future without the bypass tunnel.

**Table 5.4-2
Estimated Average Water Charge for
Upstate Households with the Bypass Tunnel**

Year	Upstate Charge Estimate (\$)¹	Increase over Future Without the Proposed Project (\$)
2020	162	12
Note: ¹ Upstate charge represents water charge only (i.e., not sewer) in 2020 dollars. Source: Amawalk Consulting, October 2011.		

This increase represents a very small percentage of rents and homeowner expenses and would not be expected to result in potential significant adverse displacement effects.

For this reason, the projected incremental costs from the bypass tunnel to upstate water rates are not expected to result in potential significant adverse socioeconomic impacts.

5.4-5 CONCLUSIONS

The projected incremental costs from the bypass tunnel to New York City and upstate water rates are not expected to result in potential significant adverse socioeconomic impacts. *

⁴ In the future without the bypass tunnel, projected water and sewer rate and single-family residence charge was based on DEP’s projections of rates and charges in 2020, the latest year for which information is available and the year when construction financing would be complete.

5.5-1 INTRODUCTION

This section of Chapter 5 evaluates the potential infrastructure impacts associated with the operation of the bypass tunnel and summarizes the analyses supporting the conclusion that no significant adverse infrastructure impacts would result. Potential infrastructure impacts during construction of Project 1 and Project 2B are discussed in Chapter 2, “Probable Impacts of Project 1, Shaft and Bypass Tunnel Construction,” Section 2.14, “Infrastructure,” and Chapter 4, “Probable Impacts of Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing,” Section 4.2, “Probable Impacts of Physical Construction,” respectively.

This section is organized as follows:

- Section 5.5-2, “Methodology,” describes the analysis methodology and relevant regulations.
- Section 5.5-3, “Evaluation of Impacts,” describe stormwater runoff for permanent, post-construction conditions at the west and east connection sites.
- Section 5.5-4, “Conclusions,” presents the conclusions of the infrastructure analysis for bypass tunnel operation.

5.5-2 METHODOLOGY

The *New York City Environmental Quality Review (CEQR) Technical Manual (January 2012)* recommends an assessment of infrastructure impacts (e.g., impacts on water supply, wastewater treatment, and stormwater management; other infrastructure aspects like sanitation, energy, and transportation are addressed separately) if a project would create exceptionally large demands for water (or increase water demands in service areas with low water pressure), result in very large increases in wastewater flows in conveyance systems and/or treatment plants, or result in significant increases in stormwater discharges.

The purpose of the proposed project is to ensure that DEP can continue to reliably deliver drinking water to upstate and New York City customers into the future. Bypass tunnel operation would not result in any change in water delivery capacity, nor would it result in increases in wastewater flows. Therefore, an analysis of water supply and wastewater treatment is not

warranted, and the assessment in this section focuses on potential impacts associated with stormwater runoff at both the west and east connection sites.

Specifically, this section assesses potential stormwater discharges at those locations where there would be an expansion of impervious surfaces upon completion of construction activities for Project 1 and Project 2B and during operation of the bypass tunnel. Such runoff would be attenuated through the implementation of erosion and sediment control practices and stormwater management systems designed in conformance with the New York State and local regulations described below.

~~As noted in Chapter 1, “Program Description”, an alternate option to provide a reliable potable water supply to the east connection site would involve the potential installation of a water main between the site and the Town of Wappinger water supply (United Wappinger Water District [UWWD]) prior to construction of the east connection shaft under Project 1.~~ Upon completion of Projects 1, 2A, and 2B, DEP would make available to the Town of Wappinger a connection to the RWBT. ~~This would consist of a tap only.~~ As noted in Chapter 1, “Program Description,” an alternate option to provide a reliable potable water supply to the east connection site would involve the potential installation of a water main between the site and the Town of Wappinger water supply (United Wappinger Water District [UWWD]) prior to construction of the east connection shaft under Project 1. This water main could potentially provide the town with a connection to the RWBT and a long-term source of potable water. The Town of Wappinger will conduct its own environmental analyses, including an analysis of the impact of construction and use of any distribution lines, additional piping, or treatment necessary for the distribution of water within the Town of Wappinger.

5.5-2.1 STATE REGULATIONS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

The project will require coverage under the New York State Department of Environmental Conservation’s (NYSDEC) State Pollutant Discharge Elimination System General Permit for Stormwater Discharges from Construction Activities Permit No. GP-0-10-001 (SPDES GP-0-10-001). The design standards and guidance for erosion and sediment control and post-construction practices are outlined in the following documents:

- New York Standards and Specifications for Erosion and Sediment Controls—last revised August 2005
- New York State Stormwater Management Design Manual (NYSSMDM—last revised August 2010).

5.5-2.2 LOCAL MUNICIPALITIES

TOWN OF NEWBURGH—WEST OF HUDSON

Conformance with the Stormwater Management Code (Town Code Chapter 157) would be required. Typically, this can be achieved through conformance with the NYSDEC General Permit 0-10-001. Subsequent to the issuance of the DEIS, a draft Stormwater Pollution Prevention Plan (SWPPP) was prepared in accordance with the NYSSMDM and is included in the FEIS as Appendix 2.14-1. After the FEIS is issued, a revised SWPPP—which is currently being prepared, and upon which the FEIS conclusions are based—will be issued to address comments from the Town of Newburgh on the draft SWPPP, and to reflect the latest project design for the west connection site and the water main extension and dewatering pipeline segment along Route 9W. The Town of Newburgh—as a regulated, traditional land use MS4—~~would be~~ is responsible for the review of a ~~Stormwater Pollution Prevention Plan (SWPPP) the SWPPP~~ and ensuring that the post-construction inspection and maintenance plan would be implemented in conformance with the ~~Stormwater Pollution Prevention Plan (SWPPP); SWPPP,~~ NYSSMDM, and Town Code.

TOWN OF WAPPINGER—EAST OF HUDSON

All land development activities require conformance with the Stormwater Management and Erosion and Sediment Control Code (Town Code Chapter 213, Article I). Typically, this can be achieved through conformance with the NYSDEC General Permit 0-10-001. Subsequent to the issuance of the DEIS, a draft SWPPP was prepared in accordance with the NYSSMDM and is included in the FEIS as Appendix 2.14-2. After the FEIS is issued, a revised SWPPP—which is currently being prepared, and upon which the FEIS conclusions are based—will be issued to address comments from the Town of Wappinger on the draft SWPPP, and to reflect the latest project design for the east connection site. The Town of Wappinger—as a regulated, traditional land use MS4—is responsible for review of the SWPPP and ensuring that the post-construction inspection and maintenance plan would be implemented in conformance with the SWPPP, NYSSMDM, and Town Code.

5.5-3 EVALUATION OF IMPACTS

5.5-3.1 WEST OF HUDSON

Once construction activities have been completed for Project 1 and Project 2B, the post-construction stormwater management practices would be installed, and trees and vegetation would be planted on the west connection site. Once the site is completely stabilized, a Notice of Termination would be filed with the Town MS4 coordinator and NYSDEC. Final stabilization means that all soil-disturbing activities at the site have ceased and a uniform, perennial vegetative cover with a density of 80 percent over the entire pervious surface has been

established, or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap, or washed/crushed stone, have been applied on all disturbed areas that are not covered by permanent structures, concrete, or pavement.

Once construction is complete, the water main extension and dewatering pipeline would not result in an increase in impervious surfaces.

The post-construction practices would include green infrastructure elements, such as tree pits plantings, a bioretention basin, and a stormwater pond an approximately 14-foot-deep micro-pool extended detention basin. ~~infiltration basins, or a created wetland.~~ The stormwater management system ~~would be~~ has been designed to treat the Water Quality Volume ~~and to reduce~~ with the goal of reducing the peak flows to pre-construction conditions.

A long-term inspection and maintenance program would be implemented to ensure that the stormwater management system continues to function in conformance with the design. The program, which would be carried out by the DEP Bureau of Water Supply, would likely include the following:

- The side slopes of the pond would be mowed at a minimum once a year. If necessary, invasive woody vegetation around and in the pond would be removed to prevent it from becoming established within the pond.
- Litter and debris would be removed from catch basins, vegetated swales, the pond ponds, and ~~the~~ stormwater control structures.
- The stormwater management system would be inspected after each major storm event (greater than 2-year, 24-hour storm) to ensure that small orifices and inlets remain open.
- Silt would be cleaned from catch basins and other drainage structures when silt depth exceeds half the depth of the sump.
- Sediment would be removed from stormwater management practices as needed, and every 5 years at a minimum.
- Use of road salt for maintenance of driveway areas would be minimized.
- Eroded areas and gullies would be restored and re-seeded, as necessary.

In addition to inspection and maintenance of the stormwater management system, the entire west connection site would be inspected for areas of potential erosion, debris, or loss of vegetation, and appropriate remedial measures would be implemented as needed.

Therefore, the implementation of the stormwater management system would fully alleviate potential stormwater runoff impacts resulting from the construction of the new impervious surfaces associated with the access road on the west connection site.

5.5-3.2 EAST OF HUDSON

Once construction activities have been completed, the post-construction stormwater management practices would be installed, and trees and vegetation would be planted on the east connection site.

Once the site is completely stabilized, a Notice of Termination would be filed with the Town MS4 coordinator and NYSDEC. The post-construction practices would include green infrastructure methods and stormwater management practices, such as a bioretention basin and an underground sand filter. The stormwater management system ~~would be~~ has been designed to treat the Water Quality Volume, thereby reducing potential pollutants.

Once construction is complete, the potential installation of a water main between the site and the Town of Wappinger water supply from UWWD would likely not result in an increase in impervious surfaces.

As part of the SWPPP a long-term inspection and maintenance program would be implemented to ensure that the stormwater management system continues to function properly at the east connection site. The program, which would be carried out by the DEP Bureau of Water Supply, would likely include the following:

- Litter and debris would be removed from catch basins, vegetated swales, the underground sand filter and the bioretention basin. ~~and the stormwater control structures.~~
- The bioretention basin ~~or rain garden~~ would be mowed once per year at a minimum
- The stormwater management system would be inspected after each major storm event (greater than 2-year, 24-hour storm) to ensure that small orifices and inlets remain open.
- Silt would be cleaned from catch basins and other drainage structures when the silt depth exceeds half the depth of the sump.
- Sediment would be removed from stormwater management practices as needed, and every five years at a minimum.
- Use of road salt for maintenance of driveway areas would be minimized.
- Eroded areas and gullies would be restored and re-seeded, as necessary.

In addition to inspection and maintenance of the stormwater management system, the entire east connection site would be inspected for areas of potential erosion, debris, or loss of vegetation, and appropriate remedial measures would be implemented as needed.

Therefore, the implementation of the stormwater management system would fully alleviate the potential stormwater runoff impacts resulting from the construction of the new impervious surfaces associated with the access road on the east connection site.

5.5-4 CONCLUSION

Based on the information presented above, operation of the bypass tunnel would not result in any significant adverse infrastructure impacts. A long-term operation and maintenance plan for the permanent stormwater management practices at both the west and east connection sites would be outlined in the final SWPPPs and would be implemented by the DEP Bureau of Water Supply. *

5.6-1 INTRODUCTION

This section reviews the potential effects on public health from the operation of the bypass tunnel once construction is completed. The potential effect on water supply users is also discussed. The associated analyses pertaining to the overall public health conditions of the project site and study area are summarized below along with an evaluation of the potential for significant adverse impacts.

The potential for significant adverse impacts on public health during construction is discussed in Chapter 2, “Probable Impacts of Project 1, Shaft and Bypass Tunnel Construction,” Section 2.17, “Public Health.”

This section is organized as follows:

- Section 5.6-2, “Background,” provides information on the City of New York’s obligation to provide a reliable potable water supply that meets all public health and regulatory requirements.
- Section 5.6-3, “Probable Impact of Bypass Tunnel Operation,” discusses the potential for traffic, air quality, noise, and hazardous materials impacts from operation of the bypass tunnel as they relate to public health. A discussion of the potential effects on water users is also included.
- Section 5.6-4, “Conclusions,” presents the conclusion of the public health analysis for operation of the bypass tunnel.

5.6-2 BACKGROUND

The City of New York has a fundamental obligation to provide a reliable potable water supply that meets all public health and regulatory requirements, and is mandated under the Safe Drinking Water Act (SDWA) and New York Sanitary Code to do so. On behalf of the City of New York, DEP is responsible for ensuring the safe and reliable transmission of drinking water from the watershed to consumers in sufficient quantity to meet all present and future water demands.

The Delaware system has provided high-quality water to consumers for many years and is anticipated to continue to supply the same level of water quality for the foreseeable future. After

the repairs are complete and the bypass tunnel is connected to the RWBT, water would flow through the RWBT and the newly constructed bypass tunnel. Operation of the bypass tunnel would enable DEP to continue to supply water to consumers and would support public health by protecting the water supply to upstate consumers and New York City.

5.6-3 PROBABLE IMPACTS OF BYPASS TUNNEL OPERATION

According to the *New York City Environmental Quality Review (CEQR) Technical Manual (January 2012)*, when no significant unmitigated adverse impact from a proposed project is predicted in other CEQR analysis areas—such as air quality, water quality, hazardous materials, or noise—no public health analysis is warranted. The following sections detail how operation of the bypass tunnel would not result in significant adverse impacts in these analysis areas or on water users, and would serve as an overall public health benefit.

5.6-3.1 TRANSPORTATION, AIR QUALITY, AND NOISE

There would be no anticipated project-related impacts on transportation, air quality, or noise from the operation of the bypass tunnel. The bypass tunnel would result in limited additional workers or truck trips once it is completed; therefore, there would be no significant increase in vehicular traffic or vehicular emissions once the bypass tunnel is in operation. In addition, the bypass tunnel, when completed, would not include any new stationary sources of air pollution. Further, operation of the bypass tunnel would not introduce any new sources of noise. No activities associated with the operation of the bypass tunnel are expected to exceed accepted city, state, or federal health-based standards with respect to public health. Although there would be anticipated temporary impacts on air quality, noise, and traffic due to temporary construction-related activities (see Chapter 2, Section 2.17), the bypass tunnel is not anticipated to have any significant adverse impacts on transportation, air quality, or noise when it is in operation and, therefore, no predicted significant adverse impacts on public health.

5.6-3.2 HAZARDOUS MATERIALS

Following the proposed program's construction period, construction-related materials and equipment would be removed from the west and east connection sites and the dewatering pipeline route. During the operation of the bypass tunnel there would be no increased exposure to hazardous materials; therefore, no significant adverse impacts on public health from hazardous materials would occur.

A complete analysis of the potential for significant adverse impacts from hazardous materials during the shaft and bypass tunnel construction period is presented in Chapter 2, Section 2.9, "Hazardous Materials." Section 2.9 describes in detail the preventative measures that would be implemented to minimize exposure to any potential hazardous materials and protect construction workers, the surrounding community, and DEP staff during construction of the bypass tunnel.

5.6-3.3 WATER SUPPLY USERS

The operation of the bypass tunnel would support public health by enabling DEP to continue to supply water to consumers by supporting inspections of other tunnel segments and providing greater flexibility to inspect and repair the RWBT. On completion of the shafts and bypass tunnel, the City of New York would continue to provide water to upstate consumers and New York City. Therefore, operation of the bypass tunnel would not result in significant adverse impacts to water supply users or on public health.

5.6-4 CONCLUSION

Operation of the bypass tunnel would not result in significant adverse impacts to water supply users or on public health. Instead, operation of the bypass tunnel would benefit water supply users by allowing DEP to continue to supply high-quality water to consumers safely and reliably.

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