FTA ALTERNATIVES ANALYSIS
DRAFT/FINAL ENVIRONMENTAL IMPACT STATEMENT

DANBURY BRANCH IMPROVEMENT PROGRAM TASK 5

ENVIRONMENTAL TECHNICAL MEMORANDUM IMPACTS ANALYSIS

STATE PROJECT 302-008


SECTION 14: SURFACE AND GROUNDWATER RESOURCES

FEBRUARY 2012

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METHODOLOGY

The Danbury Branch Improvement Program alternatives include a variety of rail infrastructure improvements with the potential to impact water quality. Direct permanent impacts could result from activities such as: excavation and/or placement of structures and fill material within water resources; spillage or leakage of contaminants into water resources; and alteration of land/soil conditions and stream channels. Direct temporary impacts beyond the permanent impact zones could result from vegetation clearing, construction vehicle access, temporary water handling, material laydown areas, and equipment staging areas. Indirect impacts, which are off-site or delayed effects, may include things like: increased water temperature and turbidity as a result of soil erosion and sedimentation of water bodies; hydrologic changes in water flows or patterns; and gradual intrusion of contaminants into ground water.

To determine potential direct and indirect impacts from each project alternative on surface and groundwater resources, improvement concept plans were overlaid with GIS resource mapping that was developed for this project corridor and described in *Section 14: Surface and Groundwater Resources* (April 2009) of the Existing Conditions Environmental Technical Memorandum. The proximity of surface waters and aquifer protection areas to the improvement sites was also measured to help assess potential impacts. The proximity data are shown for each of the build alternatives in Tables 1 (Alternative C), 2 (Alternative D), and 3 (Alternative E).

IMPACTS

For each alternative, the potential for direct and indirect impacts to surface and groundwater resources is attributed to the construction of the following major project elements:

- New or improved (existing) passenger stations
- Rail reconstruction
- Structures and bridges
- Traction power systems (electrification)
- Track reconfigurations, sidings, and connections
- Storage, maintenance yards

For the qualitative impact analysis presented herein, it is assumed that proper Best Management Practices (BMPs) will be designed and implemented for all project improvements. All construction will be subject to CTDOT's *Standard Specifications for Roads, Bridges, and Incidental Construction* (Form 816). Drainage systems at new stations and existing stations where expanded surface parking or other upgrades are planned will be designed in conformance with CTDOT's Drainage Manual as well as with the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). This will ensure that site runoff does not cause adverse flooding or indirect scour impacts on adjacent and downstream waters, lands, and wetlands.

Stormwater management designs at stations will adhere to the Connecticut Department of Environmental Protection (DEP or CTDEP) *Connecticut Stormwater Quality Manual* (2004) and will apply to the construction period (temporary) as well as to finished construction (permanent). Low impact development techniques such as the use of pervious pavement and other innovative measures will be considered by designers during detailed project design to minimize potential stormwater impacts. The design of all rail infrastructure improvements such as track reconfigurations, bridge and structural work, electrification, and yard work will also comply with the FEMA NFIP requirements which will further help to reduce the potential for offsite water quality impacts associated with drainage and stormwater runoff. Furthermore, to prevent and minimize sedimentation, siltation, and/or other pollution of surface waters during the construction period, a stormwater pollution prevention plan will be developed and implemented in accordance with the DEP's *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*.

The above measures will be applied to all construction activities associated with the Danbury Branch Improvement Program and will help to minimize potential surface and groundwater quality impacts. Future design of stormwater treatments and BMPs would include quantitative analysis of water quality and runoff volume data in order to ensure that the particular improvement would not result in water quality degradation or exacerbate causes of water impairment of surface and groundwater resources.

Alternative A - No Build

There would be no project-related changes to water quality under the No Build Alternative since no improvements would be made to stations, tracks, or other rail infrastructure. Stormwater runoff from the existing rail corridor and station areas will continue to be collected and conveyed through existing drainage system features and discharged to receiving waters at current outfall locations.

Alternative B - Transportation System Management (TSM)

Alternative B is the Transportation System Management (TSM) Alternative. The Federal Transit Administration (FTA) defines TSM as "everything that can be done without new construction or vehicle procurement." For the Danbury Branch, this alternative would add two weekday rail shuttle trains in the morning and evening between South Norwalk and Wilton and provide hourly service during the midday from South Norwalk to Danbury. More frequent rail service would also be provided on weekends. Each station would have enhanced local bus and transit service options. There would also be new connecting express bus service between the existing Danbury rail station and select locations in Brookfield and New Milford (in relatively close proximity to what would have been the Brookfield and New Milford rail station sites noted in Alternative D).

Alternative B is similar to the No Build Alternative in that no improvements would be made to stations, tracks, or other rail infrastructure. As such, this alternative would have no effect on the quality of existing surface or groundwater resources within the study corridor. Stormwater runoff from existing stations and along the corridor will continue to be collected and conveyed through existing drainage system features and discharged to receiving waters at current outfall

locations. Overall, the TSM alternative will not offer the opportunity for long term stormwater management improvements that the other build alternatives do.

Alternative C - South Norwalk to Danbury Improvements

Alternative C would provide infrastructure and service improvements between South Norwalk and Danbury on the existing Branch. Improvements would include upgrading track to 60 mile per hour maximum speed; expanding parking and improving access at stations; upgrading 15 bridges from an older open deck structure to modern ballast deck bridges; upgrading the rail yard and providing a new maintenance facility at Danbury Yard; and electrifying the rail line. New rolling stock would be added to allow for expanded service or for the electric trains.

Impacts under this alternative are associated with upgrades to existing passenger stations, installation of the traction power system (electrification), track reconfigurations, and construction of replacement bridges. Potential impacts to surface and groundwater resources from Alternative C improvements are summarized in Table 1 and are described in more detail below.

Passenger Stations (Existing Station Upgrades)

Under this alternative, improvements are planned at five of the seven existing stations located along the Danbury Branch rail corridor. While none of the station improvements involve direct footprint impacts to surface or groundwater resources, they do entail construction of impervious pavement, structures, and buildings (rooftops). Indirect (off-site) impacts to surface water quality can result from increases in impervious surfaces such as these. Potential impacts include increased runoff volumes, contaminant loads, and runoff velocities. Thermal impacts to receiving waters are also possible, especially during summer months when runoff from hot asphalt surfaces is discharged into cool surface water streams.

Impervious surfaces do not allow infiltration of stormwater, so conversion of pervious to impervious surface causes increased runoff volumes Paved roadways and parking lots are accumulation areas for contaminants associated with motor vehicles, such as leaked fuel and oil, brake and tire dust (including lead and other metals), and other potentially toxic materials. During storm events, these contaminants can be conveyed via sheet flow or drainage systems to downstream waters. The increased numbers of vehicles on these larger impervious surfaces can therefore bring about greater amounts of pollutants in runoff.

Runoff velocities are also affected by changes in site surfaces. Impervious surfaces convey runoff faster than pervious soils and vegetation, resulting in faster-moving, more erosive velocities of stormwater. Therefore, whenever a vegetated site is converted to paved surfaces, adjacent receiving surface waters are at risk of potential erosion and sedimentation impacts, in addition to degradation by polluted stormwater.

To prevent and/or minimize adverse impacts from increased impervious surfaces, the stormwater systems at each station site will be upgraded and/or re-designed and improved as part of the planned station projects. According to federal statutes, any improvements to existing transportation facilities require corresponding improvements to the drainage systems of these

facilities. The types of drainage improvements will vary, depending on the size of the facility expansion or upgrade, the quality of the receiving water, and other factors. Essentially, drainage features will be designed for each station site to account for the specific conditions on each site. Primary stormwater treatment measures will be provided wherever possible. Potential drainage improvements could include, but not be limited to: new or additional deep-sump catch basins; vegetated water quality swales or ditches; stormwater detention or retention basin; improved erosion control measures at discharge points; and buffer strips or infiltration strips. Innovative low-impact development (LID) measures such as pervious pavements, rain gardens, and other measures will also be considered for implementation on a site-by-site basis as the design of the project advances. Stormwater management design will be consistent with the CTDOT Drainage Manual and the 2004 *Connecticut Stormwater Quality Manual*.

Drainage systems will be designed to effectively minimize off-site adverse water quality impacts from increased runoff volumes, contaminant loads, and velocities. For each station site, the cumulative area of land disturbance will be greater than one acre during construction, requiring submission of a General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities to the Connecticut Department of Energy and Environmental Protection (CTDEEP, formerly DEP). Per the requirements of this General Permit, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared and will be properly implemented on the active construction sites at all times. Review of the SWPPP by CTDEEP would be required for any project with over 10 acres of land disturbance. Although construction of all possible improvements along the Branch would result in the disturbance of more than 10 acres, the improvements are not anticipated to be constructed all at once. Instead, they would be built as separately contracted, stand-alone construction projects, each with independent utility. Each project would thus be permitted separately; none are anticipated to exceed 10 acres of land disturbance.

The planned improvements at the five existing stations in Alternative C station and the anticipated impacts on surface waters from changes in runoff conditions are described in more detail below. Overall, the planned improvements are not expected to directly or indirectly affect groundwater resources. There are no aquifer protection areas (APAs) close to any of the existing station locations. The Merritt 7 Station is the nearest station to an APA; it is located approximately 1,090 feet northeast of the boundary of a mapped Level "A" Kellogg-Deering Wellfield APA #106 and it is over 2,000 feet to the active wells within the wellfield. There is a GAA-Impaired well located approximately 250 feet southwest of the Cannondale Station. Coordination with the water company that owns this well will be conducted regarding the proposed improvements in order to respond to any concerns. Given the proper implementation of BMPs to prevent leaks or spills of contaminants, there would be negligible if any direct or indirect impacts on groundwater from the station improvements and no potential for additional water quality impairment.

Merritt 7 (Norwalk): At the Merritt 7 Station in Norwalk, a new 200-space surface parking lot would be constructed on acquired property west of Glover Avenue and the existing low level platform would be replaced by a 500' long high level platform. A new pedestrian overpass would be constructed over the tracks to access commercial areas on the east side of the tracks. The planned upgrades at the Merritt 7 Station, including the new parking lot, are

located on previously developed property with existing impervious paving and buildings, so there will be no net increase of impervious surface from the improvements at this station. Runoff quantity and volumes at the site would therefore be similar to existing conditions. The additional parking lot will accommodate increased vehicular use and thus could result in higher contaminant loads in runoff. The stormwater management system design for the site would incorporate techniques to remove and treat suspended sediment and other pollutants, thereby minimizing adverse water quality impacts on the nearby (but off-site) Norwalk River.

Cannondale (Wilton): Improvements planned at Cannondale station include a new surface parking lot with 50 spaces and lengthening the existing high level platform. There are no surface water resources on site. The net increase of impervious surface, primarily associated with the parking lot expansion on currently vegetated ground, is 0.45 acres. Runoff quantity, contaminant loads, and velocities would increase at the site. Mitigation will be provided by the stormwater management plan. The station design would incorporate stormwater management techniques to properly manage and treat runoff prior to discharge from the site and would include primary treatment to the extent possible. The stormwater management plan will address dissipation of runoff velocities and removal of suspended sediment and other pollutants and will thus minimize adverse water quality impacts on the nearby (but off-site) Norwalk River.

Branchville (Ridgefield): At Branchville, vehicular access to the existing station would be changed and a new parking lot would be constructed between Route 7 and the Norwalk River on acquired property. Portland Avenue would be relocated and require a new bridge over the Norwalk River. Depot Road would be reconfigured, requiring replacement of the existing Depot Road Bridge over the Norwalk River. A new pedestrian overpass at Branchville would be constructed to span the tracks and the Norwalk River. The proposed roadway and pedestrian bridge structures over the Norwalk River would not involve the placement of piers in the water – they would be clear span structures. At this conceptual design phase, construction is anticipated to take place outside of the river channel and floodway. As the project development process moves forward, bridge designs, construction methods, and construction staging, will be carefully planned and implemented to ensure maximum protection of the Norwalk River. Temporary construction impacts associated with increased sedimentation and/or other potential contaminants impacting the quality of the river will be minimized to the greatest extent possible through proper implementation of construction BMPs designed specifically for these bridge locations.

The net increase of impervious surface at this station site, primarily associated with parking lot expansions on currently vegetated ground, is 0.41 acres. Due to the increase in impervious surface; runoff quantity, contaminant loads, and velocities would increase at this site and may affect nearby receiving waters. Mitigation will be provided as detailed in a stormwater management plan that will be specifically prepared for this site. Stormwater management techniques will be designed to properly manage and treat site runoff prior to discharge from the site and will include primary treatment to the extent possible. The management plan will be designed to dissipate runoff velocities/volumes and remove suspended sediment and other pollutants from stormwater. This will minimize adverse water quality impacts on the Norwalk River, which runs through the site in a confined engineered

channel. Due to the location of the work on lands along the edge of the river, there is potential for temporary sedimentation impacts during construction. These impacts will be minimized to the greatest extent possible through proper implementation of site specific erosion and sedimentation controls in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*.

Redding: In addition to a parking lot expansion, the planned Redding Station improvements would include reconfiguring the passenger drop-off area. No surface waters would be directly impacted but there would be a 0.9 acre increase in impervious surfaces associated with the parking lot expansion on currently vegetated ground. Runoff quantity, contaminant loads, and velocities would thus increase at this site. Mitigation will be provided by the stormwater management plan that will be specifically prepared for this site. The station design would incorporate stormwater management techniques to properly manage and treat runoff prior to discharge from the site and would include primary treatment to the extent possible. The stormwater management plan will address dissipation of runoff velocities and removal of suspended sediment and other pollutants and will thus minimize adverse water quality impacts on the adjacent Hawley Pond Brook (to the north) and the Saugatuck River (to the south).

Bethel: Improvements at Bethel call for an expansion of parking to add approximately 160 spaces, resulting in a net increase of impervious surface of an estimated 1.42 acres. No surface waters would be directly impacted, but runoff quantity, contaminant loads, and velocities would increase at this site. Mitigation will be provided by the stormwater management plan that will be specifically prepared for this site. Stormwater management techniques will be designed to properly manage and treat site runoff prior to discharge from the site and will include primary treatment to the extent possible. The management plan will be designed to dissipate runoff velocities/volumes and remove suspended sediment and other pollutants from stormwater, thus minimizing adverse water quality impacts on off-site receiving.

Structures and Bridges

There are improvements involving undergrade and overhead bridges included with Alternative C.

Undergrade (UG) bridges (railroad goes over a road or water): There are 18 UG bridges where work is planned in Alternative C. Seven of these are over roadways and 11 are over waterways.

The UG bridges over roadways include a new bridge at MP 0 in Norwalk over Washington and South Main Streets and six replacement bridges at Norwalk MP 0.1, Norwalk MP 0.2, Wilton MP 11.01, Redding MP 14.16, Redding MP 14.8, and Bethel MP 19.64. The only one of these close to a water resource is the Bethel Bridge MP 19.64 over Grassy Plains Road, which is adjacent to Sympaug Brook. For this and the other UG bridges over roadways in Alternative C, construction is anticipated to occur from the roadways and their ROWs. Appropriate BMPs, including E&S controls, will be

maintained during construction to prevent disruption of areas beyond the existing disturbed and maintained rail and roadway ROWs. Drainage upgrades will be incorporated into the bridge designs and other BMPs will be implemented. As such, there will be no direct footprint impacts to surface or groundwater resources from the construction of UG bridges over roadways. Potential offsite or indirect impacts to surface and groundwater quality from these UG bridges will be effectively minimized to the greatest extent possible.

The 11 UG bridges over water are at the following locations:

- Norwalk (MP 3.2) over Norwalk River
- Norwalk (MP 5.12) over tributary to Norwalk River
- Norwalk (MP 6.43) over Norwalk River
- Norwalk (MP 6.64) over Norwalk River
- Wilton (MP 8.7) over Norwalk River
- Wilton (MP 9.42) over Norwalk River
- Wilton (MP 11.55) over Norwalk River
- Wilton (MP 12.17) at Factory Pond (Norwalk River)
- Redding (MP 16.4) over Umpawaug Pond Brook
- Redding (MP 17.1) over Saugatuck River
- Bethel (MP 21.41) over Sympaug Brook

Nine of these bridges -- all but MP 3.2 and MP 6.64 -- are replacement bridges on the existing rail alignment. For eight of these nine bridge replacements, Wilton MP 11.55 being the only exception (described below), construction is anticipated to occur from previously disturbed rail ROW and to use the existing bridges' support structures (e.g., piers and abutments) to the greatest extent possible. Under this scenario, the existing bridge decks would be removed and the new bridge deck would be lifted into place onto the existing abutments. The new bridge deck would function like a pan, containing the ballast, ties, and track. Drainage from these bridge decks would be similar to existing conditions. For short spans, water travels along the ballast pan that extends over the back wall and into the adjacent ground, where there is often a lateral underdrain. For longer spans, there are small PVC drain spouts from the ballast pan. Overall, this non-intrusive bridge construction methodology and the proposed bridge drainage design would minimize impacts to nearby surface and groundwater resources.

If the bridge piers or abutments will need major repairs or replacement as determined by future engineering and hydraulic studies or if areas beyond the existing disturbed ROW (not currently anticipated) are required for some aspect of construction, direct and indirect impacts to surface and groundwater resources are possible. In the past, a rail-mounted snooper has been used to access the sides and undersides of bridges along the Danbury Branch for minor repairs, to avoid disturbance of banks and avoid direct impacts to water resources. Where possible, this method will be used for repairs to any bridge abutments or piers. However, more substantial repairs or outright replacement of bridge substructures could involve soils/rock excavation and equipment access around the bridge structures which could impact underlying or nearby watercourses. If the need for more

intrusive construction measures becomes apparent during future site investigations and engineering studies, then every effort will be made to minimize impacts to surface and groundwater resources through careful consideration of construction staging, innovative construction methods, and site specific project drainage design and implementation of E&S controls.

The Wilton MP 11.55 bridge over the Norwalk River will require a new 161-foot long single span replacement on the existing alignment. There will be no new piers constructed in the water but two piers supporting the existing bridge would either be completely removed or cut just below the mud line. The work to remove or cut the piers will result in direct impacts in the water at this bridge site. If pier removal is undertaken, disturbance of the river bottom could result in increased turbidity and other impacts, which if not contained locally, could result in impacts to downstream waters. If the existing bridge abutments are determined by future engineering inspections and hydraulic studies to require repair, rehabilitation of replacement, then there could also be additional direct impacts to the Norwalk River at this crossing. The extent of potential impacts cannot be quantified at this conceptual design phase. Potential direct impacts, however, will be minimized to the greatest extent possible through future design efforts and consideration of non-intrusive construction methods, among other means.

For the Wilton MP 11.55 bridge and for all UG bridges requiring work along the rail corridor, every effort will be made to locate temporary material laydown areas and construction access ways outside of wetlands, waterways, floodplains, aquifer protection areas, and culturally sensitive areas so as to minimize the potential for direct or indirect impacts to these resources, including surface and ground waters. Indirect impacts will be minimized to the greatest extent possible through proper implementation of construction BMPs and stormwater management measures.

Two of the UG bridges over water are slightly or totally off existing alignments. The bridge at MP 3.2 over the Norwalk River would be a new bridge on a new alignment and the bridge at MP 6.64 over the Norwalk River would occur on a slight alignment shift associated with track curve shift Curve 6B. These are discussed in more detail below.

> **Bridge at MP 3.2 over the Norwalk River:** This would be a new long-span bridge on a revised track alignment south of the current alignment (and existing bridge) and associated with the proposed track Curves 3A and 3B. To minimize encroachment on the Norwalk River and its floodway, the conceptual design calls for a 160-foot long single span structure with no piers in the water. Installation of the new bridge abutments and wingwalls would occur on the high terraces above the river channel on both sides of the river. There would be clearing of vegetation and temporary work between the face of the proposed abutment and the river, posing the greatest risk of construction-period impacts to water quality. Risks are associated with sediments from exposed/disturbed work areas being carried in site runoff to the river and with contaminants potentially leaked by construction equipment. Based on concept plans, construction of the footing and abutments for the new bridge would result in temporary impacts 12-15 feet from the ends of the

bridge span toward the river, with permanent impacts (abutments) within approximately eight feet of the end of span. The abutments would be about 28 feet wide, perpendicular to the tracks, from which would extend approximately 15-foot long wingwalls placed nearly parallel to the river channel.

During construction, protective measures will include the following: no equipment or material storage will occur within flood zones along the river unless site conditions are restrictive, leaving the contractor with no other feasible option to effectively stage construction; extensive BMPs for blasting and rock excavation; temporary sheeting between the excavation areas and the river for bank stabilization; and comprehensive site specific erosion, sedimentation, and site stabilization controls that meet the requirements of the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*. These measures will be designed to minimize adverse temporary impacts to the river bank and water quality from construction. After rail traffic is operational on the new bridge, the existing bridge – which has no piers or supports in the river - would be removed and the abandoned rail alignment on both sides of the river would be stabilized and planted to establish vegetative cover consistent with the ROW..

Bridge MP 3.2 is located within the Kellogg-Deering Wellfield APA #106, which is described in more detail in *Section 14: Surface and Groundwater Resources* (April 2009) of the Existing Conditions Environmental Technical Memorandum. The extent of land area to be disturbed by soil and rock excavation required to construct the bridge abutments is minimal when compared to the overall surface area of the APA, which represents the entire recharge area for the wellhead. Every effort will be made by the contractor to minimize the potential for direct infiltration of oils, fuels, and other fluids from construction equipment into the underlying groundwater. This will be achieved by good construction practice, ensuring equipment is in clean and good working order, and that leaks or spills are immediately contained and cleaned up. When not in use, equipment, fuels, and lubricants should be stored, where feasible and possible, on impervious surface areas to minimize the chance for infiltration. With the incorporation of these BMPs, and due to the fact that the area of excavation is small in comparison to the overall APA surface area, potential impacts to groundwater quality from bridge construction will be significantly controlled and minimized to the greatest extent possible. Because of its location within an APA, review of this construction by the CTDEEP Aquifer Protection Area Program will be required. In addition, coordination with the water company that owns the wellfield will be conducted to respond to their concerns. These measures will ensure that bridge construction will have no impact on groundwater quantity or yield at wellhead.

Overall, minor temporary surface water quality impacts to the Norwalk River may result from construction of Bridge MP 3.2 due to the proximity of excavation activities. Comprehensive BMPs will be implemented to reduce the duration and intensity of such impacts. Once the bridge has been constructed, the prior bridge

deck removed, and the track area and abutments stabilized, no long-term direct or indirect impacts on water resources from this improvement would be expected.

Bridge MP 6.64 over the Norwalk River: This bridge is associated with the realignment of Curve 6B, which is offset to the east from the existing alignment by three feet near the southeast corner of the bridge. A new 60-foot single-span structure over the Norwalk River and its associated floodway is proposed at this location to accommodate the new alignment. The new bridge would be approximately five feet longer than the existing bridge. The conceptual design calls for the proposed bridge replacement to be constructed from the rail (e.g. rail-mounted equipment) to the extent possible. Existing abutments would also be used if hydraulic and other pending engineering studies determine this to be possible. The use of existing abutments would retain the existing river opening and would minimize any potential temporary construction impacts to water quality that could arise if construction of a new abutment(s) is required.

As indicated above, the temporary and permanent impact zone on the southeast side of the bridge may extend approximately three feet beyond the existing disturbed ROW to accommodate the alignment shift and tie into the Curve 6B. This area would be permanently stabilized as railroad embankment.

At this conceptual design stage, no work is anticipated to be conducted in the Norwalk River or required between the face of existing abutments and the river. However, site-specific detailed hydraulic and engineering studies to be conducted later during the project development process may determine that more significant work is required at this location in order to construct the bridge. Regardless, every effort will be made to avoid direct impacts to the Norwalk River. Construction will be sequenced and staged to minimize impacts to water quality to the greatest extent possible. Erosion and sedimentation controls will be designed and installed to prevent and/or minimize temporary adverse construction impacts to the river bank and to water quality. Exposed and disturbed surfaces will be stabilized immediately upon completion of construction to reduce the potential for post-construction sedimentation impacts from the erosive forces of stormwater runoff. There are no sensitive groundwater resources mapped near this bridge site and thus no impacts to groundwater are anticipated.

Given the conditions at this site, the conceptual construction methodology that is being proposed, and the proper use of BMPs during construction, permanent direct and indirect impacts on water resources from this bridge replacement will be minimized to the greatest extent possible.

Overhead (OH) bridges: Improvements planned to the Route 7 overhead bridge in Wilton (MP 7.87) are within 50 feet of the Norwalk River. Construction is anticipated to occur from upland roadway ROW areas. Thus, disturbance from construction, including staging areas, will be located outside of the river channel and, to the extent possible, east of Route 7 (away from the river) and outside of any adjacent floodplains or other

regulated water resource and wetland areas. With appropriately installed and maintained E&S controls, construction BMPs, and prompt site stabilization practices, adverse impacts to surface or groundwater resources will be substantially minimized at this location.

Traction Power System - Electrification

Electrification facilities associated with the Traction Power System included with Alternative C would extend from approximately MP 1.1 in Norwalk to MP 23.9 in Danbury. Facilities include electrical substations, smaller remote terminal units (RTUs), and catenary and support structures.

Substations and remote terminal units (RTUs): Substations and RTUs that would be required as part of this electrification system are generally situated in small trackside areas along the rail ROW. They are small box-like structures resting on a gravel bed and therefore cause very minor areas of impervious surface and minimal runoff. All potential contaminants associated with the electrical components are well contained within the constructed housings. Underground conduits and cables connecting the new substations and RTUs with the catenary system will occur within the previously disturbed/maintained railroad right-of-way (ROW).

The substations at Norwalk, Wilton, Ridgefield, and Danbury and the RTUs in Norwalk and Bethel are planned to be located on previously disturbed ground to avoid directly impacting surface and groundwater resources. Construction of these facilities will require minimal site disturbance and earthwork; therefore the potential for sedimentation of nearby surface waters during construction is low. However, the risk of E&S impacts from construction of the Norwalk substation is higher because the site is directly adjacent to the Norwalk River. This substation site is on an acquired property which is currently a paved parking lot adjacent to the Norwalk River. Erosion and sedimentation controls will be implemented to minimize the potential for adverse construction impacts, such as increased sediment inputs to the river from site runoff. Once constructed, drainage features and screening vegetation around the substation will stabilize soils and provide water quality renovation. Due to the installation of E&S controls during construction, new stormwater drainage, and vegetative screening, runoff from the site after construction will likely be improved compared to existing conditions.

The Redding substation site is the only electrical facility site which is currently partially vegetated. Most of this facility would be located on previously cleared and compacted ground, but the west side is on forested land adjacent to Hawley Pond Brook (water quality classification of AA – described in *Section 14: Surface and Groundwater Resources* (April 2009) of the Existing Conditions Environmental Technical Memorandum). This is another site that will require more extensive BMPs incorporated into the design and construction of the facility. These measures will be implemented to prevent harmful impacts to the brook and other downstream waters. Once constructed, drainage features and screening vegetation around the substation will stabilize soils and provide for water quality renovation, resulting in drainage and runoff conditions

relatively similar to the current site. As such, adverse impacts to Hawley Pond Brook from construction of this substation will be minimized to the greatest extent possible.

Catenary and support structures: Electrification proposed under Alternative C would require the installation of catenary and support structures at regular intervals along the corridor from Norwalk to Danbury – similar to what was proposed for the Danbury Branch Signalization & Pole Line Project (State Project No. 0302-0007; Federal Project No. CT90-X300): also known as the Centralized Traffic Control (CTC) Project. Detailed design plans were developed for that study as were draft permit applications (Gannett Fleming 2008). The placement and dimensions of the catenary structures from Norwalk to Danbury under the proposed Danbury Branch Improvement Program Alternative C are assumed to be identical to the signal structures described in the CTC Project. The construction methodology is also presumed to be similar, with pole installation by track-mounted equipment, and minor hand-work required around each pole foundation in order to remove spoils and restore the ground to existing conditions. The numerous small areas of disturbance associated with the installation of each pole would be stabilized and planted to establish vegetative cover consistent with the ROW wherever possible..

Based on GIS analysis of the Alternative C catenary pole locations, none will be located directly within surface waters; however some will be located adjacent to surface water resources. The construction methods for installing the catenary structures described above are designed to minimize potential adverse water quality impacts, such as increased sediment input to nearby waters. E & S control measures will be established as appropriate for conditions at each location prior to installation, to prevent disturbed soils from migrating into adjacent waters or wetlands. Given these procedures, adverse localized impacts to surface water quality from catenary installation are anticipated to be negligible.

Similarly, installation of the catenary system is not anticipated to adversely affect ground water resources. Drilling for pole structures may go as deep as 10 to 15 feet, which could potentially encounter shallow groundwater where pole locations are located within floodplains or lowlands next to ponds and large wetlands. However, the poles and concrete foundations are stable non-polluting materials. The possible intrusions into shallow groundwater would not alter groundwater elevations (levels) or groundwater movements, and would not pose any risk of pollution. If dewatering is necessary, waters from dewatering will be properly managed per the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities.

Track Reconfigurations, Sidings and Connections

There are many track reconfigurations planned under Alternative C to improve rail operations and/or speed. There are a total of 23 curve reconfigurations (each of which may involve more than one curve) plus a branch connection with the New Haven mainline in South Norwalk. This branch connection improvement is referenced as CP241. There are no passing or storage sidings planned with Alternative C.

Track curve reconfigurations: The track curve reconfigurations are locations where existing curves would be redesigned to flatten out sharp curves; this will allow greater train speeds. Each reconfiguration involves changes to one or more curves. The amount of the proposed flattening or shift of the track (to the inside of the curve) varies from approximately one foot to 40 feet for different curves. Where a proposed shift is only one or two feet from the existing track, no changes to the existing rail bed are anticipated. This is because the rails can simply be moved within the existing track bed. Where a proposed shift is three feet or greater from the existing track, new fill would be placed alongside the existing rail bed on the side of the track shift (east or west of the existing track) to support the track in its new location. In these cases, the toe of slope for the new rail bed embankment would extend beyond its current location by the same distance as the track shift (since the rail and the rail bed are shifting together). Hence, the direct impact zone for each curve with a shift of three feet or more would be approximately the same width as the proposed track shift. For example, if a particular curve shift is 16 feet east of the current track (centerline) at its farthest point; the estimated direct impact zone on lands adjacent to the rail bed is 16 foot wide at its greatest width.

The shape of each direct impact zone is like a crescent, with the broadest impact zone in the middle of the curve; the impact zone narrows down where the ends of curve connect to the existing track. Impacts to mapped surface water resources in these curve footprints will be permanent impacts. Curve reconfiguration work is anticipated to be conducted from the existing rail (e.g. from rail-mounted equipment) and within the existing disturbed rail bed to the greatest extent possible.

Where the proposed track realignment totally diverges from the existing alignment, the new alignment footprint is 30 feet wide centered on the track. Direct impacts to surface water resources within the new alignment envelope would be permanent. All efforts will be made to construct the new alignments from areas within the permanent impact footprint. Sections of track to be abandoned will be removed. The ground surface within the former track footprint will be stabilized and planted to establish vegetative cover consistent with the ROW..

Only one of the curve reconfigurations included with Alternative C would directly impact surface waters, which is Curve 15B, described below. This is an open water impact. Ground water resources are not close to this site, so adverse impacts on ground water are not anticipated. None of the other track curve reconfigurations included under Alternative C were assessed to directly or indirectly impact surface water resources or groundwater. [Note: Curve 15B and other curves would affect wetlands; those impacts are described separately in the Wetlands impact report.]

> **Curve 15B [within reconfiguration formed by track Curve 15B & 15C, MP 15.62 – 15.77]** requires realignment of track up to 15 feet east of its existing alignment. This realignment would require construction of track bed and ballast partially within the open water of Umpawaug Pond in Redding, which lies directly adjacent to the tracks in this location. The pond is a feature along Umpawaug Pond Brook, a designated Class AA waterway within the Saugatuck River

watershed and is described in more detail in *Section 14: Surface and Groundwater Resources* (April 2009) of the Existing Conditions Environmental Technical Memorandum. Based on the conceptual footprint, the required fill for the realignment (including the rails and embankment) would impact approximately 3,500 square feet (0.08 acres) of open water and 450 linear feet of the pond's shoreline. The shoreline at this location is presently a very narrow strip of rip-rap between the tracks and the pond, with occasional clumps of shrubs and small trees. The fill material would be clean non-polluting stone and rip-rap which would not affect the long-term water quality in the pond. However, some of the natural pond bottom sediments would be permanently replaced by rip-rap. There would be temporary water quality impacts during the placement of the fill, which would take place from rail-mounted equipment. Turbidity and other temporary impacts would be limited and minimized to the greatest extent possible through use of appropriate in-water controls such as turbidity curtains. Work (disturbance) in the pond would require a Section 404 permit from the U.S. Army Corps of Engineers and an Inland Wetlands and Watercourses Permit and Section 401 Water Quality Certificate from the CTDEEP. Mitigation in the form of compensatory shoreline and open water replacement would likely be required (at a minimum). The mitigation plan for this impact will be thoroughly coordinated between the CTDOT, CTDEEP, USACE and other regulators as appropriate during project permitting.

Additional branch connection at CP 241: The construction of the additional branch connection at CP 241 from MP 0 to MP 0.3 in Norwalk would occur within previously disturbed rail ROW and on acquired property with existing buildings and parking areas. Appropriate E&S control measures will be installed and regularly maintained over the duration of construction in order to minimize offsite migration of sediments and adsorbed contaminants. With these BMPs, this construction activity is not anticipated to directly or indirectly impact surface water or groundwater resources.

Storage and Maintenance Yards

The planned work at the Danbury Yard would be located within the level urban-industrialized existing rail yard and adjacent previously developed property. Interior train car cleaning including toilet dumping, minor repair service such as brake shoe replacements, and daily inspections presently occur at the existing rail yard. The yard is located within an Aquifer Protection Area (APA) associated with a wellhead located approximately 1,600 feet to the northeast. The yard is presently equipped with stormwater collection, treatment, and conveyance systems as well as other waste and water handling devices and infrastructure that help to protect underlying groundwater as well as the Still River, which is channelized nearby. Thus, potential contamination from dripping or leaking fluids, fuel, and oils as trains sit overnight is currently managed. No fueling of trains takes place at the existing yard, so the potential for large fuel leaks or spills due to overfilling or other fueling mishaps is low.

Proposed project improvements at the yard include realigning existing storage tracks and providing additional tracks to bring the total number of storage tracks to eight. A 3,000 square-

foot paved outdoor storage area and a 3,000 square-foot single story building to house employee welfare facilities and provide additional indoor storage space are also planned. The efficiency of existing stormwater collection and treatment systems will be evaluated by project engineers as the design progresses and will be upgraded as necessary to provide protection to nearby surface and groundwater resources, in keeping with the 2004 DEP Stormwater Quality Manual. These systems will be maintained on a regular basis according to standard railroad operational protocol. Additional water treatment and collection devices that may be provided with site improvements include more diesel engine track pans to collect leaks or drips from overnight engine storage and new oil-water separators to treat discharges. Coordination with the water company that owns the well will be conducted to address any of their concerns.

Construction of the new yard facilities will involve minimal excavation and earthwork within an already developed site. Land use at the site will not change. Overall, the type of activities performed at the yard will remain the same, with a slight increase in train capacity being the primary change. Given the surficial nature of the construction work, installation and maintenance of appropriate erosion and sedimentation controls, and the potential upgrade of the stormwater collection and treatment systems, the potential for direct or indirect adverse impacts to water resources or water quality will be limited. A General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities may be required for this improvement, along with a Stormwater Pollution Prevention Plan (SWPPP) to be implemented during construction. Because of its location within an APA, review of this construction by the CTDEEP Aquifer Protection Area Program will be required.

Alternative D - Extension from Danbury to New Milford

Alternative D would extend existing Danbury Branch passenger service 14.7 miles from Danbury to New Milford. This includes replacing the existing freight track by constructing new track along the same alignment to accommodate speeds up to 60 miles per hour, adding new stations and parking facilities at Danbury North, Brookfield and New Milford, and adding new rolling stock. A new maintenance facility and storage yard would also be built in the vicinity of New Milford.

The analysis of potential impacts to surface and groundwater resources from Alternative D is summarized in Table 2 and described by improvement type below.

Rail Reconstruction

Replacing the existing track from Danbury to New Milford would provide a higher quality of rail on new ties. The track in most locations is centered within level ground stabilized by ballast and gravel. The replacement work will be done in short segments by rail-mounted equipment, take place in level areas of gravel and ballast fill, and will be stabilized as soon as the replacement section is in place. This work is not anticipated to expose soils for long periods of time or result in increased erosion and sedimentation during or after construction. Direct or indirect impacts are therefore expected to be minimal on surface or ground water resources from track reconstruction.

Passenger Stations (New)

Improvements from Danbury to New Milford under Alternative D would involve the construction of two new passenger stations: Brookfield and New Milford. Both new stations will involve the construction of passing sidings, 300-foot long high-level platforms with canopies, new passenger waiting shelters, and new surface parking lots with a capacity of approximately 100 vehicles.

Brookfield Station: No surface waters are in the direct footprint of the new station elements. There is a high risk of construction-related water quality impacts to the Still River, a DEP designated Class C watercourse (described in *Section 14: Surface and Groundwater Resources* (April 2009) of the Existing Conditions Environmental Technical Memorandum), from the planned Brookfield station. This is because the Still River is located approximately 100 feet down-slope of the station site, parallel to the planned rectilinear surface parking lots. Construction of the parking lots would require clearing and disturbance of over an acre of currently vegetated land. Erosion and sedimentation controls will be implemented at the site to minimize adverse temporary impacts during construction. There are no important groundwater resources in the vicinity of this site and no adverse impacts to groundwater are anticipated.

A permanent net increase of impervious surface area will result from development of the new Brookfield station and its facilities. Approximately 1.2 acres of new impervious surface would be created, caused primarily by the conversion of currently vegetated land to paved surfaces. Runoff quantity would increase from the site as would velocities. Mitigation will be provided by the stormwater management plan, which would incorporate stormwater management techniques to properly manage and treat runoff prior to discharge from the site and include primary treatment to the extent possible. The stormwater management plan will address dissipation of runoff velocities and removal of suspended sediment and other pollutants and will thus minimize adverse water quality impacts on the adjacent Still River.

New Milford Station: The New Milford passenger station is planned to be located approximately 750 feet east of a relatively degraded section of the Housatonic River (DEP designated Class D/B watercourse as described in *Section 14: Surface and Groundwater Resources* (April 2009) of the Existing Conditions Environmental Technical Memorandum). Terrain is level and there are developed parcels between the rail site and the river. The risk of direct (construction-related) or indirect impacts to the river is very low. The planned New Milford Station elements would all be located on previously developed property with existing impervious paving and buildings. As such, there will be no net increase of impervious surface at that station. Runoff volumes from the site will be similar to current (impervious) conditions. The quality of runoff is expected to be improved as a result of station development due to the design and installation of a new stormwater management system to current DEP standards.

The New Milford station site is situated within the boundary of two Level "B" APAs and approximately 1,550 feet away from three active water supply wells (GAA-Impaired) owned by United Water CT, Inc. (New Milford System). The wells are located on the

opposite side of the Housatonic River and are not expected to be affected by project construction. Excavations needed during station construction are anticipated to be shallow, thus direct penetration into ground water is not anticipated. Implementation of erosion and sedimentation controls and other BMPs during construction will prevent potentially harmful equipment fluid leaks and other pollutants from infiltrating into groundwater or reaching adjacent surface waters. Coordination with the Connecticut Department of Public Health (DPH) as well as with United Water CT, Inc. will remain open over the course of the project development process to ensure that all water quality and water supply concerns relative to the project are adequately addressed. In addition, because of its location within APAs, review of this construction by the CTDEEP Aquifer Protection Area Program will be required. These measures will ensure that groundwater quality is not impacted and that further impairment would not be caused by the project.

Structures and Bridges

Undergrade (UG) bridges (railroad goes over a road or water): There are six undergrade bridge replacements included with Alternative D: four carry the rail over roadways, and two carry the rail over water. All of the overhead bridge replacements would only be required with the electrification option and are reported under Bridge Raisings in the section on *Traction Power System – Electrification*.

The UG bridges over roadways include replacement bridges at MP 29.47, MP 29.9 (a farm pass that may be replaced or filled), and MP 33.07 in Brookfield, and MP 38.62 in New Milford. For these replacement UG bridges, construction is anticipated to occur from the rail ROW. There are no surface or groundwater resources within the footprint of the proposed work areas of any of these bridges thus there are no estimated direct impacts to these water resources. BMPs will be implemented and E&S controls maintained during construction to minimize temporary off-site sediment or contaminant loading impacts from stormwater runoff to nearby surface waters. As such, UG bridges over roadways are not anticipated to have direct impacts on water resources, and indirect construction period impacts will be effectively managed and minimized.

Two UG bridges carry the rail over the Still River, one at MP 26.6 in Danbury, and the other at MP 35.1 in New Milford. Impacts associated with these UG bridges are described in more detail below.

MP 26.6 over Still River: Preliminary design concepts for the bridge at MP 26.6 include a 2-span bridge with one pier that will be located in the water. The finished pier dimensions of 30 x 10 feet would result in a permanent open water and river bottom impact of 300 square feet (0.007 acres). Additional temporary impacts are expected during construction, associated with the installation of the pier. Use of flotation dams at the perimeter of in-water work areas and other appropriate water handling measures will be implemented to contain the work area and minimize turbidity and other temporary water quality impacts during construction.

On the land side, if the existing bridge abutments require repair, rehabilitation or replacement, there could be additional direct impacts and temporary indirect construction impacts to water resources at this crossing. These impacts would be minimized with proper E&S controls, construction phasing, and site stabilization measures. Construction staging adjacent to the bridge will be necessary but equipment and staging activities will be out of the water and located within 15 feet of the track centerline, coincident with the existing disturbed/maintained ROW. The existing 3-span bridge (to be replaced) will be removed; its two piers would likely be completely removed or cut off below the mud line (hence another activity with a potential to affect water quality). Once constructed, there would be no long-term water quality impacts anticipated from the bridge.

For this bridge location, or for any project construction activities in water for that matter, a Section 404 permit from the U.S. Army Corps of Engineers (USACE) and an Inland Wetlands and Watercourses Permit and Section 401 Water Quality Certificate from the DEP would be required at the very minimum. Depending on the location and nature of project construction activities, other water related permits may also be required, such as water company permits, CTDEP Flood Management Certification, General Construction Permits for the Discharge of Stormwater and Dewatering Wastewaters, and Coastal Permits (portions of Norwalk only). For this particular bridge over the Still River, dewatering will be required. Waters from dewatering during construction will be properly managed per DEP requirements as set forth in the General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities. Depending on the potential benefits from removing the existing piers, mitigation for the impacts to open water and/or river bottom may be required.

MP 35.1 over the Still River: This bridge is planned to be a single-span replacement bridge on existing alignment. Given the anticipated construction methodology for this type of bridge replacement (described under the UG bridges in Alternative C), direct or indirect impacts to surface waters or groundwater resources are anticipated to be negligible.

In addition to the UG bridges, there are a total of seven overhead bridge replacements associated with Alternative D. All of the overhead bridge replacements would only be required with the electrification option and are reported under Bridge Raisings in the section on *Traction Power System – Electrification*.

Traction Power System - Electrification

Electrification is an option under Alternative D, extending from approximately MP 23.9 in Danbury to MP 39 in New Milford. Facilities required for electrification include electrical substations and catenary and support structures. There are no RTUs included in this alternative. In addition, seven overhead bridges would need to be raised to provide enough clearance for the catenary wires to pass under them. This would not be necessary for the diesel (non-electrified) option of Alternative D.

Substations: Substations required as part of this alternative will occupy relatively small trackside areas and therefore will not introduce substantial areas of impervious surface or potential contaminants into a watershed. The substations at New Milford are to be located on previously disturbed ground or within the railroad ROW to avoid directly impacting surface and groundwater resources. Construction of these facilities will require minimal site disturbance and earthwork; therefore, the potential for sedimentation of nearby surface waters is low. The proposed location of the Brookfield substation is within a lightly vegetated strip adjacent to the disturbed rail ROW and surrounded by roadways and suburban development. No special risks associated with temporary construction impacts (i.e. increased sediment or contaminant inputs to surface waters) are evident. During design and construction of all of these substation facilities, appropriate erosion and sedimentation controls and site stabilization measures will be implemented to prevent harmful impacts on receiving waters. No groundwater resources are close by and no adverse impacts are expected.

Catenary and support structures: The construction methods and general potential for impacts from the catenary and support structures in Alternative D would be the same as described under Alternative C. Based on GIS analysis, no catenary poles will be located directly within a surface water resource and protective measures implemented during installation will prevent indirect impacts. As such, adverse impacts to water resources associated with the catenary structures are expected to be minimal and easily managed.

Bridge raisings: Three of the seven overhead (OH) bridges to be raised are on upland locations at least 500 feet away from surface and groundwater resources, at Danbury MP 24.33 and Danbury MP 26.2 (which has two parallel bridges). These bridge-raisings pose few risks of direct or indirect water quality impacts. Four bridges are close to mapped water resources, posing a risk of indirect impacts such as increased sediment or contaminant loading attributed to construction activities, as follow:

- The Silvermine Road Bridge in Brookfield (MP 30.2) is approximately 1,600 feet east of the Still River. Impacts to the river are anticipated to be minimal with appropriate implementation of erosion and sedimentation controls and effective site stabilization post-construction. The bridge is located approximately 100 feet northwest of a cluster of groundwater wells (GAA). No blasting or deep earth excavations are anticipated at this bridge, so potential impacts to groundwater from construction are likely to be substantially reduced. However, as the design progresses, special BMPs to protect groundwater will be evaluated and applied, as appropriate, to prevent groundwater contamination at this site. Coordination with the water company that owns these wells will also be enacted to ensure their concerns are adequately addressed. Special BMPs may consist of structural and non-structural controls. Examples of structural controls include:

    - Temporary sediment basins that are designed to allow time for sediments to settle and water to infiltrate the ground.
    - Berms -- barriers that are temporarily built to direct polluted runoff from entering storm drains and waterways.

- Entrance/Exit controls are used to stabilize construction entrances/exits to reduce the amount of soil removed from the construction site. Gravel is an example of a temporary control used to reduce "track-out" from the construction areas.

Non-structural controls would essentially involve increased standards for the following practices:

- Good housekeeping – Techniques including spill prevention, oil and fuel containment, designation of construction vehicle maintenance areas and road sweeping to remove soils, especially with areas of steep slopes.
- Site stabilization – Techniques include seeding, mulching, stone cover, sod application, as soon as possible to reduce the amount of exposed soil.
- Phased construction – Reducing the amount of exposed areas at one time and conducting work in dry seasons will help to mitigate for land clearing activities.

These types of structure and non-structural controls to protect surface and groundwater quality will be considered on a site-by-site basis for all sensitive project sites throughout the corridor for the project alternatives presented in this technical memorandum.

- The Route 25, Whisconier Road Bridge in Brookfield (MP 31.26) is upslope of the Still River and within 200 feet of the river bank. Temporary and permanent stormwater management, erosion and sedimentation control, and post-construction earth stabilization will be carefully designed, installed, and maintained to minimize adverse impacts to the river.
- The Pumpkin Hill Road Bridge (MP 33.9) in New Milford is within 500 feet of the Still River. Here, too, temporary and permanent stormwater management and E&S controls will be implemented to minimize adverse impacts to the river.
- The Erickson Road Bridge (MP 34.74) in New Milford is within 500 feet of the Still River. Bridge construction will require placement of fill on its west end in order to raise the bridge's vertical clearance over the railroad tracks. Temporary and permanent stormwater management, E&S controls, and site/slope stabilization measures will be carefully designed, installed, and maintained to minimize adverse impacts to the river.

Track Reconfigurations, Storage Sidings and Connections

There are five track curve reconfigurations included under Alternative D to improve rail operations and/or speed. Crossover connections within the existing Danbury Yard and at MP 26.96, approximately 2.6 miles north of Danbury Yard, are planned for operational improvements. One storage siding is included.

Track curve reconfigurations: The five track curve reconfigurations planned as part of Alternative D are not located directly adjacent to or within water resources. Any needed

excavations will be shallow and their area (square footage) will be limited to only what is appropriate to complete the construction activity. E&S controls will be established where work lies adjacent to downslope surface waters or wetlands. Also, construction at each site will be phased to minimize the total amount of exposed or disturbed earth on the site at any given time. Areas where construction has paused for an extended duration will be temporarily stabilized, and where construction areas completed will be permanently stabilized as soon as possible. Therefore, track curve reconfigurations included under Alternative D are anticipated to have minimal if any direct or indirect impacts on surface water or groundwater resources.

Replacement storage sidings: The one replacement storage siding planned near the Danbury/Brookfield town line at MP 27.24 to MP 27.58 would be located on level ground within a broad maintained railroad ROW. Its construction would not be expected to directly or indirectly impact surface water or groundwater resources.

Connections – Crossovers: The two crossover connections planned as part of Alternative D are not located within water resources. They would be located on level ground within maintained railroad ROW. The Still River through the Danbury Yard site (one of the connection locations) flows within an engineered channel outside of the conceptual disturbance area of the proposed connection in the Yard. The connection at MP 26.96 is not within or directly adjacent to water resources. No direct or indirect impacts to water resources are anticipated from these proposed connections.

Storage and Maintenance Yards

Construction of the planned storage and maintenance yard in New Milford would involve:

- eight new storage tracks with paved service aisles between every other track for maintenance and equipment access
- a paved access drive and parking
- approximately 3,000 square feet of paved outdoor storage
- a 3,000 SF building to house employee welfare facilities and indoor storage

The planned site is located on a nearly eight-acre facility, primarily on previously developed property of the old Brass Mill and is between electric transmission lines and the old mill building. However, a portion of the facility would require clearing and grading of undeveloped land with vegetative cover. The clearing will create temporary areas of exposed soils that could become eroded and cause sedimentation impacts to downstream receiving waters. The net increase of impervious surface associated with the proposed large paved areas and structures (rooftops) is approximately four acres. Potential adverse impacts will accrue from the increased quantity of runoff, increased contaminant loads in the runoff, and increased runoff velocity. Mitigation will be provided by the stormwater management plan which may include innovative stormwater management techniques such as pervious pavements, rain gardens, and other measures that may be found to be appropriate. Temporary and permanent stormwater management systems will be designed to collect, treat, and slowly discharge runoff. These measures will minimize adverse impacts on the quality of receiving waters.

Yard operations can be a source of surface and groundwater contamination due to leaking and/or dripping oil and hazardous materials (OHMs) as the locomotive and trains sit overnight. Maintenance activities planned at this yard include interior car cleaning, toilet dumping, and minor mechanical actions such as brake shoe replacement. There will be no fueling of trains at this yard, so the potential for fuel leaks and spills is low. Many of the potential water quality impacts can be prevented with properly installed and maintained BMPs and stormwater collection and treatment measures. Typical BMPs include the use of diesel engine track pans to collect liquids and oil-water separators to treat discharges.

Alternative E - Improvements from South Norwalk to Wilton

Alternative E is being considered at the direction of the State of Connecticut's Transportation Strategy Board. It would provide partial electrification of the Danbury Branch, from South Norwalk to Wilton, a distance of 7.5 miles. Parking and access improvements would be made at Merritt 7 station, and there would be minor modifications to track and structures along this section.

Alternative E would involve improvements at the Merritt 7 Station, track curve reconfigurations, and bridge improvements from MP 0 to MP 7.5, and partial electrification of the Danbury Branch from approximately MP 1.1 to MP 7.5. Impacts from this alternative are therefore a subset of the impacts of Alternative C.

Passenger Stations (Existing Station Upgrades)

The Merritt 7 Station in Norwalk would be the only improved station under this alternative. As described under Alternative C, runoff quantity and runoff volume at the site after the station improvements would be similar to existing conditions. However, the additional parking lot will accommodate increased vehicular use and thus result in higher contaminant loads in runoff. The stormwater management system design would incorporate techniques to remove and treat suspended sediment and other pollutants; E&S control measures will be implemented throughout the construction period to minimize construction–related off-site impacts to the Norwalk River. Refer to Alternative C for a description of the potential impacts to groundwater and to the Level "A" Kellogg- Deering wellfield from the proposed station improvements.

Structures and Bridges

There are undergrade bridges but no overhead bridge replacements included with Alternative E.

> **Undergrade (UG) bridges (railroad goes over a road or water):** There would be three UG bridge replacements over roadways and four UG bridges over waters in Alternative E. The UG bridges over roadways include a new bridge at MP 0 in Norwalk over Washington and South Main Streets and two replacement bridges at Norwalk MP 0.1 and Norwalk MP 0.2. Construction work for the UG bridges over roadways is anticipated to occur from the roadways and their ROWs. Appropriate BMPs including E&S controls will be implemented and maintained during construction to prevent disruption of off-site waters. Drainage upgrades will be incorporated into the bridge designs. As such, the UG

bridges over roadways are not anticipated to have substantive direct or indirect impacts on surface or groundwater resources.

Four replacement bridges carry the rail line over water. Two of the bridges over water are replacement bridges on existing alignment: Norwalk (MP 5.12) over a tributary to the Norwalk River; and Norwalk (MP 6.43) over the Norwalk River. Potential impacts to surface and groundwater from these bridge replacements are anticipated to be minor or negligible as long as the existing bridge abutments can be used, as described under Alternative C. The other two bridges over water are slightly or totally off of existing alignment. These two bridges (at MP 3.2 over the Norwalk River and MP 6.64 over the Norwalk River) have greater potential for impacts; however, proper design and use of E&S controls and other BMPs during construction will minimize potential impacts to the greatest extent possible. Detailed discussion of impacts at these bridges appears under Alternative C.

Traction Power System - Electrification

Substations and remote terminal units (RTUs): There is one substation (Wilton) and one RTU (Norwalk RTU) proposed by Alternative E. (Note: the Norwalk substation under Alternative C is not included in this alternative). Both of these facilities are located on previously disturbed (currently paved) ground. Construction of these facilities will require minimal excavation and soil disturbance, and E&S controls will be implemented. Therefore, the potential for sedimentation of nearby surface waters is low. There are no groundwater resources in close proximity to these facilities. Adverse impacts to surface or groundwater resources are therefore expected to be negligible.

Catenary and support structures: Based on GIS analysis, no catenary poles will be located directly within a water resource as part of Alternative E. Given the anticipated construction methodology discussed under Alternative C, direct and indirect impacts to surface and groundwater quality associated with construction of the catenary for Alternative E are anticipated to be minimal.

Track Reconfigurations, Sidings and Connections

Track curve reconfigurations: Alternative E includes the same track realignments as Alternative C from MP 0 to MP 7.5. There are no realignments which are anticipated to impact surface or groundwater resources.

Additional branch connection at CP 241: The construction of the additional branch connection at CP 241 from MP 0 to MP 0.3 in Norwalk would occur within previously disturbed rail ROW and on acquired property with existing buildings and parking areas. Its construction will not directly or indirectly impact surface water or groundwater resources.

Structures and Bridges

There are undergrade bridges but no overhead bridge replacements included with Alternative E.

> **Undergrade (UG) bridges (railroad goes over a road or water):** There would be three UG bridge replacements over roadways and four UG bridges over waters in Alternative E. The UG bridges over roadways include a new bridge at MP 0 in Norwalk over Washington and South Main Streets and two replacement bridges at Norwalk MP 0.1 and Norwalk MP 0.2. Construction work for the UG bridges over roadways is anticipated to occur from the roadways and their ROWs. Appropriate BMPs including E&S controls will be implemented and maintained during construction to prevent disruption of off-site waters. Drainage upgrades will be incorporated into the bridge designs. As such, the UG bridges over roadways are not anticipated to have any substantive direct or indirect impacts on surface or groundwater resources.
>
> Four replacement bridges carry the rail line over water. Two of the bridges over water are replacement bridges on existing alignment: Norwalk (MP 5.12) over a tributary to the Norwalk River and Norwalk (MP 6.43) over the Norwalk River. Potential impacts to surface and groundwater from these bridge replacements are described under Alternative C. The other two bridges over water are slightly or totally off of existing alignment. Detailed discussion of impacts at these bridges appears under Alternative C.

MITIGATION

Best Management Practices (BMPs) will be applied to all construction activities associated with the recommended projects within the Danbury Branch Improvement Program.

A summary of impacts described in this technical memorandum is the following: Permanent direct impacts to water resources would result from the filling of Umpawaug Pond for track Curve 15B under Alternative C (approximately 3,500 square feet) and the installation of a pier in the Still River for the replacement of Danbury Bridge MP 26.6 under Alternative D (approximately 300 square feet). Impacts to water quality from project construction, however, are expected to be minimal and will be greatly reduced with the proper implementation and maintenance of E&S controls, construction phasing, and effective site stabilization measures.

The two projects noted above and any other improvements with work in the water (e.g., river, stream, lake or pond) would require (at minimum) an Inland Wetlands and Watercourses Permit from CTDEEP. Depending on the location and size of the construction site and fill area, projects with work in water may also require a Section 404 permit from the U.S. Army Corps of Engineers (USACE) and a Section 401 Water Quality Certificate from the CTDEEP. Refer to the Wetlands impact report for additional details about mitigating for the loss of open water habitat and shoreline mentioned above.

Mitigation for adverse impacts due to increased impervious surfaces from parking lot expansions at all the stations (upgrades and new) and at the planned New Milford Maintenance Yard would primarily take the form of stormwater management improvements. According to federal statutes,

any improvements to existing transportation facilities require improvements to the drainage systems of these facilities. The types of drainage improvements will vary, depending on the size of the facility expansion or upgrade, the quality of the receiving water, and other factors. Essentially, drainage features will be designed for each station site to account for the specific conditions on each site. Primary stormwater treatment measures will be provided wherever possible. Potential drainage improvements could include, but not be limited to: new or additional deep-sump catch basins; vegetated water quality swales or ditches; stormwater detention or retention basin; improved erosion control measures at discharge points; and buffer strips or infiltration strips. Innovative low-impact development (LID) measures such as pervious pavements, rain gardens, and other measures will also be considered for implementation on a site-by-site basis as the design of the project advances. Stormwater management design will be consistent with the CTDOT Drainage Manual and the 2004 *Connecticut Stormwater Quality Manual*.

For the improvements within mapped APAs or within several hundred feet of groundwater wells with no mapped APA, coordination with water companies will be conducted to address any of their concerns. For improvements within an APA, review of the proposed construction by the CTDEEP Aquifer Protection Area Program will be required.

For construction of any individual or collective improvements that will disturb more than one acre of land and those involving dewatering, submission of a General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (Stormwater General Permit for Construction Activities) to DEP will be required. A Stormwater Pollution Prevention Plan (SWPPP) will be implemented on the active construction sites at all times. Based on conceptual engineering, this General Permit will apply to all of the station sites individually (upgrades and new stations), the CP 241 track reconfiguration (Alternative C and E), and the New Milford Yard in Alternative D. If cumulative ground disturbance will be 10 acres or greater, the SWPPP will need to be submitted to CTDEEP for review and approval. None of the individual improvements proposed in any of the alternatives is currently estimated to be 10 acres or more in size and each improvement has independent utility. However, if several improvements were under construction at the same time and their total ground disturbance were 10 acres or more, this regulation would apply.

Table 1: Alternative C Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Existing Stations (Upgrades)						
Merritt 7	Norwalk	3.6	3.6	New 200-space parking lot on new property w. of Glover Ave; pedestrian bridge over tracks from new parking to platform; replace low-level platform with high-level platform; new canopy, ramps, bike lockers.	Norwalk River - 500 feet south	Kellogg-Deering Wellfield APA #106 - 1,090 feet south
Cannondale	Wilton	8.85	8.85	Extend high-level platform; expand parking lot by 50 spaces to a total of 190; provide bike lockers.	Norwalk River - 250 feet south	Over 1/2 mile away from APA, GAA Well located approximately 250 feet southwest
Branchville	Ridgefield	12.65	12.65	Revise access to parking by relocating Portland Ave to south on new bridge over Norwalk River; reconstruct Depot Rd with new bridge over river (eliminates at-grade xing); expand parking to south and acquire property for addit parking across river along Rt 7. Pedestrian bridge over river from new parking to station. Provide bike lockers.	Norwalk River - within 50 feet to the west	Over 1/2 mile away
Redding	Redding	17.1	17.1	Concept plan shows expanded parking lot by 100 spaces for total 180 spaces; reconfigure drop-off area; provide bike lockers. If parking is scaled back by removing one row on south side, 75 added spaces are provided rather than 100 (adequate for demand) - Impacts are based on 75 added spaces. No platform work.	Hawley Pond Brook - within 100 feet of the site to the northeast & Saugatuck River - within 100 feet of the site to the southwest	Over 1/2 mile away
Bethel	Bethel	21	21	Expand parking lot by 160 for total 350 spaces; provide bike lockers. No platform work.	Sympaug Brook - 900 feet west	Over 1/2 mile away
Undergrade Bridges (Rail goes over Road or Water)						
Washington & South Main St.	Norwalk	0.0	0.0	New (additional) single track truss bridge 240' span on added parallel track alignment. Includes concrete retaining walls on spread footings. Form liners used to simulate stone blocks on face of concrete walls.	Norwalk River - 550 feet east	Over 1/2 mile away
Marshall St.	Norwalk	0.1	0.1	Replace historic bridge with 120' span ballast deck structure on existing alignment and raise to provide clearance.	Norwalk River - 950 feet east	Over 1/2 mile away
Ann St.	Norwalk	0.2	0.2	Replace with 57' long span ballast deck structure on existing alignment.	Norwalk River - 950 feet east	Over 1/2 mile away
Norwalk River	Norwalk	3.2	3.2	New 160' long ballast deck span bridge on totally new alignment of Curves 3A and 3B. Bridge ends skewed and alignment nearly parallel to the river to minimize impacts. No work in river channel.	Over the Norwalk River	Kellogg-Deering Wellfield APA #106 - surrounds bridge, 3,000 feet northeast of APA wells
Small stream	Norwalk	5.12	5.12	Replace 15' span ballast deck on existing alignment.	Over a tributary to the Norwalk River	Over 1/2 mile away
Small stream	Norwalk	6.43	6.43	Replace 40' long span ballast deck on existing alignment.	Over the Norwalk River	Over 1/2 mile away
Norwalk River	Wilton	6.64	6.64	Replace with ballast deck type, 65' span structure on revised alignment of Curve 6B. North side of span on existing alignment; south side offset 3' easterly from existing alignment. Temporary impacts for 50'x100' construction staging/laydown to be located near bridge.	Over the Norwalk River	Over 1/2 mile away

Table 1: Alternative C Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Norwalk River	Wilton	8.7	8.7	Replace with ballast deck type, 86' span structure on existing alignment.	Over the Norwalk River	Over 1/2 mile away from APA, GAA Well located approximately 250 feet southwest
Norwalk River	Wilton	9.42	9.42	Replace with ballast deck type, 86' span structure on existing alignment.	Over the Norwalk River	Over 1/2 mile away
Old Mill Rd.	Wilton	11.01	11.01	Replace with ballast deck type, 32' span structure on existing realignment.	Norwalk River - 250 feet west	Over 1/2 mile away
Norwalk River	Wilton	11.55	11.55	Replace with ballast deck type, 161' single-span structure on existing alignment. No new structures (no piers) in water but two existing piers at this crossing would be removed or cut below water line.	Over the Norwalk River	Over 1/2 mile away
Factory Pond	Wilton	12.17	12.17	Replace with ballast deck type, 49' span structure on existing alignment.	Over Factory Pond	Over 1/2 mile away
Old Redding Rd.	Redding	14.16	14.16	Replace with ballast deck type, 28' span structure on existing alignment.	Unnamed pond - within 100 feet to the northwest	Over 1/2 mile away
Simpaug Tpke.	Redding	14.8	14.8	Replace with ballast deck type, 60' span structure on Curve 14B (realignment). Curve 14B located up to 14' west of existing centerline.	Over a tributary of the Norwalk River	Over 1/2 mile away
Umpawaug Pond Brook	Redding	16.4	16.4	Replace with ballast deck type, 49' span structure on existing alignment.	Over Umpawaug Pond Brook	Over 1/2 mile away
Saugatuck River	Redding	17.1	17.1	Replace with ballast deck type, 41' span structure on existing alignment.	Over the Saugatuck River	Over 1/2 mile away
Grassy Plains Rd. (Rt. 53)	Bethel	19.64	19.64	Replace with ballast deck type, 29' span structure on existing alignment.	Sympaug Brook - within 100 feet to the north	Over 1/2 mile away
Sympaug Brook	Bethel	21.4	21.4	Replace with ballast deck type, 22' span structure on existing alignment.	Over Sympaug Brook	Unnamed APA - 1500' east
Overhead Bridges (Rail goes under Road)						
Route 7	Wilton	7.87	7.87	Replace with longer span 50' structure to accommodate track realignment Curve 7E.	Norwalk River - within 50 feet to the west	Over 1/2 mile away

Table 1: Alternative C Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Traction Power System - Electrification						
Catenary and support structures	Norwalk to Danbury	1.1	23.9	New catenary poles located within 12 feet of track centerline; existing poles removed along corridor.	Catenary goes over all rivers; poles closest at Umpawaug Pond Brook - 5 feet away near MP 15.7	Within mapped APAs in Norwalk (MP2.5-3.2) and Danbury (MP23-23.9); nearest well 700 feet (GAA well - Cannondale)
RTU (CP401)	Norwalk	0.63	0.63	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Norwalk River - 950 feet northeast	Over 1/2 mile away
Substation (SUB-41D)	Norwalk	1.62	1.62	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Norwalk River - 180 feet southwest	Over 1/2 mile away
Substation (SUB-170D)	Wilton	7.25	7.25	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Norwalk River - 250 feet southwest	Over 1/2 mile away
Substation (SUB-305D)	Ridgefield	13	13	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Norwalk River - 175 feet west	Over 1/2 mile away
Substation (SUB-RED)	Redding	17.2	17.2	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Hawley Pond Brook - within 100 feet of the site to the northeast	Over 1/2 mile away
RTU (CP421)	Bethel	20.22	20.22	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Sympaug Brook - 1,250 feet west	Over 1/2 mile away
Substation (SUB-560D)	Danbury	23.3	23.3	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Still River - within 100 feet	Site within Osborne Street APA #73; APA well located 2,250 feet northeast
Track Reconfigurations						
CP 241	Norwalk	0	0.3	New parallel 2nd track and extension of existing Norwalk passing siding in urban developed setting. Requires property acquisitions on North Main Street.	Norwalk River - 1250 feet east	Over 1/2 mile away
Curves 0E, 1A & 1B	Norwalk	1	1.7	Major realignment of track to west away from Norwalk River. Property acquisitions.	Norwalk River - 240 feet east	Over 1/2 mile away
Curves 2B, 3A, 3B & 3C (incl. Bridge MP 3.2)	Norwalk	2.7	4	Curve 2B is offset only 2'. 3A & 3B have large off-sets (new alignments assoc with Bridge 3.2).	Norwalk River - 100 feet east	Kellogg-Deering Wellfield APA #106 - 1500 feet southeast
Curve 3D	Norwalk	3.82	3.96	Curve 3D is offset by 4' from existing centerline.	Norwalk River - 250 feet east	Kellogg-Deering Wellfield APA #106 - surrounds track
Curve 4C	Wilton	4.8	4.97	Curve 4C is offset by 6' from existing centerline.	Copts Brook - 250 feet east	Over 1/2 mile away
Curve 5	Wilton	5.75	5.83	Curve shift is only 1' - no work outside disturbed ROW	Norwalk River - 600 feet east	Over 1/2 mile away
Curve 6A	Wilton	6.07	6.24	Curve shift is only 2' - no work outside disturbed ROW	Norwalk River - 100 feet east	Over 1/2 mile away
Curve 6B (incl. Bridge MP 6.64)	Wilton	6.53	6.68	Curve shift for Curve 6B is 3' - includes replacement Bridge 6.64 on this curve.	Norwalk River from 0 - 200 feet west	Over 1/2 mile away
Curves 7E & 8	Wilton	7.71	8.47	7E curve shift is 8' off centerline. Curve 8 is only 1' shift.	Norwalk River - between 100 feet and 740 feet east & an unnamed pond - within 100 feet to the west	Over 1/2 mile away from APA, GAA Well located approximately 1,500 feet northwest

Table 1: Alternative C Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Curve 9C	Wilton	9.53	9.84	Curve 9C has shift up to 42' west of existing track (ROW acquisition).	Norwalk River - 200 feet west	Over 1/2 mile away
Curves 10B & 11A	Wilton	11	11.47	Shifts up to 25' off existing - ROW required. Curve 11A includes retaining wall to minimize encroachment on forested floodplain of Norwalk River.	Norwalk River - between 100 feet and 200 feet west	Over 1/2 mile away
Curve 12A	Wilton	12.21	12.33	Curve 12 A shift is 12' to the east.	Norwalk River - 400 feet west	Over 1/2 mile away
Curve 12B	Wilton/ Ridgefield	12.42	12.57	12B max curve shift is 8' off centerline to East.	Norwalk River - within 100 feet to the west	Over 1/2 mile away
Curve 13B	Redding	13.25	13.4	13B max curve shift is 12' off centerline to East. Includes retaining wall to minimize excavation of abutting slope and keep work within existing ROW.	Norwalk River - 100 feet west	Over 1/2 mile away
Curve 13C	Redding	13.46	13.59	13C max curve shift is 8' off centerline to West.	Over a tributary of the Norwalk River	Over 1/2 mile away
Curve 13D	Redding	13.63	13.7	Curve shift is only 1' - no work outside disturbed ROW	Norwalk River - 375 feet west	Over 1/2 mile away
Curve 14A	Redding	13.97	14.1	Curve 14 A shift is 13' to the east.Includes retaining wall to minimize excavation of abutting slope and keep work within existing ROW.	Unnamed pond - 500 feet northwest	Over 1/2 mile away
Curves 14B, 14C, 14D & 15A	Redding	14.24	15.14	14B shifts 13' to the west; 14C is 36' west and includes retaining wall to avoid parallel private drive and keep work within existing ROW. 14D is 14' east with new bridge over Simpaug Tpk. Curve 15A shift is 2'.	Over a tributary of the Norwalk River	Over 1/2 mile away
Curves 15B & 15C	Redding	15.26	15.77	15B shifts 14' to West; 15C shifts 23' to East.	Umpawaug Pond - within 100 feet to the east	Over 1/2 mile away
Curves 16A & 16B	Redding	16.58	16.89	16A shifts 22' to East. 16B is less than 1'.	Unnamed pond - 375 feet southwest	Over 1/2 mile away
Curve 17A	Redding	17.25	17.45	17A shifts 6' to West.	Bogus Mountain Brook - 950 feet northeast	Over 1/2 mile away
Curve 17B	Redding	17.57	17.72	17B shifts 11' to East.	Bogus Mountain Brook - 400 feet southwest	Over 1/2 mile away
Curve 17C	Redding	17.83	18.01	17C shifts 15' to West	Bell Pond - 650 feet southeast	Over 1/2 mile away
Curve 19A	Bethel	19.07	19.18	19A shifts 4' West	Sympaug Pond - within 100 feet to the east	Over 1/2 mile away
Rail Storage and Maintenance						
Danbury Yard	Danbury	23	24	Realign existing and add tracks to provide 8 storage tracks with paved service aisles between every other track; 3,000 SF single-story building; 3,000 SF outdoor storage. Property acquisition required within existing urban setting.	Still River - within 100 feet to the west	Site within Osborne Street APA #73; APA well is 1,600 feet northeast
TOTAL						

Table 2: Alternative D Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Rail Reconstruction						
Reconstruct Track	Danbury to New Milford	23.9	39.16	Replace existing tracks with higher grade of rail on new ties. Work accomplished by rail-mounted equipment within existing gravel/ballast ROW.	Still River in New Milford - 15 feet away near MP 35	Within mapped APAs in Danbury (MP23.9-24.5) and New Milford (MP37.3-39); nearest well 20 feet (GAA well - Brookfield)
Proposed Stations						
Brookfield Station	Brookfield	31.5	31.5	New 300' long high level platform with canopy, shelter, ramps, bike lockers; 100-space parking lot and drop-off area; sidewalk from staton to Rt 202 on north side of Rt 25. Property acquisition required.	Still River - 200 feet west	Over 1/2 mile away
Brookfield Passing Siding at Station	Brookfield	31.46	31.96	Parallel siding for overwidth freight to be located east of the commuter rail track at the new station.	Still River - 200 feet west	Over 1/2 mile away
New Milford Station	New Milford	38.35	38.35	New 300' long high level platform with canopy, shelter, ramps, bike lockers; 110-space parking lot and drop-off area. Property acquisition required.	Housatonic River - 750 feet west	Site within 2 APAs (Indian Field APA #103 and Fort Hill Road APA #104); 3 GAA wells 1,750 feet to southwest
New Milford Passing Siding at Station	New Milford	38.0	38.46	Parallel siding for overwidth freight to be located west of the commuter rail track at the new station.	Housatonic River - 750 feet west	Site within 2 APAs (Indian Field APA #103 and Fort Hill Road APA #104); 3 GAA wells 1,750 feet to southwest
Undergrade Bridges (Rail goes over Road or Water)						
Still River	Danbury	26.6	26.6	Replace with 207' two-span ballast deck on existing alignment. One new pier of approximately 30' x10' in Still River. Existing two piers to be removed or cut below water line.	Over the Still River	Over 1/2 mile away
Junction Rd. (Rt. 133)	Brookfield	29.47	29.47	Replace with 45' single span ballast deck on existing alignment.	Tributary of the Still River - 950 feet northeast	Cluster of six GAA wells - 700 feet northeast
Farm Pass	Brookfield	29.9	29.9	Replace or fill (close bridge).	Tributary of the Still River - 130 feet southeast	Cluster of six GAA wells - 2,000 feet northeast
Old Middle Rd.	Brookfield	33.07	33.07	Replace with 33' single span ballast deck on existing alignment.	Still River - 600 feet northwest	Over 1/2 mile away
Still River	New Milford	35.1	35.1	Replace with 102' single span ballast deck on existing alignment.	Over the Still River	Over 1/2 mile away
Housatonic Ave.	New Milford	38.62	38.62	Replace with 39' single span ballast deck on existing alignment.	Housatonic River - 650 feet south	Site within 2 APAs (Indian Field APA #103 and Fort Hill Road APA #104); 3 GAA wells 1,350 feet to southwest

Table 2: Alternative D Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Traction Power System - Electrification						
Catenary and support structures	Danbury to New Milford	23.9	39.0 +/-	New catenary poles located within 12 feet of track centerline; existing poles removed along corridor.	Catenary goes over all rivers; closest pole near Still River in New Milford (MP35) - 15 feet away	Within mapped APAs in Danbury (MP23.9-24.5) and New Milford (MP37.3-39); nearest well 20 feet (GAA well - Brookfield)
Raise Bridge - White St.	Danbury	24.33	24.33	Replace with 49' single-span multi-girder bridge on existing alignment to allow greater vertical clearance.	Still River - 1,800 feet east	Osborne Street APA #73 is 350 feet west
Raise Bridge - I-84	Danbury	26.2	26.2	Replace existing I-84 Eastbound bridge to provide clearance for catenary; 292' five-span steel multigirder bridge.	Beaver Brook - 750 feet west	Over 1/2 mile away
Raise Bridge - I-84	Danbury	26.2	26.2	Replace existing I-84 Westbound bridge to provide clearance for catenary; 292' five-span steel multigirder bridge.	Beaver Brook - 750 feet west	Over 1/2 mile away
Substation (SUB-BRK)	Brookfield	29.5	29.5	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Tributary of the Still River - 900 feet northeast	Cluster of six GAA wells - 600 feet northeast
Raise Bridge - Silvermine Rd.	Brookfield	30.2	30.2	Raise to provide vertical clearance for catenary.	Still River - 1,600 feet west	Cluster of GAA wells - 100 feet southeast
Raise Bridge - Whisconier Rd. (Rt. 25)	Brookfield	31.26	31.26	Raise to provide vertical clearance for catenary.	Still River - 200 feet northwest	Over 1/2 mile away
Raise Bridge - Old Pumpkin Hill Rd.	New Milford	33.9	33.9	Raise to provide vertical clearance for catenary.	Still River - 560 feet west	Over 1/2 mile away
Raise Bridge - Erickson Rd.	New Milford	34.74	34.74	Raise to provide vertical clearance for catenary.	Still River - 375 feet west	GAA well located approximately 2,200 feet northwest
Substation	New Milford	39.0 +/-	39.0 +/-	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	West Aspetuck River - 1,125 feet north	Unnamed APA surrounds site
Track Reconfigurations						
Curve 1A	Brookfield	28.22	28.43	Curve 1A shifts track 16' to West	Unnamed pond - 250 feet southwest	Over 1/2 mile away
Curve 1B	Brookfield	28.72	28.82	Curve shift is only 2' to the West	Still River - 950 feet southwest	Cluster of GAA wells - 1,550 feet southeast
Curve 6A	New Milford	33.2	33.35	Curve 6A shifts track 3' to the West	Still River - 60 feet west	Over 1/2 mile away
Curve 8A	New Milford	33.53	35.6	Curve shift is only 1' to the East	Still River - 350 feet southwest	GAA well - 1,300 feet southwest
Curve 9A	New Milford	35.96	36.12	Curve shift is less than 1'	Housatonic River - wihtin 100 feet	Over 1/2 mile away
Storage Sidings						
Storage Siding	Danbury/ Brookfield	27.24	27.58	Parallel storage siding east of existing track, within large railroad ROW.	Still River - 1,000 feet northwest	Over 1/2 mile away
Rail Storage and Maintenance						
New Milford Yard	New Milford	39.0 +/-	39.0 +/-	8 storage tracks with paved service aisles between every other track; 3,000 SF single-story building; 3,000 SF outdoor storage. Property acquisition required of prior industrial property.	West Aspetuck River - 175 feet north	Unnamed APA - surrounds site

Table 3: Alternative E Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Existing Stations (Upgrades)						
Merritt 7	Norwalk	3.6	3.6	New 200-space parking lot on new property w. of Glover Ave; pedestrian bridge over tracks from new parking to platform; replace low-level platform with high-level platform; new canopy, ramps, bike lockers.	Norwalk River - 500 feet south	Kellogg-Deering Wellfield APA #106 is 1,090 feet south
Undergrade Bridges (Rail goes over Road or Water)						
Washington & South Main St.	Norwalk	0.0	0.0	New (additional) single track truss bridge 240' span on added parallel track alignment. Includes concrete retaining walls on spread footings. Form liners used to simulate stone blocks on face of concrete walls.	Norwalk River - 550 feet east	Over 1/2 mile away
Marshall St.	Norwalk	0.1	0.1	Replace historic bridge with 120' span ballast deck structure on existing alignment and raise to provide clearance.	Norwalk River - 950 feet east	Over 1/2 mile away
Ann St.	Norwalk	0.2	0.2	Replace with 57' long span ballast deck structure on existing alignment.	Norwalk River - 950 feet east	Over 1/2 mile away
Norwalk River	Norwalk	3.2	3.2	New 160' long ballast deck span bridge on totally new alignment of Curves 3A and 3B. Bridge ends skewed and alignment nearly parallel to the river to minimize impacts. No work in river channel.	Over the Norwalk River	Site within Kellogg-Deering Wellfield APA #106; 3,000 feet northeast of APA wells
Small stream	Norwalk	5.12	5.12	Replace 15' span ballast deck on existing alignment.	Over a tributary to the Norwalk River	Over 1/2 mile away
Small stream	Norwalk	6.43	6.43	Replace 40' long span ballast deck on existing alignment.	Over the Norwalk River	Over 1/2 mile away
Norwalk River	Wilton	6.64	6.64	Replace with ballast deck type, 65' span structure on revised alignment of Curve 6B. North side of span on existing alignment; south side offset 3' easterly from existing alignment. Temporary impacts for 50'x100' construction staging/laydown to be located near bridge.	Over the Norwalk River	Over 1/2 mile away
Traction Power System - Electrification						
Catenary and support structures	Norwalk to Danbury	1.1	7.5	New catenary poles located within 12 feet of track centerline; existing poles removed along corridor.	Catenary goes over all rivers; poles closest at Norwalk River - 20 feet away near MP 3.1	Within mapped APA in Norwalk (MP2.5-3.2); nearest well 2,000 feet (APA well - Norwalk)
RTU (CP401)	Norwalk	0.63	0.63	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Norwalk River - 950 feet northeast	Over 1/2 mile away
Substation (SUB-170D)	Wilton	7.25	7.25	New facility (metal enclosure on concrete walls or columns) surrounded by crushed stone.	Norwalk River - 180 feet southwest	Over 1/2 mile away

Table 3: Alternative E Impacts to Surface and Groundwater Resources

Improvement Type	Location	Study Milepost (MP)		Work Description	Nearest Surface Water	Nearest Aquifer Protection Area (APA)
		From	To			
Track Reconfigurations						
CP 241	Norwalk	0	0.3	New parallel 2nd track and extension of existing Norwalk passing siding in urban developed setting. Requires property acquisitions on North Main Street. No impacts to adjacent undisturbed areas.	Norwalk River - 1250 feet east	Over 1/2 mile away
Curves 0E, 1A & 1B	Norwalk	1	1.7	Major realignment of track to west away from Norwalk River. Property acquisitions.	Norwalk River - 240 feet east	Over 1/2 mile away
Curves 2B, 3A, 3B & 3C (incl. Bridge MP 3.2)	Norwalk	2.7	4	Curve 2B is offset only 2'. 3A & 3B have large off-sets (new alignments assoc with Bridge 3.2)	Norwalk River - 100 feet east	Kellogg-Deering Wellfield APA #106 is 1,500 feet southeast
Curve 3D	Norwalk	3.82	3.96	Curve 3D is offset by 4' from existing centerline.	Norwalk River - 250 feet east	Kellogg-Deering Wellfield APA #106 surrounds track
Curve 4C	Wilton	4.8	4.97	Curve 4C is offset by 6' from existing centerline.	Copts Brook - 250 feet east	Over 1/2 mile away
Curve 5	Wilton	5.75	5.83	Curve shift is only 1' - no work outside disturbed ROW	Norwalk River - 600 feet east	Over 1/2 mile away
Curve 6A	Wilton	6.07	6.24	Curve shift is only 2' - no work outside disturbed ROW	Norwalk River - 100 feet east	Over 1/2 mile away
Curve 6B (incl. Bridge MP 6.64)	Wilton	6.53	6.68	Curve shift for Curve 6B is 3' - includes replacement Bridge 6.64 on this curve.	Norwalk River - 200 feet west	Over 1/2 mile away
TOTAL						