

## ***5.0 ENVIRONMENTAL ISSUES***

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This chapter provides an update on the environmental impacts associated with the Hamilton Canal District Project.

### **5.1 MASSACHUSETTS CONTINGENCY PLAN**

The Project contains the location of multiple Massachusetts Contingency Plan (MCP) release tracking numbers (RTNs). The MCP sites noted at 291 Jackson Street (RTN 3-26423) and 307 Jackson Street (3-26424) have been assigned a single Special Project Designation associated with RTN 3-0027420 and are associated with the development of the Hamilton Canal District. In addition, 221 Jackson Street (RTN 3-25687) and 307 Jackson Street (3-26095) are Tier 2/Phase II sites within the project. The City of Lowell is expected to complete MCP response actions resulting in Response Action Outcomes (RAO) for 221 Jackson Street and 291 Jackson Street prior to transfer of parcels to the proponent. The MCP sites noted at 351 Jackson Street (RTN 26421), 6 King Street (RTN 3-26844), 379 Middlesex street (RTN 3-26426) and 389 Middlesex Street (3-26425) have been assigned a single Special Project Designation associated with RTN 3-0027400 and are associated with the development of the New Lowell Trial Court. As such, the response actions are not included as part of this filing. The Commonwealth of Massachusetts Division of Capital Asset Management (DCAM) is the lead agency for this area.

A notice of project delay for the Phase II and Phase III submittals for the MCP site noted at 221 Jackson Street (RTN 3-25687) was submitted to DEP on behalf of the City on February 2, 2009. A Release Abatement Measure (RAM) had been initiated and was intended to result in RAO by the due date of February 26, 2009. Weather conditions resulted in a delay and the City's intention is to complete a Response Action Outcome by October 2009. For the MCP site at 291 Jackson, the City intends to complete a RAO by January 2010.

For the MCP site noted at 307 Jackson Street (3-26095), the proponent, an eligible person, intends to seek to reestablish the deadline for response actions by submitting a Tier II Classification Submittal by the due date of July 31, 2009, in accordance with the requirements of the MCP (310 CMR 40.0570).

Consistent with the "Brownfields Act" of 1998 and as an "eligible person" as defined by the "Brownfields Act," the proponent expects to complete response actions to address soil contamination and potential ongoing sources of groundwater or surface water contamination within the property boundaries of 307 Jackson Street in accordance with MCP standards. In accordance with these requirements, the proponent will address and

assess the potential for contaminant migration to the surface water and sediment in the abutting canals via groundwater and/or runoff from on-site sources.

Assessment and response actions will be conducted in accordance with the MCP. The proponent will comply with existing Activity and Use Limitations and/or with the requirements for RAMs found at 310 CMR 40.0442(3) and DEP guidance regarding construction of structures and utility corridors that could impede future response actions, as appropriate. The proponent expects that preconstruction activities will achieve the substantive technical standards for comprehensive response actions and risk characterization found in the MCP and include site assessment, risk characterization, feasibility evaluation, reduction of concentrations to below Upper Concentration Limits, source control, and other remedial actions as appropriate to achieve a condition of No Significant Risk.

The proponent will conduct response actions such as excavation and handling of contaminated soil, dewatering, or mitigation of vapor intrusion, at MCP disposal sites per the requirements of a RAM plan prepared in accordance with the MCP, as well as any existing Activity and Use Limitations which have been implemented to date during completion of MCP response actions. In addition, a site specific soil management plan will be prepared to address appropriate location-specific disposal and treatment of soil based on soil testing results. The RAM plan would address known contamination, worker exposure during excavation, and dust monitoring and action levels for applying dust suppression.

## **5.2 ASSESSMENT OF INDOOR AIR QUALITY**

The project includes multiple disposal sites that have been reported to DEP under the requirements of the MCP and have received Release Tracking Numbers (RTNs). Within the project site, disposal sites located at 221 Jackson Street, 291 Jackson Street, and 307 Jackson Street have been identified as having chlorinated or petroleum-related volatile organic compounds. Based on observed depths to groundwater in the project area of 2.5 to 13.0 foot depths and the existing or proposed depths of structures that may include underground space, there is a potential for impacts to indoor air quality in existing or proposed new buildings if controls are not used. There is not sufficient information at this time to quantify the potential for indoor air impacts to existing or proposed building structures.

As noted above, the City of Lowell is expected to complete MCP response actions resulting in Response Action Outcomes (RAO) for 221 Jackson Street and 291 Jackson Street, prior to transfer of parcels to the proponent. The proponent expects to complete MCP response actions resulting in an RAO for 307 Jackson Street.

The RAO to be submitted for 221 Jackson Street (RTN 3-25687) will address indoor air contamination through soil removal conducted as a RAM- which is ongoing as of the time

of this document. This RAM is intended in part to remove soil posing a potential for indoor air contamination. The RAO to be submitted for 291 Jackson Street is also based on an ongoing RAM and addresses the potential for indoor air contamination. It is anticipated that the RAO for each site will address DEP requirements for assessment of indoor air contamination.

The potential for vapor intrusion at each parcel will be evaluated through review of site data and information from nearby properties, and/or collection of additional data. Data reviewed and/or new data collected will include an analysis of groundwater, soil, and soil vapor for volatile organic compounds. DEP guidance regarding indoor air contamination assessment, published in 2008, will be considered in this evaluation. RAM Plans would be prepared to address response actions related to mitigation of vapor intrusion and would consider the potential for migration to or from nearby properties. Response actions would be documented in the RAO Statements. Vapor intrusion would be addressed through compliance with existing Activity and Use Limitations (AULs), remediation of soil or groundwater as feasible, design and implementation of engineering controls such as barriers or ventilation, other building design techniques, and application of new AULs as appropriate.

### **5.3 GROUNDWATER MANAGEMENT PLAN**

Groundwater has been observed to be present at depths ranging from 2.5 to 13.0 feet below ground level. It is likely that some excavation will extend below this depth, particularly in areas planned for below-grade parking. As noted above, the project includes multiple disposal sites that have received RTNs. In addition, based on the site history of urbanization, filling, building, and various land uses, potential pollutants that are not reportable under the MCP may exist in project areas. These pollutants have the potential to impact groundwater. Dewatering to support excavation for foundations and below-grade parking will be necessary in multiple areas. Therefore, during the planning process, the proponent will conduct groundwater sampling and testing in all project areas where dewatering and excavation may occur. Test results will be used to identify necessary components of on-site water treatment to remove suspended solids and other contaminants prior to discharge. The proponent will prepare an application for one or more temporary construction dewatering permits, such as an EPA Remediation General Permit and/or city or regional permits, to discharge treated water. It is anticipated that treated water would be discharged to surface water, likely one or more of the canals. As such, a Notice of Intent would be provided to the Conservation Commission regarding the anticipated discharge. Groundwater quality will also be monitored during construction as part of the discharge permit requirements. The application for temporary construction dewatering and discharge will contain a plan for management and location of discharges. It is anticipated that dewatering discharge would be treated using solids removal, metals precipitation, resin treatment, and/or carbon filters as appropriate.

Based on the design excavation depth and planned excavation methods, the potential for lateral migration of contaminated groundwater will be assessed. The use of a temporary excavation support system around the perimeter of below-grade buildings and installed into or through the existing marine clays is expected to minimize groundwater movement. In order to avoid migration of subsurface contaminants, recharge of stormwater into groundwater is not recommended at this site.

#### **5.4 CONSTRUCTION PERIOD AIR QUALITY MITIGATION MEASURES**

The proponent has not yet conducted Asbestos Containing Materials (ACM) surveys of the remaining portions of the Appleton Mill, the Freudenberg building, and the small “guard house.” cursory walk-throughs indicate that these facilities probably contain some ACM’s, most likely in floor tiles. Prior to undertaking any partial or complete demolition activities, the proponent will have the surveys completed and will file both the Notification Prior to Demolition or Construction form (BWPAAQ06) and the Asbestos Removal Notification Form (ANF001) for each building at least 10 days before commencing any abatement activities. The building surveys will not be limited to ACM’s, but will also identify all other hazardous materials that will require remediation prior to construction activities. All surveys, remediation design, and abatement activities will be conducted under the supervision of a licensed Industrial Hygienist and appropriately certified asbestos inspectors. Any non-standard demolition or abatement methods proposed will be submitted to DEP for prior review and approval.

The proponent has reviewed the RAO for RTN3-20636 that involved the cleanup of uncontrolled ACM in the midst of general demolition debris caused by the demolition activities of the previous owners between 2001 and 2006. The proponent understands that in spite of the RAO, there is the potential that remaining on-site debris may contain additional ACMs. If suspect ACMs are observed during the handling and transport of remaining debris, accredited asbestos inspectors will be used to identify and test such materials. If additional ACMs are discovered, notifications to DEP will be made for approval to remove and dispose of the materials properly.

#### **5.5 AIR QUALITY AND GREENHOUSE GAS EMISSIONS**

In October 2007, the Massachusetts Office of Energy and Environmental Affairs (EEA) published the final version of its greenhouse (GHG) policy for MEPA projects: “Greenhouse Gas Emissions Policy and Protocol” in the Environmental Monitor. The policy requires a project to quantify carbon dioxide (CO<sub>2</sub>) emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition, the policy requires the proponent to quantify the effect of proposed mitigation in terms of emissions reductions and energy savings.

In accordance with the EEA Policy, the EENF and subsequent DEIR included a GHG analysis for the proposed project. In the Certificate on the DEIR, the proponent was asked to update its greenhouse gas analysis based on comments regarding the energy code and to consider additional renewable energy sources and TDM measures and to explain why certain measures were deemed infeasible.

### **5.5.1 UPDATED GREENHOUSE GAS ANALYSIS**

The GHG emissions generated by the proposed project will include direct emissions of carbon dioxide (CO<sub>2</sub>) from natural gas combustion for heating and diesel fuel combustion for emergency generators. Indirect emissions of CO<sub>2</sub> will result from project-generated motor vehicle trips and the electricity used on the site for lighting, cooking, building cooling and ventilation, and the operation of other equipment such as computers.

A greenhouse gas (GHG) emissions analysis was performed for the proposed Hamilton Canal District Project (the “project”). CO<sub>2</sub> emissions were quantified for: (1) the Base Case corresponding to the 7<sup>th</sup> Edition MA Building Code, (2) the Preferred Alternative, which includes some energy saving design features, and (3) the Mitigation Alternative, which includes additional energy savings elements. This analysis uses the Tech Environmental Energy Model, which replicates the output of the EPA Energy STAR Target Finder using data and algorithms from the U.S. Department of Energy, Energy Information Administration (EIA), and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. The Mitigation Alternative reduces the Project’s direct and indirect stationary source energy-related emissions of CO<sub>2</sub> by 20.6%, compared to the Base Case.

CO<sub>2</sub> emissions produced by project vehicle trips were analyzed using the EPA MOBILE6.2 Mobile Source Emission Factor Model. Mitigation measures for transportation emissions include a number of transportation demand management (TDM) strategies for the project. These measures will improve traffic operations, reduce project-generated vehicle trips, and reduce project-related motor vehicle CO<sub>2</sub> emissions by approximately 5%. Overall, mitigation measures in the Mitigation Alternative are expected to reduce the Project’s total CO<sub>2</sub> emissions by 19.8% compared to the Base Case.

The GHG analysis presented in this report has been updated in several areas from the GHG analysis presented in the DEIR. The full report may be found in Appendix F. Base case electrical use is lower due to the greater energy efficiency requirements of the most recent version of the MA Building Code. Base Case gas use is now slightly higher because the DEIR analysis assumed a base case boiler efficiency that was higher than the minimum specified in the code; that error has been corrected. Specific design information for the project in regards to the design capacity and energy

efficiency of HVAC units has been incorporated in the energy and CO<sub>2</sub> emission calculations.

The full project will consist of 14 buildings and one parking garage. The preferred program will consist of a total of 1,872,295 gsf as follows:

- 766,879 gsf residential space;
- 382,500 gsf office space;
- 54,800 gsf retail space;
- 6,500 gsf restaurant/other commercial space;
- 34,566 gsf gallery space and 450-seat theatre; and
- 627,050 gsf total parking.

### **5.5.2 ON-SITE RENEWABLE ENERGY SOURCES**

The Proponent has set a goal to generate 5% of its electricity from renewable sources, and has considered photo-voltaic (PV) systems, solar thermal, wind, geothermal and hydro-electric sources. On-site renewable energy planning is only in the concept stage, but several potential sources have been evaluated.

The site has potential for hydro-electric power generation and was historically used for water power purposes. The actual rights to develop hydropower on the site have been the subject of litigation and thus the proponent has not been able to offer any commitments toward hydro electric. However, based on recent administrative rulings and court decisions, the Proponent now believes that they have the necessary rights to develop hydropower on the site. The economics of this undertaking have not been evaluated at this time, but the Proponent is willing to commit to undertaking a feasibility study in association with the redevelopment of Parcel 8.

The proponent has commissioned a study regarding the use of adjacent canal waters for heating and cooling project buildings and has found it infeasible because the canal system cannot provide enough geothermal resource to completely replace the development's planned conventional HVAC systems. The canal resource is either not large enough to handle peak heating or cooling conditions and/or is not within the temperature range needed at those peak times for effective use. In addition, there are occasions in which the canal resource may not be available, such as during canal draining and maintenance. See Appendix J, Feasibility Study, for more details.

Wind energy is considered to be infeasible at this site. Based on a review of the US Department of Energy, National Renewable Energy Laboratory 50 meter wind energy maps, the project site is ranked "poor", the lowest category of wind energy with average wind speeds of less than 5.5 m/s. Similarly, maps for wind speeds in Lowell

prepared by the Massachusetts Technology Collaborative show very low potential for the site. Therefore, there is not sufficient wind energy at this location to make wind power generation feasible.

PV systems may offer the best opportunity to generate renewable electrical energy on this site. The GHG Analysis contained in Appendix F included a feasibility analysis of the economics of PV systems on the site. There is more than sufficient roof area with the proper solar orientation to take advantage of PV systems. However, the feasibility analysis demonstrated that the owner installed PV system would have an installed cost of \$3.8 million, a negative net present value in excess of \$0.5 million and a simple payback of 17 years. Thus, owner installed PV systems are not feasible. Based on the recommendations in the GHG analysis that the economics may be more favorable for third party providers, the proponent is in discussion with a local vendor for solar system installations. See Appendix F, Greenhouse Gas Analysis and Appendix J, Feasibility Studies for more information. The proponent is also investigating solar thermal systems for residential buildings, which include parcels 2, 4, 8, 9, and 11.

### 5.5.3 MITIGATION MEASURES

All reasonable and feasible measures to reduce GHG emissions will be adopted by the Project. The measures the project proponent intends to pursue including siting and site design measures, building design and operation measures, and transportation demand measures. Each category of measures is listed below.

#### SITING AND SITE DESIGN MEASURES

***Sustainable Development Principles*** – The Project design promotes compact development and conserves land. The Project includes the rehabilitation of existing buildings and will have over 60 dwelling units per buildable acre and greater than a 3.0 FAR for non-residential areas.

***Protection for Open Space*** – The site plan includes the creation of new open space in the form of three new parks totaling over 26,000 sf.

***Minimize Building Footprint*** – Urban redevelopment will be done at a scale and density appropriate to the site and multi-story buildings will be used to minimize the building footprint.

***Low Impact Development for Stormwater Design*** – The design integrates landscaping and green space along with green roofs to generate less stormwater runoff.

***Design Project to Support Alternative Transportation to Site*** – The Project is located in close proximity to the LRTA Gallagher Transportation Terminal, the Kennedy Bus

Transfer Center, and the MBTA Lowell commuter rail station. The project proponent will work with the LRTA, MVRTA, and the MBTA to develop an effective and comprehensive transportation plan for the Project.

***Minimize Energy Use Through Building Orientation*** – The blocks have been designed along the canals and have south facing elevations that will provide passive solar gain.

### **BUILDING DESIGN AND OPERATION MEASURES**

All reasonable and feasible building design and building operation mitigation measures will be adopted by the Project. These measures are listed below and in aggregate; they would reduce the combination of direct and indirect CO<sub>2</sub> emissions by 18.8% in the Preferred Alternative and 20.6% in the Mitigation Alternative. Mitigation measures to reduce direct and indirect CO<sub>2</sub> emissions are presented together because measures to reduce electrical use for cooling in a building inadvertently require more fuel to be burned for space heating because heat acquired from solar gain is reduced.

### **Design Elements of the Preferred Alternative**

***Increase Roof and Wall Insulation*** – The latest MA Building Code has increased minimum R-values for roof and wall insulation for the entire project. For the 30% of gross building area that is LEED NC certified, roof and wall insulation values will be further increased to R-38 and R-25, respectively.

***Green Roofs*** – Green roofs consist of layers of gravel, soil, and vegetation atop a rubberized water-proof membrane. Green roofs add significant weight to a building's roof, and thus the roof must be designed for that added weight. The proponent will commit to green roofs on 30% of the total roof area of the project, which is approximately 1.8 acres of roof area.

***Duct Sealing*** – HVAC supply ducts will be sealed and then insulated to reduce energy losses.

***Programmable Thermostats*** – Hamilton Canal District will use programmable thermostats in all buildings to reduce energy use. An energy management system to control and track energy use will be established for the commercial buildings in the Project.

***Very High-Efficiency HVAC Systems*** – The mitigation alternative uses HVAC units with an Energy Efficiency Ratio (EER) of 11.4 to 14.0. These are energy saving units since standard HVAC units of the size planned for the Project have an EER of 8.5.

**Maximize Interior Day-Lighting** – Most buildings in the Hamilton Canal District are 5 to 6 stories tall. The new buildings are being designed with shallow floor plates to let light into central core areas, and light shelves will be incorporated in the taller buildings; these reflect sunlight from the windows into the center of each floor. These are the best day-lighting strategies for multi-story buildings, and these measures will provide day-lighting and reduce interior electric lighting needs.

**Third Party Commissioning** – The Project will use a third party to do building commissioning.

**Renewable Energy** – The Project is committed to generating 5% of its electricity from renewable sources, including the potential to utilize photo-voltaic (PV) systems, solar thermal, geothermal, wind, and hydro-electric sources. See Section 5.52 for more detail.

**Energy Efficient Windows** - Historic replication of windows on some buildings (suggested by NPS) and design constraints on other buildings will likely limit the project to just meeting the new more stringent U-values in the revised building code for many buildings. Residential buildings will use a fiberglass-framed window unit that can achieve a value of  $U=0.35$ , which is better than the building code requirement.

**Energy Efficient Interior Lighting** – The proponent has incorporated additional energy savings in residential and office spaces and will be achieved through a combination of compact fluorescent, Super T8, and T5 fixtures.

**Energy Efficient Exterior Lighting** – The project is set in an urban environment and exterior lighting will be primarily provided by street lights owned by the City of Lowell. There will be limited lighting of building exteriors. Low-level, energy efficient lighting will be specified for building entrances and courtyard areas.

**Building Materials** – Whenever possible, the project will use environmentally friendly building materials, including materials with recycled content, and rapidly renewable building materials, and building materials that are manufactured within the region.

**Construction Waste Management** – The Project will comply with all State solid waste regulations. The Project intends to use recycled aggregate materials in the asphalt paving on the site and would use recycled fly ash in the concrete paving materials. The Project is committed to recycling 50% of all construction debris from the site.

**Operations Waste Management** – The Project design provides for storage and collection of recyclables (paper, glass, metal and plastic) for both the residential and

commercial uses. Potentially hazardous wastes will be collected and recycled through the City of Lowell's hazmat recycling program. There will be a recycling area in each building, sized in accordance with the building's proposed use(s) and final design.

**Water Conserving Fixtures** – The Project proponent will use water conserving fixtures that exceed building code requirements. All commercial areas will use sinks and toilets with auto sensors. Residential units will have low-flow shower heads and toilets.

**Rainwater Reuse** – Roof runoff of rainwater will be collected and used for landscape irrigation.

#### **Additional Building Design Measures for the Mitigation Alternative**

**Cool Roof Design** – For the mitigation alternative, the Project will use reflective white roofs on all buildings that do not have a green roof. This would increase the reflection of sunlight and will help maintain a cooler building temperature in the summer, reducing energy use.

**Super High-Efficiency HVAC Systems** – While the final mechanical equipment list is not available for the individual buildings in the project because it is in the concept level of design, the project engineers have provided a list of equipment by type of use, the code energy performance rating, and the higher efficiency equipment that is proposed as part of the Mitigation Alternative. For the purposes of this GHG analysis, each residential unit was assumed to have a vertical stack water-source heat pump (<17 MBH<sup>8</sup>), and common areas of each residential building were assumed to have 15 water-source heat pumps (non-vertical stack, > 17 and <135 MBH). Retail spaces would be provided with package rooftop air-cooled units less than 240 MBH in size. Office space would have two chillers and two <300 ton cooling towers per building. For the restaurant and theatre spaces, package rooftop air-cooled units in the >240 MBH category were assumed.

#### **TRANSPORTATION DEMAND MEASURES**

All reasonable and feasible transportation demand mitigation (TDM) measures will be adopted by the Project.

**Locate New Buildings in or Near Areas Designated for Transit-Oriented Development** - The Project is located in close proximity to the LRTA Gallagher Transit Terminal, the Kennedy Bus Transfer Center and, the MBTA Lowell commuter rail station.

**Transportation Management Association and On-Site Vehicle Trip Reduction Coordinator** – In past years, there was a transportation management association (TMA) serving the Greater Lowell area. It appears that it was not successful in sustaining operations. It is important to note that the proponent’s site is currently vacant and construction of office buildings for major employers that might take advantage of the TMA may be years away. Once the adjacent Lowell Trial Court and the Parcel 1 office building on the project site are constructed, there may be a basis to form a TMA focused on Downtown Lowell. At that time, the proponent will work with the Lowell Plan to assess the interest of major local employers in the area and form a TMA. In the interim, the proponent will provide a trip reduction coordinator whose responsibility will be to see that all project tenants, including residential, retail, and office tenants, are aware of the non-SOV transportation options.

**Provide New Transit Service or Support Extension of Existing Transit** - The Project Proponent will work with the LRTA, MVRTA, and the MBTA to modify existing bus routes that take advantage of the new roadway connections created by the project to enhance access to public transportation. The proponent has dedicated a right-of-way for an expanded trolley route that will run from the terminus of the existing trolley line through the site to the Gallagher Transportation Terminal. The proponent has engaged the Lowell Plan to take the lead on a feasibility study for the expansion of the trolley route. An independent transportation consultant has been commissioned to undertake the feasibility and the proponent sits on the board of the trolley study group.

**Multi-use Paths** – The project will incorporate multi-use paths to and through the site to encourage alternate transportation within the property.

**Parking Capacity** – The Project’s parking capacity will be sized to meet, but not exceed, local parking requirements.

**Parking Management** – The Project’s parking management program will minimize parking demand by charging all tenants for parking spaces. The project will provide preferential carpool and/or vanpool parking in the garages. The project will also commit to providing at least one parking space in the on-site parking garage for a third party vendor, such as ZipCar, to contribute to the reduction of the project’s site trip generation. The Project will encourage tenants to implement parking cash-out.

The Hamilton Canal District development is guided by a form-based code. The form-based code has no minimum parking supply requirements for development projects, thus allowing for reduced parking supply and the use of shared parking arrangements. The proponent has chosen not to include a parking component into Phase I of the project development. Future Phase I residents will need to use the existing JAM Parking Garage for parking needs.

**Live/Work units** - The proponent is constructing 130 units of live/work units on-site, therefore, reducing the number of residents needing to commute in and out of the site for work. Laundry and fitness services will also be provided in residential buildings further reducing the need for vehicle trips.

**Rideshare/Transit Information** – The proponent will encourage future tenant-employers to join MassRide and to utilize existing ride share-matching programs to match employees in carpools and vanpools.

**Subsidize Transit Passes** –The proponent will encourage tenant-employers to offer subsidized transit passes to their employees.

**Use of Pre-Tax Dollars for Non-Single Occupancy Vehicle Commuting Costs** - The proponent will encourage tenant-employers to offer the option of using pre-tax dollars for non-single occupancy vehicle commuting costs to their employees.

**Preferential Parking** – The Project will provide preferential parking for employees who carpool.

**Provide a Guaranteed Ride Home Program** –The project will encourage tenant-employers to offer a Guaranteed Ride Home program to their employees.

**Bicycle Storage** – The Proponent will provide bicycle racks in secure, sheltered areas on site to encourage bicycle use among employees and potential customers. The proponent will also encourage future commercial tenants to install locker room/shower facilities to increase bicycle use.

**Roadway Improvements** – The Project proponent will improve various intersections in the Project area to improve traffic flow and reduce vehicle delays (see Chapter 4, Transportation, for more details).

**Traffic Signalization Coordination to Improve Traffic Flow and Support Pedestrian Safety** - Traffic signal timing adjustments will be made for all signalized intersections in study area. This will improve traffic flow and reduce vehicle delays.

**Make On-Site Improvements to Reduce VMT** – An extensive network of sidewalks and paths, with adequate lighting and landscaping, will be constructed to encourage pedestrian traffic within the project area.

**Provide No-Idling Truck Zones at Loading/Off-Loading Areas** – The Project will comply with the Massachusetts Idling Regulation (310 CMR 7.11). The Project will post idling restriction signs in all loading dock and drop-off areas.

As part of the revised GHG analysis, the proponent has committed to additional TDM measures that were not included in the DEIR, particularly the formation of a TMA. In aggregate, these measures are estimated to reduce CO<sub>2</sub> transportation emissions by 5%. An additional transportation mitigation measure, the purchase of alternative fuel and/or fuel efficient vehicles for fleet, was also considered for the Hamilton Canal project, but was rejected as the project will not maintain a fleet of vehicles; therefore, this measure is inappropriate for this Project.

#### **5.5.4 MITIGATION SUMMARY**

The analysis includes a calculation of the CO<sub>2</sub> emissions for the Hamilton Canal District Project for the Base Case (a building that complies with the 7<sup>th</sup> Edition MA Building Code), the Preferred Alternative (includes some energy mitigation measures), and the Mitigation Alternative (includes additional energy savings elements and TDM measures). The Project will commit to the Mitigation Alternative for which total CO<sub>2</sub> emissions are reduced 19.8% from 17,793 tons/year to 14,278 tons/year. If the project goal to generate 5% of its electricity from on-site renewable sources is achieved, CO<sub>2</sub> emissions will be reduced by an additional 367 tons/year.