PARALLEL PRODUCTS OF NEW ENGLAND, INC.

Massachusetts Environmental Policy Act Expanded Environmental Notification Form

Site Location:

100 Duchaine Boulevard
New Bedford, Massachusetts 02745

February 2019

Prepared For:

Parallel Products of New England, Inc.
100 Duchaine Boulevard
New Bedford, Massachusetts 02745

Green Seal Environmental, Inc.

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Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Massachusetts Environmental Policy Act (MEPA) Office

Environmental Notification Form

For Office Use Only

EEA#: ____________________

MEPA Analyst: ______________

The information requested on this form must be completed in order to submit a document electronically for review under the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: **Parallel Products of New England**		
Street Address: **100 Duchaine Boulevard**		
Municipality: **New Bedford**	Watershed: **Buzzards Bay**	
Universal Transverse Mercator Coordinates: **337625 E 4620066.5 N 9(Meters)**	Latitude: **41.717N** Longitude: **70.95 W**	
Estimated commencement date: **01/01/2019**	Estimated completion date: **01/01/2021**	
Project Type: **Solid Waste**	Status of project design: **10 %complete**	
Proponent: **Parallel Products of New England, LLC**		
Street Address: **100 Duchaine Boulevard**		
Municipality: **New Bedford**	State: **MA**	Zip Code: **02746**
Name of Contact Person: **Tim Cusson**		
Firm/Agency: **Green Seal Environmental**	Street Address: **114 State Road**	
Municipality: **Sagamore Beach**	State: **MA**	Zip Code: **02562**
Phone**: 508-888-6034**	Fax: **508-888-1506**	E-mail: **w.hall@gseenv.com**

Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)?
☒ Yes ☐ No

If this is an Expanded Environmental Notification Form (ENF) (see 301 CMR 11.05(7)) or a Notice of Project Change (NPC), are you requesting:

a Single EIR? (see 301 CMR 11.06(8))	☒ Yes	☐ No
a Special Review Procedure? (see 301CMR 11.09)	☐ Yes	☒ No
a Waiver of mandatory EIR? (see 301 CMR 11.11)	☐ Yes	☒ No
a Phase I Waiver? (see 301 CMR 11.11)	☒ Yes	☐ No

(Note: Greenhouse Gas Emissions analysis must be included in the Expanded ENF.)

Which MEPA review threshold(s) does the project meet or exceed (see 301 CMR 11.03)?
301 CMR 11.03 (5)(b)(5) Wastewater
301 CMR 11.03 (9)(a) Solid and Hazardous Waste
Which State Agency Permits will the project require?
MassDEP
Identify any financial assistance or land transfer from an Agency of the Commonwealth, including the Agency name and the amount of funding or land area in acres:
$ 500,000 IRAPgrant from MassDOT

Summary of Project Size & Environmental Impacts	Existing	Change	Total
LAND			
Total site acreage	**71**		
New acres of land altered		**8.8**	
Acres of impervious area	**16**	**3.5**	**19.5**
Square feet of new bordering vegetated wetlands alteration		**4,436**	
Square feet of new other wetland alteration		**350**	
Acres of new non-water dependent use of tidelands or waterways		**0**	
STRUCTURES			
Gross square footage	**95,916**	**227,890**	**323,806**
Number of housing units	**0**	**0**	**0**
Maximum height (feet)		**45**	
TRANSPORTATION			
Vehicle trips per day	**76**	**492**	**568**
Parking spaces	**468**	**(-60)**	**428**
WASTEWATER			
Water Use (Gallons per day)	**150**	**13,000**	**13,150**
Water withdrawal (GPD)	**0**	**0**	**0**
Wastewater generation/treatment (GPD)	**150**	**82,975**	**83,125**
Length of water mains (miles)	**0**	**0**	**0**
Length of sewer mains (miles)	**0**	**0**	**0**

Has this project been filed with MEPA before?
☐ Yes (EEA #__________) ☒ No

Has any project on this site been filed with MEPA before?
☐ Yes (EEA #__________) ☒ No

GENERAL PROJECT INFORMATION – all proponents must fill out this section

PROJECT DESCRIPTION:

Describe the existing conditions and land uses on the project site:

A project description follows. A draft of the Site Suitability Application (BWP SW-01 and applicable attachments) to MassDEP is included as Appendix A. This application includes a characterization of the site and surrounding environment. Additionally, this application includes a Land Use Plan and a Water Resources Plan. These plans identify areas of the environment that could potentially be impacted by the proposed project. This application also addresses potential nuisance issues associated with the proposed project.

The site is an approximately 71 acre parcel identified by the New Bedford Tax Assessor as Lot 5 on Assessor's Plat 134. The site is zoned Industrial C. A locus plan of the site location is included in Appendix A, Insert 1. The site is located within the New Bedford Business Park. The site was previously owned by Multilayer Coating Technologies and before that by Polaroid Corporation. The site was used by both previous owners to manufacture film. The site as developed by Polaroid included access roads, parking areas, stormwater management features and numerous buildings. An existing conditions plan of the site is included with Appendix A, Insert 4. PPNE intends to utilize the existing infrastructure to the extent possible in developing the proposed project.

Maps showing land use and water resources in the project area and in relation to the proposed project are included in Appendix A, Inserts 2 and 3.

Based on the historical use of the subject property, a Phase I Environmental Site Assessment and a Limited Subsurface Investigation (LSI) was conducted at the subject site. These investigations concluded that "Based on the results of this LSI, SAGE has not identified the presence of subsurface impacts at the site that would require reporting to MassDEP. As such, SAGE is of the opinion that further actions are not warranted at this time."

Describe the proposed project and its programmatic and physical elements:

Introduction

Parallel Products of New England (PPNE) is located at 969 Shawmut Avenue, New Bedford. Affiliates of PPNE, SMRE 100 LLC and SMRE SUBLOT 20 LLC owns the properties located at 100 Duchaine Boulevard, New Bedford, MA. The project property boundaries are shown on the project plans included in Appendix A. The site includes 71 acres of land and is zoned 1C (Industrial). PPNE has completed the installation of 1.5 MW of solar power at the site that this is presently operational. PPNE is currently working on the installation of an additional 1.9 MW of solar power on site. PPNE intends to install roof top solar on the various buildings and canopy solar being developed as defined in this application. PPNE is proposing to develop the site in two phases. The phased project development is due to the fact that the permitting for Phase 1 construction and operation can be accomplished in several months and the permitting for Phase 2 will require a longer period of time.

Phase 1 development consists of building a glass Beneficiation operation to the 100 Duchaine Boulevard site and the construction of approximately 1.9 MW of solar power energy generation. This operation will recycle the glass containers that are collected through the Massachusetts bottle deposit system. Bottles collected will be processed such that the glass can be reused to produce new glass containers and other products. Processing at the site will include crushing, sizing and separation of the glass by color. The cullet produced will subsequently be sold to glass manufacturers for the production of new products including glass containers. The closure of the Ardagh Group glass bottle plant in Milford, MA and the subsequent closing of the Strategic materials Beneficiating plant in Franklyn Ma earlier this year has resulted in glass being disposed of in landfills stored in various location's as well as being shipped to other glass bottle recycling facilities throughout the country.

As a result of the limited options for recycling glass in Ma and the greater distances needed to send processed glass to manufacturers, PPNE will construct a rail sidetrack from the existing rail line adjacent to the 100 Duchaine Boulevard site. This will allow shipment of recycled glass by rail that will significantly increase transportation efficiencies and reduce greenhouse gas emissions. Phase 1 construction does not trigger any MEPA review thresholds. The Phase 1 activity is included in this EENF as required by 301 CMR 11.01 (c) Segmentation. PPNE is requesting a Phase 1 Waiver to allow the construction of the Phase 1 infrastructure to begin prior to the acceptance of the Single EIR required for Phase 2 construction.

As part of this Phase 1 Waiver, the 1.9 MW of solar power will be constructed on site during Phase 1. Solar panels will be constructed on a canopy system that will be constructed over the glass processing system, part of the proposed rail sidetrack and over existing parking areas. The proposed 1.9 MW solar power installation will be in addition to the existing 1.5 MW solar power project on site.

Phase 2 of the project includes the construction of a municipal solid waste (MSW) processing/handling facility and the biosolids processing facility. Currently, significant quantities of MSW and biosolids are being trucked out of state for treatment and disposal. PPNE will construct a facility to collect and process this material in Massachusetts and then ship the residual waste out of state by rail for disposal. The processing proposed will also significantly increase transportation efficiencies and reduce greenhouse gas emissions.

The proposed solid waste handling facility will accept up to 1,500 tons per day of MSW delivered to the facility by truck. The proposed facility will process the MSW to extract recyclable material from the MSW. PPNE expects to recover and recycle approximately 20% of the MSW received, which is supports the Massachusetts solid Waste Master Plan and is state-of-the-art for the Commonwealth. The non-recyclable fraction of the MSW along with the C&D residuals/bulky waste will be then loaded in rail cars for transport to out of state disposal sites, primarily landfills.

In addition, a processing facility will be built to dry biosolids into a Class A biosolid. Biosolids accepted will consist of thickened wet slurry biosolids with a solids content ranging from 5-10% and biosolids cake with a solids content ranging from 15-30%. The facility will initially utilize natural gas to dry the biosolids. PPNE may opt to add gasification equipment to produce syn gas from dried biosolids at a future date. The gasification process would include a gasifier to produce syn gas and a thermal thermal oxidizer to recover heat energy for use in the drying process. The addition of gasification equipment would reduce or eliminate the need for natural gas for drying biosolids. Appropriate emissions equipment will also be installed downstream of the thermal oxidizer.

Site Description

The site is an approximately 71 acre parcel comprised of several parcels but primarily the lot identified by the New Bedford Tax Assessor as Lot 5 on Assessor's Plat 134. The site is zoned Industrial C. A locus plan of the site location is included in Appendix A, Figure 1. The site is located within the New Bedford Business Park. The site as presently developed includes access roads, parking areas, stormwater management features and various buildings. An existing conditions plan of the site is included Appendix A, Insert 4. PPNE intends to utilize the existing infrastructure to the extent possible in developing the proposed project.

Stormwater Management

The existing facilities on site will be used for the proposed project to the extent possible. Previous site development included a stormwater management system that included a series of catch basins, detention ponds and subsurface infiltration systems. The proposed construction will utilize the existing impervious surfaces to the extent possible to minimize the impacts of stormwater. Access to the site will utilize existing paved site driveways. The MSW receiving building and the biosolids processing facilities will be constructed entirely on land that is currently impervious. The MSW processing system will be constructed within an existing building on site. Additional detention basins or expansion of existing basins coupled with additional infiltration basins will be constructed, as required, to meet the requirements of the current Massachusetts Stormwater Management Policy.

Traffic

MSW, C&D, glass and biosolids deliveries will arrive via Alfred Bessette Memorial Highway (Route 140). Route 140 runs in the north-south direction providing two lanes of travel in each direction and separated by a grass median. Truck traffic will exit Route 140 at Braley Road and travel on Braley Road to Duchaine Boulevard to the site. The facility will receive deliveries of MSW, C&D, glass and biosolids by truck. Deliveries will be between the hours of 6 AM and 6 PM Monday through Saturday. Biosolids deliveries may also occur on Sundays between the hours of 6 AM and 6 PM.

The facility plans to ship outbound material by rail, but some outbound shipments may be by truck as deemed necessary. To be conservative, the traffic study performed for the project assumed that all outbound material is transported by truck. The study evaluated traffic impacts based on 284 inbound trips and 284 outbound trips (trucks carrying material and employee trips traveling to and from work).

The study has determined that the proposed project development will not have any appreciable impact on the operations of the study area intersections or roadways. The traffic study has been included as Appendix B.

Noise

Epsilon Associates, Inc. (Epsilon) has been retained by PPNE to conduct a sound level assessment for this Project. Existing condition sound levels were measured around the site, an operational sound level modeling analysis was conducted for the major sound producing elements of the Project, and noise controls necessary to meet the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Noise Policy have been incorporated in to the project design.

Noise controls included in the project design include:

- In order to keep site sound levels at a minimum, the Project will use of an electric rail car pusher to move railway cars stored on-site.
- The exhaust fans on the Biosolids building will be fitted with fan silencer or low noise fans will be utilized.
- The scrubber stack located west of the Biosolids building will be fitted with a silencer or a lower noise fan will be utilized.
- A 50-foot long 15-foot tall sound barrier wall will be included along the southern edge of the Biosolids building.

Results of a complete sound level assessment demonstrate that sound levels from the Project with the sound mitigation measures listed above will meet the requirements set forth in the MassDEP Noise Policy at residential locations. The Epsilon Noise Impact Study is attached as Appendix D.

Odor Emissions

Although Massachusetts currently has no official odor policy or thresholds, odor is regulated under 310 CMR 7.09 in that operations that emit odors shall not permit their emissions to "cause a condition of air pollution." A Draft Odor Policy for Composting Facilities was published by MassDEP in January 1996. This draft guidance document recommended a minimum design standard benchmark of 5 D/T.

The proposed project has been specifically designed to avoid causation of odor "nuisance" conditions. Odor will be managed by the use of odor control technologies, including wet scrubbing and ionization and by stacks designed with good dispersion characteristics and high dilution. A study to model odor emissions from the proposed facility was conducted by Epsilon Associates. The report determined that odor concentration at the property lines adjacent to residential dwellings was limited to a maximum of 1 D/T. The Epsilon report is included in Appendix D.

Air Emissions

Epsilon Associates has evaluated air impacts associated with the proposed project and has prepared a report detailing its findings. The report is included as Appendix D. The analysis presented in this report encompasses a broader range of air emission sources than would be included in an air plan application in that certain mobile combustion sources are included in addition to all stationary combustion sources located at the site. The emissions analysis includes emissions from:

1. Mobile Sources-This includes emissions from front end loaders operating on site as well as truck traffic on site.

2. Stationary Sources-This includes emissions from MSW tipping and processing, glass processing and boilers used for biosolids drying and biosolids building heating.

3. Non-Combustion Particulate Matter Sources-This includes emissions from dust from MSW and C&D waste tipping and rail car loading, dust from glass processing and rail car loading, dust from vehicle travel on site and particulate matter in water drift from the cooling towers

associated with the biosolids dryers.

The Epsilon report demonstrates that, under maximum expected operating conditions and using conservative assumptions, the project's impacts will comply with all applicable standards. Specifically:

- The National Ambient Air Quality Standards (NAAQS) will not be exceeded. Per EPA, these standards "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.

- MassDEP has developed "health- and science-based air guidelines - known as Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) - to evaluate potential human health risks from exposures to chemicals in air. The Massachusetts AALs and TELs will not be exceeded in residential areas.

Environmental Justice

Parallel Products of New England, Inc. (PPNE) has commissioned Epsilon to prepare an Environmental Justice (EJ) analysis to document that the facility proposed for 100 Duchaine Boulevard in New Bedford, Massachusetts uses all feasible measures to avoid, minimize, and reduce potential air-related impacts on EJ populations within one-mile of the proposed solid waste facility. The proposed PPNE facility exceeds the Massachusetts Environmental Policy Act (MEPA) threshold for new solid waste processing capacity of 150 or more tons per day (TPD), and the wastewater mandatory threshold of 150 or more TPD of sewage sludge, triggering the requirement for filing of an Environmental Notification Form (ENF) and a mandatory Environmental Impact Report (EIR). The Environmental Justice Analysis is included as Appendix J.

Phase 1 Construction

Phase 1 construction will consist of the construction of a glass processing building and equipment and construction of a rail sidetrack from the main line rail to the 100 Duchaine Boulevard site. The glass processing area will consist of a 27,500 sf building to house the processing equipment. A site plan showing the Phase 1 development is included within Appendix A, Insert 5.

The Phase 1 construction does not trigger any MEPA review thresholds. Permits required for Phase 1 are as follows:

1. Order of Conditions from New Bedford Conservation Commission (for rail sidetrack construction only)

2. General Recycling Permit from MassDEP. (General Permit Application has been submitted and there are no comments from MassDEP)

3. Site Plan Approval from the New Bedford Planning Board (Site Plan Approval has been obtained for the glass processing building construction and glass operation. Site Plan Approval will be amended, as required, for the solar project and for the rail sidetrack construction).

The glass processing building will be constructed adjacent to the existing buildings on site as shown on the project plans included in Insert 5 within Appendix A. The building location will be on an existing concrete pad, which remains from the past use by Polaroid Corporation. The building will be 125 feet by 220 feet and will be a pre-engineered metal building. The equipment arrangement is shown on the project plans included in Insert 5 within Appendix A. Glass bottles collected from the state's deposit system are fed into a hopper by a front end loader. The glass then goes through a crusher and over a deck screen separating the glass into two sizes. The sized glass then passes through organic and metal removal equipment and then moves on to optical sorters. The optical sorters will separate glass into three colors, amber, flint and green. The glass is then conveyed to bunkers. The glass is stored in the bunkers until it is loaded into rail cars or trucks for shipment to bottle manufacturers. Existing access roads to the site and through the site will be used by trucks delivering glass to the facility to be processed.

A rail side track will be constructed from the main rail line to the west of the site to the site to provide rail service to the site. The side track will provide the capacity to store empty rail cars to be filled with processed glass and to store rail cars filled with processed glass waiting for rail service to transport the glass to bottle manufacturers. The rail sidetrack must cross wetlands in order to access the site. The rail alignment has been developed to minimize the wetland impacts. Wetland impacts will be less than 5,000 sf. Wetlands replication is anticipated.

The rail sidetrack will be constructed to meet the needs of the glass processing facilities constructed in Phase 1. The rail sidetrack will be expanded in Phase 2 to meet the needs for transport of solid waste. The completed Phase 1 construction plan is included in Appendix A, Insert 5.

Phase 1 Waiver

PPNE is requesting a Phase 1 Waiver of a mandatory EIR review. Specifically, PPNE requests that the Phase 1 construction as defined above be allowed to proceed prior to the submittal of an EIR for the project.

The construction associated with Phase 1 of the PPNE project does not trigger any MEPA review thresholds detailed in 301 CMR 11.03. Phase 1 of the PPNE project is subject to MEPA review due solely to the project segmentation requirements at 301 CMR 11.01 (c).

Phase 1 of the PPNE project is required to accommodate an existing recycling business. In Phase 1 an existing glass recycling operation from 969 Shawmut Ave New Bedford, MA will be relocated to the proposed New Bedford site. Glass recycling in Massachusetts has been significantly impacted by the 2018 closure of the glass bottle manufacturing facility in Milford, MA. As a result of the closure of the Milford facility, recycled glass is currently being sent to landfills, being stored and sent to other recycling facilities outside of MA.

PPNE needs to develop rail capabilities for the site to enable reliable and economical transportation of recycled glass to available glass manufacturers. Transport by truck is not economical for the distances required and the added trucking requirement comes at a time of a nationwide trucking shortage. For these reasons, it is a hardship to PPNE to delay construction of the required facilities to enable transportation by rail to the site.

The need for rail access to the site is an immediate need and is required whether or not Phase 2 of the project is ever constructed. Phase 2 construction would add additional track so that the site can handle a sufficient number of rail cars to meet the requirements of proposed solid waste handling operations.

Although construction of Phase 1 does not trigger MEPA review, the project is subject to adequate regulatory review and approval. Phase 1 construction requires the following approvals for construction to commence.

1. Order of Conditions from New Bedford Conservation Commission for the rail sidetrack and solar project.

2. General Recycling Permit from MassDEP (General Permit has been obtained)
3. Modification of existing Site Plan Approval from the New Bedford Planning Board

Phase 1 of the proposed project has been designed to minimize impacts to the environment. The glass processing building has been located on an area of the site that is currently impervious due to a concrete slab remaining from previous use of the site by Polaroid. The rail sidetrack has been located to minimize wetlands impacts by selection of the track layout and by using retaining walls in wetlands to minimize the size of the area occupied by the sidetrack.

As part of this Phase 1 Waiver, the 1.9 MW of solar power will be constructed on site during Phase 1. Solar panels will be constructed on a canopy system that will be constructed over the glass processing system, part of the proposed rail sidetrack and over existing parking areas. It is imperative that a Phase 1 Waiver be issued for the solar array as without it, there is risk that it would not be able to be developed under the SMART program.

Phase 2 Construction

Phase 2 construction will include the construction of a MSW transfer station and biosolids drying facility. Phase 2 is expected to be constructed approximately two years after the Phase 1 construction. The project is being constructed in two phases due the difference in the expected duration of obtaining the required permits. The Phase 2 construction plan is included in Appendix A, Insert 5.

A new solid waste handling building will be constructed. The building is expected to be approximately 50,000 square feet in floor area and will connect with the existing site buildings. The tipping building will be designed to allow waste delivery trucks to drive into the building to dump loads of waste material for subsequent processing/handling. One the waste is tipped and staged, front end loaders will load the MSW into a feed hopper that will send the material through the various stages of the MSW processing equipment. All waste handling will be done within an enclosed building that has proper environmental controls. Any contact water which is released from the MSW will be collected in trench drains and will be handled as industrial wastewater.

The existing building on site adjacent to the proposed tipping building will be used for the processing of MSW. The existing building will be modified as required to house the MSW processing equipment used to extract recyclable materials from MSW. This existing building will also include a baler to bale and shrink wrap (or bale) MSW after processing to remove recyclable materials. Baled and shrink wrapped MSW and Category 2 and 3 C&D will be loaded in rail cars for shipment to off-site locations (disposal and/or waste-to-energy).

The facility will accept both baled MSW and MSW delivered loose in transfer trailers and packer trucks. Baled MSW is anticipated to be sent to the proposed facility from other transfer stations that have baled MSW to meet the railroad requirements for shipping MSW in rail cars. Baled MSW accepted at the proposed facility will be loaded into rail cars for shipment to disposal sites such as a landfill or waste to energy facility. The facility will also accept Category 2 (C&D processing residuals) and Category 3 waste (bulky waste).

In addition to baled MSW, the facility will also accept loose MSW delivered in transfer trailers and packer trucks. Transfer trailers will consist of 100 cy live floor trailers. The average 100 cy transfer trailer capacity is generally 28 tons. Transfer trailers will originate primarily at transfer stations. Transfer trailers arriving at the facility will be weighed on a truck scale at the facility and then the truck will back into the tipping building and will discharge the waste onto the building floor. Packer trucks such as the trucks that provide curbside pickup of

MSW will also deliver MSW to the facility. The average capacity of a packer truck ranges from 8 to 14 tons depending upon size. It is expected that Category 2 and 3 waste will be delivered in 100 cy live floor trailers.

Non-baled MSW received by the facility will be processed to extract recyclable materials. Processing will consist of a processing line that includes both mechanized separation equipment and manual picking. Materials extracted for future recycling will include metals, cardboard, aluminum, wood, glass, PET, paper and plastic (subject to market conditions). The facility will include one or two processing lines. A determination on the number of processing lines to be installed will be made during final project design. The design capacity of a processing line will be approximately 40 tons per hour. The processing line(s) will operate two to three shifts per day depending on the inbound volume accepted. The processing line flow diagram and equipment specifications are included in Appendix E. The processing line is expected to extract 20% recyclables from the MSW. After the recycled material has been extracted, the remaining waste will be baled and shrink wrapped for transport to a disposal facility. The primary means of transport for disposal will be by rail. Trucks can also be used to transport waste, if necessary. Recyclable materials extracted from MSW will be sent to recycling markets by either rail or truck depending upon the commodity and location of receiving facility.

The facility will also accept C&D residual waste and bulky waste. This waste is classified as Category 2 and Category 3 C&D waste by MassDEP. Category 2 waste is C&D waste that has been processed by a C&D processing facility and Category 3 is bulky waste that has little or no recyclable value. The processing facility will have removed all waste ban material and other recyclable material from the C&D material as deemed appropriate. The Category 2 or Category 3 material accepted at the facility will be used as cover for baled MSW in the rail cars. It is expected that Category 2 and Category 3 C&D waste will be delivered to the site in live floor trailers. This material will be received in the proposed tipping building.

Baled MSW, after loading in rail cars, may be covered with C&D residuals as directed by the railroad. Each rail car can carry up to 90 tons of solid waste for disposal. A maximum of 1,300 tons per day is expected to be sent for disposal, which equated to 15 rail cars each day. The rail sidetrack will be modified in Phase 2 to allow the storage of more rail cars than can be accommodated by the sidetrack construction in Phase 1. The expanded rail sidetrack is shown on the Phase 2 site plan included in Appendix A, Insert 5.

In Phase 2, a new biosolids drying facility will be constructed. The facility will accept and process up to a maximum of 50 dry tons per day of biosolids. The biosolids will originate at municipal wastewater treatment plants. The biosolids will be delivered to the facility by truck. The biosolids processing will be done within a new building to be constructed on site. The building is expected to be approximately 30,000 sf. The proposed biosolids processing facility is shown on the project plans included in Insert 5 within Appendix A.

The facility will accept dewatered cake biosolids with a solids content of between 15% and 30%. The facility will also accept thickened wet slurry biosolids with a solids content of between 5% and 10%. Wet slurry biosolids received by the facility will be stored in tanks on site prior to processing. The tanks will be sized to contain three days of deliveries. Attachment 9 within Appendix A includes a process flow diagram and mass balance for the proposed facility when operated at 45 dry tons per day. The maximum daily processing capability will be 50 dry tons per day. The ratio of thickened wet slurry biosolids to dewatered cake will vary. The process flow diagram shows the expected ratio of tonnages of wet slurry biosolids to tonnages of dewatered cake biosolids. The actual break down of wet slurry and dewatered cake will vary depending on the material being produced by wastewater treatment plants that elect to utilize the proposed facility. PPNE may elect to construct a facility to process less than 50 dry tons per day. This determination will be based on market conditions at the time of facility construction. A 50 dry ton per day facility has been evaluated for the EENF as this is the largest size facility under consideration.

Biosolids delivered as a thickened wet slurry will be dewatered by centrifuge or screw press to produce biosolids cake with an expected solids content of 30%. The dewatering system will be designed to process 20 dry tons per day of wet slurry. Wastewater extracted in the dewatering process will be directed to the New Bedford sewer system. The dewatering system will be designed to have a solids capture rate of 95%. It is expected that the discharge to the New Bedford sewer system from the dewatering system will be 52,000 gallons per day. The dewatered slurry biosolids cake and the biosolids cake delivered to the facility will then be blended together. The blending area will include sufficient storage capacity for eight hours of production/processing.

The blended cake will then be directed to a thermal dryer that utilizes a natural gas burner. The biosolids will be dried to approximately 90% solids. Moisture evaporated from the biosolids during the drying process will be condensed with the condensate water discharged to the New Bedford sewer system. It is expected that the daily discharge of condensate to the sewer system will be 30,000 gallons per day. Drying will significantly reduce the weight and volume of the biosolids. The dried biosolids will be sent for disposal via railcar or truck or beneficially for purposes such as alternative daily landfill cover if the required Beneficial Use Determination permits are obtained. The facility will have the capability of storing seven days of dried sludge production.

The proposed facility will be designed to control odors generated by the biosolids processing. All processing will be done within an enclosed building. Two odor control systems will be provided to control odor. A scrubber will process foul air associated with the sludge and cake storage, transfer, dewatering and drying processes. These areas will be operated under negative pressure with the extracted air directed to the scrubber. Air from low odor areas of the processing building will be treated with an ionization system to provide odor control through the HVAC system.

After construction of the proposed drying facility, PPNE may at some point modify the facility to include gasification of the dried biosolids. The gasification system will consist of a gasifier and thermal oxidizer. Heat generated in the thermal oxidizer will be used to dry the biosolids reducing or eliminating the need for natural gas. The ash produced in the gasification process would be sent for disposal by rail or by truck.

Greenhouse Gas Analysis

A greenhouse gas (GHG) analysis that complies with the MEPA Greenhouse Gas Emissions Policy and Protocol (GHF Policy) has been prepared and is included in Appendix C. The analysis addresses GHG emissions generated by operation of the project and associated traffic and includes commitments to mitigate GHG emissions that will result due to development and operation of the project.

NOTE: The project description should summarize both the project's direct and indirect impacts (including construction period impacts) in terms of their magnitude, geographic extent, duration and frequency, and reversibility, as applicable. It should also discuss the infrastructure requirements of the project and the capacity of the municipal and/or regional infrastructure to sustain these requirements into the future.

Describe the on-site project alternatives (and alternative off-site locations, if applicable), considered by the proponent, including at least one feasible alternative that is allowed under current zoning, and the reasons(s) that they were not selected as the preferred alternative:

The proposed project includes three main elements as follows:

1. Processing and reuse of glass collected through the state bottle deposit system.
2. Processing of MSW and C&D with the transfer of residual waste for disposal by rail/truck
3. Drying biosolids with transfer for disposal of dried biosolids for disposal/reuse by rail/truck

Glass Processing

Parallel Products has operated a glass processing facility in New Bedford, Massachusetts and before that in Billerica, Massachusetts. These facilities processed Massachusetts deposit system glass bottles. Glass processing consists of crushing and screening to produce a 3/8" minus product. This product is then transported to facilities that recycle glass. Parallel Products is moving the existing glass processing operations to the New Bedford site. No alternative glass processing operations have been evaluated as this project element is a relocation of an existing process.

Historically, Parallel Products has shipped their processed glass to a glass bottle factory in Milford, MA. This facility closed on March 31, 2018. As a result of the closure, processed glass is now being transported out of state by truck, stored or sent for disposal. Trucking glass this distance is not economical. The only feasible means of long-distance transport is by rail. Parallel Products is proposing to construct a rail side track to the site from the existing main line adjacent to the site. This sidetrack will allow for transport of processed glass to recycling markets throughout the United States by rail. The glass processing facilities will be constructed in Phase 1.

MSW and C&D Processing and Transfer for Disposal

The project being developed by Parallel Products is being developed to handle municipal solid waste (MSW) in southeast Massachusetts. MSW transfer stations accept waste from waste haulers and then load the waste into trucks or rail cars for transport to disposal locations. These transfer stations typically do not process the waste or extract recyclable material from the MSW. PPNE, has elected to install mechanized equipment to extract recyclable materials from the MSW.

PPNE expects to be able to extract 20% of the MSW and divert this material to recycling outlets. The separation will be done with a processing line that will include screens, air separators, magnets, eddy current separators and optical separators. Details of the proposed processing equipment are included in Appendix E.

Two alternatives for handling the MSW remaining after extraction of recyclable materials were evaluated as follows:

Alternative 1

MSW would be delivered to the processing facility by truck. The MSW would then be processed to extract as much recyclable material as possible. The processing line is expected to include air separators, magnets, eddy current separators, screen and a picking line. It is expected that this processing can extract 20% of the MSW as a recyclable material/commodity. The residual MSW after extracting recyclable material will be baled and wrapped in preparation for transport to a landfill for disposal. The residual MSW would be transported off site by rail due to the distances to available landfills.

Alternative 2

MSW would be delivered to the processing facility by truck. The MSW would then be processed to extract as much recyclable material as possible. The processing line is expected to include air separators, magnets, eddy current separators, screen and a picking line. It is expected that this processing can extract 20% of the MSW as recyclable material. Processing at this point is the same as Alternative 1. In Alternative 2, the residual MSW would be gasified. The syngas produced would be used to generate electricity. The ash remaining after the gasification process would be sent out of state for disposal by rail.

After evaluating the two alternatives it was determined that, although MSW gasification is a proven technology, there are no commercial applications at the proposed scale. As such it was determined that the technology has not demonstrated the required reliability and economic viability necessary to justify the capital investment. PPNE will reevaluate the use of gasification in the future and may opt to add a gasification system to the biosolids processing in the future.

Alternative 1 was selected for project development

Both Alternative 1 and 2 utilize the rail sidetrack constructed in phase 1 for the handling of glass. As with handling glass, as a result of landfill closures, truck transport to disposal sites is uneconomical by truck. Appendix E from the 2016 update of the Massachusetts Solid Waste Master Plan was considered as part of this analysis. This is a map of the state showing the location of landfills and combustion facilities in Massachusetts. Since this map was published, the Fall River landfill has closed, the Bourne landfill has become an ash landfill for ash generated at SEMAS and Crapo Hill Landfill is largely limited to member towns. The Taunton Landfill will close in 2021, the Southbridge Landfill has closed at the end of 2018, the Chicopee Landfill is closing in 2019 and the Carver Landfill is closing in 2021. Massachusetts is currently exporting waste to other states and the tonnage being exported is expected to dramatically increase. Trucking to out of state landfills is uneconomical and increases impacts to the roadway networks as well as greenhouse gas emissions. In addition, there is currently a nationwide shortage of trucking capacity. Parallel Products will utilize rail for MSW disposal as part of its business strategy

Biosolids Drying

A biosolids drying facility will be constructed in Phase 2 of the project development. The project is being developed to address the need for local biosolids processing. Currently, most of the biosolids generated in southeastern Massachusetts are transported out of state for processing or disposal. The proposed project will provide a local in-state alternative for processing biosolids. Processing of biosolids will consist of drying the biosolids to reduce the volume and tonnage of the material that needs to be disposed in a landfill. Two biosolids processing alternatives have been evaluated.

One alternative is to dry the biosolids in a dryer using natural gas as a heat source. The second alternative is the use a gasification process to gasify the dried biosolids to create a syn gas. This syn gas would be combusted in a thermal oxidizer with the heat generated used to dry incoming biosolids.

PPNE has determined that the gasification of biosolids is not a commercially proven technology and therefore has selected the natural gas drying alternative. PPNE will construct the facility of sufficient size that a gasification component can be added in the future. PPNE is currently evaluating the potential to add a gasification component to the biosolids processing facility and may decide to add gasification in the future.

Site Selection

There are limited alternatives for locating a truck to rail solid waste handling facility in southeastern Massachusetts that would be considered adequate from both a user and regulatory perspective. An necessary factor is the any suitable site must be located adjacent to an existing active rail line. Rail service to the selected site area runs from Taunton to New Bedford. Suitable sites are limited to the lands abutting these rail lines.

A suitable site for the proposed use must be zoned industrial with a solid waste handling as an acceptable use.

A suitable site must comply with the Massachusetts solid waste siting regulations at 310 CMR 16.00. This regulation includes restrictive siting criteria for the waste handling area of solid waste handling facilities including:

1. The waste handling area of a transfer station cannot be located within a Zone II of a public water supply, within an Interim Wellhead Protection Area of a public water supply, within a Zone I of a public water supply or within 250 feet of an existing well.

2. The waste handling area of the facility cannot be within 500 feet of an occupied residential dwelling.

3. The waste handling area of a facility cannot be within a Riverfront Area

4. A facility cannot be located on land classified as Prime, Unique or of State and Local Importance

5. A facility cannot be located where traffic impacts will constitute a danger to the public health, safety or the environment

6. A facility cannot be located where siting would have an adverse impact on Endangered, Threatened or Special Concern species, on Ecologically Significant Natural Communities or on any state Wildlife Management Area

7. A facility cannot be located within an Area of Critical Environmental Concern or would fail to protect the outstanding resources of an ACEC

8. A facility cannot be located where the facility would have an adverse impact on state forests or municipal parklands.

9. A facility cannot be located where operation of the facility would result in nuisance conditions which would constitute a danger to the public health, safety or the environment considering noise, litter, vermin, odors, bird hazards to air traffic and other nuisance problems.

Three sites have been evaluated as potential sites for use as a solid waste handling facility. These sites are located at 100 Duchaine Boulevard, New Bedford, 1080 Shawmut Avenue, New Bedford and 781 Church Street, New Bedford. All three sites are located adjacent to the rail line. An evaluation of each site follows. The potential to purchase the sites other than the selected site has not been investigated.

Site 1-100 Duchaine Boulevard, New Bedford

This is the site that was selected for development. The site is approximately 71 acres zoned Industrial C with assessor's parcel ID 133-15. The site meets all of the siting criteria established by the MassDEP for siting a solid waste facility. The site has the space and buffereng necessary to develop a solid waste handling facility and to construct a rail sidetrack of sufficient length to provide the rail service required.

The site is located in the Industrial Park and traffic to the site has good access via Route 140. Truck traffic to the facility doesn't pass any residential homes.

Site 2-1080 Shawmut Avenue, New Bedford

This is a 3.6 acre site zoned Industrial B with assessor's parcel ID 123-20. A cursory review of this site indicates that the site meets all of the siting criteria established by MassDEP for siting a solid waste facility. The site abuts the existing rail line. It is expected that the project, when operating at full capacity, would fill 15 rail cars per day. Preliminary layouts for the facility at this location indicate that the site size is insufficient to include a 60,000 sf building and a rail sidetrack sufficient to fill 13 rail cars per day. As such, this site is deemed insufficient in size for the project proposed by Parallel Products.

Site 3-781 Church Street, New Bedford

This site is a 21.86 acre site zoned Industrial C with assessor's parcel ID 129-41. The site abuts the existing rail line. A cursory review of this site indicates that the site meets all of the siting criteria established by MassDEP for siting a solid waste facility. The project is somewhat constrained by wetlands but sufficient land is available for an enclosed handling building and a sidetrack capable of handling and filling 13 rail cars per day.

Access to the site requires truck traffic to pass numerous residential homes and New Bedford Vocational Technical High School. This traffic situation is likely to be considered a nuisance condition and as such would not meet the MassDEP criterial for a solid waste facility. As such, this site was not considered a viable site for the proposed project.

NOTE*: The purpose of the alternatives analysis is to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment, keeping in mind that the objective of the MEPA review process is to avoid or minimize damage to the environment to the greatest extent feasible. Examples of alternative projects include alternative site locations, alternative site uses, and alternative site configurations.*

Summarize the mitigation measures proposed to offset the impacts of the preferred alternative:

1. The project is being constructed on a previously disturbed and largely abandoned site in an industrial zone.
2. Project is maximizing the use of existing infrastructure, including access roads and buildings.
3. The project is filling a need for recycling of deposit system glass bottles
4. The project is providing a solution for the lack of landfill disposal options within the state by providing a rail alternative that will provide access to out of state disposal options
5. Reduction in greenhouse gas emissions based on the use of rail for out bound waste shipment
6. Compliance with Massachusetts Stormwater Management Policy
7. Compliance with Solid Waste Management Regulations including waste ban regulations
8. Provides an in-state solution for biosolids treatment and disposal.
9. Potential nuisance conditions (odor, noise, traffic, emissions) have been evaluated in detail and mitigation

measures have been incorporated, if necessary.

If the project is proposed to be constructed in phases, please describe each phase:
The proposed project will be constructed in two phases as follows:

Phase 1 includes the following elements

- Construction of glass processing building and equipment
- Construction of rail side track from mainline to the glass processing area
- Construction of 1.9 MW of photovoltaic solar power constructed on canopy system(s) under the SMART Program

Phase 2 includes the following elements

- Construction of a MSW processing and handling facility
- Construction of a biosolids drying facility
- Expansion of the rail side track to provide for out bound shipment of MSW residuals

Additional definition of the project phases is included in the project description above.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN:

Is the project within or adjacent to an Area of Critical Environmental Concern?
☐Yes (Specify____________________________________)
☒ **No**

if yes, does the ACEC have an approved Resource Management Plan? ___ Yes ___ No;
If yes, describe how the project complies with this plan.
____
Will there be stormwater runoff or discharge to the designated ACEC? ___ Yes ___ No;
If yes, describe and assess the potential impacts of such stormwater runoff/discharge to the designated ACEC.
____

RARE SPECIES:

Does the project site include Estimated and/or Priority Habitat of State-Listed Rare Species? (see http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/priority_habitat/priority_habitat_home.htm)
☐Yes (Specify____________________________________) ☒ **No**

HISTORICAL /ARCHAEOLOGICAL RESOURCES:

Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?
☐Yes (Specify____________________________________) ☒ **No**

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources? ☐Yes (Specify____________________________________) ☐No

WATER RESOURCES:

Is there an Outstanding Resource Water (ORW) on or within a half-mile radius of the project site? ☐Yes ☒ **No**

if yes, identify the ORW and its location. ____

(NOTE: Outstanding Resource Waters include Class A public water supplies, their tributaries, and bordering wetlands; active and inactive reservoirs approved by MassDEP; certain waters within Areas of Critical Environmental Concern, and certified vernal pools. Outstanding resource waters are listed in the Surface Water Quality Standards, 314 CMR 4.00.)

Are there any impaired water bodies on or within a half-mile radius of the project site? ___Yes X No; if yes, identify the water body and pollutant(s) causing the impairment:______________________________________.

Is the project within a medium or high stress basin, as established by the Massachusetts

Water Resources Commission? ☐Yes ☒ **No**

STORMWATER MANAGEMENT:

Generally describe the project's stormwater impacts and measures that the project will take to comply with the standards found in MassDEP's Stormwater Management Regulations:

The project is being developed to utilize the existing infrastructure of the site as developed by the previous owners. Existing access roads and existing buildings will be used to the maximum extent possible. New buildings are being constructed largely on areas that are currently impervious.

The site has an existing stormwater management plan in place. Existing stormwater basins and catch basin systems will be used and expanded if necessary to comply with current Stormwater Management Regulations.

MASSACHUSETTS CONTINGENCY PLAN:

Has the project site been, or is it currently being, regulated under M.G.L.c.21E or the Massachusetts Contingency Plan? ? ☒**Yes** ☐ ***No***; if yes, please describe the current status of the site (including Release Tracking Number (RTN), cleanup phase, and Response No
Action Outcome classification): **See table**

Release Substance/Amount	**Date Reported/Agency**	**Release Tracking Number (RTN)**	**Remedial Actions Taken**	**Regulatory Outcome**	**Source (**)**
Liquid Latex Spill to roadway and wooded areas	1978 to Fire Prevention	Not assigned	Vacuumed up Latex	No Enforcement	Fire Prevention
Silver Nitrate Spill (600 Gallons)	1979 to EPA	Not assigned	Installation of booms, sandbags, potassium bromite	No confirmatory testing completed of soil or groundwater	Fire Prevention
1,000-5,000 pounds of virgin hazardous substances in the form of Tamol 731 was spilled from drums	1992	Not assigned	Unknown	Spill Closed	ERIS Datamap Report
Ethylene Glycol (Continuous Release)	1993-Identified as historic spill	Not assigned	Unknown	Spill Closed	ERIS Datamap Report
Liquid Latex overflow of the on-site waste water treatment plant mix tank	1993-Identified as historic spill	Not assigned	Unknown	Spill Closed	ERIS Datamap Report
Methyl Ethyl Ketone (MEK) 300 gallons interior of chemical mixing plant	1994 to Fire Preventio	Not assigned	Unknown	No Enforcement	Fire Prevention
Process Waste Line Break	1994 to Fire Preventio	RTN 4-10618	Installation of two shallow wells-GW and soil sampling	Retraction of RTN	Previous Phase I ESA by Delta Environmental Consultants
A release of #6 fuel oil	1993 to MassDEP	RTN 4-10113	Monitoring	Class B-1 RAO in 1994. MassDEP Audit complet in 1995	MassDEP online records
2,400 gallons of sulfuric acid occurred from the waste water treatment plant area	March 2008 to MassD	RTN 4-16316	Excavation and Monitoring	Class A-1 RAO in 2006. MassDEP Audit complet in 2008	MassDEP online records

Source: Phase I Environmental Site Assessment prepared for 100 Duchaine Boulevard, New Bedford by Sage Environmental dated October 2016

Is there an Activity and Use Limitation (AUL) on any portion of the project site? ☐Yes ☒ **No**
if yes, describe which portion of the site and how the project will be consistent with the AUL:
____________________.

Are you aware of any Reportable Conditions at the property that have not yet been assigned an RTN?
☐Yes ☒ **No**; if yes, please describe:___________________________________

SOLID AND HAZARDOUS WASTE:

If the project will generate solid waste during demolition or construction, describe alternatives considered for re-use, recycling, and disposal of, e.g., asphalt, brick, concrete, gypsum, metal, wood:

Demolition and construction activity will result in the generation of solid waste. The construction and demolition waste generated by the project will be sent to licensed construction and demolition waste processors to maximize recycling of the waste materials.

(NOTE: Asphalt pavement, brick, concrete and metal are banned from disposal at Massachusetts landfills and waste combustion facilities and wood is banned from disposal at Massachusetts landfills. See 310 CMR 19.017 for the complete list of banned materials.)

Will your project disturb asbestos containing materials? ☐Yes ☒ **No**;
if yes, please consult state asbestos requirements at http://mass.gov/MassDEP/air/asbhom01.htm

Describe anti-idling and other measures to limit emissions from construction equipment: ________________

DESIGNATED WILD AND SCENIC RIVER:

Is this project site located wholly or partially within a defined river corridor of a federally designated Wild and Scenic River or a state designated Scenic River? ☐Yes ☒ **No**;
if yes, specify name of river and designation:

If yes, does the project have the potential to impact any of the "outstandingly remarkable" resources of a federally Wild and Scenic River or the stated purpose of a state designated Scenic River?
Yes ___ No ___ ; if yes, specify name of river and designation: _____________;
if yes, will the project will result in any impacts to any of the designated "outstandingly remarkable" resources of the Wild and Scenic River or the stated purposes of a Scenic River.
Yes ___ No ___ ;
if yes,describe the potential impacts to one or more of the "outstandingly remarkable" resources or stated purposes and mitigation measures proposed.

ATTACHMENTS:

1. List of all attachments to this document.
2. U.S.G.S. map (good quality color copy, 8-½ x 11 inches or larger, at a scale of 1:24,000) indicating the project location and boundaries.
3.. Plan, at an appropriate scale, of existing conditions on the project site and its immediate environs, showing all known structures, roadways and parking lots, railroad rights-of-way, wetlands and water bodies, wooded areas, farmland, steep slopes, public open spaces, and major utilities.
4 Plan, at an appropriate scale, depicting environmental constraints on or adjacent to the project site such as Priority and/or Estimated Habitat of state-listed rare species, Areas of Critical Environmental Concern, Chapter 91 jurisdictional areas, Article 97 lands, wetland resource area delineations, water supply protection areas, and historic resources

and/or districts.

5. Plan, at an appropriate scale, of proposed conditions upon completion of project (if construction of the project is proposed to be phased, there should be a site plan showing conditions upon the completion of each phase).
6. List of all agencies and persons to whom the proponent circulated the ENF, in accordance with 301 CMR 11.16(2).
7. List of municipal and federal permits and reviews required by the project, as applicable.

LAND SECTION – all proponents must fill out this section

I. Thresholds / Permits

A. Does the project meet or exceed any review thresholds related to **land** (see 301 CMR 11.03(1)
☐Yes ☒ **No**; if yes, specify each threshold:

II. Impacts and Permits

A. Describe, in acres, the current and proposed character of the project site, as follows:

	Existing	Change	Total
Footprint of buildings	________	________	________
Internal roadways	________	________	________
Parking and other paved areas	________	________	________
Other altered areas	________	________	________
Undeveloped areas	________	________	________
Total: Project Site Acreage	________	________	________

B. Has any part of the project site been in active agricultural use in the last five years?
___ Yes ___ No; if yes, how many acres of land in agricultural use (with prime state or locally important agricultural soils) will be converted to nonagricultural use?

C. Is any part of the project site currently or proposed to be in active forestry use?
___ Yes ___ No; if yes, please describe current and proposed forestry activities and indicate whether any part of the site is the subject of a forest management plan approved by the Department of Conservation and Recreation:

D. Does any part of the project involve conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97? ___ Yes ___ No; if yes, describe:

E. Is any part of the project site currently subject to a conservation restriction, preservation restriction, agricultural preservation restriction or watershed preservation restriction? ___ Yes___ No; if yes, does the project involve the release or modification of such restriction? ___ Yes ___ No; if yes, describe:

F. Does the project require approval of a new urban redevelopment project or a fundamental change in an existing urban redevelopment project under M.G.L.c.121A? ___ Yes ___ No; if yes, describe:

G. Does the project require approval of a new urban renewal plan or a major modification of an existing urban renewal plan under M.G.L.c.121B? Yes ___ No ___; if yes, describe:

III. Consistency

A. Identify the current municipal comprehensive land use plan
Title:__________________________ Date___________________

B. Describe the project's consistency with that plan with regard to:
1) economic development _______________________
2) adequacy of infrastructure _____________________
3) open space impacts ___________________________
4) compatibility with adjacent land uses_______________

C. Identify the current Regional Policy Plan of the applicable Regional Planning Agency (RPA)
RPA: ____________________

Title:___________________________ Date____________________

D. Describe the project's consistency with that plan with regard to:
   1) economic development _________________________
   2) adequacy of infrastructure ________________________
   3) open space impacts _____________________________

RARE SPECIES SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **rare species or habitat** (see 301 CMR 11.03(2))? ☐Yes ☒ **No**; if yes, specify, in quantitative terms:

(NOTE: If you are uncertain, it is recommended that you consult with the Natural Heritage and Endangered Species Program (NHESP) prior to submitting the ENF.)

B. Does the project require any state permits related to **rare species or habitat**? ___ Yes _X_No

C. Does the project site fall within mapped rare species habitat (Priority or Estimated Habitat?) in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes _X__ No.

D. If you answered "No" to <u>all</u> questions A, B and C, proceed to the **Wetlands, Waterways, and Tidelands Section**. If you answered "Yes" to <u>either</u> question A or question B, fill out the remainder of the Rare Species section below.

II. Impacts and Permits

A. Does the project site fall within Priority or Estimated Habitat in the current Massachusetts Natural Heritage Atlas (attach relevant page)? ___ Yes ___ No. If yes,

1. Have you consulted with the Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP)? ___Yes ___No; if yes, have you received a determination as to whether the project will result in the "take" of a rare species? ___ Yes ___ No; if yes, attach the letter of determination to this submission.

2. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate rare species impacts

3. Which rare species are known to occur within the Priority or Estimated Habitat?

4. Has the site been surveyed for rare species in accordance with the Massachusetts Endangered Species Act? ___ Yes ___ No

4. If your project is within Estimated Habitat, have you filed a Notice of Intent or received an Order of Conditions for this project? ___ Yes ___ No; if yes, did you send a copy of the Notice of Intent to the Natural Heritage and Endangered Species Program, in accordance with the Wetlands Protection Act regulations? ___ Yes ___ No

B. Will the project "take" an endangered, threatened, and/or species of special concern in accordance with M.G.L. c.131A (see also 321 CMR 10.04)? ___ Yes ___ No; if yes, provide a summary of proposed measures to minimize and mitigate impacts to significant habitat:

WETLANDS, WATERWAYS, AND TIDELANDS SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wetlands, waterways, and tidelands** (see 301 CMR 11.03(3))? ☐Yes ☒ **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits (or a local Order of Conditions) related to **wetlands, waterways, or tidelands**? ☒**Yes** ☐ No; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Water Supply Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wetlands, Waterways, and Tidelands Section below.

II. Wetlands Impacts and Permits

A. Does the project require a new or amended Order of Conditions under the Wetlands Protection Act (M.G.L. c.131A)? X Yes ___ No; if yes, has a Notice of Intent been filed? ___ Yes X No; if yes, list the date and MassDEP file number: ______; if yes, has a local Order of Conditions been issued? ___ Yes ___ No; Was the Order of Conditions appealed? ___ Yes ___ No. Will the project require a Variance from the Wetlands regulations? ___ Yes X No.

B. Describe any proposed permanent or temporary impacts to wetland resource areas located on the project site:

Wetland areas need to be filled in order to construct a new rail sidetrack to the site. The wetland areas include bordering vegetated wetlands and land under water as a new culvert will be constructed to cross and existing drainage swale.

C. Estimate the extent and type of impact that the project will have on wetland resources, and indicate whether the impacts are temporary or permanent:

Wetland impacts will be permanent as the rail sidetrack construction will be a permanent site feature. The size of the wetland area impacted has been minimized by constructing retaining walls to retain the fill required by the track construction

Coastal Wetlands	Area (square feet) or Length (linear feet)	Temporary or Permanent Impact?
Land Under the Ocean	0	
Designated Port Areas	0	
Coastal Beaches	0	
Coastal Dunes	0	
Barrier Beaches	0	
Coastal Banks	0	
Rocky Intertidal Shores	0	
Salt Marshes	0	
Land Under Salt Ponds	0	
Land Containing Shellfish	0	
Fish Runs	0	
Land Subject to Coastal Storm Flowage	0	

Inland Wetlands		
Bank (lf)	60	
Bordering Vegetated Wetlands	4,436	
Isolated Vegetated Wetlands	0	
Land under Water	350	
Isolated Land Subject to Flooding	0	
Bordering Land Subject to Flooding	0	
Riverfront Area	1500	

D. Is any part of the project:

1. proposed as a **limited project**? ___ Yes X No; if yes, what is the area (in sf)?____
2. the construction or alteration of a **dam**? ___ Yes X No; if yes, describe:
3. fill or structure in a **velocity zone** or **regulatory floodway**? ___ Yes X No
4. dredging or disposal of dredged material? ___ Yes X No; if yes, describe the volume of dredged material and the proposed disposal site:
5. a discharge to an **Outstanding Resource Water (ORW)** or an **Area of Critical Environmental Concern (ACEC)**? ___ Yes X No
6. subject to a wetlands restriction order? ___ Yes X No; if yes, identify the area (in sf):
7. located in buffer zones? ___Yes ___No; if yes, how much (in sf) ______

E. Will the project:

1. be subject to a local wetlands ordinance or bylaw? X Yes ___ No
2. alter any federally-protected wetlands not regulated under state law? ___ Yes _X__ No; if yes, what is the area (sf)?

III. Waterways and Tidelands Impacts and Permits

A. Does the project site contain waterways or tidelands (including filled former tidelands) that are subject to the Waterways Act, M.G.L.c.91? ☐Yes ☒ **No**; if yes, is there a current Chapter 91 License or Permit affecting the project site? ☐Yes ☐ No; if yes, list the date and license or permit number and provide a copy of the historic map used to determine extent of filled tidelands:

D. Does the project require a new or modified license or permit under M.G.L.c.91? ☐Yes ☒ **No**; if yes, how many acres of the project site subject to M.G.L.c.91 will be for non-water-dependent use? Current ___ Change ___ Total ___

If yes, how many square feet of solid fill or pile-supported structures (in sf)?

C. For non-water-dependent use projects, indicate the following:

Area of filled tidelands on the site: 0
Area of filled tidelands covered by buildings: 0
For portions of site on filled tidelands, list ground floor uses and area of each use:
None
Does the project include new non-water-dependent uses located over flowed tidelands?
Yes ___ No X
Height of building on filled tidelands 0

Also show the following on a site plan: Mean High Water, Mean Low Water, Water-dependent Use Zone, location of uses within buildings on tidelands, and interior and exterior areas and facilities dedicated for public use, and historic high and historic low water marks.
Not Applicable

D. Is the project located on landlocked tidelands? ☐Yes ☒ **No**; if yes, describe the project's impact on the public's right to access, use and enjoy jurisdictional tidelands and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

E. Is the project located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations? ☐Yes ☒ **No**; if yes, describe the project's impact on groundwater levels and describe measures the project will implement to avoid, minimize or mitigate any adverse impact:

F. Is the project non-water-dependent **and** located on landlocked tidelands **or** waterways or tidelands subject to the Waterways Act **and** subject to a mandatory EIR? ☐Yes ☒ **No**; *(NOTE: If yes, then the project will be subject to Public Benefit Review and Determination.)*

G. Does the project include dredging? ☐Yes ☒ **No**; if yes, answer the following questions:
What type of dredging? Improvement ___ Maintenance ___ Both ____
What is the proposed dredge volume, in cubic yards (cys) _________
What is the proposed dredge footprint ____length (ft) ___width (ft)____depth (ft);
Will dredging impact the following resource areas?
Intertidal Yes__ No__; if yes, ___ sq ft
Outstanding Resource Waters Yes__ No__; if yes, ___ sq ft
Other resource area (i.e. shellfish beds, eel grass beds) Yes__ No__; if yes __ sq ft
If yes to any of the above, have you evaluated appropriate and practicable steps to: 1) avoidance; 2) if avoidance is not possible, minimization; 3) if either avoidance or minimize is not possible, mitigation?
If no to any of the above, what information or documentation was used to support this determination?
Provide a comprehensive analysis of practicable alternatives for improvement dredging in accordance with 314 CMR 9.07(1)(b). Physical and chemical data of the sediment shall be included in the comprehensive analysis.
Sediment Characterization
Existing gradation analysis results? __Yes ___No: if yes, provide results.
Existing chemical results for parameters listed in 314 CMR 9.07(2)(b)6? ___Yes ____No; if yes, provide results.
Do you have sufficient information to evaluate feasibility of the following management options for dredged sediment? If yes, check the appropriate option.

Beach Nourishment ___
Unconfined Ocean Disposal ___
Confined Disposal:
Confined Aquatic Disposal (CAD) ___
Confined Disposal Facility (CDF) ___
Landfill Reuse in accordance with COMM-97-001 ___
Shoreline Placement ___
Upland Material Reuse____
In-State landfill disposal____
Out-of-state landfill disposal ____
(NOTE: This information is required for a 401 Water Quality Certification.)

IV. Consistency:

A. Does the project have effects on the coastal resources or uses, and/or is the project located within the Coastal Zone? ☐Yes ☒ **No**; if yes, describe these effects and the projects consistency with the policies of the Office of Coastal Zone Management:

B. Is the project located within an area subject to a Municipal Harbor Plan? ☐Yes ☒ **No**; if yes, identify the Municipal Harbor Plan and describe the project's consistency with that plan:

WATER SUPPLY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **water supply** (see 301 CMR 11.03(4))? ☐Yes ☒ **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **water supply**? ☐Yes ☒ **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Wastewater Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Water Supply Section below.

II. Impacts and Permits

A. Describe, in gallons per day (gpd), the volume and source of water use for existing and proposed activities at the project site:

	Existing	Change	Total
Municipal or regional water supply	________	________	________
Withdrawal from groundwater	________	________	________
Withdrawal from surface water	________	________	________
Interbasin transfer	________	________	________

(NOTE: Interbasin Transfer approval will be required if the basin and community where the proposed water supply source is located is different from the basin and community where the wastewater from the source will be discharged.)

B. If the source is a municipal or regional supply, has the municipality or region indicated that there is adequate capacity in the system to accommodate the project? ___ Yes ___ No

C. If the project involves a new or expanded withdrawal from a groundwater or surface water source, has a pumping test been conducted? ___ Yes ___ No; if yes, attach a map of the drilling sites and a summary of the alternatives considered and the results. ______________

D. What is the currently permitted withdrawal at the proposed water supply source (in gallons per day)? _____Will the project require an increase in that withdrawal? ___Yes ___No; if yes, then how much of an increase (gpd)? ____________________

E. Does the project site currently contain a water supply well, a drinking water treatment facility, water main, or other water supply facility, or will the project involve construction of a new facility? ___ Yes ___No. If yes, describe existing and proposed water supply facilities at the project site:

	Permitted Flow	Existing Avg Daily Flow	Project Flow	Total
Capacity of water supply well(s) (gpd)	_______	________	________	________
Capacity of water treatment plant (gpd)	_______	________	________	________

F. If the project involves a new interbasin transfer of water, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or proposed?

G. Does the project involve:

1. new water service by the Massachusetts Water Resources Authority or other agency of the Commonwealth to a municipality or water district? ___ Yes ___ No
2. a Watershed Protection Act variance? ___ Yes ___ No; if yes, how many acres of alteration?
3. a non-bridged stream crossing 1,000 or less feet upstream of a public surface drinking

water supply for purpose of forest harvesting activities? ___ Yes ___ No

III. Consistency

Describe the project's consistency with water conservation plans or other plans to enhance water resources, quality, facilities and services:

WASTEWATER SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **wastewater** (see 301 CMR 11.03(5))? ☒**Yes** ☐ No; if yes, specify, in quantitative terms:

The project will exceed the review threshold for wastewater under 301 CMR 11.03 (5)(a)(6). An ENF and Mandatory EIR is required for new capacity for the processing of 150 wet tpd of sewage sludge.

B. Does the project require any state permits related to **wastewater**? ☒**Yes** ☐ No; if yes, specify which permit:

According to MassDEP during multiple scoping sessions, the project is to be permitted by MassDEP solid waste section under 310 CMR 16.00 and 310 CMR 19.000

C. If you answered "No" to both questions A and B, proceed to the **Transportation -- Traffic Generation Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Wastewater Section below.

II. Impacts and Permits

A. Describe the volume (in gallons per day) and type of disposal of wastewater generation for existing and proposed activities at the project site (calculate according to 310 CMR 15.00 for septic systems or 314 CMR 7.00 for sewer systems):

	Existing	Change	Total
Discharge of sanitary wastewater gpd	375	83,000	83,150
Discharge of industrial wastewater gpd	0	<5	<5
TOTAL **gpd**	375	83,000	83,150
	Existing	Change	Total
Discharge to groundwater gpd	0	0	0
Discharge to outstanding resource water gpd	0	0	0
Discharge to municipal or regional wastewater facility gpd	375	83,000	83,150
TOTAL **gpd**	375	83,000	83,150

B. Is the existing collection system at or near its capacity? ☐Yes ☒ **No**; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

D. Is the existing wastewater disposal facility at or near its permitted capacity? ☐Yes ☒ **No**; if yes, then describe the measures to be undertaken to accommodate the project's wastewater flows:

Discharge is to the City of New Bedford sewer system

D. Does the project site currently contain a wastewater treatment facility, sewer main, or other wastewater disposal facility, or will the project involve construction of a new facility? ☐Yes ☒ **No** if yes, describe as follows:

	Permitted	Existing Avg Daily Flow	Project Flow	Total
Wastewater treatment plant capacity (in gallons per day)	______	________	________	________

E. If the project requires an interbasin transfer of wastewater, which basins are involved, what is the direction of the transfer, and is the interbasin transfer existing or new?

No interbasin transfer of wastewater exists or is proposed.

(NOTE: Interbasin Transfer approval may be needed if the basin and community where wastewater will be discharged is different from the basin and community where the source of water supply is located.)

F. Does the project involve new sewer service by the Massachusetts Water Resources Authority (MWRA) or other Agency of the Commonwealth to a municipality or sewer district? ☐Yes ☒ **No**

G. Is there an existing facility, or is a new facility proposed at the project site for the storage, treatment, processing, combustion or disposal of sewage sludge, sludge ash, grit, screenings, wastewater reuse (gray water) or other sewage residual materials? ☒**Yes** ☐ No; if yes, what is the capacity (tons per day):

	Existing	Change	Total
Storage	0	50	50
Treatment	0	50	50
Processing	0	50	50
Combustion			
Disposal			

*Note that facility is 50 dry tons in aggregate.

H. Describe the water conservation measures to be undertaken by the project, and other wastewater mitigation, such as infiltration and inflow removal.

Wastewater is primarily due to water removed from biosolids either by dewatering or by drying/condensing.

III. Consistency

A. Describe measures that the proponent will take to comply with applicable state, regional, and local plans and policies related to wastewater management:

Project will require state and local permits. Presently, biosolids are being trucked out of state for treatment and disposal. PPNE will construct a facility to collect and process this material in Massachusetts and then ship the residual waste out of state by rail for disposal. The processing proposed will also significantly increase transportation efficiencies and reduce greenhouse gas emissions. This facility will help local communities in the Commonwealth handle and overriding need to find outlets for this material.

B. If the project requires a sewer extension permit, is that extension included in a comprehensive wastewater management plan? ☐Yes ☒ **No** if yes, indicate the EEA number for the plan and whether the project site is within a sewer service area recommended or approved in that plan:

TRANSPORTATION SECTION (TRAFFIC GENERATION)

I. Thresholds / Permit

A. Will the project meet or exceed any review thresholds related to **traffic generation** (see 301 CMR 11.03(6))? ☐Yes ☒ **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **state-controlled roadways**? ☐Yes ☒ **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Roadways and Other Transportation Facilities Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Traffic Generation Section below.

II. Traffic Impacts and Permits

A. Describe existing and proposed vehicular traffic generated by activities at the project site:

	Existing	Change	Total
Number of parking spaces	_______	________	_______
Number of vehicle trips per day	________	________	________
ITE Land Use Code(s):	________	________	________

B. What is the estimated average daily traffic on roadways serving the site?

Roadway	Existing	Change	Total
1. ___________________	________	________	________
2. ____________________	________	________	________
3. ____________________	________	________	________

C. If applicable, describe proposed mitigation measures on state-controlled roadways that the project proponent will implement:

D. How will the project implement and/or promote the use of transit, pedestrian and bicycle facilities and services to provide access to and from the project site?

C. Is there a Transportation Management Association (TMA) that provides transportation demand management (TDM) services in the area of the project site? ____ Yes ____ No; if yes, describe if and how will the project will participate in the TMA:

D. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation facilities? ____ Yes ____ No; if yes, generally describe:

E. If the project will penetrate approach airspace of a nearby airport, has the proponent filed a Massachusetts Aeronautics Commission Airspace Review Form (780 CMR 111.7) and a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (FAA) (CFR Title 14 Part 77.13, forms 7460-1 and 7460-2)?

III. Consistency

Describe measures that the proponent will take to comply with municipal, regional, state, and federal plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services:

TRANSPORTATION SECTION (ROADWAYS AND OTHER TRANSPORTATION FACILITIES)

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **roadways or other transportation facilities** (see 301 CMR 11.03(6))? ☐Yes ☒ **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **roadways or other transportation facilities**? ☐Yes ☒ **No**; if yes, specify which permit:

C. If you answered "No" to both questions A and B, proceed to the **Energy Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Roadways Section below.

II. Transportation Facility Impacts

A. Describe existing and proposed transportation facilities in the immediate vicinity of the project site:

B. Will the project involve any

1. Alteration of bank or terrain (in linear feet)? ____________
2. Cutting of living public shade trees (number)? ____________
3. Elimination of stone wall (in linear feet)? ____________

III. Consistency -- Describe the project's consistency with other federal, state, regional, and local plans and policies related to traffic, transit, pedestrian and bicycle transportation facilities and services, including consistency with the applicable regional transportation plan and the Transportation Improvements Plan (TIP), the State Bicycle Plan, and the State Pedestrian Plan:

ENERGY SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **energy** (see 301 CMR 11.03(7))?
☐Yes ☒ **No**; if yes, specify, in quantitative terms:

C. Does the project require any state permits related to **energy**? ☒Yes ☐ **No**; if yes, specify which permit:

Facility requires approval under the SMART program administered by DOER

C. If you answered "No" to both questions A and B, proceed to the **Air Quality Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Energy Section below.

II. Impacts and Permits

A. Describe existing and proposed energy generation and transmission facilities at the project site:

	Existing	Change	Total
Capacity of electric generating facility (megawatts)	1.5	1.9	3.4
Length of fuel line (in miles)	________	________	________
Length of transmission lines (in miles)	________	________	________
Capacity of transmission lines (in kilovolts)	________	________	________

B. If the project involves construction or expansion of an electric generating facility, what are:

1. the facility's current and proposed fuel source(s)? Solar Power
2. the facility's current and proposed cooling source(s)? None

C. If the project involves construction of an electrical transmission line, will it be located on a new, unused, or abandoned right of way? ___Yes X No; if yes, please describe:

Transmission line construction is not included in project

D. Describe the project's other impacts on energy facilities and services:

III. Consistency

Describe the project's consistency with state, municipal, regional, and federal plans and policies for enhancing energy facilities and services:

AIR QUALITY SECTION

I. Thresholds

A. Will the project meet or exceed any review thresholds related to **air quality** (see 301 CMR 11.03(8))? ☐Yes ☒ **No**; if yes, specify, in quantitative terms:

B. Does the project require any state permits related to **air quality**? ☒Yes ☐ **No**; if yes, specify which permit:
Limited Plan Approval (BWP AQ01)

C. If you answered "No" to both questions A and B, proceed to the **Solid and Hazardous Waste Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Air Quality Section below.

II. Impacts and Permits

A. Does the project involve construction or modification of a major stationary source (see 310 CMR 7.00, Appendix A)? ___ Yes X No; if yes, describe existing and proposed emissions (in tons per day) of:

	Existing	Change	Total
Particulate matter	________	________	________
Carbon monoxide	________	________	________
Sulfur dioxide	________	________	________
Volatile organic compounds	________	________	________
Oxides of nitrogen	________	________	________
Lead	________	________	________
Any hazardous air pollutant	________	________	________
Carbon dioxide	________	________	________

B. Describe the project's other impacts on air resources and air quality, including noise impacts:

At PPNE's request, Epsilon Associates, Inc. has conducted a sound assessment and an air and odor analysis for evaluation of the proposed facility's sound, air, and odor impacts. The air impacts analysis conservatively considers the aggregate impact of on-site stationary sources and both on- and off-site mobile sources associated with the proposed project. Supporting reports are attached to this EENF.

The air analysis demonstrates that the proposed facility will not cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS). The sound assessment and air and odor analysis demonstrate MassDEP noise policy criteria, ambient air toxics criteria, and draft odor policy criteria will not be exceeded in the nearby residential neighborhoods as a result of this project.

All facility stacks have been designed for dispersion of air and odor emissions to meet the NAAQS and relevant criteria. Sound generating equipment placements have been selected and sound mitigation measures (including a noise barrier wall and silencers) have been designed into the proposed project in order to minimize sound impacts in the nearby residential neighborhoods.

III. Consistency

A. Describe the project's consistency with the State Implementation Plan:

The United States Environmental Protection Agency (USEPA) and MassDEP have promulgated regulations that establish ambient air quality standards and air emission limits and regulatory applicability thresholds, providing the bases for an evaluation of the potential impacts of proposed facilities on ambient air quality. In Massachusetts, for minor sources such as the proposed project, compliance with these regulatory requirements is administered through the MassDEP air plan approval process.

A review of key USEPA and MassDEP regulatory requirements is included in the air and odor analysis report. No specific USEPA air regulations apply. Compliance with applicable MassDEP regulatory requirements will ensure consistency with the State Implementation Plan (SIP). It is likely that the MassDEP air plan approval process will apply in the format of a limited plan approval (LPA).

B. Describe measures that the proponent will take to comply with other federal, state, regional, and local plans and policies related to air resources and air quality:

All facility stacks have been designed for dispersion of air and odor emissions to meet the USEPA NAAQS and other relevant criteria (MassDEP odor and air toxics). Sound generating equipment placements have been selected and sound mitigation measures (including a noise barrier wall and silencers) have been designed into the proposed project in order to minimize sound impacts in the nearby residential neighborhoods.

SOLID AND HAZARDOUS WASTE SECTION

I. Thresholds / Permits

A. Will the project meet or exceed any review thresholds related to **solid or hazardous waste** (see 301 CMR 11.03(9))? ☒**Yes** ☐ No; if yes, specify, in quantitative terms:

D. Does the project require any state permits related to **solid and hazardous waste**? ☒**Yes** ☐ No; if yes, specify which permit:

- Site Suitability (BWP SW-01)
- Authorization to Construct a Large Handling Facility (BWP SW-05)
- Authorization to Operate a Large Handling Facility (BWP SW-06)

C. If you answered "No" to both questions A and B, proceed to the **Historical and Archaeological Resources Section**. If you answered "Yes" to either question A or question B, fill out the remainder of the Solid and Hazardous Waste Section below.

II. Impacts and Permits

A. Is there any current or proposed facility at the project site for the storage, treatment, processing, combustion or disposal of solid waste? X Yes ___ No; if yes, what is the volume (in tons per day) of the capacity:

	Existing	Change	Total
Storage	0	1500	1500
Treatment, processing	0	1500	1500
Combustion	0	0	0
Disposal	0	0	0

B. Is there any current or proposed facility at the project site for the storage, recycling, treatment or disposal of hazardous waste? ___ Yes X No; if yes, what is the volume (in tons or gallons per day) of the capacity:

	Existing	Change	Total
Storage			
Recycling			
Treatment			
Disposal			

C. If the project will generate solid waste (for example, during demolition or construction), describe alternatives considered for re-use, recycling, and disposal:

D. If the project involves demolition, do any buildings to be demolished contain asbestos?
☐Yes ☒ **No**

E. Describe the project's other solid and hazardous waste impacts (including indirect impacts):

The project will have significant positive impacts including, methods for long term viable out-of-state transportation, greenhouse gas emission reductions, increase recycling rates, jobs, etc.

III. Consistency

Describe measures that the proponent will take to comply with the State Solid Waste Master Plan:

Project will be permitted by MassDEP. Compliance with the State Solid Waste Master Plan will be addressed in the Site Suitability permit and Authorization to Construct permit. It should be noted that processing MSW prior to disposal and/or waste to energy is considered state-of-the-art and fully complies with the goals and initiatives set forth within the Solid Waste Master Plan

HISTORICAL AND ARCHAEOLOGICAL RESOURCES SECTION

I. Thresholds / Impacts

A. Have you consulted with the Massachusetts Historical Commission? ☐Yes ☒ **No**; if yes, attach correspondence. For project sites involving lands under water, have you consulted with the Massachusetts Board of Underwater Archaeological Resources? ____Yes ____ No; if yes, attach correspondence

B. Is any part of the project site a historic structure, or a structure within a historic district, in either case listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ☐Yes ☒ **No** No; if yes, does the project involve the demolition of all or any exterior part of such historic structure? ___ Yes ___ No; if yes, please describe:

C. Is any part of the project site an archaeological site listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth? ☐Yes ☒ **No**; if yes, does the project involve the destruction of all or any part of such archaeological site? ☐Yes ☒ **No**; if yes, please describe:

D. If you answered "No" to <u>all parts of both</u> questions A, B and C, proceed to the **Attachments and Certifications** Sections. If you answered "Yes" to <u>any part of either</u> question A or question B, fill out the remainder of the Historical and Archaeological Resources Section below.

II. Impacts

Describe and assess the project's impacts, direct and indirect, on listed or inventoried historical and archaeological resources:

III. Consistency

Describe measures that the proponent will take to comply with federal, state, regional, and local plans and policies related to preserving historical and archaeological resources:

CERTIFICATIONS:

1. The Public Notice of Environmental Review has been/will be published in the following newspapers in accordance with 301 CMR 11.15(1):

New Bedford Standard Times	February 13, 2019
Portuguese Times	February 13, 2019
El Planeta	February 8, 2019

2. This form has been circulated to Agencies and Persons in accordance with 301 CMR 11.16(2).

Signatures:

	2-11-19
Date Signature of Responsible Officer or Proponent	Date Signature of person preparing ENF (if different from above)
Tim Cusson	Whitney Hall
Name (print or type)	Name (print or type)
Parallel Products of New England, LLC	Green Seal Environmental, Inc.
Firm/Agency	Firm/Agency
100 Duchaine Boulevard	114 State Road
Street	Street
New Bedford	Sagamore Beach
Municipality/State/Zip	Municipality/State/Zip
Massachusetts 02746	Massachusetts 02562
Phone	Phone
508-884-5100	508-888-6034

APPENDIX LIST
MASSACHUSETTS ENVIRONMENTAL POLICY ACT
EXPANDED ENVIRONMENTAL NOTIFICATION FORM
(Satisfies the requirements of Attachment 1 of EENF)

APPENDIX	DESCRIPTION	COMMENTS
A	Draft Site Suitability Report	
	Narrative	Provides added project description as required for EENF
	Attachments	
	Attachment 1-Technical Fee	Technical fee will be paid prior to final Site Suitability Appl
	Attachment 2-MEPA Certificate	Will be included in final version of Site Suitability Appl.
	Attachment 3-Traffic Study	Included in EENF Appendix B
	Attachment 4-NHESP	Included in EENF Appendix H
	Attachment 5-Odor Modeling	Included in EENF Appendix D
	Attachment 6-Noise Assessment	Included in EENF Appendix D
	Attachment 7-Air Modeling	Included in EENF Appendix D
	Attachment 8-Equipment Specs	Included in EENF Appendix E
	Attachment 9-Biosolids Process Diag.	Provides added project description as required for EENF
	Attachment 10-Biosolids Equip Sizing	Provides added project description as required for EENF
	Inserts	
	Insert 1-USGS Site Locus	Satisfies the requirements of Attachment 2 of EENF
	Insert 2-Water Resources Plan	Satisfies the requirements of Attachment 4 of EENF
	Insert 3-Land Use Plan	Satisfies the requirements of Attachment 4 of EENF
	Insert 4-Existing Conditions Plan	Satisfies the requirements of Attachment 3 of EENF
	Insert 5-Proposed Conditions Plans	Satisfies the requirements of Attachment 5 of EENF
B	Traffic Impact Analysis Report	Provides added project description as required for EENF
C	Greenhouse Gas Emissions Report	Provides added project description as required for EENF
D	Air/Odor and Noise Report	Provides added project description as required for EENF
E	Equipment Specifications	Provides added project description as required for EENF
F	Mailing/Distribution List	Satisfies the requirement of Attachment 6 of EENF form
G	List of Required Permits	Satisfies the requirement of Attachment 7 of EENF form
H	Natural Heritage & Endangered Species Correspondence	Satisfies the requirement of Attachment 4 of EENF form
I	Public Notice Document	As required by Certifications Statement for EENF
J	Environmental Justice Analysis	Satisfies requirements of the Environmental Justice Policy

APPENDIX A

DRAFT - MASSDEP SITE SUITABILITY APPLICATION

PARALLEL PRODUCTS OF NEW ENGLAND, INC.

Draft Site Suitability Application - BWP SW 01

Solid Waste Processing and Transfer Station and Biosolids Processing Facility
100 Duchaine Boulevard
New Bedford, Massachusetts 02745

February 2019

Prepared For:

Parallel Products of New England, Inc.
100 Duchaine Boulevard
New Bedford, Massachusetts 02745

Green Seal Environmental, Inc.

114 State Road, Building B, Sagamore Beach, MA 02562 | Tel: (508) 888-6034 | Fax: (508) 888-1506 | www.gseenv.com

Site Suitability Introduction

Introduction

Green Seal Environmental, Inc. (GSE) has prepared the following document for the Massachusetts Department of Environmental Protection (MassDEP) on behalf of Parallel Products of New England (the "Applicant" or "PPNE") for the property at 100 Duchaine Boulevard, New Bedford, MA. Parallel Products New England headquarters is located at 100 Duchaine Boulevard, New Bedford, MA.

This application provides the necessary information for MassDEP to find the Facility/Site suitable to handle municipal solid waste (MSW) and construction and demolition debris (C&D), limited to a total of 1,500 tons/day and 450,000 tons annually, pursuant to the siting criteria of 310 CMR 16.00 applicable to this proposed site.

The facility will also accept 50 dry tons per day and 15,000 dry tons annually of biosolids generated at wastewater treatment plants. It was determined at a pre-application meeting with MassDEP that the biosolids processing would be permitted as a solid waste.

Information contained herein includes a Site Suitability Application (BWP SW 01), supporting narratives, attachments, and Inserts for the proposed site and surrounding area as required under 310 CMR 16.00.

How To Use This Document

This document coincides with the format of the MassDEP's Site Suitability application and contains the following information:

- Site Suitability application form (BWP SW 01) provided by MassDEP;
- A narrative that provides required information relative to each individual suitability criteria;
- Attachments that supplement certain sections of the application corresponding with that particular section (e.g., traffic analysis, MEPA, and NHESP); and
- Inserts/plans for comparison to the Site Suitability Criteria such as Water Resources and Land Uses, Existing Conditions, and Proposed Conditions.

Non-Applicability

In the sections of the Site Suitability Application that do not pertain to the project, the statement ***"not applicable"*** will appear. However, some of these sections will contain a narrative and/or justification statement. Where a statement is determined to be necessary, the reader will be directed to the appropriate section within this document and any supporting attachments or Inserts.

Site Suitability Table of Contents

Continued on next page

Site Suitability Table of Contents, *Continued*

Section I. General Information

Introduction

The following sections are addenda to the General Information section contained within the Site Suitability application and address the topics included in Section I of the application.

Section I Table of Contents

Section I of the Site Suitability Application (BWP SW 01) includes general project information. This section includes eight sections identified by the letters A through H. The title and page identification for each section is included in the table below. The following Section I table of contents references page numbers of this document, not the application forms.

Site Location and Project Description (A)

Site Location

PPNE proposes to construct and operate a 1,500 tons/day MSW and C&D handling, processing and transfer station and a 50 dry ton per day biosolids drying unit (the "Facility"). The proposed project is to be located at 100 Duchaine Boulevard, New Bedford, MA. Project development will also include a glass processing system for processing glass collected under the Massachusetts bottle deposit system and a 1.5 MW photovoltaic solar power installation mounted on a series of canopies. The glass processing operations and solar power installation does not require as a solid waste permit but will be discussed in this application as it is a project feature.

The site is an approximately 71 acre parcel identified by the New Bedford Tax Assessor as Lot 5 on Assessor's Plat 134. Affiliates of PPNE, SMRE 100 LLC and SMRE SUBLOT 20 own the property located at 100 Duchaine Boulevard, New Bedford, MA. The site is zoned Industrial C. A locus plan of the site location is included in Insert 1. The site is located within the New Bedford Business Park.

Insert 2, 3, 4 and 5 show the property lines and the proposed Site Assignment limits, waste handling area and relationships to various setbacks/receptors relevant to 310 CMR 16.40.

Continued on next page

Site Location and Project Description (A), *Continued*

Type of Facility

PPNE is proposing to construct a waste handling and processing facility. The project should be considered a state-of-the-art MSW and C&D handling, processing and transfer Facility with an integrated rail line and a biosolids drying facility. Waste handling will be performed within the proposed 50,000-square-foot metal framed/sheathed building and waste processing will be within an existing 103,000 sf building adjacent and connected to the proposed handling building. Loading of waste in to rail cars will be performed within the proposed 50,000 sf building. PPNE may store certain wastes and recyclable materials extracted from the waste outdoors in covered containers. No MSW will be stored outside of the waste handling building(s)

Biosolids processing will be undertaken within a 30,000 sf building to be located as shown on the plans in Inserts 2, 3, and 5. The biosolids building and associated processing will be performed in a separate building from the MSW and C&D operations are discrete and separate operations. Biosolids processing will consist of drying the biosolids to a moisture content of approximately 10% to reduce the mass and volume of the biosolids. The dried biosolids will be sent off site for subsequent disposal.

PPNE is also proceeding with the development of a glass processing facility on the site. This facility will not require a solid waste permit. This operation will recycle the glass containers that are collected through the Massachusetts deposit system. Bottles collected will be processed such that the glass can be reused to produce new glass containers. Processing at the site will include crushing, sizing and separation of the glass by color. The cullet produced is then sold to glass manufacturers for the production of new glass containers.

PPNE is also adding an additional 1.9 MW of solar power to the site. The solar panels will be mounted on a series of structures located over parking areas, over the glass processing area and over the proposed rail sidetrack.

Site Area

The site is a 71 acre parcel is located at 100 Duchaine Boulevard, New Bedford and is within the New Bedford Industrial Park. The site was formerly owned by Polaroid Corporation and existing buildings and access roads are being reused to the maximum extent possible. PPNE proposes to site assign the entire site area with the exception of the land areas of the site which have been identified as prime farmland.

Continued on next page

Site Location and Project Description (A), Continued

Site Area (continued)

The proposed site assignment limits are shown on plans included in Insert 2, 3, and 5. Waste handling, other than the storage of wastes in covered containers, is limited to the areas within the proposed 50,000 square foot tipping building, the area within the existing 103,000 square foot building to be used for MSW processing, and the area within the 30,000 square foot biosolids processing building. PPNE has identified additional waste handling areas as shown on the plans in Inserts 2, 3, and 5 to allow for the storage of waste and for the storage of recyclable materials extracted from MSW. Storage of these materials would be within the identified waste handling area. Storage of material outside of the waste handling buildings would be within covered containers or within rail cars. No MSW would be stored outside of the buildings unless it was within a railcar staged for off-site shipment.

PPNE is currently developing the site for processing of recycled glass bottles. The glass processing will size and sort glass to be recycled to glass bottle manufacturers. A 27,500 sf building will be constructed to house the glass processing equipment. It is expected that the glass processing facility will be constructed and in operation prior to the completion of solid waste permitting. A new rail sidetrack will be constructed from the existing rail line that borders the western property line of the site. This sidetrack will initially be used to transport processed recycled glass to recycling markets. The sidetrack will be extended to provide additional rail car storage when the proposed solid waste facilities are constructed.

Continued on next page

Site Location and Project Description (A), Continued

Capacity

The Applicant proposes permitting a MSW and C&D handling, processing and transfer Facility and biosolids processing facility with a rail component:

a. The proposed Facility will have a maximum daily capacity of 1,500 TPD of MSW and Category 2 and 3 construction and demolition waste and 50 dry tons per day of biosolids.

b. Based upon a maximum daily capacity of 1,500 TPD of MSW and C&D the project will process and transfer a maximum of 450,000 tons per year of MSW and C&D waste. Based upon a maximum daily capacity of 50 dry tons per day of biosolids the project will process a maximum of 15,000 dry tons per year of biosolids. The proponent requests and annualized solid waste capacity of 465,000 tons per year.

c. As presently proposed, the biosolids processing facility will operate 7 days per week, 24 hours per day and the MSW processing facility may operate up to 24 hours per day as required to process incoming MSW, subject to limitations that may be administered by the City of New Bedford (e.g. Planning Board or Board of Health).

d. The facility will accept MSW, C&D, glass and biosolids between the hours of 6 AM and 6 PM Monday through Saturday. Biosolids may also be accepted on Sundays between 6 AM and 6 PM.

e. The Facility is expected to have a lifetime of approximately 30 years, however the lifetime capacity does not theoretically have any limitation.

f. Based upon the projections given above, the estimated lifetime capacity for the Facility is 14 million tons, based on 30-years.

Continued on next page

Site Location and Project Description (A), *Continued*

Type of Waste

The Facility will handle, process and transfer MSW and C&D materials. As defined by MassDEP, MSW is any residential or commercial solid waste. The facility will also process biosolids generated at wastewater treatment plants.

Construction and demolition waste is waste building materials and rubble resulting from the construction, remodeling, repair or demolition of buildings, pavements, roads, or other structures. Construction and demolition waste includes but is not limited to, concrete, bricks, asphalt pavement, masonry, plaster, gypsum wallboard, metal, lumber, and wood. The proposed facility will accept only Category 2 C&D waste (residual waste from C&D processing facilities) and Category 3 C&D (Bulky waste).

No hazardous wastes will be accepted.

Project Description-Summary

The following sections within the site location and project description section of this narrative provide a detailed project description of the proposed project. The project includes three main elements as follows:

1. A 1,500 tpd solid waste handling and processing facility. This project element will accept and process municipal solid waste (MSW) and Category 2 and 3 construction and demolition waste (C&D). Recyclable materials will be sent to recycling markets and the non recyclable fraction of the waste will be sent off site for disposal.
2. A biosolids drying facility that will accept and process a maximum of 50 dry tons per day. Dried biosolids will be sent off site for disposal.
3. The glass processing facility will process approximately 200 tpd of glass bottles and will produce glass cullet for shipment to bottle manufacturers to produce bottles.

Project development will also include the construction of a new rail sidetrack from the existing rail line adjacent to the site that will be used for outbound shipment of the products of all three of the above project elements.

Continued on next page

Site Location and Project Description (A), Continued

Project Description-Summary (continued)

The project will be constructed in two phases. Phase 1 will consist of the construction of the glass processing facility. Phase 1 will also include the construction of the rail sidetrack from the existing rail line to the west of the site to the glass processing areas. A 1.9 MW solar power project will also be included in Phase 1. The Phase 1 development is shown on the plans included in Insert 5.

Phase 2 construction will include the construction of the MSW/C&D transfer and processing facilities and the biosolids drying facility. This phase will also include the expansion of the rail sidetrack in order to provide for additional on site rail car storage tracks to service the MSW/C&D operations.

Site Description

The site is an approximately 71 acre parcel identified by the New Bedford Tax Assessor as Lot 5 on Assessor's Plat 134. The site is zoned Industrial C. A locus plan of the site location is included in Insert 1. The site is located within the New Bedford Business Park. The site was previously owned by Multilayer Coating Technologies and before that by Polaroid Corporation. The site was used by both previous owners to manufacture film. The site as developed by Polaroid included access roads, parking areas, stormwater management features and various buildings. An existing conditions plan of the site is included Insert 4. PPNE intends to utilize the existing infrastructure to the extent possible in developing the proposed project.

Based on the conclusions of a Phase I Environmental Site Assessment, a Limited Subsurface Investigation was conducted at the site by Sage Environmental. This investigation concluded that "Based on the results of this LSI, SAGE has not identified the presence of subsurface impacts at the site that would require reporting to MassDEP. As such, SAGE is of the opinion that further actions are not warranted at this time."

Glass Processing Facility

Phase 1 development is the relocation and upgrade of the glass recycling operation that Strategic Materials previously operated in Franklin, MA to the 100 Duchaine Boulevard site. The new glass recycling facility will be owned by PPNE and will be operated in conjunction with Strategic Materials.

Continued on next page

Site Location and Project Description (A), Continued

Glass Processing Facility (continued)

This operation will recycle the glass containers that are collected through the Massachusetts bottle deposit system. Bottles collected will be processed such that the glass can be reused to produce new glass containers. Processing at the site will include crushing, sizing and separation of the glass by color. The cullet produced is then sold to glass manufacturers for the production of new glass containers. The closure of the Ardagh Group glass bottle plant in Milford, MA earlier this year has resulted in glass shipment to other glass bottle manufacturers. Currently processed glass is being transported to various glass bottle manufacturers located in New York, Atlanta and Houston.

As a result of the greater distances to glass bottle manufacturers, PPNE will construct a rail sidetrack from the existing rail line adjacent to the 100 Duchaine Boulevard site. This will allow shipment of recycled glass by rail.

The glass processing area will consist of a 27,500 sf building to house the processing equipment. A site plan showing the Phase 1 development is included in Insert 3.

The glass processing building will be constructed adjacent to the existing buildings on site as shown on the project plans included in Insert 3. The building location will be on an existing concrete pad which remains from the past use by Polaroid Corporation. The building will be 125 feet by 220 feet and will be a pre-engineered metal building. The equipment arrangement is presented within the project plans included in Insert 5. Glass bottles collected from the state's deposit system are fed into a hopper by a front-end loader. The glass then goes through a crusher and over a deck screen separating the glass into two sizes. The sized glass then passes through organic and metal removal equipment and then moves on to optical sorters. The optical sorters will separate glass into three colors, amber, flint and green. The glass is then conveyed to bunkers. The glass is stored in the bunkers until it is loaded into rail cars or trucks for shipment to bottle manufacturers. Existing access roads will be used by trucks delivering glass to the facility to be processed.

An additional 1.9 MW of solar power will be added to the site. The solar panels will be located on roof tops of structures built over the glass processing area, over the rail sidetrack and over parking areas. Please refer the Site plans for further detail.

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Site Location and Project Description (A), Continued

Glass Processing Facility (continued)

Phase 2 construction will include the construction of a MSW processing/handling facility. Phase 2 is expected to be constructed approximately two years after the Phase 1 construction. The project is being constructed in two phases due the difference in the expected duration of obtaining the required permits. The Phase 2 construction is shown on drawing C-2A included in Insert 5.

A new waste handling building will be constructed. The building is expected to be approximately 50,000 square feet in floor area and will connect with the existing site building. The tipping building will be designed to allow waste delivery trucks to drive into the building to dump loads of waste material for processing/handling/transfer. After tipping, front end loaders will stage the material for subsequent processing/handling.

The existing building on site adjacent to the proposed tipping building will be used for the processing of MSW. The existing building will be modified as required to house the MSW processing equipment used to extract recyclable material from MSW. Specifications for the MSW processing equipment are included in Attachment 8. This existing building will also include a baler to bale and shrink wrap (or bag) MSW after processing. Baled and shrink wrapped (or bagged) MSW and Category 2 and 3 C&D will be loaded in rail cars for shipment to disposal sites.

The facility will accept both baled MSW and MSW delivered loose in transfer trailers and packer trucks.

Baled MSW will be delivered to the proposed facility from other transfer stations that have baled MSW to meet the railroad requirements for shipping MSW in rail cars. Baled MSW accepted at the proposed facility will be loaded into rail cars for shipment to disposal sites such as a landfill or waste to energy facility. The facility will also accept C&D defined as Category 2 (C&D processing residuals) and Category 3 waste (bulky waste).

In addition to baled MSW, the facility will also accept loose MSW delivered in transfer trailers and packer trucks. Transfer trailers will consist of 100 cy live floor trailers. The average 100 cy transfer trailer capacity is 28 tons. Transfer trailers will originate primarily at transfer stations.

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Site Location and Project Description (A), Continued

Glass Processing Facility (continued)

Transfer trailers arriving at the facility will be weighed on a truck scale at the facility and then the truck will back into the tipping building and will discharge the waste onto the interior tipping floor. Packer trucks such as the trucks that provide curbside pickup of MSW will also deliver MSW to the facility. The average capacity of a packer/smaller trucks is 9 tons. It is expected that Category 2 and 3 waste will be delivered in 100 cy live floor trailers.

Non baled MSW received by the facility will be processed to extract recyclable materials. Processing will consist of a processing line that includes both mechanized separation equipment and a manual picking line. Materials extracted will include metals, cardboard, aluminum, wood, glass, PET, paper and plastic. The facility will include two processing lines with each line capable of processing 40 tons per hour of MSW. The processing lines will operate two to three shifts per day depending on the inbound volume accepted. The processing line flow diagram and equipment specifications are included in Attachment 8. A plan of the processing equipment is included within Insert 5. The processing line is expected to extract approximately 20% recyclables from the MSW. After the recycled material has been extracted, the remaining waste will be baled and shrink wrapped for transport to a disposal facility. The primary means of transport for disposal will be by rail. Trucks can also be used to transport waste, if necessary. Recyclable materials extracted from MSW will be sent to recycling markets by rail or truck.

The facility will also accept C&D residual waste and bulky waste. This waste is classified as Category 2 and Category 3 C&D waste by MassDEP. Category 2 waste is C&D waste that has been processed by a C&D processing facility and Category 3 is bulky waste that has little or no recyclable value. The processing facility will have removed all waste ban material and other recyclable material from the C&D material as deemed appropriate. The Category 2 or Category 3 material accepted at the facility will be used as cover for baled MSW in the rail cars. It is expected that Category 2 and Category 3 C&D waste will be delivered to the site in live floor trailers. This material will be received in the proposed tipping building.

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Site Location and Project Description (A), Continued

Glass Processing Facility (continued)

At the present time, CSX will only allow shipment of MSW in intermodal containers. These containers are typically loaded on flat bed rail cars. PPNE expects that CSX will revise the requirements for MSW shipment to allow baled and shrink wrapped or baled and bagged MSW, in combination with C&D waste, to be transported in gondola rail cars. As such, PPNE is proposing the installation of a baler. If there is no change in the CSX requirements, PPNE may opt to not install a baler and will load loose MSW in intermodal containers for transport.

Each rail car can carry up to 90 tons of solid waste for disposal. It is expected that at full capacity the facility will produce 1,300 tons per day of residual waste that will be sent for disposal. This will be sent for disposal in, on average, 15 rail cars each day. In the event that the MSW processing equipment is unavailable, a maximum daily average of 1,500 tons of MSW could be sent for disposal. The rail sidetrack will be modified in Phase 2 to allow the storage of more rail cars than can be accommodated by the sidetrack construction in Phase 1. The expanded rail sidetrack is shown on the Phase 2 site plan included in Insert 5.

The Facility will be developed using state-of-the-art Best Management Practices (BMPs) to minimize potential impacts to the Site and surrounding environment. A partial list of BMPs that will be incorporated into the Facility are as follows:

- All tipping, handling, and loading will be performed within a fully enclosed processing and handling building.
- The building floor is designed as impervious concrete that will prevent any potential contamination of groundwater. Any liquids released from the waste will be collected in a floor drain system. The liquid collected in this system will be gravity fed to a wastewater holding tank, which will be periodically trucked off site for disposal at a wastewater treatment plant. Sewer is available on-site and should this discharge be allowed to enter the New Bedford Sanitary Sewer, permits will be sought through the City.
- Use of a fine atomized misting system within the MSW Transfer Building and processing building will effectively control fugitive dust and odor in the building.
- Regular daily cleanup and sweeping will occur on the external paved surfaces.

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Site Location and Project Description (A), Continued

Biosolids Drying Facility

In Phase 2, the biosolids drying facility will be constructed. The facility will accept and process up to a maximum of 50 dry tons per day of biosolids. The biosolids will originate at various municipal wastewater treatment plants. The biosolids will be delivered to the facility by truck. The biosolids processing will be performed within a new building proposed to be constructed on site. The building is expected to be approximately 30,000 sf. The proposed biosolids processing facility is shown on the proposed conditions plans included in Insert 5.

The facility will include the following five major processes:

- Liquid/thickened Sludge Receiving and Storage System
- Dewatering System
- Dewatered Cake Receiving and Storage System
- Cake Mixing System
- Drying System

Attachment 9 includes a Process Flow and Preliminary Basis of Design and Attachment 10 includes Biosolids Preliminary Equipment Sizing.

The facility will accept dewatered biosolids cake with a solids content of between 15% and 30%. The facility will also accept thickened wet slurry biosolids with a solids content of between 5% and 10%. Wet slurry biosolids received by the facility will be stored in tanks on site prior to processing. The tanks will be sized to contain three days of deliveries. Attachment 9 includes a process flow diagram and mass balance for the proposed facility when operated at 45 dry tons per day. The maximum daily processing capability will be 50 dry tons per day. The ratio of thickened wet slurry biosolids to dewatered cake will vary. The process flow diagram shows the expected ratio of tonnages of wet slurry biosolids to tonnages of dewatered cake biosolids. The actual breakdown of wet slurry and dewatered cake will vary depending on the material being produced by wastewater treatment plants that elect to utilize the proposed facility. PPNE may elect to construct a facility to process less than 50 dry tons per day. This determination will be based on market conditions at the time of facility construction.

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Site Location and Project Description (A), Continued

Biosolids Drying Facility (continued)

Biosolids delivered as a thickened wet slurry will be dewatered by centrifuge or screw press to produce biosolids cake with an expected solids content of 30%. The dewatering system will be designed to process 20 dry tons per day of wet slurry. Wastewater extracted in the dewatering process will be directed to the New Bedford sewer system. The expected discharge to the New Bedford sewer system from the dewatering process is expected to be 52,000 gallons per day. The dewatering system will be designed to have a solids capture rate of 95%. The dewatered slurry biosolids cake and the biosolids cake delivered to the facility will then be blended together. The blending area has capacity/storage for approximately eight hours of production.

The blended cake will then be directed to a thermal dryer that utilizes a natural gas burner. The biosolids will be dried to approximately 90% solids. Moisture evaporated from the biosolids during the drying process will be condensed with the condensate water discharged to the New Bedford sewer system. It is expected that the daily discharge of condensate to the sewer system will be 30,000 gallons per day. Drying will reduce the weight and volume of the biosolids. The dried biosolids will be sent for disposal in rail cars or beneficially used for purposes such as alternative daily landfill cover if the required Beneficial Use Determination permits are obtained. The facility will have the capability of storing seven days of dried sludge production.

The Facility will be developed using state-of-the-art Best Management Practices (BMPs) to minimize potential impacts to the Site and surrounding environment. A partial list of BMPs that will be incorporated into the Facility are as follows:

- All handling and processing of biosolids will be within an enclosed building
- Foul air associated with the sludge and cake storage, transfer, dewatering and drying processes will be collected under negative pressure and transferred to a scrubber for odor control. Foul air will be collected from the following plant areas:
    1. Biosolids Receiving Tanks
    2. Cake Receiving Bins
    3. Cake Screw Conveyors
    4. Dewatering Screw Conveyors
    5. Cake Mixing Bin
    6. Dewatered Cake Belt Conveyor
    7. Dried Biosolids Storage Silo
    8. Thermal Dryer Exhaust
    9. Filtrate/Condensate Wet Well Cake

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Site Location and Project Description (A), Continued

Biosolids Drying Facility (continued)

- The low odor, high volume process room air will be provided with an ionization system for odor control. Foul air from the following areas will be treated with the ionization odor control system:
    1. Cake Receiving Room
    2. Dewatering Process Room
    3. Cake Mixing Room
    4. Dryer Process Room

Applicant

The Applicant is Parallel Products New England, LLC, which has a corporate address of 100 Duchaine Boulevard, New Bedford, Massachusetts. The Site, at 100 Duchaine Boulevard, New Bedford, is owned by affiliates of PPNE, SMRE 100 LLC and SMRE SUBLOT 20, LLC.

The plans in Insert 2, 3, 4 and 5 depict the property lines and the proposed Site Assignment limits and relationships to various setbacks relevant to 310 CMR 16.40.

Fees, Household Hazardous Waste, Waivers (C-E)

Fees

As part of the site suitability process, the New Bedford Board of Health will assess PPNE a Technical Fee. The Board of Health may use the fee for eligible costs of reviewing technical data, obtaining technical assistance, and conducting a public hearing. The maximum allowable technical fee that the Board of Health can assess is computed per 310 CMR 16.00 and is based on the type of Facility and the tons of waste accepted per day.

From 310 CMR 16.99 Appendix A, Table 2, the Maximum Technical Fee for Handling Facilities is based on the maximum daily volume of waste, measured in tons per day (TPD), that is proposed to be accepted at the Facility. PPNE is proposing to accept up to 1,500 TPD of municipal solid waste at the Facility. The Maximum Technical Fee for the proposed Facility capacity is as follows:

- Maximum Fee = $3,000 + (1,500 TPD x $20.00/TPD) = $33,000.00

The total of the Maximum Technical Fee ($33,000) is required be adjusted for inflation by a factor determined by the ratio of the Boston Consumer Price Index ("BCPI") for September of the year preceding the current year, divided by the BCPI for September 1988. Per information provided by the U.S. Department of Labor, Bureau of Labor Statistics, the BCPI for September 2018 was 278.7 and for September 1988 were 126.2.

Applying the adjustment factor results in the following Maximum Technical Fee for the proposed facility = $33,000 x (278.7/126.2) = $72,877

As such a check in the amount of $72,877 will be provided to the Board of Heath. Please see Attachment 1 for a copy of the check.

Household Hazardous Waste

The Applicant is not applying, pursuant to the Massachusetts Hazardous Waste Regulations (310 CMR 30.000, section 30.190), for approval to operate a Facility for the collection of Household Hazardous Waste. Oil and hazardous waste storage on-site will consist of limited quantities of spent hydraulic oil, motor oil and anti-freeze, generated from servicing on-site equipment.

Furthermore, if Household Hazardous Waste is found during inspections, the oil and/or hazardous material will be placed in a secured and approved container for subsequent removal and proper disposal.

Waivers

PPNE is not requesting any waivers per 310 CMR 16.18.

Priority Resources and Land Uses (F-H)

MEPA

According to 310 CMR 16.08(5)(d), the Applicant must provide evidence that the proposed project does or does not require review under the Massachusetts Environmental Policy Act (MEPA).

An Expanded Environmental Notification Form (EENF) was prepared and submitted to the MEPA office. Subsequently a Single EIR was submitted for the project. A copy of the Secretary's Certificate(s) are presented in Attachment 2.

Wetlands Resources

The wetland boundaries and 100-foot wetland buffer zones, as defined by MassGIS, are shown on the attached Water Resources Plan (Insert 2). Wetlands as determined and flagged by a wetland scientist are shown on the existing conditions plan presented within Insert 4.

Construction of the rail side track and the MSW processing/handling building will require the filing a Notice of Intent with the New Bedford Conservation Commission.

Riverfront Area

A drainage swale was constructed along the northern and western property lines by the former owner of the property associated with construction of the existing site development. A 25-foot Riverfront Area is associated with these drainage swales as shown on Water Resources Plan in Insert 2 as well as Inserts 4 & 5. Developed portions of the proposed project are located outside of the identified Riverfront Areas with the exception of the rail crossing of the manmade drainage swale.

Construction of the rail sidetrack for the glass processing project will impact the Riverfront Area. Construction of the rail sidetrack will not proceed until an Order of Conditions is received from the New Bedford Conservation Commission.

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Priority Resources and Land Uses (F-H), *Continued*

100 Year Floodplain

The 100-year flood boundaries as determined by the Federal Emergency Management Agency (FEMA) are shown on the attached Water Resources Plan (Insert 2). All of the developed portions of the site will be above the 100-year floodplain elevation and have no impact on the floodplain. As shown on Insert 2, the limit of the 100 year zone is approximately 650 feet south of the PPNE property line.

Proposed Impacts on Resource Areas

The table presented below outlines impacts on Resource Areas from the development of the proposed Facility. The Facility will file a Notice of Intent to obtain an Order of Conditions from the New Bedford Conservation Commission following the site assignment process.

Resource	Proposed Alteration
Impact to Bordering Vegetated Wetlands (BVW)	4,436 square feet
Impact to Other Wetland	350 square feet
Cumulative BVW & IVW Impacts	0 square feet
Flood Zone Area Filling	0 square feet
Flood Zone Capacity Lost	0 cubic feet
Compensatory Flood Storage	0 cubic feet
Riverfront Area Impacts	1500 square feet

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Priority Resources and Land Uses (F-H) *Continued*

Maps

The following section addresses plans and Inserts that GSE has prepared for the proposed project. Please refer to the Insert section for copies of the appropriate plans.

Separation of waste handling from groundwater

A groundwater contour map has not been prepared. Two groundwater monitoring wells in the area of the proposed tipping building, MW-4 and MW-5, have been installed and the water elevations are measured monthly. The location of the monitoring wells is shown on the Existing Conditions Plan included in Insert 4.

Monitoring Well MW-4	Depth to GW-Feet	GW Elev.-Feet	Adjusted Max. GW Elev.-Feet
June 28, 2018	5.35	74.77	78.5
July 27, 2018	6.35	73.77	77.8
August 28, 2018	5.15	74.97	78.7
September 28, 2018	3.40	76.72	80.3
October 31, 2018	3.30	76.82	79.6
November 30, 2018	2.70	77.42	78.9
Monitoring Well MW-5	**Depth to GW-Feet**	**GW Elev.-Feet**	**Adjusted Max GW Elev.-Feet**
June 28, 2018	6.50	74.16	77.9
July 27, 2018	7.8	72.86	77.0
August 28, 2018	6.9	73.76	77.5
September 28, 2018	4.95	75.71	79.3
October 31, 2018	5.05	75.61	78.4
November 30, 2018	4.50	76.16	77.6

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Priority Resources and Land Uses (F-H), Continued

Separation of waste handling from groundwater (continued)

The table presented above shows groundwater elevations measured in monitoring wells MW-4 and MW-5. The measured groundwater levels in MW-4 and MW-5 have been adjusted to calculate a maximum groundwater level using the Frimpter Method (USGS Water Resources Investigations 80-1205) using the USGS well (MA-NGW 116) which is located at the New Bedford Airport. Water elevations in the USGS well have been recorded for 54 years. As shown in the above table the groundwater elevation adjusted to the maximum expected groundwater elevation is el 80.3 feet.

The waste handling area of the tipping building must be a minimum of 2 feet above the maximum groundwater level. Waste handling areas in the MSW processing area include the tipping building floor, the rail car loading area floor and the trench drain system at each truck door in the tipping building. The entire trench drain system including the trench drains, the sump that collects water from the trench drains, the industrial wastewater holding tank and all system piping to the tank must be a minimum of 2 feet above maximum groundwater elevation.

The lowest area of waste handling area for the trench drain system will be approximately 1.5 feet below the floor elevation of the tipping building. To provide the required 2 foot separation to groundwater, the tipping building floor must be at a minimum elevation of el 83.8 feet (groundwater at el 80.3 plus 2 foot separation plus 1.5 foot for trench drain system).

Monitoring of groundwater will continue on a monthly schedule as confirmation that the groundwater separation requirement is met. Should groundwater monitoring indicate higher groundwater levels than have currently been recorded, the tipping floor elevation would be raised in the ATC application to provide the required 2-foot separation to maximum groundwater levels.

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Priority Resources and Land Uses (F-H), Continued

Locus Map

The following table provides pertinent information relative to the "Locus Map." A locus map is included in Insert 1.

Quad Name and Date	New Bedford North - 2018
Latitude and Longitude	Lat. 41.7161 N, Long. -70.9521 W

Priority Resources

The following table provides a brief narrative of the priority resource features found within ½-mile radius of the Site. Please refer to the Water Resources Plan (Insert 2), the Land Use Plan (Insert 3), the Existing Conditions Plan (Insert 4), and the Proposed Conditions Plans (Insert 5) of this application for more information on these features.

Regional Details (1/2 mile radius)	Description
Wetlands	The Water Resources Plan (Insert 2) depicts wetlands as obtained from MassGIS within a ½-mile radius of the site. The Existing Conditions Plan (Insert 4) shows a field-surveyed delineation of wetland areas on the PPNE property. Buffer areas extending 100 feet from wetlands identified on-site and in the vicinity of the site are also indicated on the above-mentioned Inserts. The site was previously owned by Polaroid Corporation. Polaroid developed and operated the site as a manufacturing facility for its products. Existing infrastructure consists of access and egress roads, parking areas, driveways, buildings, building slabs, and a stormwater management system. The site has large areas of wetlands. The project has been developed to utilize the existing infrastructure to the maximum extent possible to minimize impacts to wetlands. The design of all storm water management systems will be in conformance with MassDEP's Stormwater Management Policy for water quality, recharge, and control of sediment contamination.

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Priority Resources and Land Uses (F-H) *Continued*

Priority Resources, (*continued)*

Regional Details (1/2 mile radius)	**Description** **Please refer to the Water Resources Plan included as Insert 2.**
Proposed Drinking Water Source Areas	The nearest mapped proposed drinking water source area is an aquifer located approximately 1-mile northwest of the site. According MA GIS, the site is located within a Medium Yield Aquifer as shown on Insert 2. A "Non-Potential Drinking Water Source Area – High Yield" is located approximately 700 feet north of the PPNE property line. Note that all waste handling operations at the proposed facility will take place indoors.
Zone A & B Areas	The nearest Zone A is located in the corridor for Route 140. This is approximately 1,250 feet from the PPNE property line. The PPNE site is not within a Zone A of a surface water supply. The site is approximately 18,500 feet from a Zone B for Long Pond in Freetown and 18,500 feet from a Zone B for the Copicut Reservoir in Fall River. Zone B is not shown on Insert 2 as the distance to the Zone B is beyond the half mile radius depicted on Insert 2.
Zone I	The Site is not located within or in close proximity to Zone I of a public water supply. The nearest Public Water Supply Wells are located approximately 2 miles east of the Site off of Peckham Road.
IWPA or Zone II	The Site is not located within an IWPA or Zone II. The nearest Zone II is approximately 2.5 miles east of the proposed facility. The nearest IWPA is approximately 2 miles east of the proposed facility.

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Priority Resources and Land Uses (F-H) *Continued*

Land Uses The following table provides a brief narrative of land uses within ½-mile of the Site. Please note that this information was obtained using digitized images and vectorized data from the Massachusetts Geographic Information Systems (MassGIS) and other publicly available information from the MassGIS website. Please refer to Insert 3, Land Use Plan.

Regional Details (1/2 mile radius)	Description
Natural Heritage Endangered Species Program	According to MassGIS, there is Priority Habitat of Rare Species and an Estimated Habitat of Rare Wildlife located approximately 0.5 mile south of the subject Site. A portion of the areas of Rare Species Habitat and Habitat of Rare Wildlife are located within the half mile radius depicted on the Land Use Plan in Insert 5. The Natural Heritage and Endangered Species Program has confirmed that the project will not impact any Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife (See Attachment 4).
Wildlife Management Areas	GSE reviewed the Division of Fisheries and Wildlife website for information regarding Wildlife Management Areas. No Wildlife Management Areas are located within a ½ mile of the Site boundary.
ACECs	According to MassGIS, the nearest Area of Critical Environmental Concern (ACEC) is located over 10 miles east of the subject Site.
Agricultural Lands (Adjacent & On-Site)	Areas of prime farmland and farmland of statewide importance as identified by soils classification on the MassGIS system are mapped at the site and are indicated on the Land Use Plan in Insert 3. Farmland of state-wide importance was identified along the eastern property line and prime farmland soils were identified along the western property line. The "facility" is greater than 100 feet from all prime farmland soils and from farmland of statewide importance.
State Forests	GSE reviewed the Department of Conservation and Recreation website for information regarding State forests. The nearest State Forest is the Freetown-Fall River State Forest, which is more than 5 miles from the site.

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Priority Resources and Land Uses (F-H), *Continued*

Land Uses,
(continued)

Regional Details (1/2 mile radius)	**Description** **Please refer to the Land Use Plan included as Insert 3.**
Conservation and Park Lands	The site borders the Acushnet Cedar Swamp State Reservation. The site is separated from the Acushnet Cedar Swamp State Reservation by the rail line at the property's westerly property line. The primary purpose of the State Reservation is recreation and conservation. The area is shown on the Land Use Plan in Insert 3. Pine Hill Park is located 1,250 feet to the southeast of the site property line. The primary purpose is recreation. The Greater New Bedford Industrial Foundation owns conservation land 1,600 feet to the northwest of the site's property line. The park is shown on the Land Use Plan in Insert 3. The City of New Bedford owns a small parcel of vacant land just east of Route 140. This land is labeled on Insert 3 as Clough Cr. This land is approximately 1,800 feet east of the site property line.
MDC Reservations	The MDC is now the Department of Conservation and Recreation (DCR). No DCR parks/reservations were identified within 0.5 miles of the proposed Facility.
EOEA Restricted Land	GSE did not identify any lands with conservation, preservation, agricultural, or watershed protection restrictions approved by the secretary of EOEA within a ½ mile of the Site.
Privately Owned Public Access Conservation Land	GSE did not identify any privately owned public access conservation lands in close proximity to the subject Site. Based on the proposed location, the subject Site will not have adverse impacts on the physical environment of local conservation lands.
Residential Dwellings (500 Foot Radius)	No residential dwellings exist within 500 feet of the proposed waste handling area of the proposed project. The waste handling area of the site has been limited to areas that maintain a minimum setback distance of 500 feet from residential dwellings along Phillips Road.

Continued on next page

Priority Resources and Land Uses (F-H), Continued

Land Uses,
(continued)

<table>
<tr><th>Regional Details (1/2 mile radius)</th><th>Description

Please refer to the Land Use Plan included as Insert 3.</th></tr>
<tr><td>Commercial Buildings (500 Foot Radius)</td><td>Five commercial buildings are located within 500 feet of the property line of the subject site. All five buildings are located within the industrial park. The
<table>
<tr><th>Facility/Business</th><th>Address</th></tr>
<tr><td>IMTRA Corporation</td><td>30 Samuel Barnet Blvd</td></tr>
<tr><td>Milhench Arthur L “Trustee”</td><td>127 Duchaine Blvd</td></tr>
<tr><td>N E Plastics Corporation</td><td>126 Duchaine Blvd</td></tr>
<tr><td>C P Bourg Inc.</td><td>50 Samuel Barnet Blvd</td></tr>
<tr><td>City of New Bedford (Lift Station)</td><td>100 Duchaine Blvd</td></tr>
<tr><td>Eversource</td><td>50 Duchaine Blvd</td></tr>
</table>
commercial buildings within 500 feet of the Site are:</td></tr>
<tr><td>Health Care Facilities</td><td>GSE identified did not identify any health care facilities within ½ mile of the site.</td></tr>
<tr><td>Prisons</td><td>GSE did not identify any prisons within ½ mile of the Site.</td></tr>
<tr><td>Schools</td><td>GSE did not identify any schools within ½ mile of the Site.</td></tr>
<tr><td>Daycare Facilities</td><td>GSE did not identify any daycares within ½ mile of the Site.</td></tr>
<tr><td>Senior & Youth Centers</td><td>GSE did not identify any senior or youth centers within ½ mile of the Site.</td></tr>
</table>

Continued on next page

Priority Resources and Land Uses (F-H), *Continued*

On-Site Land Use

The following table provides a brief overview of the proposed on-site land use. This information can be found on the Proposed Condition Site Plan(s) – presented as Insert 5.

Criteria	Description
Solid Waste Facilities	GSE did not identify any solid waste facilities within ½ mile of the Site. Note the Crapo Hill Landfill is located 6,500 feet to the northwest.
On-Site Waste Handling Areas	The waste handling areas at the Site are confined to the limits of the proposed buildings.
Areas of Waste Deposition	Waste will not be landfilled and/or incinerated on the Site. Inbound materials will be tipped, handled, and loaded within the confines of the building. The waste materials will then be transported off-site via rail or large trucks.
Existing Buildings	An existing 103,000 sf building will be used for MSW processing. A new 50,000 sf building will be constructed for tipping MSW and for loading rail cars with solid waste prior to shipment to disposal sites.
Access Roads	Traffic to and from the facility will use Route 140. Please refer the Traffic Report presented as Attachment 3 and the site plans included in Insert 5 for further detail.
Traffic Flow	The traffic flow pattern is shown on the Traffic Report (Attachment 3). The Site has adequate room for safe and effective traffic flow and truck queueing on-site.
Zoning of Abutting Properties	The abutting properties, as defined in 310 CMR 16.02, to north of the site are zoned Multi-Use 1. The remaining abutting properties are zoned Industrial.
Site Zoning	The site is zoned Industrial C. The New Bedford City Solicitor has determined that the use is an allowed use provided a site assignment and all other required permits and licenses have been obtained. The zoning in the area of the project is shown on Insert 3A.

Section II. Facility Specific Criteria (A-C)

Introduction

The following section addresses Facility-specific criteria [310 CMR 16.40(3)(d)] for Waste Handling and Processing Facilities. Please refer to the prior statements in this narrative in the Priority Resources and Land Uses description, Attachments, Inserts, and Site Plans for additional information.

Table of Contents – Section II

The following is a TOC for Section II of the Site Suitability application. The page numbers cited refer to page numbers of the general document, not the application form.

Landfills

The proposed Facility is a solid waste handling Facility that will not landfill/dispose waste on-site. Therefore, this section does not apply.

Combustion Facilities

The proposed Facility is a solid waste handling Facility that will not burn or incinerate waste on-site. Therefore, this section does not apply.

Continued on next page

Section II. Facility Specific Criteria (A-C) *Continued*

Zone I of a Public Water Supply	The proposed waste handling area is not located within a Zone I of a public water supply. MassDEP establishes Zone I areas as the area encompassed by a protective radius of 400 feet around a public water system well with a yield of 100,000 gallons per day or greater. The Site is not located within or in close proximity to Zone I of a public water supply. The nearest Public Water Supply Wells are located approximately 2 miles east of the Site. The proposed Project complies with the requirements of 310 CMR 16.40(3) (d) (1).
IWPA and Zone II Areas	The proposed waste handling area is not within an Interim Wellhead Protection Areas or the Zone II of a public water supply well. The nearest Zone II is approximately 1.7 miles south of the proposed facility. The nearest IWPA is approximately 1.8 miles northeast of the proposed facility. The proposed Project complies with the requirements of 310 CMR 16.40(3) (d) (2).
Zone A	The proposed waste handling area is not within the Zone A of a public water supply. As shown on the Water Resources Plan (Insert 2), no Public Surface Water Supplies are located within ½ mile of the Site. The proposed Project complies with the requirements of 310 CMR 16.40(3) (d) (3).
Private Water Supplies	Private well locations in the vicinity of the site were obtained from the Commonwealth of Massachusetts Energy & Environmental Affairs Data Portal. No private wells were identified within 500 feet of the waste handling area. The proposed Project complies with the requirements of 310 CMR 16.40(3) (d) (4).

Continued on next page

Section II. Facility Specific Criteria (A-C), *Continued*

Occupied Facilities

There are no existing occupied residential dwellings, prisons, health care facilities, elementary schools, middle schools or high schools, children's preschools, licensed day care centers, senior centers, or youth centers within 500 feet of the proposed waste handling areas at the Facility. The locations of these sensitive receptors are presented within Insert 3.

The residential dwellings nearest the proposed waste handling facility are located on Phillips Road. All residential dwellings are a minimum of 500 feet from any of the proposed on-site waste handling area.

The proposed Project complies with the requirements of 310 CMR 16.40(3) (d) (5).

Riverfront Area

The waste handling area is not within a Riverfront Area as defined at 310 CMR 10.00. A "River" is defined at 310 CMR 10.58(2)1.a. as a perennial stream where "the issuing authority shall presume that a river or stream shown as perennial on the current U.S. Geologic Survey ("USGS") or more recent map provided by the MassDEP is perennial unless rebutted by evidence from a competent source asserting to the contrary or a finding by the issuing authority." The Riverfront Area is defined at 310 CMR 10.58(2)(a)3.a. as "the area of land between a river's mean annual high-water line measured horizontally outward from the river and a parallel line located 25 feet away." The waste handling area will not be within 25 feet of a river. A limited amount of the proposed rail sidetrack will cross the riverfront area to access the proposed facility. Please note the Riverfront Area is 25-feet in New Bedford versus 200 feet.

The proposed Project complies with the requirements of 310 CMR 16.40(3) (d) (6).

Continued on next page

Section II. Facility Specific Criteria (A-C), *Continued*

Depth to Groundwater

The Facility will maintain at least a two-foot separation between the maximum high groundwater elevation and the waste handling area. A groundwater contour map of the subject Site has not been developed and GSE opines that it is not warranted. The maximum groundwater elevation has been calculated based on two groundwater monitoring wells on opposite sides of the proposed MSW waste handling building. Records of groundwater levels in the monitoring wells and calculated maximum groundwater levels are discussed in Section I, H above. Based on this calculation the tipping building floor is proposed to be set at or above el 84.3 feet. The groundwater levels will continue to be monitored up to the ATC application. The tipping floor elevation will be adjusted if any unexpected high groundwater levels occur (outside of the 54 years presently monitored and compared to).

The plans in insert 5 identifies the proposed slab elevations which satisfies the requirements of 310 CMR 16.40(3) (d) (7).

Continued on next page

Section III. General Criteria (A-L)

Introduction

The following section addresses Section III of the Site Suitability Application - General Site Suitability Criteria for a Solid Waste Management Facility. Please refer to the prior statements in this narrative in the Priority Resources and Land Uses description, Attachments, Inserts, and Site Plans for additional information.

Table of Contents – Section III

The following is a TOC for Section III of the Site Suitability application. The page numbers cited refer to page numbers of the general document, not the application form.

Agricultural Land (A)

Agricultural Land(s)

Areas of prime farmland, farmland of unique importance, and farmland of statewide importance as identified by soils classification on the MassGIS system are indicated on the Land Use Plan in Insert 5.

The proposed "facility" is not within 100 feet of the Farmland of state-wide importance.

Continued on next page

Traffic Impacts (B)

Traffic Impacts

The traffic associated with the Facility has been evaluated to demonstrate that the traffic impacts from Facility operations would not constitute a danger to the public health, safety, or the environment, taking into consideration the following factors:

1. traffic congestion;
2. pedestrian and vehicle safety;
3. road configurations;
4. alternate routes; and
5. vehicle emissions.

Traffic study overview

The proponent commissioned a traffic study with McMahon Associates. The purpose of this study was to evaluate existing and projected traffic operational and safety conditions in the vicinity of the site and identify mitigating measures to offset potential project-related traffic impacts on the surrounding roadways, if determined to be necessary based on safety and/or other conditions such as Level of Service (LOS). The traffic study is included in Attachment 3.

The study was conducted in three steps. The first step involved an inventory of existing traffic conditions in the vicinity of the site. This included collecting traffic counts at key intersections during weekday morning and weekday afternoon peak periods. Crash data was obtained from the Massachusetts Department of Transportation (MassDOT) to evaluate existing safety conditions with the study area.

The second step of the study builds upon data collected in the first phase and establishes the basis for evaluating the transportation impacts associated with future conditions. In this step, Existing 2018 traffic conditions were projected to 2025 No Build (without project) conditions and 2025 Build (with project) conditions.

The third step identifies measures, if necessary, to improve existing and future traffic operations and safety, minimize potential traffic impacts, and provide safe and efficient access to the project site.

Continued on next page

Traffic Impacts (B), Continued

Traffic study overview (continued)

McMahon Associates' assessment based their review on current traffic volumes and accident data collected for this study area, a review of readily accessible traffic analyses, and the anticipated traffic generating characteristics of the proposed development. This study examined existing and projected traffic operations (both with and without the proposed project) at key intersections in the vicinity of the project site. The study area chosen by McMahon Associates was based on a review of the surrounding roadway network and anticipated traffic generating characteristics of the proposed project. The appended study provides a detailed analysis of traffic operations during the weekday morning and weekday afternoon peak hours, when the combination of adjacent roadway volumes and potential traffic increases associated with the project would be greatest. As such, McMahon Associates assessed "worst case" scenarios with respect to traffic impacts.

The proposed facility is expected to generate approximately 418 new truck trips per day (209 trucks entering, 209 trucks exiting) for the solid waste operations. These truck estimates conservatively assume all outbound materials would be transported via truck though a significant portion of materials would be transported via rail. In addition, there are approximately 150 employee trips (75 entering, 75 exiting) estimated for the facility per day, for a total estimated 568 vehicle trips accessing the site daily.

The capacity analysis indicates that the proposed development will not have an appreciable impact on the operations of the study area intersections or roadways and that mitigation measures are not necessary on the surrounding roadway network to accommodate the proposed development.

Based upon review and interpretation of the Traffic Impact Study, it is McMahon's opinion that the siting of the Facility will not constitute a danger to the public health, safety, or the environment based on traffic congestion, pedestrian and vehicle safety, road configurations, or alternate routes in conformance with the requirements of 310 CMR 16.40(4)(b).

Please refer to Attachment 3 for a copy of the Traffic Impact Study

Continued on next page

Wildlife and Wildlife Habitat (C)

Introduction

This section addresses the Natural Heritage and Endangered Species Program (NHESP) administered by the Massachusetts Division of Fisheries & Wildlife (MassWildlife).

Habitat of Endangered Species

According to MassGIS, there is Priority Habitat of Rare Species and an Estimated Habitat of Rare Wildlife located approximately 1500 feet south of the subject Site. These areas are separated from the Site by the existing rail line. The areas of Rare Species Habitat and Habitat of Rare Wildlife are noted on Insert 3. The siting of the proposed Facility will not have an adverse impact on Endangered, Threatened, or Special Concern species listed by the NHESP.

Additionally, the Massachusetts Division of Fisheries & Wildlife was contacted with respect to the subject Site. The Massachusetts Division of Fisheries & Wildlife responded by email on January 3, 2019 which said, in part, "this project site does not occur within Estimated Habitat of Rare Wildlife or Priority Habitat as indicated in the Massachusetts Heritage Atlas (14th Edition). Therefore, the project is not required to be reviewed for compliance with the rare wildlife species section of the Massachusetts Wetlands Protection Act Regulations". A copy of the email communication is included in Attachment 4.

The proposed Project complies with the requirements of 310 CMR 16.40(4) (c) (1).

Ecologically Significant Communities

The siting of the proposed Facility will not have an adverse impact on an Ecologically Significant Natural Community. There are no areas identified by the Natural Heritage and Endangered Species Program as ecoregions within ½ mile of the Site.

The proposed Project complies with the requirements of 310 CMR 16.40(4) (c) (2).

Wildlife Management Area

The siting of the proposed Facility will not have an adverse impact on the wildlife habitat of any state Wildlife Management Area. GSE reviewed MassGIS and the Division of Fisheries and Wildlife website for information regarding Wildlife Management Areas. No Wildlife Management Areas are located with ½ mile of the Site.

The proposed Project complies with the requirements of 310 CMR 16.40(4) (c) (3).

Areas of Critical Environmental Concern (D)

Introduction	This section addresses Areas of Critical Environmental Concern (ACEC) administered by the Executive Office of Environmental Affairs.
ACEC On-Site	Based on GSE's review of the MassGIS ACEC data layer, the Site is not within an ACEC. The proposed Project complies with the requirements of 310 CMR 16.40(4) (d) (1).
ACEC Adjacent	Based on GSE's review of the MassGIS ACEC data layer, no ACECs are located adjacent to the proposed Site. The proposed Project complies with the requirements of 310 CMR 16.40(4) (d) (2).

Protection of Open Space (E)

Introduction

This section addresses land areas that are considered parks and recreation lands under local, regional, and state regulatory agency jurisdiction.

State Forests

GSE reviewed the Department of Conservation and Recreation website for information regarding State forests. According to the Department of Conservation and Recreation website there are no State owned or operated forests within ½ mile of the Site.

Therefore, the siting of the Facility will not have an adverse impact on the physical environment of, or on the use and enjoyment of, State forests in conformance with the requirements of 310 CMR 16.40(4)(e)(1).

State or Municipal Conservation and Park Lands

The site borders the Acushnet Cedar Swamp State Reservation. The site is separated from the Acushnet Cedar Swamp State Reservation by the rail line along the western property line. The primary purpose of the State Reservation is recreation and conservation. This is the only state conservation or park land within one half mile of the site. The area is shown on the Land Use Plan in Insert 3. The reservation is managed by MassDEP.

The siting of the Facility will not have an adverse impact on the physical environment of, or on the use and enjoyment of, state or municipal parklands or conservation land, or other open space held for natural resource purposes in accordance with Article 97 of the Massachusetts Constitution in conformance with the requirements of 310 CMR 16.40(4) (e) (2).

MDC Reservations

The MDC is now part of the Massachusetts Department of Conservation and Recreation (DCR). GSE reviewed the DCR website for information regarding reservations in the area of the proposed Facility and none were located within ½ mile of the Facility.

Therefore, the siting of the Facility will not have an adverse impact on the physical environment of, or on the use and enjoyment of, DCR (MDC) reservations in conformance with the requirements of 310 CMR 16.40(4)(e)(3).

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Protection of Open Space (E), Continued

EOEA Restricted Lands

GSE reviewed MassGIS and the Executive Office of Energy and Environmental Affairs website for any lands with conservation, preservation, agricultural, or watershed protection restrictions approved by the secretary of EOEA within ½ mile of the Site. GSE did not identify any lands with conservation, preservation, agricultural, or watershed protection restrictions approved by the Secretary of EOEA within ½ mile of the Site.

Therefore, the siting of the Facility will not have an adverse impact on the physical environment of, or on the use and enjoyment of, on EOEA restricted lands in conformance with the requirements of 310 CMR 16.40(4)(e)(4).

Privately Owned Public Conservation Land

GSE reviewed MassGIS and the Executive Office of Energy and Environmental Affairs website for any privately owned public access conservation lands in close proximity to the subject Site. GSE did not identify any privately owned public access conservation lands in close proximity to the subject Site. Therefore, the siting of the Facility will not have an adverse impact on the physical environment of, or on the use and enjoyment of, local conservation lands in conformance with the requirements of 310 CMR 16.40(4)(e)(5).

Air Quality Impacts (F)

Introduction

The following section addresses the potential air quality impacts regarding anticipated emissions from operation of the proposed facility.

According to 310 CMR 16.40(4)(f), Potential Air Quality Impacts, no site shall be determined to be suitable or be assigned as a Solid Waste Management Facility where the anticipated emissions from the Facility would not meet required State and Federal air quality standards or criteria or would otherwise constitute a danger to the public health, safety or the environment, taking into consideration:

1. The concentration and dispersion of emissions
2. The number and proximity of sensitive receptors; and
3. The attainment status of the area.

Regulation

The proposed Facility will likely be subject to MassDEP air plan approval (air permitting) requirements under 310 CMR 7.02. Key standards for approval are listed in 310 CMR 7.02 (4) for Limited Plan Approvals and 310 CMR 7.02 (5) for Comprehensive Plan Approvals. These standards typically include ensuring that these new stationary sources will be in compliance with all applicable federal and MassDEP air regulatory requirements, ensuring that the new sources will meet ambient air quality criteria, and requiring a certification that any facilities in Massachusetts owned or operated the applicant are in compliance with MassDEP air requirements (or are on an approved schedule to come into compliance). The proposed facility is likely subject to the MassDEP air plan approval requirements for a Limited Plan Application (LPA) and will comply by filing the necessary documents and forms with MassDEP through the MassDEP/EEA ePLACE Portal. The LPA applicability threshold is one (1) tpy of any regulated pollutant, whereas the non-major Comprehensive Plan Application (nmCPA) applicability threshold is ten (10) tpy of any regulated pollutant.

Continued on next page

Air Quality Impacts (F), Continued

Emissions Analysis

Epsilon Associates has evaluated air impacts associated with the proposed project and has prepared a report detailing its findings. The report is included as Attachment 7. The analysis presented in this report encompasses a broader range of air emission sources than would be included in an air plan application in that certain mobile combustion sources are included in addition to all stationary combustion sources located at the site. The emissions analysis includes emissions from:

1. Mobile Sources-This includes emissions from front end loaders operating on site as well as truck traffic on site.

2. Stationary Sources-This includes emissions from MSW tipping and processing, glass processing and boilers used for biosolids drying and biosolids building heating.

3. Non-Combustion Particulate Matter Sources-This includes emissions from dust from MSW and C&D waste tipping and rail car loading, dust from glass processing and rail car loading, dust from vehicle travel on site and particulate matter in water drift from the cooling towers associated with the biosolids dryers.

The Epsilon report demonstrates that, under maximum expected operating conditions and using conservative assumptions, the proposed project will not cause or contribute to an exceedance of the National Ambient Air Quality Standards (NAAQS).

Nuisance Conditions (G)

Introduction

The following section addresses nuisance conditions identified at 310 CMR 16.40(4) (g). This section addresses the following potential nuisance conditions:

- Noise
- Dust
- Litter
- Vectors such as rodents and insects
- Odors
- Bird hazards to air traffic

Noise

Noise on site will be minimized by conducting all tipping, handling, and loading of MSW materials within an enclosed building.

Trucks delivering waste to the site will utilize major roadway networks (Route 140 to New Bedford Industrial Park).

In addition, the placement of the MSW tipping building has been strategically located on the site to:

- Have the tipping/delivery doors on the west building elevation, which is away from the closest receptor.
- Allow the building to act as a sound buffer to the closest receptor.

Biosolids processing will be conducted within an enclosed building. The cooling towers and fan intakes have been located on the west building elevation, which is furthest from residential receptors.

Epsilon Associates, Inc. (Epsilon) has been retained by PPNE to conduct a sound level assessment for this Project. Existing condition sound levels were measured around the site, an operational sound level modeling analysis was conducted for the major sound producing elements of the Project, and noise controls necessary to meet the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Noise Policy have been incorporated in to the project design.

Continued on next page

Nuisance Conditions (G), Continued

Noise (continued)

Noise controls included in the project design include:

- In order to keep site sound levels at a minimum, the Project will use of an electric rail car pusher to move railway cars stored on-site.
- The exhaust fans on the Biosolids building will be fitted with fan silencer or low noise fans will be utilized.
- The scrubber stack located west of the Biosolids building will be fitted with a silencer or a lower noise fan will be utilized.
- A 50-foot long 15-foot tall sound barrier wall will be included along the southern edge of the Biosolids building.

Results of a complete sound level assessment demonstrate that sound levels from the Project with the sound mitigation measures listed above will meet the requirements set forth in the MassDEP Noise Policy at residential locations. The Epsilon Noise Impact Study is attached as Attachment 6.

The proposed Project complies with the requirements of 310 CMR 16.40(4) (g) (1).

Litter

All waste handling activities will occur within the confines of the proposed MSW tipping and MSW processing buildings. The buildings will provide for significant protection from the elements, thus significantly reducing the potential for windblown litter nuisance conditions.

All commercial vehicles that will transport materials either to or from the Facility will be required to be covered in order to prevent incidental littering. Additionally, the Facility will provide a phone number for the public to use to report any complaints regarding vehicles traveling on roads without covering on their trucks, and such, drivers violating the requirement will be banned from delivering to the Facility.

Facility personnel will implement a daily inspection program as a part of the Operations & Maintenance Program.

Continued on next page

Nuisance Conditions (G), Continued

Litter (continued)

For these reasons, the establishment or operation of the Facility will not result in a nuisance condition that would constitute a danger to the public health, safety, or the environment taking into account litter pursuant to 310 CMR 16.40(4)(g)(2).

Vectors

Vermin will be discouraged by confining the waste handling operations to the inside of proposed building. Additionally, MSW will be handled in such a way as to avoid the attraction of rodents and insects by rapidly moving the material from the tipping floor to the processing lines and then baler and wrapper. For these reasons, coupled with the mitigation measures presented in the next section, the establishment or operation of the Facility will not result in nuisance conditions that would constitute a danger to public health, safety, or the environment taking into consideration vermin such as rodents and insects pursuant to 310 CMR 16.40(4)(g)(3).

Nuisance Conditions (G), *Continued*

Vector Mitigation

PPNE will implement mitigation measures to ensure that vectors do not pose a nuisance condition. The following measures will be incorporated into PPNE's Operation and Maintenance Plan that will be developed as part of the Authorization to Construct phase to further describe and illustrate the processes and procedures for the control of nuisance conditions. Proposed measures include, but are not limited to, the following, subject to revision as operations are finalized and during subsequent operational permitting with MassDEP:

- Contracting with a vector control management firm.
- Installing rodent traps within and around the interior and exterior of the building.
- Minimizing door openings within the proposed building.
- Conducting all waste handling activities indoors.
- Maintaining equipment on-site that will remove the materials from the tipping floor for subsequent handling.
- Covering the containers and trailers prior to leaving the waste handling building.
- Sweeping the paved areas and the interior of the building (as needed) at regular intervals.
- Instituting a daily inspection program for vectors following the Operations and Maintenance Plan that will be prepared for the proposed Facility.

Continued on next page

Nuisance Conditions (G), Continued

Odor

Proposed policies and procedure with respect to nuisance odor conditions include the following measures, subject to revision as operations are finalized and during subsequent operational permitting with MassDEP:

MSW handling and processing

- Confining all waste handling to within the building only.
- Having the ability to entirely enclose/secure the Facility.
- Covering the trailers and containers.
- Using a fine water mist and odor agents to reduce odor adhering particulate matter from escaping the building.

Biosolids processing

- Confining all waste handling to within the building only.
- Providing a scrubber system for the control of odor from biosolids storage, transfer, dewatering, and drying
- Providing an ionization system for the processing building

Massachusetts currently has no official odor policy or threshold. Odor is regulated under 310 CMR 7.09 in that operations that emit odors shall not permit their emissions to "cause a condition of air pollution". A Draft Odor Policy for Composting Facilities was published by MassDEP in January 1996. This draft guidance document recommended a minimum design standard benchmark of 5 D/T.

A study to model odor emissions from the proposed facility was conducted by Epsilon Associates. An odor concentration threshold of 1 D/T was used for the design of the stacks in order to avoid nuisance conditions in nearby residences. The design criteria used is more conservative than the MassDEP Draft Policy. The Epsilon report is included in Attachment 5.

Continued on next page

Nuisance Conditions (G), Continued

Odor (continued)

The Epsilon report demonstrates that odor associated with the establishment or operation of the Facility will not result in nuisance conditions that would constitute a danger to public health, safety, or the environmental taking into consideration odors pursuant to 310 CMR 16.40(4)(g)(4).

Bird Hazards To Air Traffic

The closest airport identified is the New Bedford Municipal Airport located approximately 2.2 miles (south) from the Site. Based on the distance to the nearest airport and the design considerations noted below, birds will not be a hazard to air traffic.

- The Facility will not be a landfill, and thus is not subject to the regulations discussed in the FAA Advisory Circular #150/5200-34(2000) regarding the construction or establishment of municipal solid waste landfills near airports.
- The Site is outside of the 3,000-foot buffer established by M.G.L. Chapter 90, Section 35B for building height restrictions within proximity of airports.
- Vectors such as gulls will not be attracted to the Site given the completely enclosed operation.
- No waste handling, loading, or unloading, will be allowed outside of the building.
- A vector control service will be contracted.

Continued on next page

Nuisance Conditions (G), *Continued*

Bird Hazards to Air Traffic - Mitigation

Even though bird hazards are not a significant concern at the subject Facility, PPNE will still implement mitigation measures to ensure that bird hazards do not pose a threat. The following measure will be incorporated into PPNE's Operation and Maintenance Plan that will be developed as part of the Authorization to Construct phase to further describe and illustrate the process and procedures for the control of nuisance conditions. These measures include, but are not limited to the following, subject to revision as operations are finalized and during subsequent operational permitting with MassDEP:

- Minimizing door openings within the proposed building;
- Conducting all waste handling activities indoors;
- Maintaining equipment on-site that will remove the materials from the tipping floor for subsequent handling and off-site shipment;
- Covering the containers and trailers prior to leaving the processing building;
- Sweeping the paved areas and the interior of the building (as needed) at regular intervals; and,
- Instituting a daily inspection program for vectors following the Operations and Maintenance Plan that will be prepared for the proposed Facility.

Based on the location of the airports from the Site and the proposed controls at the Site, the establishment or operation of the Facility would not result in nuisance conditions that would constitute a danger to the public health, safety, or the environment taking into consideration bird hazards to air traffic in compliance with the requirements of 310 CMR 16.40(4) (g) (5).

Other Nuisance Conditions

Other nuisance conditions are not likely to exist during the construction and operation of the Facility.

The proposed Project complies with the requirements of 310 CMR 16.40(4) (g) (6).

Size of the Facility (H)

Introduction

The following section discusses the characteristics and logistics of the proposed Facility and details how the Facility has been designed to adequately handle up to 1,500 TPD of MSW and C&D material and meet the Size of Facility criterion at 310 CMR 16.40(4)(h). This section includes information regarding the following:

- Size of the Facility
- Access Roads (Material Ingress & Egress)
- Vehicle Queuing Areas
- Tipping, Waste Consolidation, and Loading Operations
- Comparison with Existing Facilities
- Waste Tipping Capacity Factors
- Setbacks of Waste Handling Areas from property boundaries

Size of Facility

The size of the proposed Site is sufficient to properly operate and maintain the Facility. The proposed Facility consists of the construction of an approximately 50,000-square foot tipping building as well as a rail yard, scales, scale house, associated driveway and parking areas, underground utilities, site grading, paving, and stormwater controls. An existing building will be used for processing MSW to extract recyclable materials. The proposed Facility will be located on 71 acres of land. The area to be site assigned within these parcels will be 63.7 acres. The area proposed to be site assigned includes the total site area with the exception of areas designated as prime farmland or farmland of statewide importance. The area proposed to be designated as waste handling areas is 38.4 acres. The waste handling area excludes area within the site assigned limits that are within 100 feet of the property line, areas that are within 100 feet of prime farmlands and areas within 500 feet of residential dwellings. Insert 3 depicts the proposed limits of site assignment and limits of waste handling areas.

The proposed Facility is designed to accept MSW and C&D delivered by truck for processing/handling and transfer primarily onto rail cars and secondarily, as conditions dictate, larger trucks for transport to various off-site locations. The solid waste handling building (solid waste handling area) has been sized so that all unloading, handling, and loading onto rail cars and/or trucks will occur within the building interior.

The biosolids processing facility has been sized such that all processing is within the enclosed building. The building has been sized for the currently proposed drying facility and has included sufficient indoor space to accommodate the addition of biosolids gasification equipment in the future.

Continued on next page

Size of the Facility (H), *Continued*

Access Roads – Material Ingress and Egress

The following describes MSW flow on-site.

1. Vehicular ingress and egress will be from/to Route 140 to the east of the subject property.
2. The ingress traffic pattern entering the site follows along an existing paved driveway. The paved driveways are designed for one-way traffic around the perimeter of the site. This area provides for queuing, two scales, and a bypass lane to ensure there is no queuing of trucks off of the subject site. Scale house personnel will be able to monitor inbound and outbound traffic patterns.
3. From the inbound scale, delivering waste vehicles would proceed to the tipping building. The vehicle will back into one of the five proposed inbound offloading doorways. A sixth doorway in the northwest corner is reserved for railcars or outbound live floor tractor trailers. Please see the plans in Insert 5 which depict the exterior Facility layout and interior building layout, respectively.
4. Once in the building, the inbound waste vehicles will tip their loads and exit out of the tipping door in which they entered located along the western side of the waste handling building.
5. Exiting vehicles would proceed from the waste handling building to the outbound scale before exiting the site.

The flow of biosolids on site will be similar to the flow of MSW except that the biosolids will be delivered to the biosolids processing building. After delivering biosolids, trucks will need to circle around the facility on the existing site driveways to utilize the outbound scale before leaving the site.

Continued on next page

Size of the Facility (H), *Continued*

Vehicle Queueing

The Site provides a significant amount of space for inbound vehicle queuing as the length of the driveway from the site entrance to the inbound scale is approximately 850 feet.

Building Size, Elevations and Doorways

The proposed MSW tipping building is 50,000 square feet in size (note this includes tipping area for Category 2 and 3 C&D). The building's footprint allows for two coupled railcars to be in the MSW tipping building at one time. The building is sized to include the following areas within the building

1. The waste tipping, inspection and areas (11,250 sf)
2. Temporary waste storage area (1,500 tons/15,000 sf)
3. Baled waste storage area (1,500 tons/4,700 sf)
4. The rail car loading area (7,750 sf)
5. The MSW processing feed hopper loading area (6,000 sf)

The MSW processing building is an existing 103,000 square foot building. Approximately 37,000 square feet of this building will be used for MSW processing. Processing will consist of extracting recyclable material from the MSW and then the remaining residual waste will be baled for out bound transport. The facility will utilize a series of conveyors, magnets, eddy current separators, air classifiers, and picking lines to remove recyclable materials. The system layout and equipment list has been provided within Attachment 8.

The proposed biosolids processing facility is located in a 30,000 square foot building to be constructed on site as shown on the plans in Insert 5. The facility has been sized for the proposed drying process and has additional space provided such that this building will also include a proposed future modification that will add biosolids gasification to the biosolids system processing.

The proposed biosolids processing will consist of the following elements:

1. Liquid/thickened biosolids receiving and storage area
2. Liquid biosolids dewatering area
3. Cake biosolids receiving and storage area
4. Biosolids cake mixing area
5. Cake buffer storage area
6. Biosolids drying area

Continued on next page

Size of the Facility (H), *Continued*

Building Size, Elevations and Doorways, continued

The above processes will require the following equipment and systems:

1. Chemical scrubber odor control system
2. Ionization odor control system
3. Cooling tower

The glass processing facility is not a solid waste activity and as such the details are not discussed further.

MSW/C&D Tipping overview

The Facility's operations protocols will require personnel to inspect and oversee MSW and C&D waste tipping activities. The following table outlines PPNE's proposed procedure, subject to revision as operations are finalized during subsequent operational permitting with MassDEP.

Step	Action
1	An incoming driver is prompted to back his/her vehicle up and onto the concrete tipping area.
2	Facility personnel will direct the driver to tip the waste in one of several designated areas.
3	The load is inspected by trained Facility personnel for unacceptable materials (e.g. visible waste ban materials).
4	Pending an acceptable inspection, the vehicle exits the waste handling area within the building and heads towards the outbound scale.

MSW/C&D Waste Consolidation

The following table outlines PPNE's proposed procedure for MSW and C&D consolidation within the waste handling building, subject to revision as operations are finalized and during subsequent operational permitting with MassDEP.

Step	Action
1	Pending an acceptable inspection and safe vehicle exit, the tipped waste materials may be pushed to the waste staging area located within the southern area of the tipping building.
2	The materials will be loaded into the feed hopper of the processing system by a front-end loader and/or excavator.
3	After processing to extract recyclable material, the non recycled fraction is baled and shrink wrapped.
4	Bales of material are moved back into the tipping building and loaded in to rail cars.

The buildings have been sized to allow sufficient space for material tipping, processing, and loading outbound rail cars. The specifications of the equipment to be provided to extract recyclable materials from MSW are included in Attachment 8

Continued on next page

Size of the Facility (H), Continued

Railcar or Live Floor Loading Operations

The following table outlines PPNE's procedure for railcar or truck loading within the building, subject to revision as operations are finalized and during subsequent operational permitting with MassDEP.

Step	Action
1	A front-end loader and/or excavator will load MSW from the tipping floor in to a feed hopper for the MSW processing system.
2	Baled and wrapped residual material will be moved from the MSW processing area to the tipping building.
2	The baled material will be directly loaded into a live floor trailer and/or rail car located in the proposed outbound loadout and railcar staging area. Rail cars will be topped off with Category 2 C&D residuals as required by the Railroad.
3	The rail cars and/or trailers will be covered with an appropriate cover for subsequent staging and transport to the final disposal destination.

Comparison with Existing Facilities

The proposed 50,000-square foot waste handling building provides greater operational area than the following solid waste facilities:

- Allied Waste System Fall River transfer station [1,000 TPD 20,700 sf.]
- Braintree transfer station [1,600 TPD, 23,600 sf]
- Allied Peabody transfer station [1,000 TPD, 23,400]
- New England Waste Disposal transfer station [1,000 TPD, 32,500 sf]

Additionally, it appears this Facility will exceed the aforementioned facilities with respect to queueing areas, etc.

Continued on next page

Size of the Facility (H), *Continued*

Waste Tipping Capacity Factors The table presented below has been prepared to outline the doorway capacities as it relates to tonnage based on various delivery scenarios.

PPNE Five Door Peak Factor Calculations			
	All 8-Ton Packer/Roll-off Vehicles	**50% Packers/Roll-off & 50% Live Floor Trailers by Weight**	**100% Live Floor Trailers by Weight**
Average Tons Per Vehicle	9	18.5	28
Inbound Trucks Per Day Based on Weight Assumptions	167	81	54
Tons Received Per Day at Facility	1500	1500	1500
Hourly Tonnage if Averaged Over 12 Operational Hours	125	125	125
Operational Hours Per Day for Tipping Waste	12	12	12
Number of Doorways Used	5	5	5
Time to Tip Per Vehicle (Minutes Averaged)	10.0	12	15
Trucks Per Hour Per Doorway	6	5	4
Tons Per Hour Per Doorway	54	93	112
Tons Per Hour - 5 Doorways	270	465	560
Peak Capacity Factor 5 Doorways Utilized	2.2	3.7	4.5

Notes:

1. *Packers/Roll-off weights averaged based on anticipated volumes and assume to carry 9-tons per vehicle.*
2. *Live floor trailers assumed to carry 28 tons per vehicle.*
3. *Tipping time for packers/roll-off is 10 minutes (generally tipping is less than 5 minutes).*
4. *Tipping time for live floor trailers is 15 minutes.*
5. *Columns 2 and 3 assume that tonnage average is by weight. For example, if deliveries are 50% packers/roll-offs and 50% live floor trailers, then each vehicle type delivers 500 TPD.*
6. *Column 3 has assumed 100% live floor trailers.*
7. *Figures have been rounded up when necessary.*

Continued on next page

Size of the Facility (H), *Continued*

Waste Handling Setbacks

The table below presents various setbacks from the waste handling buildings. The distances in the table below do not reflect distances to the larger waste handling areas which includes covered outdoor storage and rail car storage. The distances below are from the waste handling buildings.

Setback	Distance
Transfer/Processing Building to closest property line	250 feet to closest property line (south property line)
Biosolids Processing Building to closest property line	430 feet to the closest property line (east property line)
Transfer/Processing Building to closest occupied residential dwelling	1200 feet to property located to the east
Biosolids Processing Building to closest occupied residential dwelling	537 feet to property located to the east
Transfer/Processing Building to closest Riverfront Area	165 feet
Biosolids Processing Building to closest Riverfront Area	220 feet

Note: Refer to the Priority Resource and Land Use sections of this narrative and Inserts 2 and 3 that depict setbacks from other various features that are located off-site. Based on the regulations set forth in 310 CMR 16.40, all of the required minimum setbacks has been met.

Conclusion

Based on the size of the Site, the design of the handling building, associated paved surfaces, the available space for queuing of trucks, and the analysis of the interior operations, the size of the proposed Site is sufficient to properly operate and maintain the proposed Facility.

The proposed Project complies with the requirements of 310 CMR 16.40(4)(h).

Areas Previously Used for Solid Waste Disposal (I)

Introduction

The following section discusses areas previously used for solid waste disposal and demonstrates compliance with 310 CMR 16.40(4) (i).

Abutting Properties

Based on GSE's research, no former solid waste landfill disposal activities were identified on abutting properties.

Proposed Site

No portion of the Site has been previously used for solid waste disposal as listed on the MassDEP Solid Waste Facilities Master List.

Conclusion

1. No prior solid waste Facility operated on any area adjacent to the proposed Facility.
2. GSE is unaware of any solid waste activities or contamination that would adversely impact or threaten to adversely impact the Site.

The proposed Project complies with the requirements of 310 CMR 16.40(4) (i).

Existing Disposal Facilities (J)

Introduction

The following section discusses existing disposal facilities in the vicinity of the proposed Site.

Active Disposal Facilities

MassDEP and the local Board of Health shall give preferential consideration to sites located in municipalities in which no existing landfill or solid waste combustion facilities are located, a preference that will be applied only to new facilities that will not be for the exclusive use of the municipality in which the Site is located. The proposed Facility does not meet these requirements and is therefore not entitled to a preference.

The Crapo Hill landfill is located in New Bedford and is used for disposal by the City of New Bedford and the Town of Dartmouth. The City of New Bedford and the Town of Dartmouth are not expected to utilize the proposed facility for MSW disposal.

New Bedford does not have any facilities for processing biosolids. The proposed facility will be available to accept biosolids from New Bedford should the City wish to use the facility.

Project Need

Currently both biosolids and MSW are being transported out of state for disposal due to a lack of in state disposal sites. Recent landfill closures in Massachusetts has resulted in limited disposal options that are within economical trucking distances. The proposed facility with its rail access will provide economical disposal options for southeastern Massachusetts.

The proposed project includes the construction of a state-of-the-art facility for extracting recyclable materials from MSW, which is in-line with the goals and initiatives set for within the Massachusetts Solid Waste Master Plan.

Other Sources of Contamination or Pollution (K)

Introduction

The Facility includes environmental controls for stormwater, contact water, dust, odors, vectors, bird hazards, and noise. The Facility will not pose a threat to public health, safety, or the environment taking into consideration the impacts of existing sources of pollution or contamination pursuant to 310 CMR 16.40(4)(k).

Consideration of Other Sources of Contamination or Pollution

Other sources of contamination or pollution could be emissions from construction. The Facility will incorporate the proper controls, protocols, and procedures to reduce emissions, which will be addressed in future MassDEP and City permitting endeavors. This will also hold true for the environmental controls that will incorporated into the facility design.

The Facility as proposed will create an overall reduction in CO_2 emissions annually. It is documented by CSX that moving freight (waste) by rail is approximately 4 times more fuel efficient than moving freight on the highway. Trains can move a ton of freight over 470 miles on a single gallon of fuel whereas a truck can move a ton of freight only approximately 134 miles per gallon of fuel.

Consolidating waste and incorporating rail efficiencies can result in significant reductions to CO_2 emissions, which follows the goals and initiatives of the Massachusetts Environmental Policy Act (MEPA), M.G.L. c. 30, ss. 61-621 and within 301 CMR 11.00.

The proposed Project complies with the requirements of 310 CMR 16.40(4)(k).

Regional Participation (L)

Regional Participation & Need

MassDEP and the Board of Health shall give preferential consideration to sites located in municipalities not already participating in a regional disposal Facility pursuant to 310 CMR 16.40(4) (l). The City of New Bedford is a member of the Greater New Bedford Refuse District, which is served by the Crapo Hill Landfill. As such, the City is not a preferred municipality under M.G.L. c. 111, § 150A½ (15) and (16).

The proposed Facility's maximum capacity and annualized capacity will support regional need within the surrounding area(s). By having a Facility in close proximity to major roadway networks coupled with access to rail, the Facility is designed around regional participation. The facility serves a disposal need created by a lack of landfills in Massachusetts and in other states that can be economically serviced by truck transport.

Continued on next page

Section IV. Integrated Solid Waste Management (A-D)

Introduction Section IV is applicable to Landfills and Combustion facilities only.

Section V. Waivers

Waiver	The Facility is not requesting any waivers under 310 CMR 16.40.

ATTACHMENT 1

RECEIPT OF TECHNICAL FEE

The Site Suitability Application included in the Expanded Environmental Notification Form is in Draft form. When the Site Suitability Application is Final it will be submitted to MassDEP. The Site Suitability Report cannot be submitted to MassDEP until the MEPA review is completed and the Secretaries Certificate has been issued. The Site Suitability Application narrative is included as an Appendix to the Expanded Environmental Notification Form to provide as much available information on the project for the MEPA review. The Technical Fee will be paid to the New Bedford Board of Health prior to submission of the Final Site Suitability Application to MassDEP.

ATTACHMENT 2

MEPA CERTIFICATE AND CORRESPONDENCE

The Site Suitability Application included in the Expanded Environmental Notification Form is in Draft form. When the Site Suitability Application is Final it will be submitted to MassDEP. The Site Suitability Report cannot be submitted to MassDEP until the MEPA review is completed and the Secretaries Certificate has been issued. The Site Suitability Application narrative is included as an Appendix to the Expanded Environmental Notification Form to provide as much available information on the project for the MEPA review. The Secretaries Certificate will be included in this Attachment for the final submittal to MassDEP.

ATTACHMENT 3

TRAFFIC STUDY

The Site Suitability Application included in the Expanded Environmental Notification Form is in Draft form. When the Site Suitability Application is Final it will be submitted to MassDEP. The Site Suitability Report cannot be submitted to MassDEP until the MEPA review is completed and the Secretaries Certificate has been issued. The Site Suitability Application narrative is included as an Appendix to the Expanded Environmental Notification Form to provide as much available information on the project for the MEPA review.

The Traffic Impact Report will be included in this Attachment for the Final version of the Site Suitability Application. For this Draft version of the application, the Traffic Impact Report is included in Appendix B of the Expanded Environmental Notification Form.

ATTACHMENT 4

NHESP CORRESPONDENCE

From:	Holt, Emily (FWE)
To:	Whitney Hall
Subject:	100 Duchaine Blvd, New Bedford
Date:	Thursday, January 03, 2019 1:06:13 PM

Whitney,

I received your letter request and have determined that this project site does not occur within Estimated Habitat of Rare Wildlife or Priority Habitat as indicated in the *Massachusetts Natural Heritage Atlas* (14th Edition). Therefore, the project is not required to be reviewed for compliance with the rare wildlife species section of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.37, 10.59 & 10.58(4)(b)) or the MA Endangered Species Act Regulations (321 CMR 10.18).

I will return the submitted fee to Green Seal Environmental, as the site is not subject to MESA review.

Best,

Emily Holt
Endangered Species Review Assistant
Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6385 | f: (508) 389-7890
mass.gov/nhesp

ATTACHMENT 5

ODOR MODELING

The Site Suitability Application included in the Expanded Environmental Notification Form is in Draft form. When the Site Suitability Application is Final it will be submitted to MassDEP. The Site Suitability Report cannot be submitted to MassDEP until the MEPA review is completed and the Secretaries Certificate has been issued. The Site Suitability Application narrative is included as an Appendix to the Expanded Environmental Notification Form to provide as much available information on the project for the MEPA review.

The Odor Modeling Report will be included in this Attachment for the Final version of the Site Suitability Application. For this Draft version of the application, the Odor Modeling Report is included in Appendix D of the Expanded Environmental Notification Form.

ATTACHMENT 6

NOISE ASSESSMENT

The Site Suitability Application included in the Expanded Environmental Notification Form is in Draft form. When the Site Suitability Application is Final it will be submitted to MassDEP. The Site Suitability Report cannot be submitted to MassDEP until the MEPA review is completed and the Secretaries Certificate has been issued. The Site Suitability Application narrative is included as an Appendix to the Expanded Environmental Notification Form to provide as much available information on the project for the MEPA review.

The Noise Assessment Report will be included in this Attachment for the Final version of the Site Suitability Application. For this Draft version of the application, the Noise Assessment Report is included in Appendix D of the Expanded Environmental Notification Form.

ATTACHMENT 7

AIR MODELING

The Site Suitability Application included in the Expanded Environmental Notification Form is in Draft form. When the Site Suitability Application is Final it will be submitted to MassDEP. The Site Suitability Report cannot be submitted to MassDEP until the MEPA review is completed and the Secretaries Certificate has been issued. The Site Suitability Application narrative is included as an Appendix to the Expanded Environmental Notification Form to provide as much available information on the project for the MEPA review.

The Air Modeling Report will be included in this Attachment for the Final version of the Site Suitability Application. For this Draft version of the application, the Air Modeling Report is included in Appendix D of the Expanded Environmental Notification Form.

ATTACHMENT 8

MSW PROCESSING EQUIPMENT

The Site Suitability Application included in the Expanded Environmental Notification Form is in Draft form. When the Site Suitability Application is Final it will be submitted to MassDEP. The Site Suitability Report cannot be submitted to MassDEP until the MEPA review is completed and the Secretaries Certificate has been issued. The Site Suitability Application narrative is included as an Appendix to the Expanded Environmental Notification Form to provide as much available information on the project for the MEPA review.

The Equipment Specifications will be included in this Attachment for the Final version of the Site Suitability Application. For this Draft version of the application, the Equipment Specifications are included in Appendix E of the Expanded Environmental Notification Form.

ATTACHMENT 9

BIOSOLIDS PROCESS FLOW DIAGRAM AND BASIS OF DESIGN

Appendix A: Process Flow and Preliminary Basis of Design

The Facility will include the following five major processes:

- Liquid/Thickened Sludge Receiving and Storage System
- Dewatering System
- Dewatered Cake Receiving and Storage System
- Cake Mixing System
- Drying System

Sources of Solids

The facility will receive both thickened sludge and dewatered cake. The thickened sludge will be generated from New Bedford. The dewatered cake will be generated from Brockton and Fall River. Refer to **Table 1**.

Table 1: Solid Generation

Type	Source	Total Solids (%)	Solids Load (DTPD)	Mass (DTPY)	Comments
Thickened Sludge	New Bedford	7	19.5	7,132	Annual Average (2017)
Dewatered Cake	Brockton	28.5	11.9	4,328	Average (2015-2017)
Dewatered Cake	Fall River	20	13.7	5,000	Annual Average (2016)
TOTAL		-	**45.1**	**16,460**	

Table 2: Peaking Factor Assumptions

Condition	Peaking Factor (PF)
Annual Average: Max Week	1.8
Annual Average: Max Month	1.5

Refer to **Figure 1** for a preliminary process flow diagram and mass balance.

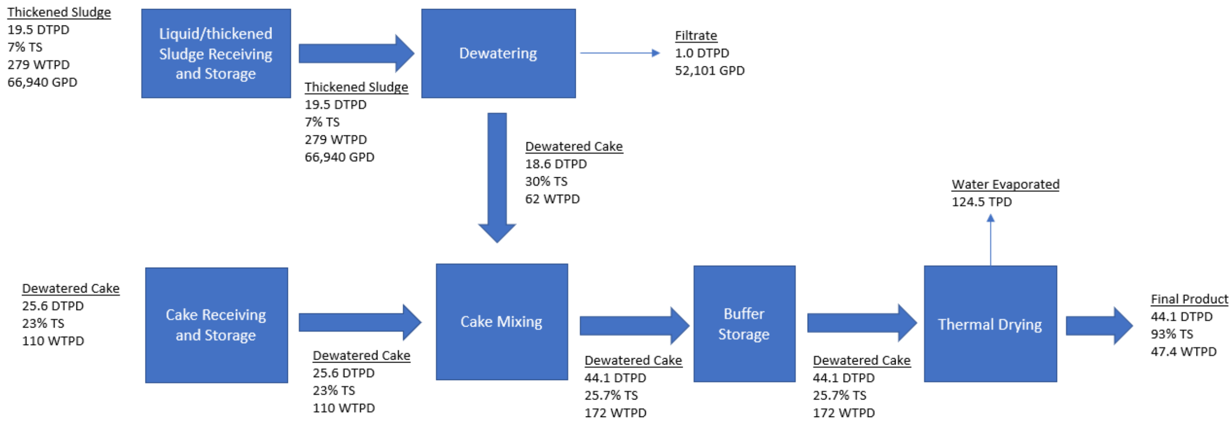


Figure 1: Preliminary Process Flow Diagram and Mass Balance

The following describes sizing assumptions regarding the various processes used to develop information included in this memorandum:

- **Liquid/Thickened Sludge Receiving and Storage System:** The system will be designed to receive approximately 20 DTPD, at an assumed total solids percent (TS%) of 7%. This is the equivalent of approximately 67,000 gallons per day (GPD). The system will include the following:
  - Three days of storage capacity via buried concrete tanks
  - Tank mixing system
  - Rotary lobe pumps to transfer sludge to the dewatering system
  - Odorous air take-offs from tank headspace

- **Dewatering System:** Dewatering system will produce cake with a minimum TS% of 30% (based on input received from TCR). The dewatering system will be required to have a minimum solid capture rate of 95%. The filtrate/centrate produced from the dewatering system will be conveyed to the municipal sewer. A polymer system will be provided and include polymer blending systems and polymer storage. Overall, the system will include the following:
  - 2 dewatering units (duty/standby)
  - 2 polymer storage tanks and recirculation pumps
  - 2 polymer make-up units
  - Odorous air take-offs from dewatering equipment headspace near the discharge chute
  - Constructed in a building with odor control provided

- **Dewatered Cake Receiving and Storage System:** The system will receive approximately 25 DTPD and have a storage capacity of approximately 3 days. The system will include the following components:

- 2 receiving silo/hoppers
- Conveyance equipment
- Odorous air take-offs from hopper headspace
- Constructed in a building with odor control provided

- **Cake Mixing System:** The cake mixing system will receive cake from the dewatering system as well as the dewatered cake from the Dewatered Cake Receiving and Storage Facility and have a design capacity of up to 50 DTPD. The cake mixing system will provide mixing of the various cake sources and provide buffer storage to the drying unit.

- **Drying System:** A thermal dryer system will be provided with a capacity of 50 DTPD, with an influent cake TS% ranging from 25% to 30%. The final product will have a TS% greater than 90%. The drying facility will include the following:
  - Belt dryers
  - Constructed in building with odor control provided
  - Upstream buffer storage of 8 hours provided
  - Final product storage silos to provide 7 days of storage

ATTACHMENT 10

BIOSOLIDS PRELIMINARY EQUIPMENT SIZING

Appendix B: Preliminary Equipment Sizing

Liquid Receiving and Storage

Parameter	Annual Average Conditions	Max Month Conditions	Max Week Conditions
Received Volume, gal/day	66,940	100,410	120,492
Received Mass, lbs (dry)/day	39,079	58,619	70,343
TS%	7%	7%	7%

Parameter	Assumption	Note
Tank Type	Buried	
Tank Material	concrete	
Tank Mixing Provided	Yes	Chopper Pumps
No of Tanks	Two	
Required Storage, days	3	Sized for Max month
Volume per Tank, gal	190,000	Assuming 80% usable volume
Transfer pump type to Dewatering	Rotary Lobe Pump	Duty/Standby at MW condition
Odor Control	Yes, for headspace	Sized for two tanks, half-full
Total Electrical usage per year, kwH	587,910	Assume 24 hour per day operation

Dewatering

Parameter	Annual Average Conditions	Max Week Conditions	Max Month Conditions
Received Volume, gal/day	66,940	120,492	100,410
Received Mass, lbs (dry)/day	39,079	70,343	58,619
TS%	7%	7%	7%

Parameter	Assumption	Note
Min. solids capture	95%	
Manufacturer and Model	Schwing Model 11.03 Screw Press	
Duty Units	1	
Standby Units	1	
Location	Inside Building	
Min. TS%	30%	Based on input provided by TCR. TCR conducted dewatered pilot tests using the

		Schwing dewatering screw press.
Filtrate/centrate	Gravity to sewer	
Washwater	Potable Water	Assumed washwater booster pumps not required
Odor Control Provided	Yes	
HVAC required	Yes	Per NFPA 820 Requirements
Operating time	168 hours/week	7 days/week,24 hours/day
Total Electrical usage per year, kwH	192,175	

Cake Receiving and Storage

Parameter	Annual Average Conditions	Max Week Conditions	Max Month Conditions
Received Mass, lbs (dry)/day	51,112	92,002	76,668
TS%	23%	23%	23%

Parameter	Assumption	Note
Manufacturer	Schwing	
Required Storage, days	3	At AA conditions
Location	Inside	For freezing and odor considerations
No of Silos	2	
Volume per silo, CF	2,450	
Transfer type to cake mixing	Screw conveyor	
Odor Control	Yes	
Building	enclosed	
Total electrical usage per year, kwH	422,425	Assume 24 hour per day operation

Cake Mixing

Parameter	Annual Average Conditions	Max Week Conditions	Max Month Conditions
Cake Mass, lbs (dry)/day	88,238	158,828	132,357
Cake Volume, CY	196	352	294

Parameter	Assumption	Note
Manufacturer and Model	Schwing 350 mm mixer	
Transfer type to buffer storage/Drying	Screw conveyor	Sized for MW condition
Odor Control	Yes	
Total Electrical usage per year, kwH	424,600	Assume 24 hour per day operation

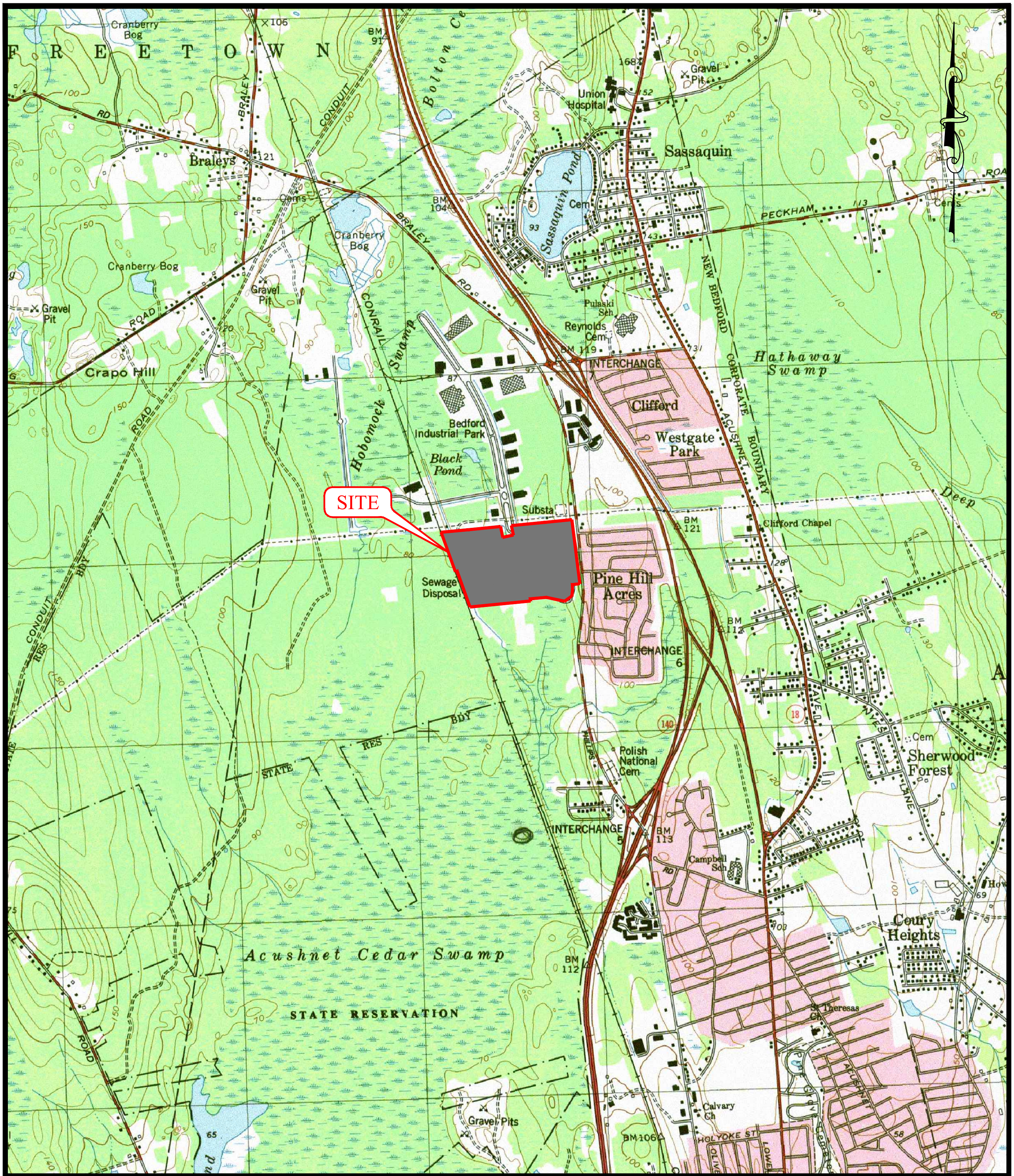
Drying

Parameter	Annual Average Conditions	Max Week Conditions	Max Month Conditions
Cake Mass, lbs (dry)/day	88,238	158,828	132,357
Cake Volume, CY	196	353	294

Parameter	Assumption	Note
Upstream Buffer Storage, hours	8	
Buffer Storage Silo Volume, CY	30	At MW conditions
Dryer Manufacturer and Model	Gryphon Model 1060U	
Duty Units required	4	
Location	Inside Building	
Min. TS%	93%	
Condensate	Gravity to sewer	
Final conveyance	Belt conveyor	
Building	Yes	Shared with other unit processes (dewatering, cake receiving, etc)
HVAC required	Yes	Per NFPA 820 requirements
Final Product storage	7 days	At MW conditions
Final Product storage silo Volume, CY	1,110	At MW conditions
Operating time	168 hours/week	7 days/week, 24 hours/day
Total Electrical usage per year, kwH	3,409,125	

INSERT 1

LOCUS PLAN



NOTE: USGS TOPOGRAPHIC MAP WAS PROVIDED BY THE OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MassGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS CURRENT TO MARCH 2017.

REVISIONS	
NO./ DATE	COMMENT

DRAWING TITLE:

SITE LOCUS MAP

CAD TECH:	CHECKED BY:
T. JANICKI	G. WIRSEN
ENGINEER:	DATE:
W. HALL	12/17/201

PREPARED FOR:

PARALLEL PRODUCTS OF NEW ENGLAND, INC.
969 SHAMUT AVENUE
NEW BEDFORD, MA 02746

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

LOCUS:

NEW BEDFORD INDUSTRIAL PARK
100 DUCHAINE BOULEVARD
NEW BEDFORD, MA 02745

SCALE:

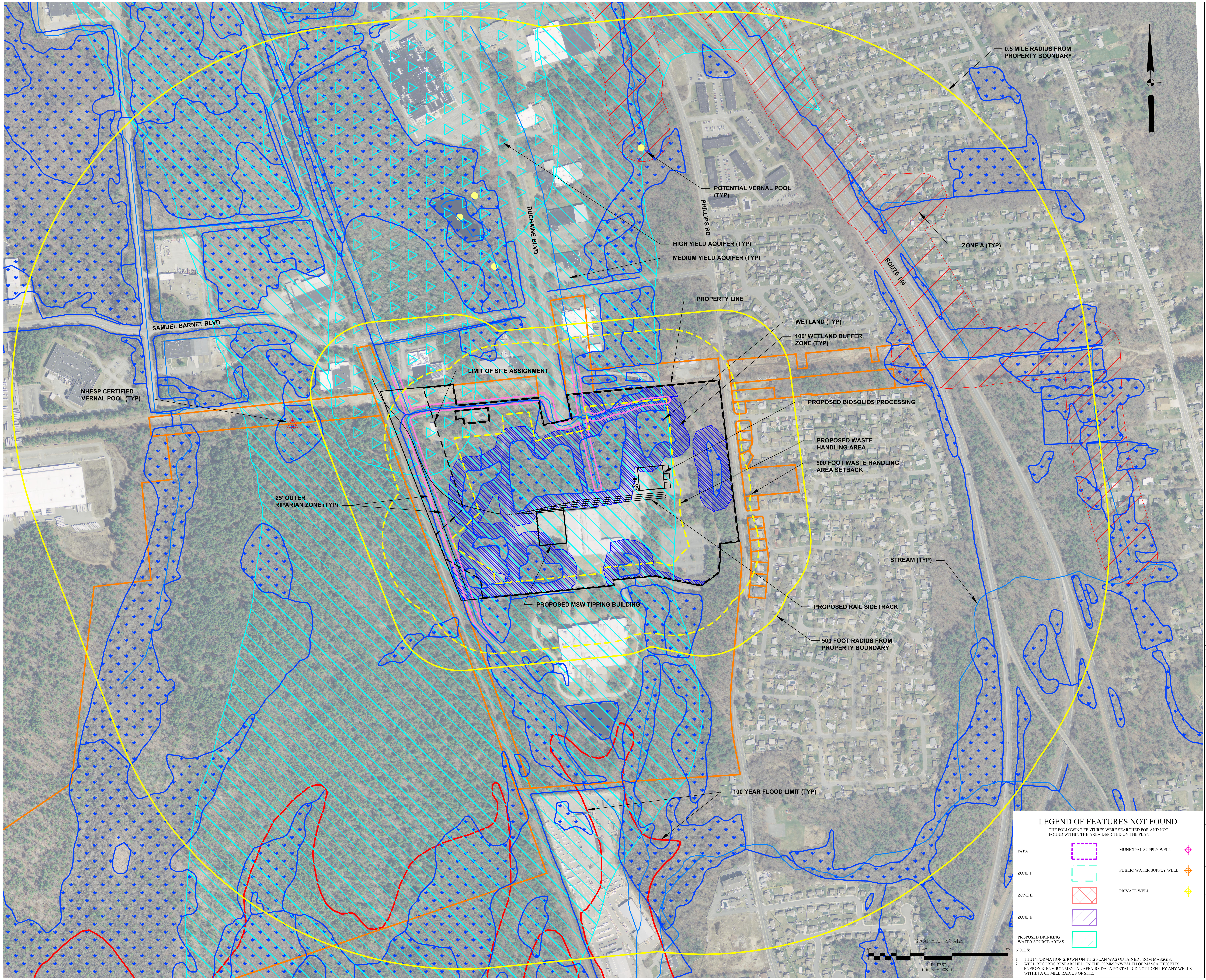
1" = 2,500'

SHEET:

INSERT 1

INSERT 2

WATER RESOURCES PLAN



LEGEND

DEP WETLANDS
100' BUFFER ZONE
HIGH YIELD AQUIFER
MEDIUM YIELD AQUIFER
ZONE A
500 FOOT AND 0.5 MILE SITE SETBACKS
WASTE HANDLING AREA AND 500 FOOT SETBACK
SITE ASSIGNMENT LINE
SITE PROPERTY LINES
ABUTTER PROPERTY LINE
FEMA 100 YEAR FLOOD LIMIT
25' OUTER RIPARIAN ZONE TO RIVERFRONT AREA
NHESP CERTIFIED VERNAL POOL
POTENTIAL VERNAL POOL

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

REVISIONS

NO.	DATE	COMMENT
A	2/1/2019	ISSUED FOR PERMITTING

PURPOSE:

SITE SUITABILITY

LOCUS:

NEW BEDFORD INDUSTRIAL PARK
100 DUCHAINE BOULEVARD
NEW BEDFORD, MA 02745

PREPARED FOR:

PARALLEL PRODUCTS OF NEW ENGLAND, INC.
969 SHAWMUT AVENUE
NEW BEDFORD, MA 02746

DRAWING TITLE:

WATER RESOURCES PLAN

CAD TECH:	CHECKED BY:
T. JANICKI	G. WIRSEN
ENGINEER:	DATE:
W. HALL	2/1/2019

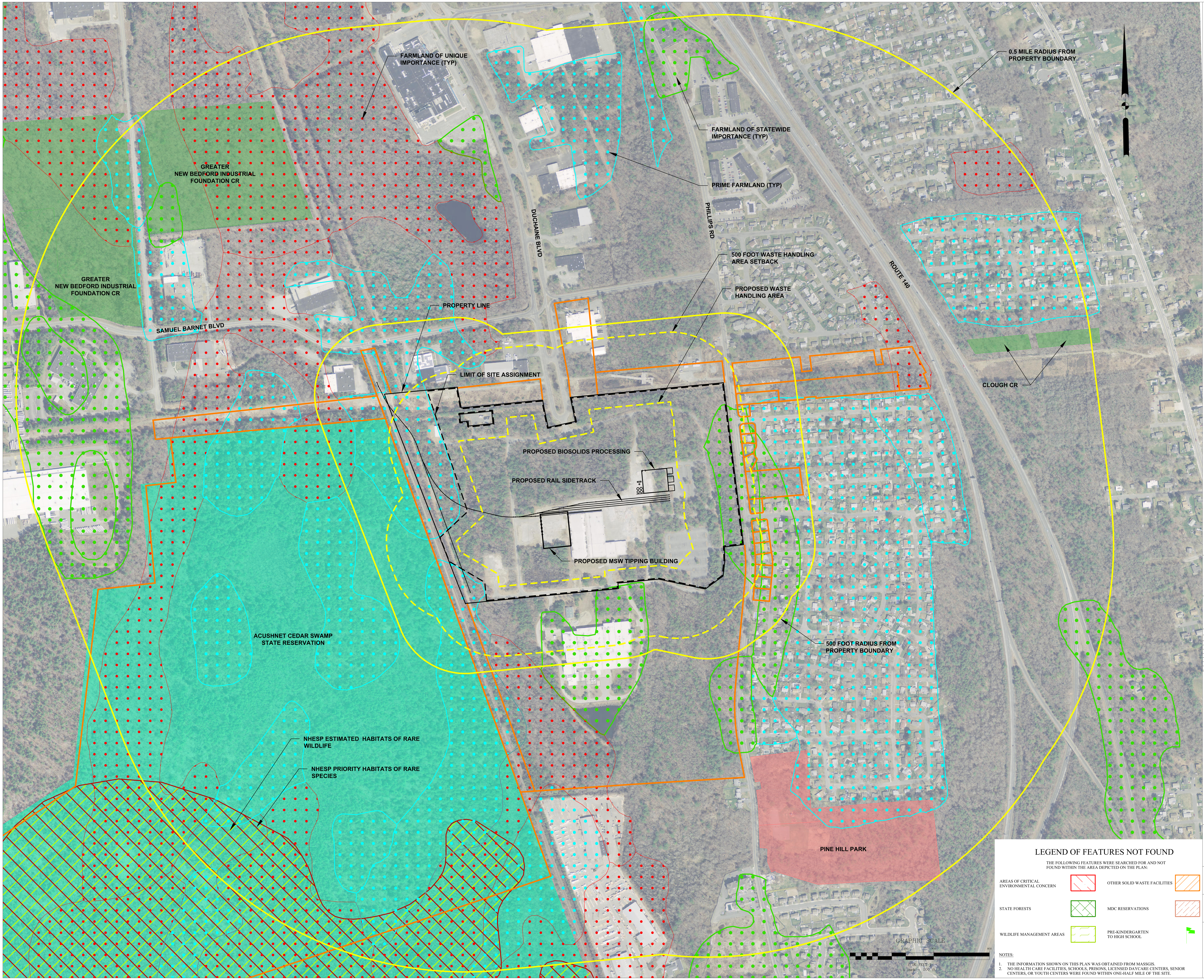
COMMONWEALTH OF MASSACHUSETTS
WHITNEY W. HALL II
CIVIL
NO. 29740
REGISTERED PROFESSIONAL ENGINEER

SCALE: *1" = 200'*

SHEET: INSERT 2

INSERT 3

LAND USE PLAN



LEGEND

- PRIME FARMLAND
- FARMLAND OF UNIQUE IMPORTANCE
- FARMLAND OF STATEWIDE IMPORTANCE
- CONSERVATION AREA
- RECREATION AREA
- CONSERVATION AND RECREATION AREA
- NHESP PRIORITY HABITATS OF RARE SPECIES
- NHESP ESTIMATED HABITATS OF RARE WILDLIFE
- 500 FOOT AND 0.5 MILE SITE SETBACKS
- WASTE HANDLING AREA AND 500 FOOT SETBACK
- SITE ASSIGNMENT LINE
- SITE PROPERTY LINES
- ABUTTER PROPERTY LINE

LEGEND OF FEATURES NOT FOUND

THE FOLLOWING FEATURES WERE SEARCHED FOR AND NOT FOUND WITHIN THE AREA DEPICTED ON THE PLAN:

- AREAS OF CRITICAL ENVIRONMENTAL CONCERN
- OTHER SOLID WASTE FACILITIES
- STATE FORESTS
- MDC RESERVATIONS
- WILDLIFE MANAGEMENT AREAS
- PRE-KINDERGARTEN TO HIGH SCHOOL

NOTES:

1. THE INFORMATION SHOWN ON THIS PLAN WAS OBTAINED FROM MASSGIS.
2. NO HEALTH CARE FACILITIES, SCHOOLS, PRISONS, LICENSED DAYCARE CENTERS, SENIOR CENTERS, OR YOUTH CENTERS WERE FOUND WITHIN ONE-HALF MILE OF THE SITE.

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Dimensions are as indicated.

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REVISIONS:

NO.	DATE	COMMENT
A	2/1/2019	ISSUED FOR PERMITTING

PURPOSE:

SITE SUITABILITY

LOCUS:

NEW BEDFORD INDUSTRIAL PARK
100 DUCHAINE BOULEVARD
NEW BEDFORD, MA 02745

PREPARED FOR:

PARALLEL PRODUCTS OF NEW ENGLAND, INC.
969 SHAWMUT AVENUE
NEW BEDFORD, MA 02746

DRAWING TITLE:

LAND USE PLAN

CAD TECH: T. JANICKI

CHECKED BY: G. WIRSEN

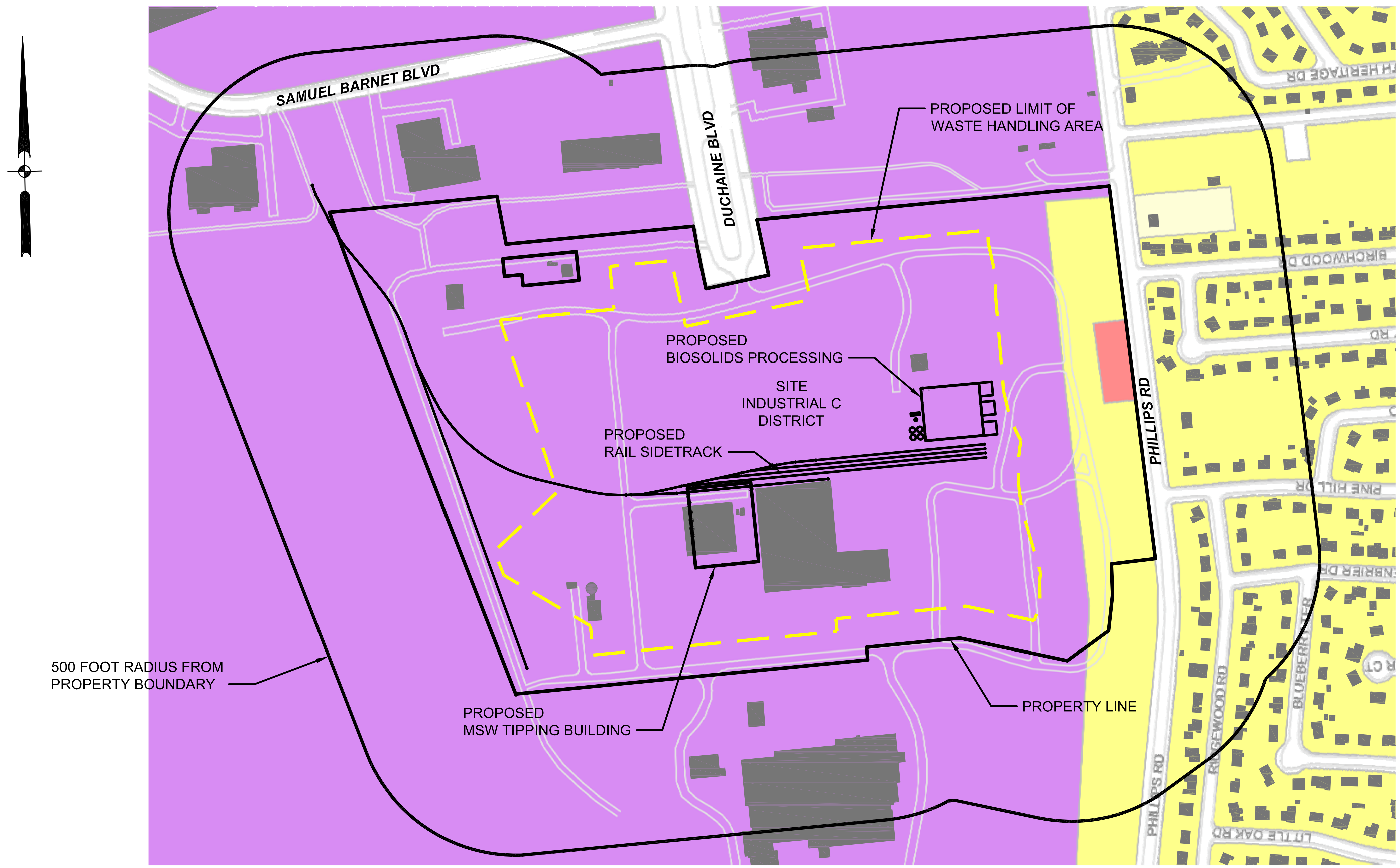
ENGINEER: W. HALL

DATE: 2/1/2019

COMMONWEALTH OF MASSACHUSETTS
WHITNEY W. HALL II
CIVIL
NO. 29740
REGISTERED PROFESSIONAL ENGINEER

SCALE: 1" = 200'

SHEET: INSERT 3



New Bedford Zoning

Zoning 2015

- Residential A
- Residential AA
- Mixed Use Business
- Industrial C

Map Produced by:
City of New Bedford
Management Information Systems
June 2015

NOTE:

THE INFORMATION SHOWN ON THIS PLAN WAS OBTAINED FROM THE CITY OF NEW BEDFORD AND MASSGIS.

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REVISIONS

NO.	DATE	COMMENTS
A	2/1/2019	ISSUED FOR PERMITTING

PROJECT:

SITE SUITABILITY

LOCUS:

NEW BEDFORD INDUSTRIAL PARK
100 DUCHAINE BOULEVARD
NEW BEDFORD, MA 02745

PREPARED FOR:

PARALLEL PRODUCTS OF NEW ENGLAND, INC.
969 SHAWMUT AVENUE
NEW BEDFORD, MA 02746

DRAWING TITLE:

ZONING & OVERLAY MAP

ENGINEER: W. HALL

CAD TECH: T. JANICKI

CHECKED BY: G. WIRSEN

SCALE: Not to Scale

DATE: 2/1/2019

SHEET: INSERT 3A

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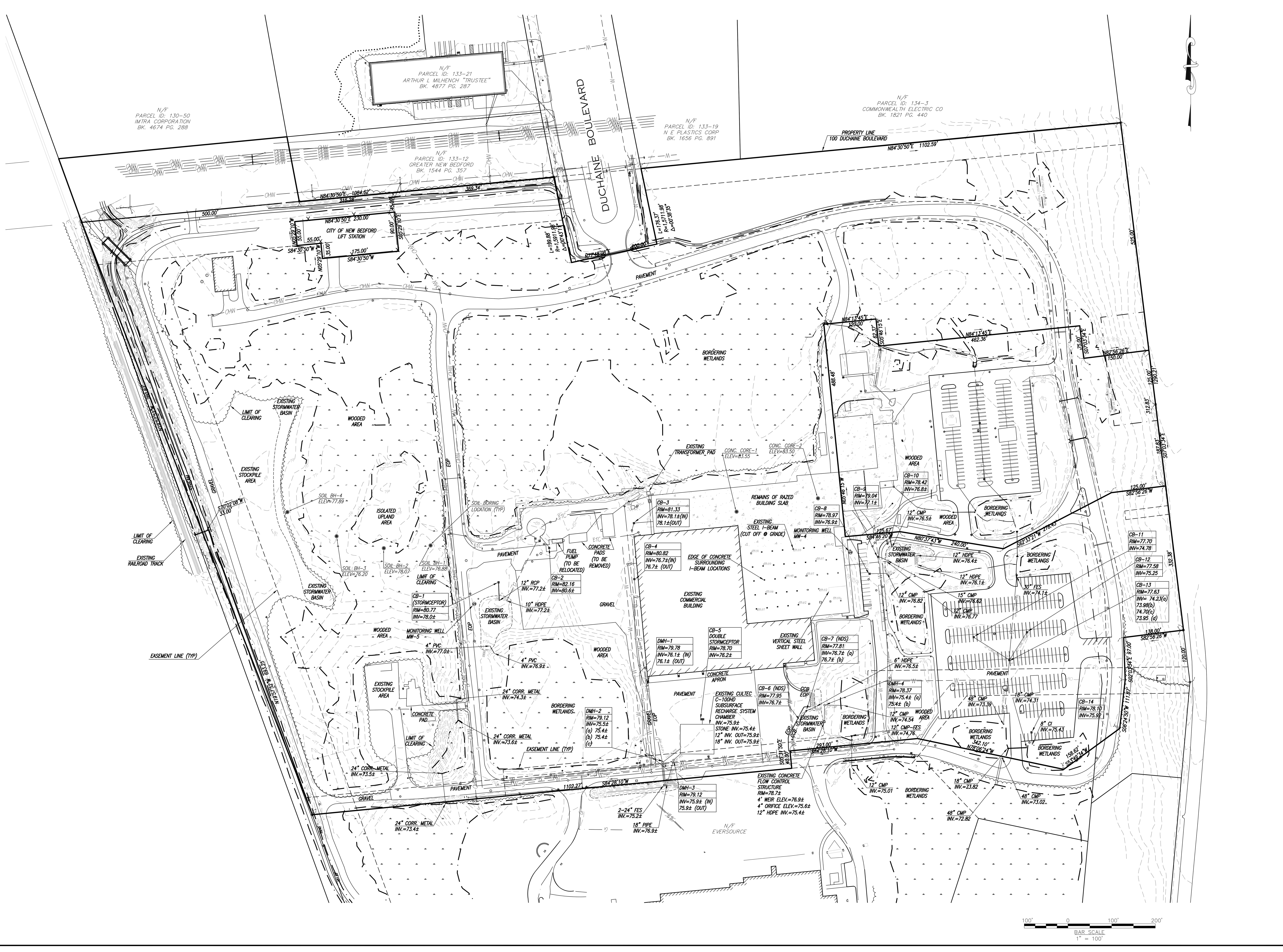
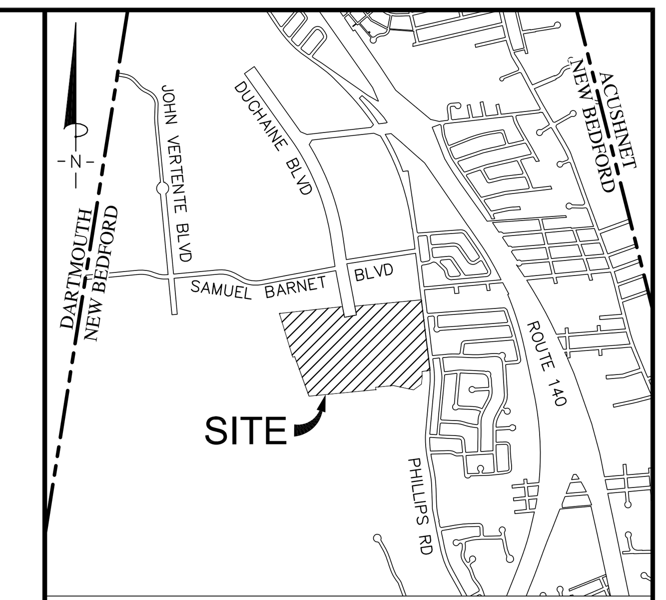
EXISTING CONDITIONS PLAN





LOCUS MAP NOT TO SCALE

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REVISIONS

NO.	DATE	COMMENT
A	2/1/2019	ISSUED FOR PERMITTING

PURPOSE:

PERMITTING

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

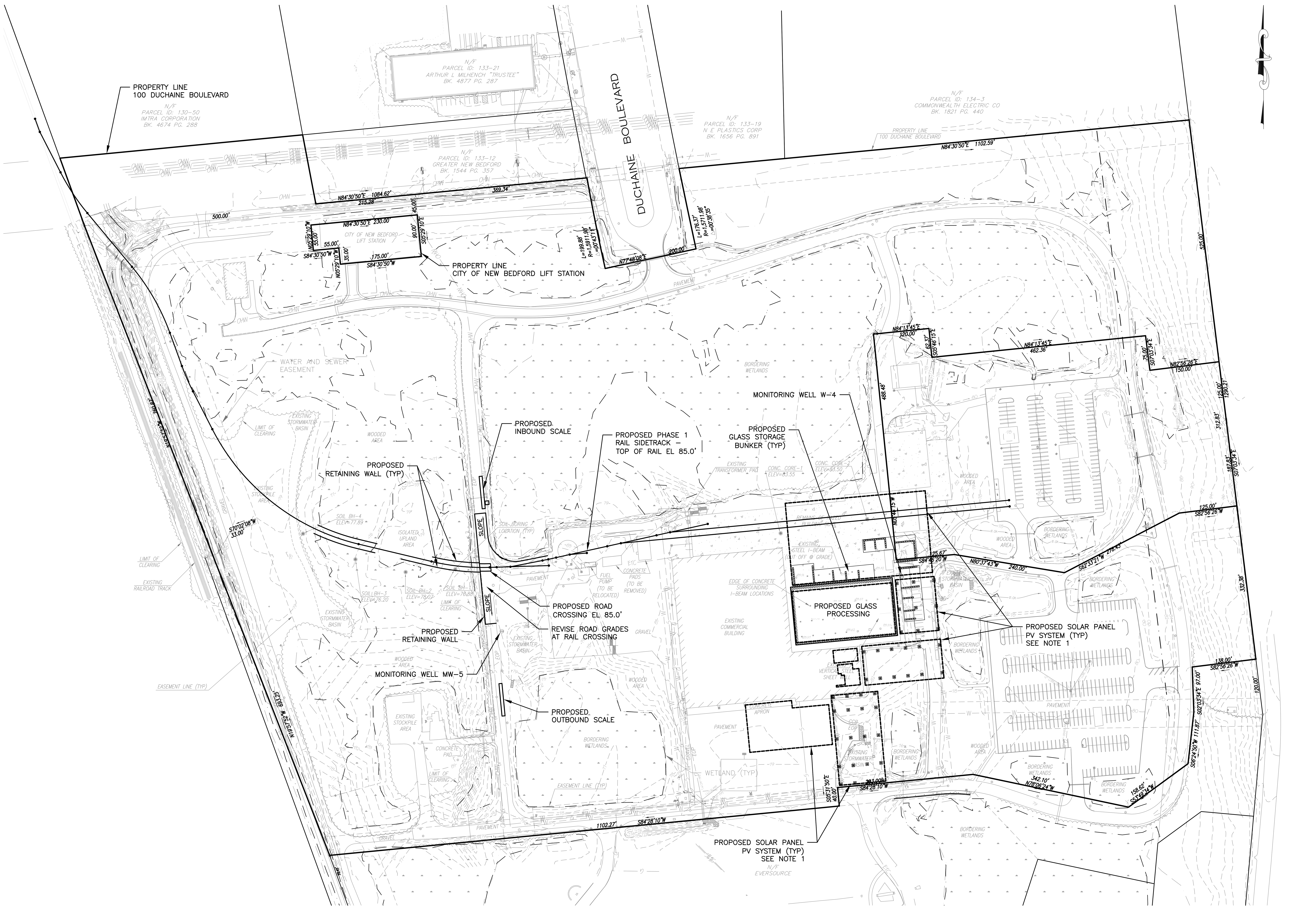
DRAWING TITLE:

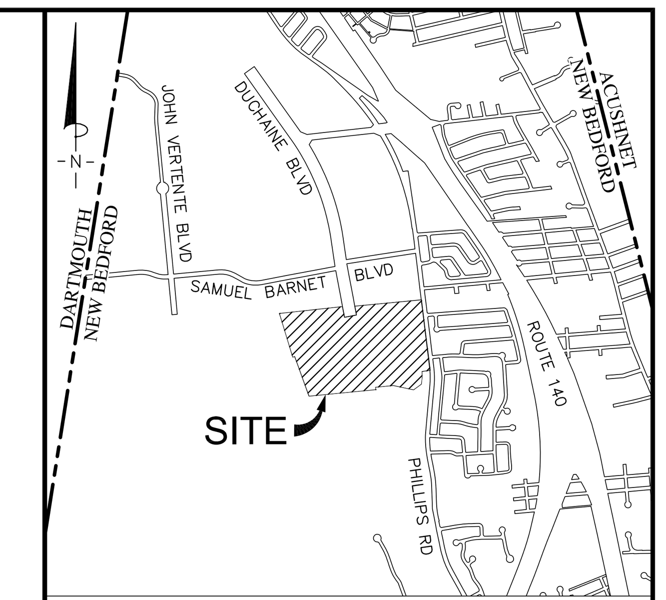
EXISTING CONDITIONS PLAN

CAD TECH:	CHECKED BY:
T. JANICKI	
ENGINEER:	DATE:
W. HALL	2/1/2019
	SCALE: 1"=100'
	SHEET: C-1

INSERT 5

PROPOSED CONDITIONS PLAN





LOCUS MAP NOT TO SCALE

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REVISIONS

NO.	DATE	COMMENT
A	2/1/2019	ISSUED FOR PERMITTING

PURPOSE:

PERMITTING

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

PHASE 1 SITE PLAN

CAD TECH:	CHECKED BY:
T. JANICKI	
ENGINEER:	DATE:
W. HALL	2/1/2019
	SCALE: 1"=100'
	SHEET: C-2

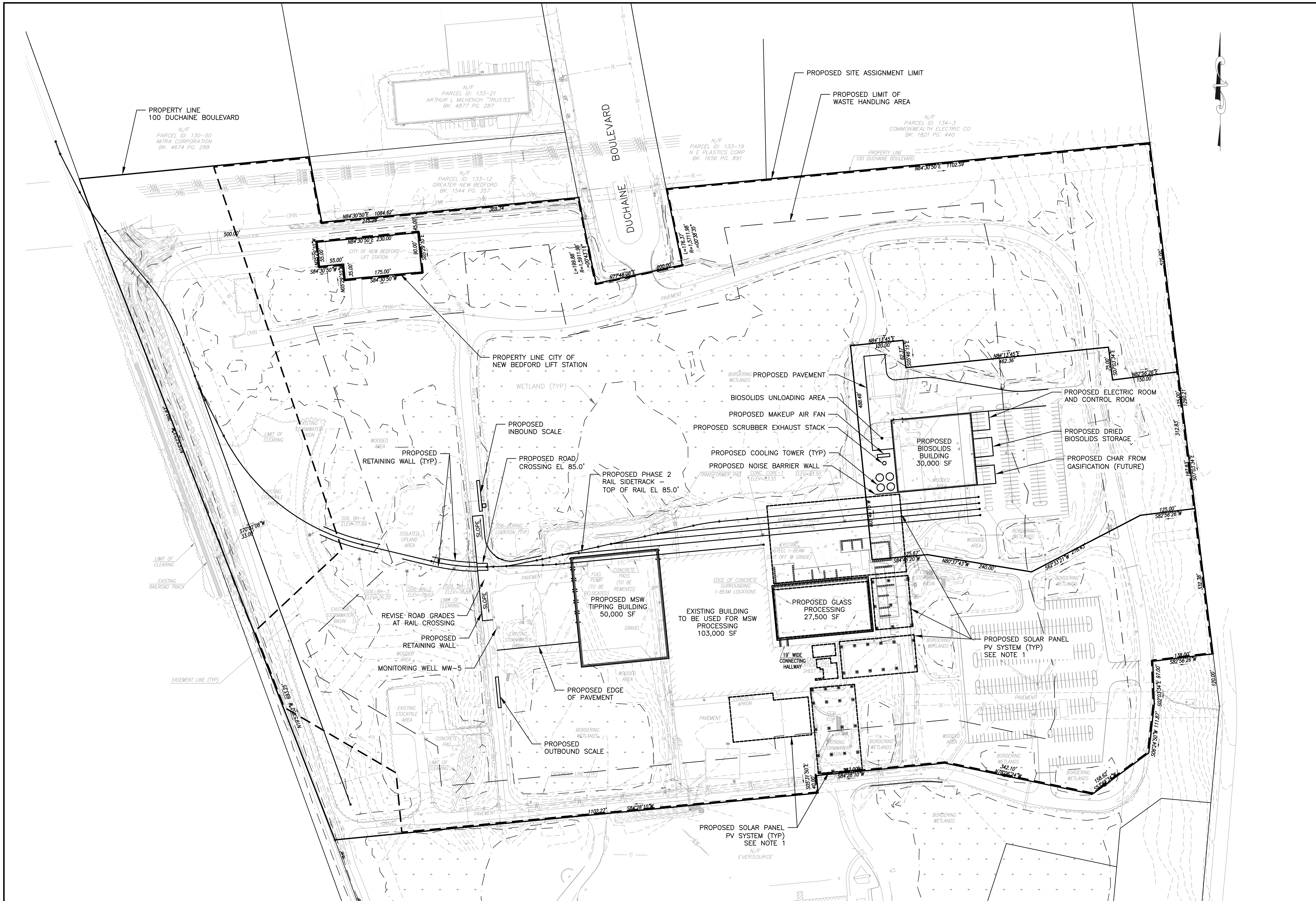
LEGEND

EXISTING FEATURES
PROPOSED FEATURES

100' 0 100' 200'
BAR SCALE
1" = 100'

NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.



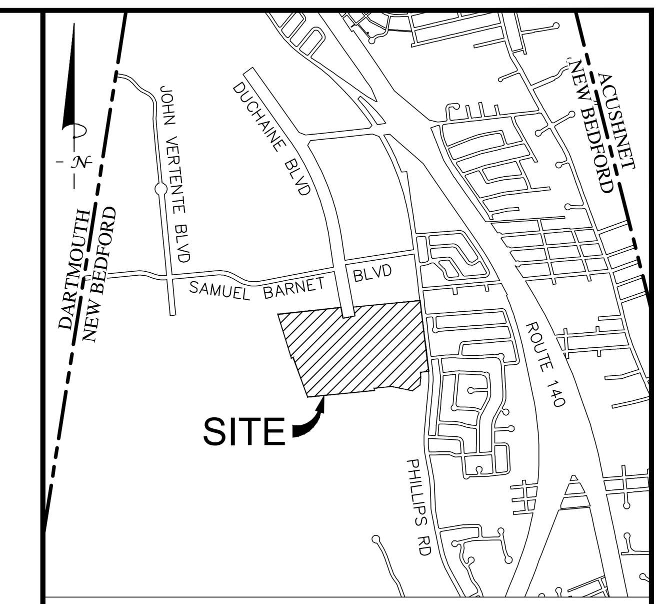
LEGEND

- EXISTING FEATURES
- PROPOSED FEATURES
- SITE ASSIGNMENT LIMIT
- LIMIT OF WASTE HANDLING AREA

100' 0 100' 200'
BAR SCALE
1" = 100'

NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.



LOCUS MAP NOT TO SCALE

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Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

REVISIONS

NO.	DATE	COMMENT
A	2/4/2019	ISSUED FOR PERMITTING

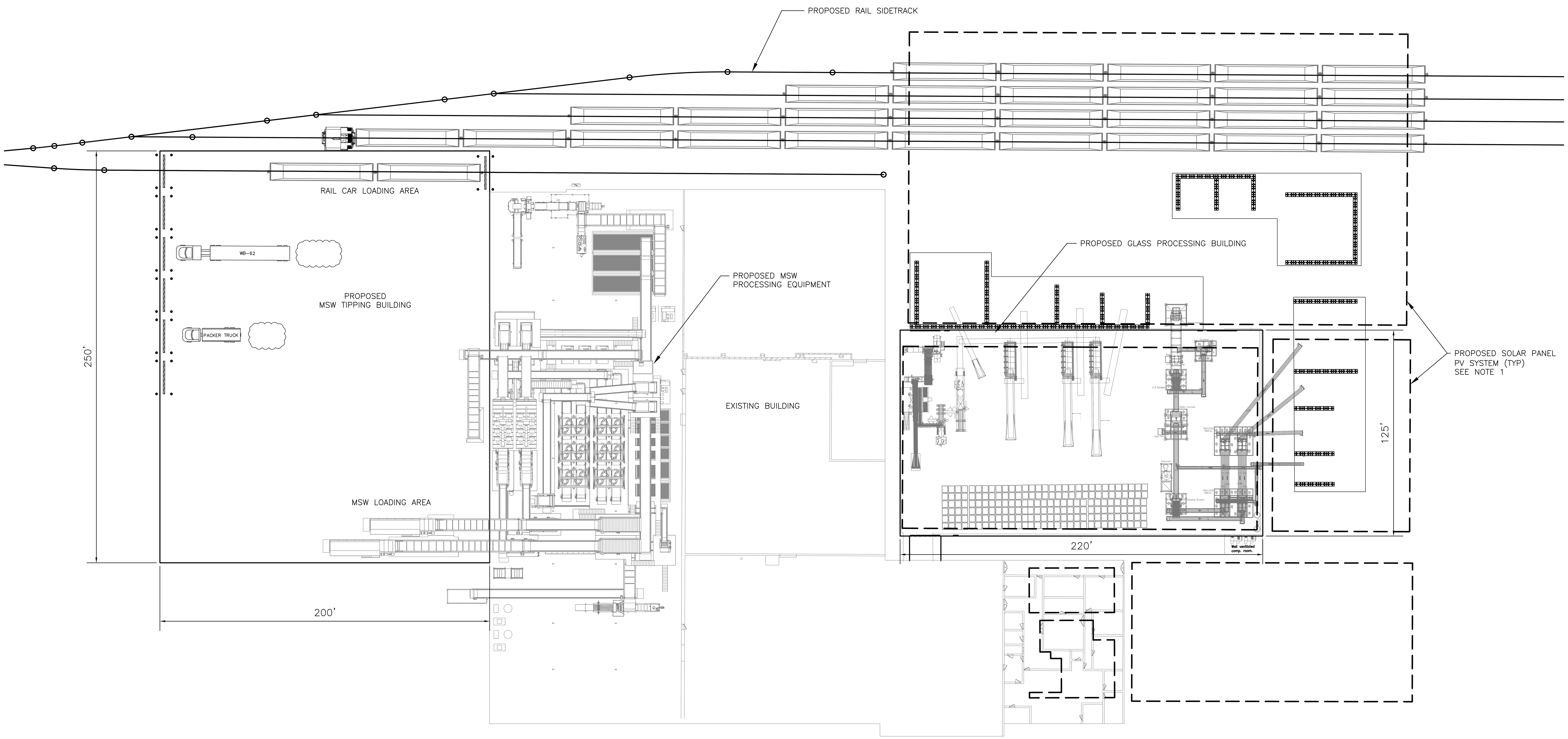
PURPOSE:
PERMITTING

LOCUS:
100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:
PARALLEL PRODUCTS, LLC

DRAWING TITLE:
PHASE 2 SITE PLAN

CAD TECH: T. JANICKI
CHECKED BY:
ENGINEER: W. HALL
DATE: 2/1/2019
SCALE: 1"=100'
SHEET: C-2A



NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.

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REVISIONS

NO.	DATE	COMMENT
A	2/1/2019	ISSUED FOR PERMITTING

PURPOSE:

PERMITTING

LOCUS:

NEW BEDFORD
INDUSTRIAL PARK
in
NEW BEDFORD, MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

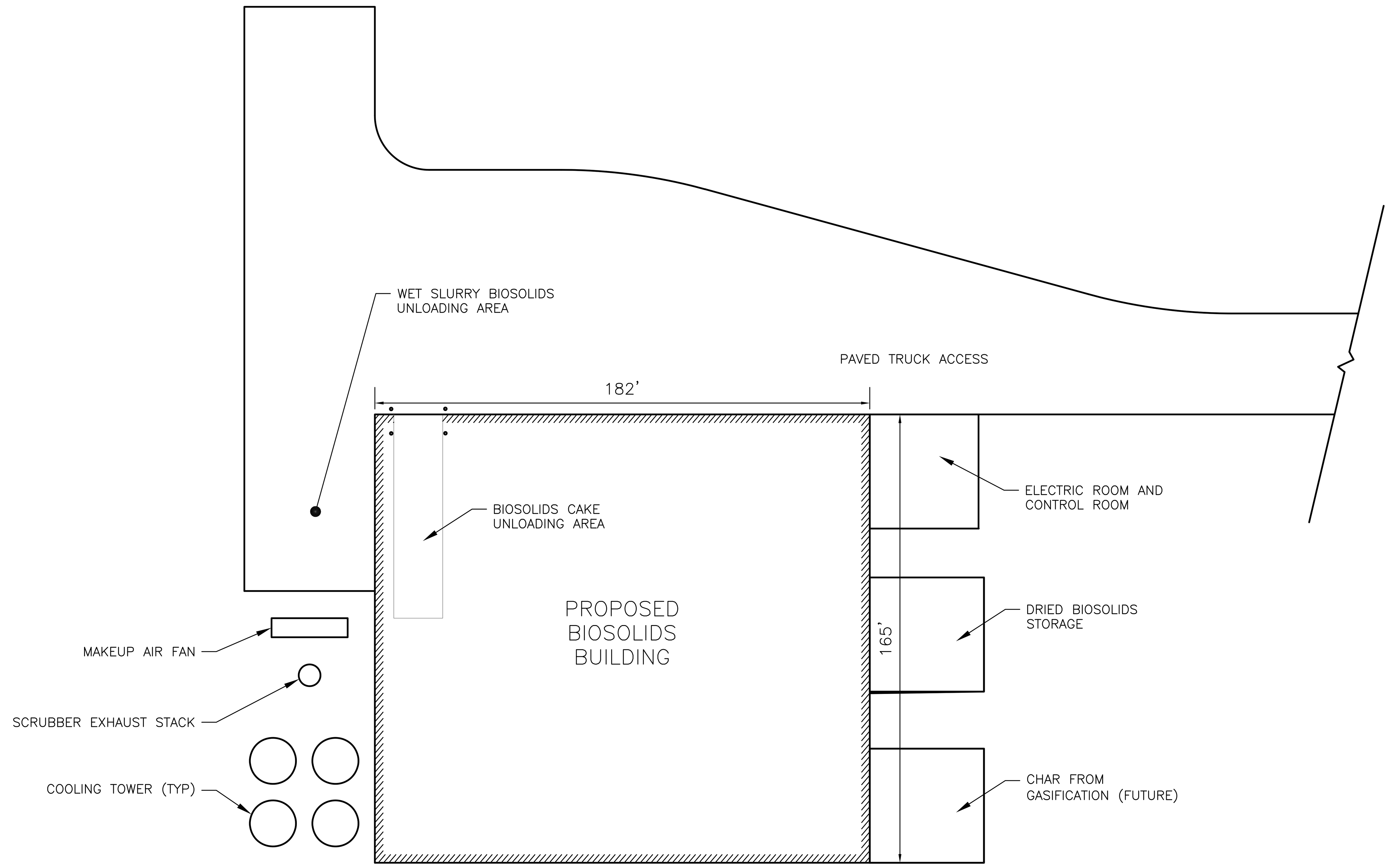
DRAWING TITLE:

BUILDING LAYOUT
TIPPING, MSW PROCESSING,
GLASS PROCESSING

CAD TECH:	CHECKED BY:
T. JANICKI	G. WIRSEN
ENGINEER:	DATE:
W. HALL	2/1/2019

SCALE: 1/32" =1'-0"

SHEET: C-3



32' 0 32' 64'
BAR SCALE
1/32" = 1'-0"

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Sagamore Beach, MA 02562
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REVISIONS

NO.	DATE	COMMENT
A	2/1/2019	ISSUED FOR PERMITTING

PURPOSE:

PERMITTING

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

BUILDING LAYOUT
BIOSOLIDS PROCESSING

CAD TECH:	CHECKED BY:
T. JANICKI	G. WIRSEN
ENGINEER:	DATE:
W. HALL	2/1/2019
	SCALE: 1/32" =1'-0"
	SHEET: C-4

APPENDIX B

TRAFFIC IMPACT ANALYSIS REPORT

McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Traffic Impact Study

Solid Waste Transfer Station

100 Duchaine Boulevard
New Bedford, MA

Prepared by
McMahon Associates, Inc.
120 Water Street, 4th Floor
Boston, MA 02109
617.556.0020

Prepared for
Green Seal Environmental, Inc.

July 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

McMahon Associates, Inc. has reviewed the existing traffic operations and potential traffic impacts associated with the proposed solid waste facility to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts, as shown in Figure 1. The purpose of this study was to evaluate existing and projected traffic operational and safety conditions in the vicinity of the site and identify mitigating measures to offset potential project-related traffic impacts on the surrounding roadways, if determined to necessary based on safety and/or operational conditions. This study has determined that the proposed project, when developed and operational will allow for safe and efficient access to and from the facility without the addition of mitigation measures.

Our assessment is based on a review of current traffic volumes and crash data collected for this study, a review of readily accessible traffic analyses, and the anticipated traffic generating characteristics of the proposed development. This study examines existing and projected traffic operations (both with and without the proposed project) at key intersections in the vicinity of the project site. The study area was chosen based on a review of the surrounding roadway network and anticipated traffic generating characteristics of the proposed project. It provides a detailed analysis of traffic operations during the weekday morning and weekday afternoon peak hours, when the combination of adjacent roadway volumes and potential traffic increases associated with the project would be greatest.

Based on the analysis presented in this study, McMahon Associates concludes that the projected traffic increases associated with both the background traffic growth and the project-related traffic generated by the proposed facility can be accommodated on the surrounding roadway network. This report documents our findings and recommendations. It should be noted that these conclusions conservatively base all inbound and outbound traffic via truck without incorporating alternative modes or methods of waste disposal.

Project Description

The existing site consists of the NWD Trucking facility and is bounded by a rail line to the east, Philips Road to the west, industrial properties to the north and undeveloped land to the south. The project proponent intends to remove the existing NWD Trucking operation and construct a solid waste facility that will accept municipal solid waste (MSW) and construction and demolition (C&D) materials for handling the maximum daily approval of 1,500 tons per day (tpd). Access to the proposed site would be provided by one full-access driveway from Duchaine Boulevard, which leads to an internal one-way loop roadway surrounding the proposed facility.

Figure 1
Site Location
New Bedford Transfer Station
New Bedford, MA

Study Methodology

This study evaluates existing and projected traffic operations at study area intersections for the weekday morning and weekday afternoon peak hour traffic conditions when the combination of adjacent roadway volumes and potential traffic increases associated with the project would be greatest.

The study was conducted in three steps. The first step involved an inventory of existing traffic conditions in the vicinity of the site. As part of this inventory, traffic counts were collected at key intersections during the weekday morning and weekday afternoon peak periods. Crash data was obtained from the Massachusetts Department of Transportation (MassDOT) to evaluate existing safety conditions within the study area.

The second step of the study builds upon data collected in the first phase and establishes the basis for evaluating the transportation impacts associated with future conditions. In this step, Existing 2018 traffic volumes were projected to 2025 No Build (without project) conditions and 2025 Build (with project) conditions. In this phase, the projected traffic demands of other future developments that could influence traffic volumes at the study area intersections were assessed.

The final step identifies measures, if necessary, to improve existing and future traffic operations and safety, minimize potential traffic impacts, and provide safe and efficient access to the project site.

Study Area Intersections

The area identified for detailed analysis in this study was determined based on a review of the anticipated traffic generating characteristics of the proposed project, a review of the surrounding roadway network serving the project site. The study area intersections include:

- Route 140 Northbound on/off-ramp at Braley Road
- Route 140 Southbound on/off-ramp at Braley Road
- Braley Road/Theodore Rice Boulevard at Phillips Road
- Theodore Rice Boulevard at Duchaine Boulevard
- Duchaine Boulevard at Samuel Barnet Boulevard
- Phillips Road at Samuel Barnet Boulevard
- Duchaine Boulevard at Site Driveway

EXISTING CONDITIONS

Effective evaluation of potential traffic impacts associated with the proposed development requires a thorough understanding of the existing traffic conditions on the roadways and intersections serving the project site. The assessment of existing conditions consists of an inventory of the roadway and intersection geometries and traffic control devices, collection of peak-period traffic volumes, and a review of recent crash history. A discussion of this information is presented below.

Roadway Network

The project site benefits from access via the local and regional roadway systems. A brief description of the principal roadways serving the project site is presented below.

<u>Alfred Bessette Memorial Highway (Route 140)</u>
Alfred Bessette Memorial Highway (Route 140) is a limited access roadway that is classified as an urban principal arterial under MassDOT jurisdiction. Route 140 runs in the north-south direction throughout southeastern Massachusetts, providing two lanes of travel in each direction and separated by a grass median. Route 140 has exits adjacent to the study area at Philips Road (Exit 5) and Braley Road (Exit 7). Route 140 northbound and southbound ramps are under stop control with both Philips Road and Braley Road.

<u>Braley Road</u>
Braley Road is classified as an urban minor arterial under MassDOT jurisdiction within the study area, and primarily provides access to residential and industrial properties. Braley Road generally runs in the east-west direction between Acushnet Avenue to the east and Phillips Road to the west, providing a single travel lane measuring 11 feet in width in each direction.

<u>Theodore Rice Boulevard</u>
Braley Road ends at Philips Road and Theodore Rice Boulevard continues as the east-west connection between Philips Road to the east and Duchaine Boulevard to the west, which provides access to industrial land uses. Theodore Rice Boulevard is classified as a local roadway under City of New Bedford jurisdiction and provides a 20-foot wide travel lane in each direction, separated by a 12-foot wide raised, grass median. There are no sidewalks provided on either side of the roadway. The posted speed limit on Theodore Rice Boulevard is 30 mph.

<u>Phillips Road</u>
Phillips Road is classified as an urban major collector under City of New Bedford jurisdiction and runs in the north-south direction between Braley Road/Theodore Rice Boulevard to the north and Church Street to the south. Phillips Road is a two lane, two-way roadway, providing a 15-foot wide travel lane in each direction. Within the study area, a four-foot

wide sidewalk and a six-foot wide marked bike lane are each provided on either side of the roadway . The posted speed limit on Phillips Road is 30 mph.

Duchaine Boulevard

Duchaine Boulevard is classified as a local roadway under City of New Bedford jurisdiction and provides access to industrial lane uses within the New Bedford Industrial Park. Duchaine Boulevard runs in the north-south direction and provides two 14-foot wide travel lanes in each direction separated by a grass median. Shoulders measuring 11 feet in width are provided on both sides of the roadway. Since the roadway is median divided, there are multiple U-turns locations along the corridor and the posted speed limit is 30 mph.

Samuel Barnet Boulevard

Samuel Barnet Boulevard is a local roadway under City of New Bedford jurisdiction and runs in the east-west direction, providing a connection between Phillips Road to the east and Duchaine Boulevard to the west. Samuel Barnet Boulevard provides access to industrial land uses and serves the New Bedford Industrial Park. Samuel Barnet Boulevard is a two-way, two-lane roadway generally providing a 13-foot wide travel lane in each direction, with seven-foot wide shoulders on either side of the roadway. The posted speed limit on Samuel Barnet Boulevard is 30 mph.

Existing Traffic Volumes

Existing Peak Hour Traffic Volumes

Manual turning movement counts were conducted at the study area intersections on Wednesday, June 13, 2018. The traffic counts were conducted during the weekday morning peak period from 7:00 AM to 9:00 AM, and the weekday afternoon peak period from 3:00 PM to 6:00 PM. The traffic counts are summarized in 15-minute intervals and are provided in Appendix A of this report. The four highest consecutive 15-minute intervals during the peak periods constitutes as the peak hour for the study area network. The highest weekday morning peak hour volume was recorded between 7:30 AM and 8:30 AM, and the afternoon peak hour was recorded between 3:00 PM and 4:00 PM.

A 48-hour automatic traffic recorder (ATR) count was conducted on Duchaine Boulevard on Wednesday, June 13, 2018 and Thursday, June 14, 2018. The ATR collected traffic volumes on Duchaine Boulevard near the proposed project site. The results of the counts are tabulated in 15-minute periods and are provided in Appendix B of this report. The four highest consecutive 15-minute intervals during the weekday morning and weekday afternoon peak periods constitutes as the peak hours for Duchaine Boulevard. The ATR data and peak hourly traffic flows are summarized in Table 1 below.

Table 1: ATR Summary

	ADT[1]	HV%[2]	85th Percentile Speed[3] (mph)	AM Peak (7:00AM to 8:00AM)	PM Peak (3:00PM to 4:00PM)
Duchaine Boulevard					
North of Samuel Barnet Boulevard					
Northbound	2010	25.0	37	136	202
Southbound	2130	24.0	36	269	121
TOTAL	**4,140**	**24.5**	**37**	**405**	**323**

[1] ADT - Average Daily Traffic (Vehicles per Day)

[2] HV% - Percentage of Heavy Vehicles based on TMC completed on June 13, 2018

[3] Based on Field Speed Study completed July 13, 2018

Seasonal Variation

In order to determine seasonal variation in the area of the project, traffic count data from MassDOT continuous count station 617 on Route 140 just north of the project site was reviewed. Based on this data, traffic volumes in the month of June are higher than an average month. Therefore, to present a conservative analysis, traffic volumes were not adjusted downward to present an average month. The peak hourly traffic flows are depicted in Figures 2 and 3 for the weekday morning, and weekday afternoon peak hours, respectively.

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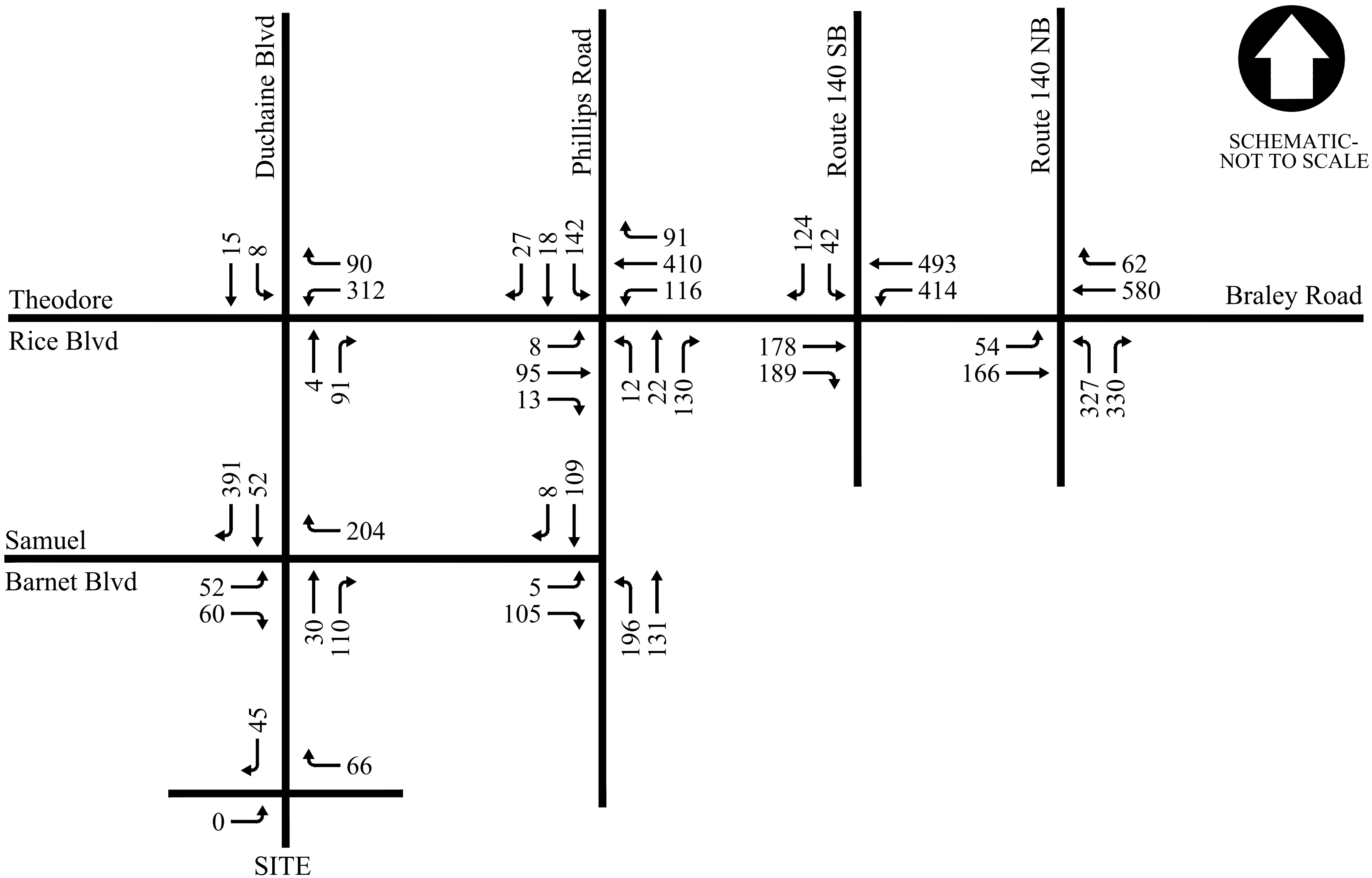

MCMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Figure 2
2018 Existing Weekday AM
Transfer Station
New Bedford, MA

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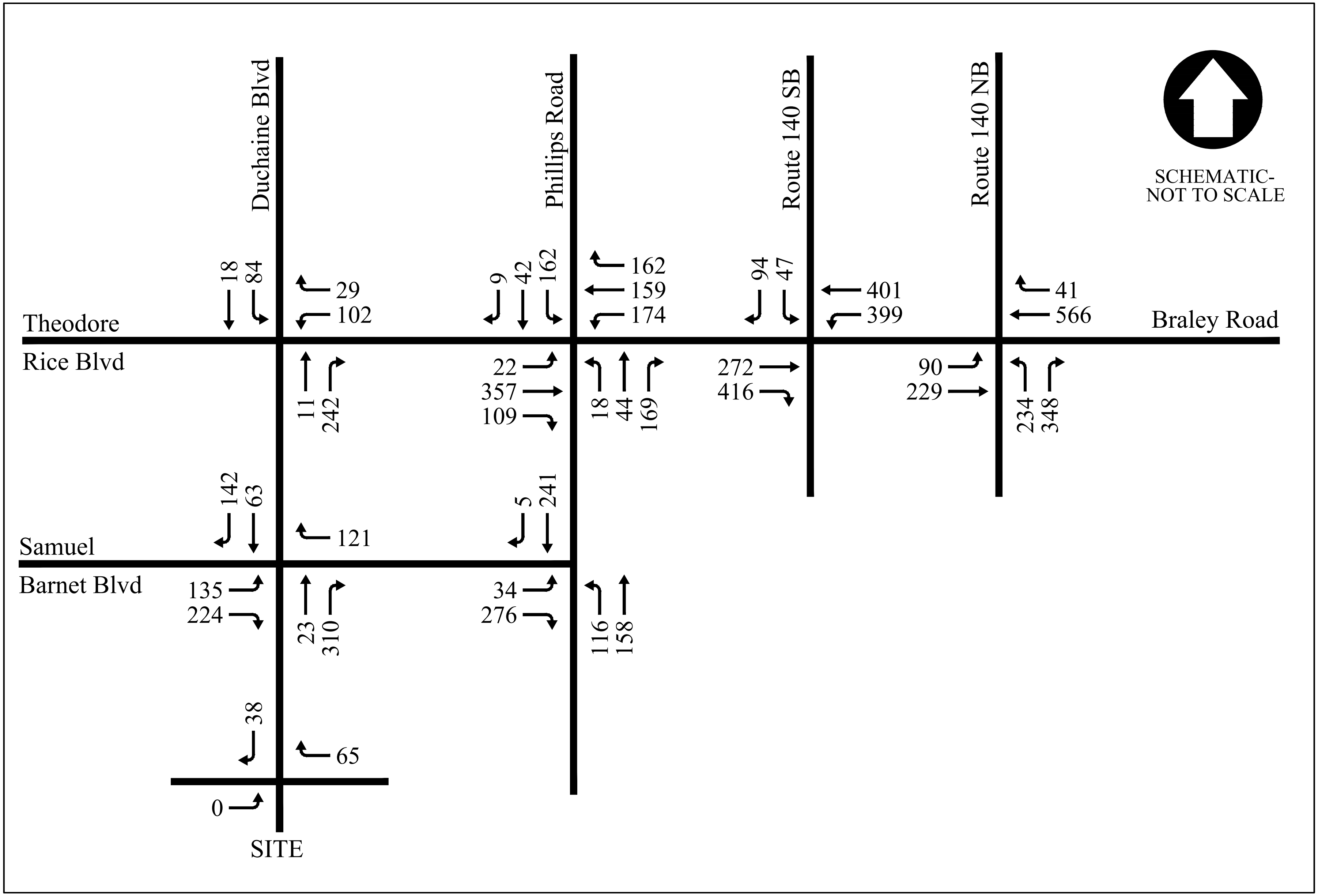


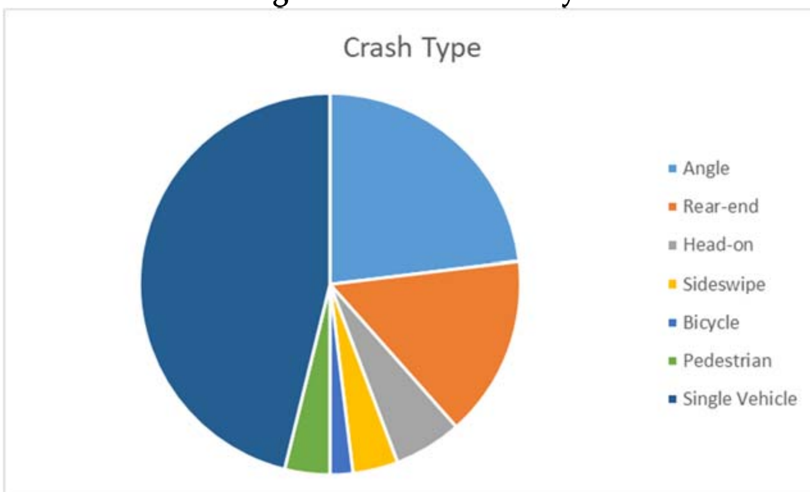
McMAHON
TRANSPORTATION ENGINEERS & PLANNERS

Figure 3
2018 Existing Weekday PM
Transfer Station
New Bedford, MA

Crash Summary

Crash data for the study area intersections was obtained from MassDOT for the most recent five-year period available. This data includes complete yearly crash summaries for 2011, 2012, 2013, 2014, and 2015. The crash data is summarized in Figure 4 below and a detailed summary is provided in Appendix C.

Figure 4: Crash Summary



Over the five-year period analyzed, the unsignalized intersection of the Route 140 Northbound on/off ramps at Braley Road had a total of 13 reported crashes, resulting in a crash rate of 0.43 crashes per million vehicles entering. The majority of the reported crashes were single vehicle, rear-end, and angle collisions with seven of the reported crashes resulting in personal injury. The unsignalized intersection of the Route 140 Southbound on/off ramps at Braley Road had a total of five reported crashes, resulting in a crash rate of 0.15 crashes per million vehicles entering. A majority of the reported crashes at this intersection were single vehicle collisions, one of which resulted in personal injury. The intersection of Duchaine Boulevard at Samuel Barnet Boulevard had a total of three reported crashes, resulting in a crash rate of 0.15 crashes per million vehicles entering and all three reported crashes were single vehicle collisions resulting in property damage only. The intersection of Phillips Road at Samuel Barnet Boulevard also had a total of three reported crashes which resulted in a crash rate of 0.18 crashes per million vehicles entering, two of which resulted in personal injury and one involving property damage only. The resulting crash rates at all of these intersections were lower than both the identical statewide and District 5 average crash rates of 0.57 crashes per million entering vehicles.

The unsignalized intersection of Braley Road/Theodore Rice Boulevard at Phillips Road had a total of 17 reported crashes over the five-year period analyzed, resulting in a crash rate of 0.59 crashes per million vehicles entering, which is slightly higher than the statewide and District 5 crash rate. The majority of the 17 reported crashes were single vehicle collisions and angle collisions, and seven crashes resulted in personal injury.

The unsignalized intersection of Theodore Rice Boulevard at Duchaine Boulevard had a total of 11 crashes over the five-year period analyzed resulting in a crash rate of 1.12 crashes per million vehicles entering, which is higher than the statewide and District 5 average crash rate. Seven of the 11 reported crashes were single vehicle collisions, one of which, in 2014, resulted in a fatality. Based on reports, speed was a prominent factor in this fatal crash and it is suspected that the operator of the vehicle was street racing and the fatal crash was believed to be an isolated incident.

FUTURE CONDITIONS

To determine future traffic demands on the study area roadways, the 2018 Existing traffic volumes were projected to the future year 2025, when the proposed development is expected to be fully built and occupied. Independent of the proposed project, traffic volumes on the roadways in 2025 are assumed to include existing traffic, as well as new traffic resulting from general growth in the study area and from other planned development projects. The potential background traffic growth unrelated to the proposed project was considered in the development of the 2025 No Build (without project) peak hour traffic volumes. The anticipated traffic increases associated with the proposed development were then added to the 2025 No Build volumes to reflect the 2025 Build (with project) traffic conditions. A more detailed description of the development of the 2025 No Build and 2025 Build traffic volume networks follows.

Future Roadway Improvements

Planned roadway improvement projects can affect area travel patterns and future traffic operations. There are no planned roadway improvements that would impact traffic on the study area roadways.

Background Traffic Growth

Traffic growth is primarily a function of changes in motor vehicle use and expected land redevelopment in the region. To predict a rate at which traffic on the roadways in the vicinity of the site can be expected to grow during the seven-year forecast period (2018 to 2025), both historic traffic growth and planned area redevelopments were examined.

Historic Traffic Growth

A background growth rate of one percent per year was confirmed with the Southeastern Regional Planning and Economic Development District (SPREDD) in order to forecast increases in general traffic volumes on the study area roadways and intersections for our future analysis. This rate captures growth associated with general changes in population and accounts for other small developments in the vicinity of the study area.

Site-Specific Growth

There are no planned/permitted developments adjacent to the project study area to be added as site specific growth.

2025 No Build Traffic Volumes

The 2018 Existing peak hour traffic volumes were grown by one percent per year over the seven-year study horizon (2018 to 2025) to establish the 2025 base future traffic volumes. The 2025 No Build weekday morning and weekday afternoon peak hour traffic volume networks are illustrated in Figures 5 and 6, respectively, and are documented in the traffic projection model presented in Appendix D of this report.

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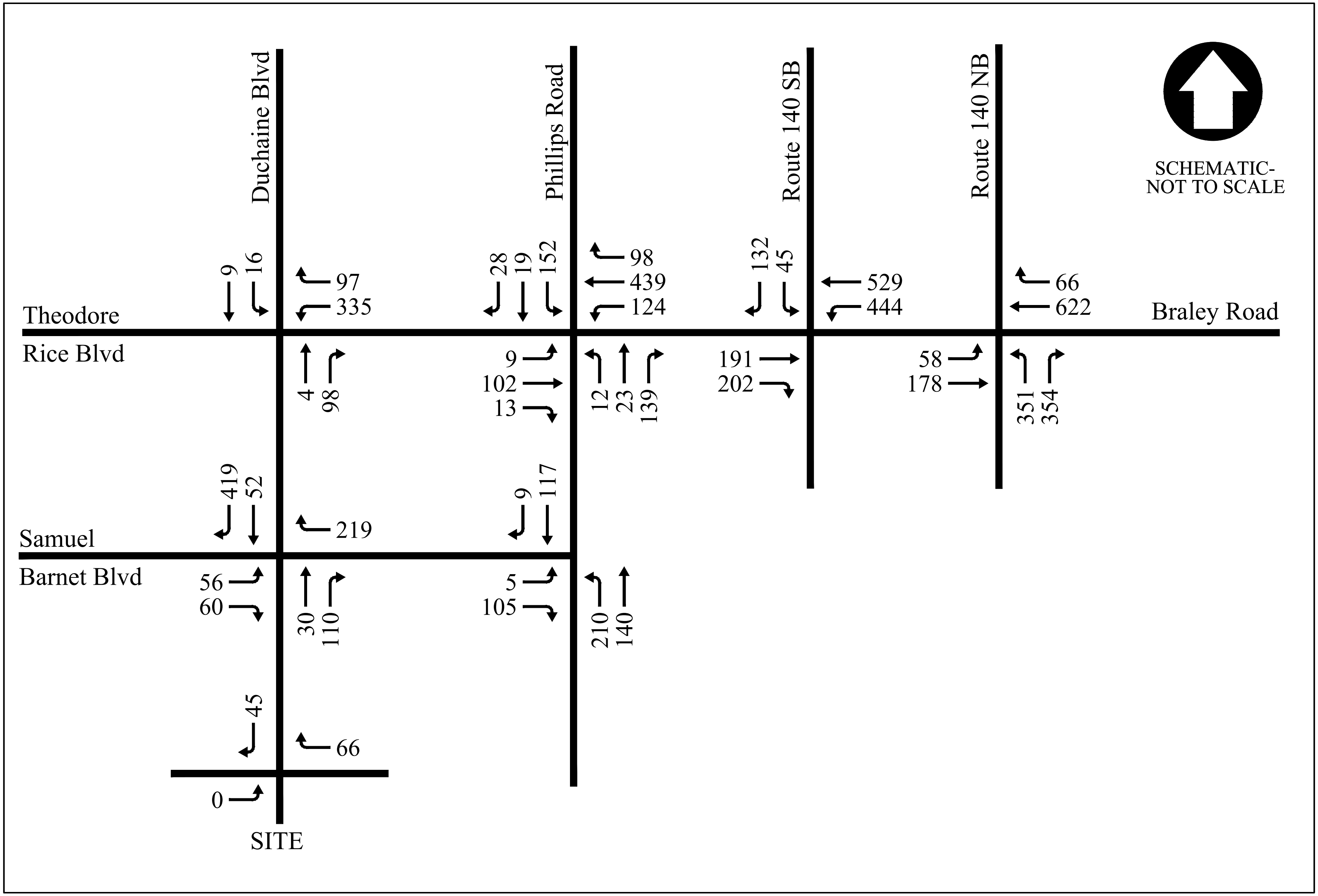

Figure 5
2025 No Build Weekday AM
Transfer Station
New Bedford, MA

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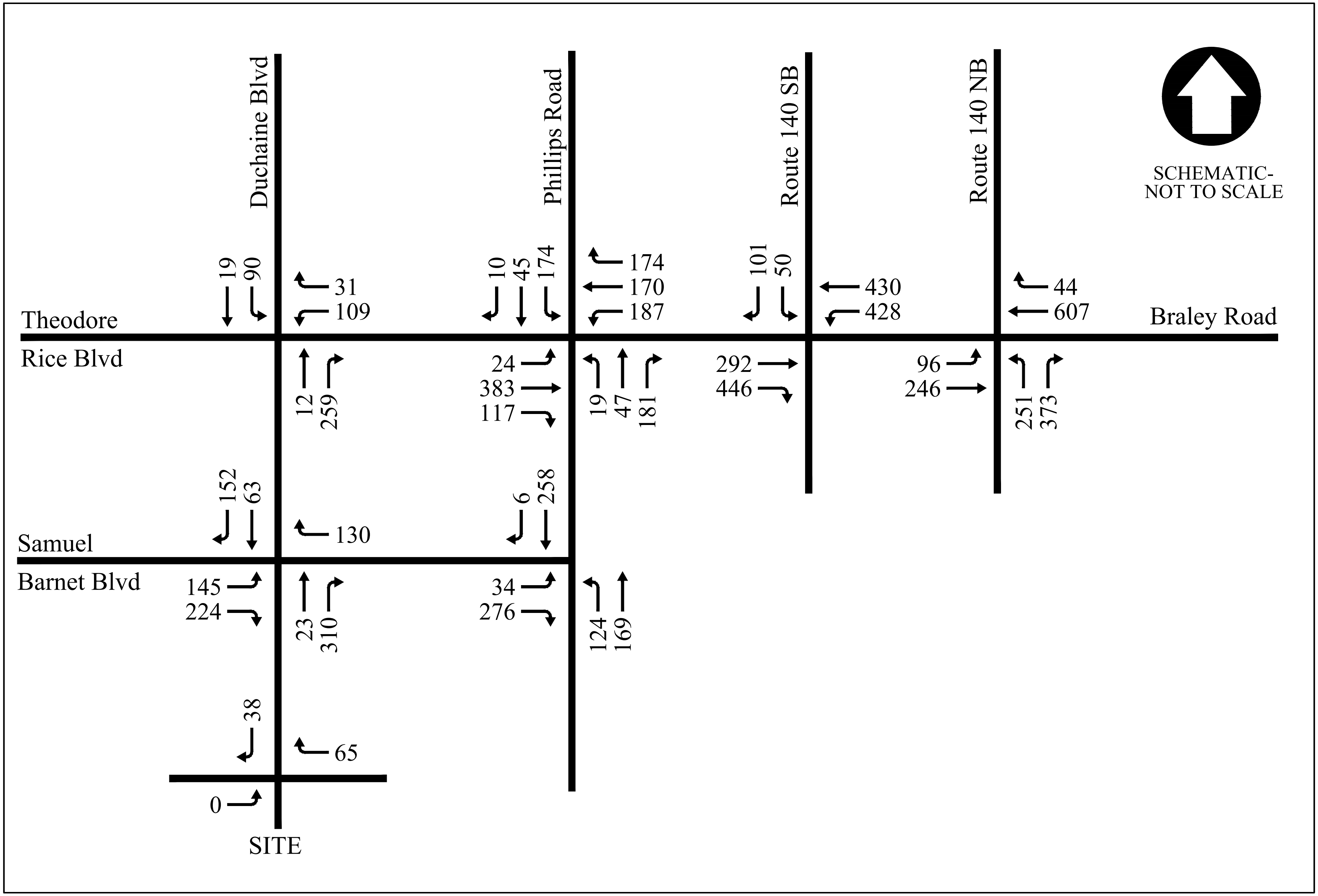

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Figure 6
2025 No Build Weekday PM
Transfer Station
New Bedford, MA

Site-Generated Traffic

The site proposes to receive a maximum of 1,500 tpd of solid waste (MSW and C&D). To estimate the trip generation for the proposed site, data was collected for a three-month period from a comparable site in Rochester, MA that has a maximum approval for 1,500 tpd. Based on information received, the inbound materials to the Rochester site were applied to the New Bedford facility. Inbound materials to the proposed site include approximately 1071 tons/day in transfer trailers (approximately 28.2 tons per load), 243 tons/day in packer trucks (approximately 9 tons per load), 11 tons/day in roll-off trucks (approximately 5.5 tons per load), and 26 tons/day in roll-off containers (approximately 4 tons per load of the maximum 6.5 tons per truck capacity to be conservative). Outbound materials were conservatively estimated to be transported from the proposed site by trailers (28 tons per load) in trucks that are assumed to be empty entering the site and full exiting the site, to be conservative. Additionally, a significant portion of outbound materials are expected to be gasified on site, which would further reduce the volume of outbound trailers. To be conservative for purposes of this traffic study, all outbound materials are assumed to be transported via trailer.

In addition to the 1,500 tpd of solid waste (MSW and C&D), the site proposes to process biosolids, which would account for approximately 500 additional tpd of solid waste to be processed as well as recyclable glass that can be extracted from MSW processing and account for approximately 300 tpd of outbound materials. The existing NWD Trucking facility would be removed and associated trips have been removed from generation estimates.

The proposed facility is expected to operate with approximately 75 daily employees, operating in three, 8-hour shifts each consisting of 25 employees. The first shift is from 7:00 AM to 3:00 PM. These employees would be expected to arrive to the facility outside of the weekday morning peak hour but would leave the site during the weekday afternoon peak hour. The second shift is expected to operate from 3:00 PM to 11:00 PM. These employees are expected to arrive and depart from the site outside of the peak hours analyzed. The last shift is expected to operate from 11:00 PM to 7:00 AM. It is expected that these employees will be leaving the site during the weekday morning peak hour.

The proposed facility is expected to generate approximately 418 new truck trips per day (209 truck trips entering, 209 truck trips exiting) for the solid waste operations. In addition, there are approximately 150 employee trips (75 trips entering, 75 trips exiting) estimated for the facility per day, for a total estimated 568 vehicle trips accessing the site daily.

The site is proposed to accept truck deliveries between 6:00 AM and 6:00 PM. Data from the comparable site in Rochester, MA provides the hourly distribution of truck traffic entering the site. This data was utilized to determine the estimated number of trips expected to access the site during both the weekday morning and weekday afternoon peak hours.

A summary of the expected peak hour trip generation is shown in Table 2 below and is shown in detail in Appendix E of this report.

Table 2: Vehicular Trip Generation

	Weekday			Weekday AM Peak Hour (2)			Weekday PM Peak Hour (2)		
Description	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
MSW/C&D Trips(1)									
Packer	27	27	54	2	2	4	2	2	4
Roll-off Container	7	7	14	1	0	1	0	1	1
Roll-off	2	2	4	0	0	0	0	0	0
MSW Transfer Trailer	38	38	76	3	3	6	3	3	6
C&D Transfer Trailer	5	5	10	0	1	1	1	0	1
Outbound Trailers	54	54	108	4	4	8	4	4	8
Biosolid Trips	20	20	40	2	2	4	2	2	4
Glass Trips	54	54	108	5	5	10	5	5	10
Parallel Products Trips	40	40	80	0	0	0	5	5	10
NWD Trucking Trips	-38	-38	-76	-3	-3	-6	-3	-3	-6
Truck Trip Total	***209***	***209***	***418***	***14***	***14***	***28***	***19***	***19***	***38***
Transfer Station Employees	75	75	150	0	25	25	0	25	25
Total	**284**	**284**	**568**	**14**	**39**	**53**	**19**	**44**	**63**

(1) Based on the volume of trucks delivering solid waste to Covanta in Rochester as determined from MassDEP records for 2015.
(2) Based on the daily distribution of trucks delivering waste to Covanta in Rochester as determined from MassDEP records for 2015.

As shown in Table 2, the peak hour trip generation of the proposed transfer station is estimated to result in an increase of approximately 53 vehicle trips (14 entering and 39 exiting) during the weekday morning peak hour, and approximately 63 vehicle trips (19 entering and 44 exiting) during the weekday afternoon peak hour.

Project Trip Distribution and Assignment

The traffic expected to be generated by the proposed development was distributed onto the study area roadways and intersections based on expected access to/from Route 140. It is expected that the majority of traffic entering the site will utilize Route 140 to Braley Road, but a small portion of traffic from the south may utilize Phillips Road to access the proposed site. The resulting arrival and departure patterns are presented in Figure 7.

2025 Future Build Peak Hour Traffic Volumes

To establish the 2025 Build peak hour traffic volumes, the project-related traffic was assigned to the surrounding roadway network based on the project distribution patterns discussed above. These project trips were then added to the 2025 No Build peak hour traffic volumes to reflect the 2025 Build peak hour traffic volumes. The resulting 2025 Build weekday morning and weekday afternoon peak hour traffic volumes are presented in Figures 8 and 9, respectively.

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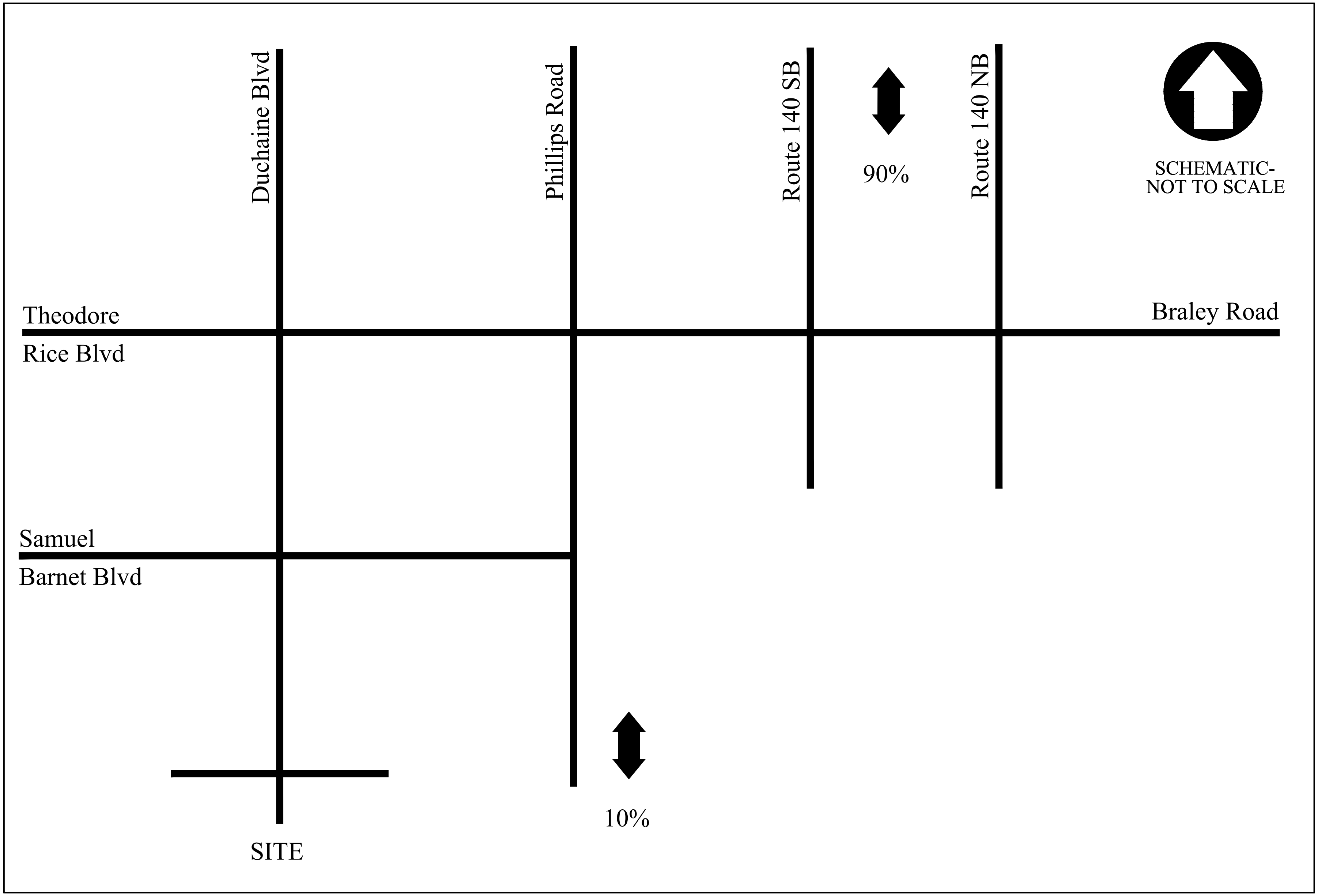

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Figure 7
Direction of Arrivals and Departures
Transfer Station
New Bedford, MA

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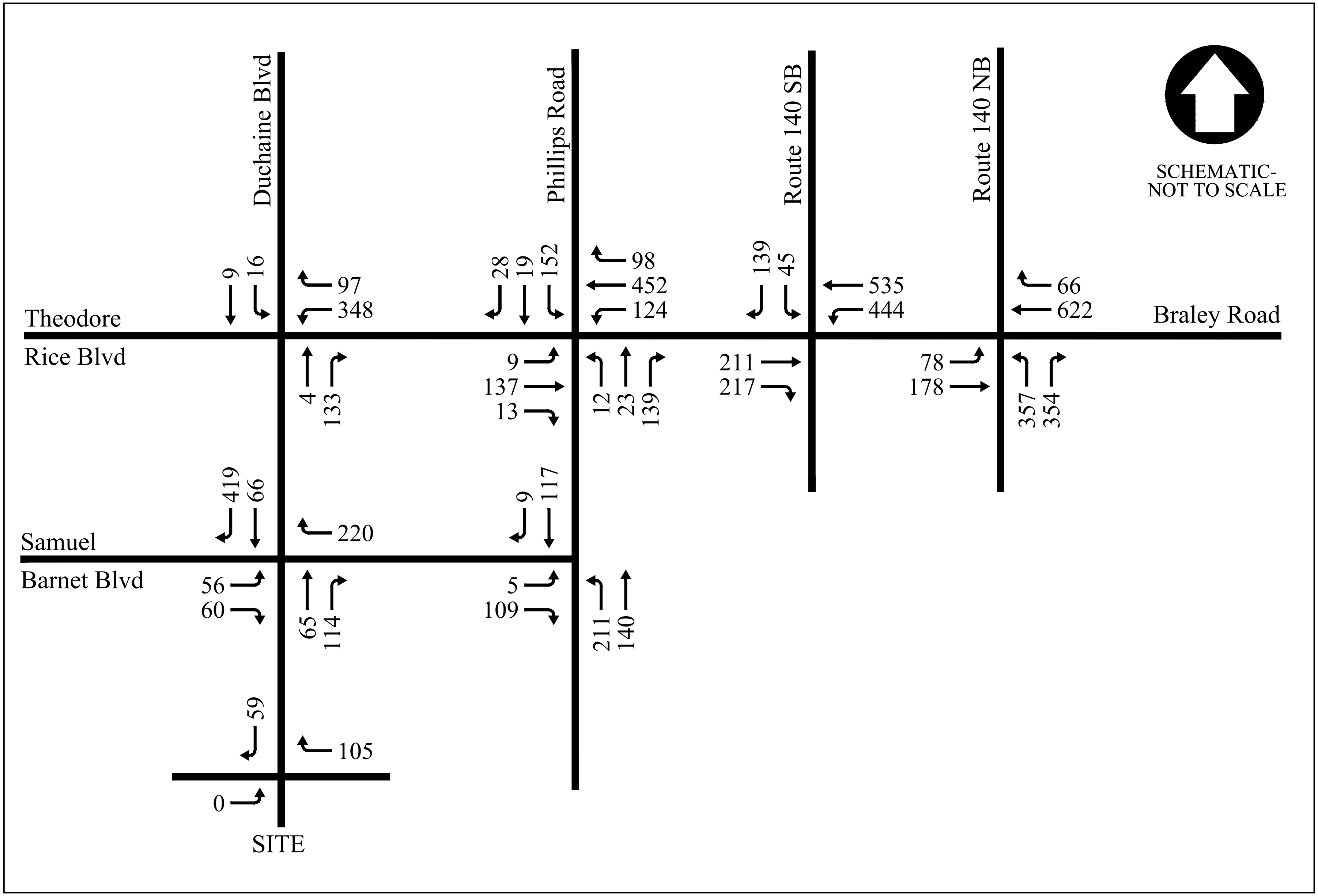

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Figure 8
2025 Build Weekday AM
Transfer Station
New Bedford, MA

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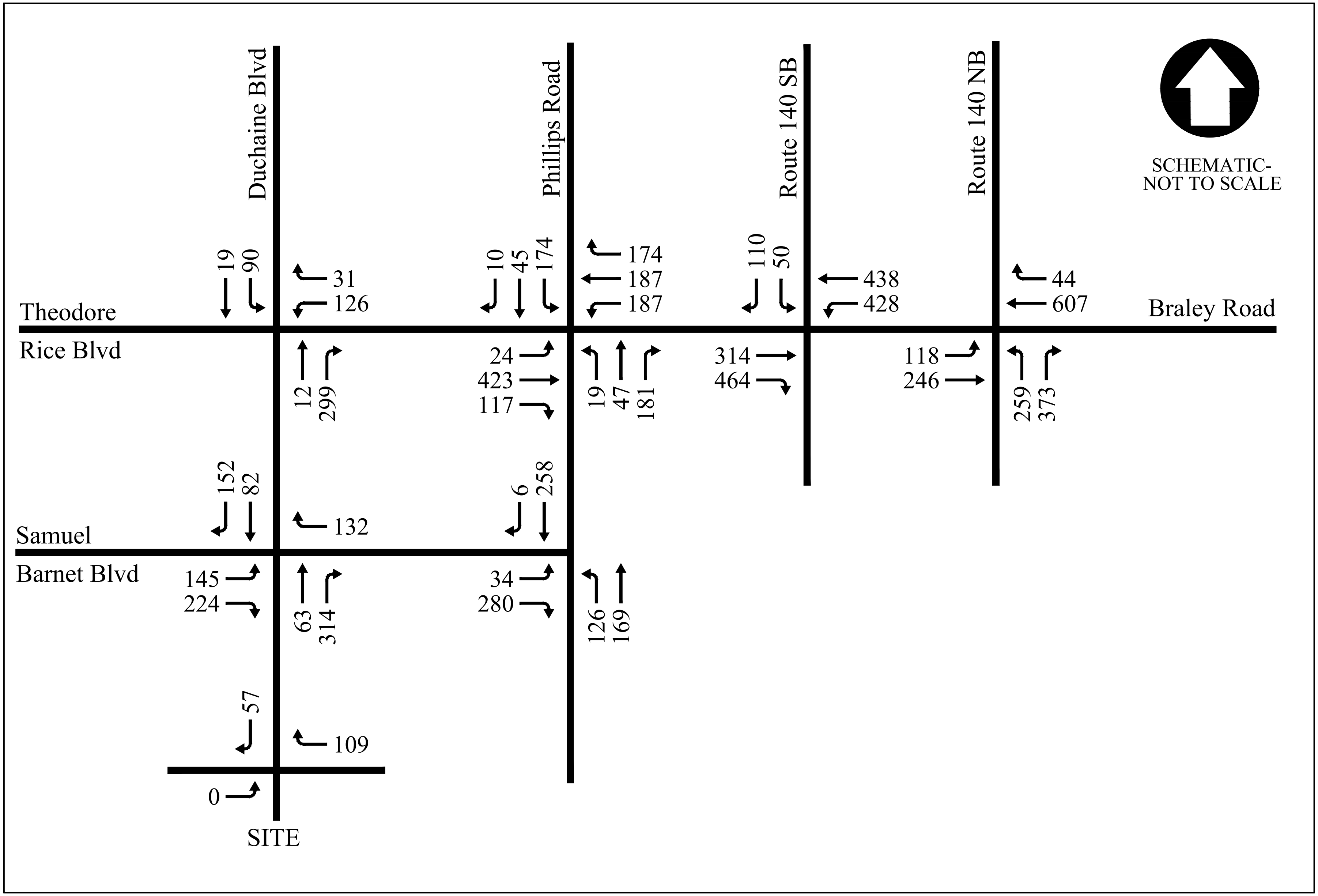

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TRANSPORTATION ENGINEERS & PLANNERS

Figure 9
2025 Build Weekday PM
Transfer Station
New Bedford, MA

TRAFFIC OPERATIONS ANALYSIS

In previous sections of this report, the quantity of traffic on the study area roadways was described. The following section describes the quality of traffic flow at the study area intersections for the given travel demands. As a basis for this assessment, intersection capacity analyses were conducted using Synchro capacity analysis software for the study area intersections under the 2018 Existing, 2025 No Build and 2025 Build peak hour traffic conditions. The weekday morning and weekday afternoon peak hours were analyzed for the study area intersections under the three conditions. This analysis is based on procedures contained in the *Highway Capacity Manual* (HCM) which are summarized in Appendix F. A discussion of the evaluation criteria and a summary of the results of the capacity analyses are presented below.

Level-of-Service Criteria

Operating levels of service (LOS) are reported on a scale of A to F with A representing the best conditions (with little or no delay) and F representing the worst operating conditions (long delays).

Capacity Analysis Results

Intersection capacity analyses were conducted for the study area intersections to evaluate the 2018 Existing, 2025 No Build and 2025 Build peak hour traffic conditions. Based on the analysis, the network peak hour of the adjacent street traffic occurs between 7:30 AM and 8:30 AM for the weekday morning, and 3:00 PM and 4:00 PM for the weekday afternoon.

The capacity analysis results for the 2018 Existing, 2025 No Build and 2025 Build conditions are presented in Appendix G, Appendix H, and Appendix I, respectively. The results of the signalized and unsignalized intersection capacity analyses are presented in Table 3 below.

Table 3: Capacity Analysis Results

			2018 Existing						2025 No Build						2025 Build					
			Weekday AM			Weekday PM			Weekday AM			Weekday PM			Weekday AM			Weekday PM		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Route 140 Northbound Ramps	EB	LT	A	2.4	0.08	A	2.7	0.12	A	2.4	0.08	A	2.8	0.13	A	3.1	0.11	A	3.3	0.16
at Braley Road	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	L	F	>50.0	>1.00	F	>50.0	>1.00	F	>50	>1.00	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
		R	B	12.2	0.41	B	14.3	0.50	B	12.5	0.43	C	15.5	0.55	B	12.8	0.45	C	15.5	0.55
Route 140 Southbound Ramps	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
at Braley Road	WB	LT	A	4.7	0.40	A	7.2	0.53	A	4.8	0.42	A	8.3	0.60	A	5.1	0.46	A	8.8	0.63
	SB	L	F	>50.0	>1.00	F	>50.0	>1.00	F	>50	>1.00	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
		R	B	14.4	0.28	B	12.1	0.18	B	14.9	0.29	B	12.6	0.20	C	15.8	0.33	B	12.9	0.22
Braley Road/	EB	LT	A	8.9	0.01	A	8.3	0.02	A	9.0	0.01	A	8.3	0.03	A	9.1	0.01	A	8.4	0.03
Theodore Rice Boulevard at		R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Phillips Road	WB	LTR	A	1.5	0.09	A	3.3	0.19	A	1.5	0.09	A	3.4	0.21	A	1.4	0.10	A	3.4	0.22
	NB	LTR	A	9.1	0.19	D	26.7	0.65	A	9.4	0.21	F	>50.0	0.85	B	10.2	0.24	F	>50.0	0.99
	SB	LTR	F	>50.0	0.92	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
Theodore Rice Boulevard at	WB	LR	A	8.0	0.25	A	7.6	0.08	A	8.0	0.25	A	7.6	0.08	A	8.1	0.27	A	7.7	0.10
Duchaine Boulevard	NB	TR	C	20.8	0.01	B	11.3	0.01	C	21.5	0.01	B	11.5	0.01	C	23.6	0.01	B	11.9	0.01
	SB	L	C	21.1	0.08	B	11.8	0.18	C	22.2	0.09	B	12.1	0.20	C	24.7	0.11	B	12.8	0.21
		T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.02	A	0.0	0.00	A	0.0	0.00
Duchaine Boulevard at	EB	LR	B	12.2	0.12	B	11.1	0.22	B	12.3	0.12	B	11.3	0.24	B	13.3	0.14	B	12.3	0.27
Samuel Barnet Boulevard	WB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Phillips Road at	EB	LR	B	10.5	0.18	C	18.6	0.60	B	10.6	0.18	C	20.2	0.63	B	10.7	0.19	C	20.5	0.64
Samuel Barnet Boulevard	NB	LT	A	4.8	0.17	A	3.5	0.11	A	4.8	0.18	A	3.6	0.12	A	4.9	0.19	A	3.6	0.13
	SB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Duchaine Boulevard at	EB	L	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Site Driveway	WB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00

1 Level-of-Service
2 Average vehicle delay in seconds
3 Volume to capacity ratio
n/a Not Applicable

Table 3 reports the level-of-service results for the unsignalized intersections within the study area during the weekday morning and weekday afternoon peak hours (which can also be found in Appendix J). The specific capacity analysis results of the study area intersections are discussed below.

Route 140 Northbound on/off-ramp at Braley Road

As shown in Table 3, the critical stop-controlled northbound approach at the Route 140 Northbound off-ramp currently operates at a LOS B for right turning vehicles, and LOS F for left turning vehicles during both the weekday morning and weekday afternoon peak hours. Under the 2025 No Build and 2025 Build conditions, the capacity analysis indicates that the right turning movement at this approach is expected to continue to operate at LOS B during the weekday morning peak hour and drop from LOS B to LOS C during the weekday afternoon peak hour. The left tuning movement is expected to continue to operate at the same LOS during both the weekday morning and weekday afternoon peak hours. All movements on Braley Road are shown to operate at LOS A during all peak hours analyzed.

Route 140 Southbound on/off-ramp at Braley Road

The capacity analysis results show the stop-controlled southbound approach at the Route 140 southbound off-ramp currently operating at LOS F for left turning vehicles and LOS B for right turning vehicles. Under the 2025 No Build conditions there are not expected to be any changes in LOS at the southbound approach. Under the 2025 Build conditions, the capacity analysis results indicate that the southbound right movement is expected to drop from LOS B to LOS C during the weekday morning peak hour with a minor increase in delay (less than two seconds) and is expected to continue to operate at a LOS B during the weekday afternoon peak hour. The southbound left approach is shown to continue to operate at LOS F during both the weekday morning and weekday afternoon peak hours. All movements on Braley Road are shown to operate at LOS A during all peak hours analyzed.

Braley Road/Theodore Rice Boulevard at Phillips Road

Under the 2018 Existing conditions, the stop-controlled northbound approach is shown to operate at a LOS A during the weekday morning peak hour and LOS D during the weekday afternoon peak hour, and the southbound approach is shown to operate at LOS F during both the weekday morning and weekday afternoon peak hours. Under the 2025 No Build conditions, the northbound approach is expected to continue to operate at LOS A during the weekday morning peak hour, but it is expected to drop from LOS D to LOS F during the weekday afternoon peak hour. Under the 2025 Build conditions, the northbound approach is shown to continue to operate at LOS F during the weekday afternoon peak hour, and continue to operate under capacity, but is expected to drop from at LOS A to LOS B during the weekday morning peak hour with a minor increase in delay (less than 2 seconds). All other approaches are expected to continue operating at the same LOS under all future conditions analyzed.

Theodore Rice Boulevard at Duchaine Boulevard

The stop-controlled northbound approach at the intersection of Theodore Rice Boulevard at Duchaine Boulevard is shown to currently operate at a LOS C during the weekday morning peak hour and LOS B during the weekday afternoon peak hour. The southbound left turn approach is also shown to operate at a LOS C during the weekday morning peak hour and LOS B during the weekday afternoon peak hour while the southbound through movement operates at a LOS A during both peak hours. The capacity analysis indicates that under the 2025 No Build and 2025 Build conditions, there is not expected to be any changes in LOS at either approach. The westbound movement is shown to operate at LOS A under all conditions analyzed.

Duchaine Boulevard at Samuel Barnet Boulevard

The stop-controlled eastbound movement at the intersection of Duchaine Boulevard at Samuel Barnet Boulevard currently operates at a LOS B during both the weekday morning and weekday afternoon peak hours. Based on the capacity analysis results, it is expected that the eastbound approach will continue to operate at LOS B under all future conditions (2025 No Build and 2025 Build). The westbound, northbound and southbound free movements are shown to operate at LOS A during all peak hours analyzed.

Phillips Road at Samuel Barnet Boulevard

The critical eastbound approach on Samuel Barnet Boulevard at the intersection of Phillips Road at Samuel Barnet Boulevard currently operates at a LOS B during the weekday morning peak hour and LOS C during the weekday afternoon peak hour. The capacity analysis indicates that under the 2025 No Build and 2025 Build conditions, there are not expected to be any changes in LOS at this approach. All movements on Phillips Road are shown to operate at LOS A during all peak hours analyzed.

CONCLUSION

The proposed transfer station development project consists of a solid waste treatment plant proposed to accommodate a receiving capacity of approximately 1,500 tons per day or MSW and C&D materials and additional recycling and biosolid materials. The site proposes to utilize the existing buildings on the site as well as construct new buildings to handle municipal solid waste (MSW) as well as construction and demolition (C&D) waste. The site is proposed to be accessed via the existing site driveway on Duchaine Boulevard, which leads to an internal one-way loop roadway surrounding the proposed facility.

The transfer station development is expected to result in approximately 568 vehicle trips (284 entering and 284 exiting) on a typical weekday, approximately 53 vehicle trips (14 entering and 39 exiting) during the weekday morning peak hour, and approximately 63 vehicle trips (19 entering and 44 exiting) during the weekday afternoon peak hour.

The capacity analysis indicates that the proposed development will not have any appreciable impact on the operations of the study area intersections or roadways. Based on the capacity analysis there are expected to be minor increases in delay at the southbound right turn movement at the intersection of the Route 140 southbound off ramp and Braley Road, and the northbound approach at the intersection of Braley Road/Theodore Rice Boulevard at Philips Road. However, both of these approaches are expected to operate under capacity under the 2025 Build conditions. The capacity analysis results indicate that the operations at the other study area intersections are not expected to be impacted as a result of the proposed development. McMahon Associates, Inc. concludes that mitigation measures are not necessary on the surrounding roadway network to accommodate the proposed development.

Additionally, it is our opinion that the traffic impacts of the proposed development of this solid waste facility located at 100 Duchaine Boulevard do not constitute a danger to the public health, safety, or the environment with consideration to traffic congestion, pedestrian and vehicular safety, and roadway configuration.

Appendix for Traffic Impact Study

Solid Waste Transfer Station

100 Duchaine Boulevard,

New Bedford, MA

Prepared by
McMahon Associates, Inc.
300 Myles Standish Boulevard, Suite 201
Taunton, MA 02780
508.823.2245

Prepared for
Green Seal Environmental, Inc.

July 2018

APPENDIX A

Manual Turning Movement Count Data

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063A
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	21	142	0	0	48	0	44	1	0	48	19	0	323
07:15 AM	0	0	0	0	16	145	0	0	56	0	62	2	0	34	16	0	331
07:30 AM	0	0	0	0	19	151	0	0	77	0	80	1	0	37	12	0	377
07:45 AM	0	0	0	0	16	150	0	0	78	0	97	0	0	37	18	0	396
Total	0	0	0	0	72	588	0	0	259	0	283	4	0	156	65	0	1427
08:00 AM	0	0	0	0	12	133	0	0	80	0	70	0	0	45	8	0	348
08:15 AM	0	0	0	0	15	142	0	0	95	0	80	1	0	45	16	0	394
08:30 AM	0	0	0	0	16	166	0	0	71	0	36	2	0	43	10	0	344
08:45 AM	0	0	0	1	14	137	0	0	68	0	51	1	0	33	19	1	325
Total	0	0	0	1	57	578	0	0	314	0	237	4	0	166	53	1	1411
Grand Total	0	0	0	1	129	1166	0	0	573	0	520	8	0	322	118	1	2838
Apprch %	0	0	0	100	10	90	0	0	52	0	47.2	0.7	0	73	26.8	0.2	
Total %	0	0	0	0	4.5	41.1	0	0	20.2	0	18.3	0.3	0	11.3	4.2	0	
Cars & Peds	0	0	0	1	128	1130	0	0	551	0	496	8	0	302	87	1	2704
% Cars & Peds	0	0	0	100	99.2	96.9	0	0	96.2	0	95.4	100	0	93.8	73.7	100	95.3
Trucks & Buses	0	0	0	0	1	36	0	0	22	0	24	0	0	19	31	0	133
% Trucks & Buses	0	0	0	0	0.8	3.1	0	0	3.8	0	4.6	0	0	5.9	26.3	0	4.7
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	**19**	**151**	0	0	**170**	77	0	80	**1**	158	0	37	12	0	49	377
07:45 AM	0	0	0	0	0	16	150	0	0	166	78	0	**97**	0	175	0	37	**18**	0	55	**396**
08:00 AM	0	0	0	0	0	12	133	0	0	145	80	0	70	0	150	0	**45**	8	0	53	348
08:15 AM	0	0	0	0	0	15	142	0	0	157	**95**	0	80	1	**176**	0	45	16	0	**61**	394
Total Volume	0	0	0	0	0	62	576	0	0	638	330	0	327	2	659	0	164	54	0	218	1515
% App. Total	0	0	0	0		9.7	90.3	0	0		50.1	0	49.6	0.3		0	75.2	24.8	0		
PHF	.000	.000	.000	.000	.000	.816	.954	.000	.000	.938	.868	.000	.843	.500	.936	.000	.911	.750	.000	.893	.956
Cars & Peds	0	0	0	0	0	62	562	0	0	624	316	0	313	2	631	0	152	40	0	192	1447
% Cars & Peds	0	0	0	0	0	100	97.6	0	0	97.8	95.8	0	95.7	100	95.8	0	92.7	74.1	0	88.1	95.5
Trucks & Buses	0	0	0	0	0	0	14	0	0	14	14	0	14	0	28	0	11	14	0	25	67
% Trucks & Buses	0	0	0	0	0	0	2.4	0	0	2.2	4.2	0	4.3	0	4.2	0	6.7	25.9	0	11.5	4.4
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0.5	0.1

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
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N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063A
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	21	140	0	0	46	0	41	1	0	46	17	0	312
07:15 AM	0	0	0	0	16	144	0	0	55	0	60	2	0	34	11	0	322
07:30 AM	0	0	0	0	19	148	0	0	74	0	75	1	0	33	9	0	359
07:45 AM	0	0	0	0	16	147	0	0	77	0	94	0	0	34	10	0	378
Total	0	0	0	0	72	579	0	0	252	0	270	4	0	147	47	0	1371
08:00 AM	0	0	0	0	12	131	0	0	75	0	66	0	0	43	7	0	334
08:15 AM	0	0	0	0	15	136	0	0	90	0	78	1	0	42	14	0	376
08:30 AM	0	0	0	0	15	151	0	0	69	0	34	2	0	38	9	0	318
08:45 AM	0	0	0	1	14	133	0	0	65	0	48	1	0	32	10	1	305
Total	0	0	0	1	56	551	0	0	299	0	226	4	0	155	40	1	1333
Grand Total	0	0	0	1	128	1130	0	0	551	0	496	8	0	302	87	1	2704
Apprch %	0	0	0	100	10.2	89.8	0	0	52.2	0	47	0.8	0	77.4	22.3	0.3	
Total %	0	0	0	0	4.7	41.8	0	0	20.4	0	18.3	0.3	0	11.2	3.2	0	

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	**19**	**148**	0	0	**167**	74	0	75	**1**	150	0	33	9	0	42	359
07:45 AM	0	0	0	0	0	16	147	0	0	163	77	0	**94**	0	**171**	0	34	10	0	44	**378**
08:00 AM	0	0	0	0	0	12	131	0	0	143	75	0	66	0	141	0	**43**	7	0	50	334
08:15 AM	0	0	0	0	0	15	136	0	0	151	**90**	0	78	1	169	0	42	**14**	0	**56**	376
Total Volume	0	0	0	0	0	62	562	0	0	624	316	0	313	2	631	0	152	40	0	192	1447
% App. Total	0	0	0	0		9.9	90.1	0	0		50.1	0	49.6	0.3		0	79.2	20.8	0		
PHF	.000	.000	.000	.000	.000	.816	.949	.000	.000	.934	.878	.000	.832	.500	.923	.000	.884	.714	.000	.857	.957

Transportation Data Corporation
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N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063A
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	2	0	0	2	0	3	0	0	2	2	0	11
07:15 AM	0	0	0	0	0	1	0	0	1	0	2	0	0	0	5	0	9
07:30 AM	0	0	0	0	0	3	0	0	3	0	5	0	0	3	3	0	17
07:45 AM	0	0	0	0	0	3	0	0	1	0	3	0	0	3	8	0	18
Total	0	0	0	0	0	9	0	0	7	0	13	0	0	8	18	0	55
08:00 AM	0	0	0	0	0	2	0	0	5	0	4	0	0	2	1	0	14
08:15 AM	0	0	0	0	0	6	0	0	5	0	2	0	0	3	2	0	18
08:30 AM	0	0	0	0	1	15	0	0	2	0	2	0	0	5	1	0	26
08:45 AM	0	0	0	0	0	4	0	0	3	0	3	0	0	1	9	0	20
Total	0	0	0	0	1	27	0	0	15	0	11	0	0	11	13	0	78
Grand Total	0	0	0	0	1	36	0	0	22	0	24	0	0	19	31	0	133
Apprch %	0	0	0	0	2.7	97.3	0	0	47.8	0	52.2	0	0	38	62	0	
Total %	0	0	0	0	0.8	27.1	0	0	16.5	0	18	0	0	14.3	23.3	0	

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	2	0	0	2	**5**	0	**4**	0	**9**	0	2	1	0	3	14
08:15 AM	0	0	0	0	0	0	6	0	0	6	5	0	2	0	7	0	3	2	0	5	18
08:30 AM	0	0	0	0	0	**1**	**15**	0	0	**16**	2	0	2	0	4	0	**5**	1	0	6	**26**
08:45 AM	0	0	0	0	0	0	4	0	0	4	3	0	3	0	6	0	1	**9**	0	**10**	20
Total Volume	0	0	0	0	0	1	27	0	0	28	15	0	11	0	26	0	11	13	0	24	78
% App. Total	0	0	0	0		3.6	96.4	0	0		57.7	0	42.3	0		0	45.8	54.2	0		
PHF	.000	.000	.000	.000	.000	.250	.450	.000	.000	.438	.750	.000	.688	.000	.722	.000	.550	.361	.000	.600	.750

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N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063A
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Bikes by Direction

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

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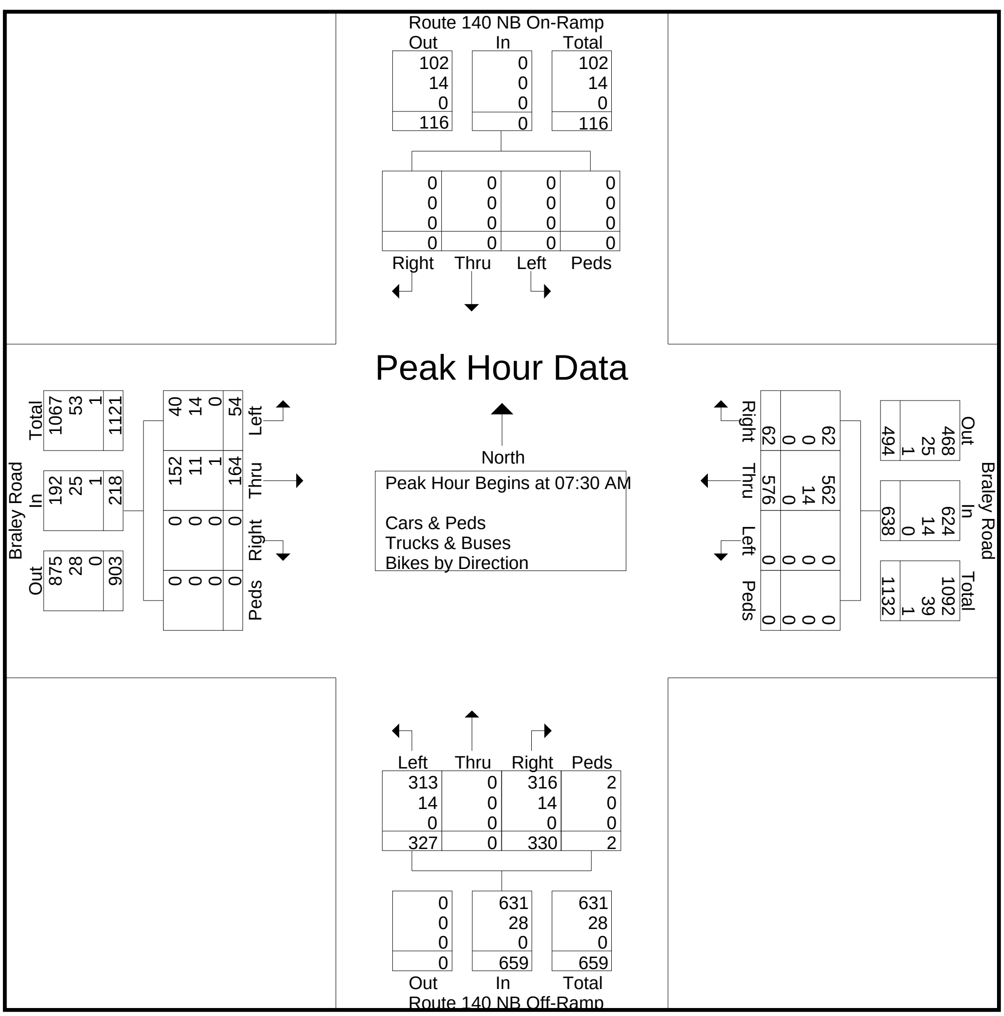
N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063A
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	**19**	**151**	0	0	**170**	77	0	80	**1**	158	0	37	12	0	49	377
07:45 AM	0	0	0	0	0	16	150	0	0	166	78	0	**97**	0	175	0	37	**18**	0	55	**396**
08:00 AM	0	0	0	0	0	12	133	0	0	145	80	0	70	0	150	0	**45**	8	0	53	348
08:15 AM	0	0	0	0	0	15	142	0	0	157	**95**	0	80	1	**176**	0	45	16	0	**61**	394
Total Volume	0	0	0	0	0	62	576	0	0	638	330	0	327	2	659	0	164	54	0	218	1515
% App. Total	0	0	0	0		9.7	90.3	0	0		50.1	0	49.6	0.3		0	75.2	24.8	0		
PHF	.000	.000	.000	.000	.000	.816	.954	.000	.000	.938	.868	.000	.843	.500	.936	.000	.911	.750	.000	.893	.956
Cars & Peds	0	0	0	0	0	62	562	0	0	624	316	0	313	2	631	0	152	40	0	192	1447
% Cars & Peds	0	0	0	0	0	100	97.6	0	0	97.8	95.8	0	95.7	100	95.8	0	92.7	74.1	0	88.1	95.5
Trucks & Buses	0	0	0	0	0	0	14	0	0	14	14	0	14	0	28	0	11	14	0	25	67
% Trucks & Buses	0	0	0	0	0	0	2.4	0	0	2.2	4.2	0	4.3	0	4.2	0	6.7	25.9	0	11.5	4.4
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0.5	0.1



Transportation Data Corporation

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N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063AA
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	15	163	0	0	87	0	48	0	0	56	22	0	391
03:15 PM	0	0	0	0	12	151	0	0	96	0	62	0	0	70	19	0	410
03:30 PM	0	0	0	0	8	134	0	1	67	0	58	1	0	58	32	1	360
03:45 PM	0	0	0	0	6	118	0	0	98	0	66	0	0	45	17	0	350
Total	0	0	0	0	41	566	0	1	348	0	234	1	0	229	90	1	1511
04:00 PM	0	0	0	0	8	109	0	0	88	0	49	0	0	53	29	0	336
04:15 PM	0	0	0	0	6	104	0	0	98	0	50	0	0	60	18	0	336
04:30 PM	0	0	0	0	12	109	0	0	100	0	45	0	0	65	15	0	346
04:45 PM	0	0	0	0	7	100	0	0	102	0	48	0	0	48	14	0	319
Total	0	0	0	0	33	422	0	0	388	0	192	0	0	226	76	0	1337
05:00 PM	0	0	0	0	9	112	0	0	90	0	41	1	0	71	58	0	382
05:15 PM	0	0	0	0	10	105	0	0	94	0	48	0	0	55	17	0	329
05:30 PM	0	0	0	0	9	91	0	0	95	0	34	0	0	52	17	0	298
05:45 PM	0	0	0	0	9	89	0	0	101	0	31	0	0	47	6	0	283
Total	0	0	0	0	37	397	0	0	380	0	154	1	0	225	98	0	1292
Grand Total	0	0	0	0	111	1385	0	1	1116	0	580	2	0	680	264	1	4140
Apprch %	0	0	0	0	7.4	92.5	0	0.1	65.7	0	34.2	0.1	0	72	27.9	0.1	
Total %	0	0	0	0	2.7	33.5	0	0	27	0	14	0	0	16.4	6.4	0	
Cars & Peds	0	0	0	0	108	1354	0	1	1103	0	546	2	0	671	255	1	4041
% Cars & Peds	0	0	0	0	97.3	97.8	0	100	98.8	0	94.1	100	0	98.7	96.6	100	97.6
Trucks & Buses	0	0	0	0	3	30	0	0	13	0	34	0	0	7	9	0	96
% Trucks & Buses	0	0	0	0	2.7	2.2	0	0	1.2	0	5.9	0	0	1	3.4	0	2.3
Bikes by Direction	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
% Bikes by Direction	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.3	0	0	0.1

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	**15**	**163**	0	0	**178**	87	0	48	0	135	0	56	22	0	78	391
03:15 PM	0	0	0	0	0	12	151	0	0	163	96	0	62	0	158	0	**70**	19	0	89	**410**
03:30 PM	0	0	0	0	0	8	134	0	**1**	143	67	0	58	**1**	126	0	58	**32**	**1**	**91**	360
03:45 PM	0	0	0	0	0	6	118	0	0	124	**98**	0	**66**	0	**164**	0	45	17	0	62	350
Total Volume	0	0	0	0	0	41	566	0	1	608	348	0	234	1	583	0	229	90	1	320	1511
% App. Total	0	0	0	0		6.7	93.1	0	0.2		59.7	0	40.1	0.2		0	71.6	28.1	0.3		
PHF	.000	.000	.000	.000	.000	.683	.868	.000	.250	.854	.888	.000	.886	.250	.889	.000	.818	.703	.250	.879	.921
Cars & Peds	0	0	0	0	0	39	549	0	1	589	338	0	215	1	554	0	225	86	1	312	1455
% Cars & Peds	0	0	0	0	0	95.1	97.0	0	100	96.9	97.1	0	91.9	100	95.0	0	98.3	95.6	100	97.5	96.3
Trucks & Buses	0	0	0	0	0	2	17	0	0	19	10	0	19	0	29	0	4	4	0	8	56
% Trucks & Buses	0	0	0	0	0	4.9	3.0	0	0	3.1	2.9	0	8.1	0	5.0	0	1.7	4.4	0	2.5	3.7
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Transportation Data Corporation
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N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063AA
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	15	158	0	0	84	0	44	0	0	56	21	0	378
03:15 PM	0	0	0	0	10	145	0	0	93	0	57	0	0	68	17	0	390
03:30 PM	0	0	0	0	8	130	0	1	65	0	54	1	0	57	32	1	349
03:45 PM	0	0	0	0	6	116	0	0	96	0	60	0	0	44	16	0	338
Total	0	0	0	0	39	549	0	1	338	0	215	1	0	225	86	1	1455
04:00 PM	0	0	0	0	8	105	0	0	88	0	46	0	0	52	29	0	328
04:15 PM	0	0	0	0	6	103	0	0	98	0	48	0	0	59	17	0	331
04:30 PM	0	0	0	0	12	106	0	0	100	0	43	0	0	63	14	0	338
04:45 PM	0	0	0	0	7	98	0	0	102	0	48	0	0	48	12	0	315
Total	0	0	0	0	33	412	0	0	388	0	185	0	0	222	72	0	1312
05:00 PM	0	0	0	0	9	111	0	0	89	0	37	1	0	71	58	0	376
05:15 PM	0	0	0	0	9	104	0	0	93	0	46	0	0	54	16	0	322
05:30 PM	0	0	0	0	9	90	0	0	95	0	32	0	0	52	17	0	295
05:45 PM	0	0	0	0	9	88	0	0	100	0	31	0	0	47	6	0	281
Total	0	0	0	0	36	393	0	0	377	0	146	1	0	224	97	0	1274
Grand Total	0	0	0	0	108	1354	0	1	1103	0	546	2	0	671	255	1	4041
Apprch %	0	0	0	0	7.4	92.5	0	0.1	66.8	0	33.1	0.1	0	72.4	27.5	0.1	
Total %	0	0	0	0	2.7	33.5	0	0	27.3	0	13.5	0	0	16.6	6.3	0	

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	**15**	**158**	0	0	**173**	84	0	44	0	128	0	56	21	0	77	378
03:15 PM	0	0	0	0	0	10	145	0	0	155	93	0	57	0	150	0	**68**	17	0	85	**390**
03:30 PM	0	0	0	0	0	8	130	0	**1**	139	65	0	54	**1**	120	0	57	**32**	**1**	**90**	349
03:45 PM	0	0	0	0	0	6	116	0	0	122	**96**	0	**60**	0	**156**	0	44	16	0	60	338
Total Volume	0	0	0	0	0	39	549	0	1	589	338	0	215	1	554	0	225	86	1	312	1455
% App. Total	0	0	0	0		6.6	93.2	0	0.2		61	0	38.8	0.2		0	72.1	27.6	0.3		
PHF	.000	.000	.000	.000	.000	.650	.869	.000	.250	.851	.880	.000	.896	.250	.888	.000	.827	.672	.250	.867	.933

Transportation Data Corporation
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N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063AA
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	5	0	0	3	0	4	0	0	0	1	0	13
03:15 PM	0	0	0	0	2	6	0	0	3	0	5	0	0	2	2	0	20
03:30 PM	0	0	0	0	0	4	0	0	2	0	4	0	0	1	0	0	11
03:45 PM	0	0	0	0	0	2	0	0	2	0	6	0	0	1	1	0	12
Total	0	0	0	0	2	17	0	0	10	0	19	0	0	4	4	0	56
04:00 PM	0	0	0	0	0	4	0	0	0	0	3	0	0	1	0	0	8
04:15 PM	0	0	0	0	0	1	0	0	0	0	2	0	0	1	1	0	5
04:30 PM	0	0	0	0	0	3	0	0	0	0	2	0	0	0	1	0	6
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	2	0	4
Total	0	0	0	0	0	10	0	0	0	0	7	0	0	2	4	0	23
05:00 PM	0	0	0	0	0	1	0	0	1	0	4	0	0	0	0	0	6
05:15 PM	0	0	0	0	1	1	0	0	1	0	2	0	0	1	1	0	7
05:30 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	2
Total	0	0	0	0	1	3	0	0	3	0	8	0	0	1	1	0	17
Grand Total	0	0	0	0	3	30	0	0	13	0	34	0	0	7	9	0	96
Apprch %	0	0	0	0	9.1	90.9	0	0	27.7	0	72.3	0	0	43.8	56.2	0	
Total %	0	0	0	0	3.1	31.2	0	0	13.5	0	35.4	0	0	7.3	9.4	0	

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	0	5	0	0	5	**3**	0	4	0	7	0	0	1	0	1	13
03:15 PM	0	0	0	0	0	**2**	**6**	0	0	**8**	3	0	5	0	**8**	0	**2**	**2**	0	**4**	**20**
03:30 PM	0	0	0	0	0	0	4	0	0	4	2	0	4	0	6	0	1	0	0	1	11
03:45 PM	0	0	0	0	0	0	2	0	0	2	2	0	**6**	0	8	0	1	1	0	2	12
Total Volume	0	0	0	0	0	2	17	0	0	19	10	0	19	0	29	0	4	4	0	8	56
% App. Total	0	0	0	0		10.5	89.5	0	0		34.5	0	65.5	0		0	50	50	0		
PHF	.000	.000	.000	.000	.000	.250	.708	.000	.000	.594	.833	.000	.792	.000	.906	.000	.500	.500	.000	.500	.700

Transportation Data Corporation
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N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063AA
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Bikes by Direction

	Route 140 NB On-Ramp From North				Braley Road From East				Route 140 NB Off-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	33.3	0	0	0	0	0	0	0	66.7	0	0	

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	**2**	**2**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

Transportation Data Corporation
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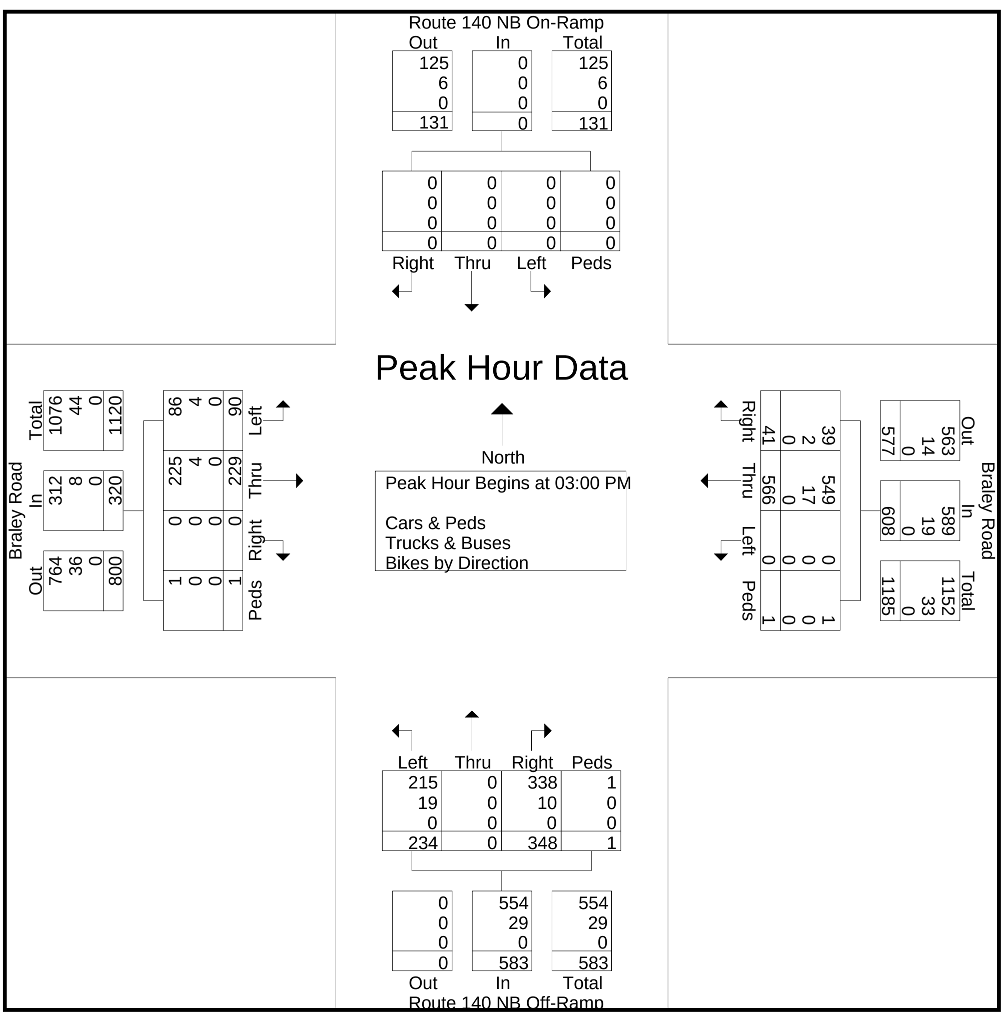
N/S: Route 140 Northbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063AA
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Route 140 NB On-Ramp From North					Braley Road From East					Route 140 NB Off-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	**15**	**163**	0	0	**178**	87	0	48	0	135	0	56	22	0	78	391
03:15 PM	0	0	0	0	0	12	151	0	0	163	96	0	62	0	158	0	**70**	19	0	89	**410**
03:30 PM	0	0	0	0	0	8	134	0	**1**	143	67	0	58	**1**	126	0	58	**32**	**1**	**91**	360
03:45 PM	0	0	0	0	0	6	118	0	0	124	**98**	0	**66**	0	**164**	0	45	17	0	62	350
Total Volume	0	0	0	0	0	41	566	0	1	608	348	0	234	1	583	0	229	90	1	320	1511
% App. Total	0	0	0	0		6.7	93.1	0	0.2		59.7	0	40.1	0.2		0	71.6	28.1	0.3		
PHF	.000	.000	.000	.000	.000	.683	.868	.000	.250	.854	.888	.000	.886	.250	.889	.000	.818	.703	.250	.879	.921
Cars & Peds	0	0	0	0	0	39	549	0	1	589	338	0	215	1	554	0	225	86	1	312	1455
% Cars & Peds	0	0	0	0	0	95.1	97.0	0	100	96.9	97.1	0	91.9	100	95.0	0	98.3	95.6	100	97.5	96.3
Trucks & Buses	0	0	0	0	0	2	17	0	0	19	10	0	19	0	29	0	4	4	0	8	56
% Trucks & Buses	0	0	0	0	0	4.9	3.0	0	0	3.1	2.9	0	8.1	0	5.0	0	1.7	4.4	0	2.5	3.7
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063B
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	29	0	9	0	0	76	108	0	0	0	0	0	109	56	0	0	387
07:15 AM	26	0	7	0	0	93	115	0	0	0	0	1	45	45	0	0	332
07:30 AM	37	0	12	0	0	120	111	0	0	0	0	1	50	37	0	0	368
07:45 AM	28	0	14	0	0	136	112	0	0	0	0	0	40	41	0	0	371
Total	120	0	42	0	0	425	446	0	0	0	0	2	244	179	0	0	1458
08:00 AM	30	0	11	0	0	109	91	0	0	0	0	1	47	42	0	0	331
08:15 AM	29	0	5	0	0	119	100	0	0	0	0	0	49	56	0	0	358
08:30 AM	29	0	3	0	0	90	117	0	0	0	0	2	40	49	0	0	330
08:45 AM	16	0	7	0	0	88	100	0	0	0	0	2	31	44	0	0	288
Total	104	0	26	0	0	406	408	0	0	0	0	5	167	191	0	0	1307
Grand Total	224	0	68	0	0	831	854	0	0	0	0	7	411	370	0	0	2765
Apprch %	76.7	0	23.3	0	0	49.3	50.7	0	0	0	0	100	52.6	47.4	0	0	
Total %	8.1	0	2.5	0	0	30.1	30.9	0	0	0	0	0.3	14.9	13.4	0	0	
Cars & Peds	198	0	62	0	0	798	827	0	0	0	0	7	387	325	0	0	2604
% Cars & Peds	88.4	0	91.2	0	0	96	96.8	0	0	0	0	100	94.2	87.8	0	0	94.2
Trucks & Buses	26	0	6	0	0	33	27	0	0	0	0	0	24	44	0	0	160
% Trucks & Buses	11.6	0	8.8	0	0	4	3.2	0	0	0	0	0	5.8	11.9	0	0	5.8
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	29	0	9	0	38	0	76	108	0	184	0	0	0	0	0	**109**	**56**	0	0	**165**	**387**
07:15 AM	26	0	7	0	33	0	93	**115**	0	208	0	0	0	**1**	**1**	45	45	0	0	90	332
07:30 AM	**37**	0	12	0	**49**	0	120	111	0	231	0	0	0	1	1	50	37	0	0	87	368
07:45 AM	28	0	**14**	0	42	0	**136**	112	0	**248**	0	0	0	0	0	40	41	0	0	81	371
Total Volume	120	0	42	0	162	0	425	446	0	871	0	0	0	2	2	244	179	0	0	423	1458
% App. Total	74.1	0	25.9	0		0	48.8	51.2	0		0	0	0	100		57.7	42.3	0	0		
PHF	.811	.000	.750	.000	.827	.000	.781	.970	.000	.878	.000	.000	.000	.500	.500	.560	.799	.000	.000	.641	.942
Cars & Peds	109	0	39	0	148	0	408	442	0	850	0	0	0	2	2	232	154	0	0	386	1386
% Cars & Peds	90.8	0	92.9	0	91.4	0	96.0	99.1	0	97.6	0	0	0	100	100	95.1	86.0	0	0	91.3	95.1
Trucks & Buses	11	0	3	0	14	0	17	4	0	21	0	0	0	0	0	12	24	0	0	36	71
% Trucks & Buses	9.2	0	7.1	0	8.6	0	4.0	0.9	0	2.4	0	0	0	0	0	4.9	13.4	0	0	8.5	4.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0.2	0.1

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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063B
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	27	0	8	0	0	72	107	0	0	0	0	0	109	52	0	0	375
07:15 AM	23	0	7	0	0	91	114	0	0	0	0	1	41	40	0	0	317
07:30 AM	32	0	10	0	0	113	110	0	0	0	0	1	47	32	0	0	345
07:45 AM	27	0	14	0	0	132	111	0	0	0	0	0	35	30	0	0	349
Total	109	0	39	0	0	408	442	0	0	0	0	2	232	154	0	0	1386
08:00 AM	29	0	9	0	0	105	89	0	0	0	0	1	43	41	0	0	317
08:15 AM	25	0	4	0	0	115	97	0	0	0	0	0	47	51	0	0	339
08:30 AM	23	0	3	0	0	86	102	0	0	0	0	2	38	43	0	0	297
08:45 AM	12	0	7	0	0	84	97	0	0	0	0	2	27	36	0	0	265
Total	89	0	23	0	0	390	385	0	0	0	0	5	155	171	0	0	1218
Grand Total	198	0	62	0	0	798	827	0	0	0	0	7	387	325	0	0	2604
Apprch %	76.2	0	23.8	0	0	49.1	50.9	0	0	0	0	100	54.4	45.6	0	0	
Total %	7.6	0	2.4	0	0	30.6	31.8	0	0	0	0	0.3	14.9	12.5	0	0	

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	27	0	8	0	35	0	72	107	0	179	0	0	0	0	0	**109**	**52**	0	0	**161**	**375**
07:15 AM	23	0	7	0	30	0	91	**114**	0	205	0	0	0	**1**	**1**	41	40	0	0	81	317
07:30 AM	**32**	0	10	0	**42**	0	113	110	0	223	0	0	0	1	1	47	32	0	0	79	345
07:45 AM	27	0	**14**	0	41	0	**132**	111	0	**243**	0	0	0	0	0	35	30	0	0	65	349
Total Volume	109	0	39	0	148	0	408	442	0	850	0	0	0	2	2	232	154	0	0	386	1386
% App. Total	73.6	0	26.4	0		0	48	52	0		0	0	0	100		60.1	39.9	0	0		
PHF	.852	.000	.696	.000	.881	.000	.773	.969	.000	.874	.000	.000	.000	.500	.500	.532	.740	.000	.000	.599	.924

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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063B
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Trucks & Buses

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	2	0	1	0	0	4	1	0	0	0	0	0	0	4	0	0	12
07:15 AM	3	0	0	0	0	2	1	0	0	0	0	0	4	5	0	0	15
07:30 AM	5	0	2	0	0	7	1	0	0	0	0	0	3	4	0	0	22
07:45 AM	1	0	0	0	0	4	1	0	0	0	0	0	5	11	0	0	22
Total	11	0	3	0	0	17	4	0	0	0	0	0	12	24	0	0	71
08:00 AM	1	0	2	0	0	4	2	0	0	0	0	0	4	1	0	0	14
08:15 AM	4	0	1	0	0	4	3	0	0	0	0	0	2	5	0	0	19
08:30 AM	6	0	0	0	0	4	15	0	0	0	0	0	2	6	0	0	33
08:45 AM	4	0	0	0	0	4	3	0	0	0	0	0	4	8	0	0	23
Total	15	0	3	0	0	16	23	0	0	0	0	0	12	20	0	0	89
Grand Total	26	0	6	0	0	33	27	0	0	0	0	0	24	44	0	0	160
Apprch %	81.2	0	18.8	0	0	55	45	0	0	0	0	0	35.3	64.7	0	0	
Total %	16.2	0	3.8	0	0	20.6	16.9	0	0	0	0	0	15	27.5	0	0	

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	1	0	**2**	0	3	0	**4**	2	0	6	0	0	0	0	0	**4**	1	0	0	5	14
08:15 AM	4	0	1	0	5	0	4	3	0	7	0	0	0	0	0	2	5	0	0	7	19
08:30 AM	**6**	0	0	0	**6**	0	4	**15**	0	**19**	0	0	0	0	0	2	6	0	0	8	**33**
08:45 AM	4	0	0	0	4	0	4	3	0	7	0	0	0	0	0	4	**8**	0	0	**12**	23
Total Volume	15	0	3	0	18	0	16	23	0	39	0	0	0	0	0	12	20	0	0	32	89
% App. Total	83.3	0	16.7	0		0	41	59	0		0	0	0	0		37.5	62.5	0	0		
PHF	.625	.000	.375	.000	.750	.000	1.00	.383	.000	.513	.000	.000	.000	.000	.000	.750	.625	.000	.000	.667	.674

Transportation Data Corporation
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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063B
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

Transportation Data Corporation
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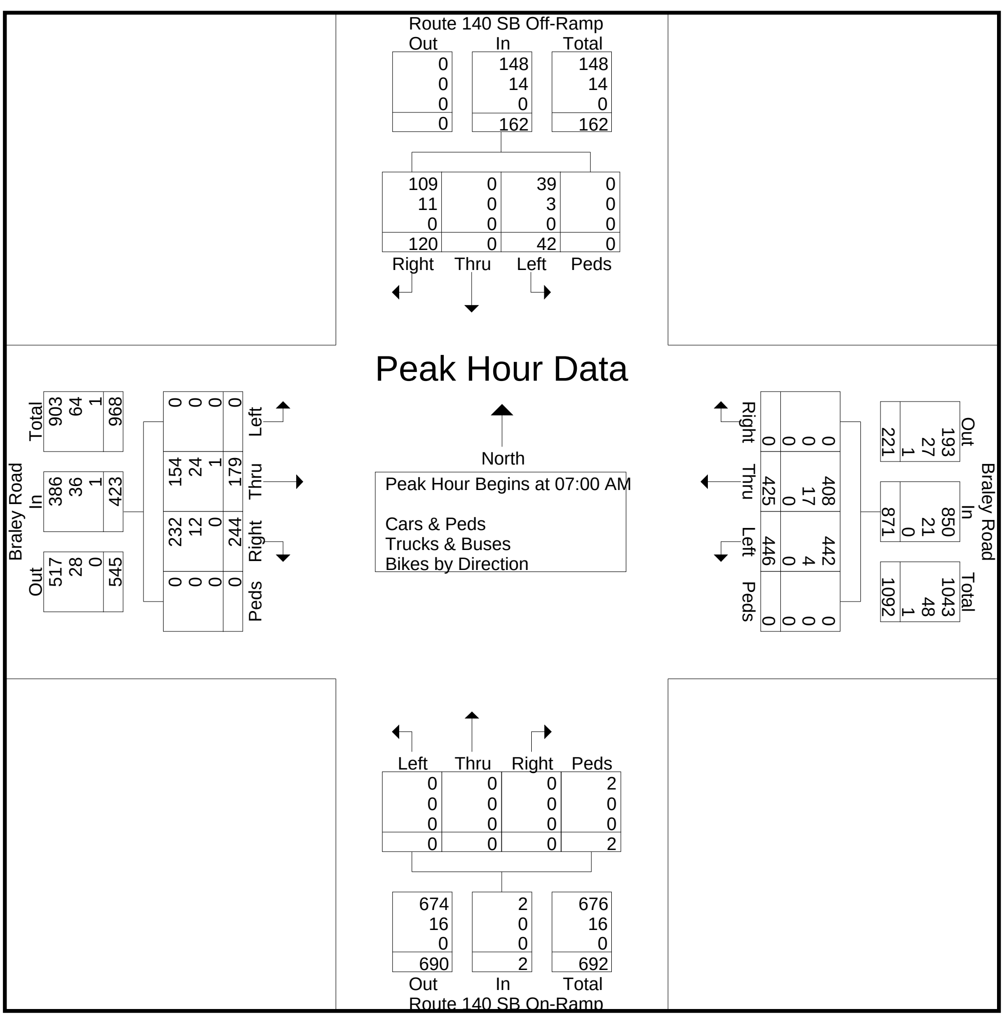
N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063B
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	29	0	9	0	38	0	76	108	0	184	0	0	0	0	0	**109**	**56**	0	0	**165**	**387**
07:15 AM	26	0	7	0	33	0	93	**115**	0	208	0	0	0	**1**	**1**	45	45	0	0	90	332
07:30 AM	**37**	0	12	0	**49**	0	120	111	0	231	0	0	0	1	1	50	37	0	0	87	368
07:45 AM	28	0	**14**	0	42	0	**136**	112	0	**248**	0	0	0	0	0	40	41	0	0	81	371
Total Volume	120	0	42	0	162	0	425	446	0	871	0	0	0	2	2	244	179	0	0	423	1458
% App. Total	74.1	0	25.9	0		0	48.8	51.2	0		0	0	0	100		57.7	42.3	0	0		
PHF	.811	.000	.750	.000	.827	.000	.781	.970	.000	.878	.000	.000	.000	.500	.500	.560	.799	.000	.000	.641	.942
Cars & Peds	109	0	39	0	148	0	408	442	0	850	0	0	0	2	2	232	154	0	0	386	1386
% Cars & Peds	90.8	0	92.9	0	91.4	0	96.0	99.1	0	97.6	0	0	0	100	100	95.1	86.0	0	0	91.3	95.1
Trucks & Buses	11	0	3	0	14	0	17	4	0	21	0	0	0	0	0	12	24	0	0	36	71
% Trucks & Buses	9.2	0	7.1	0	8.6	0	4.0	0.9	0	2.4	0	0	0	0	0	4.9	13.4	0	0	8.5	4.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0.2	0.1



Transportation Data Corporation

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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063BB
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	22	0	9	0	0	92	120	0	0	0	0	0	128	68	0	0	439
03:15 PM	18	0	11	0	0	101	111	0	0	0	0	0	77	79	0	0	397
03:30 PM	27	0	14	0	0	105	87	0	0	0	0	0	132	74	0	0	439
03:45 PM	27	0	13	0	0	101	80	0	0	0	0	0	79	49	0	1	350
Total	94	0	47	0	0	399	398	0	0	0	0	0	416	270	0	1	1625
04:00 PM	38	0	12	0	0	80	76	0	0	0	0	0	112	70	0	0	388
04:15 PM	23	0	20	0	0	85	70	0	0	0	0	0	64	57	0	0	319
04:30 PM	19	0	20	0	0	79	80	0	0	0	0	0	72	68	0	0	338
04:45 PM	21	0	11	0	0	77	70	0	0	0	0	0	75	52	0	0	306
Total	101	0	63	0	0	321	296	0	0	0	0	0	323	247	0	0	1351
05:00 PM	25	0	16	0	0	67	84	0	0	0	0	1	115	112	0	0	420
05:15 PM	30	1	19	0	0	74	81	0	0	0	0	0	56	50	0	0	311
05:30 PM	19	0	19	0	0	59	67	0	0	0	0	0	66	47	0	0	277
05:45 PM	16	0	15	0	0	65	57	0	0	0	0	0	35	38	0	0	226
Total	90	1	69	0	0	265	289	0	0	0	0	1	272	247	0	0	1234
Grand Total	285	1	179	0	0	985	983	0	0	0	0	1	1011	764	0	1	4210
Apprch %	61.3	0.2	38.5	0	0	50.1	49.9	0	0	0	0	100	56.9	43	0	0.1	
Total %	6.8	0	4.3	0	0	23.4	23.3	0	0	0	0	0	24	18.1	0	0	
Cars & Peds	269	1	176	0	0	944	959	0	0	0	0	1	973	748	0	1	4072
% Cars & Peds	94.4	100	98.3	0	0	95.8	97.6	0	0	0	0	100	96.2	97.9	0	100	96.7
Trucks & Buses	16	0	3	0	0	40	24	0	0	0	0	0	38	14	0	0	135
% Trucks & Buses	5.6	0	1.7	0	0	4.1	2.4	0	0	0	0	0	3.8	1.8	0	0	3.2
Bikes by Direction	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
% Bikes by Direction	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0.3	0	0	0.1

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	22	0	9	0	31	0	92	**120**	0	**212**	0	0	0	0	0	128	68	0	0	196	**439**
03:15 PM	18	0	11	0	29	0	101	111	0	212	0	0	0	0	0	77	**79**	0	0	156	397
03:30 PM	**27**	0	**14**	0	**41**	0	**105**	87	0	192	0	0	0	0	0	**132**	74	0	0	**206**	439
03:45 PM	27	0	13	0	40	0	101	80	0	181	0	0	0	0	0	79	49	0	**1**	129	350
Total Volume	94	0	47	0	141	0	399	398	0	797	0	0	0	0	0	416	270	0	1	687	1625
% App. Total	66.7	0	33.3	0		0	50.1	49.9	0		0	0	0	0		60.6	39.3	0	0.1		
PHF	.870	.000	.839	.000	.860	.000	.950	.829	.000	.940	.000	.000	.000	.000	.000	.788	.854	.000	.250	.834	.925
Cars & Peds	87	0	46	0	133	0	376	385	0	761	0	0	0	0	0	393	263	0	1	657	1551
% Cars & Peds	92.6	0	97.9	0	94.3	0	94.2	96.7	0	95.5	0	0	0	0	0	94.5	97.4	0	100	95.6	95.4
Trucks & Buses	7	0	1	0	8	0	23	13	0	36	0	0	0	0	0	23	7	0	0	30	74
% Trucks & Buses	7.4	0	2.1	0	5.7	0	5.8	3.3	0	4.5	0	0	0	0	0	5.5	2.6	0	0	4.4	4.6
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Transportation Data Corporation
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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063BB
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	20	0	9	0	0	86	117	0	0	0	0	0	124	67	0	0	423
03:15 PM	17	0	11	0	0	95	106	0	0	0	0	0	70	75	0	0	374
03:30 PM	26	0	14	0	0	101	83	0	0	0	0	0	128	73	0	0	425
03:45 PM	24	0	12	0	0	94	79	0	0	0	0	0	71	48	0	1	329
Total	87	0	46	0	0	376	385	0	0	0	0	0	393	263	0	1	1551
04:00 PM	38	0	12	0	0	76	73	0	0	0	0	0	110	69	0	0	378
04:15 PM	21	0	19	0	0	83	69	0	0	0	0	0	62	56	0	0	310
04:30 PM	18	0	20	0	0	76	77	0	0	0	0	0	69	65	0	0	325
04:45 PM	19	0	11	0	0	75	70	0	0	0	0	0	72	50	0	0	297
Total	96	0	62	0	0	310	289	0	0	0	0	0	313	240	0	0	1310
05:00 PM	24	0	16	0	0	64	83	0	0	0	0	1	114	111	0	0	413
05:15 PM	28	1	18	0	0	73	79	0	0	0	0	0	54	49	0	0	302
05:30 PM	18	0	19	0	0	56	67	0	0	0	0	0	65	47	0	0	272
05:45 PM	16	0	15	0	0	65	56	0	0	0	0	0	34	38	0	0	224
Total	86	1	68	0	0	258	285	0	0	0	0	1	267	245	0	0	1211
Grand Total	269	1	176	0	0	944	959	0	0	0	0	1	973	748	0	1	4072
Apprch %	60.3	0.2	39.5	0	0	49.6	50.4	0	0	0	0	100	56.5	43.4	0	0.1	
Total %	6.6	0	4.3	0	0	23.2	23.6	0	0	0	0	0	23.9	18.4	0	0	

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	20	0	9	0	29	0	86	**117**	0	**203**	0	0	0	0	0	124	67	0	0	191	423
03:15 PM	17	0	11	0	28	0	95	106	0	201	0	0	0	0	0	70	**75**	0	0	145	374
03:30 PM	**26**	0	**14**	0	**40**	0	**101**	83	0	184	0	0	0	0	0	**128**	73	0	0	**201**	**425**
03:45 PM	24	0	12	0	36	0	94	79	0	173	0	0	0	0	0	71	48	0	**1**	120	329
Total Volume	87	0	46	0	133	0	376	385	0	761	0	0	0	0	0	393	263	0	1	657	1551
% App. Total	65.4	0	34.6	0		0	49.4	50.6	0		0	0	0	0		59.8	40	0	0.2		
PHF	.837	.000	.821	.000	.831	.000	.931	.823	.000	.937	.000	.000	.000	.000	.000	.768	.877	.000	.250	.817	.912

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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063BB
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	2	0	0	0	0	6	3	0	0	0	0	0	4	1	0	0	16
03:15 PM	1	0	0	0	0	6	5	0	0	0	0	0	7	4	0	0	23
03:30 PM	1	0	0	0	0	4	4	0	0	0	0	0	4	1	0	0	14
03:45 PM	3	0	1	0	0	7	1	0	0	0	0	0	8	1	0	0	21
Total	7	0	1	0	0	23	13	0	0	0	0	0	23	7	0	0	74
04:00 PM	0	0	0	0	0	4	3	0	0	0	0	0	2	1	0	0	10
04:15 PM	2	0	1	0	0	2	1	0	0	0	0	0	2	1	0	0	9
04:30 PM	1	0	0	0	0	3	3	0	0	0	0	0	3	1	0	0	11
04:45 PM	2	0	0	0	0	2	0	0	0	0	0	0	3	2	0	0	9
Total	5	0	1	0	0	11	7	0	0	0	0	0	10	5	0	0	39
05:00 PM	1	0	0	0	0	3	1	0	0	0	0	0	1	1	0	0	7
05:15 PM	2	0	1	0	0	1	2	0	0	0	0	0	2	1	0	0	9
05:30 PM	1	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	4
05:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	2
Total	4	0	1	0	0	6	4	0	0	0	0	0	5	2	0	0	22
Grand Total	16	0	3	0	0	40	24	0	0	0	0	0	38	14	0	0	135
Apprch %	84.2	0	15.8	0	0	62.5	37.5	0	0	0	0	0	73.1	26.9	0	0	
Total %	11.9	0	2.2	0	0	29.6	17.8	0	0	0	0	0	28.1	10.4	0	0	

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	2	0	0	0	2	0	6	3	0	9	0	0	0	0	0	4	1	0	0	5	16
03:15 PM	1	0	0	0	1	0	6	**5**	0	**11**	0	0	0	0	0	7	**4**	0	0	**11**	**23**
03:30 PM	1	0	0	0	1	0	4	4	0	8	0	0	0	0	0	4	1	0	0	5	14
03:45 PM	**3**	0	**1**	0	**4**	0	**7**	1	0	8	0	0	0	0	0	**8**	1	0	0	9	21
Total Volume	7	0	1	0	8	0	23	13	0	36	0	0	0	0	0	23	7	0	0	30	74
% App. Total	87.5	0	12.5	0		0	63.9	36.1	0		0	0	0	0		76.7	23.3	0	0		
PHF	.583	.000	.250	.000	.500	.000	.821	.650	.000	.818	.000	.000	.000	.000	.000	.719	.438	.000	.000	.682	.804

Transportation Data Corporation

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N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063BB
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Route 140 SB Off-Ramp From North				Braley Road From East				Route 140 SB On-Ramp From South				Braley Road From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	3
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	100	0	0	
Total %	0	0	0	0	0	33.3	0	0	0	0	0	0	0	66.7	0	0	

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	**2**	**2**
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250

Transportation Data Corporation
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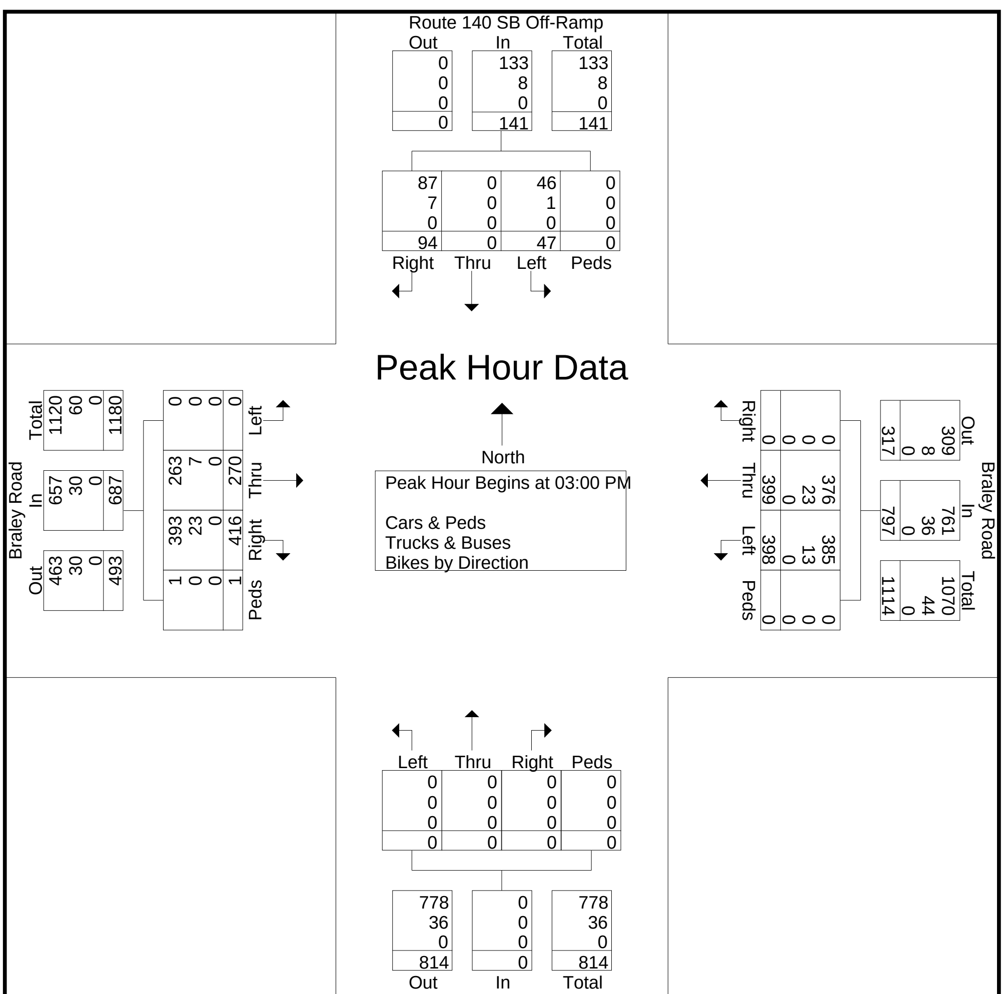
N/S: Route 140 Southbound Ramps
E/W: Braley Road
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063BB
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Route 140 SB Off-Ramp From North					Braley Road From East					Route 140 SB On-Ramp From South					Braley Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	22	0	9	0	31	0	92	**120**	0	**212**	0	0	0	0	0	128	68	0	0	196	**439**
03:15 PM	18	0	11	0	29	0	101	111	0	212	0	0	0	0	0	77	**79**	0	0	156	397
03:30 PM	**27**	0	**14**	0	**41**	0	**105**	87	0	192	0	0	0	0	0	**132**	74	0	0	**206**	439
03:45 PM	27	0	13	0	40	0	101	80	0	181	0	0	0	0	0	79	49	0	**1**	129	350
Total Volume	94	0	47	0	141	0	399	398	0	797	0	0	0	0	0	416	270	0	1	687	1625
% App. Total	66.7	0	33.3	0		0	50.1	49.9	0		0	0	0	0		60.6	39.3	0	0.1		
PHF	.870	.000	.839	.000	.860	.000	.950	.829	.000	.940	.000	.000	.000	.000	.000	.788	.854	.000	.250	.834	.925
Cars & Peds	87	0	46	0	133	0	376	385	0	761	0	0	0	0	0	393	263	0	1	657	1551
% Cars & Peds	92.6	0	97.9	0	94.3	0	94.2	96.7	0	95.5	0	0	0	0	0	94.5	97.4	0	100	95.6	95.4
Trucks & Buses	7	0	1	0	8	0	23	13	0	36	0	0	0	0	0	23	7	0	0	30	74
% Trucks & Buses	7.4	0	2.1	0	5.7	0	5.8	3.3	0	4.5	0	0	0	0	0	5.5	2.6	0	0	4.4	4.6
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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N/S: Phillips Road
E/W: Braley Road/Theo Rice Blvd.
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063C
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	11	2	37	0	16	76	12	0	27	2	5	0	9	101	2	0	300
07:15 AM	2	10	42	0	20	84	15	0	29	6	2	1	3	16	0	0	230
07:30 AM	6	3	39	0	17	110	31	0	28	3	2	0	0	22	0	0	261
07:45 AM	7	4	33	0	26	124	14	0	24	7	6	0	6	23	1	0	275
Total	26	19	151	0	79	394	72	0	108	18	15	1	18	162	3	0	1066
08:00 AM	8	1	37	2	20	98	28	0	28	6	2	0	5	25	5	0	265
08:15 AM	6	10	33	0	28	78	43	0	50	6	2	0	2	25	2	0	285
08:30 AM	6	5	35	0	16	64	33	2	41	6	3	1	0	11	0	0	223
08:45 AM	5	12	21	0	23	62	23	0	19	4	6	0	1	34	2	0	212
Total	25	28	126	2	87	302	127	2	138	22	13	1	8	95	9	0	985
Grand Total	51	47	277	2	166	696	199	2	246	40	28	2	26	257	12	0	2051
Apprch %	13.5	12.5	73.5	0.5	15.6	65.5	18.7	0.2	77.8	12.7	8.9	0.6	8.8	87.1	4.1	0	
Total %	2.5	2.3	13.5	0.1	8.1	33.9	9.7	0.1	12	2	1.4	0.1	1.3	12.5	0.6	0	
Cars & Peds	44	46	270	2	161	649	192	2	234	37	27	2	25	208	9	0	1908
% Cars & Peds	86.3	97.9	97.5	100	97	93.2	96.5	100	95.1	92.5	96.4	100	96.2	80.9	75	0	93
Trucks & Buses	5	1	6	0	5	47	7	0	12	2	1	0	0	49	3	0	138
% Trucks & Buses	9.8	2.1	2.2	0	3	6.8	3.5	0	4.9	5	3.6	0	0	19.1	25	0	6.7
Bikes by Direction	2	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	5
% Bikes by Direction	3.9	0	0.4	0	0	0	0	0	0	2.5	0	0	3.8	0	0	0	0.2

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	6	3	**39**	0	48	17	110	31	0	158	28	3	2	0	33	0	22	0	0	22	261
07:45 AM	7	4	33	0	44	26	**124**	14	0	**164**	24	**7**	**6**	0	37	**6**	23	1	0	30	275
08:00 AM	**8**	1	37	**2**	48	20	98	28	0	146	28	6	2	0	36	5	**25**	**5**	0	**35**	265
08:15 AM	6	**10**	33	0	**49**	**28**	78	**43**	0	149	**50**	6	2	0	**58**	2	25	2	0	29	**285**
Total Volume	27	18	142	2	189	91	410	116	0	617	130	22	12	0	164	13	95	8	0	116	1086
% App. Total	14.3	9.5	75.1	1.1		14.7	66.5	18.8	0		79.3	13.4	7.3	0		11.2	81.9	6.9	0		
PHF	.844	.450	.910	.250	.964	.813	.827	.674	.000	.941	.650	.786	.500	.000	.707	.542	.950	.400	.000	.829	.953
Cars & Peds	24	17	139	2	182	90	386	111	0	587	128	21	11	0	160	12	67	6	0	85	1014
% Cars & Peds	88.9	94.4	97.9	100	96.3	98.9	94.1	95.7	0	95.1	98.5	95.5	91.7	0	97.6	92.3	70.5	75.0	0	73.3	93.4
Trucks & Buses	2	1	2	0	5	1	24	5	0	30	2	1	1	0	4	0	28	2	0	30	69
% Trucks & Buses	7.4	5.6	1.4	0	2.6	1.1	5.9	4.3	0	4.9	1.5	4.5	8.3	0	2.4	0	29.5	25.0	0	25.9	6.4
Bikes by Direction	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
% Bikes by Direction	3.7	0	0.7	0	1.1	0	0	0	0	0	0	0	0	0	0	7.7	0	0	0	0.9	0.3

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N/S: Phillips Road
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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063C
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	11	2	36	0	15	71	12	0	25	1	5	0	9	100	2	0	289
07:15 AM	1	10	40	0	19	81	14	0	28	6	2	1	3	11	0	0	216
07:30 AM	5	3	38	0	16	101	29	0	28	3	1	0	0	17	0	0	241
07:45 AM	7	4	32	0	26	121	12	0	24	7	6	0	6	12	0	0	257
Total	24	19	146	0	76	374	67	0	105	17	14	1	18	140	2	0	1003
08:00 AM	7	1	37	2	20	92	28	0	28	5	2	0	4	19	5	0	250
08:15 AM	5	9	32	0	28	72	42	0	48	6	2	0	2	19	1	0	266
08:30 AM	6	5	34	0	15	56	32	2	36	5	3	1	0	8	0	0	203
08:45 AM	2	12	21	0	22	55	23	0	17	4	6	0	1	22	1	0	186
Total	20	27	124	2	85	275	125	2	129	20	13	1	7	68	7	0	905
Grand Total	44	46	270	2	161	649	192	2	234	37	27	2	25	208	9	0	1908
Apprch %	12.2	12.7	74.6	0.6	16	64.6	19.1	0.2	78	12.3	9	0.7	10.3	86	3.7	0	
Total %	2.3	2.4	14.2	0.1	8.4	34	10.1	0.1	12.3	1.9	1.4	0.1	1.3	10.9	0.5	0	

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	5	3	**38**	0	46	16	101	29	0	146	28	3	1	0	32	0	17	0	0	17	241
07:45 AM	**7**	4	32	0	43	26	**121**	12	0	**159**	24	**7**	**6**	0	37	**6**	12	0	0	18	257
08:00 AM	7	1	37	**2**	**47**	20	92	28	0	140	28	5	2	0	35	4	**19**	**5**	0	**28**	250
08:15 AM	5	**9**	32	0	46	**28**	72	**42**	0	142	**48**	6	2	0	**56**	2	19	1	0	22	**266**
Total Volume	24	17	139	2	182	90	386	111	0	587	128	21	11	0	160	12	67	6	0	85	1014
% App. Total	13.2	9.3	76.4	1.1		15.3	65.8	18.9	0		80	13.1	6.9	0		14.1	78.8	7.1	0		
PHF	.857	.472	.914	.250	.968	.804	.798	.661	.000	.923	.667	.750	.458	.000	.714	.500	.882	.300	.000	.759	.953

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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063C
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	1	0	1	5	0	0	2	1	0	0	0	1	0	0	11
07:15 AM	1	0	2	0	1	3	1	0	1	0	0	0	0	5	0	0	14
07:30 AM	1	0	0	0	1	9	2	0	0	0	1	0	0	5	0	0	19
07:45 AM	0	0	1	0	0	3	2	0	0	0	0	0	0	11	1	0	18
Total	2	0	4	0	3	20	5	0	3	1	1	0	0	22	1	0	62
08:00 AM	0	0	0	0	0	6	0	0	0	1	0	0	0	6	0	0	13
08:15 AM	1	1	1	0	0	6	1	0	2	0	0	0	0	6	1	0	19
08:30 AM	0	0	1	0	1	8	1	0	5	0	0	0	0	3	0	0	19
08:45 AM	2	0	0	0	1	7	0	0	2	0	0	0	0	12	1	0	25
Total	3	1	2	0	2	27	2	0	9	1	0	0	0	27	2	0	76
Grand Total	5	1	6	0	5	47	7	0	12	2	1	0	0	49	3	0	138
Apprch %	41.7	8.3	50	0	8.5	79.7	11.9	0	80	13.3	6.7	0	0	94.2	5.8	0	
Total %	3.6	0.7	4.3	0	3.6	34.1	5.1	0	8.7	1.4	0.7	0	0	35.5	2.2	0	

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	6	0	0	6	0	**1**	0	0	1	0	6	0	0	6	13
08:15 AM	1	**1**	**1**	0	**3**	0	6	**1**	0	7	2	0	0	0	2	0	6	**1**	0	7	19
08:30 AM	0	0	1	0	1	**1**	**8**	1	0	**10**	**5**	0	0	0	**5**	0	3	0	0	3	19
08:45 AM	**2**	0	0	0	2	1	7	0	0	8	2	0	0	0	2	0	**12**	1	0	**13**	**25**
Total Volume	3	1	2	0	6	2	27	2	0	31	9	1	0	0	10	0	27	2	0	29	76
% App. Total	50	16.7	33.3	0		6.5	87.1	6.5	0		90	10	0	0		0	93.1	6.9	0		
PHF	.375	.250	.500	.000	.500	.500	.844	.500	.000	.775	.450	.250	.000	.000	.500	.000	.563	.500	.000	.558	.760

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File Name : 05063C
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	4
Grand Total	2	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	5
Apprch %	66.7	0	33.3	0	0	0	0	0	0	100	0	0	100	0	0	0	
Total %	40	0	20	0	0	0	0	0	0	20	0	0	20	0	0	0	

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**1**	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**1**	**2**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	1
08:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	4
% App. Total	100	0	0	0		0	0	0	0		0	100	0	0		100	0	0	0		
PHF	.500	.000	.000	.000	.500	.000	.000	.000	.000	.000	.000	.250	.000	.000	.250	.250	.000	.000	.000	.250	.500

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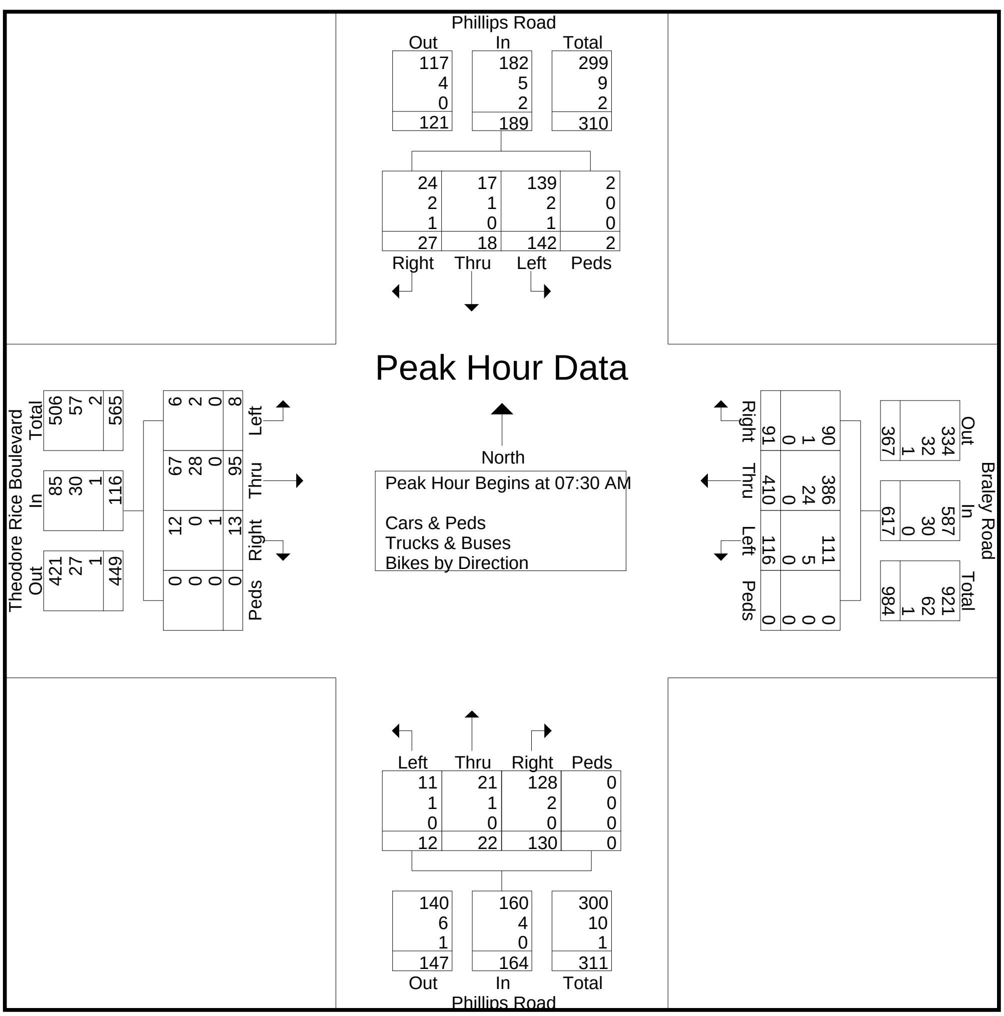
N/S: Phillips Road
E/W: Braley Road/Theo Rice Blvd.
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063C
Site Code : Y1821511
Start Date : 6/13/2018

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	6	3	**39**	0	48	17	110	31	0	158	28	3	2	0	33	0	22	0	0	22	261
07:45 AM	7	4	33	0	44	26	**124**	14	0	**164**	24	**7**	**6**	0	37	**6**	23	1	0	30	275
08:00 AM	**8**	1	37	**2**	48	20	98	28	0	146	28	6	2	0	36	5	**25**	**5**	0	**35**	265
08:15 AM	6	**10**	33	0	**49**	**28**	78	**43**	0	149	**50**	6	2	0	**58**	2	25	2	0	29	**285**
Total Volume	27	18	142	2	189	91	410	116	0	617	130	22	12	0	164	13	95	8	0	116	1086
% App. Total	14.3	9.5	75.1	1.1		14.7	66.5	18.8	0		79.3	13.4	7.3	0		11.2	81.9	6.9	0		
PHF	.844	.450	.910	.250	.964	.813	.827	.674	.000	.941	.650	.786	.500	.000	.707	.542	.950	.400	.000	.829	.953
Cars & Peds	24	17	139	2	182	90	386	111	0	587	128	21	11	0	160	12	67	6	0	85	1014
% Cars & Peds	88.9	94.4	97.9	100	96.3	98.9	94.1	95.7	0	95.1	98.5	95.5	91.7	0	97.6	92.3	70.5	75.0	0	73.3	93.4
Trucks & Buses	2	1	2	0	5	1	24	5	0	30	2	1	1	0	4	0	28	2	0	30	69
% Trucks & Buses	7.4	5.6	1.4	0	2.6	1.1	5.9	4.3	0	4.9	1.5	4.5	8.3	0	2.4	0	29.5	25.0	0	25.9	6.4
Bikes by Direction	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3
% Bikes by Direction	3.7	0	0.7	0	1.1	0	0	0	0	0	0	0	0	0	0	7.7	0	0	0	0.9	0.3



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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063CC
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	3	11	38	0	33	33	47	0	57	14	5	0	54	100	6	0	401
03:15 PM	5	12	39	0	42	37	38	0	37	11	8	0	8	80	7	0	324
03:30 PM	1	7	43	0	46	44	42	0	47	10	1	2	42	116	6	0	407
03:45 PM	0	12	41	0	39	43	45	0	26	9	4	0	5	58	3	0	285
Total	9	42	161	0	160	157	172	0	167	44	18	2	109	354	22	0	1417
04:00 PM	4	23	51	0	44	21	57	0	38	12	0	0	20	95	6	0	371
04:15 PM	0	13	30	0	44	23	40	0	34	10	6	0	6	53	10	0	269
04:30 PM	0	13	32	0	37	20	41	0	30	18	3	0	9	79	8	0	290
04:45 PM	0	7	32	0	34	16	46	0	24	10	0	0	6	67	2	0	244
Total	4	56	145	0	159	80	184	0	126	50	9	0	41	294	26	0	1174
05:00 PM	2	8	47	0	36	9	47	0	57	14	1	0	44	121	14	0	400
05:15 PM	1	12	29	0	42	13	52	0	30	13	2	0	2	48	2	0	246
05:30 PM	2	4	43	0	27	13	38	0	24	11	1	0	5	49	1	0	218
05:45 PM	1	12	35	0	34	14	33	0	20	10	1	0	1	16	1	0	178
Total	6	36	154	0	139	49	170	0	131	48	5	0	52	234	18	0	1042
Grand Total	19	134	460	0	458	286	526	0	424	142	32	2	202	882	66	0	3633
Apprch %	3.1	21.9	75	0	36.1	22.5	41.4	0	70.7	23.7	5.3	0.3	17.6	76.7	5.7	0	
Total %	0.5	3.7	12.7	0	12.6	7.9	14.5	0	11.7	3.9	0.9	0.1	5.6	24.3	1.8	0	
Cars & Peds	14	132	453	0	453	244	514	0	415	139	32	2	198	844	60	0	3500
% Cars & Peds	73.7	98.5	98.5	0	98.9	85.3	97.7	0	97.9	97.9	100	100	98	95.7	90.9	0	96.3
Trucks & Buses	5	2	6	0	5	42	11	0	8	3	0	0	4	38	6	0	130
% Trucks & Buses	26.3	1.5	1.3	0	1.1	14.7	2.1	0	1.9	2.1	0	0	2	4.3	9.1	0	3.6
Bikes by Direction	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	3
% Bikes by Direction	0	0	0.2	0	0	0	0.2	0	0.2	0	0	0	0	0	0	0	0.1

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	3	11	38	0	52	33	33	**47**	0	113	**57**	**14**	5	0	**76**	**54**	100	6	0	160	401
03:15 PM	**5**	**12**	39	0	**56**	42	37	38	0	117	37	11	**8**	0	56	8	80	**7**	0	95	324
03:30 PM	1	7	**43**	0	51	**46**	**44**	42	0	**132**	47	10	1	**2**	60	42	**116**	6	0	**164**	**407**
03:45 PM	0	12	41	0	53	39	43	45	0	127	26	9	4	0	39	5	58	3	0	66	285
Total Volume	9	42	161	0	212	160	157	172	0	489	167	44	18	2	231	109	354	22	0	485	1417
% App. Total	4.2	19.8	75.9	0		32.7	32.1	35.2	0		72.3	19	7.8	0.9		22.5	73	4.5	0		
PHF	.450	.875	.936	.000	.946	.870	.892	.915	.000	.926	.732	.786	.563	.250	.760	.505	.763	.786	.000	.739	.870
Cars & Peds	6	41	156	0	203	157	134	168	0	459	160	42	18	2	222	107	335	18	0	460	1344
% Cars & Peds	66.7	97.6	96.9	0	95.8	98.1	85.4	97.7	0	93.9	95.8	95.5	100	100	96.1	98.2	94.6	81.8	0	94.8	94.8
Trucks & Buses	3	1	5	0	9	3	23	4	0	30	7	2	0	0	9	2	19	4	0	25	73
% Trucks & Buses	33.3	2.4	3.1	0	4.2	1.9	14.6	2.3	0	6.1	4.2	4.5	0	0	3.9	1.8	5.4	18.2	0	5.2	5.2
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063CC
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	2	11	37	0	32	28	45	0	57	14	5	0	54	96	3	0	384
03:15 PM	4	11	38	0	41	33	36	0	34	10	8	0	8	72	7	0	302
03:30 PM	0	7	43	0	46	39	42	0	44	9	1	2	40	114	6	0	393
03:45 PM	0	12	38	0	38	34	45	0	25	9	4	0	5	53	2	0	265
Total	6	41	156	0	157	134	168	0	160	42	18	2	107	335	18	0	1344
04:00 PM	4	23	51	0	44	19	55	0	38	12	0	0	19	92	6	0	363
04:15 PM	0	13	30	0	44	20	39	0	34	10	6	0	6	51	9	0	262
04:30 PM	0	13	30	0	37	16	41	0	29	18	3	0	9	75	8	0	279
04:45 PM	0	7	32	0	33	15	44	0	24	10	0	0	6	63	2	0	236
Total	4	56	143	0	158	70	179	0	125	50	9	0	40	281	25	0	1140
05:00 PM	1	8	47	0	35	7	46	0	57	14	1	0	43	120	14	0	393
05:15 PM	1	12	29	0	42	10	52	0	29	13	2	0	2	46	1	0	239
05:30 PM	1	4	43	0	27	9	36	0	24	11	1	0	5	47	1	0	209
05:45 PM	1	11	35	0	34	14	33	0	20	9	1	0	1	15	1	0	175
Total	4	35	154	0	138	40	167	0	130	47	5	0	51	228	17	0	1016
Grand Total	14	132	453	0	453	244	514	0	415	139	32	2	198	844	60	0	3500
Apprch %	2.3	22	75.6	0	37.4	20.1	42.4	0	70.6	23.6	5.4	0.3	18	76.6	5.4	0	
Total %	0.4	3.8	12.9	0	12.9	7	14.7	0	11.9	4	0.9	0.1	5.7	24.1	1.7	0	

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	2	11	37	0	50	32	28	**45**	0	105	**57**	**14**	5	0	**76**	**54**	96	3	0	153	384
03:15 PM	**4**	11	38	0	**53**	41	33	36	0	110	34	10	**8**	0	52	8	72	**7**	0	87	302
03:30 PM	0	7	**43**	0	50	**46**	**39**	42	0	**127**	44	9	1	**2**	56	40	**114**	6	0	**160**	**393**
03:45 PM	0	**12**	38	0	50	38	34	45	0	117	25	9	4	0	38	5	53	2	0	60	265
Total Volume	6	41	156	0	203	157	134	168	0	459	160	42	18	2	222	107	335	18	0	460	1344
% App. Total	3	20.2	76.8	0		34.2	29.2	36.6	0		72.1	18.9	8.1	0.9		23.3	72.8	3.9	0		
PHF	.375	.854	.907	.000	.958	.853	.859	.933	.000	.904	.702	.750	.563	.250	.730	.495	.735	.643	.000	.719	.855

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Client: McM/S. Hawkins

File Name : 05063CC
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	1	0	1	0	1	5	2	0	0	0	0	0	0	4	3	0	17
03:15 PM	1	1	1	0	1	4	2	0	3	1	0	0	0	8	0	0	22
03:30 PM	1	0	0	0	0	5	0	0	3	1	0	0	2	2	0	0	14
03:45 PM	0	0	3	0	1	9	0	0	1	0	0	0	0	5	1	0	20
Total	3	1	5	0	3	23	4	0	7	2	0	0	2	19	4	0	73
04:00 PM	0	0	0	0	0	2	2	0	0	0	0	0	1	3	0	0	8
04:15 PM	0	0	0	0	0	3	1	0	0	0	0	0	0	2	1	0	7
04:30 PM	0	0	1	0	0	4	0	0	0	0	0	0	0	4	0	0	9
04:45 PM	0	0	0	0	1	1	2	0	0	0	0	0	0	4	0	0	8
Total	0	0	1	0	1	10	5	0	0	0	0	0	1	13	1	0	32
05:00 PM	1	0	0	0	1	2	1	0	0	0	0	0	1	1	0	0	7
05:15 PM	0	0	0	0	0	3	0	0	1	0	0	0	0	2	1	0	7
05:30 PM	1	0	0	0	0	4	1	0	0	0	0	0	0	2	0	0	8
05:45 PM	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	3
Total	2	1	0	0	1	9	2	0	1	1	0	0	1	6	1	0	25
Grand Total	5	2	6	0	5	42	11	0	8	3	0	0	4	38	6	0	130
Apprch %	38.5	15.4	46.2	0	8.6	72.4	19	0	72.7	27.3	0	0	8.3	79.2	12.5	0	
Total %	3.8	1.5	4.6	0	3.8	32.3	8.5	0	6.2	2.3	0	0	3.1	29.2	4.6	0	

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	**1**	0	1	0	2	**1**	5	**2**	0	8	0	0	0	0	0	0	4	**3**	0	7	17
03:15 PM	1	**1**	1	0	**3**	1	4	2	0	7	**3**	**1**	0	0	**4**	0	**8**	0	0	**8**	**22**
03:30 PM	1	0	0	0	1	0	5	0	0	5	3	1	0	0	4	**2**	2	0	0	4	14
03:45 PM	0	0	**3**	0	3	1	**9**	0	0	**10**	1	0	0	0	1	0	5	1	0	6	20
Total Volume	3	1	5	0	9	3	23	4	0	30	7	2	0	0	9	2	19	4	0	25	73
% App. Total	33.3	11.1	55.6	0		10	76.7	13.3	0		77.8	22.2	0	0		8	76	16	0		
PHF	.750	.250	.417	.000	.750	.750	.639	.500	.000	.750	.583	.500	.000	.000	.563	.250	.594	.333	.000	.781	.830

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Client: McM/S. Hawkins

File Name : 05063CC
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Phillips Road From North				Braley Road From East				Phillips Road From South				Theodore Rice Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	3
Apprch %	0	0	100	0	0	0	100	0	100	0	0	0	0	0	0	0	
Total %	0	0	33.3	0	0	0	33.3	0	33.3	0	0	0	0	0	0	0	

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	**1**	0	**1**	0	0	0	0	0	**1**	0	0	0	**1**	0	0	0	0	0	**2**
Total Volume	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	2
% App. Total	0	0	100	0		0	0	0	0		100	0	0	0		0	0	0	0		
PHF	.000	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.250

Transportation Data Corporation
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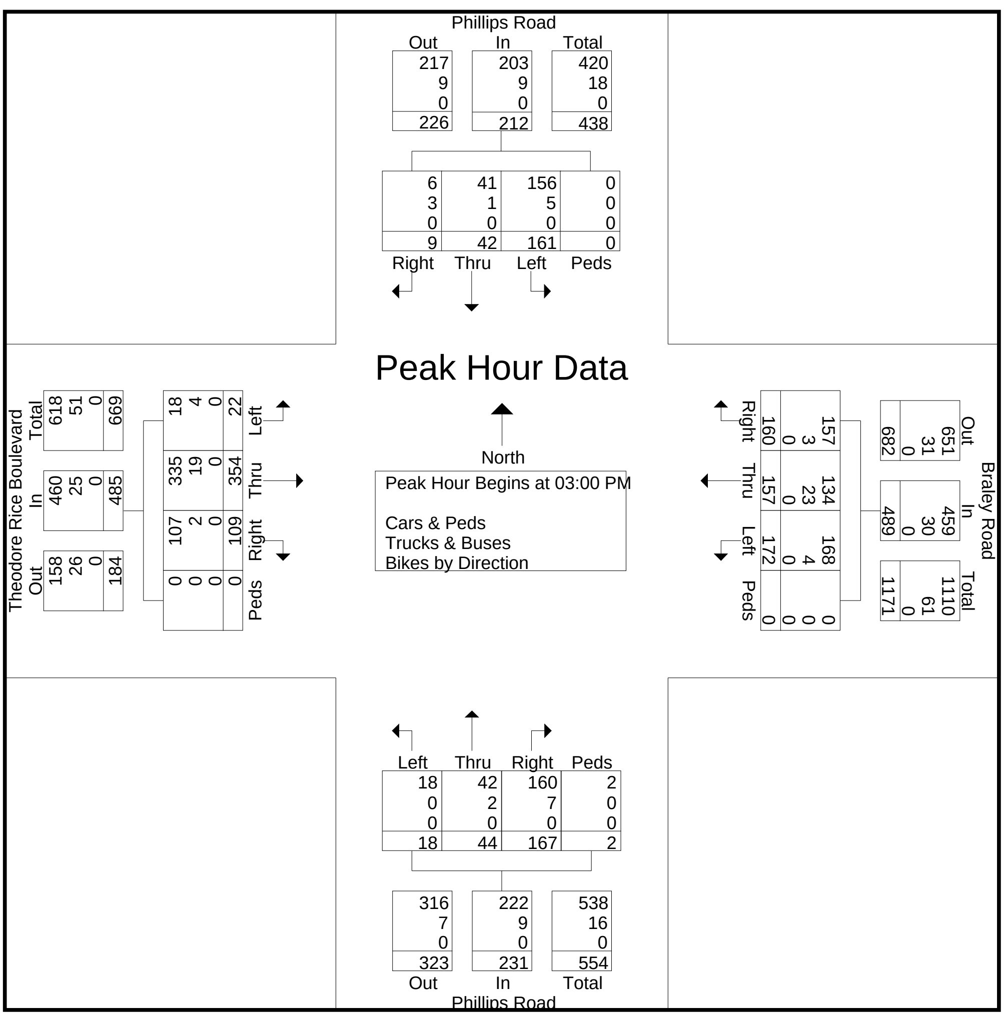
N/S: Phillips Road
E/W: Braley Road/Theo Rice Blvd.
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063CC
Site Code : Y1821511
Start Date : 6/13/2018

	Phillips Road From North					Braley Road From East					Phillips Road From South					Theodore Rice Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	3	11	38	0	52	33	33	**47**	0	113	**57**	**14**	5	0	**76**	**54**	100	6	0	160	401
03:15 PM	**5**	**12**	39	0	**56**	42	37	38	0	117	37	11	**8**	0	56	8	80	**7**	0	95	324
03:30 PM	1	7	**43**	0	51	**46**	**44**	42	0	**132**	47	10	1	**2**	60	42	**116**	6	0	**164**	**407**
03:45 PM	0	12	41	0	53	39	43	45	0	127	26	9	4	0	39	5	58	3	0	66	285
Total Volume	9	42	161	0	212	160	157	172	0	489	167	44	18	2	231	109	354	22	0	485	1417
% App. Total	4.2	19.8	75.9	0		32.7	32.1	35.2	0		72.3	19	7.8	0.9		22.5	73	4.5	0		
PHF	.450	.875	.936	.000	.946	.870	.892	.915	.000	.926	.732	.786	.563	.250	.760	.505	.763	.786	.000	.739	.870
Cars & Peds	6	41	156	0	203	157	134	168	0	459	160	42	18	2	222	107	335	18	0	460	1344
% Cars & Peds	66.7	97.6	96.9	0	95.8	98.1	85.4	97.7	0	93.9	95.8	95.5	100	100	96.1	98.2	94.6	81.8	0	94.8	94.8
Trucks & Buses	3	1	5	0	9	3	23	4	0	30	7	2	0	0	9	2	19	4	0	25	73
% Trucks & Buses	33.3	2.4	3.1	0	4.2	1.9	14.6	2.3	0	6.1	4.2	4.5	0	0	3.9	1.8	5.4	18.2	0	5.2	5.2
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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N/S: Duchaine Boulevard
E: Theodore Rice Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063D
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	1	24	0	15	48	0	73	0	0	161
07:15 AM	1	2	0	11	53	0	17	2	0	86
07:30 AM	3	3	0	23	85	0	20	1	0	135
07:45 AM	1	4	0	40	84	0	24	2	0	155
Total	6	33	0	89	270	0	134	5	0	537
08:00 AM	2	4	0	17	78	0	29	0	0	130
08:15 AM	2	4	0	10	65	0	18	1	0	100
08:30 AM	2	2	0	6	28	0	11	2	0	51
08:45 AM	3	7	0	9	38	0	24	5	0	86
Total	9	17	0	42	209	0	82	8	0	367
Grand Total	15	50	0	131	479	0	216	13	0	904
Apprch %	23.1	76.9	0	21.5	78.5	0	94.3	5.7	0	
Total %	1.7	5.5	0	14.5	53	0	23.9	1.4	0	
Cars & Peds	12	45	0	121	434	0	167	9	0	788
% Cars & Peds	80	90	0	92.4	90.6	0	77.3	69.2	0	87.2
Trucks & Buses	3	5	0	10	45	0	49	4	0	116
% Trucks & Buses	20	10	0	7.6	9.4	0	22.7	30.8	0	12.8
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	1	**24**	0	**25**	15	48	0	63	**73**	0	0	**73**	**161**
07:15 AM	1	2	0	3	11	53	0	64	17	**2**	0	19	86
07:30 AM	**3**	3	0	6	23	**85**	0	108	20	1	0	21	135
07:45 AM	1	4	0	5	**40**	84	0	**124**	24	2	0	26	155
Total Volume	6	33	0	39	89	270	0	359	134	5	0	139	537
% App. Total	15.4	84.6	0		24.8	75.2	0		96.4	3.6	0		
PHF	.500	.344	.000	.390	.556	.794	.000	.724	.459	.625	.000	.476	.834
Cars & Peds	6	32	0	38	85	249	0	334	108	4	0	112	484
% Cars & Peds	100	97.0	0	97.4	95.5	92.2	0	93.0	80.6	80.0	0	80.6	90.1
Trucks & Buses	0	1	0	1	4	21	0	25	26	1	0	27	53
% Trucks & Buses	0	3.0	0	2.6	4.5	7.8	0	7.0	19.4	20.0	0	19.4	9.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

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N/S: Duchaine Boulevard
E: Theodore Rice Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063D
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	1	24	0	14	45	0	72	0	0	156
07:15 AM	1	2	0	11	48	0	11	1	0	74
07:30 AM	3	3	0	21	75	0	13	1	0	116
07:45 AM	1	3	0	39	81	0	12	2	0	138
Total	6	32	0	85	249	0	108	4	0	484
08:00 AM	2	4	0	16	74	0	23	0	0	119
08:15 AM	1	3	0	9	59	0	14	0	0	86
08:30 AM	2	1	0	6	23	0	9	2	0	43
08:45 AM	1	5	0	5	29	0	13	3	0	56
Total	6	13	0	36	185	0	59	5	0	304
Grand Total	12	45	0	121	434	0	167	9	0	788
Apprch %	21.1	78.9	0	21.8	78.2	0	94.9	5.1	0	
Total %	1.5	5.7	0	15.4	55.1	0	21.2	1.1	0	

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	1	**24**	0	**25**	14	45	0	59	**72**	0	0	**72**	**156**
07:15 AM	1	2	0	3	11	48	0	59	11	1	0	12	74
07:30 AM	**3**	3	0	6	21	75	0	96	13	1	0	14	116
07:45 AM	1	3	0	4	**39**	**81**	0	**120**	12	**2**	0	14	138
Total Volume	6	32	0	38	85	249	0	334	108	4	0	112	484
% App. Total	15.8	84.2	0		25.4	74.6	0		96.4	3.6	0		
PHF	.500	.333	.000	.380	.545	.769	.000	.696	.375	.500	.000	.389	.776

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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063D
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	1	3	0	1	0	0	5
07:15 AM	0	0	0	0	5	0	6	1	0	12
07:30 AM	0	0	0	2	10	0	7	0	0	19
07:45 AM	0	1	0	1	3	0	12	0	0	17
Total	0	1	0	4	21	0	26	1	0	53
08:00 AM	0	0	0	1	4	0	6	0	0	11
08:15 AM	1	1	0	1	6	0	4	1	0	14
08:30 AM	0	1	0	0	5	0	2	0	0	8
08:45 AM	2	2	0	4	9	0	11	2	0	30
Total	3	4	0	6	24	0	23	3	0	63
Grand Total	3	5	0	10	45	0	49	4	0	116
Apprch %	37.5	62.5	0	18.2	81.8	0	92.5	7.5	0	
Total %	2.6	4.3	0	8.6	38.8	0	42.2	3.4	0	

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00 AM													
08:00 AM	0	0	0	0	1	4	0	5	6	0	0	6	11
08:15 AM	1	1	0	2	1	6	0	7	4	1	0	5	14
08:30 AM	0	1	0	1	0	5	0	5	2	0	0	2	8
08:45 AM	**2**	**2**	0	**4**	**4**	**9**	0	**13**	**11**	**2**	0	**13**	**30**
Total Volume	3	4	0	7	6	24	0	30	23	3	0	26	63
% App. Total	42.9	57.1	0		20	80	0		88.5	11.5	0		
PHF	.375	.500	.000	.438	.375	.667	.000	.577	.523	.375	.000	.500	.525

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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063D
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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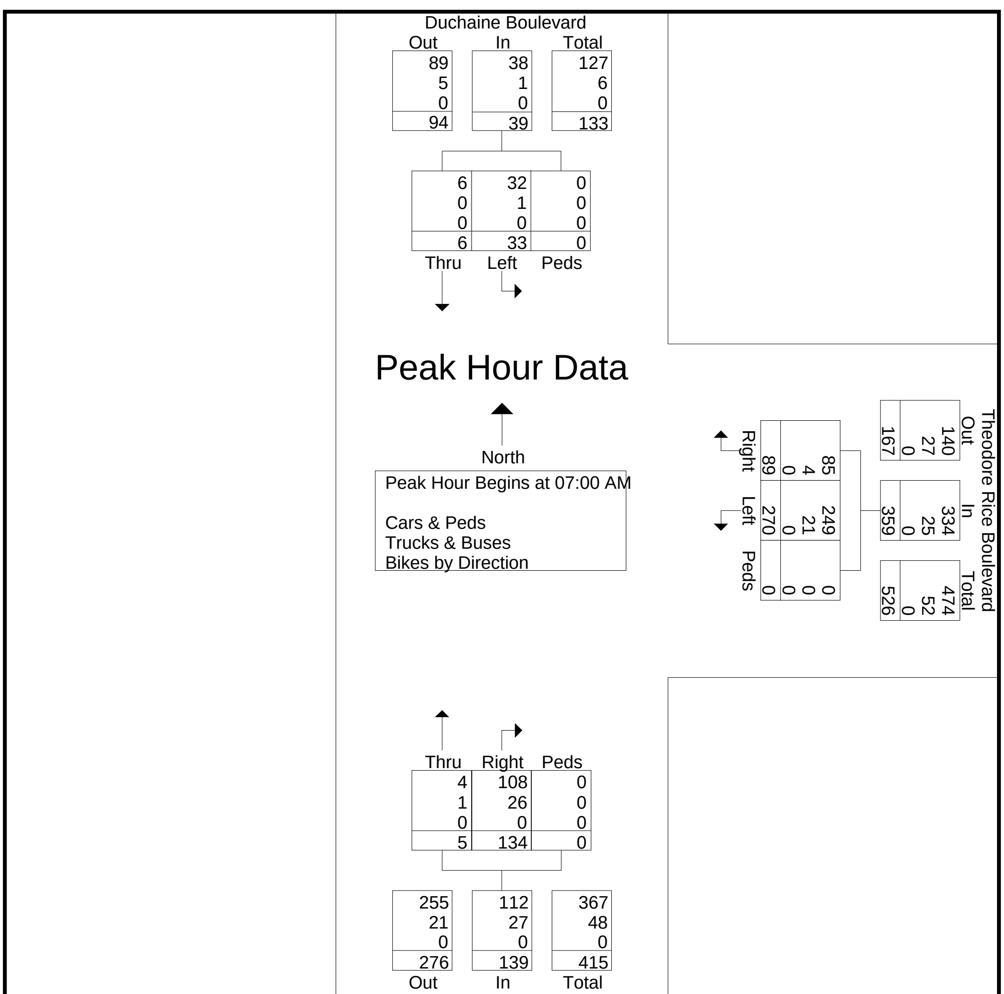
N/S: Duchaine Boulevard
E: Theodore Rice Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063D
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	1	**24**	0	**25**	15	48	0	63	**73**	0	0	**73**	**161**
07:15 AM	1	2	0	3	11	53	0	64	17	**2**	0	19	86
07:30 AM	**3**	3	0	6	23	**85**	0	108	20	1	0	21	135
07:45 AM	1	4	0	5	**40**	84	0	**124**	24	2	0	26	155
Total Volume	6	33	0	39	89	270	0	359	134	5	0	139	537
% App. Total	15.4	84.6	0		24.8	75.2	0		96.4	3.6	0		
PHF	.500	.344	.000	.390	.556	.794	.000	.724	.459	.625	.000	.476	.834
Cars & Peds	6	32	0	38	85	249	0	334	108	4	0	112	484
% Cars & Peds	100	97.0	0	97.4	95.5	92.2	0	93.0	80.6	80.0	0	80.6	90.1
Trucks & Buses	0	1	0	1	4	21	0	25	26	1	0	27	53
% Trucks & Buses	0	3.0	0	2.6	4.5	7.8	0	7.0	19.4	20.0	0	19.4	9.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



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N/S: Duchaine Boulevard
E: Theodore Rice Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063DD
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	4	27	0	5	21	0	123	2	0	182
03:15 PM	5	11	0	13	24	0	42	3	0	98
03:30 PM	3	40	0	5	29	0	43	5	0	125
03:45 PM	6	6	0	6	28	0	34	1	0	81
Total	18	84	0	29	102	0	242	11	0	486
04:00 PM	2	15	0	1	10	0	77	3	0	108
04:15 PM	2	7	0	4	11	0	34	4	0	62
04:30 PM	7	10	0	1	15	0	48	2	0	83
04:45 PM	3	8	0	0	13	0	42	2	0	68
Total	14	40	0	6	49	0	201	11	0	321
05:00 PM	2	58	0	3	10	0	62	0	0	135
05:15 PM	2	11	0	3	10	0	30	0	0	56
05:30 PM	1	9	0	3	11	0	30	0	0	54
05:45 PM	1	3	0	2	15	0	13	2	0	36
Total	6	81	0	11	46	0	135	2	0	281
Grand Total	38	205	0	46	197	0	578	24	0	1088
Apprch %	15.6	84.4	0	18.9	81.1	0	96	4	0	
Total %	3.5	18.8	0	4.2	18.1	0	53.1	2.2	0	
Cars & Peds	35	193	0	36	159	0	541	18	0	982
% Cars & Peds	92.1	94.1	0	78.3	80.7	0	93.6	75	0	90.3
Trucks & Buses	3	12	0	10	38	0	37	6	0	106
% Trucks & Buses	7.9	5.9	0	21.7	19.3	0	6.4	25	0	9.7
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	4	27	0	31	5	21	0	26	**123**	2	0	**125**	**182**
03:15 PM	5	11	0	16	**13**	24	0	**37**	42	3	0	45	98
03:30 PM	3	**40**	0	**43**	5	**29**	0	34	43	**5**	0	48	125
03:45 PM	**6**	6	0	12	6	28	0	34	34	1	0	35	81
Total Volume	18	84	0	102	29	102	0	131	242	11	0	253	486
% App. Total	17.6	82.4	0		22.1	77.9	0		95.7	4.3	0		
PHF	.750	.525	.000	.593	.558	.879	.000	.885	.492	.550	.000	.506	.668
Cars & Peds	16	79	0	95	24	79	0	103	222	8	0	230	428
% Cars & Peds	88.9	94.0	0	93.1	82.8	77.5	0	78.6	91.7	72.7	0	90.9	88.1
Trucks & Buses	2	5	0	7	5	23	0	28	20	3	0	23	58
% Trucks & Buses	11.1	6.0	0	6.9	17.2	22.5	0	21.4	8.3	27.3	0	9.1	11.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

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N/S: Duchaine Boulevard
E: Theodore Rice Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063DD
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	4	25	0	4	15	0	117	2	0	167
03:15 PM	4	9	0	12	19	0	35	1	0	80
03:30 PM	2	39	0	3	25	0	42	4	0	115
03:45 PM	6	6	0	5	20	0	28	1	0	66
Total	16	79	0	24	79	0	222	8	0	428
04:00 PM	2	15	0	1	8	0	74	2	0	102
04:15 PM	1	5	0	3	9	0	33	3	0	54
04:30 PM	7	9	0	1	11	0	44	2	0	74
04:45 PM	3	8	0	0	12	0	37	1	0	61
Total	13	37	0	5	40	0	188	8	0	291
05:00 PM	2	56	0	2	8	0	61	0	0	129
05:15 PM	2	10	0	2	9	0	28	0	0	51
05:30 PM	1	9	0	1	8	0	29	0	0	48
05:45 PM	1	2	0	2	15	0	13	2	0	35
Total	6	77	0	7	40	0	131	2	0	263
Grand Total	35	193	0	36	159	0	541	18	0	982
Apprch %	15.4	84.6	0	18.5	81.5	0	96.8	3.2	0	
Total %	3.6	19.7	0	3.7	16.2	0	55.1	1.8	0	

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	4	25	0	29	4	15	0	19	**117**	2	0	**119**	**167**
03:15 PM	4	9	0	13	**12**	19	0	**31**	35	1	0	36	80
03:30 PM	2	**39**	0	**41**	3	**25**	0	28	42	**4**	0	46	115
03:45 PM	**6**	6	0	12	5	20	0	25	28	1	0	29	66
Total Volume	16	79	0	95	24	79	0	103	222	8	0	230	428
% App. Total	16.8	83.2	0		23.3	76.7	0		96.5	3.5	0		
PHF	.667	.506	.000	.579	.500	.790	.000	.831	.474	.500	.000	.483	.641

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N/S: Duchaine Boulevard
E: Theodore Rice Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063DD
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Trucks & Buses

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	0	2	0	1	6	0	6	0	0	15
03:15 PM	1	2	0	1	5	0	7	2	0	18
03:30 PM	1	1	0	2	4	0	1	1	0	10
03:45 PM	0	0	0	1	8	0	6	0	0	15
Total	2	5	0	5	23	0	20	3	0	58
04:00 PM	0	0	0	0	2	0	3	1	0	6
04:15 PM	1	2	0	1	2	0	1	1	0	8
04:30 PM	0	1	0	0	4	0	4	0	0	9
04:45 PM	0	0	0	0	1	0	5	1	0	7
Total	1	3	0	1	9	0	13	3	0	30
05:00 PM	0	2	0	1	2	0	1	0	0	6
05:15 PM	0	1	0	1	1	0	2	0	0	5
05:30 PM	0	0	0	2	3	0	1	0	0	6
05:45 PM	0	1	0	0	0	0	0	0	0	1
Total	0	4	0	4	6	0	4	0	0	18
Grand Total	3	12	0	10	38	0	37	6	0	106
Apprch %	20	80	0	20.8	79.2	0	86	14	0	
Total %	2.8	11.3	0	9.4	35.8	0	34.9	5.7	0	

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	**2**	0	2	1	6	0	7	6	0	0	6	15
03:15 PM	**1**	2	0	**3**	1	5	0	6	**7**	**2**	0	**9**	**18**
03:30 PM	1	1	0	2	**2**	4	0	6	1	1	0	2	10
03:45 PM	0	0	0	0	1	**8**	0	**9**	6	0	0	6	15
Total Volume	2	5	0	7	5	23	0	28	20	3	0	23	58
% App. Total	28.6	71.4	0		17.9	82.1	0		87	13	0		
PHF	.500	.625	.000	.583	.625	.719	.000	.778	.714	.375	.000	.639	.806

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N/S: Duchaine Boulevard
E: Theodore Rice Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063DD
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Duchaine Boulevard From North			Theodore Rice Boulevard From East			Duchaine Boulevard From South			
Start Time	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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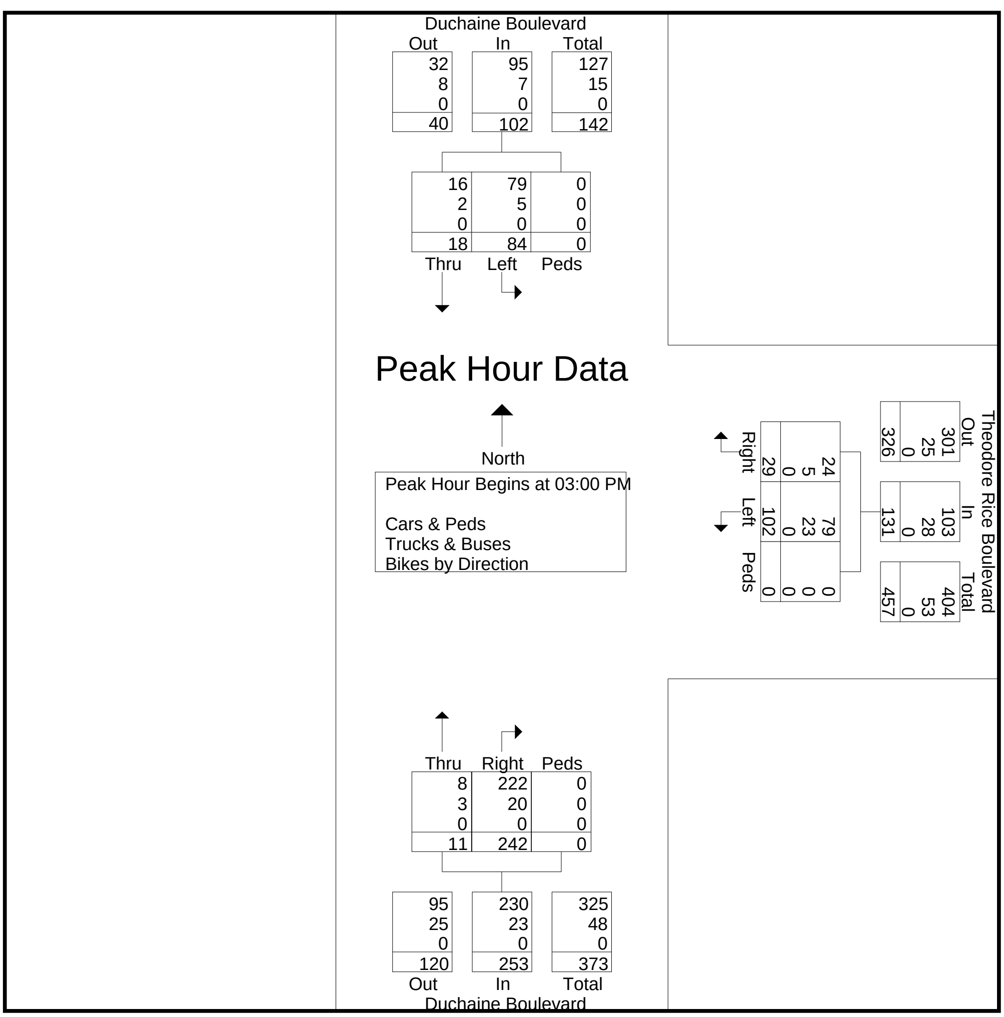
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063DD
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Duchaine Boulevard From North				Theodore Rice Boulevard From East				Duchaine Boulevard From South				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	4	27	0	31	5	21	0	26	**123**	2	0	**125**	**182**
03:15 PM	5	11	0	16	**13**	24	0	**37**	42	3	0	45	98
03:30 PM	3	**40**	0	**43**	5	**29**	0	34	43	**5**	0	48	125
03:45 PM	**6**	6	0	12	6	28	0	34	34	1	0	35	81
Total Volume	18	84	0	102	29	102	0	131	242	11	0	253	486
% App. Total	17.6	82.4	0		22.1	77.9	0		95.7	4.3	0		
PHF	.750	.525	.000	.593	.558	.879	.000	.885	.492	.550	.000	.506	.668
Cars & Peds	16	79	0	95	24	79	0	103	222	8	0	230	428
% Cars & Peds	88.9	94.0	0	93.1	82.8	77.5	0	78.6	91.7	72.7	0	90.9	88.1
Trucks & Buses	2	5	0	7	5	23	0	28	20	3	0	23	58
% Trucks & Buses	11.1	6.0	0	6.9	17.2	22.5	0	21.4	8.3	27.3	0	9.1	11.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063E
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	60	38	0	0	39	0	0	0	61	7	0	0	53	0	30	0	288
07:15 AM	48	31	0	0	47	0	0	0	10	6	0	0	2	0	5	0	149
07:30 AM	100	14	1	0	52	0	0	0	18	7	0	0	8	0	12	0	212
07:45 AM	131	12	0	0	78	0	0	0	31	8	0	0	10	0	17	0	287
Total	339	95	1	0	216	0	0	0	120	28	0	0	73	0	64	0	936
08:00 AM	83	13	2	0	32	0	0	0	47	10	0	0	35	0	14	1	237
08:15 AM	77	13	0	0	42	0	0	0	12	5	0	0	7	0	9	0	165
08:30 AM	31	10	1	0	26	0	0	1	12	2	0	0	8	0	6	0	97
08:45 AM	44	6	0	0	23	0	0	0	17	5	0	0	10	0	16	0	121
Total	235	42	3	0	123	0	0	1	88	22	0	0	60	0	45	1	620
Grand Total	574	137	4	0	339	0	0	1	208	50	0	0	133	0	109	1	1556
Apprch %	80.3	19.2	0.6	0	99.7	0	0	0.3	80.6	19.4	0	0	54.7	0	44.9	0.4	
Total %	36.9	8.8	0.3	0	21.8	0	0	0.1	13.4	3.2	0	0	8.5	0	7	0.1	
Cars & Peds	527	127	4	0	326	0	0	1	180	31	0	0	122	0	80	1	1399
% Cars & Peds	91.8	92.7	100	0	96.2	0	0	100	86.5	62	0	0	91.7	0	73.4	100	89.9
Trucks & Buses	47	10	0	0	13	0	0	0	28	19	0	0	11	0	29	0	157
% Trucks & Buses	8.2	7.3	0	0	3.8	0	0	0	13.5	38	0	0	8.3	0	26.6	0	10.1
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	60	**38**	0	0	98	39	0	0	0	39	**61**	7	0	0	**68**	**53**	0	**30**	0	**83**	**288**
07:15 AM	48	31	0	0	79	47	0	0	0	47	10	6	0	0	16	2	0	5	0	7	149
07:30 AM	100	14	**1**	0	115	52	0	0	0	52	18	7	0	0	25	8	0	12	0	20	212
07:45 AM	**131**	12	0	0	**143**	**78**	0	0	0	**78**	31	**8**	0	0	39	10	0	17	0	27	287
Total Volume	339	95	1	0	435	216	0	0	0	216	120	28	0	0	148	73	0	64	0	137	936
% App. Total	77.9	21.8	0.2	0		100	0	0	0		81.1	18.9	0	0		53.3	0	46.7	0		
PHF	.647	.625	.250	.000	.760	.692	.000	.000	.000	.692	.492	.875	.000	.000	.544	.344	.000	.533	.000	.413	.813
Cars & Peds	317	92	1	0	410	208	0	0	0	208	104	13	0	0	117	67	0	52	0	119	854
% Cars & Peds	93.5	96.8	100	0	94.3	96.3	0	0	0	96.3	86.7	46.4	0	0	79.1	91.8	0	81.3	0	86.9	91.2
Trucks & Buses	22	3	0	0	25	8	0	0	0	8	16	15	0	0	31	6	0	12	0	18	82
% Trucks & Buses	6.5	3.2	0	0	5.7	3.7	0	0	0	3.7	13.3	53.6	0	0	20.9	8.2	0	18.8	0	13.1	8.8
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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N/S: Duchaine Boulevard
E/W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063E
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	55	38	0	0	39	0	0	0	59	6	0	0	52	0	30	0	279
07:15 AM	42	31	0	0	44	0	0	0	7	1	0	0	1	0	4	0	130
07:30 AM	93	11	1	0	49	0	0	0	13	4	0	0	5	0	9	0	185
07:45 AM	127	12	0	0	76	0	0	0	25	2	0	0	9	0	9	0	260
Total	317	92	1	0	208	0	0	0	104	13	0	0	67	0	52	0	854
08:00 AM	78	11	2	0	30	0	0	0	41	8	0	0	31	0	11	1	213
08:15 AM	72	11	0	0	42	0	0	0	9	5	0	0	7	0	5	0	151
08:30 AM	27	7	1	0	24	0	0	1	12	2	0	0	8	0	5	0	87
08:45 AM	33	6	0	0	22	0	0	0	14	3	0	0	9	0	7	0	94
Total	210	35	3	0	118	0	0	1	76	18	0	0	55	0	28	1	545
Grand Total	527	127	4	0	326	0	0	1	180	31	0	0	122	0	80	1	1399
Apprch %	80.1	19.3	0.6	0	99.7	0	0	0.3	85.3	14.7	0	0	60.1	0	39.4	0.5	
Total %	37.7	9.1	0.3	0	23.3	0	0	0.1	12.9	2.2	0	0	8.7	0	5.7	0.1	

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	55	**38**	0	0	93	39	0	0	0	39	**59**	**6**	0	0	**65**	**52**	0	**30**	0	**82**	**279**
07:15 AM	42	31	0	0	73	44	0	0	0	44	7	1	0	0	8	1	0	4	0	5	130
07:30 AM	93	11	**1**	0	105	49	0	0	0	49	13	4	0	0	17	5	0	9	0	14	185
07:45 AM	**127**	12	0	0	**139**	**76**	0	0	0	**76**	25	2	0	0	27	9	0	9	0	18	260
Total Volume	317	92	1	0	410	208	0	0	0	208	104	13	0	0	117	67	0	52	0	119	854
% App. Total	77.3	22.4	0.2	0		100	0	0	0		88.9	11.1	0	0		56.3	0	43.7	0		
PHF	.624	.605	.250	.000	.737	.684	.000	.000	.000	.684	.441	.542	.000	.000	.450	.322	.000	.433	.000	.363	.765

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Client: McM/S. Hawkins

File Name : 05063E
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Trucks & Buses

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	5	0	0	0	0	0	0	0	2	1	0	0	1	0	0	0	9
07:15 AM	6	0	0	0	3	0	0	0	3	5	0	0	1	0	1	0	19
07:30 AM	7	3	0	0	3	0	0	0	5	3	0	0	3	0	3	0	27
07:45 AM	4	0	0	0	2	0	0	0	6	6	0	0	1	0	8	0	27
Total	22	3	0	0	8	0	0	0	16	15	0	0	6	0	12	0	82
08:00 AM	5	2	0	0	2	0	0	0	6	2	0	0	4	0	3	0	24
08:15 AM	5	2	0	0	0	0	0	0	3	0	0	0	0	0	4	0	14
08:30 AM	4	3	0	0	2	0	0	0	0	0	0	0	0	0	1	0	10
08:45 AM	11	0	0	0	1	0	0	0	3	2	0	0	1	0	9	0	27
Total	25	7	0	0	5	0	0	0	12	4	0	0	5	0	17	0	75
Grand Total	47	10	0	0	13	0	0	0	28	19	0	0	11	0	29	0	157
Apprch %	82.5	17.5	0	0	100	0	0	0	59.6	40.4	0	0	27.5	0	72.5	0	
Total %	29.9	6.4	0	0	8.3	0	0	0	17.8	12.1	0	0	7	0	18.5	0	

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	6	0	0	0	6	**3**	0	0	0	**3**	3	5	0	0	8	1	0	1	0	2	19
07:30 AM	**7**	**3**	0	0	**10**	3	0	0	0	3	5	3	0	0	8	3	0	3	0	6	**27**
07:45 AM	4	0	0	0	4	2	0	0	0	2	**6**	**6**	0	0	**12**	1	0	**8**	0	**9**	27
08:00 AM	5	2	0	0	7	2	0	0	0	2	6	2	0	0	8	**4**	0	3	0	7	24
Total Volume	22	5	0	0	27	10	0	0	0	10	20	16	0	0	36	9	0	15	0	24	97
% App. Total	81.5	18.5	0	0		100	0	0	0		55.6	44.4	0	0		37.5	0	62.5	0		
PHF	.786	.417	.000	.000	.675	.833	.000	.000	.000	.833	.833	.667	.000	.000	.750	.563	.000	.469	.000	.667	.898

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Client: McM/S. Hawkins

File Name : 05063E
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Bikes by Direction

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Transportation Data Corporation
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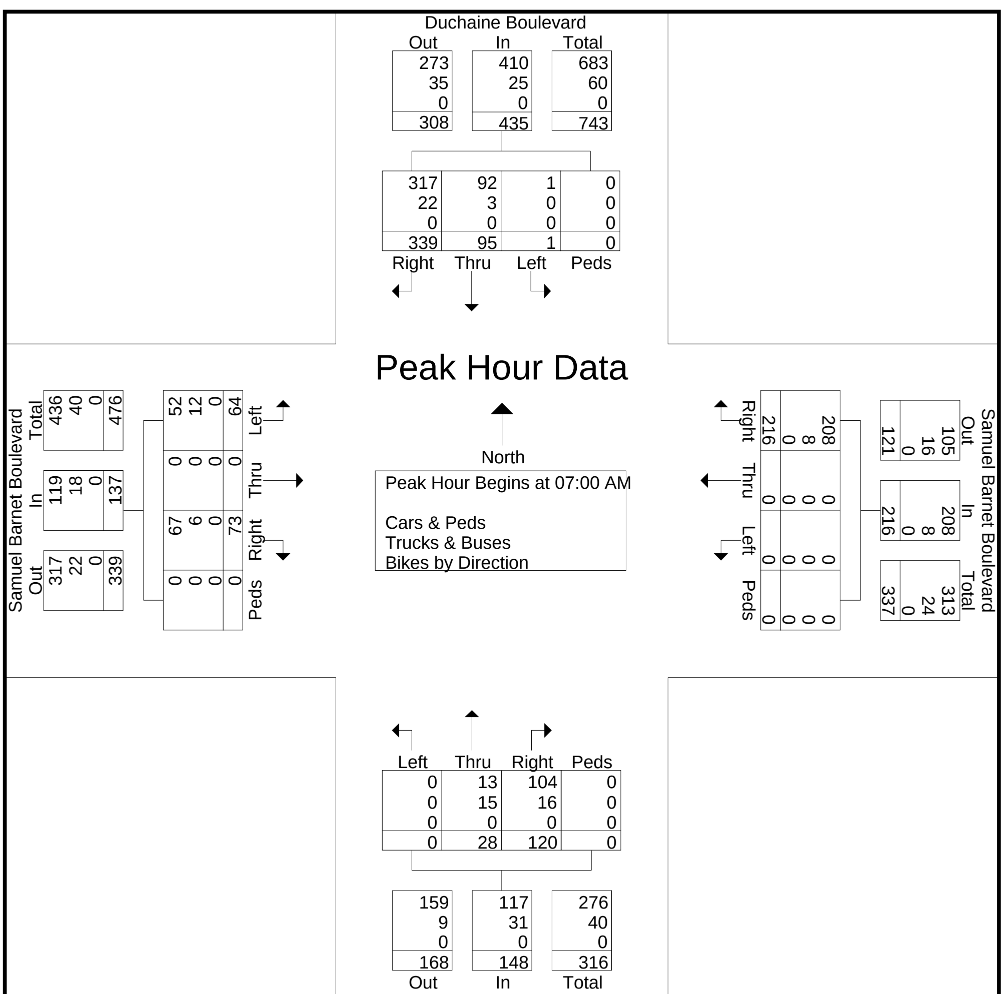
N/S: Duchaine Boulevard
E/W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063E
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	60	**38**	0	0	98	39	0	0	0	39	**61**	7	0	0	**68**	**53**	0	**30**	0	**83**	**288**
07:15 AM	48	31	0	0	79	47	0	0	0	47	10	6	0	0	16	2	0	5	0	7	149
07:30 AM	100	14	**1**	0	115	52	0	0	0	52	18	7	0	0	25	8	0	12	0	20	212
07:45 AM	**131**	12	0	0	**143**	**78**	0	0	0	**78**	31	**8**	0	0	39	10	0	17	0	27	287
Total Volume	339	95	1	0	435	216	0	0	0	216	120	28	0	0	148	73	0	64	0	137	936
% App. Total	77.9	21.8	0.2	0		100	0	0	0		81.1	18.9	0	0		53.3	0	46.7	0		
PHF	.647	.625	.250	.000	.760	.692	.000	.000	.000	.692	.492	.875	.000	.000	.544	.344	.000	.533	.000	.413	.813
Cars & Peds	317	92	1	0	410	208	0	0	0	208	104	13	0	0	117	67	0	52	0	119	854
% Cars & Peds	93.5	96.8	100	0	94.3	96.3	0	0	0	96.3	86.7	46.4	0	0	79.1	91.8	0	81.3	0	86.9	91.2
Trucks & Buses	22	3	0	0	25	8	0	0	0	8	16	15	0	0	31	6	0	12	0	18	82
% Trucks & Buses	6.5	3.2	0	0	5.7	3.7	0	0	0	3.7	13.3	53.6	0	0	20.9	8.2	0	18.8	0	13.1	8.8
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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N/S: Duchaine Boulevard
E/W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063EE
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	31	19	0	0	32	0	0	0	105	6	0	0	85	0	50	0	328
03:15 PM	41	22	0	0	37	0	0	0	41	4	0	0	16	0	30	0	191
03:30 PM	34	12	1	0	25	0	0	0	124	9	0	0	97	0	35	0	337
03:45 PM	36	10	1	0	25	0	0	0	40	4	0	0	26	0	20	0	162
Total	142	63	2	0	119	0	0	0	310	23	0	0	224	0	135	0	1018
04:00 PM	14	15	0	0	18	0	0	0	130	5	0	0	101	0	62	0	345
04:15 PM	16	4	0	0	7	0	0	0	27	2	0	0	19	0	28	0	103
04:30 PM	14	11	1	0	10	0	0	0	51	4	0	1	46	0	36	0	174
04:45 PM	19	9	0	0	14	0	0	0	42	7	0	0	21	0	22	0	134
Total	63	39	1	0	49	0	0	0	250	18	0	1	187	0	148	0	756
05:00 PM	9	11	0	0	8	0	0	0	135	1	0	0	108	0	46	0	318
05:15 PM	14	7	0	0	13	0	0	0	36	0	0	0	27	0	22	0	119
05:30 PM	12	7	0	0	9	0	0	0	37	3	0	0	33	0	24	0	125
05:45 PM	17	4	0	0	13	0	0	0	34	2	0	0	32	0	11	0	113
Total	52	29	0	0	43	0	0	0	242	6	0	0	200	0	103	0	675
Grand Total	257	131	3	0	211	0	0	0	802	47	0	1	611	0	386	0	2449
Apprch %	65.7	33.5	0.8	0	100	0	0	0	94.4	5.5	0	0.1	61.3	0	38.7	0	
Total %	10.5	5.3	0.1	0	8.6	0	0	0	32.7	1.9	0	0	24.9	0	15.8	0	
Cars & Peds	221	94	3	0	183	0	0	0	790	37	0	1	605	0	355	0	2289
% Cars & Peds	86	71.8	100	0	86.7	0	0	0	98.5	78.7	0	100	99	0	92	0	93.5
Trucks & Buses	36	37	0	0	28	0	0	0	12	10	0	0	6	0	31	0	160
% Trucks & Buses	14	28.2	0	0	13.3	0	0	0	1.5	21.3	0	0	1	0	8	0	6.5
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	**41**	**22**	0	0	**63**	**37**	0	0	0	**37**	41	4	0	0	45	16	0	30	0	46	191
03:30 PM	34	12	**1**	0	47	25	0	0	0	25	124	**9**	0	0	133	97	0	35	0	132	337
03:45 PM	36	10	1	0	47	25	0	0	0	25	40	4	0	0	44	26	0	20	0	46	162
04:00 PM	14	15	0	0	29	18	0	0	0	18	**130**	5	0	0	**135**	**101**	0	**62**	0	**163**	**345**
Total Volume	125	59	2	0	186	105	0	0	0	105	335	22	0	0	357	240	0	147	0	387	1035
% App. Total	67.2	31.7	1.1	0		100	0	0	0		93.8	6.2	0	0		62	0	38	0		
PHF	.762	.670	.500	.000	.738	.709	.000	.000	.000	.709	.644	.611	.000	.000	.661	.594	.000	.593	.000	.594	.750
Cars & Peds	112	33	2	0	147	89	0	0	0	89	330	20	0	0	350	238	0	128	0	366	952
% Cars & Peds	89.6	55.9	100	0	79.0	84.8	0	0	0	84.8	98.5	90.9	0	0	98.0	99.2	0	87.1	0	94.6	92.0
Trucks & Buses	13	26	0	0	39	16	0	0	0	16	5	2	0	0	7	2	0	19	0	21	83
% Trucks & Buses	10.4	44.1	0	0	21.0	15.2	0	0	0	15.2	1.5	9.1	0	0	2.0	0.8	0	12.9	0	5.4	8.0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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N/S: Duchaine Boulevard
E/W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063EE
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	25	18	0	0	30	0	0	0	104	5	0	0	84	0	45	0	311
03:15 PM	38	10	0	0	29	0	0	0	40	4	0	0	16	0	20	0	157
03:30 PM	31	7	1	0	24	0	0	0	124	8	0	0	97	0	33	0	325
03:45 PM	31	6	1	0	22	0	0	0	37	3	0	0	25	0	17	0	142
Total	125	41	2	0	105	0	0	0	305	20	0	0	222	0	115	0	935
04:00 PM	12	10	0	0	14	0	0	0	129	5	0	0	100	0	58	0	328
04:15 PM	12	1	0	0	6	0	0	0	26	1	0	0	19	0	28	0	93
04:30 PM	11	7	1	0	7	0	0	0	50	2	0	1	44	0	35	0	158
04:45 PM	17	9	0	0	13	0	0	0	39	4	0	0	21	0	19	0	122
Total	52	27	1	0	40	0	0	0	244	12	0	1	184	0	140	0	701
05:00 PM	7	10	0	0	7	0	0	0	135	1	0	0	108	0	45	0	313
05:15 PM	11	7	0	0	11	0	0	0	36	0	0	0	26	0	21	0	112
05:30 PM	10	6	0	0	8	0	0	0	37	3	0	0	33	0	23	0	120
05:45 PM	16	3	0	0	12	0	0	0	33	1	0	0	32	0	11	0	108
Total	44	26	0	0	38	0	0	0	241	5	0	0	199	0	100	0	653
Grand Total	221	94	3	0	183	0	0	0	790	37	0	1	605	0	355	0	2289
Apprch %	69.5	29.6	0.9	0	100	0	0	0	95.4	4.5	0	0.1	63	0	37	0	
Total %	9.7	4.1	0.1	0	8	0	0	0	34.5	1.6	0	0	26.4	0	15.5	0	

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	**38**	**10**	0	0	**48**	**29**	0	0	0	**29**	40	4	0	0	44	16	0	20	0	36	157
03:30 PM	31	7	**1**	0	39	24	0	0	0	24	124	**8**	0	0	132	97	0	33	0	130	325
03:45 PM	31	6	1	0	38	22	0	0	0	22	37	3	0	0	40	25	0	17	0	42	142
04:00 PM	12	10	0	0	22	14	0	0	0	14	**129**	5	0	0	**134**	**100**	0	**58**	0	**158**	**328**
Total Volume	112	33	2	0	147	89	0	0	0	89	330	20	0	0	350	238	0	128	0	366	952
% App. Total	76.2	22.4	1.4	0		100	0	0	0		94.3	5.7	0	0		65	0	35	0		
PHF	.737	.825	.500	.000	.766	.767	.000	.000	.000	.767	.640	.625	.000	.000	.653	.595	.000	.552	.000	.579	.726

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N/S: Duchaine Boulevard
E/W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063EE
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	6	1	0	0	2	0	0	0	1	1	0	0	1	0	5	0	17
03:15 PM	3	12	0	0	8	0	0	0	1	0	0	0	0	0	10	0	34
03:30 PM	3	5	0	0	1	0	0	0	0	1	0	0	0	0	2	0	12
03:45 PM	5	4	0	0	3	0	0	0	3	1	0	0	1	0	3	0	20
Total	17	22	0	0	14	0	0	0	5	3	0	0	2	0	20	0	83
04:00 PM	2	5	0	0	4	0	0	0	1	0	0	0	1	0	4	0	17
04:15 PM	4	3	0	0	1	0	0	0	1	1	0	0	0	0	0	0	10
04:30 PM	3	4	0	0	3	0	0	0	1	2	0	0	2	0	1	0	16
04:45 PM	2	0	0	0	1	0	0	0	3	3	0	0	0	0	3	0	12
Total	11	12	0	0	9	0	0	0	6	6	0	0	3	0	8	0	55
05:00 PM	2	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	5
05:15 PM	3	0	0	0	2	0	0	0	0	0	0	0	1	0	1	0	7
05:30 PM	2	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	5
05:45 PM	1	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	5
Total	8	3	0	0	5	0	0	0	1	1	0	0	1	0	3	0	22
Grand Total	36	37	0	0	28	0	0	0	12	10	0	0	6	0	31	0	160
Apprch %	49.3	50.7	0	0	100	0	0	0	54.5	45.5	0	0	16.2	0	83.8	0	
Total %	22.5	23.1	0	0	17.5	0	0	0	7.5	6.2	0	0	3.8	0	19.4	0	

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	**6**	1	0	0	7	2	0	0	0	2	1	**1**	0	0	2	**1**	0	5	0	6	17
03:15 PM	3	**12**	0	0	**15**	**8**	0	0	0	**8**	1	0	0	0	1	0	0	**10**	0	**10**	**34**
03:30 PM	3	5	0	0	8	1	0	0	0	1	0	1	0	0	1	0	0	2	0	2	12
03:45 PM	5	4	0	0	9	3	0	0	0	3	**3**	1	0	0	**4**	1	0	3	0	4	20
Total Volume	17	22	0	0	39	14	0	0	0	14	5	3	0	0	8	2	0	20	0	22	83
% App. Total	43.6	56.4	0	0		100	0	0	0		62.5	37.5	0	0		9.1	0	90.9	0		
PHF	.708	.458	.000	.000	.650	.438	.000	.000	.000	.438	.417	.750	.000	.000	.500	.500	.000	.500	.000	.550	.610

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Client: McM/S. Hawkins

File Name : 05063EE
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Bikes by Direction

	Duchaine Boulevard From North				Samuel Barnet Boulevard From East				Duchaine Boulevard From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total %																	

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:00 PM																					
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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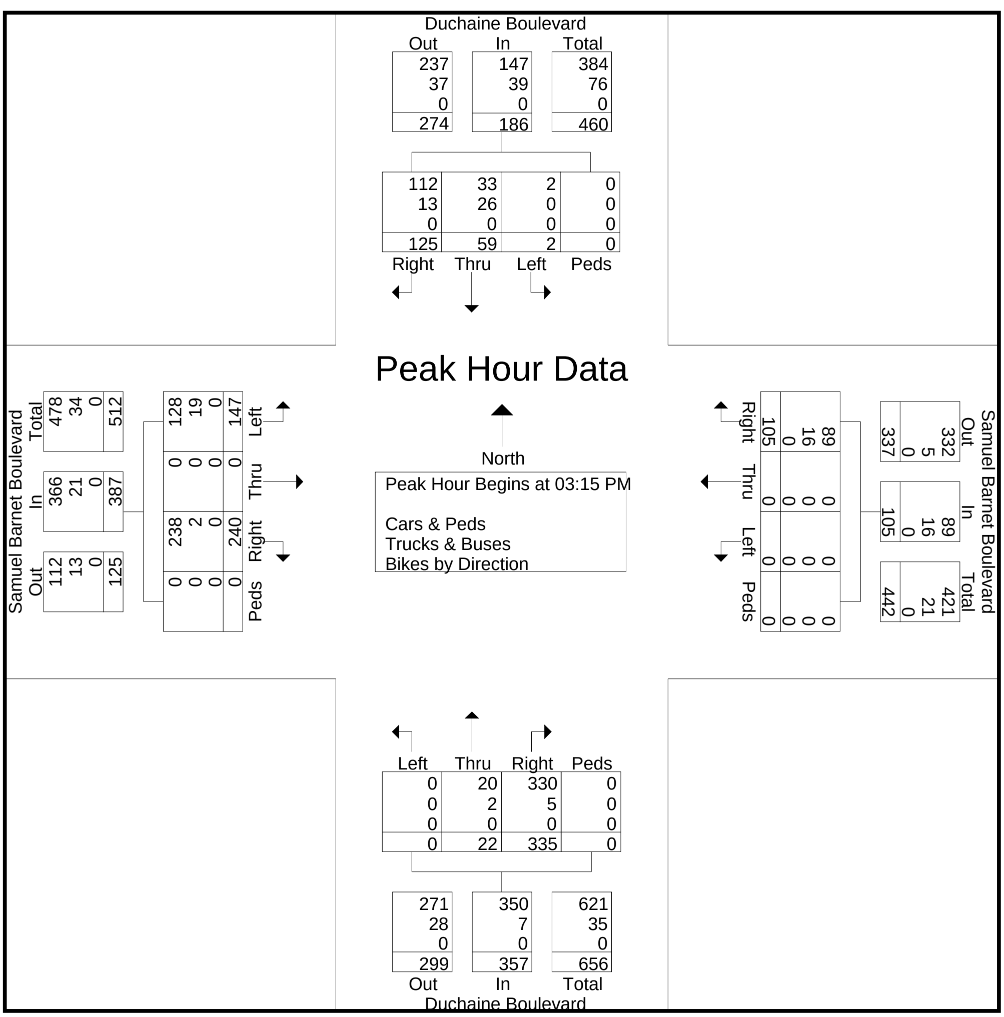
N/S: Duchaine Boulevard
E/W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063EE
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Duchaine Boulevard From North					Samuel Barnet Boulevard From East					Duchaine Boulevard From South					Samuel Barnet Boulevard From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	**41**	**22**	0	0	**63**	**37**	0	0	0	**37**	41	4	0	0	45	16	0	30	0	46	191
03:30 PM	34	12	**1**	0	47	25	0	0	0	25	124	**9**	0	0	133	97	0	35	0	132	337
03:45 PM	36	10	1	0	47	25	0	0	0	25	40	4	0	0	44	26	0	20	0	46	162
04:00 PM	14	15	0	0	29	18	0	0	0	18	**130**	5	0	0	**135**	**101**	0	**62**	0	**163**	**345**
Total Volume	125	59	2	0	186	105	0	0	0	105	335	22	0	0	357	240	0	147	0	387	1035
% App. Total	67.2	31.7	1.1	0		100	0	0	0		93.8	6.2	0	0		62	0	38	0		
PHF	.762	.670	.500	.000	.738	.709	.000	.000	.000	.709	.644	.611	.000	.000	.661	.594	.000	.593	.000	.594	.750
Cars & Peds	112	33	2	0	147	89	0	0	0	89	330	20	0	0	350	238	0	128	0	366	952
% Cars & Peds	89.6	55.9	100	0	79.0	84.8	0	0	0	84.8	98.5	90.9	0	0	98.0	99.2	0	87.1	0	94.6	92.0
Trucks & Buses	13	26	0	0	39	16	0	0	0	16	5	2	0	0	7	2	0	19	0	21	83
% Trucks & Buses	10.4	44.1	0	0	21.0	15.2	0	0	0	15.2	1.5	9.1	0	0	2.0	0.8	0	12.9	0	5.4	8.0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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N/S: Phillips Road
W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063F
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	15	0	24	40	0	58	3	0	140
07:15 AM	2	20	0	31	44	0	12	0	0	109
07:30 AM	3	24	0	25	50	0	17	2	0	121
07:45 AM	1	27	0	34	75	0	32	1	0	170
Total	6	86	0	114	209	0	119	6	0	540
08:00 AM	1	24	0	29	34	0	44	2	0	134
08:15 AM	3	34	0	43	37	0	12	0	0	129
08:30 AM	2	37	0	43	24	0	11	0	0	117
08:45 AM	0	37	0	24	25	0	17	1	0	104
Total	6	132	0	139	120	0	84	3	0	484
Grand Total	12	218	0	253	329	0	203	9	0	1024
Apprch %	5.2	94.8	0	43.5	56.5	0	95.8	4.2	0	
Total %	1.2	21.3	0	24.7	32.1	0	19.8	0.9	0	
Cars & Peds	8	213	0	240	319	0	177	7	0	964
% Cars & Peds	66.7	97.7	0	94.9	97	0	87.2	77.8	0	94.1
Trucks & Buses	4	4	0	13	10	0	26	2	0	59
% Trucks & Buses	33.3	1.8	0	5.1	3	0	12.8	22.2	0	5.8
Bikes by Direction	0	1	0	0	0	0	0	0	0	1
% Bikes by Direction	0	0.5	0	0	0	0	0	0	0	0.1

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**3**	24	0	27	25	50	0	75	17	**2**	0	19	121
07:45 AM	1	27	0	28	34	**75**	0	**109**	32	1	0	33	**170**
08:00 AM	1	24	0	25	29	34	0	63	**44**	2	0	**46**	134
08:15 AM	3	**34**	0	**37**	**43**	37	0	80	12	0	0	12	129
Total Volume	8	109	0	117	131	196	0	327	105	5	0	110	554
% App. Total	6.8	93.2	0		40.1	59.9	0		95.5	4.5	0		
PHF	.667	.801	.000	.791	.762	.653	.000	.750	.597	.625	.000	.598	.815
Cars & Peds	6	105	0	111	127	190	0	317	86	4	0	90	518
% Cars & Peds	75.0	96.3	0	94.9	96.9	96.9	0	96.9	81.9	80.0	0	81.8	93.5
Trucks & Buses	2	3	0	5	4	6	0	10	19	1	0	20	35
% Trucks & Buses	25.0	2.8	0	4.3	3.1	3.1	0	3.1	18.1	20.0	0	18.2	6.3
Bikes by Direction	0	1	0	1	0	0	0	0	0	0	0	0	1
% Bikes by Direction	0	0.9	0	0.9	0	0	0	0	0	0	0	0	0.2

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W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063F
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	15	0	22	40	0	56	3	0	136
07:15 AM	1	20	0	30	42	0	9	0	0	102
07:30 AM	2	23	0	25	48	0	13	1	0	112
07:45 AM	1	25	0	33	73	0	26	1	0	159
Total	4	83	0	110	203	0	104	5	0	509
08:00 AM	1	24	0	28	32	0	38	2	0	125
08:15 AM	2	33	0	41	37	0	9	0	0	122
08:30 AM	1	36	0	38	23	0	11	0	0	109
08:45 AM	0	37	0	23	24	0	15	0	0	99
Total	4	130	0	130	116	0	73	2	0	455
Grand Total	8	213	0	240	319	0	177	7	0	964
Apprch %	3.6	96.4	0	42.9	57.1	0	96.2	3.8	0	
Total %	0.8	22.1	0	24.9	33.1	0	18.4	0.7	0	

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**2**	23	0	25	25	48	0	73	13	1	0	14	112
07:45 AM	1	25	0	26	33	**73**	0	**106**	26	1	0	27	**159**
08:00 AM	1	24	0	25	28	32	0	60	**38**	**2**	0	**40**	125
08:15 AM	2	**33**	0	**35**	**41**	37	0	78	9	0	0	9	122
Total Volume	6	105	0	111	127	190	0	317	86	4	0	90	518
% App. Total	5.4	94.6	0		40.1	59.9	0		95.6	4.4	0		
PHF	.750	.795	.000	.793	.774	.651	.000	.748	.566	.500	.000	.563	.814

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Client: McM/S. Hawkins

File Name : 05063F
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	0	0	2	0	0	2	0	0	4
07:15 AM	1	0	0	1	2	0	3	0	0	7
07:30 AM	1	1	0	0	2	0	4	1	0	9
07:45 AM	0	2	0	1	2	0	6	0	0	11
Total	2	3	0	4	6	0	15	1	0	31
08:00 AM	0	0	0	1	2	0	6	0	0	9
08:15 AM	1	0	0	2	0	0	3	0	0	6
08:30 AM	1	1	0	5	1	0	0	0	0	8
08:45 AM	0	0	0	1	1	0	2	1	0	5
Total	2	1	0	9	4	0	11	1	0	28
Grand Total	4	4	0	13	10	0	26	2	0	59
Apprch %	50	50	0	56.5	43.5	0	92.9	7.1	0	
Total %	6.8	6.8	0	22	16.9	0	44.1	3.4	0	

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	**1**	0	0	1	**1**	**2**	0	**3**	3	0	0	3	7
07:30 AM	1	1	0	**2**	0	2	0	2	4	**1**	0	5	9
07:45 AM	0	**2**	0	2	1	2	0	3	**6**	0	0	**6**	**11**
08:00 AM	0	0	0	0	1	2	0	3	6	0	0	6	9
Total Volume	2	3	0	5	3	8	0	11	19	1	0	20	36
% App. Total	40	60	0		27.3	72.7	0		95	5	0		
PHF	.500	.375	.000	.625	.750	1.00	.000	.917	.792	.250	.000	.833	.818

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File Name : 05063F
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Bikes by Direction

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	0	0	0	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
Grand Total	0	1	0	0	0	0	0	0	0	1
Apprch %	0	100	0	0	0	0	0	0	0	
Total %	0	100	0	0	0	0	0	0	0	

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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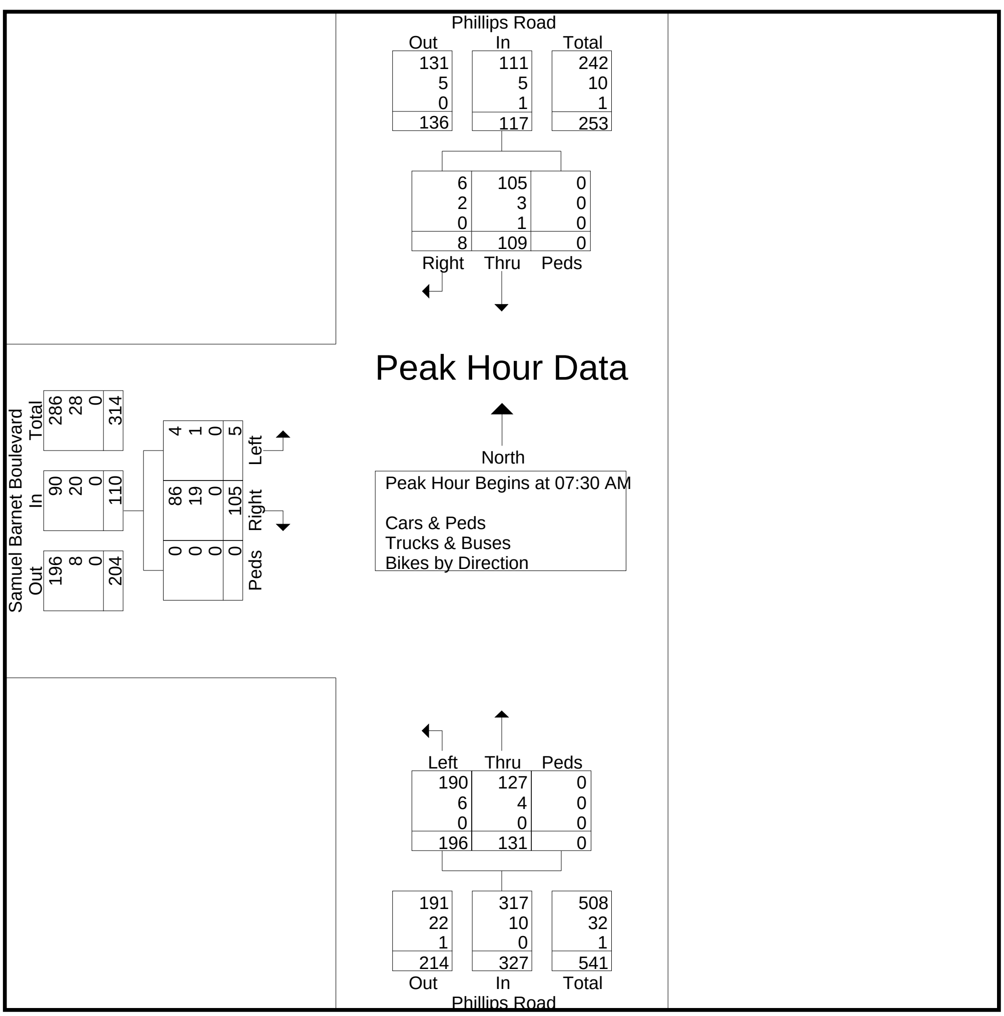
File Name : 05063F
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:30 AM													
07:30 AM	**3**	24	0	27	25	50	0	75	17	**2**	0	19	121
07:45 AM	1	27	0	28	34	**75**	0	**109**	32	1	0	33	**170**
08:00 AM	1	24	0	25	29	34	0	63	**44**	2	0	**46**	134
08:15 AM	3	**34**	0	**37**	**43**	37	0	80	12	0	0	12	129
Total Volume	8	109	0	117	131	196	0	327	105	5	0	110	554
% App. Total	6.8	93.2	0		40.1	59.9	0		95.5	4.5	0		
PHF	.667	.801	.000	.791	.762	.653	.000	.750	.597	.625	.000	.598	.815
Cars & Peds	6	105	0	111	127	190	0	317	86	4	0	90	518
% Cars & Peds	75.0	96.3	0	94.9	96.9	96.9	0	96.9	81.9	80.0	0	81.8	93.5
Trucks & Buses	2	3	0	5	4	6	0	10	19	1	0	20	35
% Trucks & Buses	25.0	2.8	0	4.3	3.1	3.1	0	3.1	18.1	20.0	0	18.2	6.3
Bikes by Direction	0	1	0	1	0	0	0	0	0	0	0	0	1
% Bikes by Direction	0	0.9	0	0.9	0	0	0	0	0	0	0	0	0.2



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File Name : 05063FF
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
03:00 PM	0	98	0	41	31	0	87	15	0	272
03:15 PM	3	38	0	42	39	0	34	8	0	164
03:30 PM	1	62	0	38	22	0	114	7	0	244
03:45 PM	1	43	0	37	24	0	38	4	0	147
Total	5	241	0	158	116	0	273	34	0	827
04:00 PM	2	77	0	35	16	0	128	1	0	259
04:15 PM	0	58	0	50	7	0	31	0	0	146
04:30 PM	0	55	0	34	11	0	46	5	0	151
04:45 PM	0	50	0	26	14	0	36	2	0	128
Total	2	240	0	145	48	0	241	8	0	684
05:00 PM	1	68	0	40	7	0	112	22	0	250
05:15 PM	2	48	0	38	11	0	38	1	0	138
05:30 PM	0	40	0	19	9	0	40	0	0	108
05:45 PM	1	38	0	25	11	0	32	0	0	107
Total	4	194	0	122	38	0	222	23	0	603
Grand Total	11	675	0	425	202	0	736	65	0	2114
Apprch %	1.6	98.4	0	67.8	32.2	0	91.9	8.1	0	
Total %	0.5	31.9	0	20.1	9.6	0	34.8	3.1	0	
Cars & Peds	8	661	0	417	177	0	726	62	0	2051
% Cars & Peds	72.7	97.9	0	98.1	87.6	0	98.6	95.4	0	97
Trucks & Buses	3	13	0	8	25	0	10	3	0	62
% Trucks & Buses	27.3	1.9	0	1.9	12.4	0	1.4	4.6	0	2.9
Bikes by Direction	0	1	0	0	0	0	0	0	0	1
% Bikes by Direction	0	0.1	0	0	0	0	0	0	0	0

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	**98**	0	**98**	41	31	0	72	87	**15**	0	102	**272**
03:15 PM	**3**	38	0	41	**42**	**39**	0	**81**	34	8	0	42	164
03:30 PM	1	62	0	63	38	22	0	60	**114**	7	0	**121**	244
03:45 PM	1	43	0	44	37	24	0	61	38	4	0	42	147
Total Volume	5	241	0	246	158	116	0	274	273	34	0	307	827
% App. Total	2	98	0		57.7	42.3	0		88.9	11.1	0		
PHF	.417	.615	.000	.628	.940	.744	.000	.846	.599	.567	.000	.634	.760
Cars & Peds	4	236	0	240	151	103	0	254	269	32	0	301	795
% Cars & Peds	80.0	97.9	0	97.6	95.6	88.8	0	92.7	98.5	94.1	0	98.0	96.1
Trucks & Buses	1	5	0	6	7	13	0	20	4	2	0	6	32
% Trucks & Buses	20.0	2.1	0	2.4	4.4	11.2	0	7.3	1.5	5.9	0	2.0	3.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

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File Name : 05063FF
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
03:00 PM	0	96	0	41	29	0	86	15	0	267
03:15 PM	2	37	0	39	32	0	34	7	0	151
03:30 PM	1	60	0	35	21	0	114	6	0	237
03:45 PM	1	43	0	36	21	0	35	4	0	140
Total	4	236	0	151	103	0	269	32	0	795
04:00 PM	1	75	0	35	13	0	127	1	0	252
04:15 PM	0	56	0	50	6	0	30	0	0	142
04:30 PM	0	54	0	34	8	0	45	5	0	146
04:45 PM	0	49	0	26	13	0	34	1	0	123
Total	1	234	0	145	40	0	236	7	0	663
05:00 PM	1	67	0	40	6	0	112	22	0	248
05:15 PM	1	48	0	38	10	0	38	1	0	136
05:30 PM	0	39	0	19	8	0	40	0	0	106
05:45 PM	1	37	0	24	10	0	31	0	0	103
Total	3	191	0	121	34	0	221	23	0	593
Grand Total	8	661	0	417	177	0	726	62	0	2051
Apprch %	1.2	98.8	0	70.2	29.8	0	92.1	7.9	0	
Total %	0.4	32.2	0	20.3	8.6	0	35.4	3	0	

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	**96**	0	**96**	**41**	29	0	70	86	**15**	0	101	**267**
03:15 PM	**2**	37	0	39	39	**32**	0	**71**	34	7	0	41	151
03:30 PM	1	60	0	61	35	21	0	56	**114**	6	0	**120**	237
03:45 PM	1	43	0	44	36	21	0	57	35	4	0	39	140
Total Volume	4	236	0	240	151	103	0	254	269	32	0	301	795
% App. Total	1.7	98.3	0		59.4	40.6	0		89.4	10.6	0		
PHF	.500	.615	.000	.625	.921	.805	.000	.894	.590	.533	.000	.627	.744

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N/S: Phillips Road
W: Samuel Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063FF
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
03:00 PM	0	2	0	0	2	0	1	0	0	5
03:15 PM	1	1	0	3	7	0	0	1	0	13
03:30 PM	0	2	0	3	1	0	0	1	0	7
03:45 PM	0	0	0	1	3	0	3	0	0	7
Total	1	5	0	7	13	0	4	2	0	32
04:00 PM	1	2	0	0	3	0	1	0	0	7
04:15 PM	0	1	0	0	1	0	1	0	0	3
04:30 PM	0	1	0	0	3	0	1	0	0	5
04:45 PM	0	1	0	0	1	0	2	1	0	5
Total	1	5	0	0	8	0	5	1	0	20
05:00 PM	0	1	0	0	1	0	0	0	0	2
05:15 PM	1	0	0	0	1	0	0	0	0	2
05:30 PM	0	1	0	0	1	0	0	0	0	2
05:45 PM	0	1	0	1	1	0	1	0	0	4
Total	1	3	0	1	4	0	1	0	0	10
Grand Total	3	13	0	8	25	0	10	3	0	62
Apprch %	18.8	81.2	0	24.2	75.8	0	76.9	23.1	0	
Total %	4.8	21	0	12.9	40.3	0	16.1	4.8	0	

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	**1**	1	0	2	**3**	**7**	0	**10**	0	**1**	0	1	**13**
03:30 PM	0	**2**	0	2	3	1	0	4	0	1	0	1	7
03:45 PM	0	0	0	0	1	3	0	4	**3**	0	0	**3**	7
04:00 PM	1	2	0	**3**	0	3	0	3	1	0	0	1	7
Total Volume	2	5	0	7	7	14	0	21	4	2	0	6	34
% App. Total	28.6	71.4	0		33.3	66.7	0		66.7	33.3	0		
PHF	.500	.625	.000	.583	.583	.500	.000	.525	.333	.500	.000	.500	.654

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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063FF
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Phillips Road From North			Phillips Road From South			Samuel Barnet Boulevard From West			
Start Time	Right	Thru	Peds	Thru	Left	Peds	Right	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	0	0	0	0	0	0	1
Apprch %	0	100	0	0	0	0	0	0	0	
Total %	0	100	0	0	0	0	0	0	0	

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:30 PM													
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

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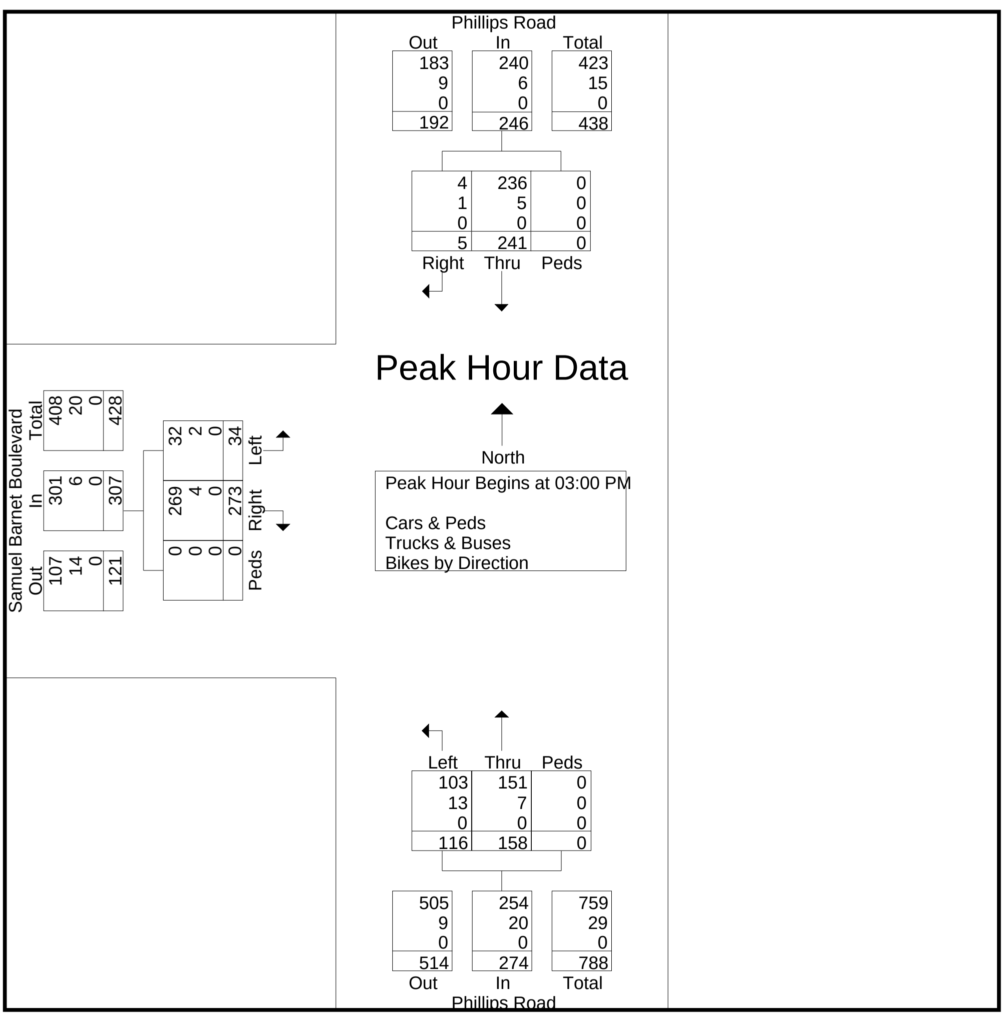
Client: McM/S. Hawkins

File Name : 05063FF
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Phillips Road From North				Phillips Road From South				Samuel Barnet Boulevard From West				
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	**98**	0	**98**	41	31	0	72	87	**15**	0	102	**272**
03:15 PM	**3**	38	0	41	**42**	**39**	0	**81**	34	8	0	42	164
03:30 PM	1	62	0	63	38	22	0	60	**114**	7	0	**121**	244
03:45 PM	1	43	0	44	37	24	0	61	38	4	0	42	147
Total Volume	5	241	0	246	158	116	0	274	273	34	0	307	827
% App. Total	2	98	0		57.7	42.3	0		88.9	11.1	0		
PHF	.417	.615	.000	.628	.940	.744	.000	.846	.599	.567	.000	.634	.760
Cars & Peds	4	236	0	240	151	103	0	254	269	32	0	301	795
% Cars & Peds	80.0	97.9	0	97.6	95.6	88.8	0	92.7	98.5	94.1	0	98.0	96.1
Trucks & Buses	1	5	0	6	7	13	0	20	4	2	0	6	32
% Trucks & Buses	20.0	2.1	0	2.4	4.4	11.2	0	7.3	1.5	5.9	0	2.0	3.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



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N: Duchaine Boulevard
E/W: #100 Site Drive (Exit/Enter Only)
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063G
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	19	0	0	12	0	0	0	0	0	31
07:15 AM	30	0	0	12	0	0	0	0	0	42
07:30 AM	11	0	0	13	0	0	0	0	0	24
07:45 AM	7	0	0	27	0	0	0	0	0	34
Total	67	0	0	64	0	0	0	0	0	131
08:00 AM	15	0	0	17	0	0	0	0	0	32
08:15 AM	12	0	0	9	0	0	0	0	0	21
08:30 AM	9	0	0	12	0	0	0	0	0	21
08:45 AM	9	0	0	14	0	0	0	0	0	23
Total	45	0	0	52	0	0	0	0	0	97
Grand Total	112	0	0	116	0	0	0	0	0	228
Apprch %	100	0	0	100	0	0	0	0	0	
Total %	49.1	0	0	50.9	0	0	0	0	0	
Cars & Peds	103	0	0	82	0	0	0	0	0	185
% Cars & Peds	92	0	0	70.7	0	0	0	0	0	81.1
Trucks & Buses	9	0	0	34	0	0	0	0	0	43
% Trucks & Buses	8	0	0	29.3	0	0	0	0	0	18.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	**30**	0	0	**30**	12	0	0	12	0	0	0	0	**42**
07:30 AM	11	0	0	11	13	0	0	13	0	0	0	0	24
07:45 AM	7	0	0	7	**27**	0	0	**27**	0	0	0	0	34
08:00 AM	15	0	0	15	17	0	0	17	0	0	0	0	32
Total Volume	63	0	0	63	69	0	0	69	0	0	0	0	132
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.525	.000	.000	.525	.639	.000	.000	.639	.000	.000	.000	.000	.786
Cars & Peds	59	0	0	59	43	0	0	43	0	0	0	0	102
% Cars & Peds	93.7	0	0	93.7	62.3	0	0	62.3	0	0	0	0	77.3
Trucks & Buses	4	0	0	4	26	0	0	26	0	0	0	0	30
% Trucks & Buses	6.3	0	0	6.3	37.7	0	0	37.7	0	0	0	0	22.7
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

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N: Duchaine Boulevard
E/W: #100 Site Drive (Exit/Enter Only)
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063G
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Cars & Peds

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	19	0	0	10	0	0	0	0	0	29
07:15 AM	30	0	0	5	0	0	0	0	0	35
07:30 AM	9	0	0	8	0	0	0	0	0	17
07:45 AM	7	0	0	17	0	0	0	0	0	24
Total	65	0	0	40	0	0	0	0	0	105
08:00 AM	13	0	0	13	0	0	0	0	0	26
08:15 AM	11	0	0	7	0	0	0	0	0	18
08:30 AM	6	0	0	12	0	0	0	0	0	18
08:45 AM	8	0	0	10	0	0	0	0	0	18
Total	38	0	0	42	0	0	0	0	0	80
Grand Total	103	0	0	82	0	0	0	0	0	185
Apprch %	100	0	0	100	0	0	0	0	0	
Total %	55.7	0	0	44.3	0	0	0	0	0	

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	19	0	0	19	10	0	0	10	0	0	0	0	29
07:15 AM	**30**	0	0	**30**	5	0	0	5	0	0	0	0	**35**
07:30 AM	9	0	0	9	8	0	0	8	0	0	0	0	17
07:45 AM	7	0	0	7	**17**	0	0	**17**	0	0	0	0	24
Total Volume	65	0	0	65	40	0	0	40	0	0	0	0	105
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.542	.000	.000	.542	.588	.000	.000	.588	.000	.000	.000	.000	.750

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File Name : 05063G
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Trucks & Buses

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	2	0	0	0	0	0	2
07:15 AM	0	0	0	7	0	0	0	0	0	7
07:30 AM	2	0	0	5	0	0	0	0	0	7
07:45 AM	0	0	0	10	0	0	0	0	0	10
Total	2	0	0	24	0	0	0	0	0	26
08:00 AM	2	0	0	4	0	0	0	0	0	6
08:15 AM	1	0	0	2	0	0	0	0	0	3
08:30 AM	3	0	0	0	0	0	0	0	0	3
08:45 AM	1	0	0	4	0	0	0	0	0	5
Total	7	0	0	10	0	0	0	0	0	17
Grand Total	9	0	0	34	0	0	0	0	0	43
Apprch %	100	0	0	100	0	0	0	0	0	
Total %	20.9	0	0	79.1	0	0	0	0	0	

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	0	0	0	0	7	0	0	7	0	0	0	0	7
07:30 AM	**2**	0	0	**2**	5	0	0	5	0	0	0	0	7
07:45 AM	0	0	0	0	**10**	0	0	**10**	0	0	0	0	**10**
08:00 AM	2	0	0	2	4	0	0	4	0	0	0	0	6
Total Volume	4	0	0	4	26	0	0	26	0	0	0	0	30
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.500	.000	.000	.500	.650	.000	.000	.650	.000	.000	.000	.000	.750

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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063G
Site Code : Y1821511
Start Date : 6/13/2018

Groups Printed- Bikes by Direction

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:00 AM													
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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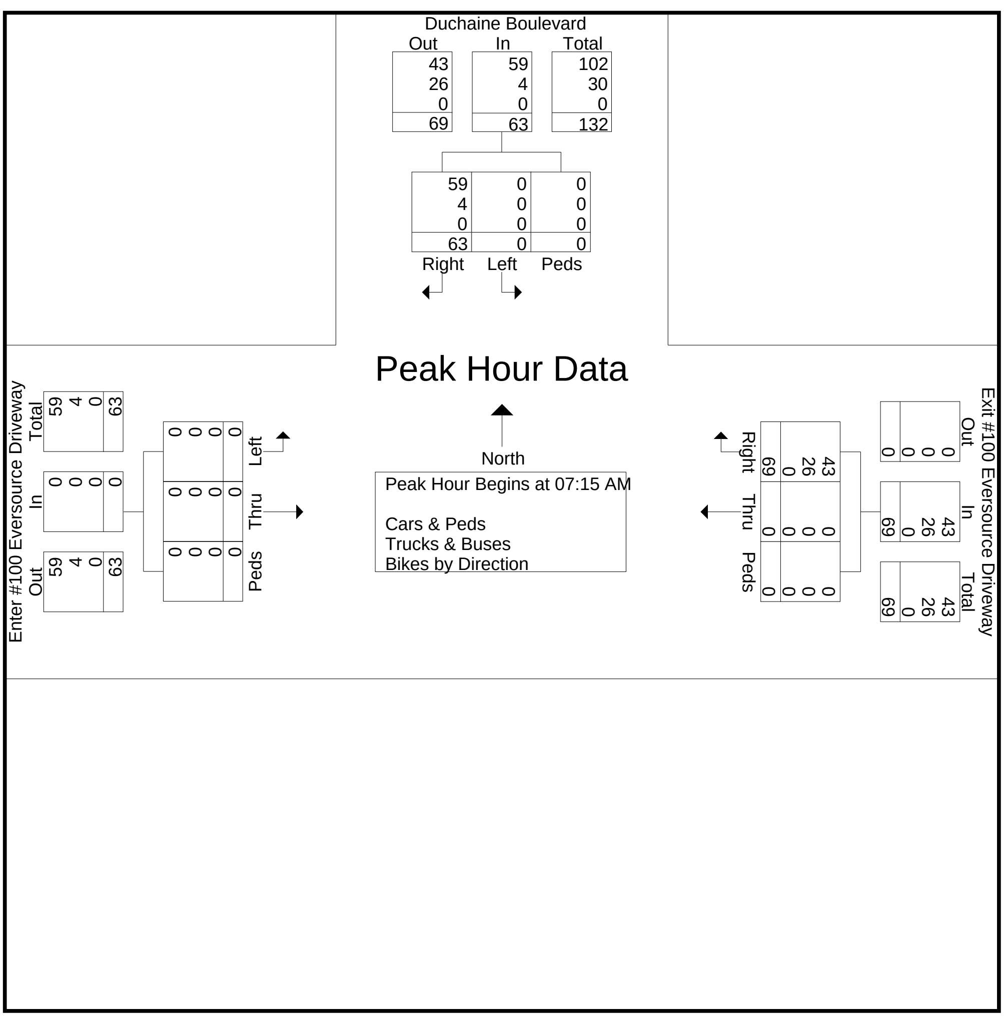
File Name : 05063G
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	**30**	0	0	**30**	12	0	0	12	0	0	0	0	**42**
07:30 AM	11	0	0	11	13	0	0	13	0	0	0	0	24
07:45 AM	7	0	0	7	**27**	0	0	**27**	0	0	0	0	34
08:00 AM	15	0	0	15	17	0	0	17	0	0	0	0	32
Total Volume	63	0	0	63	69	0	0	69	0	0	0	0	132
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.525	.000	.000	.525	.639	.000	.000	.639	.000	.000	.000	.000	.786
Cars & Peds	59	0	0	59	43	0	0	43	0	0	0	0	102
% Cars & Peds	93.7	0	0	93.7	62.3	0	0	62.3	0	0	0	0	77.3
Trucks & Buses	4	0	0	4	26	0	0	26	0	0	0	0	30
% Trucks & Buses	6.3	0	0	6.3	37.7	0	0	37.7	0	0	0	0	22.7
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



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City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063GG
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds - Trucks & Buses - Bikes by Direction

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	10	0	0	7	0	0	0	0	0	17
03:15 PM	15	0	0	20	0	0	0	0	0	35
03:30 PM	6	0	0	22	0	0	0	0	0	28
03:45 PM	7	0	0	16	0	0	0	0	0	23
Total	38	0	0	65	0	0	0	0	0	103
04:00 PM	8	0	1	23	0	0	0	0	0	32
04:15 PM	4	0	0	9	0	0	0	0	0	13
04:30 PM	7	0	0	8	0	0	0	0	0	15
04:45 PM	7	0	1	22	0	0	0	0	0	30
Total	26	0	2	62	0	0	0	0	0	90
05:00 PM	2	0	0	7	0	0	0	0	0	9
05:15 PM	3	0	0	2	0	0	0	0	0	5
05:30 PM	2	0	0	3	0	0	0	0	0	5
05:45 PM	3	0	0	3	0	0	0	0	0	6
Total	10	0	0	15	0	0	0	0	0	25
Grand Total	74	0	2	142	0	0	0	0	0	218
Apprch %	97.4	0	2.6	100	0	0	0	0	0	
Total %	33.9	0	0.9	65.1	0	0	0	0	0	
Cars & Peds	63	0	2	134	0	0	0	0	0	199
% Cars & Peds	85.1	0	100	94.4	0	0	0	0	0	91.3
Trucks & Buses	11	0	0	8	0	0	0	0	0	19
% Trucks & Buses	14.9	0	0	5.6	0	0	0	0	0	8.7
Bikes by Direction	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	**15**	0	0	**15**	20	0	0	20	0	0	0	0	**35**
03:30 PM	6	0	0	6	22	0	0	22	0	0	0	0	28
03:45 PM	7	0	0	7	16	0	0	16	0	0	0	0	23
04:00 PM	8	0	**1**	9	**23**	0	0	**23**	0	0	0	0	32
Total Volume	36	0	1	37	81	0	0	81	0	0	0	0	118
% App. Total	97.3	0	2.7		100	0	0		0	0	0		
PHF	.600	.000	.250	.617	.880	.000	.000	.880	.000	.000	.000	.000	.843
Cars & Peds	32	0	1	33	78	0	0	78	0	0	0	0	111
% Cars & Peds	88.9	0	100	89.2	96.3	0	0	96.3	0	0	0	0	94.1
Trucks & Buses	4	0	0	4	3	0	0	3	0	0	0	0	7
% Trucks & Buses	11.1	0	0	10.8	3.7	0	0	3.7	0	0	0	0	5.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

N: Duchaine Boulevard
E/W: #100 Site Drive (Exit/Enter Only)
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063GG
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Cars & Peds

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	9	0	0	7	0	0	0	0	0	16
03:15 PM	15	0	0	19	0	0	0	0	0	34
03:30 PM	5	0	0	22	0	0	0	0	0	27
03:45 PM	6	0	0	14	0	0	0	0	0	20
Total	35	0	0	62	0	0	0	0	0	97
04:00 PM	6	0	1	23	0	0	0	0	0	30
04:15 PM	3	0	0	8	0	0	0	0	0	11
04:30 PM	5	0	0	7	0	0	0	0	0	12
04:45 PM	7	0	1	20	0	0	0	0	0	28
Total	21	0	2	58	0	0	0	0	0	81
05:00 PM	1	0	0	7	0	0	0	0	0	8
05:15 PM	3	0	0	2	0	0	0	0	0	5
05:30 PM	1	0	0	3	0	0	0	0	0	4
05:45 PM	2	0	0	2	0	0	0	0	0	4
Total	7	0	0	14	0	0	0	0	0	21
Grand Total	63	0	2	134	0	0	0	0	0	199
Apprch %	96.9	0	3.1	100	0	0	0	0	0	
Total %	31.7	0	1	67.3	0	0	0	0	0	

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	**15**	0	0	**15**	19	0	0	19	0	0	0	0	**34**
03:30 PM	5	0	0	5	22	0	0	22	0	0	0	0	27
03:45 PM	6	0	0	6	14	0	0	14	0	0	0	0	20
04:00 PM	6	0	**1**	7	**23**	0	0	**23**	0	0	0	0	30
Total Volume	32	0	1	33	78	0	0	78	0	0	0	0	111
% App. Total	97	0	3		100	0	0		0	0	0		
PHF	.533	.000	.250	.550	.848	.000	.000	.848	.000	.000	.000	.000	.816

Transportation Data Corporation
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N: Duchaine Boulevard
E/W: #100 Site Drive (Exit/Enter Only)
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063GG
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Trucks & Buses

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	1	0	0	0	0	0	0	0	0	1
03:15 PM	0	0	0	1	0	0	0	0	0	1
03:30 PM	1	0	0	0	0	0	0	0	0	1
03:45 PM	1	0	0	2	0	0	0	0	0	3
Total	3	0	0	3	0	0	0	0	0	6
04:00 PM	2	0	0	0	0	0	0	0	0	2
04:15 PM	1	0	0	1	0	0	0	0	0	2
04:30 PM	2	0	0	1	0	0	0	0	0	3
04:45 PM	0	0	0	2	0	0	0	0	0	2
Total	5	0	0	4	0	0	0	0	0	9
05:00 PM	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	1	0	0	0	0	0	0	0	0	1
05:45 PM	1	0	0	1	0	0	0	0	0	2
Total	3	0	0	1	0	0	0	0	0	4
Grand Total	11	0	0	8	0	0	0	0	0	19
Apprch %	100	0	0	100	0	0	0	0	0	
Total %	57.9	0	0	42.1	0	0	0	0	0	

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:45 PM													
03:45 PM	1	0	0	1	**2**	0	0	**2**	0	0	0	0	**3**
04:00 PM	**2**	0	0	**2**	0	0	0	0	0	0	0	0	2
04:15 PM	1	0	0	1	1	0	0	1	0	0	0	0	2
04:30 PM	2	0	0	2	1	0	0	1	0	0	0	0	3
Total Volume	6	0	0	6	4	0	0	4	0	0	0	0	10
% App. Total	100	0	0		100	0	0		0	0	0		
PHF	.750	.000	.000	.750	.500	.000	.000	.500	.000	.000	.000	.000	.833

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N: Duchaine Boulevard
E/W: #100 Site Drive (Exit/Enter Only)
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063GG
Site Code : Y1821511
Start Date : 6/13/2018
Page No : 1

Groups Printed- Bikes by Direction

	Duchaine Boulevard From North			Exit #100 Eversource Driveway From East			Enter #100 Eversource Driveway From West			
Start Time	Right	Left	Peds	Right	Thru	Peds	Thru	Left	Peds	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	
Total %										

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

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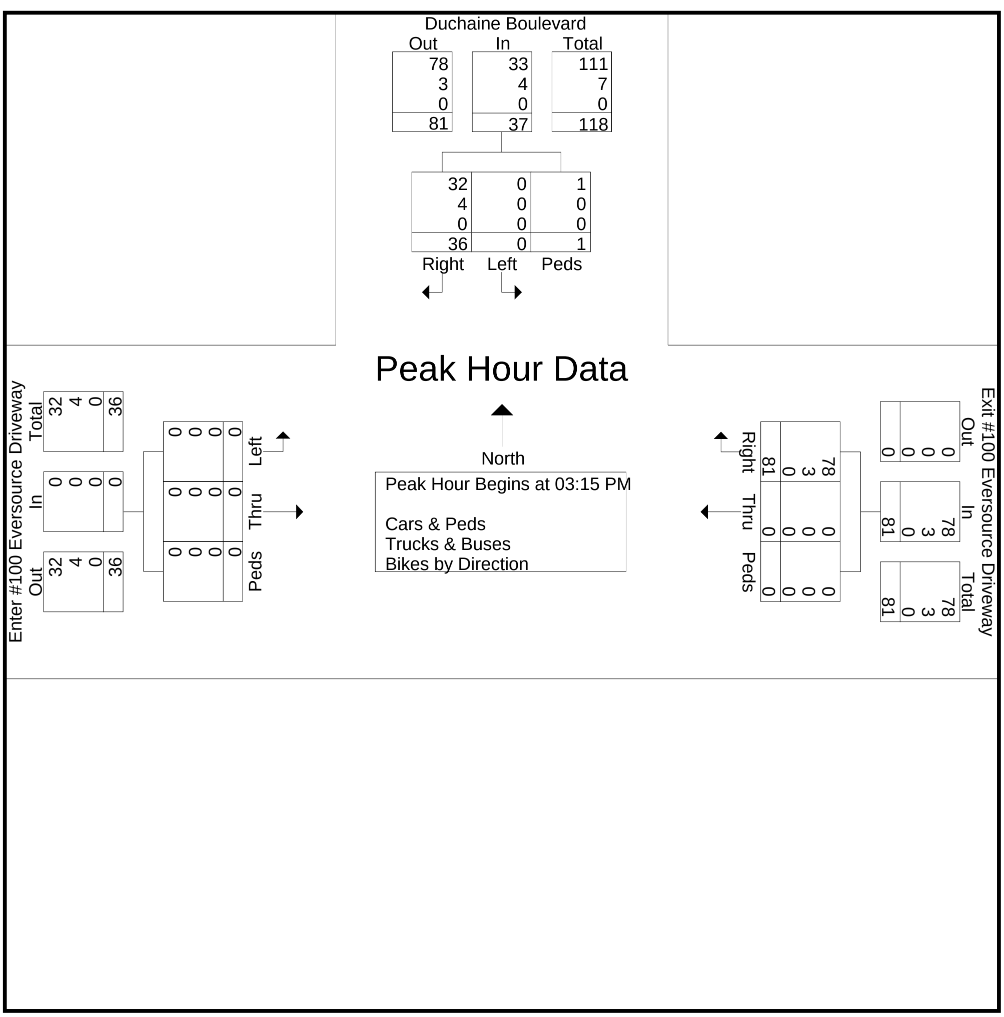
N: Duchaine Boulevard
E/W: #100 Site Drive (Exit/Enter Only)
City, State: New Bedford, MA
Client: McM/S. Hawkins

File Name : 05063GG
Site Code : Y1821511
Start Date : 6/13/2018

	Duchaine Boulevard From North				Exit #100 Eversource Driveway From East				Enter #100 Eversource Driveway From West				
Start Time	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:15 PM													
03:15 PM	**15**	0	0	**15**	20	0	0	20	0	0	0	0	**35**
03:30 PM	6	0	0	6	22	0	0	22	0	0	0	0	28
03:45 PM	7	0	0	7	16	0	0	16	0	0	0	0	23
04:00 PM	8	0	**1**	9	**23**	0	0	**23**	0	0	0	0	32
Total Volume	36	0	1	37	81	0	0	81	0	0	0	0	118
% App. Total	97.3	0	2.7		100	0	0		0	0	0		
PHF	.600	.000	.250	.617	.880	.000	.000	.880	.000	.000	.000	.000	.843
Cars & Peds	32	0	1	33	78	0	0	78	0	0	0	0	111
% Cars & Peds	88.9	0	100	89.2	96.3	0	0	96.3	0	0	0	0	94.1
Trucks & Buses	4	0	0	4	3	0	0	3	0	0	0	0	7
% Trucks & Buses	11.1	0	0	10.8	3.7	0	0	3.7	0	0	0	0	5.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



APPENDIX B

Automatic Traffic Recorder Data

Transportation Data Corporation
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tel (781) 587-0086 cell (781) 439-4999

Duchaine Boulevard north of
U-turn, north of Sam Barnet Boulevard
City, State: New Bedford, MA
Client: McM/S. Hawkins

05063Avolume
Site Code: Y-18215.11

Start	13-Jun-18	NB		SB		Combined		14-Jun	NB		SB		Combined	
Time	Wed	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	Thu	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00		16	57	4	41	20	98		16	69	1	50	17	119
12:15		2	29	0	48	2	77		2	46	3	49	5	95
12:30		0	38	2	44	2	82		0	30	0	31	0	61
12:45		4	44	0	47	4	91		1	34	0	64	1	98
01:00		2	39	1	37	3	76		1	43	1	46	2	89
01:15		1	22	0	27	1	49		1	37	0	36	1	73
01:30		1	26	2	59	3	85		3	35	3	29	6	64
01:45		2	44	2	25	4	69		1	33	0	54	1	87
02:00		1	30	0	48	1	78		6	40	1	37	7	77
02:15		4	46	2	35	6	81		1	36	0	27	1	63
02:30		1	34	3	43	4	77		1	39	2	39	3	78
02:45		4	30	2	51	6	81		0	25	2	40	2	65
03:00		3	66	1	29	4	95		1	56	2	36	3	92
03:15		1	54	8	31	9	85		6	40	5	25	11	65
03:30		2	51	2	31	4	82		5	42	5	37	10	79
03:45		9	31	7	30	16	61		13	40	3	28	16	68
04:00		9	75	2	16	11	91		3	77	6	25	9	102
04:15		10	36	5	12	15	48		8	36	5	20	13	56
04:30		2	44	16	19	18	63		6	43	14	23	20	66
04:45		14	42	25	16	39	58		5	39	27	20	32	59
05:00		23	49	12	13	35	62		26	59	20	13	46	72
05:15		10	29	10	16	20	45		17	34	23	13	40	47
05:30		19	29	35	12	54	41		8	31	30	21	38	52
05:45		11	16	31	13	42	29		19	19	36	27	55	46
06:00		9	16	17	13	26	29		5	24	18	9	23	33
06:15		16	17	35	4	51	21		9	16	27	8	36	24
06:30		28	8	59	5	87	13		24	18	57	7	81	25
06:45		24	13	84	10	108	23		25	6	92	15	117	21
07:00		44	9	55	8	99	17		32	9	54	10	86	19
07:15		23	5	48	15	71	20		19	17	46	12	65	29
07:30		27	14	95	5	122	19		16	8	68	7	84	15
07:45		42	9	71	10	113	19		34	10	93	7	127	17
08:00		27	5	67	2	94	7		19	6	60	2	79	8
08:15		16	3	57	0	73	3		23	3	54	7	77	10
08:30		15	2	31	5	46	7		15	10	55	6	70	16
08:45		41	2	51	4	92	6		49	4	34	5	83	9
09:00		32	1	39	2	71	3		30	2	37	6	67	8
09:15		17	3	27	3	44	6		27	4	22	2	49	6
09:30		32	6	28	6	60	12		26	10	32	5	58	15
09:45		27	12	25	4	52	16		25	2	30	7	55	9
10:00		35	19	28	4	63	23		34	4	24	1	58	5
10:15		28	3	38	6	66	9		22	4	25	6	47	10
10:30		31	10	25	14	56	24		13	7	31	19	44	26
10:45		19	10	30	22	49	32		26	8	31	18	57	26
11:00		43	24	37	9	80	33		42	25	29	14	71	39
11:15		27	6	35	1	62	7		28	2	35	0	63	2
11:30		49	3	35	2	84	5		24	1	20	6	44	7
11:45		42	4	44	3	86	7		48	6	43	5	91	11
Total		845	1165	1233	900	2078	2065		765	1189	1206	974	1971	2163
Day Total		2010		2133		4143			1954		2180		4134	
% Total		20.4%	28.1%	29.8%	21.7%				18.5%	28.8%	29.2%	23.6%		
Peak	-	11:00	03:15	07:30	12:00	07:00	12:00	-	11:00	03:15	07:30	12:00	07:30	12:00
Vol.	-	161	211	290	180	405	348	-	142	199	275	194	367	373
P.H.F.		0.821	0.703	0.763	0.938	0.830	0.888		0.740	0.646	0.739	0.758	0.722	0.784

ADT	ADT 4,138	AADT 4,138

Transportation Data Corporation
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Duchaine Boulevard north of
U-turn, north of Sam Barnet Boulevard
City, State: New Bedford, MA
Client: McM / S. Hawkins

05063Avolume
Site Code: Y-18215.11

Start	13-Jun-18	NB		Hour Totals		SB		Hour Totals		Combined Totals	
Time	Wed	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		16	57			4	41				
12:15		2	29			0	48				
12:30		0	38			2	44				
12:45		4	44	22	168	0	47	6	180	28	348
01:00		2	39			1	37				
01:15		1	22			0	27				
01:30		1	26			2	59				
01:45		2	44	6	131	2	25	5	148	11	279
02:00		1	30			0	48				
02:15		4	46			2	35				
02:30		1	34			3	43				
02:45		4	30	10	140	2	51	7	177	17	317
03:00		3	66			1	29				
03:15		1	54			8	31				
03:30		2	51			2	31				
03:45		9	31	15	202	7	30	18	121	33	323
04:00		9	75			2	16				
04:15		10	36			5	12				
04:30		2	44			16	19				
04:45		14	42	35	197	25	16	48	63	83	260
05:00		23	49			12	13				
05:15		10	29			10	16				
05:30		19	29			35	12				
05:45		11	16	63	123	31	13	88	54	151	177
06:00		9	16			17	13				
06:15		16	17			35	4				
06:30		28	8			59	5				
06:45		24	13	77	54	84	10	195	32	272	86
07:00		44	9			55	8				
07:15		23	5			48	15				
07:30		27	14			95	5				
07:45		42	9	136	37	71	10	269	38	405	75
08:00		27	5			67	2				
08:15		16	3			57	0				
08:30		15	2			31	5				
08:45		41	2	99	12	51	4	206	11	305	23
09:00		32	1			39	2				
09:15		17	3			27	3				
09:30		32	6			28	6				
09:45		27	12	108	22	25	4	119	15	227	37
10:00		35	19			28	4				
10:15		28	3			38	6				
10:30		31	10			25	14				
10:45		19	10	113	42	30	22	121	46	234	88
11:00		43	24			37	9				
11:15		27	6			35	1				
11:30		49	3			35	2				
11:45		42	4	161	37	44	3	151	15	312	52
Total		845	1165			1233	900			2078	2065
Combined Total		2010				2133				4143	
Percentage	0.0%										

Transportation Data Corporation
Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

Duchaine Boulevard north of
U-turn, north of Sam Barnet Boulevard
City, State: New Bedford, MA
Client: McM / S. Hawkins

05063Avolume
Site Code: Y-18215.11

Start Time	14-Jun-18 Thu	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		16	69			1	50				
12:15		2	46			3	49				
12:30		0	30			0	31				
12:45		1	34	19	179	0	64	4	194	23	373
01:00		1	43			1	46				
01:15		1	37			0	36				
01:30		3	35			3	29				
01:45		1	33	6	148	0	54	4	165	10	313
02:00		6	40			1	37				
02:15		1	36			0	27				
02:30		1	39			2	39				
02:45		0	25	8	140	2	40	5	143	13	283
03:00		1	56			2	36				
03:15		6	40			5	25				
03:30		5	42			5	37				
03:45		13	40	25	178	3	28	15	126	40	304
04:00		3	77			6	25				
04:15		8	36			5	20				
04:30		6	43			14	23				
04:45		5	39	22	195	27	20	52	88	74	283
05:00		26	59			20	13				
05:15		17	34			23	13				
05:30		8	31			30	21				
05:45		19	19	70	143	36	27	109	74	179	217
06:00		5	24			18	9				
06:15		9	16			27	8				
06:30		24	18			57	7				
06:45		25	6	63	64	92	15	194	39	257	103
07:00		32	9			54	10				
07:15		19	17			46	12				
07:30		16	8			68	7				
07:45		34	10	101	44	93	7	261	36	362	80
08:00		19	6			60	2				
08:15		23	3			54	7				
08:30		15	10			55	6				
08:45		49	4	106	23	34	5	203	20	309	43
09:00		30	2			37	6				
09:15		27	4			22	2				
09:30		26	10			32	5				
09:45		25	2	108	18	30	7	121	20	229	38
10:00		34	4			24	1				
10:15		22	4			25	6				
10:30		13	7			31	19				
10:45		26	8	95	23	31	18	111	44	206	67
11:00		42	25			29	14				
11:15		28	2			35	0				
11:30		24	1			20	6				
11:45		48	6	142	34	43	5	127	25	269	59
Total		765	1189			1206	974			1971	2163
Combined Total		1954				2180				4134	
Percentage	0.0%										
Total		1610	2354			2439	1874			4049	4228
Percent		40.6%	59.4%			56.5%	43.5%			48.9%	51.1%
ADT		ADT 4,138		AADT 4,138							

APPENDIX C

Crash Summary

	Route 140 NB on/off-ramp at Braley Road	Route 140 SB on/off-ramp at Braley Road	Braley Road/ Theodore Rice Blvd/ at Phillips Road	Theodore Rice Blvd at Duchaine Blvd	Duchaine Blvd at Samuel Barnet Blvd	Phillips Road at Samuel Barnet Blvd
2011	2	3	4	2	1	0
2012	3	1	1	1	0	0
2013	5	0	4	5	2	0
2014	0	0	4	3	0	1
2015	3	1	4	0	0	2
Total	13	5	17	11	3	3
Type						
Angle	3	1	4	3	0	1
Rear-end	4	0	3	0	0	1
Head-on	0	0	2	0	0	1
Sideswipe	0	0	2	0	0	0
Bicycle	1	0	0	0	0	0
Pedestrian	1	0	0	1	0	0
Single Vehicle	4	4	6	7	3	0
Total	13	5	17	11	3	3
Severity						
Property Damage	5	4	10	6	3	1
Personal Injury	7	1	7	3	0	2
Fatality	0	0	0	1	0	0
Other	1	0	0	1	0	0
Total	13	5	17	11	3	3
Weather						
Clear	9	4	11	6	3	3
Cloudy	1	0	2	0	0	0
Rain	1	1	3	3	0	0
Snow	1	0	0	1	0	0
Ice	0	0	0	0	0	0
Sleet	0	0	1	1	0	0
Fog	0	0	0	0	0	0
Unknown	1	0	0	0	0	0
Total	13	5	17	11	3	3
Time						
7:00 AM to 9:00 AM	1	0	4	3	0	0
9:00 AM to 4:00 PM	6	2	5	2	0	1
4:00 PM to 6:00 PM	1	2	6	1	2	0
6:00 PM to 7:00 AM	5	1	2	5	1	2
Total	13	5	17	11	3	3
Crash Rate	0.43	0.15	0.59	1.12	0.15	0.18
Statewide Average	0.57	0.57	0.57	0.57	0.57	0.57
District 5 Average	0.57	0.57	0.57	0.57	0.57	0.57

Source: MassDOT

APPENDIX D

Traffic Projection Model

Transfer Station Traffic Study
Weekday Morning Peak Hour
New Bedford, MA

Intersection	Dir.	Turn	2018 Existing Volumes Counted	2018 Existing Volumes Balanced	Background Growth 7 yrs (at 1% per year)	2025 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2025 Build Volumes
Route 140 Northbound Ramps	EB	L	54	54	4	58		0	50%	20	20	78
at Braley Road		T	164	166	12	178		0		0	0	178
	WB	T	576	580	42	622		0		0	0	622
		R	62	62	4	66		0		0	0	66
	NB	L	327	327	24	351	40%	6		0	6	357
		R	330	330	24	354		0		0	0	354
Route 140 Southbound Ramps	EB	T	176	178	13	191		0	50%	20	20	211
at Braley Road		R	186	189	13	202		0	40%	15	15	217
	WB	L	414	414	30	444		0		0	0	444
		T	484	493	36	529	40%	6		0	6	535
	SB	L	42	42	3	45		0		0	0	45
		R	124	124	8	132	50%	7		0	7	139
Braley Road/	EB	L	8	8	1	9		0		0	0	9
Theodore Rice Boulevard at		T	95	95	7	102		0	90%	35	35	137
Phillips Road		R	13	13	0	13		0		0	0	13
	WB	L	116	116	8	124		0		0	0	124
		T	410	410	29	439	90%	13		0	13	452
		R	91	91	7	98		0		0	0	98
	NB	L	12	12	0	12		0		0	0	12
		T	22	22	1	23		0		0	0	23
		R	130	130	9	139		0		0	0	139
	SB	L	142	142	10	152		0		0	0	152
		T	18	18	1	19		0		0	0	19
		R	27	27	1	28		0		0	0	28
Theodore Rice Boulevard at	WB	L	312	312	23	335	90%	13		0	13	348
Duchaine Boulevard		R	90	90	7	97		0		0	0	97
	NB	T	4	4	0	4		0		0	0	4
		R	91	91	7	98		0	90%	35	35	133
	SB	L	15	15	1	16		0		0	0	16
		T	8	8	1	9						9
Duchaine Boulevard at	EB	L	52	52	4	56		0		0	0	56
Samuel Barnet Boulevard		R	60	60		60		0		0	0	60
	WB	R	204	204	15	219	10%	1		0	1	220
	NB	T	30	30		30		0	90%	35	35	65
		R	108	110		110		0	10%	4	4	114
	SB	T	52	52		52	100%	14		0	14	66
		R	391	391	28	419		0		0	0	419
Phillips Road at	EB	L	5	5		5		0		0	0	5
Samuel Barnet Boulevard		R	105	105		105		0	10%	4	4	109
	NB	L	196	196	14	210	10%	1		0	1	211
		T	131	131	9	140		0		0	0	140
	SB	T	109	109	8	117		0		0	0	117
		R	8	8	1	9		0		0	0	9
Duchaine Boulevard at	EB	L	0	0	0	0		0		0	0	0
Site Driveway	WB	R	66	66	0	66		0	100%	39	39	105
	SB	R	45	45	0	45	100%	14		0	14	59

Peak Hour: 7:30 AM - 8:30 AM

Transfer Station Traffic Study
Weekday Afternoon Peak Hour
New Bedford, MA

Intersection	Dir.	Turn	2018 Existing Volumes Counted	2018 Existing Volumes Balanced	Background Growth 7 yrs (at 1% per year)	2025 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	2025 Build Volumes
Route 140 Northbound Ramps	EB	L	90	90	6	96		0	50%	22	22	118
at Braley Road		T	229	229	17	246		0		0	0	246
	WB	T	566	566	41	607		0		0	0	607
		R	41	41	3	44		0		0	0	44
	NB	L	234	234	17	251	40%	8		0	8	259
		R	348	348	25	373		0		0	0	373
Route 140 Southbound Ramps	EB	T	270	272	20	292		0	50%	22	22	314
at Braley Road		R	416	416	30	446		0	40%	18	18	464
	WB	L	398	399	29	428		0		0	0	428
		T	399	401	29	430	40%	8		0	8	438
	SB	L	47	47	3	50		0		0	0	50
		R	94	94	7	101	50%	9		0	9	110
Braley Road/	EB	L	22	22	2	24		0		0	0	24
Theodore Rice Boulevard at		T	354	357	26	383		0	90%	40	40	423
Phillips Road		R	109	109	8	117		0		0	0	117
	WB	L	172	174	13	187		0		0	0	187
		T	157	159	11	170	90%	17		0	17	187
		R	160	162	12	174		0		0	0	174
	NB	L	18	18	1	19		0		0	0	19
		T	44	44	3	47		0		0	0	47
		R	167	169	12	181		0		0	0	181
	SB	L	161	162	12	174		0		0	0	174
		T	42	42	3	45		0		0	0	45
		R	9	9	1	10		0		0	0	10
Theodore Rice Boulevard at	WB	L	102	102	7	109	90%	17		0	17	126
Duchaine Boulevard		R	29	29	2	31		0		0	0	31
	NB	T	11	11	1	12		0		0	0	12
		R	242	242	17	259		0	90%	40	40	299
	SB	T	84	84	6	90		0		0	0	90
		L	18	18	1	19		0		0	0	19
Duchaine Boulevard at	EB	L	135	135	10	145		0		0	0	145
Samuel Barnet Boulevard		R	224	224		224		0		0	0	224
	WB	R	119	121	9	130	10%	2		0	2	132
	NB	T	23	23		23		0	90%	40	40	63
		R	310	310		310		0	10%	4	4	314
	SB	T	63	63		63	100%	19		0	19	82
		R	142	142	10	152		0		0	0	152
Phillips Road at	EB	L	34	34		34		0		0	0	34
Samuel Barnet Boulevard		R	273	276		276		0	10%	4	4	280
	NB	L	116	116	8	124	10%	2		0	2	126
		T	158	158	11	169		0		0	0	169
	SB	T	241	241	17	258		0		0	0	258
		R	5	5	1	6		0		0	0	6
Duchaine Boulevard at	EB	L	0	0	0	0		0		0	0	0
Site Driveway	WB	R	65	65	0	65		0	100%	44	44	109
	SB	R	38	38	0	38	100%	19		0	19	57

Peak Hour: 3:00 PM - 4:00 PM

APPENDIX E

Trip Generation Calculations

Truck Type	Truck Weight (tons)	No. of Trucks per day	Tons per day
MSW			
Packer	9	27	243
Rolloff Compactor	6.5	4	26
Rolloff	5.5	2	11
Transfer Trailer	28.2	38	1071
C & D (Cat 2)			
Transfer Trailer	30	5	150
Glass			
By others (in)	32	3	88
Route Trucks (in)	3.5	45	157
Outbound	32	4	157
Outbound	24	2	41
Biosolids			
Liquid	31	17	30
Cake	24	3	10
NWD Trucking			
Trucks (Note 1)		-38	
Total Trucks		112	

Note 1: NWD Trucking is currently operating at the site. This operation will leave that site as the proposed project is constructed.

Note 2: The daily distribution of truck trips delivering MSW and C&D residuals is based on the daily distribution of trucks delivering waste to Covanta in Rochester as determined from MassDEP records for 2015. The Covanta truck distribution has been adjusted slightly to account for the difference in operating hours at Covanta (5 AM to 9 PM) vs the proposed hours of operation for the Parallel Products facility (6 AM to 6 PM). All other truck trips delivering material and for the NWD trucks that currently use the site are assumed to be evenly distributed through the proposed operating hours of 6 AM to 6 PM

.

MSW/C&D Truck Deliveries

Time	No of Trucks- Covanta	Hourly distribution of trucks at Covanta %	Hourly distribution adjustment for difference in hours of operation %	No of trucks- Inbound MSW and C&D
5-6 AM	92	8		
6-7 AM	88	7	9	7
7-8 AM	70	6	8	6
8-9 AM	78	6	8	6
9-10 AM	92	8	10	7
10-11 AM	113	10	10	8
11-12 AM	102	9	9	7
12-1 PM	121	10	10	8
1-2 PM	93	8	8	6
2-3 PM	122	10	10	7
3-4 PM	93	8	8	6
4-5 PM	56	5	6	5
5-6 PM	29	2	4	3
6-7 PM	17	1		
7-8 PM	14	1		
8-9 PM	9	1		

Traffic Study Trip Summary for Proposed Project

Time	MSW/CD Trips	Sludge Trips	Glass Trips	NWD Trips Eliminated	Par Prod Trips	Employee Trips	Total Trips
6-7 AM	14	4	8	-6	20	25	65
7-8 AM	12	4	10	-6		25	45
8-9 AM	12	4	10	-8	5		23
9-10 AM	14	4	10	-8	6		26
10-11 AM	16	4	8	-6	6		28
11-12 AM	14	0	8	-6	6		22
12-1 PM	16	0	8	-6	6		24
1-2 PM	12	4	8	-6	6		26
2-3 PM	14	4	8	-6	5	25	50
3-4 PM	12	4	10	-6	10	25	55
4-5 PM	10	4	10	-6	10		28
5-6 PM	6	4	10	-6			14
10-11 PM						25	25
11-12 PM						25	25
Total Trips	152	40	108	-76	80	150	456

APPENDIX F

Highway Capacity Manual Methodologies

CAPACITY/LEVEL-OF-SERVICE ANALYSES METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the *Highway Capacity Manual*.(1) By definition, capacity represents "the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions." The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. Level of service (LOS) is defined as "a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers". Such measures include "speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety."

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

---

(1) *Transportation Research Board, Highway Capacity Manual 2010, published by the Transportation Research Board, Washington, DC, 2010.*

Unsignalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	> 50

At signalized intersections, an additional element must be considered: time allocation. Level of service is based on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect the operations of signalized intersections. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

Signalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	≤10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	> 80

APPENDIX G

2018 Existing Capacity/Level-of-Service Analysis

Intersection	
Int Delay, s/veh	49.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	166	0	0	580	62	327	0	330	0	0	0
Future Vol, veh/h	54	166	0	0	580	62	327	0	330	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	0	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	94	94	94	92	92	92
Heavy Vehicles, %	26	7	0	0	2	0	4	0	4	2	2	2
Mvmt Flow	61	187	0	0	617	66	348	0	351	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	683	0	-	-	-	0	959	-	187
Stage 1	-	-	-	-	-	-	309	-	-
Stage 2	-	-	-	-	-	-	650	-	-
Critical Hdwy	4.36	-	-	-	-	-	6.44	-	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	-	-
Follow-up Hdwy	2.434	-	-	-	-	-	3.536	-	3.336
Pot Cap-1 Maneuver	808	-	0	0	-	-	~ 283	0	850
Stage 1	-	-	0	0	-	-	740	0	-
Stage 2	-	-	0	0	-	-	516	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	808	-	-	-	-	-	~ 259	0	850
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 259	0	-
Stage 1	-	-	-	-	-	-	678	0	-
Stage 2	-	-	-	-	-	-	516	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.4	0	113.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	259	850	808	-	-	-
HCM Lane V/C Ratio	1.343	0.413	0.075	-	-	-
HCM Control Delay (s)	215.9	12.2	9.8	0	-	-
HCM Lane LOS	F	B	A	A	-	-
HCM 95th %tile Q(veh)	18.3	2	0.2	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	17.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	178	189	414	493	0	0	0	0	42	0	124
Future Vol, veh/h	0	178	189	414	493	0	0	0	0	42	0	124
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	0	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	91	91	91	92	92	92	85	85	85
Heavy Vehicles, %	0	12	8	2	4	0	2	2	2	12	0	9
Mvmt Flow	0	207	220	455	542	0	0	0	0	49	0	146

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	427	0	0				1769	-	542
Stage 1	-	-	-	-	-	-				1452	-	-
Stage 2	-	-	-	-	-	-				317	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.52	-	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-				5.52	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.52	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.608	-	3.381
Pot Cap-1 Maneuver	0	-	-	1132	-	0				87	0	527
Stage 1	0	-	-	-	-	0				204	0	-
Stage 2	0	-	-	-	-	0				716	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1132	-	-				~ 37	0	527
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 37	0	-
Stage 1	-	-	-	-	-	-				87	0	-
Stage 2	-	-	-	-	-	-				716	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.7	119.8
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1132	-	37	527
HCM Lane V/C Ratio	-	-	0.402	-	1.335	0.277
HCM Control Delay (s)	-	-	10.3	0	$ 431.1	14.4
HCM Lane LOS	-	-	B	A	F	B
HCM 95th %tile Q(veh)	-	-	2	-	5.2	1.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	17.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	95	13	116	410	91	12	22	130	142	18	27
Future Vol, veh/h	8	95	13	116	410	91	12	22	130	142	18	27
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	-	-	225	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	94	94	94	80	80	80	96	96	96
Heavy Vehicles, %	25	30	0	4	6	1	8	5	2	1	6	7
Mvmt Flow	10	114	16	123	436	97	15	28	163	148	19	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	533	0	0	130	0	0	874	913	114	887	881	485
Stage 1	-	-	-	-	-	-	134	134	-	731	731	-
Stage 2	-	-	-	-	-	-	740	779	-	156	150	-
Critical Hdwy	4.35	-	-	4.14	-	-	7.18	6.55	6.22	7.11	6.56	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.55	-	6.11	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.55	-	6.11	5.56	-
Follow-up Hdwy	2.425	-	-	2.236	-	-	3.572	4.045	3.318	3.509	4.054	3.363
Pot Cap-1 Maneuver	928	-	-	1443	-	-	264	270	939	266	281	572
Stage 1	-	-	-	-	-	-	855	780	-	415	421	-
Stage 2	-	-	-	-	-	-	399	402	-	849	766	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	928	-	-	1443	-	-	212	234	939	180	243	572
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	234	-	180	243	-
Stage 1	-	-	-	-	-	-	845	771	-	410	369	-
Stage 2	-	-	-	-	-	-	316	353	-	669	757	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.5	9.1	90.7
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1089	928	-	-	1443	-	-	211
HCM Lane V/C Ratio	0.188	0.01	-	-	0.086	-	-	0.923
HCM Control Delay (s)	9.1	8.9	0	-	7.7	0	-	90.7
HCM Lane LOS	A	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.7	0	-	-	0.3	-	-	7.6

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	312	0	90	0	4	91	15	8	0
Future Vol, veh/h	0	0	0	312	0	90	0	4	91	15	8	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	81	92	81	92	82	82	96	96	92
Heavy Vehicles, %	2	2	2	7	2	6	2	25	32	13	13	2
Mvmt Flow	0	0	0	385	0	111	0	5	111	16	8	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	-	771	-	774	771	-
Stage 1	-	-	-	-	-	-	-	1	-	770	770	-
Stage 2	-	-	-	-	-	-	-	770	-	4	1	-
Critical Hdwy	4.12	-	-	4.17	-	-	-	6.75	-	7.23	6.63	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.75	-	6.23	5.63	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.75	-	6.23	5.63	-
Follow-up Hdwy	2.218	-	-	2.263	-	-	-	4.225	-	3.617	4.117	-
Pot Cap-1 Maneuver	-	-	-	1589	-	0	0	305	0	303	318	0
Stage 1	-	-	-	-	-	0	0	851	0	377	394	0
Stage 2	-	-	-	-	-	0	0	378	0	990	874	0
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1589	-	-	-	231	-	243	241	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	231	-	243	241	-
Stage 1	-	-	-	-	-	-	-	851	-	377	299	-
Stage 2	-	-	-	-	-	-	-	287	-	984	874	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8		20.9
HCM LOS			-	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	231	-	-	-	-	1589	-	243	241
HCM Lane V/C Ratio	0.011	-	-	-	-	0.242	-	0.081	0.017
HCM Control Delay (s)	20.8	-	0	-	-	8	0	21.1	20.2
HCM Lane LOS	C	-	A	-	-	A	A	C	C
HCM 95th %tile Q(veh)	0	-	-	-	-	1	-	0.3	0.1

Intersection												
Int Delay, s/veh	1.2											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	52	0	60	0	0	204	0	30	110	0	52	391
Future Vol, veh/h	52	0	60	0	0	204	0	30	110	0	52	391
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	0	-	50	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	35	0	13	0	0	3	0	37	19	0	13	5
Mvmt Flow	65	0	75	0	0	255	0	38	138	0	65	489

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	348	-	-				-	0	-	-	-	0
Stage 1	310	-	-				-	-	-	-	-	-
Stage 2	38	-	-				-	-	-	-	-	-
Critical Hdwy	7.125	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	6.325	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.925	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.8325	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	565	0	0				0	-	0	0	-	-
Stage 1	640	0	0				0	-	0	0	-	-
Stage 2	900	0	0				0	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	565	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	565	0	-				-	-	-	-	-	-
Stage 1	640	0	-				-	-	-	-	-	-
Stage 2	900	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	565	-	-	-
HCM Lane V/C Ratio	-	0.115	-	-	-
HCM Control Delay (s)	-	12.2	0	-	-
HCM Lane LOS	-	B	A	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-	-

Intersection						
Int Delay, s/veh	4.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	105	196	131	109	8
Future Vol, veh/h	5	105	196	131	109	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	20	18	3	3	3	25
Mvmt Flow	6	131	245	164	136	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	795	141	146	0	-	0
Stage 1	141	-	-	-	-	-
Stage 2	654	-	-	-	-	-
Critical Hdwy	6.6	6.38	4.13	-	-	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.462	2.227	-	-	-
Pot Cap-1 Maneuver	333	866	1430	-	-	-
Stage 1	844	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	270	866	1430	-	-	-
Mov Cap-2 Maneuver	270	-	-	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	485	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	4.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1430	-	787	-	-
HCM Lane V/C Ratio	0.171	-	0.175	-	-
HCM Control Delay (s)	8	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.6	-	0.6	-	-

Intersection	
Int Delay, s/veh	45.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	90	229	0	0	566	41	234	0	348	0	0	0
Future Vol, veh/h	90	229	0	0	566	41	234	0	348	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	0	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	85	85	85	89	89	89	92	92	92
Heavy Vehicles, %	4	2	0	0	3	5	8	0	3	0	0	0
Mvmt Flow	102	260	0	0	666	48	263	0	391	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	714	0	-	-	-	0	1154	-	260
Stage 1	-	-	-	-	-	-	464	-	-
Stage 2	-	-	-	-	-	-	690	-	-
Critical Hdwy	4.14	-	-	-	-	-	6.48	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.48	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.48	-	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.572	-	3.327
Pot Cap-1 Maneuver	877	-	0	0	-	-	~ 212	0	776
Stage 1	-	-	0	0	-	-	621	0	-
Stage 2	-	-	0	0	-	-	487	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	877	-	-	-	-	-	~ 183	0	776
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 183	0	-
Stage 1	-	-	-	-	-	-	537	0	-
Stage 2	-	-	-	-	-	-	487	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.7	0	118.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	183	776	877	-	-	-
HCM Lane V/C Ratio	1.437	0.504	0.117	-	-	-
HCM Control Delay (s)	272.5	14.3	9.6	0	-	-
HCM Lane LOS	F	B	A	A	-	-
HCM 95th %tile Q(veh)	16.1	2.9	0.4	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	30

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	272	416	399	401	0	0	0	0	47	0	94
Future Vol, veh/h	0	272	416	399	401	0	0	0	0	47	0	94
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	0	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	94	94	94	92	92	92	86	86	86
Heavy Vehicles, %	0	3	6	3	6	0	2	2	2	2	0	7
Mvmt Flow	0	328	501	424	427	0	0	0	0	55	0	109

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	829	0	0				1854	-	427
Stage 1	-	-	-	-	-	-				1275	-	-
Stage 2	-	-	-	-	-	-				579	-	-
Critical Hdwy	-	-	-	4.13	-	-				6.42	-	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.518	-	3.363
Pot Cap-1 Maneuver	0	-	-	798	-	0				81	0	617
Stage 1	0	-	-	-	-	0				263	0	-
Stage 2	0	-	-	-	-	0				560	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	798	-	-				~ 25	0	617
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 25	0	-
Stage 1	-	-	-	-	-	-				80	0	-
Stage 2	-	-	-	-	-	-				560	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	7.2	$ 300.5
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	798	-	25	617
HCM Lane V/C Ratio	-	-	0.532	-	2.186	0.177
HCM Control Delay (s)	-	-	14.5	0	$ 877.2	12.1
HCM Lane LOS	-	-	B	A	F	B
HCM 95th %tile Q(veh)	-	-	3.2	-	6.7	0.6

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	176.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	357	109	174	159	162	18	44	169	162	42	9
Future Vol, veh/h	22	357	109	174	159	162	18	44	169	162	42	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	-	-	225	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	93	93	93	80	80	80	95	95	95
Heavy Vehicles, %	18	5	2	2	15	2	0	5	4	3	2	33
Mvmt Flow	28	446	136	187	171	174	23	55	211	171	44	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	345	0	0	582	0	0	1156	1221	446	1230	1270	258
Stage 1	-	-	-	-	-	-	502	502	-	632	632	-
Stage 2	-	-	-	-	-	-	654	719	-	598	638	-
Critical Hdwy	4.28	-	-	4.12	-	-	7.1	6.55	6.24	7.13	6.52	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.55	-	6.13	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.55	-	6.13	5.52	-
Follow-up Hdwy	2.362	-	-	2.218	-	-	3.5	4.045	3.336	3.527	4.018	3.597
Pot Cap-1 Maneuver	1130	-	-	992	-	-	175	177	608	~ 154	168	711
Stage 1	-	-	-	-	-	-	555	537	-	467	474	-
Stage 2	-	-	-	-	-	-	459	428	-	487	471	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1130	-	-	992	-	-	100	130	608	~ 54	123	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	130	-	~ 54	123	-
Stage 1	-	-	-	-	-	-	534	517	-	450	361	-
Stage 2	-	-	-	-	-	-	302	326	-	273	454	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	3.3	26.7	$ 1261.6
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	446	1130	-	-	992	-	-	64
HCM Lane V/C Ratio	0.647	0.024	-	-	0.189	-	-	3.503
HCM Control Delay (s)	26.7	8.3	0	-	9.5	0	-	$ 1261.6
HCM Lane LOS	D	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	4.5	0.1	-	-	0.7	-	-	23.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	102	0	29	0	11	242	84	18	0
Future Vol, veh/h	0	0	0	102	0	29	0	11	242	84	18	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	92	89	92	80	80	80	80	92
Heavy Vehicles, %	2	2	2	23	2	17	2	27	8	6	11	2
Mvmt Flow	0	0	0	115	0	33	0	14	303	105	23	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	-	231	-	238	231	-
Stage 1	-	-	-	-	-	-	-	1	-	230	230	-
Stage 2	-	-	-	-	-	-	-	230	-	8	1	-
Critical Hdwy	4.12	-	-	4.33	-	-	-	6.77	-	7.16	6.61	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.77	-	6.16	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.77	-	6.16	5.61	-
Follow-up Hdwy	2.218	-	-	2.407	-	-	-	4.243	-	3.554	4.099	-
Pot Cap-1 Maneuver	-	-	-	1494	-	0	0	628	0	708	654	0
Stage 1	-	-	-	-	-	0	0	848	0	764	698	0
Stage 2	-	-	-	-	-	0	0	670	0	1003	877	0
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1494	-	-	-	580	-	654	604	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	580	-	654	604	-
Stage 1	-	-	-	-	-	-	-	848	-	764	644	-
Stage 2	-	-	-	-	-	-	-	618	-	987	877	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	7.6		11.7
HCM LOS			-	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	580	-	-	-	-	1494	-	649	604
HCM Lane V/C Ratio	0.012	-	-	-	-	0.077	-	0.179	0.019
HCM Control Delay (s)	11.3	-	0	-	-	7.6	0	11.8	11.1
HCM Lane LOS	B	-	A	-	-	A	A	B	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.2	-	0.6	0.1

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	135	0	224	0	0	121	0	23	310	0	63	142
Future Vol, veh/h	135	0	224	0	0	121	0	23	310	0	63	142
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	0	-	50	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	82	82	82
Heavy Vehicles, %	15	0	1	0	0	12	0	13	2	0	35	12
Mvmt Flow	169	0	280	0	0	151	0	29	388	0	77	173

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	193	-	-	-	0	-	-	-	0
Stage 1	164	-	-	-	-	-	-	-	-
Stage 2	29	-	-	-	-	-	-	-	-
Critical Hdwy	6.825	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	6.025	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.625	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.6425	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	755	0	0	0	-	0	0	-	-
Stage 1	815	0	0	0	-	0	0	-	-
Stage 2	958	0	0	0	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	755	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	755	0	-	-	-	-	-	-	-
Stage 1	815	0	-	-	-	-	-	-	-
Stage 2	958	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	755	-	-	-
HCM Lane V/C Ratio	-	0.224	-	-	-
HCM Control Delay (s)	-	11.1	0	-	-
HCM Lane LOS	-	B	A	-	-
HCM 95th %tile Q(veh)	-	0.9	-	-	-

Intersection						
Int Delay, s/veh	8.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	34	276	116	158	241	5
Future Vol, veh/h	34	276	116	158	241	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	85	85	80	80
Heavy Vehicles, %	6	2	11	4	2	20
Mvmt Flow	43	345	136	186	301	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	762	304	307	0	-	0
Stage 1	304	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Critical Hdwy	6.46	6.22	4.21	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.318	2.299	-	-	-
Pot Cap-1 Maneuver	367	736	1204	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	321	736	1204	-	-	-
Mov Cap-2 Maneuver	321	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	629	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.6	3.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1204	-	645	-	-
HCM Lane V/C Ratio	0.113	-	0.601	-	-
HCM Control Delay (s)	8.4	0	18.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.4	-	4	-	-

APPENDIX H

2025 No Build Capacity/Level-of-Service Analysis

Intersection	
Int Delay, s/veh	73.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	178	0	0	622	66	351	0	354	0	0	0
Future Vol, veh/h	58	178	0	0	622	66	351	0	354	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	0	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	94	94	94	92	92	92
Heavy Vehicles, %	26	7	0	0	2	0	4	0	4	2	2	2
Mvmt Flow	65	200	0	0	662	70	373	0	377	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	732	0	-	-	-	0	1027	-	200
Stage 1	-	-	-	-	-	-	330	-	-
Stage 2	-	-	-	-	-	-	697	-	-
Critical Hdwy	4.36	-	-	-	-	-	6.44	-	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	-	-
Follow-up Hdwy	2.434	-	-	-	-	-	3.536	-	3.336
Pot Cap-1 Maneuver	773	-	0	0	-	-	~ 257	0	836
Stage 1	-	-	0	0	-	-	724	0	-
Stage 2	-	-	0	0	-	-	490	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	773	-	-	-	-	-	~ 233	0	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 233	0	-
Stage 1	-	-	-	-	-	-	655	0	-
Stage 2	-	-	-	-	-	-	490	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.5	0	169.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	233	836	773	-	-	-
HCM Lane V/C Ratio	1.603	0.45	0.084	-	-	-
HCM Control Delay (s)	$ 327.9	12.8	10.1	0	-	-
HCM Lane LOS	F	B	B	A	-	-
HCM 95th %tile Q(veh)	23.5	2.4	0.3	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	30.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	191	202	444	529	0	0	0	0	45	0	132
Future Vol, veh/h	0	191	202	444	529	0	0	0	0	45	0	132
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	0	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	91	91	91	92	92	92	85	85	85
Heavy Vehicles, %	0	12	8	2	4	0	2	2	2	12	0	9
Mvmt Flow	0	222	235	488	581	0	0	0	0	53	0	155

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	457	0	0				1897	-	581
Stage 1	-	-	-	-	-	-				1557	-	-
Stage 2	-	-	-	-	-	-				340	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.52	-	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-				5.52	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.52	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.608	-	3.381
Pot Cap-1 Maneuver	0	-	-	1104	-	0				72	0	501
Stage 1	0	-	-	-	-	0				181	0	-
Stage 2	0	-	-	-	-	0				699	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1104	-	-				~ 25	0	501
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 25	0	-
Stage 1	-	-	-	-	-	-				63	0	-
Stage 2	-	-	-	-	-	-				699	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	4.9	227.1
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1104	-	25	501
HCM Lane V/C Ratio	-	-	0.442	-	2.118	0.31
HCM Control Delay (s)	-	-	10.8	0	$ 848.2	15.4
HCM Lane LOS	-	-	B	A	F	C
HCM 95th %tile Q(veh)	-	-	2.3	-	6.5	1.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	28.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	102	13	124	439	98	12	23	139	152	19	28
Future Vol, veh/h	9	102	13	124	439	98	12	23	139	152	19	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	-	-	225	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	94	94	94	80	80	80	96	96	96
Heavy Vehicles, %	25	30	0	4	6	1	8	5	2	1	6	7
Mvmt Flow	11	123	16	132	467	104	15	29	174	158	20	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	571	0	0	139	0	0	938	980	123	951	944	519
Stage 1	-	-	-	-	-	-	145	145	-	783	783	-
Stage 2	-	-	-	-	-	-	793	835	-	168	161	-
Critical Hdwy	4.35	-	-	4.14	-	-	7.18	6.55	6.22	7.11	6.56	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.55	-	6.11	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.55	-	6.11	5.56	-
Follow-up Hdwy	2.425	-	-	2.236	-	-	3.572	4.045	3.318	3.509	4.054	3.363
Pot Cap-1 Maneuver	897	-	-	1432	-	-	238	247	928	241	258	547
Stage 1	-	-	-	-	-	-	844	771	-	388	399	-
Stage 2	-	-	-	-	-	-	373	379	-	836	757	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	897	-	-	1432	-	-	186	210	928	~ 156	220	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	186	210	-	~ 156	220	-
Stage 1	-	-	-	-	-	-	833	761	-	383	344	-
Stage 2	-	-	-	-	-	-	287	327	-	645	747	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1.5	9.6	161.5
HCM LOS			A	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	1000	897	-	-	1432	-	-	182
HCM Lane V/C Ratio	0.218	0.012	-	-	0.092	-	-	1.139
HCM Control Delay (s)	9.6	9.1	0	-	7.8	0	-	161.5
HCM Lane LOS	A	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.8	0	-	-	0.3	-	-	10.5

Notes

~: Volume exceeds capacity $: Delay exceeds 300s   +: Computation Not Defined   *: All major volume in platoon

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	335	0	97	0	4	98	16	9	0
Future Vol, veh/h	0	0	0	335	0	97	0	4	98	16	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	81	92	81	92	82	82	96	96	92
Heavy Vehicles, %	2	2	2	7	2	6	2	25	32	13	13	2
Mvmt Flow	0	0	0	414	0	120	0	5	120	17	9	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	-	829	-	832	829	-
Stage 1	-	-	-	-	-	-	-	1	-	828	828	-
Stage 2	-	-	-	-	-	-	-	828	-	4	1	-
Critical Hdwy	4.12	-	-	4.17	-	-	-	6.75	-	7.23	6.63	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.75	-	6.23	5.63	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.75	-	6.23	5.63	-
Follow-up Hdwy	2.218	-	-	2.263	-	-	-	4.225	-	3.617	4.117	-
Pot Cap-1 Maneuver	-	-	-	1589	-	0	0	282	0	276	294	0
Stage 1	-	-	-	-	-	0	0	851	0	350	371	0
Stage 2	-	-	-	-	-	0	0	355	0	990	874	0
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1589	-	-	-	208	-	217	217	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	208	-	217	217	-
Stage 1	-	-	-	-	-	-	-	851	-	350	274	-
Stage 2	-	-	-	-	-	-	-	262	-	984	874	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.1		23.1
HCM LOS			-	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	208	-	-	-	-	1589	-	217	217
HCM Lane V/C Ratio	0.012	-	-	-	-	0.26	-	0.098	0.022
HCM Control Delay (s)	22.5	-	0	-	-	8.1	0	23.4	22
HCM Lane LOS	C	-	A	-	-	A	A	C	C
HCM 95th %tile Q(veh)	0	-	-	-	-	1	-	0.3	0.1

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	56	0	64	0	0	219	0	32	118	0	56	419
Future Vol, veh/h	56	0	64	0	0	219	0	32	118	0	56	419
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	0	-	50	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	35	0	13	0	0	3	0	37	19	0	13	5
Mvmt Flow	70	0	80	0	0	274	0	40	148	0	70	524

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	372	-	-				-	0	-	-	-	0
Stage 1	332	-	-				-	-	-	-	-	-
Stage 2	40	-	-				-	-	-	-	-	-
Critical Hdwy	7.125	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	6.325	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.925	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.8325	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	545	0	0				0	-	0	0	-	-
Stage 1	622	0	0				0	-	0	0	-	-
Stage 2	898	0	0				0	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	545	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	545	0	-				-	-	-	-	-	-
Stage 1	622	0	-				-	-	-	-	-	-
Stage 2	898	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	545	-	-	-
HCM Lane V/C Ratio	-	0.128	-	-	-
HCM Control Delay (s)	-	12.6	0	-	-
HCM Lane LOS	-	B	A	-	-
HCM 95th %tile Q(veh)	-	0.4	-	-	-

Intersection						
Int Delay, s/veh	4.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	105	210	140	117	9
Future Vol, veh/h	5	105	210	140	117	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	20	18	3	3	3	25
Mvmt Flow	6	131	263	175	146	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	853	152	157	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Critical Hdwy	6.6	6.38	4.13	-	-	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.462	2.227	-	-	-
Pot Cap-1 Maneuver	307	854	1417	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	461	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	244	854	1417	-	-	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	662	-	-	-	-	-
Stage 2	461	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	4.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1417	-	767	-	-
HCM Lane V/C Ratio	0.185	-	0.179	-	-
HCM Control Delay (s)	8.1	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.7	-	0.7	-	-

Intersection	
Int Delay, s/veh	67.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	246	0	0	607	44	251	0	373	0	0	0
Future Vol, veh/h	96	246	0	0	607	44	251	0	373	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	0	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	85	85	85	89	89	89	92	92	92
Heavy Vehicles, %	4	2	0	0	3	5	8	0	3	0	0	0
Mvmt Flow	109	280	0	0	714	52	282	0	419	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	766	0	-	-	-	0	1238	-	280
Stage 1	-	-	-	-	-	-	498	-	-
Stage 2	-	-	-	-	-	-	740	-	-
Critical Hdwy	4.14	-	-	-	-	-	6.48	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.48	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.48	-	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.572	-	3.327
Pot Cap-1 Maneuver	838	-	0	0	-	-	~ 189	0	756
Stage 1	-	-	0	0	-	-	598	0	-
Stage 2	-	-	0	0	-	-	461	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	838	-	-	-	-	-	~ 160	0	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 160	0	-
Stage 1	-	-	-	-	-	-	506	0	-
Stage 2	-	-	-	-	-	-	461	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.8	0	176.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	160	756	838	-	-	-
HCM Lane V/C Ratio	1.763	0.554	0.13	-	-	-
HCM Control Delay (s)	$ 416.6	15.5	9.9	0	-	-
HCM Lane LOS	F	C	A	A	-	-
HCM 95th %tile Q(veh)	20.4	3.4	0.4	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	67.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	292	446	428	430	0	0	0	0	50	0	101
Future Vol, veh/h	0	292	446	428	430	0	0	0	0	50	0	101
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	0	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	94	94	94	92	92	92	86	86	86
Heavy Vehicles, %	0	3	6	3	6	0	2	2	2	2	0	7
Mvmt Flow	0	352	537	455	457	0	0	0	0	58	0	117

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	889	0	0				1988	-	457
Stage 1	-	-	-	-	-	-				1367	-	-
Stage 2	-	-	-	-	-	-				621	-	-
Critical Hdwy	-	-	-	4.13	-	-				6.42	-	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.518	-	3.363
Pot Cap-1 Maneuver	0	-	-	758	-	0				67	0	593
Stage 1	0	-	-	-	-	0				237	0	-
Stage 2	0	-	-	-	-	0				536	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	758	-	-				~ 13	0	593
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 13	0	-
Stage 1	-	-	-	-	-	-				~ 46	0	-
Stage 2	-	-	-	-	-	-				536	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	8.3	$ 718.3
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	758	-	13	593
HCM Lane V/C Ratio	-	-	0.601	-	4.472	0.198
HCM Control Delay (s)	-	-	16.6	0	$ 2143.8	12.6
HCM Lane LOS	-	-	C	A	F	B
HCM 95th %tile Q(veh)	-	-	4.1	-	8.3	0.7

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	308.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	383	117	187	170	174	19	47	181	174	45	10
Future Vol, veh/h	24	383	117	187	170	174	19	47	181	174	45	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	-	-	225	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	93	93	93	80	80	80	95	95	95
Heavy Vehicles, %	18	5	2	2	15	2	0	5	4	3	2	33
Mvmt Flow	30	479	146	201	183	187	24	59	226	183	47	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	370	0	0	625	0	0	1241	1311	479	1321	1364	277
Stage 1	-	-	-	-	-	-	539	539	-	679	679	-
Stage 2	-	-	-	-	-	-	702	772	-	642	685	-
Critical Hdwy	4.28	-	-	4.12	-	-	7.1	6.55	6.24	7.13	6.52	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.55	-	6.13	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.55	-	6.13	5.52	-
Follow-up Hdwy	2.362	-	-	2.218	-	-	3.5	4.045	3.336	3.527	4.018	3.597
Pot Cap-1 Maneuver	1106	-	-	956	-	-	153	157	583	~ 133	148	693
Stage 1	-	-	-	-	-	-	530	517	-	440	451	-
Stage 2	-	-	-	-	-	-	432	405	-	461	448	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1106	-	-	956	-	-	76	109	583	~ 37	103	693
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	109	-	~ 37	103	-
Stage 1	-	-	-	-	-	-	507	495	-	421	328	-
Stage 2	-	-	-	-	-	-	265	295	-	238	429	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	3.4	51.5	$ 2197.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	363	1106	-	-	956	-	-	44
HCM Lane V/C Ratio	0.851	0.027	-	-	0.21	-	-	5.478
HCM Control Delay (s)	51.5	8.3	0	-	9.8	0	-	$ 2197.7
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	7.9	0.1	-	-	0.8	-	-	27.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	9.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	109	0	31	0	12	259	90	19	0
Future Vol, veh/h	0	0	0	109	0	31	0	12	259	90	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	92	89	92	80	80	80	80	92
Heavy Vehicles, %	2	2	2	23	2	17	2	27	8	6	11	2
Mvmt Flow	0	0	0	122	0	35	0	15	324	113	24	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	-	245	-	253	245	-
Stage 1	-	-	-	-	-	-	-	1	-	244	244	-
Stage 2	-	-	-	-	-	-	-	244	-	9	1	-
Critical Hdwy	4.12	-	-	4.33	-	-	-	6.77	-	7.16	6.61	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.77	-	6.16	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.77	-	6.16	5.61	-
Follow-up Hdwy	2.218	-	-	2.407	-	-	-	4.243	-	3.554	4.099	-
Pot Cap-1 Maneuver	-	-	-	1494	-	0	0	616	0	692	642	0
Stage 1	-	-	-	-	-	0	0	848	0	751	688	0
Stage 2	-	-	-	-	-	0	0	660	0	1002	877	0
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1494	-	-	-	565	-	636	589	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	565	-	636	589	-
Stage 1	-	-	-	-	-	-	-	848	-	751	632	-
Stage 2	-	-	-	-	-	-	-	606	-	984	877	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	7.6		12
HCM LOS			-	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	565	-	-	-	-	1494	-	631	589
HCM Lane V/C Ratio	0.013	-	-	-	-	0.082	-	0.197	0.02
HCM Control Delay (s)	11.5	-	0	-	-	7.6	0	12.1	11.2
HCM Lane LOS	B	-	A	-	-	A	A	B	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3	-	0.7	0.1

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	145	0	224	0	0	130	0	23	310	0	63	152
Future Vol, veh/h	145	0	224	0	0	130	0	23	310	0	63	152
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	0	-	50	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	82	82	82
Heavy Vehicles, %	15	0	1	0	0	12	0	13	2	0	35	12
Mvmt Flow	181	0	280	0	0	163	0	29	388	0	77	185

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	199	-	-	-	0	-	-	-	0
Stage 1	170	-	-	-	-	-	-	-	-
Stage 2	29	-	-	-	-	-	-	-	-
Critical Hdwy	6.825	-	-	-	-	-	-	-	-
Critical Hdwy Stg 1	6.025	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.625	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.6425	-	-	-	-	-	-	-	-
Pot Cap-1 Maneuver	748	0	0	0	-	0	0	-	-
Stage 1	809	0	0	0	-	0	0	-	-
Stage 2	958	0	0	0	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	748	0	-	-	-	-	-	-	-
Mov Cap-2 Maneuver	748	0	-	-	-	-	-	-	-
Stage 1	809	0	-	-	-	-	-	-	-
Stage 2	958	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	748	-	-	-
HCM Lane V/C Ratio	-	0.242	-	-	-
HCM Control Delay (s)	-	11.3	0	-	-
HCM Lane LOS	-	B	A	-	-
HCM 95th %tile Q(veh)	-	0.9	-	-	-

Intersection						
Int Delay, s/veh	8.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	34	276	124	169	258	6
Future Vol, veh/h	34	276	124	169	258	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	85	85	80	80
Heavy Vehicles, %	6	2	11	4	2	20
Mvmt Flow	43	345	146	199	323	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	818	327	331	0	-	0
Stage 1	327	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Critical Hdwy	6.46	6.22	4.21	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.318	2.299	-	-	-
Pot Cap-1 Maneuver	340	714	1180	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	293	714	1180	-	-	-
Mov Cap-2 Maneuver	293	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	607	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.2	3.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1180	-	617	-	-
HCM Lane V/C Ratio	0.124	-	0.628	-	-
HCM Control Delay (s)	8.5	0	20.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.4	-	4.4	-	-

APPENDIX I

2025 Build Capacity/Level-of-Service Analysis

Intersection	
Int Delay, s/veh	92.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	78	178	0	0	622	66	357	0	354	0	0	0
Future Vol, veh/h	78	178	0	0	622	66	357	0	354	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	0	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	94	94	94	94	94	94	92	92	92
Heavy Vehicles, %	26	7	0	0	2	0	4	0	4	2	2	2
Mvmt Flow	88	200	0	0	662	70	380	0	377	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	732	0	-	-	-	0	1073	-	200
Stage 1	-	-	-	-	-	-	376	-	-
Stage 2	-	-	-	-	-	-	697	-	-
Critical Hdwy	4.36	-	-	-	-	-	6.44	-	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	5.44	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.44	-	-
Follow-up Hdwy	2.434	-	-	-	-	-	3.536	-	3.336
Pot Cap-1 Maneuver	773	-	0	0	-	-	~ 242	0	836
Stage 1	-	-	0	0	-	-	690	0	-
Stage 2	-	-	0	0	-	-	490	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	773	-	-	-	-	-	~ 211	0	836
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 211	0	-
Stage 1	-	-	-	-	-	-	602	0	-
Stage 2	-	-	-	-	-	-	490	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.1	0	215.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	211	836	773	-	-	-
HCM Lane V/C Ratio	1.8	0.45	0.113	-	-	-
HCM Control Delay (s)	$ 417	12.8	10.3	0	-	-
HCM Lane LOS	F	B	B	A	-	-
HCM 95th %tile Q(veh)	26.5	2.4	0.4	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	34.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	211	217	444	535	0	0	0	0	45	0	139
Future Vol, veh/h	0	211	217	444	535	0	0	0	0	45	0	139
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	0	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	91	91	91	92	92	92	85	85	85
Heavy Vehicles, %	0	12	8	2	4	0	2	2	2	12	0	9
Mvmt Flow	0	245	252	488	588	0	0	0	0	53	0	164

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	497	0	0				1935	-	588
Stage 1	-	-	-	-	-	-				1564	-	-
Stage 2	-	-	-	-	-	-				371	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.52	-	6.29
Critical Hdwy Stg 1	-	-	-	-	-	-				5.52	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.52	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.608	-	3.381
Pot Cap-1 Maneuver	0	-	-	1067	-	0				68	0	496
Stage 1	0	-	-	-	-	0				180	0	-
Stage 2	0	-	-	-	-	0				676	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1067	-	-				~ 22	0	496
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 22	0	-
Stage 1	-	-	-	-	-	-				58	0	-
Stage 2	-	-	-	-	-	-				676	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	5.1	259.4
HCM LOS			F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1067	-	22	496
HCM Lane V/C Ratio	-	-	0.457	-	2.406	0.33
HCM Control Delay (s)	-	-	11.2	0	$ 1011.7	15.8
HCM Lane LOS	-	-	B	A	F	C
HCM 95th %tile Q(veh)	-	-	2.4	-	6.8	1.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s   +: Computation Not Defined   *: All major volume in platoon

Intersection	
Int Delay, s/veh	37.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	137	13	124	452	98	12	23	139	152	19	28
Future Vol, veh/h	9	137	13	124	452	98	12	23	139	152	19	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	-	-	225	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	94	94	94	80	80	80	96	96	96
Heavy Vehicles, %	25	30	0	4	6	1	8	5	2	1	6	7
Mvmt Flow	11	165	16	132	481	104	15	29	174	158	20	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	585	0	0	181	0	0	994	1036	165	1007	1000	533
Stage 1	-	-	-	-	-	-	187	187	-	797	797	-
Stage 2	-	-	-	-	-	-	807	849	-	210	203	-
Critical Hdwy	4.35	-	-	4.14	-	-	7.18	6.55	6.22	7.11	6.56	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.55	-	6.11	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.55	-	6.11	5.56	-
Follow-up Hdwy	2.425	-	-	2.236	-	-	3.572	4.045	3.318	3.509	4.054	3.363
Pot Cap-1 Maneuver	886	-	-	1382	-	-	218	229	879	220	239	537
Stage 1	-	-	-	-	-	-	801	740	-	381	393	-
Stage 2	-	-	-	-	-	-	367	373	-	794	726	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	886	-	-	1382	-	-	168	193	879	~ 138	202	537
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	193	-	~ 138	202	-
Stage 1	-	-	-	-	-	-	790	730	-	376	336	-
Stage 2	-	-	-	-	-	-	280	319	-	603	716	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	1.4	10.2	223
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	913	886	-	-	1382	-	-	161
HCM Lane V/C Ratio	0.238	0.012	-	-	0.095	-	-	1.288
HCM Control Delay (s)	10.2	9.1	0	-	7.9	0	-	223
HCM Lane LOS	B	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	0.9	0	-	-	0.3	-	-	12.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	348	0	97	0	4	133	16	9	0
Future Vol, veh/h	0	0	0	348	0	97	0	4	133	16	9	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	81	92	81	92	82	82	96	96	92
Heavy Vehicles, %	2	2	2	7	2	6	2	25	32	13	13	2
Mvmt Flow	0	0	0	430	0	120	0	5	162	17	9	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	-	861	-	864	861	-
Stage 1	-	-	-	-	-	-	-	1	-	860	860	-
Stage 2	-	-	-	-	-	-	-	860	-	4	1	-
Critical Hdwy	4.12	-	-	4.17	-	-	-	6.75	-	7.23	6.63	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.75	-	6.23	5.63	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.75	-	6.23	5.63	-
Follow-up Hdwy	2.218	-	-	2.263	-	-	-	4.225	-	3.617	4.117	-
Pot Cap-1 Maneuver	-	-	-	1589	-	0	0	269	0	263	282	0
Stage 1	-	-	-	-	-	0	0	851	0	336	358	0
Stage 2	-	-	-	-	-	0	0	343	0	990	874	0
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1589	-	-	-	196	-	204	206	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	196	-	204	206	-
Stage 1	-	-	-	-	-	-	-	851	-	336	261	-
Stage 2	-	-	-	-	-	-	-	250	-	984	874	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	8.1		24.4
HCM LOS			-	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	196	-	-	-	-	1589	-	204	206
HCM Lane V/C Ratio	0.012	-	-	-	-	0.27	-	0.105	0.023
HCM Control Delay (s)	23.6	-	0	-	-	8.1	0	24.7	22.9
HCM Lane LOS	C	-	A	-	-	A	A	C	C
HCM 95th %tile Q(veh)	0	-	-	-	-	1.1	-	0.3	0.1

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	56	0	60	0	0	220	0	65	114	0	66	419
Future Vol, veh/h	56	0	60	0	0	220	0	65	114	0	66	419
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	0	-	50	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	35	0	13	0	0	3	0	37	19	0	13	5
Mvmt Flow	70	0	75	0	0	275	0	81	143	0	83	524

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	426	-	-				-	0	-	-	-	0
Stage 1	345	-	-				-	-	-	-	-	-
Stage 2	81	-	-				-	-	-	-	-	-
Critical Hdwy	7.125	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	6.325	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.925	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.8325	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	503	0	0				0	-	0	0	-	-
Stage 1	612	0	0				0	-	0	0	-	-
Stage 2	858	0	0				0	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	503	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	503	0	-				-	-	-	-	-	-
Stage 1	612	0	-				-	-	-	-	-	-
Stage 2	858	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	503	-	-	-
HCM Lane V/C Ratio	-	0.139	-	-	-
HCM Control Delay (s)	-	13.3	0	-	-
HCM Lane LOS	-	B	A	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-	-

Intersection						
Int Delay, s/veh	5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	109	211	140	117	9
Future Vol, veh/h	5	109	211	140	117	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	20	18	3	3	3	25
Mvmt Flow	6	136	264	175	146	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	855	152	157	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Critical Hdwy	6.6	6.38	4.13	-	-	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.462	2.227	-	-	-
Pot Cap-1 Maneuver	306	854	1417	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	459	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	243	854	1417	-	-	-
Mov Cap-2 Maneuver	243	-	-	-	-	-
Stage 1	662	-	-	-	-	-
Stage 2	459	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	4.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1417	-	769	-	-
HCM Lane V/C Ratio	0.186	-	0.185	-	-
HCM Control Delay (s)	8.1	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.7	-	0.7	-	-

Intersection	
Int Delay, s/veh	87.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	118	246	0	0	607	44	259	0	373	0	0	0
Future Vol, veh/h	118	246	0	0	607	44	259	0	373	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	None
Storage Length	-	-	-	-	-	-	0	-	75	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	85	85	85	89	89	89	92	92	92
Heavy Vehicles, %	4	2	0	0	3	5	8	0	3	0	0	0
Mvmt Flow	134	280	0	0	714	52	291	0	419	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	766	0	-	-	-	0	1288	-	280
Stage 1	-	-	-	-	-	-	548	-	-
Stage 2	-	-	-	-	-	-	740	-	-
Critical Hdwy	4.14	-	-	-	-	-	6.48	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.48	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.48	-	-
Follow-up Hdwy	2.236	-	-	-	-	-	3.572	-	3.327
Pot Cap-1 Maneuver	838	-	0	0	-	-	~ 176	0	756
Stage 1	-	-	0	0	-	-	567	0	-
Stage 2	-	-	0	0	-	-	461	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	838	-	-	-	-	-	~ 143	0	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 143	0	-
Stage 1	-	-	-	-	-	-	460	0	-
Stage 2	-	-	-	-	-	-	461	0	-

Approach	EB	WB	NB
HCM Control Delay, s	3.3	0	230.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	143	756	838	-	-	-
HCM Lane V/C Ratio	2.035	0.554	0.16	-	-	-
HCM Control Delay (s)	$ 541.1	15.5	10.1	0	-	-
HCM Lane LOS	F	C	B	A	-	-
HCM 95th %tile Q(veh)	23.2	3.4	0.6	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	87.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	314	464	428	438	0	0	0	0	50	0	110
Future Vol, veh/h	0	314	464	428	438	0	0	0	0	50	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Stop
Storage Length	-	-	-	-	-	-	-	-	-	0	-	75
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	94	94	94	92	92	92	86	86	86
Heavy Vehicles, %	0	3	6	3	6	0	2	2	2	2	0	7
Mvmt Flow	0	378	559	455	466	0	0	0	0	58	0	128

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	937	0	0				2034	-	466
Stage 1	-	-	-	-	-	-				1376	-	-
Stage 2	-	-	-	-	-	-				658	-	-
Critical Hdwy	-	-	-	4.13	-	-				6.42	-	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.227	-	-				3.518	-	3.363
Pot Cap-1 Maneuver	0	-	-	727	-	0				63	0	586
Stage 1	0	-	-	-	-	0				234	0	-
Stage 2	0	-	-	-	-	0				515	0	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	727	-	-				~ 10	0	586
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 10	0	-
Stage 1	-	-	-	-	-	-				~ 37	0	-
Stage 2	-	-	-	-	-	-				515	0	-

Approach	EB			WB						SB
HCM Control Delay, s	0			8.8						$ 915.9
HCM LOS										F

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	727	-	10	586
HCM Lane V/C Ratio	-	-	0.626	-	5.814	0.218
HCM Control Delay (s)	-	-	17.9	0	$ 2902.5	12.9
HCM Lane LOS	-	-	C	A	F	B
HCM 95th %tile Q(veh)	-	-	4.4	-	8.6	0.8

Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	403.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	423	117	187	187	174	19	47	181	174	45	10
Future Vol, veh/h	24	423	117	187	187	174	19	47	181	174	45	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	Stop	-	-	Stop
Storage Length	-	-	225	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	93	93	93	80	80	80	95	95	95
Heavy Vehicles, %	18	5	2	2	15	2	0	5	4	3	2	33
Mvmt Flow	30	529	146	201	201	187	24	59	226	183	47	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	388	0	0	675	0	0	1309	1379	529	1389	1432	295
Stage 1	-	-	-	-	-	-	589	589	-	697	697	-
Stage 2	-	-	-	-	-	-	720	790	-	692	735	-
Critical Hdwy	4.28	-	-	4.12	-	-	7.1	6.55	6.24	7.13	6.52	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.55	-	6.13	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.55	-	6.13	5.52	-
Follow-up Hdwy	2.362	-	-	2.218	-	-	3.5	4.045	3.336	3.527	4.018	3.597
Pot Cap-1 Maneuver	1088	-	-	916	-	-	138	142	546	~ 119	134	677
Stage 1	-	-	-	-	-	-	498	491	-	430	443	-
Stage 2	-	-	-	-	-	-	422	397	-	433	425	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1088	-	-	916	-	-	62	97	546	~ 28	91	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	97	-	~ 28	91	-
Stage 1	-	-	-	-	-	-	476	469	-	411	316	-
Stage 2	-	-	-	-	-	-	252	283	-	212	406	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	3.4	85.9	$ 2969.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	312	1088	-	-	916	-	-	34
HCM Lane V/C Ratio	0.99	0.028	-	-	0.22	-	-	7.09
HCM Control Delay (s)	85.9	8.4	0	-	10	0		$ 2969.5
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	10.6	0.1	-	-	0.8	-	-	29

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	9.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	126	0	31	0	12	299	90	19	0
Future Vol, veh/h	0	0	0	126	0	31	0	12	299	90	19	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	Free	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	89	92	89	92	80	80	80	80	92
Heavy Vehicles, %	2	2	2	23	2	17	2	27	8	6	11	2
Mvmt Flow	0	0	0	142	0	35	0	15	374	113	24	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	1	0	0	-	285	-	293	285	-
Stage 1	-	-	-	-	-	-	-	1	-	284	284	-
Stage 2	-	-	-	-	-	-	-	284	-	9	1	-
Critical Hdwy	4.12	-	-	4.33	-	-	-	6.77	-	7.16	6.61	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.77	-	6.16	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.77	-	6.16	5.61	-
Follow-up Hdwy	2.218	-	-	2.407	-	-	-	4.243	-	3.554	4.099	-
Pot Cap-1 Maneuver	-	-	-	1494	-	0	0	584	0	651	609	0
Stage 1	-	-	-	-	-	0	0	848	0	714	660	0
Stage 2	-	-	-	-	-	0	0	633	0	1002	877	0
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1494	-	-	-	529	-	591	551	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	529	-	591	551	-
Stage 1	-	-	-	-	-	-	-	848	-	714	597	-
Stage 2	-	-	-	-	-	-	-	573	-	984	877	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	7.7		12.7
HCM LOS			-	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	529	-	-	-	-	1494	-	587	551
HCM Lane V/C Ratio	0.014	-	-	-	-	0.095	-	0.212	0.022
HCM Control Delay (s)	11.9	-	0	-	-	7.7	0	12.8	11.7
HCM Lane LOS	B	-	A	-	-	A	A	B	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.3	-	0.8	0.1

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	145	0	224	0	0	132	0	63	314	0	82	152
Future Vol, veh/h	145	0	224	0	0	132	0	63	314	0	82	152
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Free	-	-	Free	-	-	Free	-	-	None
Storage Length	0	-	50	-	-	0	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	82	82	82
Heavy Vehicles, %	15	0	1	0	0	12	0	13	2	0	35	12
Mvmt Flow	181	0	280	0	0	165	0	79	393	0	100	185

Major/Minor	Minor2						Major1			Major2		
Conflicting Flow All	272	-	-				-	0	-	-	-	0
Stage 1	193	-	-				-	-	-	-	-	-
Stage 2	79	-	-				-	-	-	-	-	-
Critical Hdwy	6.825	-	-				-	-	-	-	-	-
Critical Hdwy Stg 1	6.025	-	-				-	-	-	-	-	-
Critical Hdwy Stg 2	5.625	-	-				-	-	-	-	-	-
Follow-up Hdwy	3.6425	-	-				-	-	-	-	-	-
Pot Cap-1 Maneuver	675	0	0				0	-	0	0	-	-
Stage 1	788	0	0				0	-	0	0	-	-
Stage 2	909	0	0				0	-	0	0	-	-
Platoon blocked, %								-			-	-
Mov Cap-1 Maneuver	675	0	-				-	-	-	-	-	-
Mov Cap-2 Maneuver	675	0	-				-	-	-	-	-	-
Stage 1	788	0	-				-	-	-	-	-	-
Stage 2	909	0	-				-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	-	675	-	-	-
HCM Lane V/C Ratio	-	0.269	-	-	-
HCM Control Delay (s)	-	12.3	0	-	-
HCM Lane LOS	-	B	A	-	-
HCM 95th %tile Q(veh)	-	1.1	-	-	-

Intersection						
Int Delay, s/veh	8.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	34	280	126	169	258	6
Future Vol, veh/h	34	280	126	169	258	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	85	85	80	80
Heavy Vehicles, %	6	2	11	4	2	20
Mvmt Flow	43	350	148	199	323	8

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	822	327	331	0	-	0
Stage 1	327	-	-	-	-	-
Stage 2	495	-	-	-	-	-
Critical Hdwy	6.46	6.22	4.21	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.318	2.299	-	-	-
Pot Cap-1 Maneuver	338	714	1180	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	604	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	290	714	1180	-	-	-
Mov Cap-2 Maneuver	290	-	-	-	-	-
Stage 1	620	-	-	-	-	-
Stage 2	604	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.5	3.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1180	-	616	-	-
HCM Lane V/C Ratio	0.126	-	0.637	-	-
HCM Control Delay (s)	8.5	0	20.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.4	-	4.5	-	-

APPENDIX J

Capacity/Level-of-Service Analysis

Capacity Analysis Summary
New Bedford Transfer Station
New Bedford, MA

Weekday Morning Peak Hour										
			2018 Existing			2025 No Build			2025 Build	
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Route 140 Northbound Ramps	EB	LT	A	2.4	0.08	A	2.5	0.08	A	3.1	0.11
at Braley Road	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	L	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
		R	B	12.2	0.41	B	12.8	0.45	B	12.8	0.45
Route 140 Southbound Ramps	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
at Braley Road	WB	LT	A	4.7	0.40	A	4.9	0.44	A	5.1	0.46
	SB	L	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
		R	B	14.4	0.28	C	15.4	0.31	C	15.8	0.33
Braley Road/	EB	LT	A	8.9	0.01	A	9.1	0.01	A	9.1	0.01
Theodore Rice Boulevard at		R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Phillips Road	WB	LTR	A	1.5	0.09	A	1.5	0.09	A	1.4	0.10
	NB	LTR	A	9.1	0.19	A	9.6	0.22	B	10.2	0.24
	SB	LTR	F	>50.0	0.92	F	>50.0	>1.00	F	>50.0	>1.00
Theodore Rice Boulevard at	WB	LR	A	8.0	0.25	A	8.1	0.26	A	8.1	0.27
Duchaine Boulevard	NB	TR	C	20.8	0.01	C	22.5	0.01	C	23.6	0.01
	SB	L	C	21.1	0.08	C	23.4	0.10	C	24.7	0.11
		T	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Duchaine Boulevard at	EB	LR	B	12.2	0.12	B	12.5	0.13	B	13.3	0.14
Samuel Barnet Boulevard	WB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Phillips Road at	EB	LR	B	10.5	0.18	B	10.7	0.18	B	10.7	0.19
Samuel Barnet Boulevard	NB	LT	A	4.8	0.17	A	4.9	0.19	A	4.9	0.19
	SB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Duchaine Boulevard at	EB	L	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Site Driveway	WB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00

1 Level-of-Service
2 Average vehicle delay in seconds
3 Volume to capacity ratio
n/a Not Applicable

Queue Summary
New Bedford Transfer Station
New Bedford, MA

			Weekday Morning Peak Hour					
			2018 Existing		2025 No Build		2025 Build	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
Route 140 Northbound Ramps	EB	LT	n/a	5	n/a	8	n/a	10
at Braley Road	WB	TR	n/a	0	n/a	0	n/a	0
	NB	L	n/a	458	n/a	588	n/a	663
		R	n/a	50	n/a	60	n/a	60
Route 140 Southbound Ramps	EB	TR	n/a	0	n/a	0	n/a	0
at Braley Road	WB	LT	n/a	50	n/a	58	n/a	60
	SB	L	n/a	130	n/a	163	n/a	170
		R	n/a	28	n/a	33	n/a	35
Braley Road/	EB	LT	n/a	0	n/a	0	n/a	0
Theodore Rice Boulevard at		R	n/a	0	n/a	0	n/a	0
Phillips Road	WB	LTR	n/a	8	n/a	8	n/a	8
	NB	LTR	n/a	18	n/a	20	n/a	23
	SB	LTR	n/a	190	n/a	263	n/a	308
Theodore Rice Boulevard at	WB	LR	n/a	25	n/a	25	n/a	28
Duchaine Boulevard	NB	TR	n/a	0	n/a	0	n/a	0
	SB	L	n/a	8	n/a	8	n/a	8
		T	n/a	0	n/a	0	n/a	0
Duchaine Boulevard at	EB	LR	n/a	10	n/a	10	n/a	13
Samuel Barnet Boulevard	WB	R	n/a	0	n/a	0	n/a	0
	NB	TR	n/a	0	n/a	0	n/a	0
	SB	TR	n/a	0	n/a	0	n/a	0
Phillips Road at	EB	LR	n/a	15	n/a	18	n/a	18
Samuel Barnet Boulevard	NB	LT	n/a	15	n/a	18	n/a	18
	SB	TR	n/a	0	n/a	0	n/a	0
Duchaine Boulevard at	EB	L	n/a	0	n/a	0	n/a	0
Site Driveway	WB	R	n/a	0	n/a	0	n/a	0
	SB	R	n/a	0	n/a	0	n/a	0

1 50th Percentile Queue Length (ft)
2 95th Percentile Queue Length (ft)
n/a Not Applicable

Capacity Analysis Summary
New Bedford Transfer Station
New Bedford, MA

Weekday Afternoon Peak Hour											
			Existing 2018			No Build 2025			Build 2025		
Intersection	**Movement**		**LOS[1]**	**Delay[2]**	**V/C[3]**	**LOS**	**Delay**	**V/C**	**LOS**	**Delay**	**V/C**
Route 140 Northbound Ramps	EB	LT	A	2.7	0.12	A	2.8	0.13	A	3.3	0.16
at Braley Road	WB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	L	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
		R	B	14.3	0.50	C	15.5	0.55	C	15.5	0.55
Route 140 Southbound Ramps	EB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
at Braley Road	WB	LT	A	7.2	0.53	A	8.3	0.60	A	8.8	0.63
	SB	L	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
		R	B	12.1	0.18	B	12.6	0.20	B	12.9	0.22
Braley Road/	EB	LT	A	8.3	0.02	A	8.3	0.03	A	8.4	0.03
Theodore Rice Boulevard at		R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Phillips Road	WB	LTR	A	3.3	0.19	A	3.4	0.21	A	3.4	0.22
	NB	LTR	D	26.7	0.65	F	>50.0	0.85	F	>50.0	0.99
	SB	LTR	F	>50.0	>1.00	F	>50.0	>1.00	F	>50.0	>1.00
Theodore Rice Boulevard at	WB	LR	A	7.6	0.08	A	7.6	0.08	A	7.7	0.10
Duchaine Boulevard	NB	TR	B	11.3	0.01	B	11.5	0.01	B	11.9	0.01
	SB	L	B	11.8	0.18	B	12.1	0.20	B	12.8	0.21
		T	A	0.0	0.00	A	0.0	0.02	A	0.0	0.00
Duchaine Boulevard at	EB	LR	B	11.1	0.22	B	11.3	0.24	B	12.3	0.27
Samuel Barnet Boulevard	WB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	NB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Phillips Road at	EB	LR	C	18.6	0.60	C	20.2	0.63	C	20.5	0.64
Samuel Barnet Boulevard	NB	LT	A	3.5	0.11	A	3.6	0.12	A	3.6	0.13
	SB	TR	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Duchaine Boulevard at	EB	L	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
Site Driveway	WB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00
	SB	R	A	0.0	0.00	A	0.0	0.00	A	0.0	0.00

1 Level-of-Service
2 Average vehicle delay in seconds
3 Volume to capacity ratio
n/a Not Applicable

Queue Summary
New Bedford Transfer Station
New Bedford, MA

			Weekday Afternoon Peak Hour					
			Existing 2018		No Build 2025		Build 2025	
Intersection	**Movement**		**50th Queue[1]**	**95th Queue[2]**	**50th Queue**	**95th Queue**	**50th Queue**	**95th Queue**
Route 140 Northbound Ramps	EB	LT	n/a	10	n/a	10	n/a	15
at Braley Road	WB	TR	n/a	0	n/a	0	n/a	0
	NB	L	n/a	403	n/a	510	n/a	588
		R	n/a	73	n/a	85	n/a	85
Route 140 Southbound Ramps	EB	TR	n/a	0	n/a	0	n/a	0
at Braley Road	WB	LT	n/a	80	n/a	103	n/a	110
	SB	L	n/a	168	n/a	208	n/a	215
		R	n/a	15	n/a	18	n/a	20
Braley Road/	EB	LT	n/a	3	n/a	3	n/a	3
Theodore Rice Boulevard at		R	n/a	0	n/a	0	n/a	0
Phillips Road	WB	LTR	n/a	18	n/a	20	n/a	20
	NB	LTR	n/a	113	n/a	198	n/a	265
	SB	LTR	n/a	590	n/a	698	n/a	725
Theodore Rice Boulevard at	WB	LR	n/a	5	n/a	8	n/a	8
Duchaine Boulevard	NB	TR	n/a	0	n/a	0	n/a	0
	SB	L	n/a	15	n/a	18	n/a	20
		T	n/a	0	n/a	0	n/a	0
Duchaine Boulevard at	EB	LR	n/a	23	n/a	23	n/a	28
Samuel Barnet Boulevard	WB	R	n/a	0	n/a	0	n/a	0
	NB	TR	n/a	0	n/a	0	n/a	0
	SB	TR	n/a	0	n/a	0	n/a	0
Phillips Road at	EB	LR	n/a	100	n/a	110	n/a	113
Samuel Barnet Boulevard	NB	LT	n/a	10	n/a	10	n/a	10
	SB	TR	n/a	0	n/a	0	n/a	0
Duchaine Boulevard at	EB	L	n/a	0	n/a	0	n/a	0
Site Driveway	WB	R	n/a	0	n/a	0	n/a	0
	SB	R	n/a	0	n/a	0	n/a	0

1 50th Percentile Queue Length (ft)
2 95th Percentile Queue Length (ft)
n/a Not Applicable

APPENDIX C

GREENHOUSE GAS EMISSIONS REPORT

Massachusetts Environmental Policy Act
Greenhouse Gas Analysis

Parallel Products of New England
New Bedford, Massachusetts

Submitted to:
PARALLEL PRODUCTS OF NEW ENGLAND, INC.
100 Duchaine Boulevard
New Bedford, MA 02745

PARALLEL PRODUCTS

Submitted by:
EPSILON ASSOCIATES, INC.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

Epsilon ASSOCIATES INC.

February 7, 2019

TABLE OF CONTENTS

List of Attachments

List of Tables

GREENHOUSE GAS ANALYSIS

This report contains a greenhouse gas (GHG) analysis that complies with the MEPA Greenhouse Gas Emissions Policy and Protocol (GHG Policy) of May 2010. It has been prepared by Epsilon Associates on behalf of Parallel Products of New England (PPNE) for the project located at 100 Duchaine Boulevard, New Bedford, Massachusetts. The project at this location includes a solar photovoltaic (PV) initiative, glass handling, municipal solids waste (MSW) processing and construction & demolition (C&D) waste handling, and biosolids processing.

1.0 Introduction and Project Overview

1.1 MEPA Greenhouse Gas Emissions Policy and Protocol

This report addresses GHG emissions generated by operation of the project and associated traffic, and options that may reduce those emissions in accordance with the MEPA GHG Policy. The GHG Policy requires, for certain projects undergoing review by the MEPA Office and required to prepare an EIR, that GHG emissions be quantified and measured to avoid, minimize, or mitigate such emissions. The GHG Policy requires proponents to quantify the impact of proposed mitigation in terms of both energy savings and GHG emissions.

On August 15, 2018, PPNE and the project team met with the MEPA Office and the Department of Energy Resources (DOER) to outline the methodology and mitigation expectations for the project. This analysis follows the process outlined in that meeting and the follow-up communication.

The analysis provided herein focuses on emissions of carbon dioxide (CO_2). As noted in the GHG Policy, although there are other GHGs, CO_2 is the predominant contributor to global warming. Furthermore, CO_2 is by far the predominant GHG emitted from the types of sources related to the project, and CO_2 emissions can be calculated for these source types with readily available data.

GHG emissions sources can be categorized into two groups: (1) stationary sources or emissions related to activities that are stationary on the site; and (2) mobile sources or emissions related to transportation. Activities on the site can be further broken down into direct sources and indirect sources: direct sources include GHG emissions from fuel combustion; and indirect sources include GHG emissions associated with electricity and other forms of energy that are imported from off-site power plants via the regional electrical grid or local steam distribution system for use on-site.

The GHG Policy requires the proponent to calculate and compare the GHG emissions between baseline and proposed cases, each of which considers both stationary source and transportation components.

1.2 Stationary Sources

The Base Case is the baseline from which progress in energy use and GHG emissions reductions is measured. Per the GHG Policy, the base case is a project designed to meet the applicable state building code (Code) that is in effect at the time the Expanded Environmental Notification Form (EENF) is filed. The Code at the time of this filing is the 9th Edition, amended to incorporate the building energy provisions of International Energy Conservation Code (IECC) 2015. This edition of the Code will remain the baseline for all future development energy modeling for GHG Policy compliance. The baseline is a reference point from which to measure the effectiveness of energy efficiency improvements in the proposed project. For an industrial process, it is the "business as usual" scenario. The baseline case is a reference point from which progress in energy use and GHG emissions reductions is measured.

For the stationary sources component, the proposed case presents the proposed project including GHG mitigation measures anticipated to be incorporated into project designs.

1.3 Mobile Sources

The mobile source GHG analysis was developed using the standard methodology outlined in the current Transportation Impact Assessment (TIA) Guidelines (MassDOT, March 13, 2004), the Guidelines for Performing Mesoscale Analysis of Indirect Sources (MassDEP, May 1991), and information provided in the Transportation Impact Study included in Appendix B of the EENF.

The analysis is based on a study year of 2025. For purposes of the GHG analysis and using terminology consistent with the stationary source GHG analysis, both the baseline and the proposed case are the proposed build condition. For stationary sources, the baseline is essentially the applicable Building Code, and the proposed case includes design attributes exceeding code to reduce GHG. However, for mobile sources, there is no initial "code" to meet.

Often, as part of improving local traffic, intersections and roadway improvements are necessary and incorporated into a "mitigated build" traffic condition, which would represent the GHG proposed case. For this situation, no transportation system changes are proposed. Therefore, the GHG baseline and proposed cases are identical for the mobile sources.

1.4 Project Overview

The proposed overall project includes a solar PV initiative and is a combination of three industrial processes: recycled glass handling, MSW processing and C&D handling, and biosolids processing. The project will be implemented in sequential phases. The glass handling will be implemented as Phase 1. The MSW and biosolids processing will be implemented as Phase 2.

The solar PV initiative includes deployment of 1.6 MW of rooftop and carport systems and 1.9 MW of additional solar carports.

The glass handling operation will recycle the used glass containers that are collected through the Massachusetts deposit system. Bottles collected will be processed such that the glass can be reused to produce new glass containers. Processing at the site will include crushing, sizing and separation of the glass by color. The cullet produced is then sold to glass manufacturers. To facilitate the shipment of recycled glass by rail, the Proponent will construct a rail sidetrack from the existing rail line adjacent to the project site.

A new MSW tipping building will be constructed at the site, with a capacity to accept up to 1,500 tons per day of MSW delivered to the facility by truck. The tipping building is expected to be approximately 50,000 square feet in floor area and will connect with an existing 103,000 SF building. The tipping building will be designed to allow waste delivery trucks to drive into the building to dump loads of waste material for processing. Front end loaders will load the MSW into a feed hopper for the MSW processing equipment. The existing building on site adjacent to the proposed tipping building will be used for the processing of MSW. The existing building will be modified as required to house the MSW processing equipment used to extract approximately 20% of recyclable material from MSW received. This existing building will also include a baler to bale and shrink wrap MSW after processing to remove recyclable materials. The baled, non-recyclable fraction of the MSW will be loaded in rail cars for shipment to out-of-state disposal sites, along with construction and demolition (C&D) residuals and bulky waste.

A processing facility will be built to dry biosolids to Class A specifications. Biosolids accepted will consist of thickened wet slurry biosolids with a solids content ranging from 5-10% and biosolids cake with a solids content ranging from 15-30%. The facility will initially utilize natural gas to dry the biosolids. PPNE may opt to add gasification equipment to produce synthesis gas from dried biosolids at a future date. The gasification process would include a gasifier to produce synthesis gas and a thermal oxidizer to recover heat energy for use in the drying process. Addition of gasification equipment would reduce or eliminate the need for natural gas for drying biosolids. Appropriate emissions control equipment would be installed on the gasification process. Gasification is not included in the current project.

The proposed facility will be located within the current glass, MSW, C&D, and biosolids service areas, so truck mileage will be significantly reduced. The by-products of the facility will be transported offsite via railcar, a far more efficient method of transporting these types of products over these distances than on-road diesel trucks. In short, the emissions associated with moving a ton of by-product by rail are far less than moving the same amount by diesel truck. Although these transportation-related emission reductions are difficult to quantify, they will be a real project benefit.

The project design details may be slightly modified as they are refined through the permitting process.

1.5 Project GHG Approach

As discussed with MEPA, the GHG impacts of the glass handling and MSW processes are minimal. Minor conveyance and sorting equipment will be used for what is primarily waste transfer. This equipment is standard throughout the industry. As a result, for purposes of this analysis, GHG impacts of the glass handling and MSW processes will be limited to the energy use associated with their buildings. Specifically, the lighting demands for each of these buildings will be quantified and the associated GHG emissions will be included in project totals. Proposed ventilation demands will not differ from the baseline so this aspect is not quantified. There will be no heat supplied in these processing areas.

While the biosolids drying process will be more energy intensive, it, too, employs standard industry equipment. The anticipated energy demand and GHG emissions associated with the biosolids process have been detailed. However, for purposes of establishing a GHG reduction commitment, the comparison of the proposed case to a "business as usual" baseline will be comprised of lighting and comfort heating energy efficiency measures. As described further in Section 2.3, ventilation electricity use reduction, variable frequency drive (VFD) process electricity use, and advanced sludge drying measures are not part of the commitment, but possible savings for the proposed case have been quantified.

Gasification of dried biosolids is contemplated for a later stage of the project. The gasifier would manufacture synthesis gas which can be combusted in a thermal oxidizer equipped with recuperative heat recovery. Heat from the biosolids gasification can then be utilized by the biosolids drying, displacing use of natural gas. This process is described further in Section 2.3.

1.6 Organization of the Remainder of this Report

Section 2 presents the project processes, and includes:

- A summary of mitigation technologies included in the proposed project;
- Methodology and results of energy use estimation; and
- A discussion of mitigation technologies not currently included in the designs and the reasoning behind their exclusion.

Transportation-related GHG emissions are analyzed in Section 3.

Section 4 includes a summation of the Project's GHG emissions and a listing of PPNE's GHG emissions mitigation commitments.

Supporting technical analyses, such as process energy, lighting, heat, and ventilation calculations are provided in Attachment A of this report. PPNE's solar initiative is described in more detail in Attachment B of this report.

2.0 Stationary Sources

2.1 Current Design and Mitigation Measures

This section describes the mitigation technologies that are included in the proposed project. These technologies are organized as: Energy Use Reduction, Energy Generation, and Other Related.

2.1.1 Energy Use Reduction

Reduced Lighting Power Density

High-performance lighting fixtures such as high-efficiency fluorescent or light-emitting diode (LED) lighting is expected to be used where possible throughout the buildings, significantly reducing installed lighting power.

Premium Electric Motors and Variable Frequency Drives

It is expected that premium motors will be used in the processes and other mechanical equipment. Variable frequency drives (VFDs) increase the efficiency of motors operating at partial or variable load and VFDs will be applied to selected process and ventilation motors used in the biosolids processing.

High Efficiency Mechanical Equipment

The glass handling and MSW buildings will be unconditioned. Comfort heating using a condensing boiler will be provided in the biosolids building during the winter months. The use of the boiler will also keep the sludge from freezing due to the cold. This heating system equipment will be designed with design ratings and efficiencies that are equal to or better than Code.

2.1.2 Energy Generation

Photovoltaic (PV) Installation

PPNE has made significant investments in solar power generation using PV. There are currently 1.6 MW of solar power operational at the site, with another 1.9 MW planned. PPNE has installed and intends to install PV on various structures being developed, as defined in the EENF.

Rooftop PV-Ready Construction

All new buildings will be constructed PV-ready, (i.e., with appropriate structural capacity and space allocations that make a future PV retrofit possible). The new buildings include the glass processing building, the MSW tipping building, and the biosolids processing building.

Photovoltaic (PV) – Canopy and Rooftop

PPNE has completed the installation of a 1.6 MW solar canopy (truck port) system at the site. This installation is currently operational. PPNE is currently working on the design of an additional 1.9 MW solar canopy (car port and shed) and rooftop (glass processing building and loading dock building) system at the site. Please refer to section 2.2.4 for additional details regarding renewable energy commitments.

2.1.3 Other Related

Construction Waste Recycling

Parallel Products will work with its contractor(s) to implement a comprehensive construction management plan, part of which will involve creating a detailed construction waste management plan.

2.2 Energy Analysis

An Energy Analysis was performed by Three Cities Research, Hazen and Sawyer, and Epsilon Associates. The baselines represent the processes designed to "business as usual" standards; with no extraordinary equipment or energy saving measures installed. The proposed cases represent the project with the features described in Section 2.1

2.2.1 Glass Handling

The glass processing building will be constructed adjacent to the existing buildings on site. The building location will be on an existing concrete pad which remains from the past use by Polaroid Corporation. The building will be 27,500 square feet and will be a pre-engineered metal building.

Existing access roads to the site and through the site will be used by trucks delivering glass to the facility to be processed. Glass bottles collected from the state's deposit system are fed into a hopper by a front-end loader. The glass then goes through a crusher and over a deck screen separating the glass into two size classifications. The sized glass then passes through organic and metal removal equipment and then moves on to optical sorters. The optical sorters will separate glass into three colors: amber, flint and green. The glass is then conveyed to bunkers. The glass is stored in the bunkers until it is loaded into rail cars or trucks for shipment to container manufacturers. A rail side track will be constructed from the main rail line to the site to provide rail service to the site.

As previously discussed, for purposes of this analysis, GHG impacts of the glass handling process will be limited to the energy use associated with the building. Specifically, the lighting demands for the building will be quantified and the associated GHG emissions will be included in project totals. Proposed ventilation demands will not differ from the baseline, so this aspect is not quantified. There will be no heat supplied in this processing area. The building will be unconditioned.

Please refer to Table 1 for an estimate of glass handling emissions.

Table 1 Energy Use and GHG Emissions, Glass Handling

Glass Handling				
Building Size		27,500	sf	
			Baseline	**Proposed**
DIRECT (NATURAL GAS)			MMBtu/yr	MMBtu/yr
	Space Heating		0	0
		subtotal	0	0
INDIRECT (ELECTRICITY)			MWh/yr	MWh/yr
	Space Heating		0	0
	Internal Lighting		287	258
		subtotal	287	258
ENERGY USE INDEX			kBtu/sf/yr	kBtu/sf/yr
			35.6	32.0
	(compared to baseline)			**-10%**
GHG EMISSIONS			tons/yr	tons/yr
	Direct	Gas-burning	0	0
	Indirect	Electricity	102	92
		Total	102	92
		Diff, tpy		**-10**
	Diff, % (compared to baseline)			**-10.1%**
	CO_2 Emission Factors:			
	Electricity [1]	710	lb/MWh	
	Natural Gas [2]	117	lb/MMBtu	
	[1] 2016 ISO New England Electric Generator Air Emissions Report			
	[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)			

2.2.2 MSW Tipping and Processing and C&D Handling

A new MSW transfer station (tipping) building will be constructed. The building is expected to be approximately 50,000 square feet in floor area and will connect with the existing site buildings. The tipping building will be designed to allow waste delivery trucks to drive into the building to unload waste material for processing. Front end loaders will convey the MSW into a feed hopper for delivery to the MSW processing equipment.

The existing building on site adjacent to the proposed tipping building will be used for the processing of MSW. The existing building will be modified as required to house the MSW processing equipment used to extract recyclable material from MSW. This existing building will also include a baler to bale MSW after processing to remove recyclable materials.

In addition to accepting previously baled MSW from other facilities, the PPNE facility will also accept loose MSW delivered in transfer trailers and packer trucks. Transfer trailers will consist of 100 cy live floor trailers. The average 100 cy transfer trailer capacity is 28 tons. Transfer trailers will originate primarily at transfer stations. Transfer trailers arriving at the facility will be weighed on a truck scale at the facility and then the truck will back into the tipping building and will discharge the waste onto the building floor. Packer trucks such as the trucks that provide curbside pickup of MSW will also deliver MSW to the facility. The average capacity of a packer truck is 10 tons.

Non-baled MSW received by the facility will be processed to extract recyclable materials. Processing will consist of a processing line that includes both mechanized separation equipment and a manual picking line. Materials removed to be recycled will include metals, cardboard, aluminum, wood, glass, PET, paper and plastic. The facility will include two processing lines with each line capable of processing 40 tons per hour. The processing lines will operate two to three shifts per day depending on the inbound volume accepted. The processing line flow diagram and equipment specifications are included in Appendix A of the EENF. The processing line is expected to extract 20% of the MSW as recyclable products. After the recycled material has been extracted, the remaining waste will be baled and shrink wrapped for transport to a disposal facility. The primary means of transport for disposal will be by rail. Trucks can also be used to transport waste, if necessary. Recyclable materials extracted from MSW will be sent to recycling markets by rail or truck.

The facility will also accept C&D residual waste and bulky waste. These wastes are classified as Category 2 and Category 3 waste by MassDEP. Category 2 waste is C&D waste that has been previously processed by a C&D processing facility and Category 3 is bulky waste that has little or no recyclable value. The C&D processing facility will have removed all waste ban material and other recyclable material from the C&D material as deemed appropriate. The Category 2 or Category 3 material accepted at the facility will be used as cover for baled MSW in the rail cars. It is expected that Category 2 and Category 3 waste will be delivered to the site in 100 cubic yard live floor trailers. This material will be received in the proposed tipping building. Baled and shrink wrapped MSW and Category 2 and 3 wastes will be loaded in rail cars for shipment to disposal sites.

As previously discussed, for purposes of this analysis, GHG impacts of the MSW handling process will be limited to the energy use associated with the building. Specifically, the lighting demands for the building will be quantified and the associated GHG emissions will be included in project totals. Proposed case ventilation demands will not differ from the baseline, so this aspect is not quantified. There will be no heat supplied in the tipping or processing areas. The building will be unconditioned.

Please refer to Table 2 for an estimate of MSW tipping and processing and C&D handling emissions.

Table 2 Energy Use and GHG Emissions, MSW Tipping and Processing and C&D Handling

MSW Tipping and Processing				
Building Size		87,000	sf	
			Baseline	**Proposed**
DIRECT (NATURAL GAS)			MMBtu/yr	MMBtu/yr
	Space Heating		0	0
		subtotal	0	0
INDIRECT (ELECTRICITY)			MWh/yr	MWh/yr
	Space Heating		0	0
	Internal Lighting		937	844
		subtotal	937	844
ENERGY USE INDEX			kBtu/sf/yr	kBtu/sf/yr
			36.7	33.1
	(compared to baseline)			**-10%**
GHG EMISSIONS			tons/yr	tons/yr
	Direct	Gas-burning	0	0
	Indirect	Electricity	333	300
		Total	333	300
		Diff, tpy		**-33**
	Diff, % (compared to baseline)			**-9.9%**
	CO_2 Emission Factors:			
	Electricity [1]	710	lb/MWh	
	Natural Gas [2]	117	lb/MMBtu	
	[1] 2016 ISO New England Electric Generator Air Emissions Report			
	[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)			

2.2.3 Biosolids Processing

A new biosolids processing building will be constructed on site. The facility may be designed to accept and process up to a maximum of 50 dry tons per day of biosolids. PPNE may elect to construct a facility to process less than 50 dry tons per day. This determination will be based on market conditions at the time of facility construction. A 50-dry ton per day facility has been evaluated for the EENF as this is the largest size facility under consideration. The biosolids will originate at nearby municipal wastewater treatment plants. The biosolids will be delivered to the facility by truck. The building is expected to be approximately 30,000 square feet.

The facility will accept dewatered cake biosolids with a solids content of between 15% and 30%. The facility will also accept thickened wet slurry biosolids with a solids content of between 5% and 10%. Wet slurry biosolids received by the facility will be stored in tanks on site prior to processing. The tanks will be sized to contain three days of deliveries. Appendix A of the EENF includes a process flow diagram and mass balance for the proposed facility when operated at an annual average throughput of 45 dry tons per day. The ratio of thickened wet slurry biosolids to dewatered cake will vary. The process flow diagram shows the expected ratio of tonnages of wet slurry biosolids to tonnages of dewatered cake biosolids. The actual ratio of wet slurry and dewatered cake will vary depending on the material being produced by wastewater treatment plants that elect to utilize the proposed facility.

Biosolids delivered as a thickened wet slurry will be dewatered by centrifuge or screw press to produce biosolids cake with an expected solids content of 30%. The dewatering system will be designed to process 20 dry tons per day of wet slurry. Wastewater extracted in the dewatering process will be directed to the New Bedford sewer system. The dewatering system will be designed to have a solids capture rate of 95%. The dewatered slurry biosolids cake and the biosolids cake delivered to the facility will then be blended together. The blending area will include sufficient buffer storage for eight hours of production.

The blended cake will then be directed to four thermal dryers that each utilize a natural gas burner. The biosolids will be dried to approximately 90% solids. The drying technology under consideration by PPNE uses a vacuum technology which has potential to significantly reduce the amount of natural gas necessary to dry the biosolids. However, these savings are not claimed in this analysis because a guarantee and/or supporting data have not been made available to PPNE by the vendor. To be conservative, standard sludge drying equipment energy use has been assumed.

Moisture evaporated from the biosolids during the drying process will be condensed with the condensate water discharged to the New Bedford sewer system. It is expected that the daily discharge of condensate to the sewer system will be 30,000 gallons per day. Drying will reduce the weight and volume of the biosolids. The dried biosolids will be sent for disposal in rail cars or for beneficial purposes such as alternative daily landfill cover if the required Beneficial Use Determination permits are obtained. The facility will have the capability of storing seven days of dried biosolids production.

The proposed facility will be designed to control odors generated by the biosolids processing. All processing will be done within an enclosed building. Two odor control systems will be provided to control odor. A scrubber will process odorous air associated with the biosolids storage, transfer, dewatering and drying processes. These areas will be operated under negative pressure with the extracted air directed to the scrubber. Air from low odor areas of the processing building will be provided with an ionization system to provide odor control before exhaust to atmosphere.

After construction of the proposed drying facility, PPNE may at some point modify the facility to include gasification of the dried biosolids. The gasification system will consist of a gasifier and thermal oxidizer. Heat generated in the thermal oxidizer will be used to dry the biosolids reducing or eliminating the need for natural gas.

The GHG impacts of the biosolids processing facility have been quantified and the process energy loads have been estimated. This process is industry standard and does not have a GHG reduction associated with it. Therefore, GHG reduction opportunities will be limited to the energy use associated with the building. Specifically, the lighting, ventilation, and heating demands for the building have been quantified and the associated GHG emissions reductions have been included in project totals. See Attachment A of this report for quantification details and Appendix A of the EENF for the basis of design.

Please refer to Table 3 for an estimate of biosolids processing emissions.

Table 3 Energy Use and GHG Emissions, Biosolids

Biosolids Processing				
Building Size		30,000	sf	
			Baseline	**Proposed**
DIRECT (NATURAL GAS)			MMBtu/yr	MMBtu/yr
	Dryer Heating Load		136,365	136,365
	Space Heating		2,743	2,591
		subtotal	139,108	138,956
INDIRECT (ELECTRICITY)			MWh/yr	MWh/yr
	Process Electricity		4,844	4,844
	Ventilation		1,435	1,435
	Space Heating		0	0
	Internal Lighting		323	291
		subtotal	6,602	6,570
ENERGY USE INDEX			kBtu/sf/yr	kBtu/sf/yr
			5,388	5,379
	(compared to baseline)			**0%**
GHG EMISSIONS			tons/yr	tons/yr
	Direct	Gas-burning	8,138	8,129
	Indirect	Electricity	2,344	2,332
		Total	10,482	10,461
		Diff, tpy		**-20**
	Diff, % (compared to baseline)			**-0.2%**
	CO_2 Emission Factors:			
	Electricity [1]	710	lb/MWh	
	Natural Gas [2]	117	lb/MMBtu	
	[1] 2016 ISO New England Electric Generator Air Emissions Report			
	[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)			

Biosolids Ventilation Reduction

The addition of VFDs drives to the biosolids ventilation system is expected to further reduce ventilation electricity use of the biosolids processing by 7%. These reductions have been calculated based on conceptual engineering estimates and so PPNE cannot guarantee these savings. As such, the analysis of ventilation savings has been included for informational purposes but cannot be committed to at this time. For additional analysis, please refer to Attachment A of this report.

Biosolids Process Electricity Reduction

VFDs increase the efficiency of process motors operating at partial load. The addition of VFDs to selected biosolids process motors is expected to further reduce biosolids process electricity use by 12%. These reductions have been calculated based on conceptual engineering estimates and so PPNE cannot guarantee these savings. As such, the analysis of process VFD savings has been included for informational purposes but cannot be committed to at this time. For additional analysis, please refer to Attachment A of this report.

Biosolids Process Drying Technology

The addition of advanced (vacuum) drying technology to the biosolids process could further reduce biosolids process natural gas usage by 30%, according to vendor representations. However, PPNE cannot guarantee these savings due to lack of a vendor guarantee and/or supporting data. The analysis of advanced drying technology has been included for informational purposes but cannot be committed to at this time. For additional analysis, please refer to Attachment A of this report.

2.2.4 Renewable Energy Commitment

As previously discussed, the Proponent has completed the installation of 1.6 MW of truck canopy solar power at the site. PPNE is currently working on the installation of an additional 1.9 MW of canopy and rooftop solar power on site. According to PV Watts, a 3.5 MW array located in New Bedford will produce approximately 4,543 MWh annually. This equates to a 1,649 ton per year reduction in CO_2.

2.3 Mitigation Strategies Not Currently Included

A potential candidate for additional mitigation technology is addressed in this section. However, PPNE cannot commit to the use of the following additional technology for the reason stated below.

2.3.1 Biosolids Gasification

Gasification of dried biosolids is contemplated for a later stage of the project. The gasifier would manufacture synthesis gas which can be combusted in a thermal oxidizer equipped with a recuperative heat recovery. An intermediate thermal fluid would transfer heat from the thermal oxidizer to the biosolids dryer. Thus, heat provided to the biosolids dryer by use of natural gas combustion would be displaced by heat from the biosolids gasification. The biosolids would provide renewable and carbon neutral thermal energy for the drying step, and the gasifier would further reduce the mass and volume of material to be transported and disposed.

Gasification may be adopted on-site once it proves to be commercially viable. It is expected that the future addition of biosolids gasification would significantly reduce GHG emissions from the drying operation.

3.0 Mobile Source Emissions

As part of the GHG evaluation, emissions of CO_2 from project-generated traffic and other mobile sources were evaluated. Proposed project-related on-road truck trips as well as employee vehicle trips both to and from the site and onsite are included in this evaluation. Estimates of emissions due to vehicle idling are also included. In addition, PPNE plans to use several diesel-powered front-end loaders for glass and MSW handling, and an electric mobile railway car mover to relocate full and empty railway cars to various locations for use. Use of electricity for the railway car mover is excluded from this analysis, since it only is expected to operate one hour per day.

3.1 On-Road Traffic GHG Analysis

In accordance with the MEPA GHG Policy, GHG emissions were estimated for project-related mobile sources within the transportation study area [see the Traffic Impact Study[1] (TIS) for the transportation analysis]. For mobile source GHG emissions, the methodology follows the same methodology that is outlined in MassDEP guidance for mesoscale analyses.[2] The analysis typically includes a comparison of the future build conditions to a no-build or baseline condition. If emissions are greater for the future build conditions, reasonable and feasible mitigation measures will be evaluated. In this case, the proposed project ("future build") is evaluated. Non-project related traffic is not relevant, and therefore, not included as a "no build" condition.

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1 McMahon Associates, Inc., Traffic Impact Study Solid Waste Transfer Station 100 Duchaine Boulevard New Bedford, MA, July 2018

2 MassDEP, Guidelines for Performing Mesoscale Analysis of Indirect Sources, May 1991.

The mesoscale analysis performed for the Project predicts the change in regional carbon dioxide equivalent (CO_2e) emissions due to the Proposed Project. The vehicle pollutant burden was estimated for the Proposed Project for the year 2025. Traffic conditions are described in more detail in the TIS.

The EPA's MOVES computer program was adopted in 2013 to supersede Mobile 6.2 for traffic emissions analysis. In April 2014, MassDEP began providing the state-specific inputs to be able to run MOVES, completing the software transition. MOVES was used to estimate motor vehicle emission factors of CO_2e on the roadway network in the proposed project area. A peak travel day (estimated to be a weekday in March) was used in MOVES. Daily and yearly emission estimates were calculated using the vehicle count data, mileage, estimated intersection delay times, and MOVES speed-based emission factors for the year 2025 for both heavy duty diesel trucks only (for truck emissions), and light duty gas cars and trucks (for employee vehicle emissions).

The traffic data provided in the TIS form the basis of the study. Peak hour truck and employee traffic volumes were provided by the transportation consultant and estimates of Average Daily Trips (ADT) were also obtained from this document. Annual estimates are conservatively based on operation of 365 days per year.

Vehicle emissions while in motion were assumed for traffic traveling to and from Route 140. According to the TIS, 90% of site traffic would travel 3.0 miles round-trip north to Route 140 via Theodore Rice Boulevard and Braley Road. The other 10% would travel 4.5 miles round-trip south to Route 140 via Samuel Barnet Boulevard and Phillips Road. Distances for the links were estimated with mapping software (Google Earth Pro). Average speeds of 25 mph for heavy trucks and 30 mph for employee vehicles were assumed for all roadways.

Average per-vehicle idle times at the facility were estimated based on location and purpose. It was assumed that trucks idle approximately 8 minutes total on average while at the facility, either at weigh stations, or waiting to be directed to loading and unloading locations. Employee vehicles are assumed to idle for 10 seconds. Idling at offsite intersections was included, assuming approximately 2.1 minutes on average for trucks and employee vehicles.

All related calculations, including the 2025 emissions estimates, are presented as Attachment A of this report. The traffic emissions are presented in Table 4.

The Proposed Project is estimated to generate 1,262 tons per year of greenhouse gases from local on-road process truck deliveries, employee vehicle trips, and onsite and offsite idling.

Table 4 Project-Generated On-Road Traffic GHG Emissions Analysis Summary

Pollutant	CO_2e (lbs/day)	CO_2e (tons/yr)
Truck-Generated Emissions	6,593.33	1,203
Employee Vehicle-Generated Emissions	324.02	59
Total	6,917.35	1,262

3.2 Front-End Loader GHG Emissions

The Proposed Project is planning on using several front-end loaders for glass and MSW handling. The model (or similar) expected to be used for glass handling is a Caterpillar 926M, which uses a 155-horsepower diesel engine. The model (or similar) expected to be used for MSW handling is a Caterpillar 966K, which uses a 267-horsepower diesel engine. Since EPA does not yet regulate tailpipe CO_2 emissions for this type of vehicle or engine, there are no emission standards for CO_2. Therefore, CO_2 emissions calculations are conservatively based on EPA AP-42 emission factors for small diesel industrial engines.[3]

The operating hours for the two MSW handling front-end loaders total 36 hours per day (two loaders operating 12 hours during the day and one loader operating 12 hours during the night). The operating hours for the glass handling front-end loaders total 3 hours per day using one of the two loaders. The loaders are conservatively assumed to operate 365 days per year.

The front-end loader emissions are presented in Table 5. Supporting calculations are presented as Attachment A to this report.

The Proposed Project is estimated to generate 2,115 tons per year of greenhouse gases from front-end loader operations at the site.

Table 5 Front-End Loader GHG Emissions Analysis Summary

Pollutant	CO_2e (lbs/day)	CO_2e (tons/yr)
Glass Handling	534.75	98
MSW Handling	11,053.80	2,017
Total	11,588.55	2,115

3 U.S. EPA, AP 42, Fifth Edition, Volume I. Chapter 3: Stationary Internal Combustion Sources. Table 3.3-1. Oct. 1996.

3.3 Non-quantifiable mobile source GHG reductions

Currently, locally generated municipal solid waste is sent to processing facilities out of state, primarily via diesel haul trucks on interstate highways. The facilities vary, but are generally located outside of New England, where the means and cost of disposal are more economically favorable. Similarly, locally generated biosolids are being sent to processing facilities out of state. This setup results in thousands of annual vehicle miles generated by these heavy-duty diesel trucks and thousands of tons of GHG emissions produced.

Since the origin, destination, route, and frequency of these trips are variable, quantifying actual emissions totals and reductions would be speculative, at best.

By having the proposed facility located within the current service area, truck mileage is significantly reduced. The by-products of the facility will be transported offsite via railcar, a far more efficient method of transporting this type of product over these distances than on-road diesel trucks. In short, the emissions associated with moving a ton of by-product by rail are far less than moving the same amount by diesel truck.

The proposed method of transporting waste should significantly reduce GHG on a regional scale. Although the exact amount, in tons per year, is not easily quantifiable, it should be noted that the reduction is significant, and will be a net benefit to the environment. Reduced GHG emissions associated with the mobile component of this project will help the Commonwealth meet the requirements of the Global Warming Solutions Act.

3.4 Summary

Mobile sources comprise a relatively small amount of proposed project-generated GHG emissions. Table 6 summarizes the total overall mobile source GHG emissions. It is expected that normal operations would generate approximately 18,506 lb/day and 3,377 tpy of GHG.

Table 6 Mobile Source GHG Emissions Analysis Summary

Pollutant	CO_2e (lbs/day)	CO_2e (tons/yr)
Front-End Loader Emissions	11,588.55	2,115
Truck-Generated Emissions	6,593.33	1,203
Employee Vehicle-Generated Emissions	324.02	59
Total	**18,505.90**	**3,377**

4.0 Summary and Mitigation Commitments

4.1 Project GHG Summary

Table 7 below presents a composite of project GHG emissions profiles of the Baseline and Proposed cases.

Table 7 Project GHG Emissions Summary

Project GHG Emissions Summary

	Baseline	Proposed	Difference	
	tons/yr			%
Glass Handling	102	92	10	-10.1
MSW	314	282	32	-10.1
Biosolids	10,482	10,461	21	-.02
Mobile Sources	3,377	3,377		
On-site renewable energy		-1,649		

4.2 Proponent's Commitments to GHG Reduction

PPNE has detailed their commitments to mitigate project GHG emissions. Additional mitigation measures have not been quantified, primarily because the degree of accuracy or the reliability of the quantification method is uncertain.

PPNE is committed to environmental stewardship. As design develops further, the company expects that additional technologies described previously, or possibly new technologies developed in the interim period, may be adopted that will further decrease GHG emissions, but these are not yet ripe for selection. The proponent will encourage the continued evaluation of energy efficiency and renewable energy measures throughout the life of the project.

PPNE is committed to the following mitigation elements for the project:

- The installation of 3.5 MW of on-site solar arrays
- A 10% reduction over Code in lighting installations electricity use in the new buildings (glass handling, MSW tipping, and biosolids processing) and in the MSW processing area of the existing building
- High-efficiency mechanical equipment;
- High-efficiency heating equipment in the biosolids building;
- PV-Ready new construction;
- Construction waste recycling.

The proponent has included in the design of the project, all feasible GHG emissions mitigation to avoid, reduce, minimize, or mitigate damage to the environment.

The proponent is committed to implementing the energy efficiency and GHG emission reduction measures presented in this analysis but must retain an amount of design flexibility to allow for changes that will inevitably occur as design progresses. If, during project design, a specific combination of design strategies proves more advantageous from an engineering, economic, or space utilization perspective, the design of the project may vary from what has been described herein. Energy performance minima and associated GHG emission reductions will be adhered to.

Upon completion of the project, PPNE will submit a self-certification to the MEPA Office, prepared in accordance with the GHG Policy. This certification will identify the GHG mitigation measures incorporated into the project and will illustrate the degree of GHG reductions from a baseline case, as baseline is defined herein, and how such reductions are achieved.

Attachment A

GHG Analysis Supporting Calculations

New Lighting Requirements and Reduction

I. Estimate New Lighting Requirements

A. Low Bay (<25' floor to ceiling height)

			Glass	MSW	Biosolids	Checksum
East wing of existing building	7,200	SF				
East wing of existing building will use existing lighting	-7,200	SF				
Proposed glass processing building	27,500	SF	27,500			
TOTAL LOW BAY AREA	27,500	SF	27,500			
Low Bay Lighting Density	1.19	W/SF	1.19			
Low Bay Lighting Requirement	32,725	W	32,725			32,725

B. High Bay (25' - 50' floor to ceiling height)

			Glass	MSW	Biosolids	Checksum
Biosolids building	30,000	SF			30,000	
Existing building	103,000	SF*		103,000		
Less non-MSW-processing in existing building will use existing lighting	-66,000	SF*		-66,000		
Proposed MSW tipping building	50,000	SF		50,000		
TOTAL HIGH BAY AREA	117,000	SF		87,000	30,000	117,000
High Bay Lighting Density	1.23	W/SF		1.23	1.23	
High Bay Lighting Requirement	143,910	W		107,010	36,900	143,910

* Note 37,000 SF of the existing building will be for MSW processing and new lighting will be provided in this area. 103,000 SF less 37,000 SF equals 66,000 SF.

C. Sum of All New Lighting Requirements

			Glass	MSW	Biosolids	Checksum
Low bay lighting requirement	32,725	W	32,725			32,725
High bay lighting requirement	143,910	W		107,010	36,900	143,910
TOTAL NEW LIGHTING REQUIREMENT	**176,635**	**W**	32,725	107,010	36,900	176,635

II. Reduction Commitment

		Glass	MSW	Biosolids	Checksum
10	percent reduction commitment	10	10	10	
17,664	**W reduction commitment**	3,273	10,701	3,690	17,664

III. Annual Reduction

		Glass	MSW	Biosolids	Checksum
8,760	annual operating hours	8,760	8,760	8,760	
155	**MWh/yr reduction commitment**	29	94	32	155

IV. Baseline vs Proposed

		Glass	MSW	Biosolids	Checksum
8,760	annual operating hours	8,760	8,760	8,760	
176,635	W baseline	32,725	107,010	36,900	176,635
1,547	MWh/yr baseline	287	937	323	1,547
158,972	W proposed	29,453	96,309	33,210	158,972
1,393	MWh/yr proposed	258	844	291	1,393
17,664	W reduction	3,273	10,701	3,690	17,664
155	MWh/yr reduction	29	94	32	155
		Glass	MSW	Biosolids	Checksum

Biosolids Building Heating Boiler
Comparative Boiler Efficiency Energy Savings

Originally specified boiler efficiency	85%	
Estimated annual natural gas consumption (energy input)	2,743	MMBtu/yr
Energy output	2,332	MMBtu/yr
Energy efficient condensing boiler efficiency	90%	
Estimated annual natural gas consumption (energy Input)	2,591	
Comparative energy savings	152	MMBtu/yr

Calculations:
Energy Output = (Energy Input) x (Originally Specified Boiler Efficiency)
Energy Input = (Energy Output) / (Energy Efficient Boiler Efficiency)
Comparative Energy Savings = (Originally Specified Energy Input) - (Energy Efficient Energy Input)

Preliminary PV Potential

CO_2 coversion [1]	726	lbs/MWh

[1] 2013 New England Electric Generator Air Emissions Report, Table1.1, 2013 value

Calculation:

Array size	3400	kW peak DC	
Annual generation	4542.7	MWh	(see PVWatts output)
Annual GHG reduction	1649.0	tons	

Parallel Products
Mobile Source Emissions Analysis

Truck Emissions

Daily Truck Traffic

209	Trucks In
209	Trucks Out

Temporal Data

365.0	days/yr
8	Average idle time per truck at Facility (in min) ASSUMED
2.1	Average idle time per vehicle offsite en route to Rte 140 (in min)

Trip Distribution

90%	to Rte 140 via Braley Rd.
10%	to Rte 140 via Phillips Rd.

Route Mileage

3.0	miles Round Trip to Rte 140 via Braley Rd.
4.5	miles Round Trip to Rte 140 via Phillips Rd.

Daily Truck VMT

1300.0	miles per day (weekdays only)

2025 Emission Factors (from MOVES for vehicle type: 62 - Combination Long-haul Truck)

	CO2E
0 mph	7621.920
25 mph	2093.350

Idling Emissions

	CO2E
g/day	269354
lb/day	593.83
tpy	108.37

Moving Emissions

	CO2E
g/day	2721313
lb/day	5999.50
tpy	1094.91

Total Emissions

	CO2E
lb/day	6593.33
tpy	1203.28

Parallel Products
Mobile Source Emissions Analysis

Employee Emissions

Daily Employee Traffic

75	Vehicles In
75	Vehicles Out

Temporal Data

365.0	days/yr
10	Average idle time per vehicle at Facility (in seconds) ASSUMED
128.7	Average idle time per vehicle offsite en route to Rte 140 (in seconds) From Synchro

Trip Distribution

90%	to Rte 140 via Braley Rd.
10%	to Rte 140 via Phillips Rd.

Route Mileage

3.0	miles Round Trip to Rte 140 via Braley Rd.
4.5	miles Round Trip to Rte 140 via Phillips Rd.

Daily Employee VMT

466.5	miles per day (weekdays only)

2025 Emission Factors (from MOVES for vehicle types: 11,21,31,32 - Motorcycles, Passenger Cars, & Other 2 axle-4 tire vehicles)

	CO2E
0 mph	2711.780
30 mph	298.251

Idling Emissions

	CO2E
g/day	7836.847
lb/day	17.277
tpy	3.153

Moving Emissions

	CO2E
g/day	139134.095
lb/day	306.740
tpy	55.980

Total Emissions

	CO2E
lb/day	324.02
tpy	59.13

Parallel Products
Mobile Source Emissions Analysis

Glass Processing Loader

Temporal Data

	365.0	days/yr

Assumed Caterpillar 926M Waste Handler Small Wheel Loader

	155	hp

Operating Schedule

	3	hrs/day

	CO_2e	
NONROAD (via MOVES) Emission Factor		
Tractors/Loaders/Backhoes	N/A	
Tier Standards		
Tier 3 Standards (100-175 hp)	N/A	
Tier 4 Standards (75-175 hp)	N/A	
AP-42 Table 3.3-1		
Diesel Fuel	521.63	grams/hp-hr

Emissions	CO_2e
g/day	242557.3
lb/day	534.75
TPY	97.59
over 24 hr work day (g/s)	2.80738

Parallel Products
Mobile Source Emissions Analysis

MSW Tipping/Processing Loaders

Temporal Data

365.0 days/yr

Assumed Two Caterpillar 966K Waste Handler Small Wheel Loader

267 hp

Operating Schedule

36 hrs/day

2 operating together 12 hrs per day and 1 operating alone the other 12 h

	CO_2e	
NONROAD (via MOVES) Emission Factor		
Tractors/Loaders/Backhoes	N/A	
Tier Standards		
Tier 3 Standards (175-300 hp)	N/A	
Tier 4 Standards (175-750 hp)	N/A	
AP-42 Table 3.3-1		
Diesel Fuel	521.63	grams/hp-hr

Emissions (per Loader)	CO_2e
g/day	5013893.1
lb/day	11053.80
TPY	2017.32
over 24 hr work day (g/s)	58.03117
10% to open doors	5.803117063
90% Split between 4 exhaust vents	13.05701339

Biosolids Processing - Ventilation VFD Savings (Non-Commitment)

Building Size 30,000 sf

		Baseline	Proposed
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr
Not Applicable		0	0
	subtotal	0	0
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr
Ventilation Loads		1,435	1,333
	subtotal	1,435	1,333

		Baseline	Proposed
ENERGY USE INDEX		kBtu/sf/yr	kBtu/sf/yr
		163.2	151.6
(compared to baseline)			-7%

		Baseline	Proposed
GHG EMISSIONS		tons/yr	tons/yr
Direct	Gas-burning	0	0
Indirect	Electricity	509	473
	Total	509	473
	Diff, tpy		-36
	Diff, % (compared to baseline)		-7.1%

CO_2 Emission Factors:

Electricity [1]	710	lb/MWh
Natural Gas [2]	117	lb/MMBtu

[1] 2016 ISO New England Electric Generator Air Emissions Report
[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

Biosolids Processing - Process VFD Savings (Non-Commitment)

Process Throughput 16,462 DT/yr

		Baseline	Proposed
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr
Not Applicable		0	0
	subtotal	0	0
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr
Process Loads		4,844	4,249
	subtotal	4,844	4,249
ENERGY USE INDEX		kBtu/DT	kBtu/DT
		1004.0	880.7
(compared to baseline)			**-12%**
GHG EMISSIONS		tons/yr	tons/yr
Direct	Gas-burning	0	0
Indirect	Electricity	1,720	1,508
	Total	1,720	1,508
	Diff, tpy		**-211**
	Diff, % (compared to baseline)		**-12.3%**

CO_2 Emission Factors:

Electricity [1]	710	lb/MWh
Natural Gas [2]	117	lb/MMBtu

[1] 2016 ISO New England Electric Generator Air Emissions Report

[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

VFD Energy Savings Estimates - Aggregate (Process & Ventilation)

Location	Process	Use Considered for GHG Analysis	Connected Electric Load (HP)	Electricity Use with VFDs (MWh/yr)	VFD?	Connected Load with VFD (%)	Connected Load without VFD (HP)	Electricity Use without VFDs (MWh/yr)	Process Savings (MWh/yr)	Ventilation Savings (MWh/yr)
Liquid Receiving & Storage	Tank Mixing	Process	20	131	No	--	--	131	0	0
	Conveyance Pumps	Process	50	327	Yes	80%	62.5	408	82	0
Dewatering	Dewatering Unit	Process	14.5	95	Yes	80%	18.1	118	24	0
	Polymer Tank Recirculation	Process	15	98	No	--	--	98	0	0
Cake Receiving & Storage	Live Bottoms	Process	50	327	No	--	--	327	0	0
	Conveyors	Process	60	392	No	--	--	392	0	0
Cake Mixing	Cake Mixing System	Process	50	327	No	--	--	327	0	0
	Screw Conveyor	Process	30	196	No	--	--	196	0	0
Drying	Dewatered Cake Conveyor	Process	10	65	No	--	--	65	0	0
	Dryer System	Process	225	1,470	Yes	75%	300	1,960	490	0
	Final Product Conveyance	Process	10	65	No	--	--	65	0	0
Odor Control - Scrubber	Fan	Ventilation	50	327	Yes	90%	55.6	363	0	37
	Recirculation Pump	Process	7.5	49	No	--	--	49	0	0
Odor Control - Ionization	Supply Fans	Ventilation	90	588	Yes	90%	100.0	653	0	65
	Exhaust Fans	Ventilation	30	196	No	--	--	196	0	0
SUBTOTAL			712	4,651				5,348	595	102
Factor of Safety	%		20%	20%						
			142	930				930	0	0
TOTAL (rounded)			854	5,581				6,278	595	102
kWh per DT				339				381	36	6

Basis: 45.1 DT/day sludge throughput, annual average
8,760 hrs/year operation

Notes:
-- Connected load and identification of motors controlled by VFDs from Hazen & Sawyer conceptual design report December 7, 2018
-- VFD savings shown as ranging from 75% to 90%, depending on motor application per Three Cities Research estimate
-- Connected load without VFD estimated as per the following example: (225 HP with VFD) / (75% VFD savings) = (300 HP without VFD)

VFD Energy Savings Estimates - Process Loads Only

Location	Process	Use Considered for GHG Analysis	Connected Electric Load (HP)	Electricity Use with VFDs (MWh/yr)	VFD?	Connected Load with VFD (%)	Connected Load without VFD (HP)	Electricity Use without VFDs (MWh/yr)	Process Savings (MWh/yr)
Liquid Receiving & Storage	Tank Mixing	Process	20	131	No	--	--	131	0
	Conveyance Pumps	Process	50	327	Yes	80%	62.5	408	82
Dewatering	Dewatering Unit	Process	14.5	95	Yes	80%	18.1	118	24
	Polymer Tank Recirculation	Process	15	98	No	--	--	98	0
Cake Receiving & Storage	Live Bottoms	Process	50	327	No	--	--	327	0
	Conveyors	Process	60	392	No	--	--	392	0
Cake Mixing	Cake Mixing System	Process	50	327	No	--	--	327	0
	Screw Conveyor	Process	30	196	No	--	--	196	0
Drying	Dewatered Cake Conveyor	Process	10	65	No	--	--	65	0
	Dryer System	Process	225	1,470	Yes	75%	300	1,960	490
	Final Product Conveyance	Process	10	65	No	--	--	65	0
Odor Control - Scrubber	Fan	Ventilation	50	0	Yes	90%	55.6	0	0
	Recirculation Pump	Process	7.5	49	No	--	--	49	0
Odor Control - Ionization	Supply Fans	Ventilation	90	0	Yes	90%	100.0	0	0
	Exhaust Fans	Ventilation	30	0	No	--	--	0	0
SUBTOTAL			712	3,541				4,136	595
Factor of Safety	%		20%	20%					
			142	708				708	0
TOTAL (rounded)			854	4,249				4,844	595
kWh per DT				258				294	36

Basis: 45.1 DT/day sludge throughput, annual average
8,760 hrs/year operation

Notes:
-- Connected load and identification of motors controlled by VFDs from Hazen & Sawyer conceptual design report December 7, 2018
-- VFD savings shown as ranging from 75% to 90%, depending on motor application per Three Cities Research estimate
-- Connected load without VFD estimated as per the following example: (225 HP with VFD) / (75% VFD savings) = (300 HP without VFD)

VFD Energy Savings Estimates - Ventilation Loads Only

Location	Process	Use Considered for GHG Analysis	Connected Electric Load (HP)	Electricity Use with VFDs (MWh/yr)	VFD?	Connected Load with VFD (%)	Connected Load without VFD (HP)	Electricity Use without VFDs (MWh/yr)	Ventilation Savings (MWh/yr)
Liquid Receiving & Storage	Tank Mixing	Process	20	0	No	--	--	0	0
	Conveyance Pumps	Process	50	0	Yes	80%	62.5	0	0
Dewatering	Dewatering Unit	Process	14.5	0	Yes	80%	18.1	0	0
	Polymer Tank Recirculation	Process	15	0	No	--	--	0	0
Cake Receiving & Storage	Live Bottoms	Process	50	0	No	--	--	0	0
	Conveyors	Process	60	0	No	--	--	0	0
Cake Mixing	Cake Mixing System	Process	50	0	No	--	--	0	0
	Screw Conveyor	Process	30	0	No	--	--	0	0
Drying	Dewatered Cake Conveyor	Process	10	0	No	--	--	0	0
	Dryer System	Process	225	0	Yes	75%	300	0	0
	Final Product Conveyance	Process	10	0	No	--	--	0	0
Odor Control - Scrubber	Fan	Ventilation	50	327	Yes	90%	55.6	363	37
	Recirculation Pump	Process	7.5	0	No	--	--	0	0
Odor Control - Ionization	Supply Fans	Ventilation	90	588	Yes	90%	100.0	653	65
	Exhaust Fans	Ventilation	30	196	No	--	--	196	0
SUBTOTAL			712	1,110				1,212	102
Factor of Safety	%		20%	20%					
			142	222				222	0
TOTAL (rounded)			854	1,333				1,435	102
kWh per DT				81				87	6

Basis: 45.1 DT/day sludge throughput, annual average
8,760 hrs/year operation

Notes:
-- Connected load and identification of motors controlled by VFDs from Hazen & Sawyer conceptual design report December 7, 2018
-- VFD savings shown as ranging from 75% to 90%, depending on motor application per Three Cities Research estimate
-- Connected load without VFD estimated as per the following example: (225 HP with VFD) / (75% VFD savings) = (300 HP without VFD)

Biosolids Processing Dryer Technology Savings (Non-Commitment)

Process Throughput 16,462 DT/yr

		Baseline	Proposed
DIRECT (NATURAL GAS)		MMBtu/yr	MMBtu/yr
Dryer Heating Load		136,365	95,456
	subtotal	136,365	95,456
INDIRECT (ELECTRICITY)		MWh/yr	MWh/yr
Not applicable		0	0
	subtotal	0	0
ENERGY USE INDEX		kBtu/DT	kBtu/DT
		8283.9	5798.7
(compared to baseline)			**-30%**
GHG EMISSIONS		tons/yr	tons/yr
Direct	Gas-burning	7,977	5,584
Indirect	Electricity	0	0
	Total	7,977	5,584
	Diff, tpy		**-2,393**
	Diff, % (compared to baseline)		**-30.0%**

CO_2 Emission Factors:

Electricity [1]	710	lb/MWh
Natural Gas [2]	117	lb/MMBtu

[1] 2016 ISO New England Electric Generator Air Emissions Report

[2] EIA Fuel Emissions Factors, Weighted National Average (1029 Btu/scf)

Vacuum Biosolids Dryer Claimed Savings

1,500	Btu/lb of water evaporated - typical biosolids dryer energy consumption
1,050	Btu/lb of water evaporated - vendor claim (drying under vacuum)
30%	reduction in energy use claimed = (1,500 - 1,050) / (1,500) x 100
136,365	MMBtu/yr - typical biosolids dryer energy consumption given project design throughput
40,910	**MMBtu/yr reduction in project energy use for biosolids drying = (136,365 MMBtu/yr) x (30%)**
95,456	MMBtu/yr - biosolids dryer energy consumption if vendor claims are accurate

Attachment B

Parallel Products Solar Initiative

OUR CLEAN POWER INITIATIVE

PARALLEL PRODUCTS

Parallel Products is North America's leader in unsaleable Beverage Destruction and Recycling, helping our customers manage waste in an environmentally conscious manner. And the same holds true for our own operations, which consume high volumes of power that we are now offsetting by integrating self-generated, clean renewable solar power into our facilities. In our New Bedford, MA facilities we've installed over 2 megawatts (MW) of solar and we're still going!

Rooftops	**Carports**	**…and Coming Soon!**
		

Parallel Products – Processing & Recycling Facility

Duchaine Blvd, New Bedford, MA

1567kW

Solar Rooftop

& Carport System

In just 18 months, the amount of clean energy produced by this system has an environmental benefit equivalent of saving: **542,806 gallons of water used by coal fired power plants and planting 19,195 trees**

Ballasted Solar Rooftop System:	**649.90 kW DC**
Solar Carport System:	**917.15 kW DC**
Expected Annual Production:	**Roof: 814,700 kWh Carport: 1,054,700 kWh**
Total Annual Power Offset:	**1.9 MWh estimated annually**

Additional Facilities – Environmentally Sustainable Operations

61 John Vertente Blvd, New Bedford, MA

497kW

Rooftop System

In the first 6 months, the amount of clean energy produced by this system has an environmental benefit equivalent of saving: **126,913 gallons of water used by coal fired power plants and planting 4,488 trees**

Ballasted Solar Rooftop System:	**497.25 kW DC**
Total Annual Power Offset:	**571,800 kWh estimated annually**

More Solar Carports Coming Soon!

Plans are underway for an additional 1940.25kW of solar to be added to our recycling facility to produce over 2MW hours of additional clean power annually.

Conceptual Design
Courtesy of Beaumont Solar Co.

Blue: Indicates new solar
Gray: Indicates existing

APPENDIX D

AIR/ODOR AND NOISE CALCULATION REPORTS

Massachusetts Environmental Policy Act
Sound Level Assessment Report

Parallel Products of New England
New Bedford, Massachusetts

Submitted to:
PARALLEL PRODUCTS OF NEW ENGLAND, INC.
100 Duchaine Boulevard
New Bedford, MA 02745

PARALLEL PRODUCTS

Submitted by:
EPSILON ASSOCIATES, INC.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

Epsilon ASSOCIATES INC.

February 7, 2019

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

1.0 EXECUTIVE SUMMARY

Parallel Products of New England, Inc. (PPNE) is proposing to construct a glass handling, municipal solids waste (MSW) processing and C&D handling, and biosolids processing facility (the Project) to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts. Epsilon Associates, Inc. (Epsilon) has been retained by PPNE to conduct a sound level assessment for this Project. Existing condition sound levels were measured around the site, an operational sound level modeling analysis was conducted for the major sound producing elements of the Project, and noise controls necessary to meet the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Noise Policy were implemented and are discussed in this analysis.

Existing condition sound levels were measured for seven days at two locations on the site. Two supplemental short-term measurements were also performed at additional locations near the site. The 7-day average sound level using the lowest hourly L_{90} sound level measured during each daytime and nighttime period of the program was used to establish a daytime and nighttime background at each location.

Since operations will vary between the day and night, sound level modeling was conducted for a “daytime” and “nighttime” scenario. Mitigation was applied to several of the sound sources including use of an electric rail car mover, fan silencers, a stack silencer, and a noise barrier wall. With the noise mitigation measures described in this report, or equivalent design changes, the proposed Project will meet the requirements set forth in the MassDEP Noise Policy at residential locations.

2.0 INTRODUCTION

Parallel Products of New England, Inc. (PPNE) is proposing to construct a glass handling, municipal solids waste (MSW) processing and C&D handling, and biosolids processing facility (the Project) to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts. The project will be implemented in sequential phases. The glass handling will be implemented as Phase 1. The MSW and biosolids processing will be implemented as Phase 2. The sound level evaluation is for both Phase 1 and Phase 2 operations.

The glass handling operation will recycle the used glass containers that are collected through the Massachusetts deposit system. Bottles collected will be processed such that the glass can be reused to produce new glass containers. Processing at the site will include crushing, sizing and separation of the glass by color. The cullet produced is then sold to glass manufacturers. To facilitate the shipment of recycled glass by rail, the Proponent will construct a rail sidetrack from the existing rail line adjacent to the project site.

A new MSW tipping building will be constructed at the site, with a capacity to accept up to 1,500 tons per day of MSW delivered to the facility by truck. The tipping building is expected to be approximately 50,000 square feet in floor area and will connect with an existing 103,000 SF building. The tipping building will be designed to allow waste delivery trucks to drive into the building to dump loads of waste material for processing. Front-end loaders will load the MSW into a feed hopper for the MSW processing equipment. The existing building on site adjacent to the proposed tipping building will be used for the processing of MSW. The existing building will be modified as required to house the MSW processing equipment used to extract approximately 20% of recyclable material from MSW received. This existing building will also include a baler to bale and shrink wrap MSW after processing to remove recyclable materials. The baled, non-recyclable fraction of the MSW will be loaded in rail cars for shipment to out-of-state disposal sites, along with construction and demolition (C&D) residuals and bulky waste.

A processing facility will be built to dry biosolids to Class A specifications. Biosolids accepted will consist of thickened wet slurry biosolids with a solids content ranging from 5-10% and biosolids cake with a solids content ranging from 15-30%. The facility will initially utilize natural gas to dry the biosolids. PPNE may opt to add gasification equipment to produce synthesis gas from dried biosolids at a future date. The gasification process would include a gasifier to produce synthesis gas and a thermal oxidizer to recover heat energy for use in the drying process. Addition of gasification equipment would reduce or eliminate the need for natural gas for drying biosolids. Appropriate emissions control equipment would be installed on the gasification process. Gasification is not included in the current project.

The Project design details may be modified as they are refined through the permitting process.

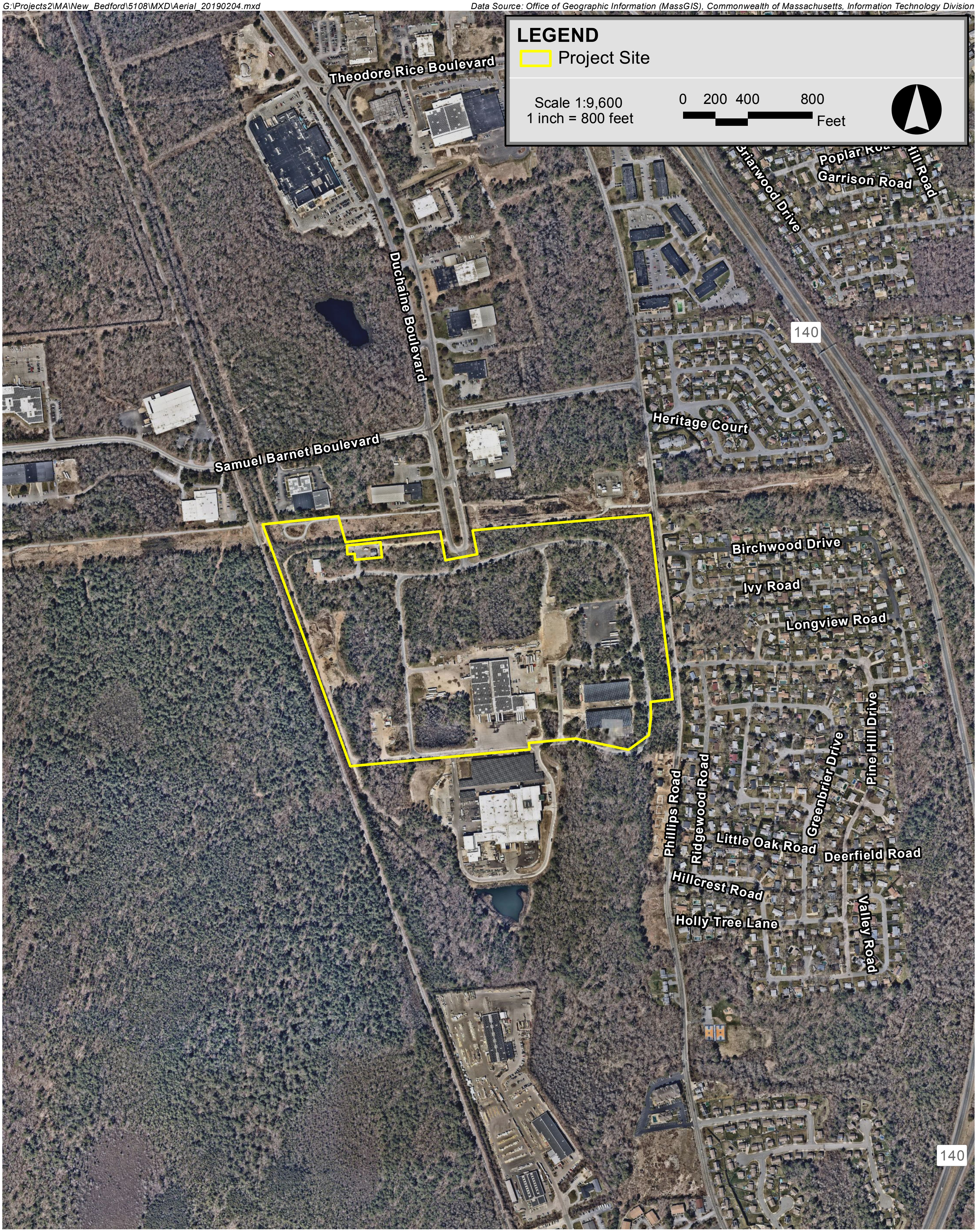
The following describes the outdoor ventilation, process equipment and other notable equipment associated with the Project that were included in the sound study:

- Rooftop exhaust fans on MSW Building, Glass Processing Building, and Biosolids Building;
- Biosolids exhaust stack;
- Biosolids makeup air fan;
- Cooling towers at Biosolids Building;
- Front-end loader and tipping operations inside open garage door bays of MSW Building;
- Front-end loader operating outside Glass Processing Building (daytime only)

This report provides a description of the applicable noise policy requirements, a brief explanation of noise terminology, a summary of the results of an ambient sound level monitoring program, and a discussion of the sound level modeling analysis for the proposed Project. Noise control options are discussed in order to meet the requirements of the MassDEP Noise Policy at residential locations.

G:\Projects2\MA\New_Bedford\5108\MXD\Aerial_20190204.mxd

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division



Parallel Products **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

Figure 2-1

Aerial Locus Map

3.0 SOUND METRICS

There are several ways in which sound levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The following information defines the sound level terminology used in this analysis.

The decibel scale is logarithmic to accommodate the wide range of sound intensities found in the environment. A property of the decibel scale is that the sound pressure levels of two or more separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a 3-decibel increase (53 dB), which is equal to doubling in sound energy but not equal to a doubling in decibel quantity (100 dB). Thus, every 3-dB change in sound level represents a doubling or halving of sound energy. Relative to this characteristic, a change in sound levels of less than 3 dB is imperceptible to the human ear.

Another mathematical property of decibels is that if one source of sound is at least 10 dB louder than another source, then the total sound level is simply the sound level of the higher-level source. For example, a sound source at 60 dB plus another sound source at 47 dB is equal to 60 dB.

A sound level meter (SLM) that is used to measure sound is a standardized instrument.[1] It contains "weighting networks" (e.g., A-, C-, Z-weightings) to adjust the frequency response of the instrument. Frequencies, reported in Hertz (Hz), are detailed characterizations of sounds, often addressed in musical terms as "pitch" or "tone". The most commonly used weighting network is the A-weighting because it most closely approximates how the human ear responds to sound at various frequencies. The A-weighting network is the accepted scale used for community sound level measurements; therefore, sounds are frequently reported as detected with a sound level meter using this weighting. A-weighted sound levels emphasize middle frequency sounds (i.e., middle pitched – around 1,000 Hz), and de-emphasize low and high frequency sounds. These sound levels are reported in decibels designated as "dBA". Z-weighted sound levels are measured sound levels without any weighting curve and are otherwise referred to as "unweighted". Sound pressure levels for some common indoor and outdoor environments are shown in Figure 3-1.

Because the sounds in our environment vary with time they cannot simply be described with a single number. Two methods are used for describing variable sounds. These are exceedance levels and the equivalent level, both of which are derived from a large number of moment-to-moment A-weighted sound level measurements. Exceedance levels are values

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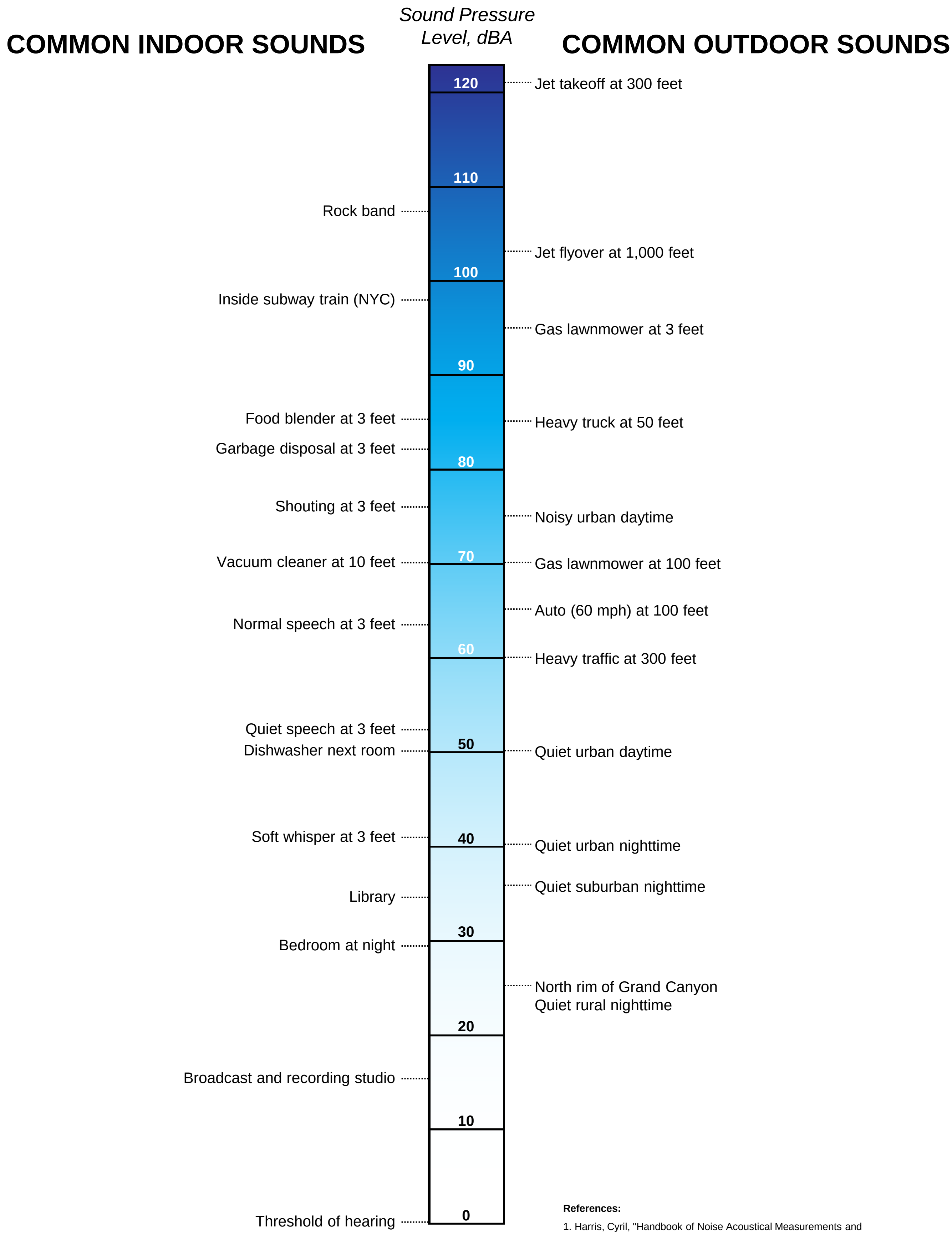
1 *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983 (R2006), published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

from the cumulative amplitude distribution of all of the sound levels observed during a measurement period. Exceedance levels are designated L_n, where n can have a value between 0 and 100 in terms of percentage. Two sound level metrics that are reported in community sound monitoring are described below.

- L_{90} is the sound level exceeded 90 percent of the time during the measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent sound sources. The L_{90} level is used to establish the "ambient" or "background" sound level as part of the MassDEP Noise Policy.

- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (*i.e.,* the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is typically A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with linear mean square sound pressure values, the L_{eq} is mostly determined by loud sounds if there are fluctuating sound levels.



References:

1. Harris, Cyril, "Handbook of Noise Acoustical Measurements and Noise Control", p 1-10., 1998
2. "Controlling Noise", USAF, AFMC, AFDTC, Elgin AFB, Fact Sheet, August 1996
3. California Dept. of Trans., "Technical Noise Supplement", Oct, 1998

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Figure 3-1

Common Indoor and Outdoor Sound Levels

4.0 NOISE REGULATIONS

4.1 Federal Regulations

There are no federal community noise regulations applicable to this Project.

4.2 Massachusetts State Regulations

The Massachusetts Department of Environmental Protection (MassDEP) has the authority to regulate noise under 310 CMR 7.10, which is part of the Commonwealth's air pollution control regulations. Under MassDEP regulations, noise is considered to be an air contaminant and, thus, 310 CMR 7.10 prohibits "unnecessary emissions" of noise.

The MassDEP administers this regulation through its Noise Policy DAQC 90-001, dated February 1, 1990. The Noise Policy limits a source to a 10-dBA increase above the ambient sound measured (the L_{90} sound level) at the property line for the site and at the nearest residences. According to the MassDEP, "Noise levels that exceed the criteria at the source's property line by themselves do not necessarily result in a violation or a condition of air pollution under MassDEP regulations (see 310 CMR 7.10). The agency also considers the effect of noise on the nearest occupied residence and/or building housing sensitive receptors".[2] In addition, "...[a] new noise source that would be located in an area in which housing or buildings containing other sensitive receptors could be developed in the future may be required to mitigate its noise impact in these areas."[2]

MassDEP's Noise Policy further prohibits "pure tone" conditions where the sound pressure level in one octave band is 3 dB or more than the sound levels in each of the two adjacent octave bands. A qualitative example of a source emitting a "pure tone" is a fan with a bad bearing that is producing an objectionable squealing sound.

4.3 Local Regulations

There are no local quantitative noise regulations applicable to this Project.

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[2] Energy and Environmental Affairs. *Noise Pollution Policy Interpretation / MassDEP*. http://www.mass.gov/eea/agencies/massdep/air/programs/noise-pollution-policy-interpretation.html. Accessed October 2016.

5.0 EXISTING SOUND LEVELS

The Project is to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts. The property is bordered by residential neighborhoods to the northeast, east and southeast, with a new residential development along the immediate southeast property line. To the north, west and south, the property is bordered by industrial/commercial properties. The site currently consists of one industrial building and several surface parking lots.

5.1 Baseline Sound Environment

An existing sound level survey was conducted during the daytime and nighttime hours to characterize the existing "baseline" acoustical environment in the vicinity of the site. Two long-term continuous sound level monitoring stations were deployed for 7-days to:

1. Establish representative A-weighted broadband ambient sound pressure levels, for evaluating requirements of the MassDEP policy limit of a 10 dBA increase due to the proposed Project; and

2. Establish representative octave-band ambient sound pressure levels to identify any existing "pure tones," as defined by MassDEP, and evaluate whether the addition of modeled sound levels from the proposed Project to these background sound levels may introduce or exacerbate existing "pure tones" in the community.

Only measurement periods during, or affected by, precipitation were excluded from the analysis. This approach is consistent with ANSI Standard S12.18-1994 (R2009).

In addition, two short-term (spot) sound level measurements were performed at two locations near the site. These measurements took place during the daytime and nighttime in residential areas that extended further away from the Project site. Daytime measurements were conducted between 10 AM and 3 PM to avoid influence from local commuter traffic. Nighttime measurements occurred between 12 AM and 3 AM to capture the quietest portion of the night. The short-term monitoring intervals were 20 minutes in duration.

5.2 Sound Level Measurement Locations

The selection of the sound level measurement locations was based upon a review of aerial photography and online resources. No schools, hospitals, or similar sensitive receptors were found near the Project area. Nearby residences were identified and accounted for in selecting proposed monitoring locations. The measurement program consisted of two (2) long-term continuous measurement locations and two (2) short-term (spot) measurement locations. The measurement locations are representative of the ambient baseline sound level environment around the Project. Coordinates of the monitoring locations are presented in Table 5-1. These measurements locations are depicted in Figure 5-1, and are described below.

- **Location CM1** is located near the Project property line immediately southeast of the Project. This location is representative of the newly built residences located next to the property line and immediately west of Phillips Road. This is also representative of all the residences that lie to the east of Phillips Road. Continuous hourly one-third octave-band and broadband sound level data was collected at this location. Noise sources at this location include on-site vehicle traffic and distant noise from Eversource, immediately south of the Project site. Vehicle traffic along Phillips Road, birds, insects and planes overhead were also all observed at this location.

- **Location CM2** is located near the Project property line immediately northwest of the Project. This location is representative of the industrial properties to the north, west and south of the Project. Continuous hourly one-third octave-band and broadband sound level data was collected at this location. Noise sources at this location included nearby noise from Farland Corp. and work that Eversource was carrying out nearby. Distant vehicle traffic, birds, insects and planes overhead were also observed at this location.

- **Location RML3** is located to the northeast of the Project at the intersection of Industrial Park Road and Phillips Road. This location is representative of all the residences to the northeast of the Project, that are east of Phillips Road and back nearby Heritage Drive. One-third octave-band and broadband sound level data were collected for 20 minutes in duration, during the daytime and nighttime at this location. Noise sources at this location included frequent vehicle traffic along Phillips Road and Industrial Park Road. Rustling vegetation, birds, insects and planes overhead were also all observed at this location.

- **Location RML4** is located to the southeast of the Project at the entrance to the City of New Bedford Pine Hill Park on Phillips Road. This location is representative of the park and all the residences to the southeast of the Project, that are to the west and east of Phillips Road. One-third octave-band and broadband sound level data was collected for 20 minutes in duration, during the daytime and nighttime at this location. Noise sources at this location included frequent vehicle traffic along Phillips Road and those entering and leaving the park. Rustling vegetation, children playing at the park, birds, insects and planes overhead were also all observed at this location.

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Figure 5-1
Sound Level Monitoring Locations

Figure 5-2 Photo of Sound Level Measurement Location CM1 (facing southeast)

Figure 5-3 Photo of Sound Level Measurement Location CM2 (facing north)

Figure 5-4 Photo of Sound Level Measurement Location RML3 (facing north)

Figure 5-5 Photo of Sound Level Measurement Location RML4 (facing southwest)

Table 5-1 GPS Coordinates –Sound Level Measurement Locations

Location	Coordinates (UTM-19N NAD83)	
	Easting (m)	Northing (m)
CM1	337911.14	4619989.37
CM2	337280.48	4620296.25
RML3	337911.89	4620634.82
RML4	337994.24	4619457.17

5.3 Measurement Methodology

A comprehensive sound level measurement program was developed to quantify the ambient sound levels around the Project. Continuous A-weighted and octave-band measurements (24 hours/day) were made concurrently at two locations over approximately a one-week period from Tuesday, June 26, 2018 through Tuesday, July 3, 2018. The long-term monitors were generally unattended, with personal observations made by a field technician during deployment, a nighttime site visit, and demobilization. Meteorological data was collected concurrently nearby, only three miles to the south at the New Bedford Regional Airport National Weather Service (NWS) station provided by the National Centers for Environmental Information (NCEI), for the duration of the measurement program. All sound level data and meteorological data collected during the program are included in the ambient analysis and presented in this report.

Two short-term (spot) sound level measurements occurred in addition, at two locations near the site. These measurements took place during the daytime and nighttime in residential areas that extended further away from the Project site to the northeast and southeast. Daytime measurements were conducted between 2 PM and 3 PM to avoid influence from local commuter traffic. Nighttime measurements occurred between 12 AM and 1:30 AM to capture the quietest portion of the night. The short-term monitoring intervals were 20 minutes in duration. The measurements were made under low wind conditions, no precipitation, and dry roadway surfaces. Each measurement was attended by Epsilon field personnel.

5.4 Measurement Equipment

Two Larson Davis (LD) Model 831 integrating sound level meters, tripod-mounted at a height of approximately five feet (1.5 meters) above ground level and fitted with the manufacturer's environmental windscreen, were used to collect continuous background sound pressure level data. An additional Larson Davis (LD) Model 831 integrating sound level meter was used with respect to the short-term ("spot") measurements. Both continuous background meters, were connected to a microphone via an extension cable and housed in an environmental suitcase, that was programmed to log statistical A-weighted broadband and unweighted octave-band sound level data (L_1, L_{10}, L_{50}, L_{90}, L_{max}, and L_{eq}) over one-hour intervals with a one-minute time history. The short-term ("spot") sound level meter was tripod-mounted at a height of five feet (1.5 meters) above ground level (AGL) with a fitted manufacturer's environmental windscreen. Capable of data logging, this short-term meter was programmed to log statistical data for each 20-minute sampling period and a one-minute time history, with the following parameters: L_1, L_{10}, L_{50}, L_{90}, L_{max}, and L_{eq}.

All sound monitoring instrumentation met the "Type 1 - Precision" requirements set forth in ANSI S1.4-1983 as specified in the ANSI S12.18-1994 methodology as well as those in ANSI S1.11-2004 (octave filter standard) for acoustical measuring devices.

5.5 Baseline Ambient Sound Levels

The ambient sound level environment consists primarily of nearby vehicle traffic from Phillips Road, traffic on Route 140 and other roadways, nearby industrial work/construction noise during the daytime, children playing at the park, rustling vegetation, occasional aircraft, birds, and insects.

5.5.1 Short-term Sound Levels

Short-term sound levels were measured during the daytime on June 26, 2018 and the nighttime of July 3, 2018, respectively. A brief summary of the measurement results is presented herein.

The baseline sound level monitoring results are presented in Table 5-2 for the short-term ("spot") and are summarized below. A MassDEP-defined "pure tone" was measured at Location RML3 as part of the existing ambient environment. These are 20-minute sampling periods at each location with a one-minute time history, for both daytime and nighttime respectively. Weather conditions corresponding to the ambient measurements are displayed in Table 5-3.

- ♦ The daytime residual background (L_{90}) measurements for RML3 ranged from 47 to 62 dBA;
- ♦ The nighttime residual background (L_{90}) measurements for RML3 ranged from 42 to 48 dBA;
- ♦ The daytime residual background (L_{90}) measurements for RML4 ranged from 50 to 59 dBA;
- ♦ The nighttime residual background (L_{90}) measurements for RML4 ranged from 33 to 40 dBA.

Table 5-2 Summary of Baseline Short-Term Sound Level Measurements – June 26 & July 3, 2018

Period	Location	Date	Start Time	L_{eq}	L_{max}	L_{90}	L_{90} Sound Pressure Levels by Octave-Band Center Frequency (Hz)								
							31.5	63	125	250	500	1000	2000	4000	8000
				dBA	dBA	dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
Day	RML3	6/26/18	2:09 PM	67	86	52	58	56	53	47	46	48	45	37	30
	RML4	6/26/18	2:34 PM	63	77	53	62	58	54	50	48	49	45	39	33
Night	RML3	7/3/18	12:11 AM	52	66	48	54	49	46	41	36	32	25	46[1]	21
	RML4	7/3/18	12:43 AM	50	67	35	47	46	41	32	32	30	22	20	19

Notes:

1. Measured existing "pure tone," likely due to insects.

Table 5-3 Baseline Measurement Weather Conditions – June 26 & July 3, 2018

	Date	Temp[1]	RH[1]	Sky[1]	Wind[1]
Day	Tuesday, June 26, 2018	76 °F	30%	Clear	Calm
Night	Tuesday, July 3, 2018	69 °F	100%	Fair	Calm

Notes:

1. Observed by Epsilon personnel.

5.5.2 Long-term Sound Levels

Long-term sound levels were measured continuously from Tuesday, June 26, 2018 through Tuesday, July 3, 2018. A brief summary of the measurement results is presented herein.

Continuous 1-hour sampling periods at each location with a one-minute time history were measured at two locations. Daytime is defined as the operational hours between 7 AM and 10 PM. Nighttime is defined as the operational hours between 10 PM and 7 AM. Hourly A-weighted broadband sound pressure level data from the continuous ambient monitoring stations at locations CM1 & CM2 are presented in Appendix B. Periods of precipitation totaling approximately 16 hours as recorded at the nearby New Bedford Regional Airport National Weather Service (NWS) station, were excluded from the dataset. These precipitation periods are shown in Appendix C.

- The hourly daytime residual background (L_{90}) measurements for CM1 ranged from 38 to 53 dBA;
- The hourly nighttime residual background (L_{90}) measurements for CM1 ranged from 29 to 48 dBA;
- The hourly daytime residual background (L_{90}) measurements for CM2 ranged from 32 to 49 dBA;
- The hourly nighttime residual background (L_{90}) measurements for CM2 ranged from 29 to 43 dBA.

5.6 Establishment of Background Sound Levels

A-weighted broadband (dBA) and unweighted octave-band (dB) background sound levels used to evaluate the Project and requirements of the MassDEP Noise Policy are presented in Table 5-4.

As observed by the Epsilon field staff, sound levels at both locations during the measurements in the summer months of June & July were significantly affected by insect noise. Sound from insects likely affects the background in this area for many months of the year due to the forested landscape. During some periods of the year, sound from insects and birds will not be present (i.e., winter); therefore, to more closely replicate sound levels observed at the same monitoring locations during these periods ("quiet seasons"), a high-frequency natural sound (HFNS) filter was applied to the measured one-third octave-band data from which a new broadband sound level was calculated. This technique removes all sound energy above the 1,250 Hertz frequency band. The methodology for the filtration process was as specified in ANSI/ASA S12.100-2014 and the sound pressure levels presented in this report using this methodology are indicated as ANS-weighted levels (presented in dBA).

At Locations CM1 and CM2 the daily lowest ANS-weighted daytime and lowest ANS-weighted nighttime L_{90} sound levels were averaged to determine the representative background sound level at each location. These representative background levels were used to evaluate sound level increases at each location.

Epsilon reviewed the short-term sound level monitoring results and determined that those sound levels were higher than the representative average lowest background levels from the long-term locations. Therefore, the representative average ANS-weighted L_{90} sound levels measured at the long term locations were conservatively used at all locations to evaluate sound level increases.

Table 5-4 Summary of Average Daytime[1] & Nighttime[2] Ambient L_{90} Sound Level Measurements

Period	Location	Representative ANS L_{90}[3]	Date	Start Time	Measured L_{90}	L_{90}[4] Sound Pressure Levels by Octave-Band Center Frequency (Hz)								
						31.5	63	125	250	500	1000	2000	4000	8000
		dBA			dBA	dB	dB	dB	dB	dB	dB	dB	dB	dB
Day	CM1	41	6/30/18	2:00 PM	41	54	53	39	37	37	36	31	25	21
	CM2	35	6/30/18	10:00 AM	35	50	43	35	35	32	28	22	21	19
Night	CM1	34	7/3/18	4:00 AM	34	48	45	37	35	31	27	22	19	19
	CM2	33	7/2/18	1:00 AM	33	51	41	34	36	31	25	18	**22**[5]	19

Notes:

1. 'Daytime' defined to be between the hours of 7AM and 10PM.
2. 'Nighttime' defined to be between the operational hours of 10PM and 7AM.
3. Representative broadband ANS-weighted L_{90} (dBA) is the average of the daily lowest ANS-weighted daytime and lowest ANS-weighted nighttime L_{90} sound levels.
4. Measured octave-band values correspond to an hourly period that matches the average ANS-weighted L_{90} sound level for both daytime and nighttime.
5. Measured existing "pure tone," likely due to insects.

6.0 MODELED SOUND LEVELS

6.1 Overview of Proposed Project Sound Sources and Controls

The proposed Project and majority of the associated on-site equipment are expected to operate 24 hours/day and 7 days per week, with the exception of an outdoor front-end loader which will operate near the Glass Processing Building only during daytime hours (7 AM to 10 PM).

At this stage of the Project, key components for the facility have been selected, however some equipment selection may be refined as the design process progresses. Reference sound level data used in the noise model includes vendor data, as well as representative data from sound level measurements of a similar facility or equipment where no data are provided by the manufacturer.

6.1.1 Proposed Sound Sources

The primary sources of sound from the Project include MSW and C&D tipping and handling, ventilation equipment, an outdoor (daytime only) front-end loader at the Glass Processing Building, process ventilation equipment at the Biosolids Building, and four cooling towers. A tabular summary of the modeled mechanical equipment proposed for the Project is presented in Table 6-1 and are further described herein.

MSW Building

A front-end loader will be located inside the western end of the new MSW Building (the tipping area) and will move MSW into a feed hopper for transfer to the existing building which will be used for processing of the MSW. The tipping/dumping of materials onto the new MSW Building floor and subsequent scooping and movement of the materials by the front-end loader will produce sound through three open garage door bays. For the purpose of conservative modeling, the doors are considered to be open at all times, although this is not the case in practice. Sound pressure levels at a reference distance of this activity were measured by Epsilon at a similar facility and used to calculate a sound power level entered into the acoustic model. The calculated sound power levels for this source are presented in Table 6-2.

Based on the current conceptual design, the new and existing MSW Buildings will also have seven (7) exhaust fans located on the rooftop. These fans each have a capacity of 24,000 CFM, and sound power levels of the New York Blower (NYB) unit used in the acoustic model are presented in Table 6-2.

Glass Processing Building

A front-end loader will be located outside the Glass Processing Building and may operate in areas to the north and east of the Building. This front-end loader will be limited to daytime use only. Epsilon visited the site on January 10, 2019 and collected reference sound levels from the exact unit. From these sound pressure levels, a sound power level was calculated and entered into the acoustic model. The Glass Processing Building will also have a rooftop exhaust fan, based on the current conceptual design. The acoustic model assumed the same model and size fan used for the MSW Building. The sound power levels used for modeling are presented in Table 6-2.

Biosolids Building

Sound sources associated with the Biosolids Building include two exhaust fans, a makeup air fan located at ground level, a scrubber exhaust stack, and four cooling towers. The exhaust fans are located on the building rooftop, and all other equipment is located on the western side of the building, in order to shield the residential neighborhood to the east. Sound power levels of the rooftop fans and makeup air fan and sound pressure levels of the cooling towers were provided by the representative manufacturer and are presented in Table 6-1.

6.1.2 Summary of Noise Controls

In order to keep site sound levels at a minimum, the Project plans to make use of an electric rail car pusher to move railway cars stored on-site.

The exhaust fans on the Biosolids building will be fitted with fan silencers as described in Table 6-3, or low noise fans capable of achieving the same resulting sound level may be utilized.

The scrubber stack located west of the Biosolids building will be fitted with a silencer as described in Table 6-3, or a lower noise unit capable of achieving the same resulting sound level as the silenced stack may be utilized.

A 50-foot long 15-foot tall sound barrier wall will be included along the southern edge of the Biosolids building as showing in Figure 6-1. The purpose of this wall is to shield the residential area to the southeast of the site from sound generated by the cooling towers. In lieu of a sound barrier wall, quieter cooling towers may be utilized.

Table 6-1 Modeled Noise Sources

Noise Source	Manufacturer/ Model	Quantity	Approximate Location	Size/Capacity
General Rooftop Exhaust Fan	New York Blower	8	MSW & Glass Processing rooftops	24,000 cfm
Biosolids Exhaust Fan	Cook 365UCIC	2	New Biosolids Building roof	25,000 cfm
Scrubber Stack Exhaust	Hartzell	1	On the west side the new Biosolids Building	40 ft stack
Cooling Tower	CTS T-2400	4	Ground level west of the new Biosolids Building	91,030 cfm
Makeup Air Fan	Governair ITF-RDH0	1	Ground level west of the new Biosolids Building	47,500 cfm
MSW Tipping and Loading	NA	1	Open garage door bays, west side of new MSW Building	NA
Front-end Loader	CAT 924G	1	East side of Glass Processing Building	NA

Table 6-2 Modeled Sound Power Levels per Noise Source

Noise Source	Broadband (dBA)	Sound Level (dB) per Octave-Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
General Rooftop Exhaust Fan	93	98	98	95	95	92	88	82	74	68
Biosolids Exhaust Fan	94	97	97	99	94	90	90	84	75	68
Scrubber Stack Exhaust	100[1]	79	79	92	96	98	96	92	86	77
Cooling Tower	99[2]	103	103	102	100	96	94	90	86	83
Makeup Air Fan	101	93	93	90	99	100	95	94	89	86
MSW Tipping and Loading	110[3]	107	109	107	107	105	106	102	99	95
Front-end Loader	101[4]	104[5]	104	93	88	84	83	77	72	70

Notes:

1. Octave band data for biofilter stack not provided, octaves were estimated based on data from similar equipment.
2. Octave band data for cooling towers not provided, octaves were estimated based on data from similar equipment.
3. Epsilon measurements of similar operations at an existing facility.
4. Epsilon measurement of existing front-end loader on Project site.

Table 6-3 Sound Attenuation Applied to Specific Noise Sources

Noise Source	Form of Mitigation	Insertion Loss (dB) per Octave-Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
Biosolids Exhaust Fan	Fan Silencer[1]	4[2]	4	8	15	26	33	25	17	14
Scrubber Stack Exhaust	Silencer[3]	0[5]	6	13	26	40	19	14	13	13
Cooling Towers	Noise Barrier Wall	-	-	-	-	-	-	-	-	-

Notes:
1. Octave-band attenuation from Ruskin Sound Control Model XFA Acoustical Diffuser.
2. No data provided. Assumed level based on 63 Hz insertion loss.
3. Silex JB-24 octave-band insertion loss data.

6.2 Modeling Methodology

The noise impacts associated with the proposed Project were predicted using the CadnaA noise calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The benefits of this software are a refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. The CadnaA software allows for octave-band calculation of sound from multiple sources as well as computation of diffraction.

Inputs and significant parameters employed in the model are described below:

- *Site Plan:* The Site Plan dated December 19, 2018 provided the locations and dimensions of key inputs into the model. These drawings are included in this report as Attachment A.

- *Modeling Locations:* Sound level modeling was conducted at four residential locations RES-1 through RES-4. Residential modeling locations 1 through 4 are representative of the closest residential property lines to the northeast, east, and southeast of the Project. The four residential modeling locations are shown in Figure 6-1. All receptors were modeled with a height of 5 feet above ground level (AGL) to mimic the ears of a typical standing observer.

- A modeling grid with 20-meter spacing was calculated for the area surrounding the Project. The grid was modeled at a height of 1.5 meters above ground level (AGL) for consistency with the discrete modeling points. This modeling grid allowed for the creation of sound level isolines in order to model sound levels at the industrial property lines, in addition to the residential receptor locations.

- *Terrain Elevation:* Elevation contours for the modeling domain were directly imported into CadnaA which allowed for consideration of terrain shielding where appropriate. The project area is located within the "2011 LiDAR for the Northeast" LIDAR project area; digital elevation model (DEM) files are at 1-meter resolution. Contours at 2-meter intervals were generated from these DEMs using ESRI's Spatial Analyst extension for ArcGIS.

- *Source Sound Levels:* Broadband and octave-band sound power levels (when available) for the potential noise sources for the Project presented in Tables 6-2 were input in the model.

- *Meteorological Conditions:* A temperature of 10°C (50°F) and a relative humidity of 70% was assumed in the model.

- *Ground Attenuation:* Spectral ground absorption was calculated using a G-factor of 0 for the Project site which corresponds to "hard ground". For all other offsite areas, a G-factor of 0.5 was used which corresponds to "mixed ground".

- *Directivity:* A directivity correction was applied to the scrubber exhaust stack.

Sound pressure levels due to the operation of all equipment operating simultaneously at full load were modeled at the four (4) sound level modeling locations. This is a conservative modeling assumption which will result in higher predicted sound levels relative to various actual part-load and intermittent operation of some of the sources.

Several modeling assumptions inherent in the ISO 9613-2 calculation methodology, or selected as conditional inputs by the user, were implemented in the CadnaA model to ensure conservative results (i.e., higher sound levels), and are described below:

- As per ISO 9613-2, the model assumed favorable conditions for sound propagation, corresponding to a moderate, well-developed ground-based temperature inversion, as might occur on a calm, clear night or equivalently downwind propagation.

- Meteorological conditions assumed in the model (T = 10°C and RH = 70%) were selected to minimize atmospheric attenuation in the 500 Hz and 1 kHz octave-bands where the human ear is most sensitive.

- No additional attenuation due to tree shielding, air turbulence, or wind shadow effects was considered in the model.

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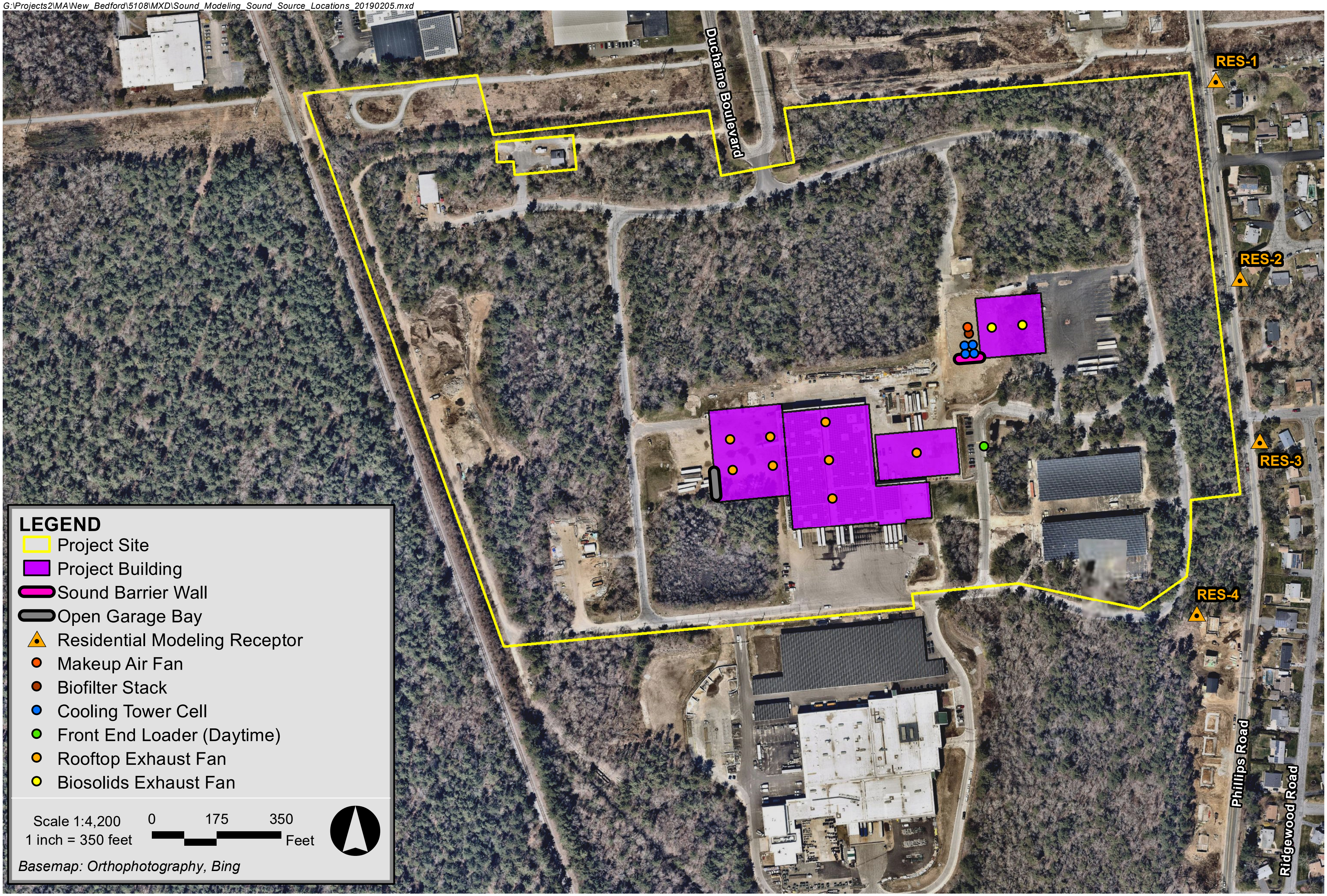

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Figure 6-1

Sound Level Modeling and Sound Source Locations

6.3 Sound Level Modeling Results

Table 6-4 shows the predicted daytime and nighttime "Project Only" broadband (dBA) sound levels at the discrete modeling points. The daytime sound levels are the result of all sources discussed in Section 6.1 operating simultaneously. The nighttime sound levels include all sources except the outdoor front-end loader in the Glass Processing area. These are exterior sound levels. Sound levels inside any receiving structure will be lower than shown in the table. In the residential areas, the predicted daytime Project Only sound levels range from 40 to 48 dBA, and the predicted nighttime Project Only sound levels range from 39 to 42 dBA. In the industrial areas, both the predicted daytime and the predicted nighttime Project Only sound levels are higher than those at the residential locations.

Table 6-4 CadnaA Discrete Point Sound Level Modeling Results

Modeling Location ID	Modeling Location Description	Daytime Project Only Sound Level[1] (dBA)	Nighttime Project Only Sound Level[1] (dBA)
RES-1	Residential property line immediately northeast of the Project	40	39
RES-2	Residential property line immediately east of the Project	46	40
RES-3	Residential property line immediately east of the Project	47	42
RES-4	Residential property line immediately southeast of the Project	48	40

Notes:

1. Sound pressure levels are rounded to the nearest whole decibel.

7.0 EVALUATION OF SOUND LEVELS

According to the MassDEP Noise Policy, a source cannot result in an increase in the ambient sound level (L_{90}) by more than 10 dBA at the property line of the site at the nearest residences. In addition to limiting the increase in the ambient sound level, the Noise Policy prohibits "pure tone" conditions where the sound pressure level in one octave band frequency is at least 3 dB greater than the sound levels in each of two adjacent frequency bands.

A daytime broadband sound level evaluation at the residences is presented in Table 7-1, and a nighttime broadband sound level evaluation at the residences is presented in Table 7-2. The ambient sound level for modeling locations RES-1 through RES-4 are estimated based on the 7 day average of the lowest daytime and nighttime hourly L_{90} levels measured at CM-1. A complete description of the ambient sound level monitoring is presented in Section 5 of this report.

The predicted future total sound levels (Project + Background) are at or below the MassDEP criterion of 10 dBA over the measured ambient (L_{90}) sound levels at the four (4) modeled residential receptors.

Sound levels at the industrial property lines to the north, west, and south of the project were examined, however results at these locations have not been evaluated with respect to the MassDEP Noise Policy because these locations are uninhabited and/or industrial.

As discussed in Section 4.2, the MassDEP declares that "Noise levels that exceed the criteria at the source's property line by themselves do not necessarily result in a violation or a condition of air pollution under MassDEP regulations"; therefore, the critical point of evaluation is at a residential neighborhood. All closest residential property lines are predicted to be below the MassDEP 10 dBA limit. At the four residential modeling receptors, the increase in ambient sound levels range from 3-8 dBA.

The Project is not predicted to create a "pure tone" per the MassDEP Noise Policy when combined with existing background sound levels at any of the four residential modeling locations as shown in Tables 7-3 and 7-4.

Table 7-1 Residential Daytime Broadband Sound Level Evaluation of the MassDEP Noise Policy

Modeling Location ID	Description	Existing Daytime Sound Level[1] [L_{90}] (dBA)	Project Only Sound Level[1] (dBA)	Future L_{90} Total Sound Level[1] (dBA)	Increase Over Background (dBA)	Meets MassDEP Noise Policy?[2]
RES-1	Residential property line immediately northeast of the Project	41	40	44	3	Yes
RES-2	Residential property line immediately east of the Project	41	46	47	6	Yes
RES-3	Residential property line immediately east of the Project	41	47	48	7	Yes
RES-4	Residential property line immediately southeast of the Project	41	48	48	7	Yes

Notes:
1. Only whole numbers are shown; calculations performed using values with additional precision.
2. Refers to MassDEP A-weighted criteria of 10 dBA over background.

Table 7-2 Residential Nighttime Broadband Sound Level Evaluation of the MassDEP Noise Policy

Modeling Location ID	Description	Existing Nighttime Sound Level[1] [L_{90}] (dBA)	Project Only Sound Level[1] (dBA)	Future L_{90} Total Sound Level[1] (dBA)	Increase Over Background (dBA)	Meets MassDEP Noise Policy?[2]
RES-1	Residential property line immediately northeast of the Project	34	39	40	6	Yes
RES-2	Residential property line immediately east of the Project	34	40	41	7	Yes
RES-3	Residential property line immediately east of the Project	34	42	42	8	Yes
RES-4	Residential property line immediately southeast of the Project	34	40	41	7	Yes

Notes:

1. Only whole numbers are shown; calculations performed using values with additional precision.
2. Refers to MassDEP A-weighted criteria of 10 dBA over background.

Table 7-3 Residential Daytime "Pure Tone" Evaluation of the MassDEP Noise Policy

Modeling Location ID	Description	Sound Level[1] (dB) per Octave-Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
RES-1	Residential property line immediately northeast of the Project	55	54	45	42	40	39	34	25	21
RES-2	Residential property line immediately east of the Project	57	56	49	43	43	43	40	29	21
RES-3	Residential property line immediately east of the Project	57	56	49	44	43	44	41	30	21
RES-4	Residential property line immediately southeast of the Project	57	56	49	44	44	45	42	31	21

Notes:

1. Sound pressure levels are rounded to the nearest whole decibel.

Table 7-4 Residential Nighttime "Pure Tone" Evaluation of the MassDEP Noise Policy

Modeling Location ID	Description	Sound Level[1] (dB) per Octave-Band Center Frequency (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
RES-1	Residential property line immediately northeast of the Project	51	50	44	41	38	35	28	19	19
RES-2	Residential property line immediately east of the Project	52	51	46	42	39	36	29	20	19
RES-3	Residential property line immediately east of the Project	52	51	46	43	40	38	31	21	19
RES-4	Residential property line immediately southeast of the Project	51	49	45	43	39	36	29	20	19

Notes:

1. Sound pressure levels are rounded to the nearest whole decibel.

8.0 CONCLUSIONS

A comprehensive sound level modeling assessment was conducted for the Parallel Products of New England Project. In addition, ambient sound levels were measured to characterize the existing background sound levels within the area. Results of a complete sound level assessment demonstrate that sound levels from the Project with the sound mitigation measures described in this report will meet the requirements set forth in the MassDEP Noise Policy at residential locations.

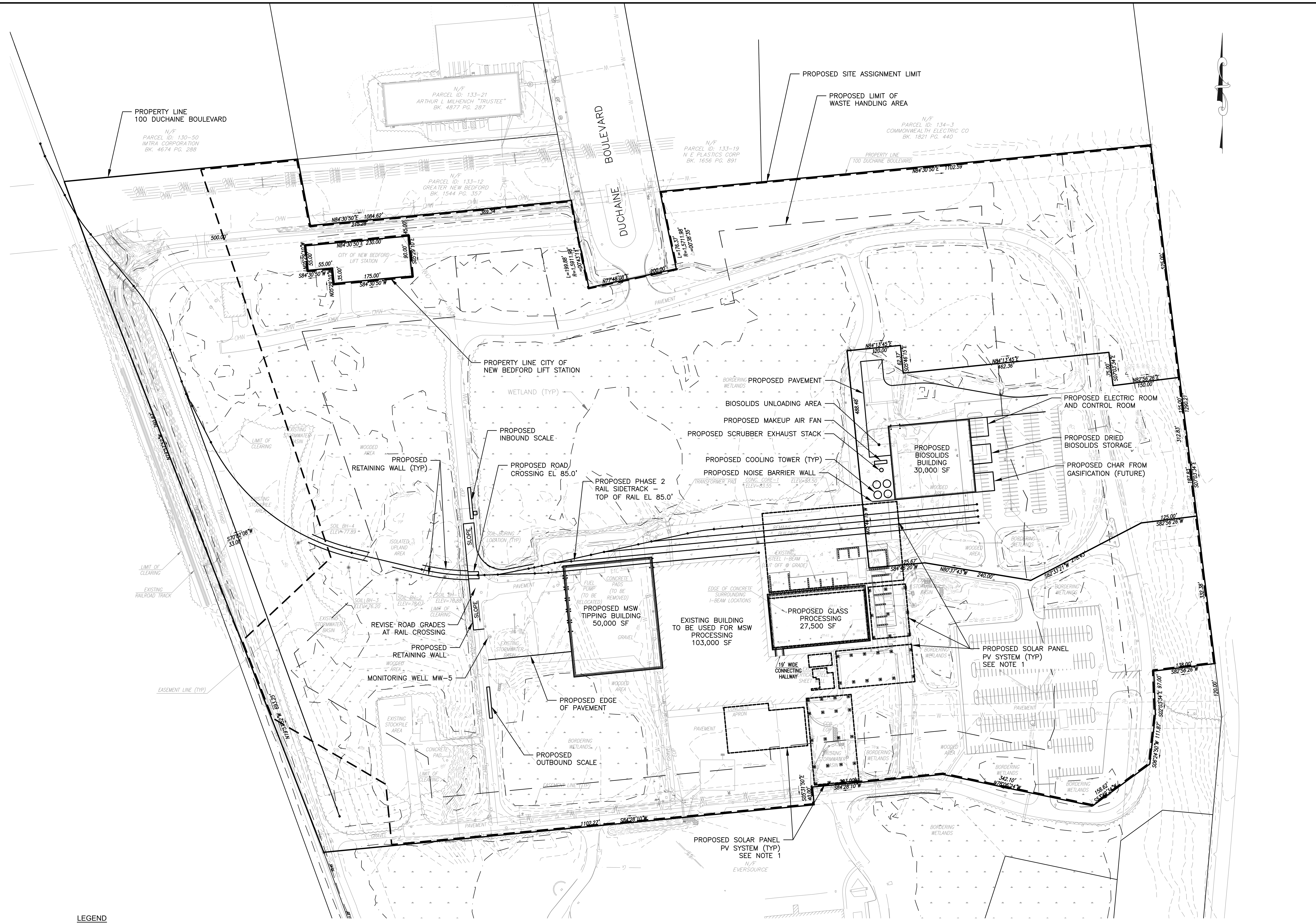
Sound pressure levels due to the operation of all equipment operating simultaneously at full load were modeled at the four residential sound level modeling locations. This is a conservative modeling assumption which will result in higher predicted sound levels relative to various actual part-load and intermittent operation of some of the sources.

Several modeling assumptions inherent in the ISO 9613-2 calculation methodology, or selected as conditional inputs by the user, were implemented in the CadnaA model to ensure conservative results (i.e., higher sound levels), and are described below:

- As per ISO 9613-2, the model assumed favorable conditions for sound propagation, corresponding to a moderate, well-developed ground-based temperature inversion, as might occur on a calm, clear night or equivalently downwind propagation.
- Meteorological conditions assumed in the model (T = 10°C and RH = 70%) were selected to minimize atmospheric attenuation in the 500 Hz and 1 kHz octave-bands where the human ear is most sensitive.
- No additional attenuation due to tree shielding, air turbulence, or wind shadow effects was considered in the model.

Appendix A

Parallel Products Site Plan



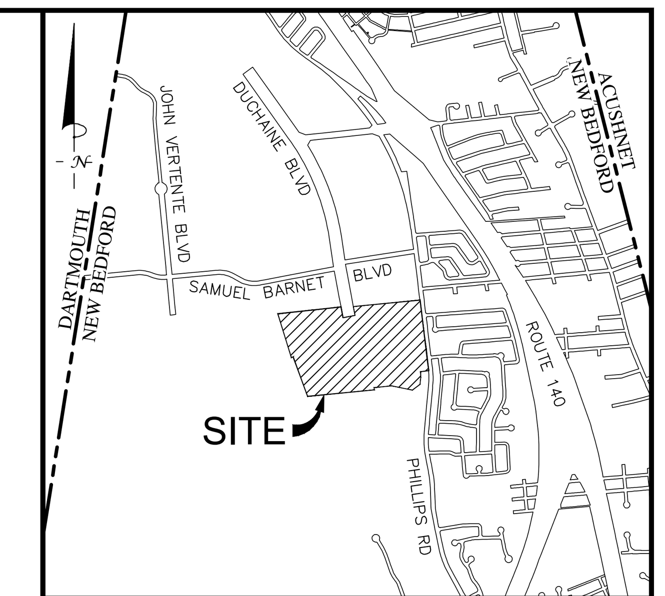
LEGEND

EXISTING FEATURES
PROPOSED FEATURES
SITE ASSIGNMENT LIMIT
LIMIT OF WASTE HANDLING AREA

100' 0 100' 200'
BAR SCALE
1" = 100'

NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.



LOCUS MAP NOT TO SCALE

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

REVISIONS

NO.	DATE	COMMENT
A	2/4/2019	ISSUED FOR PERMITTING

PURPOSE:

PERMITTING

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

PHASE 2 SITE PLAN

CAD TECH:	CHECKED BY:
T. JANICKI	
ENGINEER:	DATE:
W. HALL	2/1/2019
	SCALE: 1"=100'
	SHEET: C-2A

Appendix B

Continuous (Long-Term) Sound Level Measurement Data

Table B1

	Background Sound Levels (dBA)							
	CM1				CM2			
Date/Time	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}
6/26/2018 0:00								
6/26/2018 1:00								
6/26/2018 2:00								
6/26/2018 3:00								
6/26/2018 4:00								
6/26/2018 5:00								
6/26/2018 6:00								
6/26/2018 7:00								
6/26/2018 8:00								
6/26/2018 9:00								
6/26/2018 10:00								
6/26/2018 11:00								
6/26/2018 12:00								
6/26/2018 13:00								
6/26/2018 14:00	57	49	55	47	46	40	45	40
6/26/2018 15:00	58	50	57	48	47	41	46	40
6/26/2018 16:00	56	49	55	47	48	42	47	41
6/26/2018 17:00	57	47	55	46	49	40	48	39
6/26/2018 18:00	55	46	53	45	53	39	52	38
6/26/2018 19:00	53	44	51	44	42	38	41	38
6/26/2018 20:00	54	44	52	43	40	38	39	37
6/26/2018 21:00	52	40	51	39	39	37	38	37
6/26/2018 22:00	46	40	45	40	39	37	39	37
6/26/2018 23:00	48	37	47	37	38	37	38	36
6/27/2018 0:00	43	35	42	35	39	37	38	36
6/27/2018 1:00	40	36	39	35	39	38	39	37
6/27/2018 2:00	39	36	39	36	39	38	39	37
6/27/2018 3:00	41	37	40	36	39	37	39	37
6/27/2018 4:00	46	40	44	39	40	38	39	38
6/27/2018 5:00	54	42	52	41	44	39	43	39
6/27/2018 6:00	55	45	53	44	48	40	45	40
6/27/2018 7:00	63	48	61	47	53	40	53	40
6/27/2018 8:00	58	46	56	44	45	43	44	42
6/27/2018 9:00	56	46	55	45	44	42	44	42
6/27/2018 10:00	57	46	55	45	45	43	44	42
6/27/2018 11:00	55	47	54	45	49	42	49	42
6/27/2018 12:00	55	45	53	44	44	42	43	42
6/27/2018 13:00	56	48	55	47	47	42	46	41
6/27/2018 14:00	54	48	53	47	44	41	43	40
6/27/2018 15:00	59	49	57	48	46	40	45	39
6/27/2018 16:00	57	48	56	46	46	38	45	38

	Background Sound Levels (dBA)							
	CM1				CM2			
Date/Time	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}
6/27/2018 17:00	58	47	57	46	39	37	39	37
6/27/2018 18:00	55	45	54	45	40	38	39	37
6/27/2018 19:00	52	44	51	43	42	37	41	36
6/27/2018 20:00	54	44	53	44	39	37	38	37
6/27/2018 21:00	56	44	55	43	41	38	40	37
6/27/2018 22:00	51	40	50	39	40	37	39	36
6/27/2018 23:00	50	39	48	38	38	36	37	35
6/28/2018 0:00	45	37	43	36	37	35	36	34
6/28/2018 1:00	41	37	40	35	37	35	36	34
6/28/2018 2:00	40	36	38	34	38	36	37	34
6/28/2018 3:00	43	38	41	36	39	36	37	35
6/28/2018 4:00	47	41	45	40	41	38	39	37
6/28/2018 5:00	50	44	47	43	42	39	40	38
6/28/2018 6:00	54	46	53	45	46	41	44	40
6/28/2018 7:00	60	51	58	49	47	43	46	43
6/28/2018 8:00	56	50	55	49	46	43	44	42
6/28/2018 9:00	56	49	54	47	50	42	45	41
6/28/2018 10:00	58	48	56	46	45	40	42	39
6/28/2018 11:00	57	47	55	45	44	40	42	39
6/28/2018 12:00	59	49	58	47	44	40	42	40
6/28/2018 13:00	58	49	56	47	49	42	44	41
6/28/2018 14:00	61	53	56	50	60	49	53	44
6/28/2018 15:00	63	52	59	49	58	49	51	44
6/28/2018 16:00	60	52	55	49	58	48	51	43
6/28/2018 17:00	58	49	56	46	51	44	46	41
6/28/2018 18:00	59	47	58	45	46	41	44	37
6/28/2018 19:00	55	44	53	42	41	38	39	36
6/28/2018 20:00	51	42	49	40	40	36	36	34
6/28/2018 21:00	56	41	55	40	38	35	36	33
6/28/2018 22:00	52	39	51	37	38	36	37	34
6/28/2018 23:00	49	37	48	34	36	34	34	32
6/29/2018 0:00	44	38	42	36	36	34	35	31
6/29/2018 1:00	45	40	44	39	39	37	38	36
6/29/2018 2:00	44	43	44	43	39	38	38	37
6/29/2018 3:00	44	41	43	40	39	38	38	37
6/29/2018 4:00	51	42	49	41	41	39	40	38
6/29/2018 5:00	57	43	55	42	44	41	42	41
6/29/2018 6:00	54	45	53	44	46	42	44	41
6/29/2018 7:00	60	47	59	46	45	42	44	41
6/29/2018 8:00	60	48	58	46	44	41	43	41
6/29/2018 9:00	56	48	55	46	44	40	44	40
6/29/2018 10:00	57	47	55	45	47	40	43	39
6/29/2018 11:00	56	46	55	45	42	38	42	38

	Background Sound Levels (dBA)							
	CM1				CM2			
Date/Time	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}
6/29/2018 12:00	59	47	57	45	47	40	46	39
6/29/2018 13:00	58	50	56	48	47	38	46	38
6/29/2018 14:00	57	51	56	49	46	41	45	40
6/29/2018 15:00	58	49	56	48	50	39	49	38
6/29/2018 16:00	55	46	53	45	47	37	47	37
6/29/2018 17:00	55	46	54	45	42	37	42	37
6/29/2018 18:00	52	45	51	44	42	38	42	37
6/29/2018 19:00	56	45	55	45	42	40	41	39
6/29/2018 20:00	52	46	52	46	45	43	43	42
6/29/2018 21:00	59	47	58	46	45	43	44	43
6/29/2018 22:00	55	48	54	48	45	43	45	43
6/29/2018 23:00	53	45	52	45	45	43	45	43
6/30/2018 0:00	51	44	50	43	43	42	43	41
6/30/2018 1:00	56	44	54	44	42	41	42	40
6/30/2018 2:00	59	45	58	45	42	40	42	40
6/30/2018 3:00	53	42	51	41	41	38	40	38
6/30/2018 4:00	55	43	54	42	43	40	42	39
6/30/2018 5:00	57	44	56	43	45	41	43	41
6/30/2018 6:00	52	45	51	44	46	42	45	42
6/30/2018 7:00	57	42	55	42	46	40	42	39
6/30/2018 8:00	55	41	54	40	49	37	48	36
6/30/2018 9:00	55	43	54	42	49	36	48	35
6/30/2018 10:00	52	44	51	43	43	35	42	34
6/30/2018 11:00	52	43	51	42	47	36	46	35
6/30/2018 12:00	57	42	56	41	40	34	39	32
6/30/2018 13:00	53	42	52	41	40	33	38	32
6/30/2018 14:00	50	41	49	40	37	33	36	32
6/30/2018 15:00	50	42	48	41	39	34	38	33
6/30/2018 16:00	47	41	46	40	40	32	39	31
6/30/2018 17:00	49	41	48	40	37	33	36	31
6/30/2018 18:00	53	40	51	40	39	34	38	33
6/30/2018 19:00	46	40	45	39	37	34	36	33
6/30/2018 20:00	48	40	47	40	39	35	38	35
6/30/2018 21:00	47	40	46	40	45	36	45	36
6/30/2018 22:00	44	40	44	39	38	35	38	35
6/30/2018 23:00	45	40	44	39	39	36	39	35
7/1/2018 0:00	43	38	42	37	41	39	41	39
7/1/2018 1:00	41	37	41	36	41	39	41	39
7/1/2018 2:00	41	37	40	36	40	38	40	38
7/1/2018 3:00	41	37	41	37	39	37	39	37
7/1/2018 4:00	41	37	39	36	41	37	39	37
7/1/2018 5:00	43	39	41	39	43	39	41	39
7/1/2018 6:00	46	39	45	38	43	40	41	39

	Background Sound Levels (dBA)							
	CM1				CM2			
Date/Time	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}
7/1/2018 7:00	47	42	46	42	39	36	38	36
7/1/2018 8:00	55	42	54	41	44	35	39	34
7/1/2018 9:00	46	38	45	37	42	36	41	35
7/1/2018 10:00	51	41	49	40	39	36	38	35
7/1/2018 11:00	49	40	47	38	41	34	38	33
7/1/2018 12:00	51	42	49	41	42	35	38	35
7/1/2018 13:00	51	43	50	42	43	35	38	34
7/1/2018 14:00	57	42	56	41	38	34	38	33
7/1/2018 15:00	53	41	52	41	38	34	37	33
7/1/2018 16:00	53	43	52	42	39	35	38	34
7/1/2018 17:00	52	40	51	39	38	35	38	34
7/1/2018 18:00	49	39	48	38	38	35	37	34
7/1/2018 19:00	50	38	48	37	40	35	39	34
7/1/2018 20:00	50	39	49	38	40	36	38	35
7/1/2018 21:00	45	38	44	37	40	37	39	37
7/1/2018 22:00	44	36	43	35	39	36	39	35
7/1/2018 23:00	43	35	42	34	39	36	39	35
7/2/2018 0:00	38	32	37	31	38	35	38	35
7/2/2018 1:00	40	32	39	31	36	33	36	32
7/2/2018 2:00	37	31	36	30	34	33	34	32
7/2/2018 3:00	40	32	39	32	36	34	36	33
7/2/2018 4:00	46	36	43	35	41	37	39	37
7/2/2018 5:00	52	41	51	41	43	41	42	40
7/2/2018 6:00	52	43	51	41	45	41	44	41
7/2/2018 7:00	60	46	58	45	46	40	44	40
7/2/2018 8:00	58	49	57	47	43	38	41	37
7/2/2018 9:00	58	49	57	47	43	37	42	36
7/2/2018 10:00	57	50	55	47	42	36	41	35
7/2/2018 11:00	56	47	55	46	44	36	41	35
7/2/2018 12:00	56	47	54	45	44	37	42	36
7/2/2018 13:00	56	44	55	43	39	37	38	36
7/2/2018 14:00	56	45	55	44	49	37	48	37
7/2/2018 15:00	57	47	56	46	53	38	52	38
7/2/2018 16:00	55	47	53	46	48	40	46	39
7/2/2018 17:00	57	47	56	46	48	38	46	38
7/2/2018 18:00	56	45	55	44	46	36	45	36
7/2/2018 19:00	54	44	53	43	38	36	37	35
7/2/2018 20:00	51	42	50	42	42	36	41	36
7/2/2018 21:00	52	51	50	49	37	34	37	34
7/2/2018 22:00	56	42	55	41	37	34	36	33
7/2/2018 23:00	50	37	48	37	36	34	36	33
7/3/2018 0:00	42	34	41	33	34	32	34	31
7/3/2018 1:00	53	33	53	32	34	31	34	30

	Background Sound Levels (dBA)							
	CM1				CM2			
Date/Time	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}	L_{eq}	L_{90}	ANS L_{eq}	ANS L_{90}
7/3/2018 2:00	38	31	37	29	32	29	32	28
7/3/2018 3:00	40	29	39	28	34	30	34	28
7/3/2018 4:00	47	34	45	33	39	33	35	31
7/3/2018 5:00	52	39	49	38	42	35	34	33
7/3/2018 6:00	52	42	51	40	45	36	43	34
7/3/2018 7:00	63	49	61	47	42	37	41	36
7/3/2018 8:00	61	53	59	50	40	37	39	36
7/3/2018 9:00	60	50	59	48	45	38	44	38
7/3/2018 10:00	61	50	59	49	43	39	42	38
7/3/2018 11:00	58	47	56	46	42	39	41	39
7/3/2018 12:00	57	46	55	45	57	39	41	38
7/3/2018 13:00	55	47	54	46	43	39	42	38
7/3/2018 14:00	54	46	53	45				
7/3/2018 15:00								
7/3/2018 16:00								
7/3/2018 17:00								
7/3/2018 18:00								
7/3/2018 19:00								
7/3/2018 20:00								
7/3/2018 21:00								
7/3/2018 22:00								
7/3/2018 23:00								
7/4/2018 0:00								

Appendix C

Meteorological Data: NWS Station – New Bedford Regional Airport, MA

Table C1

STATION: KEWB
STATION NAME: New Bedford
LATITUDE: 41.67528
LONGITUDE: -70.95694
ELEVATION [ft]: 79
STATE: MA

Date/Time	Air Temp (F)	RH (%)	Precip One-Hour (in)
06/26/2018 07:00 EDT	60.8	93.8	
06/26/2018 07:05 EDT	60.8	100	
06/26/2018 07:10 EDT	62.6	93.84	
06/26/2018 07:15 EDT	62.6	88.02	
06/26/2018 07:20 EDT	62.6	88.02	
06/26/2018 07:25 EDT	62.6	93.84	
06/26/2018 07:30 EDT	62.6	88.02	
06/26/2018 07:35 EDT	64.4	88.11	
06/26/2018 07:40 EDT	64.4	82.65	
06/26/2018 07:45 EDT	64.4	77.48	
06/26/2018 07:50 EDT	64.4	77.48	
06/26/2018 07:53 EDT	64.94	78.03	
06/26/2018 07:55 EDT	64.4	77.48	
06/26/2018 08:00 EDT	64.4	77.48	
06/26/2018 08:05 EDT	64.4	77.48	
06/26/2018 08:10 EDT	66.2	72.78	
06/26/2018 08:15 EDT	66.2	72.78	
06/26/2018 08:20 EDT	66.2	68.2	
06/26/2018 08:25 EDT	66.2	68.2	
06/26/2018 08:30 EDT	68	68.41	
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06/27/2018 15:35 EDT	73.4	56.95	
06/27/2018 15:40 EDT	73.4	60.75	

06/27/2018 15:45 EDT	73.4	56.95	
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06/27/2018 15:53 EDT	71.96	63.76	
06/27/2018 15:55 EDT	71.6	68.81	
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06/27/2018 16:15 EDT	71.6	68.81	
06/27/2018 16:20 EDT	71.6	68.81	
06/27/2018 16:25 EDT	73.4	69.01	
06/27/2018 16:30 EDT	71.6	73.32	
06/27/2018 16:35 EDT	71.6	73.32	
06/27/2018 16:40 EDT	71.6	73.32	
06/27/2018 16:45 EDT	71.6	73.32	
06/27/2018 16:50 EDT	71.6	73.32	
06/27/2018 16:53 EDT	71.06	73.27	
06/27/2018 16:55 EDT	71.6	73.32	
06/27/2018 17:00 EDT	71.6	73.32	
06/27/2018 17:05 EDT	71.6	73.32	
06/27/2018 17:10 EDT	71.6	73.32	
06/27/2018 17:15 EDT	71.6	73.32	
06/27/2018 17:20 EDT	71.6	73.32	
06/27/2018 17:25 EDT	71.6	73.32	
06/27/2018 17:30 EDT	71.6	73.32	
06/27/2018 17:35 EDT	71.6	73.32	
06/27/2018 17:40 EDT	71.6	73.32	
06/27/2018 17:45 EDT	69.8	77.94	
06/27/2018 17:50 EDT	69.8	73.15	
06/27/2018 17:53 EDT	69.98	73.16	
06/27/2018 17:55 EDT	69.8	73.15	
06/27/2018 18:00 EDT	69.8	73.15	
06/27/2018 18:05 EDT	69.8	73.15	
06/27/2018 18:10 EDT	69.8	77.94	
06/27/2018 18:15 EDT	69.8	77.94	
06/27/2018 18:20 EDT	69.8	77.94	
06/27/2018 18:25 EDT	69.8	77.94	
06/27/2018 18:30 EDT	69.8	77.94	
06/27/2018 18:35 EDT	69.8	73.15	
06/27/2018 18:40 EDT	69.8	73.15	
06/27/2018 18:45 EDT	69.8	73.15	
06/27/2018 18:50 EDT	69.8	68.61	
06/27/2018 18:53 EDT	69.08	70.32	
06/27/2018 18:55 EDT	69.8	68.61	
06/27/2018 19:00 EDT	69.8	64.32	
06/27/2018 19:05 EDT	69.8	64.32	
06/27/2018 19:10 EDT	69.8	64.32	
06/27/2018 19:15 EDT	69.8	64.32	

06/27/2018 19:20 EDT	69.8	64.32	
06/27/2018 19:25 EDT	69.8	64.32	
06/27/2018 19:30 EDT	69.8	60.27	
06/27/2018 19:35 EDT	68	64.1	
06/27/2018 19:40 EDT	69.8	64.32	
06/27/2018 19:45 EDT	68	68.41	
06/27/2018 19:50 EDT	68	68.41	
06/27/2018 19:53 EDT	68	72.97	
06/27/2018 19:55 EDT	68	72.97	
06/27/2018 20:00 EDT	68	77.79	
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06/27/2018 20:10 EDT	68	77.79	
06/27/2018 20:15 EDT	68	77.79	
06/27/2018 20:20 EDT	66.2	82.77	
06/27/2018 20:25 EDT	66.2	82.77	
06/27/2018 20:30 EDT	68	77.79	
06/27/2018 20:35 EDT	66.2	82.77	
06/27/2018 20:40 EDT	68	77.79	
06/27/2018 20:45 EDT	68	82.89	
06/27/2018 20:50 EDT	68	82.89	
06/27/2018 20:53 EDT	68	81.33	
06/27/2018 20:55 EDT	68	82.89	
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06/27/2018 21:10 EDT	68	82.89	
06/27/2018 21:15 EDT	68	82.89	
06/27/2018 21:20 EDT	68	82.89	
06/27/2018 21:25 EDT	68	82.89	
06/27/2018 21:30 EDT	68	82.89	
06/27/2018 21:35 EDT	69.8	77.94	
06/27/2018 21:40 EDT	69.8	77.94	
06/27/2018 21:45 EDT	69.8	77.94	
06/27/2018 21:50 EDT	69.8	77.94	
06/27/2018 21:53 EDT	69.08	78.38	
06/27/2018 21:55 EDT	69.8	77.94	
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06/27/2018 22:05 EDT	69.8	77.94	
06/27/2018 22:10 EDT	69.8	77.94	
06/27/2018 22:15 EDT	69.8	77.94	
06/27/2018 22:20 EDT	68	82.89	
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06/27/2018 22:30 EDT	69.8	77.94	
06/27/2018 22:35 EDT	69.8	77.94	
06/27/2018 22:40 EDT	69.8	77.94	
06/27/2018 22:45 EDT	69.8	77.94	
06/27/2018 22:50 EDT	69.8	77.94	
06/27/2018 22:53 EDT	69.08	80.9	0.001

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06/27/2018 23:00 EDT	69.8	77.94	
06/27/2018 23:05 EDT	69.8	77.94	
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06/27/2018 23:15 EDT	69.8	77.94	
06/27/2018 23:20 EDT	69.8	77.94	
06/27/2018 23:25 EDT	69.8	77.94	
06/27/2018 23:30 EDT	69.8	77.94	
06/27/2018 23:35 EDT	69.8	77.94	0.01
06/27/2018 23:40 EDT	68	88.29	0.01
06/27/2018 23:45 EDT	68	88.29	0.01
06/27/2018 23:50 EDT	68	88.29	0.01
06/27/2018 23:53 EDT	68	87.18	0.01
06/27/2018 23:55 EDT	68	88.29	
06/28/2018 00:00 EDT	68	88.29	
06/28/2018 00:05 EDT	68	88.29	
06/28/2018 00:10 EDT	68	88.29	
06/28/2018 00:15 EDT	68	88.29	
06/28/2018 00:20 EDT	68	88.29	
06/28/2018 00:25 EDT	68	88.29	
06/28/2018 00:30 EDT	68	88.29	
06/28/2018 00:35 EDT	68	88.29	
06/28/2018 00:40 EDT	69.8	83.01	
06/28/2018 00:45 EDT	69.8	83.01	
06/28/2018 00:50 EDT	69.8	83.01	
06/28/2018 00:53 EDT	69.08	84.02	0.001
06/28/2018 00:55 EDT	69.8	83.01	
06/28/2018 01:00 EDT	69.8	83.01	
06/28/2018 01:05 EDT	69.8	83.01	
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06/28/2018 01:15 EDT	69.8	83.01	
06/28/2018 01:20 EDT	69.8	83.01	
06/28/2018 01:25 EDT	69.8	83.01	
06/28/2018 01:30 EDT	69.8	83.01	
06/28/2018 01:35 EDT	69.8	83.01	
06/28/2018 01:40 EDT	69.8	83.01	
06/28/2018 01:45 EDT	69.8	83.01	
06/28/2018 01:50 EDT	69.8	88.37	
06/28/2018 01:51 EDT	69.8	88.37	0.001
06/28/2018 01:53 EDT	69.08	90.01	0.001
06/28/2018 01:55 EDT	69.8	88.37	
06/28/2018 02:00 EDT	69.8	88.37	
06/28/2018 02:05 EDT	69.8	88.37	
06/28/2018 02:10 EDT	69.8	88.37	
06/28/2018 02:15 EDT	69.8	88.37	
06/28/2018 02:20 EDT	69.8	88.37	
06/28/2018 02:25 EDT	69.8	88.37	

06/28/2018 02:30 EDT	69.8	88.37	
06/28/2018 02:35 EDT	69.8	88.37	
06/28/2018 02:40 EDT	69.8	88.37	
06/28/2018 02:45 EDT	69.8	88.37	
06/28/2018 02:50 EDT	69.8	88.37	
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06/28/2018 03:00 EDT	69.8	88.37	
06/28/2018 03:05 EDT	69.8	88.37	
06/28/2018 03:10 EDT	69.8	88.37	
06/28/2018 03:15 EDT	69.8	88.37	
06/28/2018 03:20 EDT	69.8	88.37	
06/28/2018 03:25 EDT	69.8	88.37	
06/28/2018 03:28 EDT	69.08	96.37	
06/28/2018 03:30 EDT	69.8	94.03	
06/28/2018 03:35 EDT	69.8	94.03	
06/28/2018 03:40 EDT	69.8	94.03	
06/28/2018 03:45 EDT	69.8	94.03	
06/28/2018 03:50 EDT	69.8	94.03	
06/28/2018 03:53 EDT	69.08	96.37	
06/28/2018 03:55 EDT	69.8	94.03	
06/28/2018 04:00 EDT	69.8	94.03	
06/28/2018 04:05 EDT	69.8	94.03	
06/28/2018 04:08 EDT	69.08	96.37	
06/28/2018 04:10 EDT	69.8	94.03	
06/28/2018 04:15 EDT	69.8	94.03	
06/28/2018 04:20 EDT	69.8	94.03	
06/28/2018 04:25 EDT	69.8	94.03	
06/28/2018 04:30 EDT	69.8	94.03	
06/28/2018 04:35 EDT	69.8	94.03	
06/28/2018 04:40 EDT	69.8	94.03	
06/28/2018 04:45 EDT	69.8	94.03	
06/28/2018 04:50 EDT	69.8	94.03	
06/28/2018 04:53 EDT	69.08	96.37	0.001
06/28/2018 04:55 EDT	69.8	94.03	
06/28/2018 05:00 EDT	69.8	94.03	
06/28/2018 05:05 EDT	69.8	94.03	
06/28/2018 05:10 EDT	69.8	94.03	
06/28/2018 05:15 EDT	69.8	94.03	
06/28/2018 05:20 EDT	69.8	94.03	
06/28/2018 05:25 EDT	69.8	94.03	
06/28/2018 05:30 EDT	69.8	94.03	
06/28/2018 05:35 EDT	69.8	94.03	
06/28/2018 05:39 EDT	69.08	96.37	0.001
06/28/2018 05:40 EDT	69.8	94.03	
06/28/2018 05:45 EDT	69.8	94.03	
06/28/2018 05:50 EDT	69.8	94.03	

06/28/2018 05:53 EDT	69.08	96.37	0.001
06/28/2018 05:55 EDT	69.8	94.03	
06/28/2018 06:00 EDT	69.8	94.03	
06/28/2018 06:02 EDT	69.08	96.37	0.001
06/28/2018 06:05 EDT	69.8	94.03	0.01
06/28/2018 06:10 EDT	69.8	94.03	0.01
06/28/2018 06:15 EDT	69.8	94.03	0.01
06/28/2018 06:20 EDT	69.8	100	0.01
06/28/2018 06:25 EDT	69.8	100	0.01
06/28/2018 06:29 EDT	69.08	100	0.01
06/28/2018 06:30 EDT	69.8	100	0.01
06/28/2018 06:35 EDT	69.8	100	0.01
06/28/2018 06:40 EDT	69.8	100	0.03
06/28/2018 06:41 EDT	69.08	100	0.04
06/28/2018 06:45 EDT	69.8	100	0.04
06/28/2018 06:50 EDT	69.8	100	0.04
06/28/2018 06:53 EDT	69.08	100	0.04
06/28/2018 06:55 EDT	69.8	100	
06/28/2018 07:00 EDT	69.8	100	
06/28/2018 07:03 EDT	69.08	100	
06/28/2018 07:05 EDT	69.8	100	
06/28/2018 07:10 EDT	69.8	100	
06/28/2018 07:15 EDT	69.8	100	
06/28/2018 07:20 EDT	69.8	100	
06/28/2018 07:25 EDT	69.8	100	
06/28/2018 07:30 EDT	69.8	100	
06/28/2018 07:35 EDT	69.8	100	
06/28/2018 07:40 EDT	69.8	100	
06/28/2018 07:45 EDT	69.8	100	
06/28/2018 07:50 EDT	69.8	100	
06/28/2018 07:53 EDT	69.08	100	
06/28/2018 07:55 EDT	69.8	100	
06/28/2018 08:00 EDT	69.8	100	
06/28/2018 08:05 EDT	69.8	100	
06/28/2018 08:10 EDT	69.8	100	
06/28/2018 08:15 EDT	69.8	100	
06/28/2018 08:20 EDT	69.8	100	
06/28/2018 08:25 EDT	69.8	100	
06/28/2018 08:30 EDT	69.8	100	
06/28/2018 08:35 EDT	69.8	100	
06/28/2018 08:40 EDT	69.8	100	
06/28/2018 08:45 EDT	69.8	100	
06/28/2018 08:50 EDT	69.8	100	
06/28/2018 08:53 EDT	69.08	100	
06/28/2018 08:55 EDT	69.8	100	
06/28/2018 09:00 EDT	69.8	100	
06/28/2018 09:05 EDT	69.8	100	

06/28/2018 09:10 EDT	69.8	100	
06/28/2018 09:15 EDT	69.8	100	
06/28/2018 09:20 EDT	69.8	100	
06/28/2018 09:25 EDT	69.8	100	
06/28/2018 09:30 EDT	69.8	100	
06/28/2018 09:35 EDT	69.8	100	0.02
06/28/2018 09:40 EDT	69.8	100	0.02
06/28/2018 09:45 EDT	69.8	100	0.02
06/28/2018 09:50 EDT	69.8	100	0.02
06/28/2018 09:53 EDT	69.98	100	0.02
06/28/2018 09:55 EDT	69.8	100	
06/28/2018 10:00 EDT	69.8	100	
06/28/2018 10:05 EDT	69.8	100	
06/28/2018 10:10 EDT	69.8	100	
06/28/2018 10:15 EDT	69.8	100	
06/28/2018 10:20 EDT	69.8	100	
06/28/2018 10:24 EDT	69.08	100	0.001
06/28/2018 10:25 EDT	69.8	100	
06/28/2018 10:30 EDT	69.8	100	
06/28/2018 10:35 EDT	69.8	100	
06/28/2018 10:40 EDT	69.8	100	
06/28/2018 10:45 EDT	71.6	100	
06/28/2018 10:50 EDT	71.6	100	0.001
06/28/2018 10:53 EDT	71.06	100	0.001
06/28/2018 10:55 EDT	71.6	100	
06/28/2018 11:00 EDT	71.6	100	
06/28/2018 11:05 EDT	71.6	100	
06/28/2018 11:06 EDT	71.06	100	
06/28/2018 11:10 EDT	71.6	100	
06/28/2018 11:15 EDT	71.6	100	
06/28/2018 11:20 EDT	71.6	100	
06/28/2018 11:25 EDT	71.6	100	
06/28/2018 11:30 EDT	71.6	100	0.001
06/28/2018 11:35 EDT	71.6	100	
06/28/2018 11:40 EDT	71.6	100	
06/28/2018 11:45 EDT	71.6	100	
06/28/2018 11:50 EDT	69.8	100	
06/28/2018 11:53 EDT	69.98	100	0.001
06/28/2018 11:55 EDT	69.8	100	
06/28/2018 12:00 EDT	69.8	100	
06/28/2018 12:02 EDT	69.98	100	0.001
06/28/2018 12:05 EDT	69.8	100	
06/28/2018 12:10 EDT	69.8	100	
06/28/2018 12:15 EDT	69.8	100	
06/28/2018 12:19 EDT	69.98	100	0.001
06/28/2018 12:20 EDT	69.8	100	
06/28/2018 12:25 EDT	69.8	100	

06/28/2018 12:30 EDT	69.8	100	
06/28/2018 12:35 EDT	71.6	100	
06/28/2018 12:40 EDT	71.6	100	
06/28/2018 12:43 EDT	71.06	100	0.001
06/28/2018 12:45 EDT	71.6	100	
06/28/2018 12:50 EDT	71.6	100	
06/28/2018 12:53 EDT	71.06	100	0.001
06/28/2018 12:55 EDT	71.6	100	
06/28/2018 13:00 EDT	71.6	100	
06/28/2018 13:05 EDT	71.6	100	
06/28/2018 13:10 EDT	71.6	100	
06/28/2018 13:15 EDT	71.6	100	
06/28/2018 13:20 EDT	71.6	100	
06/28/2018 13:25 EDT	71.6	100	
06/28/2018 13:30 EDT	71.6	100	
06/28/2018 13:35 EDT	71.6	100	
06/28/2018 13:40 EDT	71.6	100	
06/28/2018 13:45 EDT	71.6	100	
06/28/2018 13:50 EDT	71.6	100	
06/28/2018 13:53 EDT	71.06	100	
06/28/2018 13:55 EDT	71.6	100	
06/28/2018 14:00 EDT	71.6	100	
06/28/2018 14:05 EDT	71.6	100	
06/28/2018 14:09 EDT	69.98	100	0.1
06/28/2018 14:10 EDT	69.8	100	0.13
06/28/2018 14:15 EDT	69.8	100	0.14
06/28/2018 14:18 EDT	69.98	100	0.14
06/28/2018 14:20 EDT	69.8	100	0.15
06/28/2018 14:25 EDT	69.8	100	0.15
06/28/2018 14:30 EDT	69.8	100	0.15
06/28/2018 14:35 EDT	69.8	100	0.15
06/28/2018 14:39 EDT	69.98	100	0.15
06/28/2018 14:40 EDT	69.8	100	0.15
06/28/2018 14:45 EDT	69.8	100	0.15
06/28/2018 14:50 EDT	69.8	100	0.15
06/28/2018 14:53 EDT	69.98	100	0.16
06/28/2018 14:55 EDT	69.8	100	
06/28/2018 15:00 EDT	71.6	100	
06/28/2018 15:05 EDT	71.6	100	
06/28/2018 15:10 EDT	71.6	100	
06/28/2018 15:15 EDT	71.6	100	
06/28/2018 15:20 EDT	69.8	100	
06/28/2018 15:25 EDT	69.8	100	0.03
06/28/2018 15:30 EDT	71.06	100	0.07
06/28/2018 15:35 EDT	71.6	100	0.1
06/28/2018 15:40 EDT	71.6	100	0.19
06/28/2018 15:45 EDT	71.6	100	0.25

06/28/2018 15:50 EDT	69.8	100	0.27
06/28/2018 15:53 EDT	69.98	100	0.28
06/28/2018 15:55 EDT	69.8	100	0.01
06/28/2018 15:58 EDT	69.98	100	0.08
06/28/2018 16:00 EDT	69.8	100	
06/28/2018 16:05 EDT	69.8	100	0.26
06/28/2018 16:06 EDT	69.98	100	0.27
06/28/2018 16:08 EDT	69.98	100	0.27
06/28/2018 16:10 EDT	69.8	100	0.29
06/28/2018 16:15 EDT	69.8	100	0.3
06/28/2018 16:20 EDT	69.8	100	0.3
06/28/2018 16:23 EDT	69.98	100	0.32
06/28/2018 16:25 EDT	69.8	100	0.34
06/28/2018 16:30 EDT	69.8	100	0.34
06/28/2018 16:31 EDT	69.98	100	0.35
06/28/2018 16:35 EDT	69.8	100	0.36
06/28/2018 16:39 EDT	69.98	100	0.36
06/28/2018 16:40 EDT	69.8	100	0.36
06/28/2018 16:45 EDT	69.8	100	0.36
06/28/2018 16:50 EDT	69.8	100	0.36
06/28/2018 16:53 EDT	69.98	100	0.36
06/28/2018 16:55 EDT	69.8	100	
06/28/2018 17:00 EDT	69.8	100	
06/28/2018 17:05 EDT	69.8	100	
06/28/2018 17:10 EDT	69.8	100	
06/28/2018 17:15 EDT	69.8	100	
06/28/2018 17:20 EDT	69.8	100	0.001
06/28/2018 17:25 EDT	69.8	100	
06/28/2018 17:30 EDT	69.8	100	
06/28/2018 17:34 EDT	69.98	100	0.001
06/28/2018 17:35 EDT	69.8	100	
06/28/2018 17:40 EDT	69.8	100	
06/28/2018 17:44 EDT	69.98	100	0.001
06/28/2018 17:45 EDT	69.8	100	
06/28/2018 17:50 EDT	69.8	100	
06/28/2018 17:53 EDT	69.98	100	0.01
06/28/2018 17:55 EDT	69.8	100	
06/28/2018 18:00 EDT	69.8	100	
06/28/2018 18:05 EDT	69.8	100	
06/28/2018 18:10 EDT	69.8	100	
06/28/2018 18:13 EDT	69.08	100	0.001
06/28/2018 18:15 EDT	69.8	100	
06/28/2018 18:20 EDT	69.8	100	0.01
06/28/2018 18:25 EDT	69.8	100	0.01
06/28/2018 18:30 EDT	69.8	100	0.01
06/28/2018 18:35 EDT	69.8	100	0.01
06/28/2018 18:40 EDT	69.8	100	0.01

06/28/2018 18:45 EDT	69.8	100	0.01
06/28/2018 18:50 EDT	69.8	100	0.01
06/28/2018 18:53 EDT	69.08	100	0.01
06/28/2018 18:55 EDT	69.8	100	
06/28/2018 19:00 EDT	69.8	100	
06/28/2018 19:05 EDT	69.8	100	
06/28/2018 19:07 EDT	69.98	100	
06/28/2018 19:10 EDT	69.8	100	
06/28/2018 19:15 EDT	69.8	100	
06/28/2018 19:17 EDT	69.98	100	
06/28/2018 19:20 EDT	69.8	100	
06/28/2018 19:25 EDT	69.8	100	
06/28/2018 19:30 EDT	69.8	100	
06/28/2018 19:35 EDT	69.8	100	
06/28/2018 19:40 EDT	69.8	100	
06/28/2018 19:45 EDT	69.8	100	
06/28/2018 19:46 EDT	69.98	100	
06/28/2018 19:50 EDT	69.8	100	
06/28/2018 19:53 EDT	69.98	100	
06/28/2018 19:55 EDT	69.8	100	
06/28/2018 20:00 EDT	69.8	100	
06/28/2018 20:05 EDT	69.8	100	
06/28/2018 20:10 EDT	69.8	100	
06/28/2018 20:15 EDT	69.8	100	
06/28/2018 20:20 EDT	69.8	100	
06/28/2018 20:24 EDT	69.08	100	
06/28/2018 20:25 EDT	69.8	100	
06/28/2018 20:30 EDT	69.8	100	
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06/30/2018 02:20 EDT	66.2	93.94	
06/30/2018 02:25 EDT	64.4	100	
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Massachusetts Environmental Policy Act

Air and Odor Analysis

Parallel Products of New England

New Bedford, Massachusetts

Submitted to:
PARALLEL PRODUCTS OF NEW ENGLAND, INC.
100 Duchaine Boulevard
New Bedford, MA 02745

Submitted by:
EPSILON ASSOCIATES, INC.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

February 8, 2019

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

List of Figures

List of Tables

List of Attachments

1.0 EXECUTIVE SUMMARY

Executive Summary

Parallel Products of New England (PPNE) has commissioned this study to document that the solid waste facility proposed for 100 Duchaine Boulevard in New Bedford, Massachusetts uses all feasible measures to avoid, minimize, and mitigate potential air-related impacts, and that the facility will not create conditions of unhealthy air or nuisance odors. The study documents this through a three-step process for each relevant concern:

1. Emissions estimates: The project team has assembled information on the proposed activities, and used EPA emission limits, emission factors, industry data, and information for other projects to generate emission rates. The analysis generally uses expected maximum operating rates to generate conservative estimates.

2. Computer air dispersion modeling: The model generates a 3-D field using terrain data and building dimensions. Epsilon created a grid of thousands of receptor locations, with the most receptors nearest the facility. The model uses emission rates, exhaust parameters (release height, velocity, and temperature) and five years of hourly weather data to predict ambient air concentrations in all weather conditions.

3. Comparison to standards: Model results are compared to USEPA and MassDEP health-protective criteria. Odor impacts are subjective and individualized; for odor, model results are compared to a dilution threshold that is unlikely to cause a nuisance condition, and the results are assessed based on both the frequency and intensity of the modeled concentration.

Sources of Air Emissions

Stationary sources at the facility will be subject to regulation by MassDEP, likely through the Limited Plan Approval process. This study reviews stationary sources but also heavy mobile equipment sources, and truck traffic both on-site and off-site. This more inclusive analysis allows the project to be designed holistically to minimize environmental impacts and give a more complete picture of any project related air impacts.

Broadly the emissions sources are in the following categories:

- ♦ Stationary combustion sources. There are some boilers and dryers to provide freeze protection and energy for the biosolids drying process. These combust natural gas and are below MassDEP permitting thresholds. They are generally of the size found providing heat to commercial buildings.

- ♦ Mobile diesel equipment. Parallel Products will use standard commercial equipment (trucks and front-end loaders) common to on-road and off-road traffic.

- Dust from material handling. Emissions are estimated based on material transfer operations, and road dust. A cooling-tower can also be a dust source (as mist droplets evaporate, salts in the water can remain in the air); the cooling tower is an insignificant source per MassDEP standards and is similar in size to towers serving commercial buildings.

- Potential odor sources. Biosolids and MSW can be sources of odor.

Impacts

Parallel Products proposes a facility that avoids, minimizes, and mitigates potential air-related impacts as follows:

Avoided impacts: Parallel Products has selected an industrially-zoned setting to avoid impacts to the public and is re-using significant existing infrastructure to avoid impacts associated with new construction. Material handling in enclosed areas, using best industry practices, avoids off-site impacts of air emissions and odors. Because the proposed facility will serve existing needs for material handling at a location that is closer to the sources of the materials, the project avoids transportation-related impacts currently associated with sending the materials farther by truck.

Minimized impacts: The project team evaluated and modeled dozens of potential equipment and exhaust vent/stack configurations to identify the proposed conceptual design which minimizes off-site air and odor concentrations. The proposed design optimizes the flow of material through the site, and the reuse of existing facilities, while minimizing offsite impacts in general and residential area offsite impacts in particular. Material handling loaders will be USEPA Tier certified to minimize emissions.

Mitigated impacts: Parallel Products is selecting to control odors from biosolids handling processes using wet scrubbing and ionization. Wet scrubbing can provide better control than other alternatives (e.g. biofiltration).

Comparison to Standards

The analysis shows that, under maximum expected operating conditions and using conservative assumptions, the project's impacts will comply with all applicable standards. Specifically:

- The National Ambient Air Quality Standards (NAAQS) will not be exceeded. Per USEPA, these standards "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.[1]"

1 https://www.epa.gov/criteria-air-pollutants/naaqs-table

- MassDEP has developed "health- and science-based air guidelines - known as Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) - to evaluate potential human health risks from exposures to chemicals in air.[2]" The Massachusetts AALs and TELs will not be exceeded in residential areas.

In Massachusetts, odor is regulated under 310 CMR 7.09 such that operations that emit odors shall not permit their emissions to "cause a condition of air pollution". To determine that the project is not a nuisance source of odors, the study evaluated for maximum 5-minute-averaged odor concentrations and determined that, for all locations on-site and off-site and given evaluated weather conditions, the odor concentration to be at or below 5 dilution-to-threshold (D/T). Thus, the project meets the criterion published in the MassDEP draft policy for odor from composting facilities.

[2] https://www.mass.gov/service-details/massdep-ambient-air-toxics-guidelines

2.0 INTRODUCTION

This report documents air and odor emissions estimates and related ambient impacts for the proposed Parallel Products of New England (PPNE) solid waste facility to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts.

2.1 Site Description

The site is an industrially zoned, approximately 71-acre parcel, located within the New Bedford Business Park. The site location and property boundaries are shown in **Figure 1** using an aerial view. The site was previously developed by Polaroid and already includes access roads, parking areas, and various buildings. Much of the existing infrastructure will be used in developing the proposed project. New buildings will be constructed for glass processing, municipal solid waste (MSW) and construction and demolition (C&D) waste tipping, and biosolids drying. The conceptual layout of the future and existing buildings is shown in **Figure 2** which presents a plan view.

The site is bounded on the west by undevelopable wetlands, to the north by several commercial or industrial operations unrelated to PPNE's project, to the east by residential neighborhoods, and to the south by a utility operations and maintenance facility. The properties to the west, north, and south are industrially zoned.

2.2 Project Description

PPNE plans to operate several solid waste and recycling related processes at the site:

(1) Processing of redemption and recovered glass to cullet for rail haul to out-of-state recycling facilities [300 tons per day (TPD) glass handling capacity, 75,000 tons per year (TPY) throughput];

(2) Processing of MSW to recover approximately 20 percent recyclables and to bale and rail haul the post-reclamation MSW, with C&D waste, to out-of-state waste disposal facilities (1,500 TPD MSW and C&D waste handling capacity, 450,000 TPY throughput);

(3) Receipt of biosolids liquid sludge for dewatering to cake and receipt of biosolids cake, with drying of the cake to 93 percent solids for rail haul to out-of-state disposal facilities [50 dry TPD (DTPD) biosolids capacity, 15,000 dry TPY (DTPY) throughput].

While the goal is to rail haul most of the products and residuals off-site, the air emissions estimates, and related ambient impacts have been based on use of trucks to haul materials on and off-site. This will overstate the air impacts when compared to future, predominate use of rail haul.

2.3 Outline of Report

This report describes the sources of air emissions included in the ambient air and odor impacts analysis (Section 3), the methodologies and bases for derivation of air emission estimates (Section 4), and the air regulatory applicability framework for the project (Section 5). Section 6.1 contains a description of the methodologies and bases for preparation of the ambient air impacts analyses. The criteria used in analyses and results of the analyses are presented in Section 6.2 (NO_2 and $PM_{2.5}$), Section 6.3 (Air Toxics), and Section 6.4 (Odor).

3.0 SOURCE DESCRIPTIONS

This section describes the types of air and odor emitting sources included in the ambient air and odor impacts analysis.

3.1 Combustion Sources

The analysis presented in this report encompasses a broader range of air emission sources than would be included in an air plan application in that certain mobile combustion sources are included in addition to all stationary combustion sources located at the site.

3.1.1 Stationary Sources

The MSW tipping and processing building, and the glass processing building, will be unconditioned spaces, and thus no combustion sources will be used to heat these structures. The biosolids building will be heated to 50 degrees Fahrenheit in the wintertime, using a nominal 3 million British thermal units per hour (MMBtu/hr) heat input boiler, stated on a higher heating value (HHV) basis. In addition to the boiler, the biosolids building will also house four nominal 5 MMBtu/hr (HHV) heat input dryers, each fitted with its own burner.

3.1.2 Mobile Sources

Both on-site and off-site mobile sources are included in the analysis.

On-site mobile sources include two glass handling front-end loaders, two MSW handling front-end loaders, and all truck traffic on site. Only one glass handling front-end loader will operate at a time for up to 3 hours per day, and the nominal engine size of each is 155-horsepower. Two MSW handling front-end loaders will operate at a time during the 12-hour day shift, and only one will operate during the 12-hour night shift (for a total of 36 hours per day operation), and the nominal engine size of each is 267-horsepower. The glass handling loaders are expected to be United States Environmental Protection Agency (USEPA) Tier 2 certified and the MSW handling loaders are expected to be USEPA Tier 4 certified. On-site truck traffic volume and frequency were deduced from the Traffic Impact Study (TIS) report included as Appendix B of the Expanded Environmental Notification Form (EENF), and all on-site trucks were assumed to be heavy duty diesel powered.

Off-site mobile sources include recycled glass, MSW, C&D, and biosolids truck traffic. The off-site traffic characteristics were deduced from the TIS.

3.2 Non-Combustion Particulate Matter Sources

Sources of particulate matter emissions at the site, which are not combustion-related, include:

(1) Dust from MSW and C&D waste tipping and MSW processing and associated rail car loading

(2) Dust from glass processing and associated rail car loading

(3) Dust from vehicle travel on on-site paved roads

(4) Particulate matter in water drift from the cooling towers that serve the biosolids dryers

3.3 Odor Sources

MSW and biosolids are sources of different types of odors. MSW odors will be managed at the site in enclosed buildings or in bales, and good air dispersion of the odors will be used to result in deminimis impact. Biosolids odors will be managed using the following add-on odor control devices:

(1) Wet scrubbing for the air emanating from the dryers; and

(2) Ionization for oxidation of the air constituents emanating from the dewatering operations.

Biosolids building stacks serving the above noted odor control devices have also been designed to further disperse the odor to result in deminimis impact.

3.4 Stack Parameters

Stack parameters include the stack height, diameter, location; and the exhaust temperature, flow rate, and velocity. These conceptual design parameters are tabulated and corresponded to their respective sources in **Attachment A**. Stack locations are also shown on a diagram as **Figure A-1**.

4.0 EMISSIONS ESTIMATES

Emission units at the proposed facility are categorized as stationary and mobile sources. The stationary source air emission estimates largely relied upon emission factors and methodologies from the USEPA publication AP-42. The mobile source air emission estimates relied upon the USEPA Motor Vehicle Emissions Simulator (MOVES) software/database for mobile source emission factors, USEPA Tier certification emission limits, and in some cases on the USEPA "SPECIATE" database.

Criteria pollutants, or criteria pollutant precursors, selected for emission estimating are nitrogen oxides (NO_x), particulate matter of size 10 microns or less (PM_{10}), particulate matter of size 2.5 microns or less ($PM_{2.5}$), and lead (Pb). These pollutants were selected for the following purposes:

(1) Air dispersion modeling for nitrogen dioxide (NO_2) and $PM_{2.5}$;

(2) Calculation of PM_{10} emission rates as needed to derive $PM_{2.5}$ emission rates;

(3) Analysis of lead as an air toxic compound.

Other criteria pollutants, or criteria pollutant precursors, (carbon monoxide, sulfur dioxide, and volatile organic compounds) are not included in this analysis for one or more of the following reasons:

(1) Stationary combustion sources are exempt from the air plan approval process (air permitting) due to their small size per 310 Code of Massachusetts Regulations (CMR) 7.02;

(2) Low sulfur fuels are now in use for all the stationary and mobile sources due to Federal and Massachusetts regulatory requirements;

(3) Compliance with National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO) and sulfur dioxide (SO_2) is easily demonstrated by air dispersion modeling, and compliance for these pollutants will be demonstrated for the air permitting process if required by MassDEP;

(4) Specific organic compounds which are subsets of the volatile organic compound (VOC) class of compounds are estimated for the analysis of air toxics impacts;

(5) There is no NAAQS for VOC so air dispersion modeling for this pollutant is not required; and

(6) VOC emissions from the MSW tipping and processing and from the biosolids processing operations are expected to be deminimis relative to air plan application thresholds.

The odor concentration associated with the MSW tipping and processing has been quantified using a published source based on measurements from New York City transfer stations, in conjunction with Epsilon experience. The odor and air toxics concentrations associated with the biosolids processing have primarily been estimated by Hazen & Sawyer during conceptual design of that operation.

Air toxic compounds were selected for emissions estimation based on the MassDEP Ambient Air Toxics Guidelines. In general, chemicals for which MassDEP has published allowable ambient limits (AALs) and threshold effect exposure limits (TELs), and for which specific emission factors were available, are included in the analysis.

Detailed methods used for the air and odor emission estimation are discussed below and supporting calculations can be found in **Attachment B** to this report.

4.1 Biosolids Dryers and Building Heat Boiler

The only stationary combustion sources at the site are the four biosolids dryers (5 MMBtu/hr each) and the one biosolids building heat boiler (3 MMBtu/hr). The design capacities are estimated based on expected fuel use provided in a conceptual design by Hazen & Sawyer. Emissions from these stationary combustion sources are estimated using emission factors and the estimated maximum heat input ratings. The fuel source for all five of these sources will be pipeline quality natural gas which is a clean fuel.

The dryer emission factor for NO_x, 159 pounds per million standard cubic feet (lb/MMscf) of natural gas fueled, was derived from a Pennsylvania Department of Environmental Protection (PADEP) air permit for a dryer of similar make as is planned for the New Bedford project. The boiler emission factor for NO_x, 100 lb/MMscf (small, uncontrolled boilers), was sourced from USEPA publication AP-42 "Compilation of Emission Factors" Table 1.4-1 (external combustion sources using natural gas).

The emission factor for PM10/$PM_{2.5}$, 7.6 pounds per million standard cubic feet (lb/MMscf) of natural gas, was sourced from AP-42 Table 1.4-2 and was applied to both the dryers and the boiler. The emission factor for lead, 0.0005 lb/MMscf of natural gas, was sourced from the same table and applied to all five combustion sources.

The emission factors for organic air toxics were sourced from AP-42 Table 1.4-3 and those for metals air toxics were sourced from AP-42 Table 1.4-4. All the air toxics emission factors from AP-42 are stated in units of lb/MMscf.

AP-42 Chapter 1 Section 4 (external combustion sources using natural gas) emission factors are all based on a higher heating value (HHV) of natural gas of 1,020 Btu/scf, which was used for converting the emission factors from lb/MMscf to lb/MMBtu.

Short term emission rates in pounds per hour (lb/hr) and grams per second (g/s) were calculated for the combustion source pollutants. For air dispersion modeling purposes, all five combustion sources were assumed to operate year-round (8,760 hours per year) at full estimated design capacity. The building heat boiler will only actually operate during the winter season and only one to four dryers will be operating at full or part load at any given time.

4.2 Biosolids Process Sources

The biosolids building also contains non-combustion (process) sources of air and odor emissions. Those sources are controlled before air is exhausted from the building to the atmosphere. The Hazen & Sawyer conceptual design has the biosolids dewatering operations controlled by two (2) ionization units. These units oxidize reduced sulfur compounds to abate the odor strength by a nominal 90% control. Each ionization unit exhausts to its own stack. The Hazen & Sawyer conceptual design for the biosolids drying operations recommended a single biofilter for a nominal 90% control of odor from these sources. However, at this stage of design it was considered advisable to increase the odor control efficiency to 99% by use of a single wet scrubber. The wet scrubber will exhaust to its own stack.

Odor emission rates from the ionization and scrubber stacks were calculated using the design value for exhaust flow for each of the three stacks, and the associated dilution to threshold (D/T) odor concentration values post-control. The D/T values from the Hazen & Sawyer conceptual design were presented pre-control as well as post-control. For the ionization exhausts the post-control odor concentration was provided. For the wet scrubber exhaust, Epsilon used the pre-control odor concentration and applied a 99% control efficiency. Each D/T concentration value was then multiplied by the associated exhaust flow rate (converted to cubic meters per second) to obtain the overall odor units per second (OU/s) emission rate.

The emissions of air toxics pollutants (hydrogen sulfide, carbonyl sulfide, carbon disulfide, and ammonia) from the biosolids process stacks were provided by Hazen & Sawyer in concentration units of either parts per million (ppm) or parts per billion (ppb). Pre- and post-control concentrations of these pollutants were provided. Epsilon used the post-control concentrations which assumed ionization control and biofilter control. Epsilon did not take credit for additional control that may be provided by a wet scrubber relative to a biofilter. Hazen & Sawyer also provided design exhaust flow rates for the biosolids process sources. The concentrations and the exhaust flow rates allow for the calculation of mass emission rates in lb/hr and g/s using the ideal gas law.

For the air and odor dispersion modeling analyses, the biosolids process sources are assumed to operate 8,760 hours per year at full estimated design capacity.

4.3 Biosolids Cooling Towers

Cooling towers are a source of PM10/$PM_{2.5}$ air emissions. The current design envisions four (4) small cooling towers that each operate with 900 gallons per minute (gpm) of circulating water. With the drift eliminators specified in the current design, the towers will have a maximum 0.002% drift rate. This drift rate is used to calculate how much water escapes the cooling tower in droplet form.

The cooling tower drift was then multiplied by the density of water to estimate the mass of water escaping the cooling tower cells in droplet form. Each of these droplets has some small amount of particulate dissolved in it which is based on the total dissolved solids (TDS) concentration of the circulating water. In this case, the circulating water was assumed to contain a maximum concentration of 1,800 parts per million by weight (ppmw) of TDS. The total particulate emissions from the cooling tower are estimated by taking this concentration and multiplying it by the mass of water escaping the cooling tower in droplet form.

The total PM emissions are assumed to be entirely made up of PM_{10} such that PM_{10}=PM. $PM_{2.5}$ is assumed to make up less than 12% of total particulate matter emissions and as such are equal to the total PM/PM_{10} emissions multiplied by 0.12. These pound per hour PM_{10} and $PM_{2.5}$ emission rates were multiplied by 8,760 hours per year and the total number of cells (4) to obtain the total PM_{10} and $PM_{2.5}$ emissions in tons per year from the cooling towers. The air dispersion modeling analysis is also based on the assumption that the cooling towers all operate every hour year-round. The number of cooling towers actually operating will match the number of dryers operating at any given time.

4.4 MSW Tipping and Processing

Operations generating indoor dust emissions from the MSW process can be broken into two subcategories. The first subcategory is material drops and loading operations. Material drop and loading emissions are based on the facility receiving waste 10 hours per day, 7 days per week, on 362 days of the year which equates to approximately 3,620 hours per year of waste receiving. When waste is received, it is dumped or loaded twice. Emissions from loading or dumping were calculated using a methodology set forth in USEPA AP-42 Chapter 13, Section 2.3 pertaining to aggregate handling. Since there were no factors for MSW, all waste is conservatively assumed as the dustier C&D residuals. Based on the volume of the building and assumptions on nominal air changes per hour, a total volumetric flow through the building was determined. Using the known vent exit diameter and the volumetric flow through the building, the air velocity over the MSW was determined, since this value was below the low end of the valid range for the methodology, the low end of the range was used to be conservative. The high end of the valid moisture range for the equation was used since MSW tends to contain significant moisture (>20%). The air velocity, moisture content, and particle size factor (found in AP-42 Chapter 13.2.3) were used to generate an emission factor for PM_{10} and $PM_{2.5}$ in units of pounds of emissions per ton of material processed (lb/ton). This lb/ton emission factor was then multiplied by the average hourly throughput and the number of drops to obtain a lb/hr and g/s emission rate.

The second subcategory is dust emissions from pushing the material around into piles or into a hopper. These emissions were calculated using the equation in USEPA AP-42 Section 13.2.3 for pushing of material. This equation uses the silt content which is the percentage of particles that are less than 75 microns in diameter. The silt content was conservatively assumed to be at the low end of the valid range. The silt content and moisture content are used in the USEPA emission rate equation in conjunction with the appropriate factor from AP-42. AP-42 Table 13.2.3-1 recommends using factors from AP-42 Section 11.9 Table 11.9-1. The resulting lb/hr emissions from the AP-42 equation was then multiplied by the hours per day of operation and then divided by 24 hours per day to get a 24-hr average lb/hr emission value. This process was then repeated for $PM_{2.5}$.

Dust emissions from the first and second subcategories of operations occur inside and were thus grouped together. The total lb/hr emissions of PM_{10} from the indoor activities (drop/dumping actions and pushing of material) were added together. The resulting lb/hr emission rate was multiplied by the hours of operation and converted to tons to obtain a ton per year (tpy) emission rate for the process. This same process was repeated to obtain tpy of $PM_{2.5}$ from the indoor activities.

The odor emissions from the MSW process are generated from the transfer station, during transfer and processing after initial bag break, and the processing building, from organic fines as they move through the process. Initial bag break occurs when an intact plastic bag containing MSW is broken open by the processing equipment. The 50 D/T odor concentration was based on a study of New York City transfer stations as well as other work performed by Epsilon. The total volume through the transfer building was calculated and then converted to metric units and multiplied by the D/T concentration to get an OU/s emission rate. The OU/s emission rate was then split evenly between the four (4) stacks on the transfer building. The calculations assumed 90% capture for the stacks with 10% of the emissions exiting through the doors on the transfer building. The same general process was used for calculating the OU/s emission rate for the processing building but with a different air flow that is specific to the processing building. The processing building OU/s emission rate was divided evenly amongst the building's three (3) stacks.

The odor emissions from the MSW tipping and handling processes are assumed to occur 8,760 hours per year, for the purposes of air dispersion modeling.

4.5 Glass Processing

Glass processing will generate dust. This process has two stationary source subsets associated with it. The first subset is the building exhaust stack which is a point source. A fraction, Epsilon assumes 10%, of indoor processing air emissions exits the building via the exhaust stack. The indoor processing includes loading of glass onto conveyors, sorting the glass, crushing the glass, and then dropping the glass into refined sorted piles. Air emission estimates were calculated for each step using the processing rate of the glass and factors from Table 11.19.2-2 from USEPA AP-42 Chapter 11 Section 19.

The second subset is the fugitive sources outside the building. An indoor conveyor moves material to intermediate and finished outdoor piles. A front-end loader moves glass from the intermediate piles to a hopper for indoor size sorting and crushing and moves glass from the finished outdoor piles to a rail car loading conveyor. The fugitive emissions were similarly calculated using the AP-42 factors from Table 11.19.2-2 and it was assumed that all emissions generated outdoors are emitted to the atmosphere.

The glass processing is considered to be conducted 8,760 hours per year, for the purposes of air dispersion modeling, except the front-end loader operates 3 hours per day and only operates between 7 AM and 10 PM.

4.6 Paved Roads

The outdoor emissions related to trucks driving on paved roads have been estimated for the glass, MSW, and biosolids truck traffic on-site. To estimate emissions from the trucks driving on paved roads, equation 1 from USEPA AP-42 Section 13.2.1 was used. This formula uses the road surface silt loading, average weight of vehicles traveling on the road, and a particle size multiplier to determine the emissions associated with the paved roads. The road surface silt loading that was used is from Table 13.2.1-2 for low volume roads (roads with less than 500 average daily trips). The average weight of the trucks was determined by evaluating the weight of each type of truck that enters and leaves the facility and then generating a weighted average based on the number of truck trips per day of each type of truck compared to the total truck trips per day. Using these values, the AP-42 equation generates an emission factor for the roads in grams per vehicle mile traveled.

An estimate of how much distance trucks travel on average when on site was generated based on a trip from the entrance to the scale to the middle door and then back through that path in reverse. Multiplying the emission factor times this vehicle miles traveled value resulted in a pounds per day emission rate of dust from the roads. This pound per day emission rate was then multiplied by 362 days per year and converted to tons to get a tons per year emission rate of dust from the roads. This calculation methodology was performed for both PM_{10} and $PM_{2.5}$ which vary based on the published particle size multiplier. The particle size multipliers are 1.0 for PM_{10} and 0.25 for $PM_{2.5}$.

4.7 Mobile Sources

Mobile sources of emissions include on-road truck traffic to and from the site, as well as a small number of off-road heavy construction equipment used in the waste processing.

Process operations are assumed to be continuous, 24 hours per day, seven days per week, for 365 days annually. Therefore, the onsite heavy equipment reflects continuous usage. According to the TIS, truck deliveries are estimated to occur between 6am and 6pm daily.

4.7.1 On-site

Off-road, diesel powered heavy equipment will consist of wheeled front-end loaders used for the glass processing and MSW tipping and processing operations.

The glass processing operation will use two 155-horsepower front end loaders, with only one at a time operating for a total of 3 hours per day between the hours of 7 AM and 10 PM. This equipment is assumed to be USEPA Tier 2 certified for emissions estimation purposes.

The MSW tipping and processing operation includes two 267-horsepower loaders. These are assumed to operate together for 12 hours per day (during the day shift while MSW receiving is occurring), and one will operate alone for 12 hours per day (during the night shift to continuously feed the processing equipment), for a total of 36 hours of operating time per day. These are expected to be new units, equipped with USPEA Tier 4 certified engines with emissions controls as necessary to meet the certification standards.

Emission factors for the front-end loaders were obtained from the NONROAD model included within USEPA's MOVES software or regulatory Tier certification emission limits. USEPA's SPECIATE database was used to estimate the breakdown of individual hazardous air pollutants from the total organic gases where available.

Within the facility property, on-road mobile sources include the truck traffic moving along the ring roadway, as well as trucks idling at the inbound and outbound scales and at two stopping points along the road. It is assumed that the trucks idle for a total of 2 minutes at each of the stopping points.

It was assumed all trucks were heavy duty diesel, and that the speeds along the ring roadway were limited to 15 miles per hour. A speed of 5 miles per hour was assumed for trucks making their way from the inbound scale to the tipping area and then back to the outbound scale.

Emission factors were obtained using the MOVES software using a presumed build-out year of 2025.

4.7.2 Off-site

Outside of the property, emissions from truck traffic were analyzed out to the intersections of local roads with Massachusetts State Route 140 ramps, with a number of stopping points, representing idling at local intersections.

Based on the TIS, 19 peak truck trips per hour were assumed. The study assumes 90% of the traffic comes from the north, towards Rice Boulevard/Braley Road and Route 140. The remaining 10% is associated with a southern route down Phillips Road to Route 140. Truck speeds of 25 mph were assumed for these local roads, and 15 mph on the on- and off-ramps to Route 140.

It was assumed that trucks would idle at local intersections due to regular traffic patterns. The intersections included were:

- Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road
- Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road
- Phillips Road & Theodore Rice Boulevard/Braley Road
- Duchaine Boulevard & Theodore Rice Boulevard
- Duchaine Boulevard & Samuel Barnet Boulevard
- Phillips Road & Samuel Barnet Boulevard.

Idle times at each of these intersections were determined from traffic modeling using the SYNCHRO program. This program incorporates vehicle volumes, control (signal or "stop" sign), lane configuration, and other variables to estimate intersection Level of Service (LOS), and average vehicle delay times. These delay times were used to estimate the amount of time trucks idle at each intersection. Idle emissions were then calculated from this idle time, and emission factors from the MOVES model for heavy duty diesel trucks at a speed of 0 mph.

5.0 REGULATORY APPLICABILITY

This section describes the regulatory standards and their applicability to the proposed Project. For each air regulatory program listed in **Table 5-1** below, there is a section briefly explaining why the standard does or does not apply.

Table 5-1 Summary of Applicable Requirements

Regulatory Program	Applicability
Ambient Air Quality Standards and Policies	Apply and are satisfied as described in Section 5.1 and Section 6.0
Prevention of Significant Deterioration (PSD) Review	Not Applicable, See Section 5.2
Non-Attainment New Source Review (NSR)	Not Applicable, See Section 5.3
New Source Performance Standards (NSPS)	Not Applicable, See Section 5.4
National Emission Standards for Hazardous Air Pollutants (NESHAPs)	Not Applicable, See Section 5.5
Emissions Trading Programs	Not Applicable, See Section 5.6
Visible Emissions	Applies and is satisfied as described in Section 5.7
Noise Control Regulation and Policy	Applies and is satisfied as described in Section 5.8
Industry Performance Standards	Not Applicable, See Section 5.9
Air Plan Approval	Applies and is satisfied as described in Section 5.10
Best Available Control Technology (BACT)	Applies and is satisfied as described in Section 5.11
Operating Permit and Compliance Assurance Monitoring (CAM)	Not Applicable, See Section 5.12
Massachusetts Environmental Policy Act (MEPA)	Applies and is satisfied as described in Section 5.13
Massachusetts Air Toxics Guidelines	Apply and are satisfied as described in Section 5.14

5.1 Ambient Air Quality Standards and Policies

One of the most basic goals set forth in the federal and state air regulations is to ensure that ambient air quality, including the impact of background, existing sources, and new sources, complies with ambient air quality standards. As such, all areas of the country are labeled with one of three classifications for each particular contaminant. These three classifications are "attainment," "nonattainment," and "unclassified."

In areas designated as attainment, the air quality with respect to the pollutant is equal to or better than the NAAQS. These areas are under a mandate to maintain, i.e., prevent significant deterioration of, such air quality. In areas designated as unclassifiable, there is limited air quality data, and those areas are treated as attainment areas for regulatory purposes. In areas designated as nonattainment, the air quality with respect to the pollutant is worse than the NAAQS. These areas must take actions to improve air quality and attain the NAAQS within a certain period of time.

Part of documenting compliance with Massachusetts air regulations is to document that new emission sources associated with the project do not cause or contribute to an exceedance of the air quality standards set forth by the State and Federal regulations. The USEPA has developed a set of NAAQS for six air contaminants that are collectively known as criteria pollutants. These NAAQS are intended to protect public health and welfare. The six criteria pollutants are sulfur dioxide (SO_2); particulate matter (which is broken up into two categories: PM_{10} which is particulate having an aerodynamic diameter of 10 micrometers or less, and $PM_{2.5}$ which is particulate matter having an aerodynamic diameter of 2.5 micrometers or less); nitrogen dioxide (NO_2); carbon monoxide (CO); ozone (O_3); and lead (Pb). Coinciding with the NAAQS, the Commonwealth of Massachusetts has set forth its own state air quality standards called the Massachusetts Ambient Air Quality Standards (MAAQS) which are codified in 310 CMR 6. These MAAQS generally follow the USEPA NAAQS, though the MAAQS have not been updated to reflect some of the more recent USEPA updates to the NAAQS. Recently, a proposal for conformance of the MAAQS with the NAAQS has been issued for public comment by MassDEP.

The NAAQS and MAAQS have been developed for various durations of exposure. The short-term standards typically refer to pollutant levels that are not to be exceeded except for a limited number of times per year. The long-term standards typically refer to pollutant levels that are not to be exceeded on an annual average basis. These standards can be further broken down into primary and secondary standards. Primary standards are intended to protect human health, including the health of "sensitive" populations such as asthmatics, children and the elderly. The secondary standards are intended to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The NAAQS and MAAQS for criteria pollutants are shown in Table **5-2** below.

Table 5-2 National (NAAQS) and Massachusetts (MAAQS) Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS/MAAQS ($\mu g/m^3$)	
		Primary	Secondary
CO	1-Hour	40,000[1]	Same
	8-Hour	10,000[1]	Same
Pb	Rolling 3-month avg.	0.15[2]	Same
NO_2	1-Hour	188[3]	None
	Annual	100[4]	Same
O_3	8-Hour	137.4[5]	Same
$PM_{2.5}$	24-Hour	35[6]	Same
	Annual	12[7]	15[7]
PM_{10}	24-Hour	150[1]	Same
	Annual	None	None
SO_2	1-Hour	196.0[8]	None
	3-Hour	None	1,310[1]
	24-Hour	None	None
	Annual	None	None

[1] Not to be exceeded more than once per year
[2] Not to be exceeded
[3] 98th percentile of 1-hour daily maximum concentrations averaged over 3 years
[4] Annual mean
[5] Annual fourth-highest daily maximum ozone concentration, averaged over 3 years
[6] 98th percentile, averaged over 3 years
[7] Annual mean, averaged over 3 years
[8] 99th percentile of 1-hour daily maximum concentrations averaged over 3 years

An air quality impact analysis was performed for the new sources associated with this project to document compliance with the ambient air quality standards as well as the air toxics guidance (discussed in detail in Section 5.15). This air quality impact analysis is further discussed in Section 6.0 of this document.

5.2 Prevention of Significant Deterioration (PSD) Review

The PSD new source review program is a federally-mandated program review of new major stationary sources of criteria pollutants designed to maintain the NAAQS and prevent degradation of air quality in attainment/unclassifiable areas. The PSD program, which is implemented by the Massachusetts Department of Environmental Protection (MassDEP) in Massachusetts[3], applies to new major stationary sources and major modifications of existing major sources of air pollution in attainment/unclassifiable areas. The Facility is not an existing major source under PSD regulations and the new potential emissions from the stationary sources at the project do not exceed the applicable PSD major source emissions threshold of 250 tpy.

3 MassDEP administers the federal PSD program in accordance with the provisions of the April 11, 2011 PSD Delegation Agreement between MassDEP and EPA which states that MassDEP agrees to implement and enforce the federal PSD regulations as found in 40 CFR 52.21.

5.3 Non-Attainment New Source Review

If a major source of pollution is proposed in an area designated as nonattainment for a particular pollutant, the source is subject to Nonattainment New Source Review (NSR) for that pollutant. The federal Clean Air Act defines levels of nonattainment classifications for ozone ("O_3"). The entire Commonwealth of Massachusetts was previously classified as moderate nonattainment for 8-hour ozone. MassDEP has not taken any action to revise its Nonattainment NSR provisions as a result of the recent reclassification of most of the state to "unclassifiable/attainment" for 8-hr ozone. Therefore, the Nonattainment NSR provisions of MassDEP regulations at 310 CMR 7.00 Appendix A ("Appendix A") are still currently applicable state-wide to major sources of NO_x and VOC, as precursors to ozone.

The major source threshold for NO_x and VOC is currently 50 tpy in Massachusetts. The Non-Attainment NSR regulations do not apply to this project because the aggregate potential emissions from the proposed stationary sources at the facility are below the 50 tpy threshold for NO_x and the 50 tpy threshold for VOC.

5.4 New Source Performance Standards

The USEPA has implemented New Source Performance Standards (NSPS) at 40 CFR 60. These NSPS are intended to regulate air contaminants that may be emitted by various categories of newly constructed industrial or commercial equipment. None of the emission sources at the proposed facility fall into the categories and definitions of applicability in any of the established NSPS requirements. As such, the Facility is not subject to the requirements of any NSPS.

5.5 National Emission Standards for Hazardous Air Pollutants

Realizing that there were many pollutants that did not meet the specific requirements for developing a NAAQS, Congress included a section (Section 112) in the 1990 Amendments to the Clean Air Act that established a vehicle for the USEPA to develop air quality standards for potentially hazardous pollutants. Updates to regulations set forth in 40 CFR 61 and new regulations published in 40 CFR 63 were developed to implement Section 112 of the 1990 Amendments to the Clean Air Act. The regulations at 40 CFR 61 apply to specific pollutants and source categories that do not include the proposed facility. 40 CFR 63 established numerous National Emission Standards for Hazardous Air Pollutants (NESHAPs) to regulate Hazardous Air Pollutants (HAPs). HAPs refers to specified pollutants regulated under the Clean Air Act, including organic compounds and trace metals for which the USEPA has not established ambient air quality standards. HAPs are defined in detail within 42 U.S.C. 7412, and accompanying regulations in 40 CFR Part 63, Subpart C. There are no NESHAP requirements that are applicable to the facility as proposed.

5.6 Emissions Trading Programs

The Acid Rain Program (40 CFR 72), the Regional Greenhouse Gas Initiative (RGGI), and the Massachusetts NO_x Budget program apply to fossil fuel-fired combustion devices serving a generator with a nameplate capacity of greater than 25 MWe. This proposed facility does not include any fossil fuel-fired combustion devices serving a generator larger than 25 MWe, thus these three programs do not apply.

5.7 Visible Emissions

Massachusetts regulation (310 CMR 7.06) limits smoke to No. 1 on the Ringlemann Chart (except for six minutes in an hour up to No. 2 on the Chart) and limits opacity to 20% (except for two minutes in an hour up to 40%). These limits apply to stationary sources. The proposed facility is not expected to have any visible emissions impact from stationary sources and is expected to operate well below the visible emissions limits set forth in 310 CMR 7.06.

5.8 Noise Control Regulation and Policy

MassDEP regulations, set forth in 310 CMR 7.10 and as interpreted in the MassDEP Noise Policy 90-001, limit noise increases to 10 dBA over the existing L90 ambient level at the closest residence and at property lines. Conforms to the Noise Control Regulations and Policy are discussed in Appendix D of the EENF.

5.9 Industry Performance Standards

Commercial, industrial, and institutional boilers have a compliance certification option, in lieu of air permitting, under the Massachusetts Environmental Results Program (ERP). This certification is required for boilers rated between 10 and 40 MMBtu/hr, if a project will not obtain a site-specific air plan approval for the source instead. The four (4) dryers and the boiler in the biosolids building are exempt from this certification as they are below the threshold for inclusion in the program at 5 MMBtu/hr each and 3 MMBtu/hr respectively.

5.10 Air Plan Approval

The proposed Facility will likely be subject to MassDEP air plan approval (air permitting) requirements under 310 CMR 7.02. Key standards for approval are listed in 310 CMR 7.02 (4) for Limited Plan Approvals and 310 CMR 7.02 (5) for Comprehensive Plan Approvals. These standards typically include ensuring that these new stationary sources will be in compliance with all applicable federal and MassDEP air regulatory requirements, ensuring that the new sources will meet ambient air quality criteria, and requiring a certification that any facilities in Massachusetts owned or operated the applicant are in compliance with MassDEP air requirements (or are on an approved schedule to come into compliance). The proposed facility is likely subject to the MassDEP air plan approval requirements for a Limited Plan Application (LPA) and will comply by filing the necessary documents and forms with MassDEP through the MassDEP/EEA ePLACE Portal. The LPA applicability threshold is one (1) tpy of any regulated pollutant, whereas the non-major Comprehensive Plan Application (nmCPA) applicability threshold is ten (10) tpy of any regulated pollutant.

The four (4) dryers and the boiler in the biosolids building are exempt from the air plan approval process as they are each rated below the 10 MMBtu/hr threshold for inclusion in the program. The cooling towers will comply with the listed exemption in 310 CMR 7.02(2)(b)6. The exemption applies to cooling towers with a maximum recirculation rate of 20,000 gpm (the current project design is 900 gpm) and requires the use of a drift eliminator, a non-chromium inhibitor, and enough of a bleed stream to limit the total dissolved solids (TDS) concentration in the recirculating water to 1,800 milligrams per liter (mg/L).

In addition to the federal and state limits and standards described above which are implemented through the MassDEP Air Plan Approval review, Massachusetts regulations require the application of Best Available Control Technology (BACT) for each regulated pollutant as discussed in Section 5.11 of this document. Application of BACT is reviewed by MassDEP during the air plan approval review process for stationary sources subject to that process.

5.11 Best Available Control Technology

Massachusetts BACT is based on the maximum degree of reduction of any regulated air contaminant that the MassDEP determines, on a case-by-case basis, is achievable taking into account energy, environmental, and economic impacts. A BACT determination can never result in a less stringent emission limitation than an applicable emission standard. Depending on the circumstances, BACT may parallel with the emission standard or may be more stringent than the emission standard. BACT itself is a standard that balances emission control benefits with technical feasibility, other environmental impacts and costs. BACT for stationary sources subject to the MassDEP air plan approval process will be addressed by the applicant in the air plan application.

5.12 Operating Permit and Compliance Assurance Monitoring

The proposed facility will not be subject to the requirements to obtain an operating permit as it is not a major source of emissions and no Federal regulations apply that require obtaining an operating permit (i.e., certain NSPS and NESHAP).

The Compliance Assurance Monitoring (CAM) requirements at 40 CFR 64 apply when an emission unit uses a control device to comply with certain emission limits, the potential emissions before control are above major source thresholds, and an operating permit does not specify a continuous compliance determination method, such as CEMS. No such sources exist at this facility and the proposed facility will not be required to obtain an operating permit; therefore, CAM does not apply.

5.13 Massachusetts Environmental Policy Act

The Massachusetts air plan approval regulations at 310 CMR 7.02 state that Massachusetts Environmental Policy Act (MEPA) requirements must be complied with before obtaining a plan approval. Per the MEPA Office website, MEPA requires that state agencies study the environmental consequences of their actions, including permitting and financial assistance. It also requires them to take all feasible measures to avoid, minimize, and mitigate damage to the environment.

MEPA further requires that state agencies "use all practicable means and measures to minimize damage to the environment," by studying alternatives to the proposed facility, and developing enforceable mitigation commitments, which will become conditions for the project if and when they are permitted. The project EENF serves as the MEPA compliance filing for the proposed facility.

5.14 Massachusetts Air Toxics Guidelines

Similar to the NAAQS and MAAQS discussed in Section 5.1, there are concentration thresholds for air toxics that are in place to protect air quality and human health. MassDEP has set forth guideline values known as the Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) to allow evaluation of the potential for human health risks associated with exposure from certain chemicals in the air.

MassDEP determines the AALs and TELS through an analysis of health effects. The first step in developing an AAL and TEL is to look at the carcinogenic and non-carcinogenic health effects of the chemicals.

Known or suspected carcinogenic health effects make up the basis of the Non-Threshold Effects Exposure Limits (NTELs) which are associated with a one in a million excess cancer risk over a lifetime of continuous exposure to the chemical.

The TEL addresses the non-cancer health effects and is intended to protect the general population from adverse health effects over a lifetime of exposure to the chemical. The TEL includes impacts on sensitive populations such as children and takes into account other pathways for exposure to the chemical than just ambient air. These other pathways that are evaluated in the TEL determination include indoor air, food, soil, and water.

MassDEP then compares the NTEL and TEL and assigns whichever concentration is lower as the AAL to make sure both cancer and non-cancer health impacts are mitigated to the fullest extent possible. Most AALs are based on the NTELs since the NTEL tends to be lower than the TEL for most compounds. For non-carcinogenic compounds, the AAL will be based on the TEL which results in the published AAL and TEL values being the same. It is important to note that exposure above an AAL or TEL does not necessarily mean there will be adverse health impacts, but rather that the risk of these adverse effects increases with the frequency of exposure above these levels.

To address the air toxics guidelines, air toxic mass emission rates were estimated for both stationary and mobile sources at the proposed facility, ambient concentrations from all sources were modeled, and the maximum modeled concentrations were compared to the AAL (on an annual average basis) and TEL (on a short-term basis) to ensure there are no exceedances in the residential neighborhoods. In some cases, AALs and TELs were not available for pollutants of concern, and in those cases other equivalent criteria were used for comparison. The results of the air toxics analysis that contains the comparison to these AALs and TELs (and other equivalent criteria as appropriate) is found in Section 6.3 and **Attachment D** of this report.

6.0 AIR QUALITY IMPACTS ANALYSES & RESULTS

6.1 General Approach

As part of the environmental impact analysis for the proposed project, an air quality analysis has been completed to estimate the impacts of air pollutants on the nearby residential areas.

6.1.1 Modeling Methodology

To predict potential project-generated air quality impacts at nearby locations, USEPA has developed computer software to emulate dispersion of chemicals in the atmosphere. These "models" incorporate pollutant source characteristics, local meteorological data, digital location and terrain data, and a variety of control options to estimate pollutant concentrations at a given location. This technique is often required for sources of air pollution and the acceptable and appropriate methods are specified in detail in both USEPA regulations[4] and state modeling guidelines.[5]

The models and air quality modeling techniques are developed with a relatively highly conservative margin of error, such that results are generally shown to be higher or worse than actual atmospheric dispersion. This provides reasonable confidence that by showing compliance with applicable standards, that protection of public health and welfare is assured.

6.1.2 Air Quality Model Selection and Options

The USEPA's AERMOD model (Version 18081) was selected to predict concentrations from the stationary source related to the proposed project. AERMOD is the USEPA's preferred model for regulatory applications. The use of AERMOD provides the benefits of using the most current algorithms available for steady state dispersion modeling.

The AERMOD View graphical user interface (GUI) Version 9.6.5, created by Lakes Environmental, was used to facilitate model setup and post-processing of data. The AERMOD model was selected for this analysis because it:

- is the required USEPA model for all refined regulatory analyses for receptors within 50 km of a source;
- is a refined model for facilities with multiple sources, source types, and building-induced downwash;

[4] 40 CFR Part 51, Appendix W. Guideline on Air Quality Models

[5] MassDEP, 2011: Modeling Guidance For Significant Stationary Sources Of Air Pollution, Massachusetts Department of Environmental Protection, Boston, MA 02108

- uses actual representative hourly meteorological data;
- incorporates direction-specific building parameters which can be used to predict impacts within the wake region of nearby structures;
- allows the modeling of multiple sources together to predict cumulative downwind impacts, if needed;
- provides for variable emission rates (though not applicable for this evaluation);
- provides options to select multiple averaging periods between one-hour and one year (scaling factors can be applied to adjust the one-hour impact to a peak impact less than one-hour); and,
- allows the use of large Cartesian and polar receptor grids, as well as discrete receptor locations.

Modeling was performed with all regulatory options set. Regulatory default options adopted for the model include:

- Use stack-tip downwash (except for building downwash). Stack-tip downwash is an adjustment of the actual stack release height for conditions when the gas exit velocity is less than 1.5 times the wind speed. For these conditions, the effective release height is reduced a bit, based on the diameter of the stack and the wind and gas exit velocity. This option applies to point sources only, such as stacks and vents.

- Use the missing data and calms processing routines. The model treats missing meteorological data in the same way as the calms processing routine, i.e., it sets the concentration values to zero for that hour and calculates the short-term averages according to USEPA's calms policy, as set forth in the Guideline on Air Quality Models (Appendix W to 40 CFR 51).

A complete description of the AERMOD dispersion model may be found in the AERMOD User's guide[6] and the AERMOD model implementation guide.[7]

6 USEPA, 2016: User's Guide for the AMS/EPA Regulatory Model – AERMOD. EPA-454/B-16-011. U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

7 USEPA, 2016: AERMOD Implementation Guide. EPA-454/B-16-013. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

6.1.3 *Urban / Rural Analysis*

The AERMOD model can assign sources to a rural or urban category to allow specified urban sources to use the effects of increased surface heating under stable atmospheric conditions. The **rural** dispersion classification was selected based on a visual inspection of the area within a three-kilometer radius of the proposed project site. The area within 3 km of the site is shown in **Figure 3**.

6.1.4 *Background Air Quality Data*

Ambient background concentrations (also known as "design values") are added to the source impacts to obtain total concentrations, which, in turn, are compared to the NAAQS and MAAQS.

The Clean Air Act and USEPA's authority to promulgate the NAAQS determine the statistical forms of the standards. These dictate exactly how the ambient monitored concentrations reflect an area's compliance with the NAAQS, as well as how a conducted air quality impact analysis complies with the NAAQS.

To attain the 24-hour $PM_{2.5}$ standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 $\mu g/m^3$. For annual $PM_{2.5}$ averages, the three-year average of the highest annual observations must not exceed 12 $\mu g/m^3$. To attain the one-hour NO_2 standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 $\mu g/m^3$. The Annual NO_2 NAAQS of 100 $\mu g/m^3$ is never to be exceeded.

Background concentrations were determined from the closest and most representative available monitoring stations to the project. The closest monitor is at 659 Globe Street in Fall River, and this location samples $PM_{2.5}$. The next closest monitor is at Francis School in East Providence, RI, and this location samples for NO_2.

The 2017 design values were obtained from the USEPA and are 6.1 $\mu g/m^3$ for annual $PM_{2.5}$ and 15 $\mu g/m^3$ for 24-hour $PM_{2.5}$.

In 2010 the USEPA finalized and promulgated new 1-hour NAAQS for NO_2. There have been several clarification memos released by USEPA regarding application of Appendix W modeling guidance for the new 1-hour standards. On March 1, 2011, USEPA released a memo recommending for NO_2, to use the latest three (3) year average background values that were calculated based on season and hour day.[8]

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8 USEPA, 2011; Memorandum - Additional Clarification Regarding Application of Appendix W Modeling Guidance for the NO_2 National Ambient Air Quality Standard. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. March 1, 2011.

The ambient monitored NO_2 data were obtained from the USEPA[9] for the Francis School, Rockefeller Library and Hayes Road monitors. The data were obtained and processed I accordance with MassDEP and USEPA procedures. The seasonal-hourly background concentrations used in the NO_2 modeling are presented in **Table 6-1**.

Table 6-1 NO_2 Background Concentrations by Season and Hour

Hour	Value (ppb)	Hour	Value (ppb)	Hour	Value (ppb)	Hour	Value (ppb)	Hour	Value (ppb)	Hour	Value (ppb)
WINTER											
1	30.90	2	31.30	3	32.00	4	31.70	5	33.70	6	33.80
7	35.70	8	34.60	9	33.00	10	30.60	11	23.90	12	20.30
13	19.40	14	19.30	15	19.30	16	20.70	17	20.00	18	26.10
19	29.20	20	29.40	21	31.90	22	34.00	23	32.90	24	32.60
SPRING											
1	27.20	2	27.60	3	27.70	4	29.80	5	31.20	6	33.50
7	33.40	8	28.70	9	19.60	10	16.70	11	16.70	12	16.70
13	16.70	14	16.70	15	16.70	16	16.70	17	16.70	18	16.70
19	16.70	20	17.80	21	18.30	22	20.20	23	22.90	24	23.20
SUMMER											
1	16.70	2	16.70	3	16.70	4	16.70	5	16.70	6	16.70
7	16.70	8	16.70	9	16.70	10	16.70	11	16.70	12	16.70
13	16.70	14	16.70	15	16.70	16	16.70	17	16.70	18	16.70
19	16.70	20	16.70	21	16.70	22	16.70	23	16.70	24	16.70
FALL											
1	22.90	2	22.70	3	21.20	4	20.10	5	20.10	6	21.40
7	21.90	8	24.50	9	24.00	10	20.10	11	16.70	12	16.70
13	16.70	14	16.70	15	16.70	16	16.70	17	16.70	18	17.80
19	21.50	20	23.10	21	25.00	22	24.50	23	23.30	24	23.30

6.1.5 Meteorological Data for Modeling

Five years (2013-2017) of meteorological data were used in the analysis. Surface data from New Bedford Regional Airport which is the closest and most representative meteorological station (located approximately 2.7 miles south of the proposed project) and upper air sounding data from Chatham, MA have been processed into AERMOD-ready input files using version 18081 of AERMET. Based on direction from MassDEP, the U-star adjustment

9 https://aqs.epa.gov/aqsweb/airdata/download_files.html#Raw

was used.[10] Raw 1-minute data were included using version 15272 of the AERMINUTE preprocessor to reduce the incidence of "calm" winds. A 0.5 m/s calm wind threshold was input.

AERSURFACE (version 13016) processes digital land cover data to determine the surface characteristics for use in AERMET. These parameters include surface roughness, albedo, and Bowen ratio. Based on the climatological record for New Bedford from 1996 to 2017 annual precipitation data, 2015, 2016, and 2017 are considered dry, while 2013 is average and 2014 is wet. If the total precipitation was between the 30th and 70th percentile it was considered "average", if it was less than 30th percentile "dry" and if it was greater than 70th percentile, "wet". Other options include the use of the Modify Option for the Upper Air Soundings and inputs of a base elevation of 24 meters and an anemometer height of 7.92 meters.

Continuous snow cover was determined from data downloaded from the National Operational Hydrologic Remote Sensing Center Interactive Snow Information Website (http://www.nohrsc.noaa.gov/interactive/html/graph.html). These annual datasets contain both observed and modeled snow depths for every hour of a year at a prescribed location. For New Bedford Regional Airport, only modeled data are available. The number of hours of modeled snow depth greater than zero was calculated for each month. The following rules were applied:

- Any month having greater than 1 inch of snow cover for greater than 60% of the hours was considered having "Continuous Snow Cover"
- April and May are always considered "Transitional Spring"
- June/July/August are always considered "Midsummer"
- September and October are always considered "Autumn"
- November through March without snow cover is considered "Late Autumn/Winter Without Continuous Snow Cover"

The results of the precipitation analysis and snow cover analysis are presented in **Attachment C** to this report.

Testing of the processed meteorological data found that the five-year period of 43,824 total hours, 514 calm hours were identified, and 387 (0.88%) missing hours were identified. Thus, these data should be deemed complete and representative for air quality modeling of the proposed project site. Winds are generally out of the west-northwest and southwest.

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[10] Personal communication, Epsilon Associates, Inc. (Joseph Sabato) and MassDEP (Glenn Pacheco), November 10, 2017.

A wind rose showing the distribution of wind speed and direction is presented in **Figure 4**.

6.1.6 Receptor Grid

A total of 6,496 receptors were modeled. All are in an 11 km by 11 km nested grid encompassing 121 square kilometers and extending roughly 5.5 kilometers in cardinal directions from the facility. The grid consists of a 1 km by 1 km bounding box with 20-meter spacing to encompass the neighborhood to the east of project site. The remaining receptors are defined by the following receptor distance and density:

Distance from Bounding Box (m)	Receptor Spacing (m)
200	20
500	50
1000	100
2000	200
5000	500

It is expected that with low release temperatures low exit velocities, and downwash influences, maximum impacts would be relatively close to the facility. The 20-meter receptor spacing locates a receptor at practically every house in the neighborhood to the east.

Receptors within the facility property were removed. USEPA recently issued draft guidance redefining "ambient air". A physical barrier (fence) is no longer required and USEPA is proposing that non-physical "measures" (signage, surveillance, natural obstructions) may be adequate to prevent the general public from accessing "ambient air" on private property. It is assumed that the facility will take appropriate measures to limit access to the property.

Receptor locations are shown in **Figure 5**.

Receptor terrain elevations were included in the refined analysis, as is required for regulatory refined modeling. One-third arc-second terrain data were obtained from the U.S.G.S National Map Seamless Server according to guidance set forth by USEPA.[11] Source, building, and receptor elevations are processed using the AERMAP (version 18081) processor by way of the Lakes AERMOD View interface.

[11] USEPA, 2009: AERMOD Implementation Guide. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711.

6.1.7 Good Engineering Practice Stack Height Determination

AERMOD requires direction specific building parameters to adequately incorporate the aerodynamic effects of buildings on plume dispersion. The most recent version (04274) of the Building Profile Input Program with the Prime downwash algorithms (BPIP-Prime) is used to calculate these parameters. BPIP-Prime uses the stack information, as well as the height information of nearby buildings to calculate the required heights, widths, and setbacks required to account for building downwash.

The property will consist of a number of buildings and structures. Given the locations of the stacks, they are probable to be subject to aerodynamic influences that would affect the dispersion of the stack exhaust. Thus, the proposed MSW tipping and existing MSW processing buildings, the proposed biosolids building, the proposed glass processing building, the proposed solar canopies, and the industrial building to the south of the property were input into the BPIP Prime program to create direction-specific dimension inputs for the AERMOD model. Most building tier heights were provided. Other heights were conservatively estimated. Other nearby buildings (i.e., residences) were determined to be at a distance where they would not affect dispersion. Building tiers are shown in **Figure 6**.

6.1.8 Selection of Sources to Include in Analyses

On-site stationary and heavy mobile equipment sources, and truck traffic both on-site and off-site, were included in the analysis. This represents a broader inclusion of sources than is typically considered in a MassDEP air plan application air dispersion modeling analysis. For air permitting purposes, only air emissions from stationary sources, such as the biosolids process and combustion sources, the MSW tipping and processing sources, on-site paved roads, and the glass processing sources, are included. This more inclusive analysis allows the project to be designed holistically to minimize environmental impacts and give a more complete picture of all significant project related air impacts.

6.1.9 Selection of Pollutants to Include in Analyses and Criteria

Air pollutants included in this analysis are NO_2, $PM_{2.5}$, and MassDEP air toxics. Odor impacts are also quantified. The selection of pollutants to include in the ambient air and odor impacts analysis is discussed in Section 4.0.

The NAAQS for NO_2 and $PM_{2.5}$ are the health protective criteria for those pollutants. The NAAQS for those two pollutants are enumerated in Section 6.1.4 above. The MassDEP AALs and TELs are the health protective criteria for air toxics. The AALs and TELs are listed with the air toxics analysis results in **Attachment D**. The odor criterion used for this analysis is 5 D/T, on a 5-minute average. The selected odor criterion is discussed further in Section 6.4 below.

6.2 NO_2 and $PM_{2.5}$

6.2.1 Nitrogen Dioxide (NO_2)

Oxides of nitrogen (NO_x) are emitted from combustion exhaust. For this facility, sources of NO_x are the biosolids boiler and dryers, and mobile sources. USEPA has promulgated NAAQS to protect public health and property from impacts associated with NO_x emissions.

NO_x to NO_2 Conversion

Though the NAAQS are based on NO_2 concentrations, the majority of NO_x emissions are in the form of nitric oxide (NO) rather than NO_2. Oxides of nitrogen undergo chemical conversion with atmospheric ozone to form NO_2. The AERMOD model incorporates a number of different routines to model this conversion:

- Full Conversion of NO_x to NO_2
- The use of the Ambient Ratio Method (ARM2)
- The use of more sophisticated methods incorporating ambient ozone levels which factor into the chemical conversion process: the Ozone Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM)

For this analysis, the OLM routine for NO_x to NO_2 conversion was used with default ratios of 0.5 and 0.9 for minimum and maximum, respectively and concurrent (2013-2017) monitored ozone concentrations from hourly concentrations from the Fall River monitor were used. If data were unavailable from Fall River, data were substituted from the Fairhaven, Francis School in Providence or the Harrison Avenue in Boston ozone monitors. If data were unavailable from all four monitors, data was substituted from a previous hour from the Harrison Avenue monitor.

Results

To attain the one-hour NO_2 standard, the three-year average of the 98th percentile of the maximum daily one-hour concentrations must not exceed 188 $\mu g/m^3$. This metric is represented in the modeling analysis as the maximum of the eighth-highest (H8H) 1-hour concentrations averaged over five years (as recommended by USEPA).[12] The Annual NO_2 NAAQS of 100 $\mu g/m^3$ is never to be exceeded and is confirmed by showing that the annual average for any individual year is below the 100 $\mu g/m^3$ value.

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[12] USEPA, 2010: Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. June 28, 2010.

The air quality analysis shows a five-year average of the 1-hour H8H NO_2 impact of 155.7 $\mu g/m^3$, which includes background. This value is less than the applicable 1-hour NO_2 NAAQS of 188 $\mu g/m^3$.

A maximum predicted annual concentration of 46.5 $\mu g/m^3$, also which includes background. This value is far less than the applicable annual average NO_2 NAAQS of 100 $\mu g/m^3$.

Based on these results, it can be concluded that the project meets the applicable standards for NO_2.

6.2.2 Particulate Matter less than 2.5 μm in Diameter ($PM_{2.5}$)

Particulate matter is emitted from both material handling as well as from combustion exhaust. For this facility, sources of $PM_{2.5}$ are the biosolids boiler and dryers, the MSW tipping and processing areas, the glass processing areas, paved roads, and mobile sources. USEPA has also promulgated NAAQS to protect public health and property from impacts associated with $PM_{2.5}$ emissions.

Results

To attain the 24-hour $PM_{2.5}$ standard, the three-year average of the 98th percentile of 24-hour concentrations must not exceed 35 $\mu g/m^3$. This metric is represented in the modeling analysis as the maximum of the eighth-highest (H8H) 24-hour concentrations averaged over five years (as recommended by USEPA).[13] For annual $PM_{2.5}$ averages, the three-year average of the highest annual observations must not exceed 12 $\mu g/m^3$. When modeling with National Weather Service meteorological data, rather than onsite measured data, USEPA recommends the maximum modeled value averaged over five years for determining compliance with this annual standard.

The air quality analysis shows a five-year average of the 24-hour H8H $PM_{2.5}$ impact of 7.33 $\mu g/m^3$. With the addition of the 15 $\mu g/m^3$ design value, a total $PM_{2.5}$ impact of 22.3 $\mu g/m^3$ is predicted, well below the NAAQS of 35 $\mu g/m^3$.

The five-year average of the annual concentrations shows a modeled impact of 2.43 $\mu g/m^3$ at the same location as above. Combined with a design value of 6.1 $\mu g/m^3$, a total annual $PM_{2.5}$ impact of 8.53 $\mu g/m^3$ is predicted, again well below the NAAQS of 12 $\mu g/m^3$.

Based on these results, it can be concluded that the project meets the applicable standards for $PM_{2.5}$.

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13 USEPA, 2010: Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711. March 23, 2010.

6.3 Air Toxics

Air toxics are emitted from combustion exhaust sources (stationary and mobile) and biosolids process stacks. MassDEP has published AALs and TELs to protect public health. The results of the air toxics analysis, including maximum concentration impacts predicted in the residential neighborhoods using AERMOD and comparison of the maximum concentration impacts to the AALs and TELs (or other equivalent criteria as appropriate), are included in **Attachment D** to this report. No air toxic exceeds the AALs or TELs (or other equivalent criteria) at the residential areas. Based on these results, it can be concluded that the project satisfies criteria for air toxics.

6.4 Odor

In Massachusetts, odor is regulated under 310 CMR 7.09 in that operations that emit odors shall not permit their emissions to "cause a condition of air pollution." A Draft Odor Policy for Composting Facilities was published by MassDEP in January 1996. This draft guidance document recommended a minimum design standard benchmark of 5 D/T, presumably on a 5-minute average basis.

An odor concentration threshold of 1 D/T, on a 1-minute average basis, is the criterion used in this analysis for design of stacks to avoid nuisance odor impacts in the nearby residential neighborhoods. This stringent criterion has been used by Epsilon as a design benchmark and is more conservative than the MassDEP Draft Policy.

D/T is a dimensionless ratio defined as the volume of dilution air divided by the volume of odorous air, or commonly described as the number of equivalent volumes of clean air which must be added to an odorous volume such that the odor is undetectable to the average person. Thus, a higher D/T value indicates that a sample must be diluted many times to become undetectable, indicating a stronger sample. Conversely, a weak sample would require only a few volumes to be introduced to make the odor sample undetectable.

An "odor unit per second" (OU/s) is equivalent to a mass emission rate for odor and is calculated by multiplying the odor source concentration (D/T, a dimensionless number) by the associated exhaust flow rate (cubic meters per second).

Odor is highly subjective and highly individualized. One person can find a smell tolerable or indifferent, while another finds the same smell highly offensive. Some individuals are capable of detecting odors that others cannot. Additionally, the criteria of what defines a "nuisance" are also subjective. Recurring impacts are likely far more offensive than rare or single occurrences. Therefore, the maximum predicted impact may not necessarily describe the total "nuisance" of the emitted odor.

Since dispersion modeling calculates hourly concentrations, the 1/5th (0.20 exponent) power law is typically used to convert from 1-hour to shorter minute averages.[14] The formula is often expressed as:

$$C_{new} = C_{old}\left(\frac{T_{old}}{T_{new}}\right)^{q}$$

Where "C_{new}" and "C_{old}" are the concentrations at two averaging times, "T_{new}" and "T_{old}" are the corresponding averaging times, and "q" is a value between 0.17 and 0.20.

Since the air dispersion modeling results are stated on a 1-hour average basis (60-minute average), a scaling factor is required to assess the resulting concentrations on a 1-minute average basis. The following power law and resulting scaling factor of 2.27 were used in this analysis.

$$\left(\frac{60\ minutes}{1\ minute}\right)^{0.2} = 2.27$$

As an example, a D/T of 1 on a 1-minute average would be equivalent to a D/T of 0.441 on a 1-hour average.

6.4.1 Methodology

The criterion used in this analysis to determine that the project is not a nuisance source of odors, is for maximum 5-minute odor concentrations to be at or below 5 D/T. Odor concentrations predicted to exceed this threshold do not necessarily constitute an unfavorable odor impact. Nor do concentrations below this threshold imply that one will never sense the nuisance odor. Atmospheric dispersion is far more complicated than the models can mathematically simulate. Predicted results near the threshold indicate a reasonable effort to control odor migration offsite.

Modeling analyzed odor emission rates (OU/s) from the two distinct odor-producing processes onsite: MSW tipping and processing, and biosolids processing. Since these two types of sources each produce separately distinguishable odors, they were analyzed individually. That is, odors associated with MSW tipping and processing have different recognizable properties compared to those associated with biosolids processing.

[14] Wark, K. and C. Warner, 1981. Air Pollution: Its Origin and Control, 2nd Edition, Harper Collins Publishers.

6.4.2 Results

There are zero on-site or off-site exceedances of the 5 D/T, 5-minute average, criterion, for odors produced by the biosolids processes.

There are zero on-site or off-site exceedances of the 5 D/T, 5-minute average, criterion, for odors produced by the MSW processes.

6.4.3 Odor Conclusions

The proposed project has been specifically designed to avoid causation of odor "nuisance" conditions. The biosolids odor will be managed by use of odor control technologies (ionization and wet scrubbing) and by stacks designed with good dispersion characteristics (stack heights 10-feet above the biosolids building with relatively high exit velocities). The MSW odor will be managed by use of high dilution air flows and by stack designs and locations that enhance odor dispersion (clustered, tall stacks 30-feet above the MSW buildings).

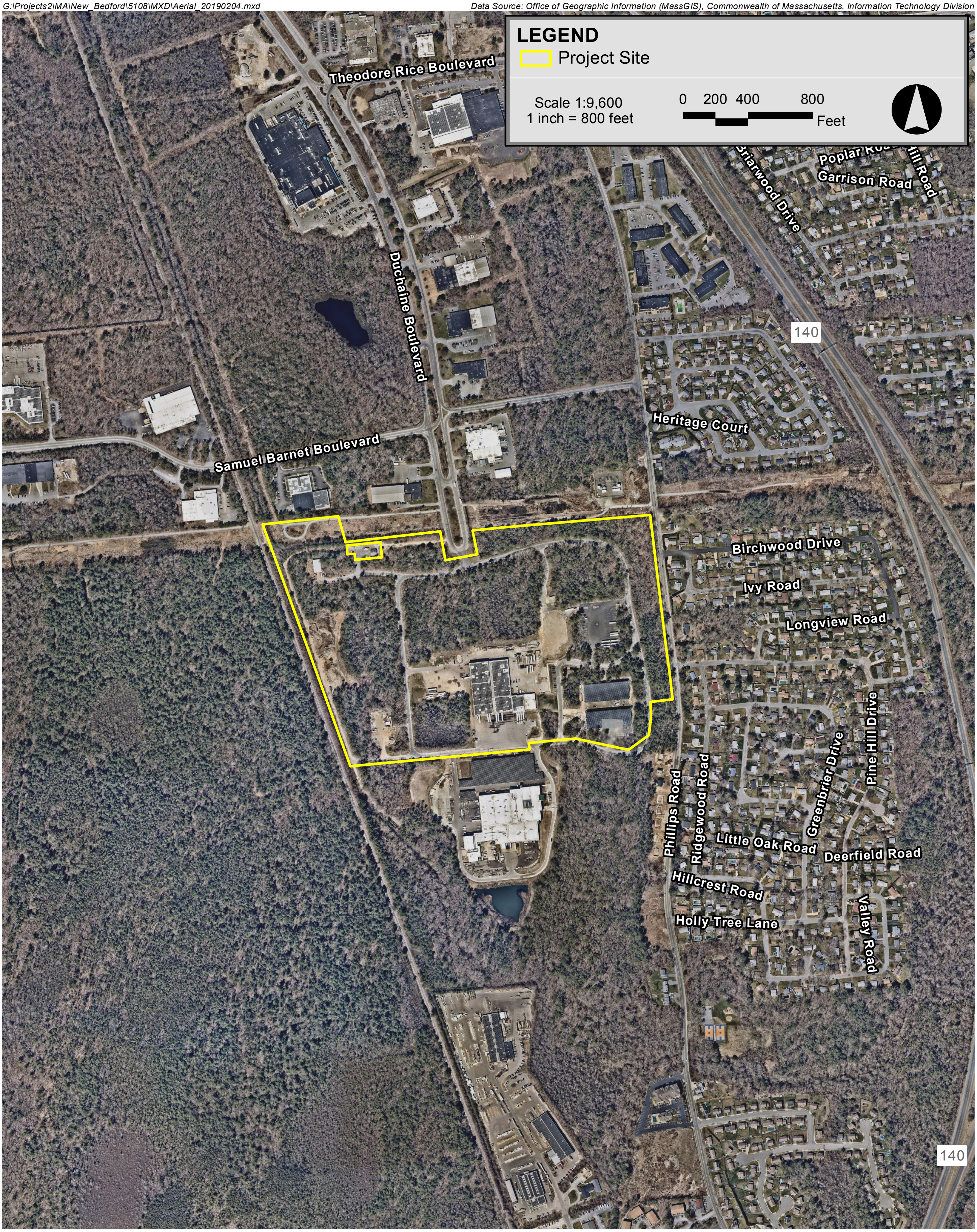
6.5 Conclusions

The predicted air pollutant and odor concentrations are shown to be below the applicable NAAQS/MAAQS, MassDEP AALs and TELs at residences, and protective odor concentration criterion at residences, using the USEPA AERMOD model. Therefore, it can be concluded that the proposed project as designed does not cause or contribute to a condition of air pollution in the area.

Figures

G:\Projects2\MA\New_Bedford\5108\MXD\Aerial_20190204.mxd

Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

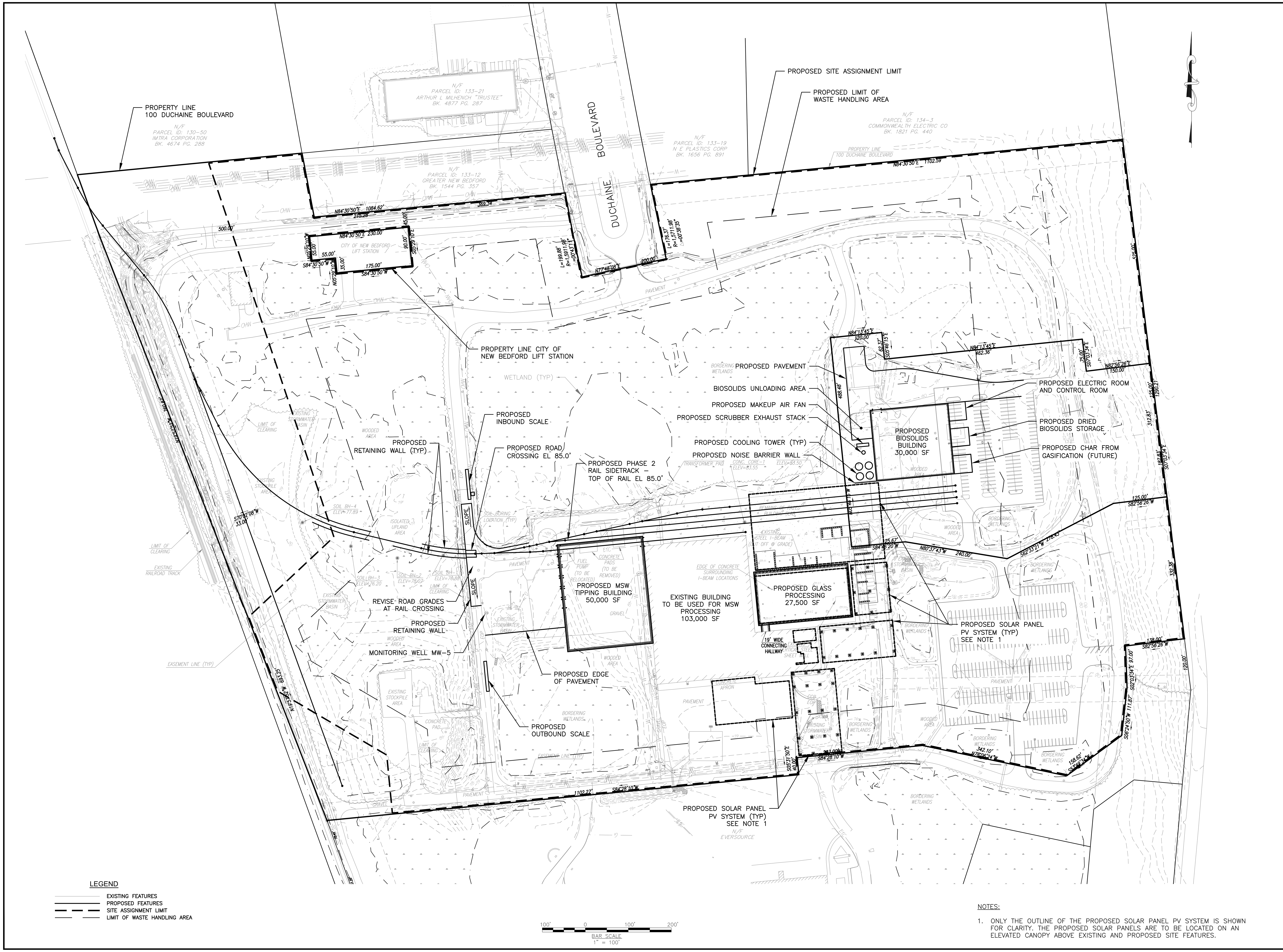


Parallel Products **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

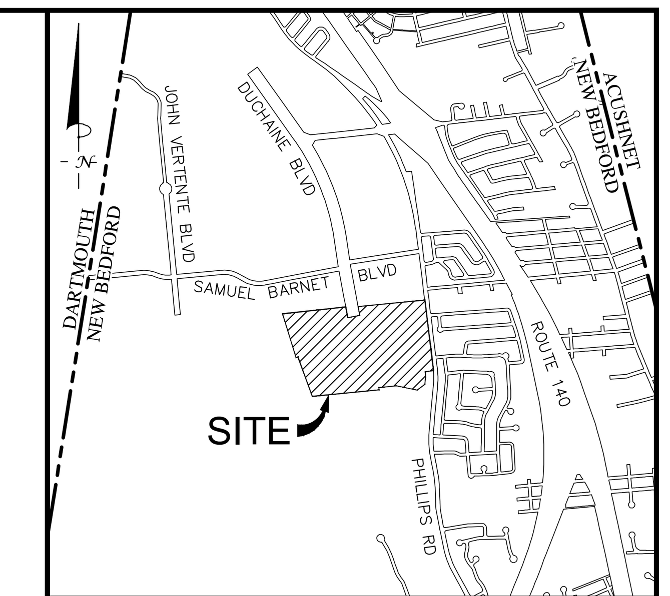
Figure 1

Aerial Locus Map



NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.



LOCUS MAP NOT TO SCALE

Green Seal Environmental, Inc.
114 State Road, Building B
Sagamore Beach, MA 02562
Tel: (508) 888-6034
Fax: (508) 888-1506
www.gseenv.com

REVISIONS

NO.	DATE	COMMENT
A	2/4/2019	ISSUED FOR PERMITTING

PURPOSE:

PERMITTING

LOCUS:

100 DUCHAINE BOULEVARD
NEW BEDFORD,
MASSACHUSETTS

PREPARED FOR:

PARALLEL PRODUCTS, LLC

DRAWING TITLE:

PHASE 2 SITE PLAN

CAD TECH:	CHECKED BY:
T. JANICKI	
ENGINEER:	DATE:
W. HALL	2/1/2019

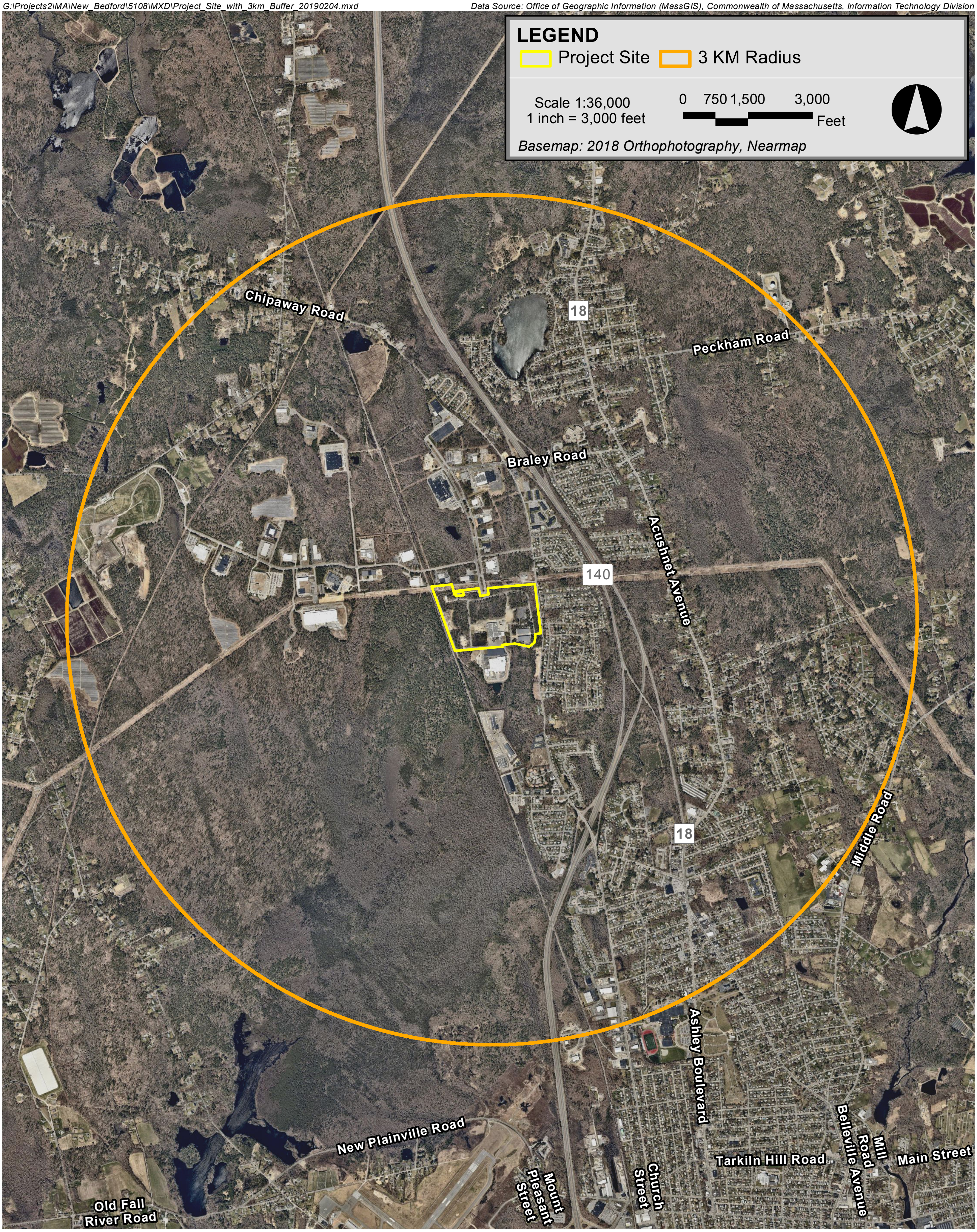
SCALE:

1"=100'

SHEET:

C2A

Figure 2
Conceptual Layout / Phase 2 Site Plan
(Green Seal Environmental, Inc.)

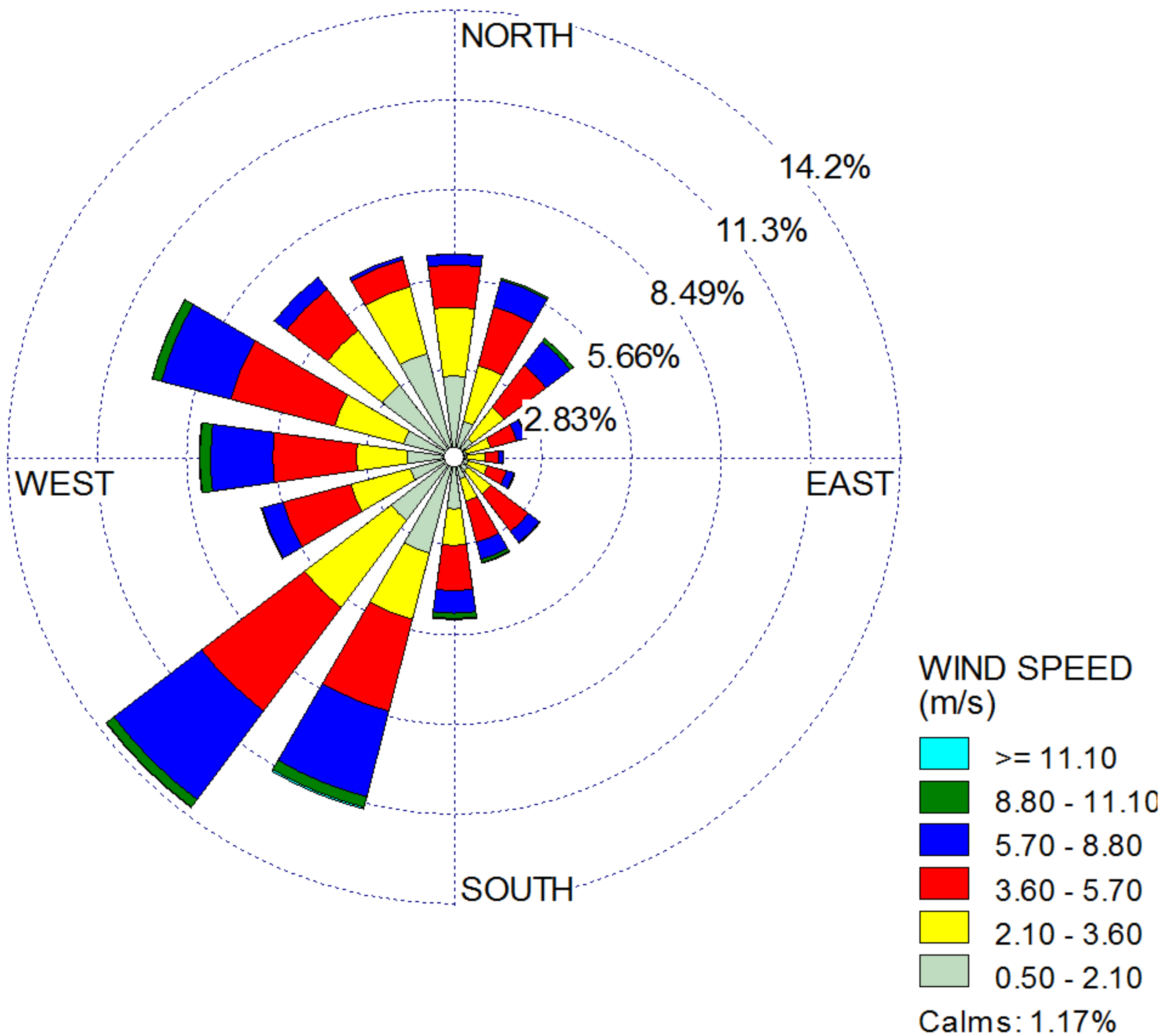


Parallel Products New Bedford, Massachusetts

Epsilon ASSOCIATES INC.

Figure 3

Proposed Project Site and 3 Kilometer Radius



NORTH
SOUTH
EAST
WEST
14.2%
11.3%
8.49%
5.66%
2.83%
WIND SPEED
(m/s)
>= 11.10
8.80 - 11.10
5.70 - 8.80
3.60 - 5.70
2.10 - 3.60
0.50 - 2.10
Calms: 1.17%

G:\Projects2\MA\New_Bedford\5108\MXD\Receptor_Locations_20190128.mxd

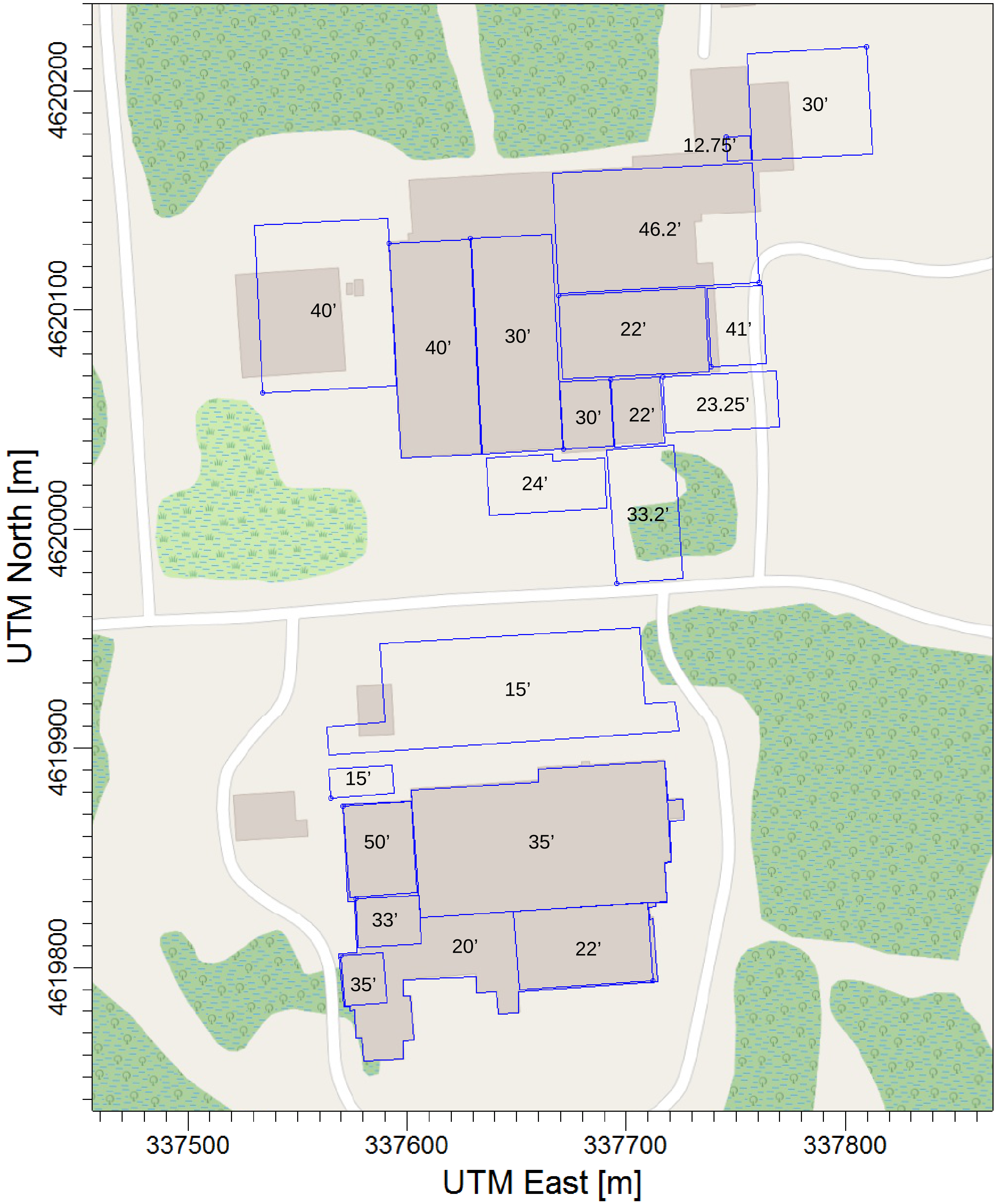
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

Parallel Products **New Bedford, Massachusetts**

Epsilon ASSOCIATES INC.

Figure 5

Receptor Locations



Parallel Products of New England   New Bedford, Massachusetts

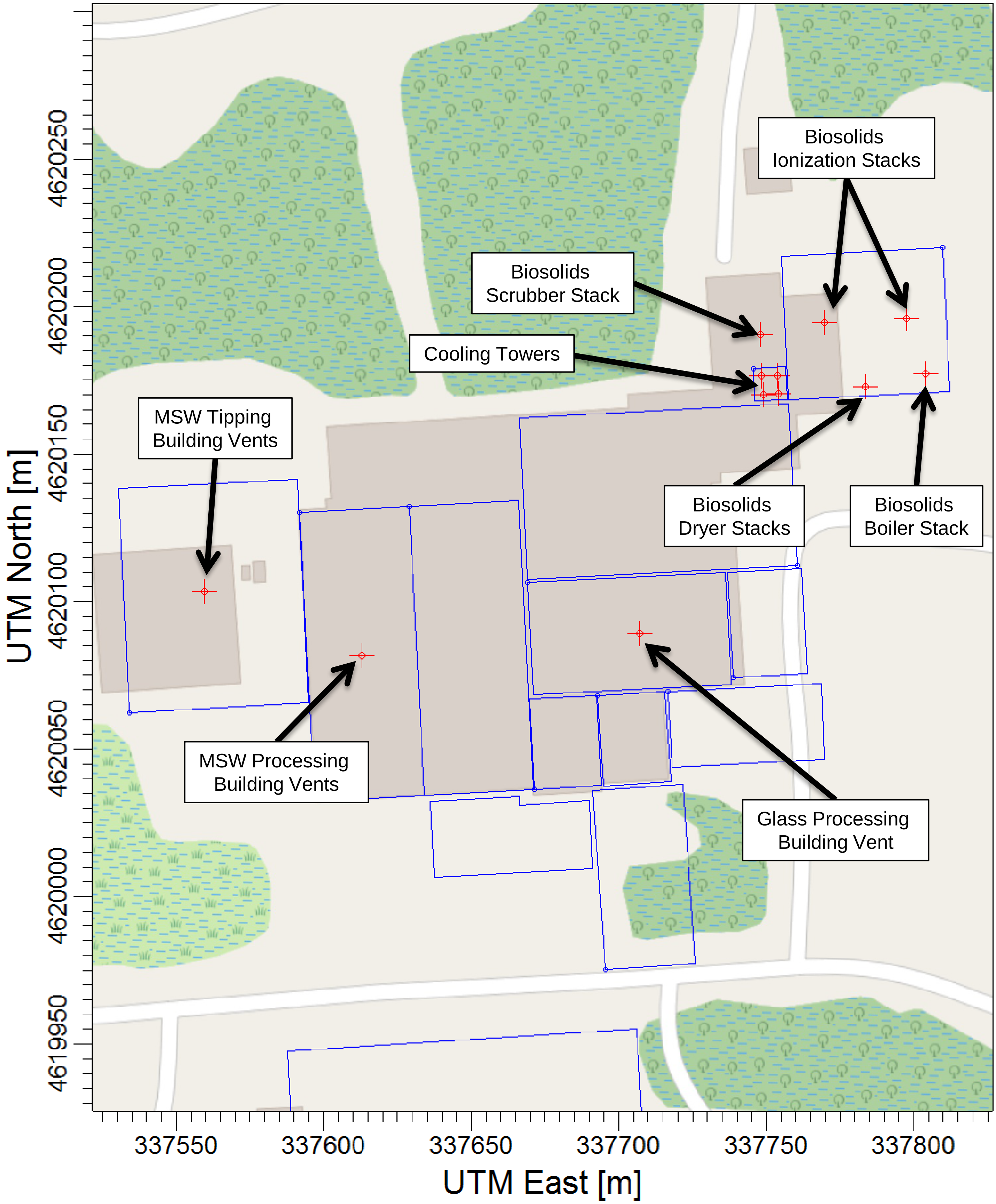
Epsilon ASSOCIATES INC.

Figure 6

Building Tiers

Attachment A

Stack Parameters



Parallel Products of New England New Bedford, Massachusetts

Epsilon ASSOCIATES INC.

Figure A-1

Stack Locations

Process	Source	ID	Model ID	Merged Plume from Multiple Stacks?	X Coord (ft)	Y Coord (ft)	Base Elevation (ft)	Stack Height AGL (ft)	Roof Height AGL (ft)	Stack Height Above Roof (ft)	Gas Exit Tempera-ture (oF)	Temp Relative to	Exhaust Flow Rate (cfm)	Stack Inside Diameter (inches)	Stack Inside Diameter (feet)	Stack Cross-Sectional Area (ft2)	Stack Exit Velocity (fps)	Notes
Biosolids	Ionization	1	BIOION1	No	1108155	15157934	79.56	40	30	10	10	above ambient	24,250	32	2.67	5.585	72.4	
Biosolids	Ionization	2	BIOION2	No	1108246	15157938	79.56	40	30	10	10	above ambient	24,250	32	2.67	5.585	72.4	
Biosolids	Scrubber		BIOCS	No	1108084	15157921	79.56	40	30	10	10	above ambient	19,500	28	2.33	4.276	76.0	
Biosolids	Ionization Winter Ops	1	BIOION1W	No	1108155	15157934	79.56	40	30	10	50	absolute	24,250	32	2.67	5.585	72.4	
Biosolids	Ionization Winter Ops	2	BIOION2W	No	1108246	15157938	79.56	40	30	10	50	absolute	24,250	32	2.67	5.585	72.4	
Biosolids	Scrubber Winter Ops		BIOCSW	No	1108084	15157921	79.56	40	30	10	50	absolute	19,500	28	2.33	4.276	76.0	
Biosolids	Boiler		BIOBOIL	No	1108267	15157877	79.56	40	30	10	140	absolute	712	6	0.50	0.196	60.4	
Biosolids	Dryers (4)		BIODRYM	**Yes**	1108200	15157863	79.56	40	30	10	140	absolute	4,744	16.02	1.34	1.400	56.5	Each individual stack diameter 8"
Biosolids	Cooling Tower	1	BIOCT1	No	1108085	15157875	79.33	12.76	NA	NA	16	above ambient	91,030	117	9.75	74.662	20.3	
Biosolids	Cooling Tower	2	BIOCT2	No	1108103	15157875	79.33	12.76	NA	NA	16	above ambient	91,030	117	9.75	74.662	20.3	
Biosolids	Cooling Tower	3	BIOCT3	No	1108087	15157854	79.33	12.76	NA	NA	16	above ambient	91,030	117	9.75	74.662	20.3	
Biosolids	Cooling Tower	4	BIOCT4	No	1108103	15157855	79.33	12.76	NA	NA	16	above ambient	91,030	117	9.75	74.662	20.3	
Glass	Building Stack		GLASSVNT	No	1107950	15157588	81.56	32	22	10	10	above ambient	24,000	52	4.33	14.748	27.1	
MSW	Transfer Stacks (4)		TVENTM	**Yes**	1107465	15157635	80.15	70	40	30	10	above ambient	96,000	104.2	8.68	59.219	27.0	Each individual stack diameter 52"
MSW	Processing Stacks (3)		PVENTM	**Yes**	1107641	15157564	81.40	70	40	30	10	above ambient	72,000	90.3	7.53	44.474	27.0	Each individual stack diameter 52"

Process	Source	ID	Model ID	Merged Plume from Multiple Stacks?	X Coord (m)	Y Coord (m)	Base Elevation (m)	Stack Height AGL (m)	Roof Height AGL (m)	Stack Height Above Roof (m)	Gas Exit Tempera-ture (K)	Temp Relative to	Exhaust Flow Rate (m3/hr)	Stack Inside Diameter (m)	Stack Cross-Sectional Area (m2)	Stack Exit Velocity (m/s)	Notes
Biosolids	Ionization	1	BIOION1	No	337769.67	4620194.6	24.25	12.19	9.14	3.05	5.56	above ambient	41,203	0.813	0.519	22.1	
Biosolids	Ionization	2	BIOION2	No	337797.58	4620195.71	24.25	12.19	9.14	3.05	5.56	above ambient	41,203	0.813	0.519	22.1	
Biosolids	Scrubber		BIOCS	No	337748.03	4620190.49	24.25	12.19	9.14	3.05	5.56	above ambient	33,132	0.711	0.397	23.2	
Biosolids	Ionization Winter Ops	1	BIOION1W	No	337769.67	4620194.60	24.25	12.19	9.14	3.05	283.15	absolute	41,203	0.813	0.519	22.1	
Biosolids	Ionization Winter Ops	2	BIOION2W	No	337797.58	4620195.71	24.25	12.19	9.14	3.05	283.15	absolute	41,203	0.813	0.519	22.1	
Biosolids	Scrubber Winter Ops		BIOCSW	No	337748.03	4620190.49	24.25	12.19	9.14	3.05	283.15	absolute	33,132	0.711	0.397	23.2	
Biosolids	Boiler		BIOBOIL	No	337804.03	4620177.19	24.25	12.19	9.14	3.05	333.15	absolute	1,209	0.152	0.018	18.4	
Biosolids	Dryers (4)		BIODRYM	**Yes**	337783.51	4620172.70	24.25	12.19	9.14	3.05	333.15	absolute	8,060	0.407	0.130	17.2	Each individual stack diameter 0.203 m
Biosolids	Cooling Tower	1	BIOCT1	No	337748.33	4620176.33	24.18	3.89	NA	NA	9	above ambient	154,667	2.972	6.936	6.19	
Biosolids	Cooling Tower	2	BIOCT2	No	337753.83	4620176.33	24.18	3.89	NA	NA	9	above ambient	154,667	2.972	6.936	6.19	
Biosolids	Cooling Tower	3	BIOCT3	No	337748.90	4620170.13	24.18	3.89	NA	NA	9	above ambient	154,667	2.972	6.936	6.19	
Biosolids	Cooling Tower	4	BIOCT4	No	337753.97	4620170.41	24.18	3.89	NA	NA	9	above ambient	154,667	2.972	6.936	6.19	
Glass	Building Stack		GLASSVNT	No	337707.29	4620089.09	24.86	9.75	6.71	3.05	5.56	above ambient	40,778	1.321	1.370	8.27	
MSW	Transfer Stacks (4)		TVENTM	**Yes**	337559.45	4620103.24	24.43	21.34	12.19	9.14	5.56	above ambient	163,111	2.647	5.502	8.24	Each individual stack diameter 1.32 m
MSW	Processing Stacks (3)		PVENTM	**Yes**	337613.01	4620081.63	24.81	21.34	12.19	9.14	5.56	above ambient	122,333	2.294	4.132	8.22	Each individual stack diameter 1.32 m

Attachment A Note

Note the stack parameters, designs, and locations presented in this attachment are conceptual and subject to refinement during detailed design review. Future changes will include equivalent process, stack, or control designs or other mitigation measures to meet the criteria for NO_2, $PM_{2.5}$, odor, and air toxics which are presented in this report.

Attachment B

Air and Odor Emission Calculations

Boiler Assumed MMBTU/hr	3

Compound	Natural Gas Emissioni Factor (lb/MMscf)	Natural Gas Emission Factor (lb/MMBtu)	Mass Emissions (lb/hr)	Mass Emissions (g/s)
Nitrogen oxides (NOx)	100.00	0.0980	0.294	0.0371
Particulate Matter (PM10, PM2.5)	7.60	0.00745	0.0224	0.00282
Lead	0.0005	4.90E-07	1.47E-06	1.85E-07

USEPA AP-42 uses 1,020 Btu/scf as the HHV of natural gas

Boiler Assumed MMBTU/hr	3

Compound	Natural Gas Emission Factor (lb/MMscf)	Natural Gas Emission Factor (lb/MMBtu)	Mass Emissions (lb/hr)	Mass Emissions (g/s)	MassDEP Air Toxic?
2-Methylnaphthalene	2.40E-05	2.35E-08	7.06E-08	8.89E-09	*
Benzene	2.10E-03	2.06E-06	6.18E-06	7.78E-07	Yes
Dichlorobenzene	1.20E-03	1.18E-06	3.53E-06	4.45E-07	**
Formaldehyde	7.50E-02	7.35E-05	2.21E-04	2.78E-05	Yes
Hexane	1.80E+00	1.76E-03	5.29E-03	6.67E-04	Yes***
Naphthalene	6.10E-04	5.98E-07	1.79E-06	2.26E-07	*
Toluene	3.40E-03	3.33E-06	1.00E-05	1.26E-06	Yes
Arsenic	2.00E-04	1.96E-07	5.88E-07	7.41E-08	Yes
Beryllium	1.20E-05	1.18E-08	3.53E-08	4.45E-09	Yes
Cadmium	1.10E-03	1.08E-06	3.24E-06	4.08E-07	Yes
Chromium	1.40E-03	1.37E-06	4.12E-06	5.19E-07	Yes
Copper	8.50E-04	8.33E-07	2.50E-06	3.15E-07	Yes
Lead	0.0005	4.90E-07	1.47E-06	1.85E-07	Yes
Mercury	2.60E-04	2.55E-07	7.65E-07	9.64E-08	Yes
Nickel	2.10E-03	2.06E-06	6.18E-06	7.78E-07	Yes
Selenium	2.40E-05	2.35E-08	7.06E-08	8.89E-09	Yes
Vanadium	2.30E-03	2.25E-06	6.76E-06	8.52E-07	Yes

MassDEP Air Toxics Special Notes:	lb/hr	g/s
* Compare sum of naphtalene and 1-methylnaphthalene for AAL and TEL	**1.86E-06**	**2.35E-07**
** Assume worst case ortho isomer for AAL and TEL comparison		
*** Alkanes and alkenes classification includes and mentions hexane		

USEPA AP-42 uses 1,020 Btu/scf as the HHV of natural gas

Dryer Assumed MMBTU/hr	5	each (there are 4 totalling 20 MMBtu/hr)

Compound	Natural Gas Emissioni Factor (lb/MMscf)	Natural Gas Emission Factor (lb/MMBtu)	Mass Emissions (lb/hr)	Mass Emissions (g/s)
Nitrogen oxides (NOx)	159.00	0.1559	0.779	0.0982
Particulate Matter (PM10, PM2.5)	7.60	0.00745	0.0373	0.00469
Lead	0.0005	4.90E-07	2.45E-06	3.09E-07

USEPA AP-42 uses 1,020 Btu/scf as the HHV of natural gas

Dryer Burner Assumed MMBTU/hr	5	(there are 4 of these for a total of 20 MMBtu/hr)

Compound	Natural Gas Emission Factor (lb/MMscf)	Natural Gas Emission Factor (lb/MMBtu)	Mass Emissions (lb/hr)	Mass Emissions (g/s)	MassDEP Air Toxic?
2-Methylnaphthalene	2.40E-05	2.35E-08	1.18E-07	1.48E-08	*
Benzene	2.10E-03	2.06E-06	1.03E-05	1.30E-06	Yes
Dichlorobenzene	1.20E-03	1.18E-06	5.88E-06	7.41E-07	**
Formaldehyde	7.50E-02	7.35E-05	3.68E-04	4.63E-05	Yes
Hexane	1.80E+00	1.76E-03	8.82E-03	1.11E-03	Yes***
Naphthalene	6.10E-04	5.98E-07	2.99E-06	3.77E-07	*
Toluene	3.40E-03	3.33E-06	1.67E-05	2.10E-06	Yes
Arsenic	2.00E-04	1.96E-07	9.80E-07	1.24E-07	Yes
Beryllium	1.20E-05	1.18E-08	5.88E-08	7.41E-09	Yes
Cadmium	1.10E-03	1.08E-06	5.39E-06	6.79E-07	Yes
Chromium	1.40E-03	1.37E-06	6.86E-06	8.65E-07	Yes
Copper	8.50E-04	8.33E-07	4.17E-06	5.25E-07	Yes
Lead	0.0005	4.90E-07	2.45E-06	3.09E-07	Yes
Mercury	2.60E-04	2.55E-07	1.27E-06	1.61E-07	Yes
Nickel	2.10E-03	2.06E-06	1.03E-05	1.30E-06	Yes
Selenium	2.40E-05	2.35E-08	1.18E-07	1.48E-08	Yes
Vanadium	2.30E-03	2.25E-06	1.13E-05	1.42E-06	Yes

MassDEP Air Toxics Special Notes:	lb/hr	g/s
* Compare sum of naphtalene and 1-methylnaphthalene for AAL and TEL	**3.11E-06**	**3.92E-07**

** Assume worst case ortho isomer for AAL and TEL comparison

*** Alkanes and alkenes classification includes and mentions hexane

USEPA AP-42 uses 1,020 Btu/scf as the HHV of natural gass

Biofilter Air Toxics Mass Rates - Conservatively Assume Wet Scrubber Emission Rates = Biofilter Emission Rates
(A wet scrubber has greater removal efficiency capability than a biofilter for odor and air toxics)

Exhaust Flow Rate (V) 19,500 cfm

Exhaust Concentrations				Fractional	Formula	MW
H2S	0.09	ppm	1,000,000	9.000E-08	2H + S	34
Carbonyl Sulfide	18.5	ppb	1,000,000,000	1.850E-08	C + O + S	60
Carbon Disulfide	7.4	ppb	1,000,000,000	7.400E-09	C + 2S	76
Ammonia	4.5	ppm	1,000,000	4.500E-06	3H + N	17

Ideal Gas Law PV = m/MW R T (m = P V MW / R / T)

0.7302 ft3-atm/deg.R-lbmol Ideal Gas Law Constant

68 deg.F Temperature
528 deg.R = (deg.F) + 460

1 atm Pressure

Exhaust Mass Rates	lb/min	lb/hr	grams/sec
H2S	1.548E-04	9.286E-03	1.170E-03
Carbonyl Sulfide	5.614E-05	3.368E-03	4.244E-04
Carbon Disulfide	2.844E-05	1.707E-03	2.150E-04
Ammonia	3.869E-03	2.322E-01	2.925E-02

Ionization Air Toxics Mass Rates

Exhaust Flow Rate (V) 48,500 cfm Combined Flow Rate Both Stacks

Exhaust Concentrations				Fractional	Formula	MW
H2S	0.1	ppm	1,000,000	1.000E-07	2H + S	34
Carbonyl Sulfide	1.0	ppb	1,000,000,000	1.000E-09	C + O + S	60
Carbon Disulfide	1.0	ppb	1,000,000,000	1.000E-09	C + 2S	76
Ammonia	0.3	ppm	1,000,000	3.000E-07	3H + N	17

Ideal Gas Law PV = m/MW R T (m = P V MW / R / T)

0.7302 ft3-atm/deg.R-lbmol Ideal Gas Law Constant

68 deg.F Temperature
528 deg.R = (deg.F) + 460

1 atm Pressure

	Both Stacks			Each Stack
Exhaust Mass Rates	lb/min	lb/hr	grams/sec	grams/sec
H2S	4.277E-04	2.566E-02	3.233E-03	1.617E-03
Carbonyl Sulfide	7.548E-06	4.529E-04	5.706E-05	2.853E-05
Carbon Disulfide	9.560E-06	5.736E-04	7.228E-05	3.614E-05
Ammonia	6.416E-04	3.849E-02	4.850E-03	2.425E-03

Wet Scrubber Odor OU/s Rates

Exhaust Flow Rate (V)	19,500	ft3/min
	9.203	m3/sec
Uncontrolled Exhaust Concentration (D/T)	9,883	
Wet Scrubber Control Efficiency	99%	
Controlled Exhaust Concentration (D/T)	98.8	
Odor Emission Rate (OU/sec)	909.6	

Ionization Odor OU/s Rates

Exhaust Flow Rate (V) - Each of Two Exhausts	24,250	ft3/min
	11.45	m3/sec
Uncontrolled Exhaust Concentration (D/T)	500	
Wet Scrubber Control Efficiency	90%	
Controlled Exhaust Concentration (D/T)	50	
Odor Emission Rate (OU/sec)	572.3	

Conversion Factors:

3.2808	ft/meter
60	sec/min

Example Calculations:

(24,250 ft3/min) / (3.2808 ft/meter)^3 / (60 sec/min) = 11.45 m3/sec

(500 D/T) x (1 - 90%) = 50 D/T

(11.45 m3/sec) x (50 D/T) = 572.5 OU/sec
(slight discrepancy due to rounding)

Cooling Tower PM Emissions						
Circulation Rate	**900**	gpm each cell				
Drift Rate	**0.0020%**		99.9980%			
Drift	0.018	gpm				
Water Density	8.34	lb/gal				
Drift Rate	9.0	lb/hr				
TDS Conc	**1,800**	ppm (mg/l)				
Emission Rate	0.016	lb/hr				
Emission Rate	7.36	g/hr				
Emission Rate	0.0710	tpy				
Emission Rate	1.84	g/hr per cell				
Emission Rate	0.000511	g/s per cell				
	Est Air Flow Per Fan		Est Air Velocity Per Fan (check calc)			
Air Flow Per Fan	**91,030**	ACFM	91,000	rounded result		
# of Cells	**4**	cells	4			
Diameter	**9.75**	ft/cell	9.75	(117 inch fan diameter)		
Surface Area	74.66	ft2	74.66			
Air Velocity Per Fan	20.32	ft/s	**20.32**			
Air Velocity Per Fan	6.19	m/s	6.19			
Circulation Rate	900	gpm				
Drift Rate	0.0020%					
Drift Loss	0.018	gpm				
Water Density	8.34	lb/gal				
Drift Rate	9.0	lb/hr				
TDS Conc	1,800	ppm (mg/l)		PM2.5 < 12% total PM		
Emission Rate	0.016	lb/hr PM		0.0019	lb/hr PM2.5	
Emission Rate	7.36	g/hr PM		0.883	g/hr pm2.5	
Emission Rate	0.0710	tpy PM		0.00852	tpy pm2.5	
Emission Rate	1.84	g/hr PM per cell		0.221	g/hr pm2.5 per cell	
Emission Rate	0.000511	g/s PM per cell		0.0000613	g/s pm2.5 per cell	
Assume total PM is PM10						
Mass Emission Rates for All Cells						
# of Cells	4					
Emission Rate	0.284	TPY PM10		0.0341	TPY PM2.5	
Note: Inputs In grey						

PM-10, PM-2.5, Odor Emission Calculations and Stack Parameters for Parallel Products Transfer and MSW/Glass and Biosolids Processing Facility, New Bedford, MA.

Date	9/6/2018
Engineer	DTR
Checked	DKB

MSW Tipping - Particulate Matter

1000 tons per day of total waste handling (municipal solid waste)
500 tons per day of Category 2 C&D Residuals (bulkier C&D)
Total of 1,500 tons per day
From traffic study, 209 trucks in and out is worst case weekday volume including biosolids and glass, and ignoring rail transport out.

Facility accepts waste 7 days per week, 10 hours per day, limited to 362 days per year, so — 3620 hrs/yr of operation receiving
MSW Processing and C&D Residuals load out to rail cars up to 16 hours per day, 7 days per week. — 5792 hrs/yr of operation processing or loading

Loads are dumped on tipping floor from trucks (9 ton packers, 5.5 ton roll-off trucks, 4 ton roll-off containers, and self dumping live floor 100 CY, 28 ton trailers)

The MSW load is dumped and transferred via front end loader into a hopper for transfer via conveyor to processing.
The C&D load is dumped and transferred by front end loader to rail car to cover bales of MSW.

So, each ton of material is dumped (or loaded) twice and may othewise be handled (using front end loader or grapple for MSW) in the tipping floor area.
Processing of MSW will be calculated separately. Starting here with transfer and rail loadout.

Absent emission factors for MSW, assume all of the waste is C&D (conservative since C&D waste inherently dustier, as it includes drywall, wood, brick, concrete, etc)

Transfer building is 250' x 225' x 40' H for a total volume of	2,250,000	CF
Assume nominal three air changes per hour (2,250,000 CF x 3)/60 min/hr=	112,500	acfm
Assume the transfer building will have four vents (52" dia x8' each) out of roof - each designed for 24,000 acfm (total of 96,000 acfm)	96,000	acfm
Vent exit diameter:	4.33	ft
Vent exit area:	14.74	SF
Vent exit velocity:	27	fps

Air is pulled from the doors at front of building to the rear vents, creating a general flow across the working area
Place one vent over rail load out area, one over the hopper, and two in rear or tipping floor.

According to EPA AP-42, Section 13.2.3, Heavy Construction Operations (Table 13.2.3-1, Recommended Emission Factors for Construction Operations, under Construction Phase - D emolition and Debris Removal, Loading of Debris On-site or Unloading of Debris Offsite, this Table recommends the use of emission factor from Section 13.2.4)

Section 13.2.4 is called Aggregate Handling and Storage Piles, which includes material unloading from trucks onto piles and loading of trucks for shipment or transfer to process

E = k (0.0032) (U/5)^1.3 / (M/2)^1.4 - Equation (1) 13.2.4

where:

E = emission factor (lb/ton)
k = particle size multiplier (dimensionless); 0.35 for PM-10 (particles less than 10 microns in diameter), and 0.053 for PM-2.5
U = mean wind speed (mile/hr)
M = material moisture content (%)

E = 0.35 (0.0032) (U/5)^1.3 / (M/2)^1.4 (for PM10)

According to EPA, this emission factor is valid over a silt (% of particles less than 75 microns dia) content range of 0.44-19%, and a moisture content range of 0.25 -4.8%.

This equation will produce higher emissions with lower moisture content. Use the high end of range of 4.8% since MSW is typcially well above 20% moisture (Steam Chapter 29 Waste to Energy, Table 1 - Range of As Received Refuse Fuel Analysis)

While the unloading and loading occurs indoors, there is air movement caused by the ventilation system. This can be translated into a "wind speed" equivalent by dividing the volume of air flow, by the face area of the room normal to the exhaust pickups. the four vents in the tipping area exhausting 96,000 acfm.

Assume all of this volume is drawn across 225' wide area at tipping floor, and over an avg height of 20'

(96,000 ft^3/min) x (1/(225x20)) SF = 21 ft/min
21 ft/min x 60 min/hr x 1 mile/5280 ft = 0.24 mph

The low end of the range of wind speed for emission factor equation above is 1.3 mph - use this as a default value to account for any stray currents caused by localized air movement

E = 0.35 x 0.0032 x (1.3/5)^1.3 / ((4.8/2)^1.4) = 0.000057 lb/ton

0.000057 lb/ton x 1500 ton/day x 1/24 hr/day x 2 drops = 0.0071 lb/hr (24 hr avg) uncontrolled PM-10
(add controls further below)

For PM-2.5, the k multiplier is 0.053 instead of 0.35, apply to emission rate: 0.053/0.35 x 0.0071 = 0.00108 lb/hr uncontrolled

Next, consider pushing of material to piles or to hopper (double counts with a drop)- use bulldozing pushing

According to EPA AP-42, Section 13.2.3, Heavy Construction Operations (Table 13.2.3-1, Recommended Emission Factors for Construction Operations, under Construction Phase - Site Preparation - Bulldozing this Table recommends the use of emission factor from Section 11.9)

Section 11.9 is called Western Surface Coal Mining, and includes bulldozing overburden (dirt)

E = 1.0 x s^1.5/ M^1.4 - Table 11.9-1 PM-15

where:

E = emission factor (lb/hr)
s = material silt content (%)
M = material moisture content (%)

multiplier for PM-10 is 0.75 according to Table 11.9-1

According to EPA, this emission factor is valid over a silt (% of particles less than 75 microns dia) content range of 3.8-15.1%, and a moisture content range of 2.2-16.8%.

This equation will produce higher emissions with lower moisture content. The highest end of the range is 16.8%
Use a conservative silt content of 3.8% (higher than the 0.44% low end of range for the drop equation above)
Use a moderate moisture for mix of C&D and MSW, mostly MSW so say 500/1500 x 5% and 1000/1500x16.8%. 12.9 % moisture

E = 1.0 x (3.8)^1.5 / ((12.9)^1.4) = 0.206 lb/hr PM-15
0.206 lb/hr x 0.75 = 0.155 lb/hr PM-10

Assume pushing occurs for all of a 10 hours shift.

0.155 lb/hr x 10 hr/day x 1/24 hr/day = 0.065 lb/hr 24-hr avg PM-10 uncontrolled

For PM-2.5, the multiplier is 0.105 instead of 0.75, apply to emission rate: 0.105/0.75 x 0.045 = 0.009 lb/hr uncontrolled

Total uncontrolled PM-10 emissions from dumping, loading, pushing (handling) of waste

	PM-10	PM-2.5	
2 dumping actions	0.007	0.001	lb/hr
10 hours pushing	0.065	0.009	lb/hr
Total	0.072	0.010	lb/hr

0.072 lb/hr x 24 hr/day x 362 day/yr/2000 lb/ton = **0.31 ton/yr** PM-10
0.010 lb/hr x 24 hr/day x 362 day/yr/2000 lb/ton = **0.04 ton/yr** PM-2.5

Sanity Check, stack test at UMW Holyoke in 2014 handling 750 tpd, including C&D found 0.17 lb/hr of PM-10 while operating
C&D is dustier than MSW — 0.17 lb/hr x 10 hr/day x 362 day/yr/2000 lb/ton = 0.31 ton/yr PM-10
Most of calculated emissions from pushing, and not directly related to tpd.

Calculate PM-10 and PM-2.5 Emissions from Fugitive Dust generated by Trucks on Paved Roads (on-site)

From EPA AP-42, Section 13.2.1 - Paved Roads

E = k (sL)^0.91 * (W)^1.02; Equation (1) - 13.2.1

where:

E = particulate emission factor (grams/vehicle mile traveled (g/VMT))
k = particle size multiplier; 1.0 g/VMT for PM-10 (particles less than 10 microns in diameter)
sL = road surface silt loading (grams per square meter)
W = average weight (tons) of vehicles traveling the road

According to EPA, this emission factor is valid over a silt (% of particles less than 75 microns dia) loading range of 0.03 - 400 g/m^2,
a mean vehicle weight of 2 - 42 tons, and a mean vehicle speed of 1 - 55 mph.

sL is from Table 13.2.1-2, for low volume roads (ADT < 500), use ubiquitous baseline value of 0.6 g/m^2
Even though the area is swept daily, to account for trackout waste floor, increase this to 2.4 g/M^2 (X4 as for winter baseline with anti skid abrasives)

	No of Truck t	Total Waste	Tons/truck
100 yd truck with 28 tons of waste - 48 tons total entering the site	43	1204	5.0
100 yd truck - empty leaving at site - 20 tons	43	0	2.1
100 yd truck with 28 tons of waste - 48 tons total leaving the site	54	1512	6.3
100 yd truck - empty arriving at site - 20 tons	54	0	2.6
Packer truck with 9 tons of waste - 12 tons, arriving at site	27	243	0.8
Packer truck - empty leaving the site - 3 tons	27	0	0.2
Roll-off truck or container with 6 tons of waste on avg - 9 tons entering	9	54	0.2
Roll-off truck or container empty leaving site - 3 tons	9	0	0.1
Biosolids truck with 25 tons of biosolids - 45 tons total entering the site	20	500	2.2
Biosolids truck empty leaving site - 20 tons	20	0	1.0
Glass trucks with empty leaving site -3 tons	54	0	0.4
Glass trucks with 5.5 tons of glass leaving the site - 8.5 tons	54	297	1.1
Average weight of all trucks	414	2959	16.9 tons/truck
	207 trucks per day		

E =1.0 x (2.4)^0.91 x (16.9) ^1.02 =	39.7 g/VMT			
	0.087 lb/VMT			
Estimate each truck travels 5492' total on-site (from entrance to scale to middle door and back to scale and out)	5492			
Total daily PM-10 fugitive emissions: 207 x 5492/5280 x 0.087 lb/VMT		18.8 lb/day		
		3.41 tons/yr	**PM-10**	
For PM-2.5, the value of k is reduced to 0.25 X g/VMT,	9.9 g/VMT			
	0.02 lb/VMT			
Factor down to PM-2.5: 0.25/1.0 x 3.41 ton/yr =		**0.85 tons/yr**	**PM-2.5**	

SUMMARY: MSW Tipping & Processing and Paved Roads

Total PM from inside and outside of transfer building	3.72 tons/yr	PM-10
	0.89 tons/yr	PM-2.5
Assume same emissions from processing as for emissions from inside transfer building	0.31 tons/yr	PM-10
	0.04 tons/yr	PM-2.5
Total	**4.03 tons/yr**	**PM-10**
	0.93 tons/yr	**PM-2.5**

MSW Tipping & Processig Odor
Odor from transfer and processing, initial bag break in transfer and metering bin.
Odor from organic fines as they move through processing.

Odor from Transfer Station

Use 96,000 ACFM at 50 D/T	45.3 M3/s	(96,000 ft3/min/(60 sec/min x 35.3 ft3/m3)
Calculate OU/s	2265 OU/s	45.3 M3/s x 50 D/T

This is higher OU/s than the highest measured at NYC Transfer Stations in the summer time in 2004 Study, also from Epsilon confidential work at TS

Divide by 4 stacks	**566.3 OU/s per stack**
PM-10 emission rate	**0.0023 g/s per stack**
PM-2.5 emission rate	**0.00032 g/s per stack**

Odor from Processing (assume same D/T as transfer)

Use 72,000 ACFM at 50 D/T	34.0 M3/s
Calculate OU/s	1699 OU/s
Divide by 3 stacks	**566.3 OU/s per stack**

Assume processing has same PM emissions as transfer building , 3 stacks

PM-10 emission rate	**0.0023 g/s per stack**
PM-2.5 emission rate	**0.00032 g/s per stack**

Ignore mobile source (truck and loader) engine PM emissions, also not currently modeling fugitives from road dust

Assume 90% capture of PM and odor emissons that occur indoors in Transfer area the vents and other 10% exits thru open doors

Check air flow thru doors when open to see if negative pressure:
Each door is 22' wide x 28 ' high
Assume on average that 3 door open at a time , total open area is 3 x 22 x 28 = 1848 SF SF

From above, there are 96000 ACFM venting from the transfer tipping area air coming in thru the doors (may be more from the processing area connected to transfer area)
96,000/1848 = 52 fpm
From experience, this should be enough inflowing air velocity to capture more than 90% of the PM and odor emissions originating inside the building

Odor from Each Transfer stack at 90% capture	**509.7 OU/s per stack**	4 stacks
PM-10 emission rate at 90% capture	**0.0020 g/s per stack**	
PM-2.5 emission rate at 90% capture	**0.00029 g/s per stack**	
Odor from doors (10%)	**226.5 OU/s from three doors total**	10% of 4 stacks
PM-10 emission rate at doors (10%)	**0.000903 g/s from three doors total**	10% of 4 stacks
PM-2.5 emission rate at doors (10%)	**0.000127 g/s from three doors total**	10% of 4 stacks
Odor from Each Processing Stack	**566.3 OU/s per stack**	3 stacks
PM-2.5 from Processing Stacks	**0.0023 g/s per stack**	
PM-10 from Processing Stacks	**0.00032 g/s per stack**	

Each of Seven Stacks

Stack exit diameter:	**4.33 ft**
Stack exit area:	**14.74 SF**
Stack exit velocity:	**27.1 fps**

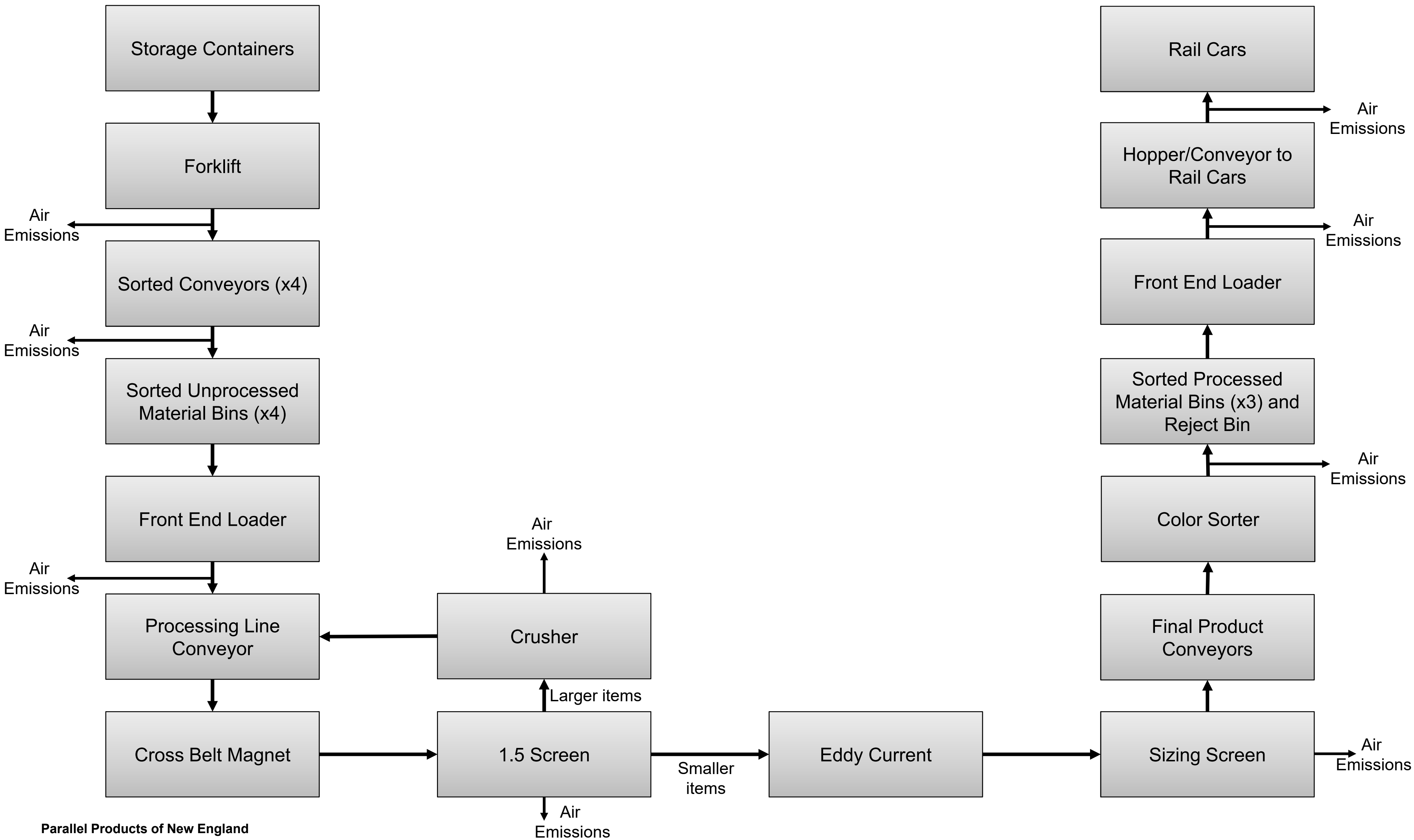


Figure B-1

Glass Processing *Block Flow Diagram*

Air Emissions Calculations

Constants/Assumptions	
Conversion [lb/ton]	2,000
Indoor Control Efficiency	90%
Primary Crushing % of total throughput	100%
Secondary Crushing % of total throughput	50%
Ratio PM2.5/PM10	30%

Air Emissions Results (75,000 TPY Throughput)				
Location	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
	TPY	TPY	lb/hr	lb/hr
Inside	0.344	0.103	1.15	0.344
Outside	0.169	0.051	0.304	0.0911

Air Emissions Calculations											
Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Total**
Drop Description	**Forklift to Sorting Conveyors**	**Sorting Conveyors to Sorted Bins**	**Front Loader to Process Line**	**Primary Crushing**	**Secondary Crushing**	**Screening**	**Fine Screening**	**Final Produce Conveyors to Sorted or Reject Bunker**	**Front End Loader from Sorted Bunker to Train Hopper**	**Conveyor to Railcar**	
Indoor/Outdoor?	Indoor	Outdoor	Outdoor	Indoor	Indoor	Indoor	Indoor	Outdoor	Outdoor	Outdoor	
Handling Rate [TPH]	12.5	12.5	125	12.5	6.25	12.5	12.5	12.5	125	12.5	
Maximum Operating Hours [hr/yr] (a)	6,000	6,000	600	6,000	6,000	6,000	6,000	6,000	600	6,000	
Modeled Operating Hours [hr/yr] (b)	8,760	8,760	600	8,760	8,760	8,760	8,760	8,760	600	8,760	
Control Efficiency	90%	0%	0%	90%	90%	90%	90%	0%	0%	0%	
PM_{10} Emissions Factor [lb/ton]	0.001	0.001	0.001	0.002	0.015	0.009	0.072	0.001	0.001	0.0001	
PM_{10} Emissions [lb/hr]	0.014	0.014	0.138	0.030	0.094	0.109	0.900	0.014	0.138	0.001	
PM_{10} Emissions Uncontrolled [TPY]	0.041	0.041	0.041	0.090	0.281	0.326	2.700	0.041	0.041	0.004	
PM_{10} Emissions Controlled [TPY]	**0.004**	**0.041**	**0.041**	**0.009**	**0.028**	**0.033**	**0.270**	**0.041**	**0.041**	**0.004**	**0.513**
$PM_{2.5}$ Emissions [lb/hr]	0.004	0.004	0.041	0.009	0.028	0.033	0.270	0.004	0.041	0.0004	
$PM_{2.5}$ Emissions [TPY]	0.012	0.012	0.012	0.027	0.084	0.098	0.810	0.012	0.012	0.001	
Maximum $PM_{2.5}$ Emissions Controlled [TPY] (a)	**0.001**	**0.012**	**0.012**	**0.003**	**0.008**	**0.010**	**0.081**	**0.012**	**0.012**	**0.001**	**0.154**
Modeled PM2.5 Emissions Controlled [TPY] (b)	**0.002**	**0.018**	**0.012**	**0.004**	**0.012**	**0.014**	**0.118**	**0.018**	**0.012**	**0.002**	**0.213**

Notes/Assumptions:
1. PM10 Emission factors for drops 1, 2, 3, 8, and 9 were determined using table 11.19.2-2 of AP-42 Conveyor Transfer Point emissions factors.
2. PM10 Emission factors for drops 4 and 5 were determined using table 11.19.2-2 of AP-42 Tertiary and Fines Crushing emissions factors respectively.
3. PM10 Emission factors for drops 6 and 7 were determined using table 11.19.2-2 of AP-42 Screening and Fine Screening emissions factors respectively.
4. PM10 Emission factors for drop 10 was determined using table 11.19.2-2 of AP-42 Truck Loading - Conveyor, Crushed Stone emissions factors.
5. PM2.5 Emissions factors were not available through table 11.19.2-2 of AP-42 so a 30% PM2.5 to PM10 ratio was assumed for the sake of conservativeness.
6. Given the maximum operating throughput of 300 TPD and approximate operating time of 3 hr/day, the loader was assumed to operate at 100 TPH. This corresponds to 1 bucket load every 1.2 minutes, assuming each bucket is 2.7 tons.

(a) At 75,000 TPY and 300 TPD, the number of equivalent operating hours is 6,000. Annual PM2.5 air emissions impacts are estimated here for this maximum annual throughput scenario.

(b) Using 300 TPD and 8,760 annual operating hours per year, maximum modeled air emission rates are calculated. This is a conservative over estimate of annual emissions.

Source Input Summary

POINT SOURCES	#	Type	Location known?	Restrictions	Release Height (ft)	Release Height (m)	Vs (ft/s)	Vs (m/s)	Ds (ft)	Ds (m)	Ts (F)	NOX (g/s)	PM2.5 (g/s)	ODOR (OU/S)
Biosolids Ionization Stacks (APR-NOV)	2	Point	Y	Apr-Nov	40	12.19	72.4	22.07	2.6667	0.81	Amb+10°F	0	0	572.5
Biosolids Scrubber Stack (APR-NOV)	1	Point	Y	Apr-Nov	40	12.19	76	23.16	2.3333	0.71	Amb+10°F	0	0	909.6
Biosolids Ionization Stacks (DEC-MAR)	2	Point	Y	Dec-Mar	40	12.19	72.4	22.07	2.6667	0.81	50	0	0	572.5
Biosolids Scrubber Stack (DEC-MAR)	1	Point	Y	Dec-Mar	40	12.19	76	23.16	2.3333	0.71	50	0	0	909.6
Biosolids Dryers MERGED STACK	1	Point	Y		40	12.19	56.57	17.24	1.3340	0.41	140	0.3928	0.01876	0
Biosolids Boiler Stack	1	Point	Y		40	12.19	60.4	18.41	0.5	0.15	140	0.0371	0.00282	0
Transfer Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	8.68	2.65	Amb+10°F	0.0300375	0.00179	2039
Processing Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	7.523	2.29	Amb+10°F	0	0.00032	1699
Glass Processing Building Vent	1	Point	Y		32	9.75	27	8.23	4.33	1.32	Amb+10°F	0	4.33E-02	0
Cooling Tower Cells	4	Point	Y		12.76	3.89	20.32	6.19	9.75	2.97	Amb+16°F	0	0.0000613	0
VOLUME SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Y (m)**		**Init Sig-Z (m)**			**NOX (g/s)**	**PM2.5 (g/s)**	**ODOR (OU/S)**
Transfer Building Door	1	Volume	Y		20	6.10	4.68		5.67			3.34E-03	2.94E-04	226.5
Truck Exhaust Inbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.59E-03	4.07E-04	0
Truck Exhaust Pause Area (Stop) 1	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.59E-03	4.07E-04	0
Truck Exhaust Pause Area (Stop) 2	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.59E-03	4.07E-04	0
Truck Exhaust Outbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.59E-03	4.07E-04	0
Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.63E-03	1.01E-04	0
Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.10E-03	6.81E-05	0
Phillips Road & Theodore Rice Boulevard/Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			4.00E-03	2.47E-04	0
Duchaine Boulevard & Theodore Rice Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.68E-04	1.04E-05	0
Duchaine Boulevard & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			4.80E-05	2.97E-06	0
Phillips Road & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.24E-04	7.67E-06	0
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**		**Init Sig-Z (m)**		**Area (ft2)**			**NOX (g/s)**	**PM2.5 (g/s)**	**ODOR (OU/S)**
Glass Processing Area Fugitive	1	Area	Y		14		0.93					0	1.84E-02	0
Glass Processing Loader Exhaust	1	Area	Y		14		0.93					2.58E-02	1.89E-03	4.491800972
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**		**Area (ft2)**	**Area (m2)**		**NOX (g/s/m2)**	**PM2.5 (g/s/m2)**	**ODOR (OU/S)**
Glass Processing Loader Exhaust + Fugitive	####	Area	Y		1.02000E+01	3.10896E+00	2.89000E+00		4.02689E+04	3.74110E+03		6.90527E-06	5.41546E-06	0.00000E+00
LINE (AREA) SOURCES (roadway segments)	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**					**NOX (g/s/m2)**	**PM2.5 (g/s/m2)**	**ODOR (OU/S/m2)**
Onsite - Entry to 1st Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					3.86E-06	4.49E-06	0
Onsite - 1st Scale to Tipping	1	Line	Y	6am-6pm	11.9	3.63	3.37					8.35E-06	5.34E-06	0
Onsite - Tipping to 2nd Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					8.73E-06	5.57E-06	0
Onsite - 2nd Scale to Exit	1	Line	Y	6am-6pm	11.9	3.63	3.37					4.36E-06	5.07E-06	0
Duchaine Blvd to Barnet (100% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					6.73E-06	3.68E-07	0
Duchaine Blvd Barnet to Rice (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					6.03E-06	3.29E-07	0
Rice Blvd to Rte 140 (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					6.00E-06	3.28E-07	0
Rte 140 NB On-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					3.69E-06	2.09E-07	0
Rte 140 SB Off-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					3.74E-06	2.12E-07	0
Barnet Blvd (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					6.58E-07	3.59E-08	0
Philips Rd to Rte 140 (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					6.69E-07	3.66E-08	0
Rte 140 SB On-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					3.79E-07	2.15E-08	0
Rte 140 NB Off-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					3.71E-07	2.10E-08	0

POINT SOURCES	#	Type	Location known?	Restrictions	Release Height (ft)	Release Height (m)	Vs (ft/s)	Vs (m/s)	Ds (ft)	Ds (m)	Ts (F)	2-Methylnaphthalene	Benzene	Dichlorobenzene	Formaldehyde	Naphthalene	Toluene	Arsenic
Biosolids Ionization Stacks (APR-NOV)	2	Point	Y	Apr-Nov	40	12.19	72.4	22.07	2.6667	0.81	Amb+10°F	0	0	0	0	0	0	0
Biosolids Scrubber Stack (APR-NOV)	1	Point	Y	Apr-Nov	40	12.19	76	23.16	2.3333	0.71	Amb+10°F	0	0	0	0	0	0	0
Biosolids Ionization Stacks (DEC-MAR)	2	Point	Y	Dec-Mar	40	12.19	72.4	22.07	2.6667	0.81	50	0	0	0	0	0	0	0
Biosolids Scrubber Stack (DEC-MAR)	1	Point	Y	Dec-Mar	40	12.19	76	23.16	2.3333	0.71	50	0	0	0	0	0	0	0
Biosolids Dryers MERGED STACK	1	Point	Y		40	12.19	56.57	17.24	1.3340	0.41	140	5.92941E-08	5.18824E-06	2.96471E-06	0.000185294	1.50706E-06	0.0000084	4.94118E-07
Biosolids Boiler Stack	1	Point	Y		40	12.19	60.4	18.41	0.5	0.15	140	8.9E-09	7.8E-07	4.4E-07	2.8E-05	2.3E-07	1.3E-06	7.4E-08
Transfer Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	8.68	2.65	Amb+10°F	0	4.73E-04	0	7.79E-03	5.44E-05	9.61E-04	1.05E-07
Processing Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	7.523	2.29	Amb+10°F	0	0	0	0	0	0	0
Glass Processing Building Vent	1	Point	Y		32	9.75	27	8.23	4.33	1.32	Amb+10°F	0	0	0	0	0	0	0
Cooling Tower Cells	4	Point	Y		12.76	3.89	20.32	6.19	9.75	2.97	Amb+16°F	0	0	0	0	0	0	0
VOLUME SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Y (m)**		**Init Sig-Z (m)**			**2-Methylnaph-thalene**	**Benzene**	**Dichloro-benzene**	**Formaldehyde**	**Naphthalene**	**Toluene**	**Arsenic**
Transfer Building Door	1	Volume	Y		20	6.10	4.68		5.67			0	5.26E-05	0	8.65E-04	6.04E-06	1.07E-04	1.16E-08
Truck Exhaust Inbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	3.73E-07	0	6.69E-05	6.87E-06	5.78E-06	2.44E-07
Truck Exhaust Pause Area (Stop) 1	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	3.73E-07	0	6.69E-05	6.87E-06	5.78E-06	2.44E-07
Truck Exhaust Pause Area (Stop) 2	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	3.73E-07	0	6.69E-05	6.87E-06	5.78E-06	2.44E-07
Truck Exhaust Outbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	3.73E-07	0	6.69E-05	6.87E-06	5.78E-06	2.44E-07
Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	9.22E-08	0	1.66E-05	1.70E-06	1.43E-06	6.03E-08
Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	6.23E-08	0	1.12E-05	1.15E-06	9.68E-07	4.08E-08
Phillips Road & Theodore Rice Boulevard/Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	2.26E-07	0	4.06E-05	4.16E-06	3.51E-06	1.48E-07
Duchaine Boulevard & Theodore Rice Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	9.48E-09	0	1.70E-06	1.75E-07	1.47E-07	6.20E-09
Duchaine Boulevard & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	2.71E-09	0	4.88E-07	5.00E-08	4.21E-08	1.78E-09
Phillips Road & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	7.02E-09	0	1.26E-06	1.29E-07	1.09E-07	4.59E-09
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**		**Init Sig-Z (m)**		**Area (ft2)**			**2-Methylnaphthalene**	**Benzene**	**Dichlorobenzene**	**Formaldehyde**	**Naphthalene**	**Toluene**	**Arsenic**
Glass Processing Area Fugitive	1	Area	Y		14		0.93					0	0	0	0	0	0	0
Glass Processing Loader Exhaust	1	Area	Y		14		0.93					0	3.38E-04	0	1.77E-03	2.75E-05	2.28E-04	8.99E-09
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**		**Area (ft2)**	**Area (m2)**		**2-Methylnaph-thalene**	**Benzene**	**Dichloro-benzene**	**Formaldehyde**	**Naphthalene**	**Toluene**	**Arsenic**
Glass Processing Loader Exhaust + Fugitive	####	Area	Y		1.02000E+01	3.10896E+00	2.89000E+00		4.02689E+04	3.74110E+03		0.00000E+00	9.03373E-08	0.00000E+00	4.73777E-07	7.34104E-09	6.09935E-08	2.40248E-12
LINE (AREA) SOURCES (roadway segments)	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**					**2-Methylnaph-thalene**	**Benzene**	**Dichloro-benzene**	**Formaldehyde**	**Naphthalene**	**Toluene**	**Arsenic**
Onsite - Entry to 1st Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	1.90E-09	0	2.16E-08	2.16E-09	2.12E-09	3.97E-11
Onsite - 1st Scale to Tipping	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	5.80E-09	0	6.74E-08	6.72E-09	6.38E-09	1.35E-10
Onsite - Tipping to 2nd Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	6.06E-09	0	7.04E-08	7.02E-09	6.66E-09	1.41E-10
Onsite - 2nd Scale to Exit	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	2.14E-09	0	2.45E-08	2.45E-09	2.40E-09	4.49E-11
Duchaine Blvd to Barnet (100% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	2.68E-09	0	3.02E-08	3.03E-09	3.05E-09	5.18E-11
Duchaine Blvd Barnet to Rice (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	2.40E-09	0	2.70E-08	2.71E-09	2.73E-09	4.64E-11
Rice Blvd to Rte 140 (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	2.39E-09	0	2.69E-08	2.70E-09	2.72E-09	4.62E-11
Rte 140 NB On-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	1.81E-09	0	2.07E-08	2.07E-09	2.03E-09	3.80E-11
Rte 140 SB Off-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	1.84E-09	0	2.10E-08	2.10E-09	2.06E-09	3.85E-11
Barnet Blvd (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	2.62E-10	0	2.95E-09	2.96E-10	2.98E-10	5.07E-12
Philips Rd to Rte 140 (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	2.67E-10	0	3.00E-09	3.01E-10	3.03E-10	5.16E-12
Rte 140 SB On-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	1.86E-10	0	2.12E-09	2.12E-10	2.09E-10	3.90E-12
Rte 140 NB Off-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	1.82E-10	0	2.08E-09	2.08E-10	2.04E-10	3.82E-12

POINT SOURCES	#	Type	Location known?	Restrictions	Release Height (ft)	Release Height (m)	Vs (ft/s)	Vs (m/s)	Ds (ft)	Ds (m)	Ts (F)	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel
Biosolids Ionization Stacks (APR-NOV)	2	Point	Y	Apr-Nov	40	12.19	72.4	22.07	2.6667	0.81	Amb+10°F	0	0	0	0	0	0	0
Biosolids Scrubber Stack (APR-NOV)	1	Point	Y	Apr-Nov	40	12.19	76	23.16	2.3333	0.71	Amb+10°F	0	0	0	0	0	0	0
Biosolids Ionization Stacks (DEC-MAR)	2	Point	Y	Dec-Mar	40	12.19	72.4	22.07	2.6667	0.81	50	0	0	0	0	0	0	0
Biosolids Scrubber Stack (DEC-MAR)	1	Point	Y	Dec-Mar	40	12.19	76	23.16	2.3333	0.71	50	0	0	0	0	0	0	0
Biosolids Dryers MERGED STACK	1	Point	Y		40	12.19	56.57	17.24	1.3340	0.41	140	2.96471E-08	2.71765E-06	3.45882E-06	0.0000021	1.23529E-06	6.42353E-07	5.18824E-06
Biosolids Boiler Stack	1	Point	Y		40	12.19	60.4	18.41	0.5	0.15	140	4.4E-09	4.1E-07	5.2E-07	3.2E-07	1.9E-07	9.6E-08	7.8E-07
Transfer Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	8.68	2.65	Amb+10°F	0	0	1.87E-09	0	0	1.39E-09	0
Processing Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	7.523	2.29	Amb+10°F	0	0	0	0	0	0	0
Glass Processing Building Vent	1	Point	Y		32	9.75	27	8.23	4.33	1.32	Amb+10°F	0	0	0	0	0	0	0
Cooling Tower Cells	4	Point	Y		12.76	3.89	20.32	6.19	9.75	2.97	Amb+16°F	0	0	0	0	0	0	0
VOLUME SOURCES	#		Location known?		Release Height (ft)	Release Height (m)	Init Sig-Y (m)		Init Sig-Z (m)			Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel
Transfer Building Door	1	Volume	Y		20	6.10	4.68		5.67			0	0	2.08E-10	0	0	1.54E-10	0.00E+00
Truck Exhaust Inbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	9.45E-10	0	0	1.17E-09	3.79E-07
Truck Exhaust Pause Area (Stop) 1	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	9.45E-10	0	0	1.17E-09	3.79E-07
Truck Exhaust Pause Area (Stop) 2	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	9.45E-10	0	0	1.17E-09	3.79E-07
Truck Exhaust Outbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	9.45E-10	0	0	1.17E-09	3.79E-07
Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	2.34E-10	0	0	2.88E-10	9.38E-08
Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	1.58E-10	0	0	1.95E-10	6.34E-08
Phillips Road & Theodore Rice Boulevard/Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	5.73E-10	0	0	7.07E-10	2.30E-07
Duchaine Boulevard & Theodore Rice Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	2.40E-11	0	0	2.97E-11	9.64E-09
Duchaine Boulevard & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	6.88E-12	0	0	8.50E-12	2.76E-09
Phillips Road & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	1.78E-11	0	0	2.20E-11	7.14E-09
AREA SOURCES	#		Location known?		Release Height (ft)		Init Sig-Z (m)		Area (ft2)			Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel
Glass Processing Area Fugitive	1	Area	Y		14		0.93					0	0	0	0	0	0	0
Glass Processing Loader Exhaust	1	Area	Y		14		0.93					0	0	1.61E-10	0	0	1.19E-10	0
AREA SOURCES	#		Location known?		Release Height (ft)	Release Height (m)	Init Sig-Z (m)		Area (ft2)	Area (m2)		Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel
Glass Processing Loader Exhaust + Fugitive	####	Area	Y		1.02000E+01	3.10896E+00	2.89000E+00		4.02689E+04	3.74110E+03		0.00000E+00	0.00000E+00	4.30450E-14	0.00000E+00	0.00000E+00	3.19336E-14	0.00000E+00
LINE (AREA) SOURCES (roadway segments)	#		Location known?		Release Height (ft)	Release Height (m)	Init Sig-Z (m)					Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel
Onsite - Entry to 1st Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.54E-13	0	0	1.90E-13	6.18E-11
Onsite - 1st Scale to Tipping	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	5.22E-13	0	0	6.45E-13	2.10E-10
Onsite - Tipping to 2nd Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	5.46E-13	0	0	6.74E-13	2.19E-10
Onsite - 2nd Scale to Exit	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.74E-13	0	0	2.15E-13	6.98E-11
Duchaine Blvd to Barnet (100% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	2.01E-13	0	0	2.48E-13	8.06E-11
Duchaine Blvd Barnet to Rice (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.80E-13	0	0	2.22E-13	7.22E-11
Rice Blvd to Rte 140 (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.79E-13	0	0	2.21E-13	7.19E-11
Rte 140 NB On-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.47E-13	0	0	1.82E-13	5.91E-11
Rte 140 SB Off-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.49E-13	0	0	1.84E-13	5.99E-11
Barnet Blvd (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.96E-14	0	0	2.42E-14	7.88E-12
Philips Rd to Rte 140 (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	2.00E-14	0	0	2.47E-14	8.01E-12
Rte 140 SB On-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.51E-14	0	0	1.87E-14	6.07E-12
Rte 140 NB Off-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	1.48E-14	0	0	1.83E-14	5.94E-12

POINT SOURCES	**#**	**Type**	**Location known?**	**Restrictions**	**Release Height (ft)**	**Release Height (m)**	**Vs (ft/s)**	**Vs (m/s)**	**Ds (ft)**	**Ds (m)**	**Ts (F)**	**Selenium**	**Vanadium**	**Ethanol**	**1,3-Butadiene**	**Acetaldehyde**	**Acrolein**	**Ammonia (NH3)**
Biosolids Ionization Stacks (APR-NOV)	2	Point	Y	Apr-Nov	40	12.19	72.4	22.07	2.6667	0.81	Amb+10°F	0	0	0	0	0	0	2.43E-03
Biosolids Scrubber Stack (APR-NOV)	1	Point	Y	Apr-Nov	40	12.19	76	23.16	2.3333	0.71	Amb+10°F	0	0	0	0	0	0	2.92E-02
Biosolids Ionization Stacks (DEC-MAR)	2	Point	Y	Dec-Mar	40	12.19	72.4	22.07	2.6667	0.81	50	0	0	0	0	0	0	2.43E-03
Biosolids Scrubber Stack (DEC-MAR)	1	Point	Y	Dec-Mar	40	12.19	76	23.16	2.3333	0.71	50	0	0	0	0	0	0	2.92E-02
Biosolids Dryers MERGED STACK	1	Point	Y		40	12.19	56.57	17.24	1.3340	0.41	140	5.92941E-08	5.68235E-06	0	0	0	0	0
Biosolids Boiler Stack	1	Point	Y		40	12.19	60.4	18.41	0.5	0.15	140	8.9E-09	8.5E-07	0	0	0	0	0
Transfer Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	8.68	2.65	Amb+10°F	0	0	0	3.40E-05	2.60E-03	3.89E-04	5.41E-04
Processing Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	7.523	2.29	Amb+10°F	0	0	0	0	0	0	0
Glass Processing Building Vent	1	Point	Y		32	9.75	27	8.23	4.33	1.32	Amb+10°F	0	0	0	0	0	0	0
Cooling Tower Cells	4	Point	Y		12.76	3.89	20.32	6.19	9.75	2.97	Amb+16°F	0	0	0	0	0	0	0
VOLUME SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Y (m)**		**Init Sig-Z (m)**			**Selenium**	**Vanadium**	**Ethanol**	**1,3-Butadiene**	**Acetaldehyde**	**Acrolein**	**Ammonia (NH3)**
Transfer Building Door	1	Volume	Y		20	6.10	4.68		5.67			0	0	0	3.78E-06	2.89E-04	4.32E-05	6.01E-05
Truck Exhaust Inbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	1.77E-06	2.75E-05	4.83E-06	6.63E-05
Truck Exhaust Pause Area (Stop) 1	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	1.77E-06	2.75E-05	4.83E-06	6.63E-05
Truck Exhaust Pause Area (Stop) 2	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	1.77E-06	2.75E-05	4.83E-06	6.63E-05
Truck Exhaust Outbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	1.77E-06	2.75E-05	4.83E-06	6.63E-05
Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	4.38E-07	6.80E-06	1.20E-06	1.64E-05
Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	2.96E-07	4.60E-06	8.09E-07	1.11E-05
Phillips Road & Theodore Rice Boulevard/Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	1.07E-06	1.67E-05	2.93E-06	4.02E-05
Duchaine Boulevard & Theodore Rice Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	4.50E-08	6.99E-07	1.23E-07	1.69E-06
Duchaine Boulevard & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	1.29E-08	2.00E-07	3.52E-08	4.83E-07
Phillips Road & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	3.34E-08	5.18E-07	9.10E-08	1.25E-06
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**		**Init Sig-Z (m)**		**Area (ft2)**			**Selenium**	**Vanadium**	**Ethanol**	**1,3-Butadiene**	**Acetaldehyde**	**Acrolein**	**Ammonia (NH3)**
Glass Processing Area Fugitive	1	Area	Y		14		0.93					0	0	0	0	0	0	0
Glass Processing Loader Exhaust	1	Area	Y		14		0.93					0	0	0	1.24E-05	6.34E-04	1.13E-04	4.65E-05
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**		**Area (ft2)**	**Area (m2)**		**Selenium**	**Vanadium**	**Ethanol**	**1,3-Butadiene**	**Acetaldehyde**	**Acrolein**	**Ammonia (NH3)**
Glass Processing Loader Exhaust + Fugitive	####	Area	Y		1.02000E+01	3.10896E+00	2.89000E+00		4.02689E+04	3.74110E+03		0.00000E+00	0.00000E+00	0.00000E+00	3.31517E-09	1.69404E-07	3.02080E-08	1.24302E-08
LINE (AREA) SOURCES (roadway segments)	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**					**Selenium**	**Vanadium**	**Ethanol**	**1,3-Butadiene**	**Acetaldehyde**	**Acrolein**	**Ammonia (NH3)**
Onsite - Entry to 1st Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	5.27E-10	8.70E-09	1.51E-09	1.35E-08
Onsite - 1st Scale to Tipping	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	1.62E-09	2.70E-08	4.68E-09	3.81E-08
Onsite - Tipping to 2nd Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	1.70E-09	2.83E-08	4.89E-09	3.98E-08
Onsite - 2nd Scale to Exit	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	5.95E-10	9.84E-09	1.71E-09	1.53E-08
Duchaine Blvd to Barnet (100% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	7.41E-10	1.22E-08	2.11E-09	2.23E-08
Duchaine Blvd Barnet to Rice (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	6.63E-10	1.09E-08	1.89E-09	1.99E-08
Rice Blvd to Rte 140 (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	6.61E-10	1.09E-08	1.88E-09	1.99E-08
Rte 140 NB On-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	5.04E-10	8.32E-09	1.44E-09	1.29E-08
Rte 140 SB Off-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	5.11E-10	8.44E-09	1.46E-09	1.31E-08
Barnet Blvd (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	7.24E-11	1.19E-09	2.06E-10	2.18E-09
Philips Rd to Rte 140 (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	7.37E-11	1.21E-09	2.10E-10	2.21E-09
Rte 140 SB On-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	5.17E-11	8.54E-10	1.48E-10	1.33E-09
Rte 140 NB Off-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	5.06E-11	8.36E-10	1.45E-10	1.30E-09

POINT SOURCES	**#**	**Type**	**Location known?**	**Restrictions**	**Release Height (ft)**	**Release Height (m)**	**Vs (ft/s)**	**Vs (m/s)**	**Ds (ft)**	**Ds (m)**	**Ts (F)**	**Ethyl Benzene**	**Hexane**	**Styrene**	**Xylene**	**Chloride**	**Primary Exhaust PM2.5 - Total**	**Dioxins**
Biosolids Ionization Stacks (APR-NOV)	2	Point	Y	Apr-Nov	40	12.19	72.4	22.07	2.6667	0.81	Amb+10°F	0	0	0	0	0	0	0
Biosolids Scrubber Stack (APR-NOV)	1	Point	Y	Apr-Nov	40	12.19	76	23.16	2.3333	0.71	Amb+10°F	0	0	0	0	0	0	0
Biosolids Ionization Stacks (DEC-MAR)	2	Point	Y	Dec-Mar	40	12.19	72.4	22.07	2.6667	0.81	50	0	0	0	0	0	0	0
Biosolids Scrubber Stack (DEC-MAR)	1	Point	Y	Dec-Mar	40	12.19	76	23.16	2.3333	0.71	50	0	0	0	0	0	0	0
Biosolids Dryers MERGED STACK	1	Point	Y		40	12.19	56.57	17.24	1.3340	0.41	140	0	0	0	0	0	0	0
Biosolids Boiler Stack	1	Point	Y		40	12.19	60.4	18.41	0.5	0.15	140	0	0	0	0	0	0	0
Transfer Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	8.68	2.65	Amb+10°F	2.44E-04	1.83E-04	0	1.31E-03	0	1.50E-03	1.74E-12
Processing Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	7.523	2.29	Amb+10°F	0	0	0	0	0	0	0
Glass Processing Building Vent	1	Point	Y		32	9.75	27	8.23	4.33	1.32	Amb+10°F	0	0	0	0	0	0	0
Cooling Tower Cells	4	Point	Y		12.76	3.89	20.32	6.19	9.75	2.97	Amb+16°F	0	0	0	0	0	0	0
VOLUME SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Y (m)**		**Init Sig-Z (m)**			**Ethyl Benzene**	**Hexane**	**Styrene**	**Xylene**	**Chloride**	**Primary Exhaust PM2.5 - Total**	**Dioxins**
Transfer Building Door	1	Volume	Y		20	6.10	4.68		5.67			2.71E-05	2.04E-05	0.00E+00	1.46E-04	0	1.67E-04	1.93E-13
Truck Exhaust Inbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			2.23E-06	1.90E-06	2.48E-07	6.22E-06	1.96E-06	4.07E-04	1.07E-12
Truck Exhaust Pause Area (Stop) 1	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			2.23E-06	1.90E-06	2.48E-07	6.22E-06	1.96E-06	4.07E-04	1.07E-12
Truck Exhaust Pause Area (Stop) 2	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			2.23E-06	1.90E-06	2.48E-07	6.22E-06	1.96E-06	4.07E-04	1.07E-12
Truck Exhaust Outbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			2.23E-06	1.90E-06	2.48E-07	6.22E-06	1.96E-06	4.07E-04	1.07E-12
Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			5.52E-07	4.70E-07	6.14E-08	1.54E-06	4.84E-07	1.01E-04	2.66E-13
Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			3.73E-07	3.18E-07	4.15E-08	1.04E-06	3.27E-07	6.81E-05	1.80E-13
Phillips Road & Theodore Rice Boulevard/Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.35E-06	1.15E-06	1.51E-07	3.77E-06	1.19E-06	2.47E-04	6.51E-13
Duchaine Boulevard & Theodore Rice Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			5.68E-08	4.83E-08	6.31E-09	1.58E-07	4.97E-08	1.04E-05	2.73E-14
Duchaine Boulevard & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.63E-08	1.39E-08	1.81E-09	4.53E-08	1.43E-08	2.97E-06	7.83E-15
Phillips Road & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			4.20E-08	3.58E-08	4.68E-09	1.17E-07	3.68E-08	7.67E-06	2.02E-14
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**		**Init Sig-Z (m)**		**Area (ft2)**			**Ethyl Benzene**	**Hexane**	**Styrene**	**Xylene**	**Chloride**	**Primary Exhaust PM2.5 - Total**	**Dioxins**
Glass Processing Area Fugitive	1	Area	Y		14		0.93					0	0	0	0	0	0	0
Glass Processing Loader Exhaust	1	Area	Y		14		0.93					2.58E-05	1.23E-05	0	7.11E-05	0	1.89E-03	1.49E-13
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**		**Area (ft2)**	**Area (m2)**		**Ethyl Benzene**	**Hexane**	**Styrene**	**Xylene**	**Chloride**	**Primary Exhaust PM2.5 - Total**	**Dioxins**
Glass Processing Loader Exhaust + Fugitive	####	Area	Y		1.02000E+01	3.10896E+00	2.89000E+00		4.02689E+04	3.74110E+03		6.89483E-09	3.29385E-09	0.00000E+00	1.90117E-08	0.00000E+00	5.06387E-07	3.99380E-17
LINE (AREA) SOURCES (roadway segments)	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**					**Ethyl Benzene**	**Hexane**	**Styrene**	**Xylene**	**Chloride**	**Primary Exhaust PM2.5 - Total**	**Dioxins**
Onsite - Entry to 1st Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					7.47E-10	7.23E-10	1.71E-10	2.31E-09	4.27E-10	1.81E-07	1.75E-16
Onsite - 1st Scale to Tipping	1	Line	Y	6am-6pm	11.9	3.63	3.37					2.26E-09	2.04E-09	3.67E-10	7.00E-09	1.55E-09	3.80E-07	5.94E-16
Onsite - Tipping to 2nd Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					2.36E-09	2.13E-09	3.83E-10	7.32E-09	1.62E-09	3.97E-07	6.20E-16
Onsite - 2nd Scale to Exit	1	Line	Y	6am-6pm	11.9	3.63	3.37					8.45E-10	8.17E-10	1.93E-10	2.61E-09	4.83E-10	2.05E-07	1.98E-16
Duchaine Blvd to Barnet (100% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.07E-09	1.08E-09	2.76E-10	3.28E-09	5.87E-10	3.22E-07	2.28E-16
Duchaine Blvd Barnet to Rice (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					9.54E-10	9.68E-10	2.47E-10	2.94E-09	5.26E-10	2.88E-07	2.04E-16
Rice Blvd to Rte 140 (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					9.50E-10	9.64E-10	2.46E-10	2.92E-09	5.24E-10	2.87E-07	2.04E-16
Rte 140 NB On-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					7.14E-10	6.91E-10	1.63E-10	2.20E-09	4.08E-10	1.73E-07	1.67E-16
Rte 140 SB Off-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					7.25E-10	7.01E-10	1.66E-10	2.24E-09	4.14E-10	1.76E-07	1.70E-16
Barnet Blvd (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.04E-10	1.06E-10	2.69E-11	3.20E-10	5.74E-11	3.15E-08	2.23E-17
Philips Rd to Rte 140 (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.06E-10	1.08E-10	2.74E-11	3.26E-10	5.84E-11	3.20E-08	2.27E-17
Rte 140 SB On-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					7.34E-11	7.10E-11	1.68E-11	2.26E-10	4.19E-11	1.78E-08	1.72E-17
Rte 140 NB Off-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					7.18E-11	6.95E-11	1.64E-11	2.22E-10	4.11E-11	1.74E-08	1.68E-17

POINT SOURCES	#	Type	Location known?	Restrictions	Release Height (ft)	Release Height (m)	Vs (ft/s)	Vs (m/s)	Ds (ft)	Ds (m)	Ts (F)	Furans
Biosolids Ionization Stacks (APR-NOV)	2	Point	Y	Apr-Nov	40	12.19	72.4	22.07	2.6667	0.81	Amb+10°F	0
Biosolids Scrubber Stack (APR-NOV)	1	Point	Y	Apr-Nov	40	12.19	76	23.16	2.3333	0.71	Amb+10°F	0
Biosolids Ionization Stacks (DEC-MAR)	2	Point	Y	Dec-Mar	40	12.19	72.4	22.07	2.6667	0.81	50	0
Biosolids Scrubber Stack (DEC-MAR)	1	Point	Y	Dec-Mar	40	12.19	76	23.16	2.3333	0.71	50	0
Biosolids Dryers MERGED STACK	1	Point	Y		40	12.19	56.57	17.24	1.3340	0.41	140	0
Biosolids Boiler Stack	1	Point	Y		40	12.19	60.4	18.41	0.5	0.15	140	0
Transfer Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	8.68	2.65	Amb+10°F	1.17E-12
Processing Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	7.523	2.29	Amb+10°F	0
Glass Processing Building Vent	1	Point	Y		32	9.75	27	8.23	4.33	1.32	Amb+10°F	0
Cooling Tower Cells	4	Point	Y		12.76	3.89	20.32	6.19	9.75	2.97	Amb+16°F	0

VOLUME SOURCES	#		Location known?		Release Height (ft)	Release Height (m)	Init Sig-Y (m)		Init Sig-Z (m)			Furans
Transfer Building Door	1	Volume	Y		20	6.10	4.68		5.67			1.30E-13
Truck Exhaust Inbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.54E-13
Truck Exhaust Pause Area (Stop) 1	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.54E-13
Truck Exhaust Pause Area (Stop) 2	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.54E-13
Truck Exhaust Outbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			6.54E-13
Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.62E-13
Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.09E-13
Phillips Road & Theodore Rice Boulevard/Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			3.97E-13
Duchaine Boulevard & Theodore Rice Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.66E-14
Duchaine Boulevard & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			4.77E-15
Phillips Road & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			1.23E-14

AREA SOURCES	#		Location known?		Release Height (ft)		Init Sig-Z (m)		Area (ft2)			Furans
Glass Processing Area Fugitive	1	Area	Y		14		0.93					0
Glass Processing Loader Exhaust	1	Area	Y		14		0.93					1.01E-13

AREA SOURCES	#		Location known?		Release Height (ft)	Release Height (m)	Init Sig-Z (m)		Area (ft2)	Area (m2)		Furans
Glass Processing Loader Exhaust + Fugitive	####	Area	Y		1.02000E+01	3.10896E+00	2.89000E+00		4.02689E+04	3.74110E+03		2.69499E-17

LINE (AREA) SOURCES (roadway segments)	#		Location known?		Release Height (ft)	Release Height (m)	Init Sig-Z (m)					Furans
Onsite - Entry to 1st Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.07E-16
Onsite - 1st Scale to Tipping	1	Line	Y	6am-6pm	11.9	3.63	3.37					3.62E-16
Onsite - Tipping to 2nd Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					3.78E-16
Onsite - 2nd Scale to Exit	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.21E-16
Duchaine Blvd to Barnet (100% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.39E-16
Duchaine Blvd Barnet to Rice (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.25E-16
Rice Blvd to Rte 140 (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.24E-16
Rte 140 NB On-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.02E-16
Rte 140 SB Off-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.03E-16
Barnet Blvd (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.36E-17
Philips Rd to Rte 140 (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.38E-17
Rte 140 SB On-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.05E-17
Rte 140 NB Off-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					1.02E-17

Source Input Summary

POINT SOURCES	#	Type	Location known?	Restrictions	Release Height (ft)	Release Height (m)	Vs (ft/s)	Vs (m/s)	Ds (ft)	Ds (m)	Ts (F)	Hydrogen Sulfide	Carbonyl Sulfide	Carbon Disulfide	Acetone	Methyl Ethyl Ketone
Biosolids Ionization Stacks (APR-NOV)	2	Point	Y	Apr-Nov	40	12.19	72.4	22.07	2.6667	0.81	Amb+10°F	1.62E-03	2.85E-05	3.61E-05	0	0
Biosolids Scrubber Stack (APR-NOV)	1	Point	Y	Apr-Nov	40	12.19	76	23.16	2.3333	0.71	Amb+10°F	1.17E-03	4.24E-04	2.15E-04	0	0
Biosolids Ionization Stacks (DEC-MAR)	2	Point	Y	Dec-Mar	40	12.19	72.4	22.07	2.6667	0.81	50	1.62E-03	2.85E-05	3.61E-05	0	0
Biosolids Scrubber Stack (DEC-MAR)	1	Point	Y	Dec-Mar	40	12.19	76	23.16	2.3333	0.71	50	1.17E-03	4.24E-04	2.15E-04	0	0
Biosolids Dryers MERGED STACK	1	Point	Y		40	12.19	56.57	17.24	1.3340	0.41	140	0	0	0	0	0
Biosolids Boiler Stack	1	Point	Y		40	12.19	60.4	18.41	0.5	0.15	140	0	0	0	0	0
Transfer Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	8.68	2.65	Amb+10°F				0.000586141	0.000123095
Processing Building Vents MERGED STACK	1	Point	Y		70	21.34	27	8.23	7.523	2.29	Amb+10°F	0	0	0	0	0
Glass Processing Building Vent	1	Point	Y		32	9.75	27	8.23	4.33	1.32	Amb+10°F	0	0	0	0	0
Cooling Tower Cells	4	Point	Y		12.76	3.89	20.32	6.19	9.75	2.97	Amb+16°F	0	0	0	0	0
VOLUME SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Y (m)**		**Init Sig-Z (m)**			**Hydrogen Sulfide**	**Carbonyl Sulfide**	**Carbon Disulfide**	**Acetone**	**Methyl Ethyl Ketone**
Transfer Building Door	1	Volume	Y		20	6.10	4.68		5.67			0	0	0	6.51268E-05	1.36772E-05
Truck Exhaust Inbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Truck Exhaust Pause Area (Stop) 1	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Truck Exhaust Pause Area (Stop) 2	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Truck Exhaust Outbound Scale	1	Volume	Confirm	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Route 140 NB Off Ramp/Route 140 NB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Route 140 SB Off Ramp/Route 140 SB On Ramp & Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Phillips Road & Theodore Rice Boulevard/Braley Road	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Duchaine Boulevard & Theodore Rice Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Duchaine Boulevard & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
Phillips Road & Samuel Barnet Boulevard	1	Volume	Y	6am-6pm	11.9	3.63	5.58		3.37			0	0	0	0	0
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**		**Init Sig-Z (m)**		**Area (ft2)**			**Hydrogen Sulfide**	**Carbonyl Sulfide**	**Carbon Disulfide**	**Acetone**	**Methyl Ethyl Ketone**
Glass Processing Area Fugitive	1	Area	Y		14		0.93					0	0	0	0	0
Glass Processing Loader Exhaust	1	Area	Y		14		0.93					0	5.61797E-05	0	0	3.51E-05
AREA SOURCES	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**		**Area (ft2)**	**Area (m2)**		**Hydrogen Sulfide**	**Carbonyl Sulfide**	**Carbon Disulfide**	**Acetone**	**Methyl Ethyl Ketone**
Glass Processing Loader Exhaust + Fugitive	####	Area	Y		1.02000E+01	3.10896E+00	2.89000E+00		4.02689E+04	3.74110E+03		0.00000E+00	1.39511E-09	0.00000E+00	0.00000E+00	9.38555E-09
LINE (AREA) SOURCES (roadway segments)	**#**		**Location known?**		**Release Height (ft)**	**Release Height (m)**	**Init Sig-Z (m)**					**Hydrogen Sulfide**	**Carbonyl Sulfide**	**Carbon Disulfide**	**Acetone**	**Methyl Ethyl Ketone**
Onsite - Entry to 1st Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Onsite - 1st Scale to Tipping	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Onsite - Tipping to 2nd Scale	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Onsite - 2nd Scale to Exit	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Duchaine Blvd to Barnet (100% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Duchaine Blvd Barnet to Rice (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Rice Blvd to Rte 140 (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Rte 140 NB On-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Rte 140 SB Off-Ramp (90% NB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Barnet Blvd (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Philips Rd to Rte 140 (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Rte 140 SB On-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0
Rte 140 NB Off-Ramp (10% SB)	1	Line	Y	6am-6pm	11.9	3.63	3.37					0	0	0	0	0

Attachment C

Air Dispersion Modeling Analyses Supporting Information

Summary of Snow Cover Analysis Results
New Bedford Regional Airport - KEWB

Summary					
	2013	2014	2015	2016	2017
January	Continuous Snow Cover	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow
February	Late Autumn/Winter w/o Snow	Continuous Snow Cover	Continuous Snow Cover	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow
March	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Continuous Snow Cover	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow
April	Transitional Spring	Transitional Spring	Transitional Spring	Transitional Spring	Transitional Spring
May	Transitional Spring	Transitional Spring	Transitional Spring	Transitional Spring	Transitional Spring
June	Midsummer	Midsummer	Midsummer	Midsummer	Midsummer
July	Midsummer	Midsummer	Midsummer	Midsummer	Midsummer
August	Midsummer	Midsummer	Midsummer	Midsummer	Midsummer
September	Autumn	Autumn	Autumn	Autumn	Autumn
October	Autumn	Autumn	Autumn	Autumn	Autumn
November	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow
December	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow	Late Autumn/Winter w/o Snow

Data from National Operational Hydrologic Remote Sensing Center Interactive Snow Information Website
http://www.nohrsc.noaa.gov/interactive/html/graph.html?station=KEWB&w=600&h=400&o=a&uc=0&by=2012&bm=1&bd=1&bh=0&ey=2012&em=12&ed=31&eh=23&data=1&units=0&region=us

Station:	KEWB - NEW BEDFORD REGIONAL AIRPORT
Latitude:	41.683333 N
Longitude:	70.966667 W
Elevation:	105 Feet
Start Date:	2012-01-01 00 UTC
Stop Date:	2012-12-31 23 UTC
Forest Density:	7%
Land Use:	Cool Forest and Field

Any month having >1" snow cover for greater than 60% of the hours was considered having "Continuous Snow Cover".
April and May are always considered "Transitional Spring"
June/July/August are always "Midsummer"
September and October are always "Autumn"
November through March without snow cover is considered "Late Autumn/Winter Without Continuous Snow Cover"

New Bedford Precipitation.xlsx

Year	Annual Inches of Rain	Notes	30th Percentile	70th Percentile
1996	N/A	ASOS installed 3/20/96	42.08	49.19
1997	N/A	No Data		
1998	N/A	No Data		
1999	42.09			
2000	42.07			
2001	47.33			
2002	43.92			
2003	46.21			
2004	40.52			
2005	58.94			
2006	53.57			
2007	43.01			
2008	59.55			
2009	57.85			
2010	47.46			
2011	53.51			
2012	37.81			
2013	45.1			
2014	50.34			
2015	40.57			
2016	37.69			
2017	41.1			

Year	Inches	Selected Moisture Profile
2013	45.10	Average
2014	50.34	Wet
2015	40.57	Dry
2016	37.69	Dry
2017	41.1	Dry

Attachment D

Air Toxics Analysis

Chemical	Averaging Period	Max Concentration	TEL (24 hour)(a)	Exceedance?	AAL (Annual)(a)	Exceedance?	Note
1,3-Butadiene	24 Hour	0.00323	1.20	NO			
	Annual	0.000554			0.003	NO	
2-Methylnaphthalene	24 Hour	0.00000522	14.25	NO			
	Annual	0.000000785			14.25	NO	
Acetaldehyde	24 Hour	0.166	30	NO			
	Annual	0.0235			0.4	NO	
Acetone	24 Hour	0.0175	160.54	NO			
	Annual	0.00233			160.54	NO	
Acrolein	24 Hour	0.0280	0.07	NO			
	Annual	0.00390			0.07	NO	
Ammonia	24 Hour	2.11	100	NO			
	Annual	0.284			100	NO	
Arsenic	24 Hour	0.000160	0.003	NO			
	Annual	0.0000262			0.0003	NO	
Benzene	24 Hour	0.0742	0.6	NO			
	Annual	0.00793			0.1	NO	
Beryllium	24 Hour	0.00000261	0.001	NO			
	Annual	0.000000392			0.0004	NO	
Cadmium	24 Hour	0.000239	0.002	NO			
	Annual	0.0000360			0.0002	NO	
Carbon Disulfide	24 Hour	0.0175	0.1	NO			
	Annual	0.00232			0.1	NO	
Carbonyl Sulfide	24 Hour	0.0300	0.1	NO			
	Annual	0.00401			0.1	NO	
Chloride	24 Hour	0.00151	7	NO			(b)
	Annual	0.000234			7	NO	
Chromium	24 Hour	0.000304	1.36	NO			
	Annual	0.0000458			0.68	NO	
Copper	24 Hour	0.000185	0.54	NO			
	Annual	0.0000278			0.54	NO	
Dichlorobenzene	24 Hour	0.000261	81.74	NO			(c)
	Annual	0.0000392			0.18	NO	
Dioxins	24 Hour	1.14E-09	4.50E-08	NO			(d)
	Annual	1.85E-10			4.50E-08	NO	
Ethanol	24 Hour	0.00	51.24	NO			
	Annual	0.00			51.24	NO	
Ethyl Benzene	24 Hour	0.00988	300	NO			
	Annual	0.00165			300	NO	
Formaldehyde	24 Hour	0.474	2	NO			
	Annual	0.0680			0.08	NO	
Furans	24 Hour	4.30E-10	0.4	NO			
	Annual	7.00E-11			0.02	NO	
Hexane	24 Hour	0.00666	95.24	NO			(e)
	Annual	0.00120			47.62	NO	
Hydrogen Sulfide	24 Hour	0.276	0.9	NO			
	Annual	0.0362			0.9	NO	
Lead	24 Hour	0.000109	0.14	NO			
	Annual	0.0000163			0.07	NO	
Mercury	24 Hour	0.0000566	0.003	NO			(f)
	Annual	0.00000853			0.0014	NO	
Methyl Ethyl Ketone	24 Hour	0.00847	200	NO			
	Annual	0.00101			10	NO	
Naphthalene	24 Hour	0.00766	14.25	NO			
	Annual	0.00160			14.25	NO	
Nickel	24 Hour	0.000476	0.27	NO			
	Annual	0.0000797			0.18	NO	
Primary Exhaust PM2.5 Total	24 Hour	0.560	5	NO			(g)
	Annual	0.114			5	NO	
Selenium	24 Hour	0.00000522	0.54	NO			
	Annual	0.000000785			0.54	NO	
Styrene	24 Hour	0.000442	200	NO			
	Annual	0.0000726			2	NO	
Toluene	24 Hour	0.0596	80	NO			
	Annual	0.00819			20	NO	
Vanadium	24 Hour	0.000500	0.27	NO			
	Annual	0.0000752			0.27	NO	
Xylene	24 Hour	0.0452	11.8	NO			
	Annual	0.00712			11.8	NO	

See next page for Notes (a) - (g)

<u>Notes to Air Toxics Analysis Result Table</u>

(a) TEL, AAL, or other health protective standard as described further in notes (d) and (g) below.
(b) Chloride maximum concentrations were evaluated relative to the TEL and AAL for hydrogen chloride.
(c) Dichlorobenzene (undefined isomers) was conservatively evaluated against the TEL for o-dichlorobenzene and AAL for p-dichlorobenzene.
(d) AALs and TELs are not published for dioxins. The maximum concentration of dioxins represented in this table is the sum of dioxins and furans. The criterion used for evaluation of this pollutant is published by MassDEP as of November 2017 ("Assessment & Control of Dioxin in Massachusetts") and represents 2,3,7,8-TCDD toxic equivalency factors (TEF).
(e) Hexane maximum concentrations were evaluated relative to the TEL and AAL for alkanes and alkenes.
(f) Mercury maximum concentrations were conservatively evaluated relative to the TEL and AAL for methyl mercury.
(g) AALs and TELs are not published for primary exhaust PM2.5 total (diesel exhaust particulate matter). The criterion used for evaluation is published by USEPA ("Integrated Risk Information System Chemical Assessment Summary") as of June 1, 1993, and this criterion (inhalation reference criterion) remains unchanged at this writing (February 8, 2019).

APPENDIX E

EQUIPMENT SPECIFICATIONS


Parallel Products
New Bedford MA

MSW Processing System
Equipment Detail

Confidential Proposal # 17-0289 DV2
17 July 2018

BHS
What's next.

Equipment Detail Diagram

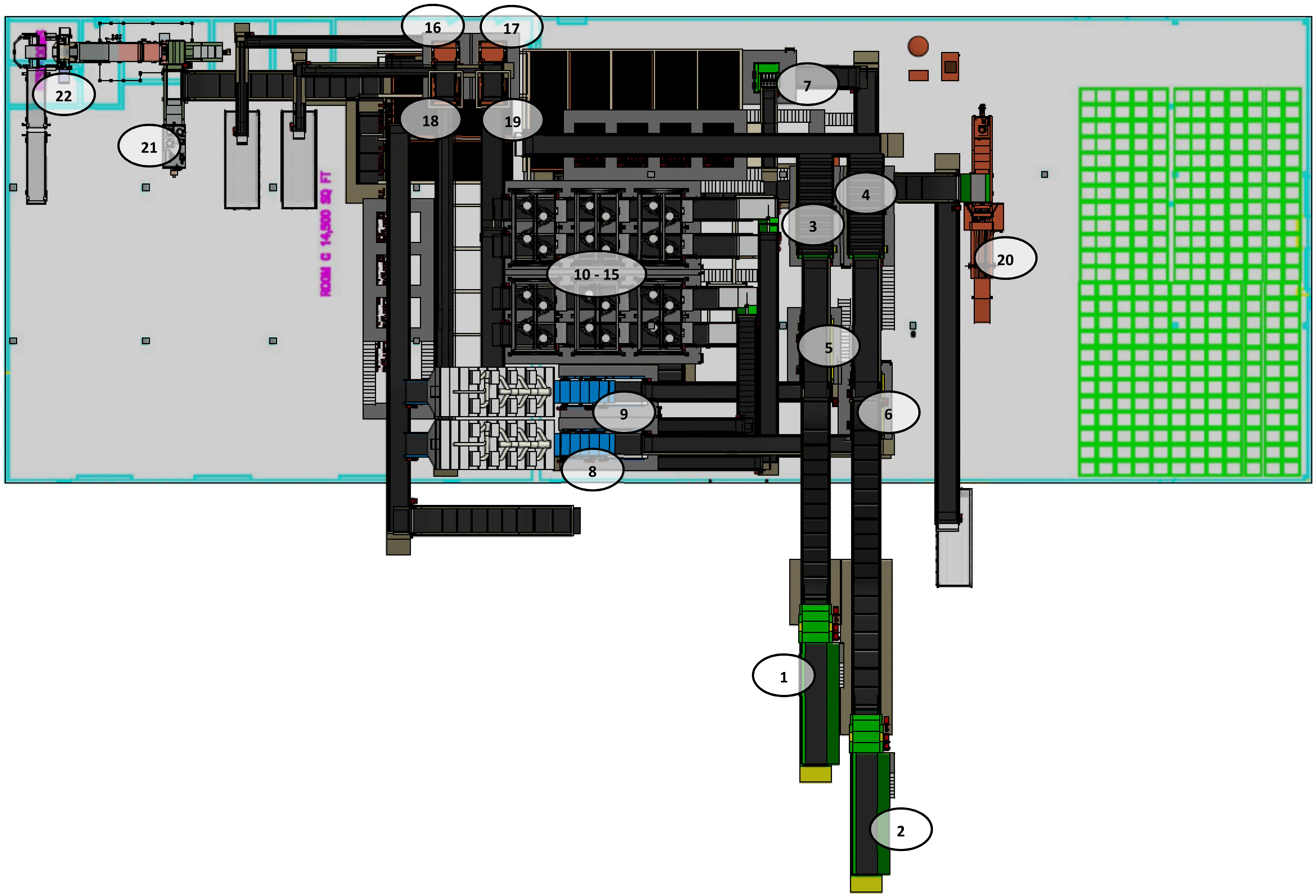


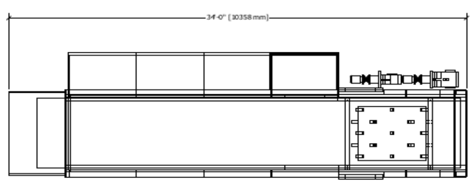
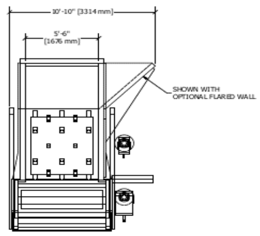
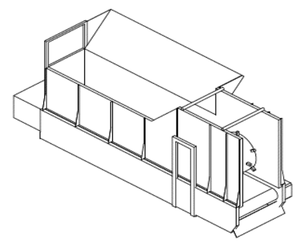
Table of Contents

Equipment Detail

17 July 2018

BHS Metering Bin: Liberator Class

Application:	Liberator Class Metering Bin provides regulated flow of material to the system equiped with ripper teeth to open large bags
Manufacturer:	BHS
Model:	MB-50 L

Width:	Approximately 2.9m [9' 8"]
Length:	Approximately 13.4m [44']
Installed Weight:	Approximately 23,000 kg [51,000 lbs]
Infeed Lip:	10'-4-1/8" (3150 mm) high, sti ened with 8" (203 mm) structural channel
Wall Construction:	Front and rear wall construction is 3/8 formed channel shaped pans
Bearings:	CRS 1045 Dodge S-2000 roller bearing pillow blocks with triple lip seal
Drive Shaft:	CRS 1045 4-7/16" (113 mm) diameter with reducer
Tail Shaft:	CRS 1045 2-7/16" (62 mm) diameter with Dodge S-2000 bearings and take-ups
Chain:	Webster Chain, 9" (229 mm) pitch, RS 932F
Access:	Includes rear door, side door, maintenance platform, flared back wall
Motors:	SEW-EURODRIVE Premium Efficiency Motor: 45 kW [60HP] Drum Drive
Design Speed:	64 RPM, 5.2 FPM
Ship Method	20' HC & 40' HC
Conveyor Type	Steel Chainbelt
Teeth:	36 replaceable tungsten carbide-tipped teeth - Optional ripper teeth to open bags included

BHS Paint Specification

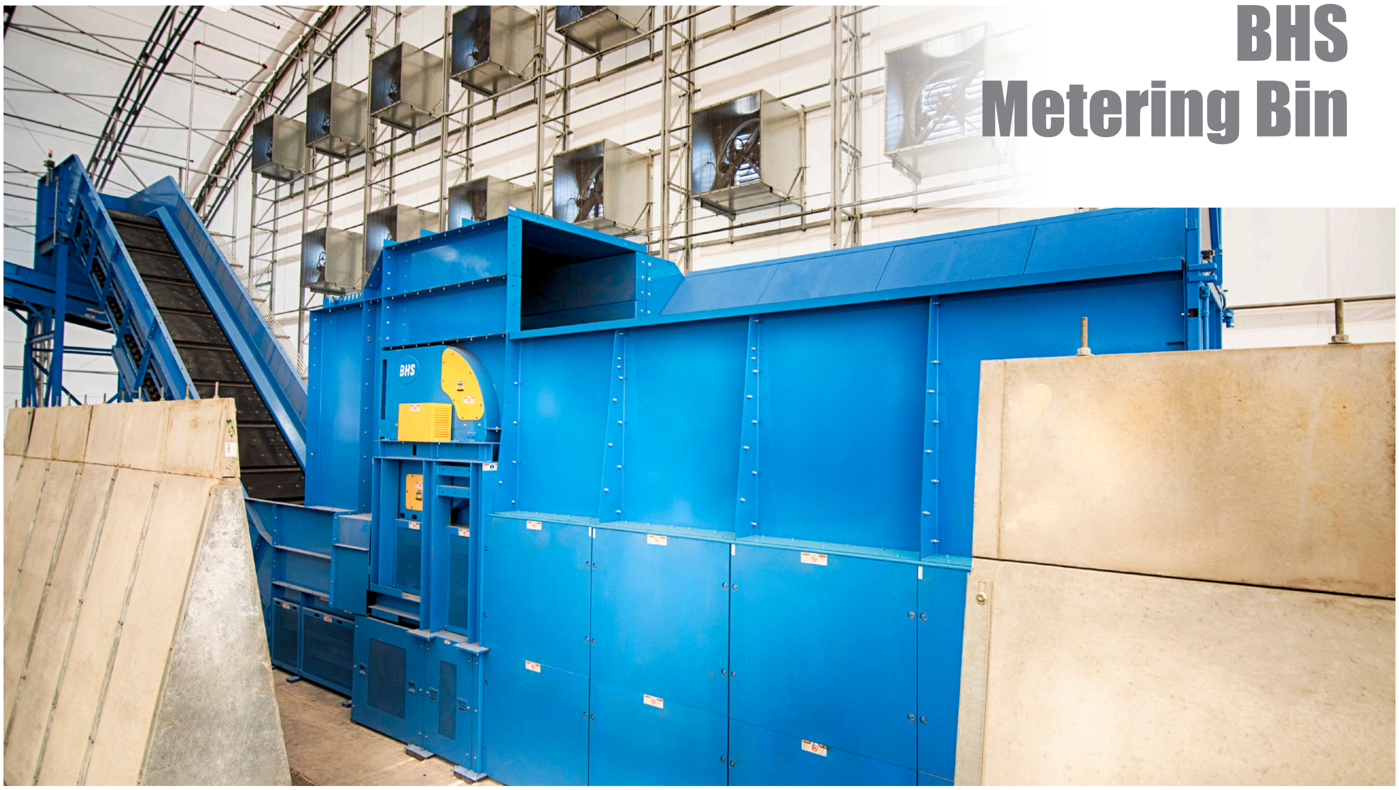
Our standard BHS paint system will meet ISO 12944-5: 1998, corrosivity categories C2 and C3.

Our paint system consists of the following steps:

- Surface Preparation: ISO ST-2 thorough hand and power tool cleaning to remove unwanted and/or foreign matter.
- Primer: One coat of Rodda 733823x Low HAP Metal Primer II
- Topcoat: Two coats Rodda 758001x Quick Drying Equipment Enamel

The total paint system as described above will achieve 120 microns NDFT, 4.7 mils.

BHS Metering Bin



The new **BHS Metering Bin** and **Metering Bin Liberator Class** provide numerous features that increase performance and decrease maintenance requirements. BHS has developed a strong platform to precisely regulate material flow through the combination of a variable speed conveyor and a counter-rotating drum at the discharge end, eliminating black-belt and keeping your system operating at peak levels. The new design's hallmark is its modularity: the design allows a wide range of mix-and match features which can transform the Metering Bin to match your own operational demands. From base features such as extra thick walls to the steel belt and bag-ripping teeth of the Liberator Class, BHS offers a bin without equal in the market.

FEATURES & BENEFITS

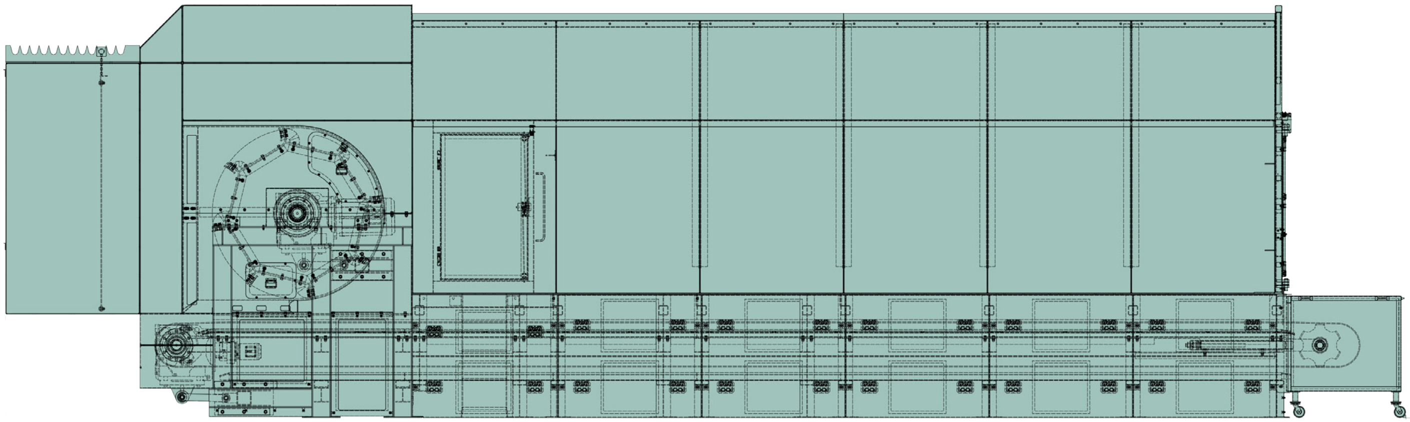
- Increases throughput and system capacity up to 20%
- Eliminates need for costly pits and additional civil work
- Quick, easy retrofit into existing facilities
- Rear door allows for easy removal of bulky items from bin
- New seal design provides protection from material interference
- Available with 60-HP driven drum to power through the toughest loads
- Reinforced load side and flared back walls for ease of loading and durability with minimal spillage

THE MODULAR ADVANTAGE

- Four-week typical lead time on standard design
- Ambidextrous load side and rear door allows for variable loading and access
- Interchangeable belts, drums & teeth
- Reinforced side wall panels
- Can be easily retrofitted to increase capacity
- AR-plated octagonal drum agitates material, opens bags and is easier to clean & repair
- 36 replaceable tungsten carbide-tipped teeth and optional ripper teeth to open bags

What's next.

BHS Metering Bin



Technical Specifications

Model	MB 30	MB 40	MB 50	MB 60
Capacity	30 yd.3 (23 m3)	40 yd.3 (31 m3)	50 yd.3 (38 m3)	60 yd.3 (46 m3)
Dimensions	W 9'- 8" (2.9 m) L 34'-0" (10.4 m) H 14'- 4" (4.3 m)	W 9'- 8" (2.9 m) L 39'-0" (11.9 m) H 14'- 4" (4.3 m)	W 9'- 8" (2.9 m) L 44'-0" (13.4 m) H 14'- 4" (4.3 m)	W 9'- 8" (2.9 m) L 49'-0" (14.9 m) H 14'- 4"(4.3 m)
Installed weight	43,682 lbs (19,814 kg)	44,096 lbs (20,002 kg)	45,842 lbs (20,794 kg)	47,588 lbs (21,586 kg)
Installed weight (Liberator Class)	47,284 lbs (21,448 kg)	48,479 lbs (21,990 kg)	51,006 lbs (23,136 kg)	53,533 lbs (24,282 kg)

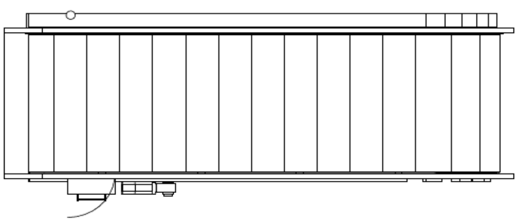
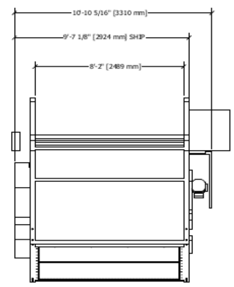
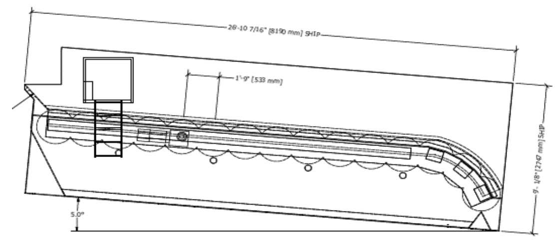
Infeed Lip	10’-4-1/8" (3150 mm) high, stiffened with 8" (203 mm) structural channel
Wall Construction	Front and rear wall construction is 3/8 formed channel shaped pans
Teeth	36 tungsten carbide tipped
Drum	Heavy Duty Abrasion Resistant (AR) plates, replaceable
Bearings	CRS 1045 Dodge S-2000 roller bearing pillow blocks with triple lip seal
Drum Drive	SEW-EURODRIVE Premium Efficiency Motor Horsepower: 25 HP, 40HP, 60HP
Drive Shaft	CRS 1045 4-7/16" (113 mm) diameter with reducer
Tail Shaft	CRS 1045 2-7/16" (62 mm) diameter with Dodge S-2000 bearings and take-ups
Chain	Webster Chain, 9" (229 mm) pitch, RS 932F
Belt	PVC 350, with angle iron flights 3" tall (76 mm) Steel belting also available
Oil	Standard Synthetic
Liberator Package	Steel belt; ripper teeth; 60 HP drum drive

Equipment Detail

17 July 2018

BHS Scalping Screen

Application:	Separate lerge material from waste stream
Manufacturer:	Bulk Handling Systems
Model:	DRS98-15-762

Screen width:	2500mm [98”] wide screening surface
Screen Length:	Approximately 8.19m [26' - 11"] long
Shipping Weight:	Approximately 11,340 kg [25,000 lbs]
Discs:	Patented rubber tri-disc A1-762 on fifteen shafts
IFO:	Variable by fixed increments, suggested openings of 178mm x 254mm [7” x 10”]
Shafts:	Fifteen (15) total shafts on one (1) deck on 533 mm [21”] shaft centers
Bearings:	Pillow block bearings
Sprockets:	Hardened double-single timed sprockets with split taper bushings
Drive Chain:	RC 80
Motors:	One (1) 7.5 kW [10 HP] SEW energy efficient motor directly coupled to gear reducer
Noise:	<85 dB(a)
Reducers:	Shaft mounted reducer
VFD:	Variable frequency drives for operating flexibility are recommended
Drive Guards:	Drive system is enclosed in a solid guard with lift off door for easy removal and replacement. Grease fittings are plumbed to a common point outside guard for convenient bearing maintenance
Angle:	Fixed 5 degree decline
Auto-lube:	Automatic oiler system for the drive chain, which includes: reservoir, solenoid, distribution manifold, flexible tubing and adjustable brush applicators
Chutes	Included

BHS Paint Specification

Our standard BHS paint system will meet ISO 12944-5: 1998, corrosivity categories C2 and C3.

Our paint system consists of the following steps:

- Surface Preparation: ISO ST-2 thorough hand and power tool cleaning to remove unwanted and/or foreign matter.
- Primer: One coat of Rodda 733823x Low HAP Metal Primer II
- Topcoat: Two coats Rodda 758001x Quick Drying Equipment Enamel

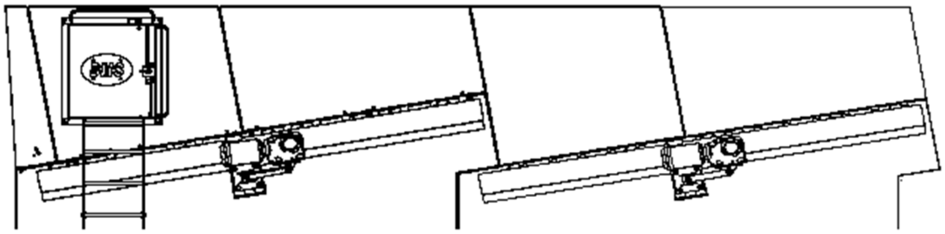
The total paint system as described above will achieve 120 microns NDFT, 4.7 mils.

Equipment Detail

17 July 2018

BHS Debris Roll Screen®

Application:	The Inter-Face Opening (IFO) of the DRS is specifically designed to maximize the removal of fines without the loss of valuable single serve containers.
Manufacturer:	Bulk Handling Systems
Model:	DRS84-11-11-236



Screen width:	2130mm [84”] wide screening surface
Screen Length:	Approximately 5.4m [17' 9"] long
Shipping Weight:	Approximately 4000 kg [9000 lbs]
Discs:	BHS patented in-line compound tri-disc design with BHS disc 2-233 / 2-236 on all shafts. Discs hardened to 400+ Brinell for long wear life
IFO:	2-233 / 2-236 with openings of 32mm x 57mm [1 ¼” x 2 ¼”]
Shafts:	Thirty (30) total shafts on two (2) decks with two (2) rollover shafts at the tail section on 222 mm [8 ¾”] shaft centers
Bearings:	Pillow block bearings
Sprockets:	Hardened double-single timed sprockets with split taper bushings
Drive Chain:	RC 80
Motors:	Two (2) 5.5 kW [7.5 HP] SEW energy efficient motor directly coupled to gear reducer
Noise:	<85 dB(a)
Reducers:	Shaft mounted reducer
VFD:	Not Included - Variable frequency drives for operating flexibility are recommended *(By Customer)*
Drive Guards:	Drive system is enclosed in a solid guard with lift off door for easy removal and replacement. Grease fittings are plumbed to a common point outside guard for convenient bearing maintenance
Angle:	Fixed 0 degree incline
Auto-lube:	Automatic oiler system for the drive chain, which includes: reservoir, solenoid, distribution manifold, flexible tubing and adjustable brush applicators
Chutes	Included

BHS Paint Specification

Our standard BHS paint system will meet ISO 12944-5: 1998, corrosivity categories C2 and C3.

Our paint system consists of the following steps:

- Surface Preparation: ISO ST-2 thorough hand and power tool cleaning to remove unwanted and/or foreign matter.
- Primer: One coat of Rodda 733823x Low HAP Metal Primer II
- Topcoat: Two coats Rodda 758001x Quick Drying Equipment Enamel

The total paint system as described above will achieve 120 microns NDFT, 4.7 mils.

BHS Debris Roll Screen®

The **BHS Debris Roll Screen®** is the industry's flagship disc screen. This proven, patented technology is the premiere sizing tool for Single Stream, Municipal Solid Waste (MSW), Construction and Demolition (C&D) waste, wood waste, compost, green waste, plastics, glass, tires and various other materials.

The unique Tri-Discs™ are in-line from shaft-to-shaft, creating a precise opening for highly-accurate material sizing. Their hardened steel, triangular shape provides superior material agitation and true sizing in a small footprint.

The compound disc design provides precise sizing far superior to other disc or "star" screens. Patented gear timing paired with variable speed drives allows for fine tuning for varying material conditions.

Excellent material agitation and separation

Patented in-line discs provide accurate sizing of material, reducing product loss

Disc and shaft design reduces material wrap, increasing uptime

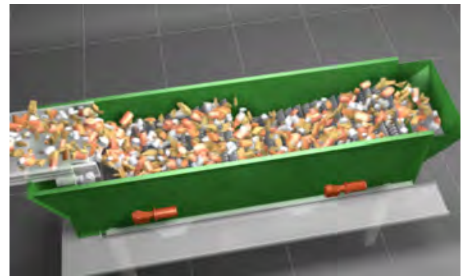
Heavy-duty discs ensure long disc life and reduced maintenance

BHS

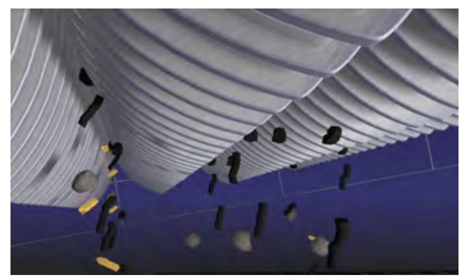
What's next.

BHS Debris Roll Screen®

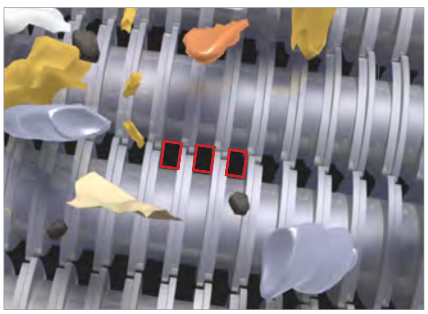
The Difference is the Discs



Our patented discs deliver superior sorting efficiency, material quality and throughput rates versus other screens. The BHS Debris Roll Screen® is unmatched in its ability to accurately sort a wide range of material from a variety of applications. The BHS' Tri Disc™ imparts a wavelike action into the material stream, efficiently and precisely sizing material and minimizing wrapping and jamming. Typical disc screens have uneven openings, allowing for inexact sizing and material wrapping and jamming.

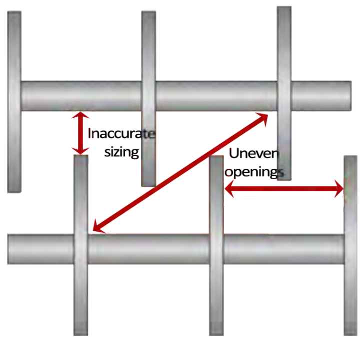


BHS DRS Screen



Precise openings

Conventional Disc Screen



General Specifications

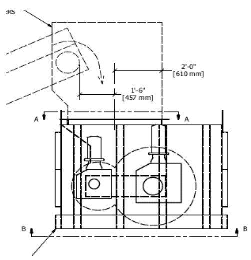
Screen width	Varies according to application
Inter-Face Openings	Varies according to application
Screen Angles	Varies according to application
Motors	SEW-EURODRIVE high efficiency gear motors
Reducers	Shaft mounted
Drive Guards	Drive system is enclosed in a solid guard with lift off door for easy removal and replacement. Grease fittings are plumbed to a common point outside guard for easy bearing maintenance.
Bearings	Dodge SC Tapped Base
Sprockets	80Q17 hardened double-single timed sprockets with split taper bushing.
Drives	RC 80 Chain-driven. Variable frequency drives recommended for operating flexibility, included with controls system.
Auto Lube	Automatic oiler system for the drive chain including reservoir, solenoid, distribution manifold, copper plumbing and adjustable brush applicators; easy sprocket, chain and bearing maintenance.

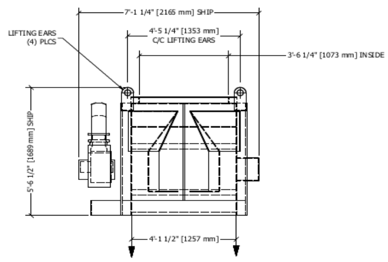
Equipment Detail

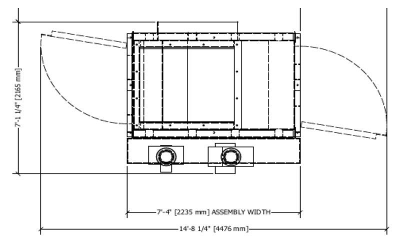
17 July 2018

BHS Bag Breaker®

Application:	The BHS Bag Breaker® is designed to minimize shredding of the bags to allow efficient recovery of film. The majority of the empty bags remain in one to three elongated pieces. The bags exit the machine with the released material.
Manufacturer:	Bulk Handling Systems
Model:	BB48







Width:	1220 mm [48"] wide
Length:	Approximately 2.11m [83"] long
Shipping Weight:	Approximately 3600 kg [8000 lbs]
Shafts:	Two (2) counter-rotating shafts with heavy-duty double row spherical roller bearings
Motors:	One (1) 7.5 kW [10 HP] and one (1) 1.5 kW [1 HP] SEW motor with Class II reducers
Noise:	<85 dB(a)
Controls:	Integrated into BHS System Controls
Access doors:	Two (2) large access doors reinforced with steel bracing with Signal latches
VFD:	Variable frequency drives for operating flexibility
Chutes	Included

BHS Paint Specification

Our standard BHS paint system will meet ISO 12944-5: 1998, corrosivity categories C2 and C3.

Our paint system consists of the following steps:

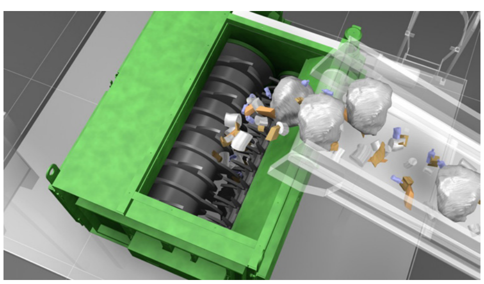
- Surface Preparation: ISO ST-2 thorough hand and power tool cleaning to remove unwanted and/or foreign matter.
- Primer: One coat of Rodda 733823x Low HAP Metal Primer II
- Topcoat: Two coats Rodda 758001x Quick Drying Equipment Enamel

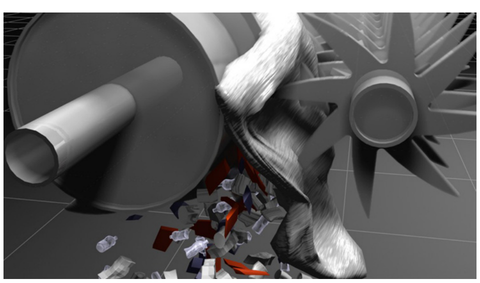
The total paint system as described above will achieve 120 microns NDFT, 4.7 mils.

BHS Bag Breaker®

The **BHS Bag Breaker®** opens bags at high volumes without damaging content, ensuring maximum recovery of valuable recyclables. The patented Bag Breaker® uses large, counter-rotating drums to efficiently open the bags and release the contents, discharging them from the bottom of the machine. Bags are torn into large pieces for easy removal.

Bagged material can be fed directly into the BHS Bag Breaker® with an infeed conveyor to achieve an evenly-metered flow rate.



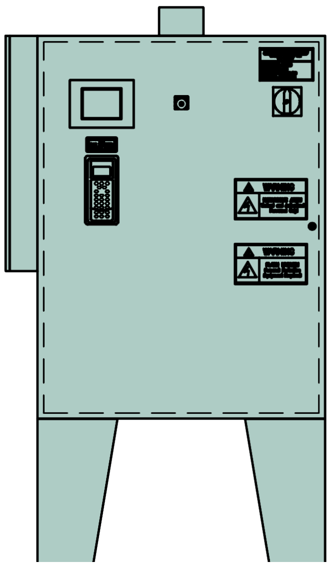


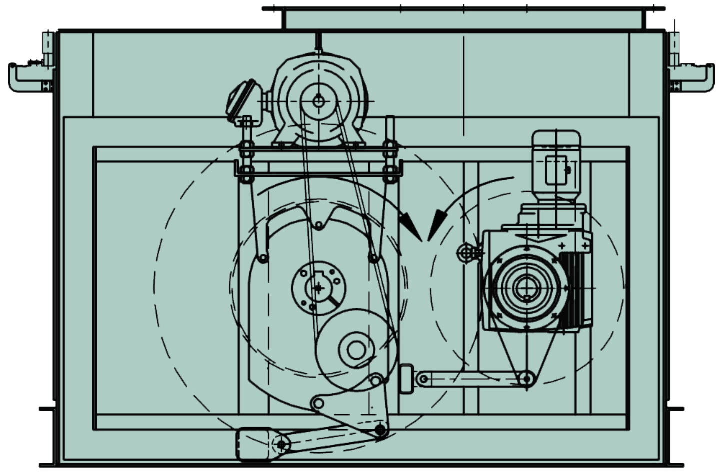
- Clean-out doors on two sides for easy access and maintenance
- Easy to retrofit into existing facility
- Opens bags without damaging valuable recyclables
- Bags are torn to large pieces rather than shredded for easy removal
- Heavy-duty construction for decreased downtime and long-operating life

BHS

What's next.

BHS Bag Breaker®

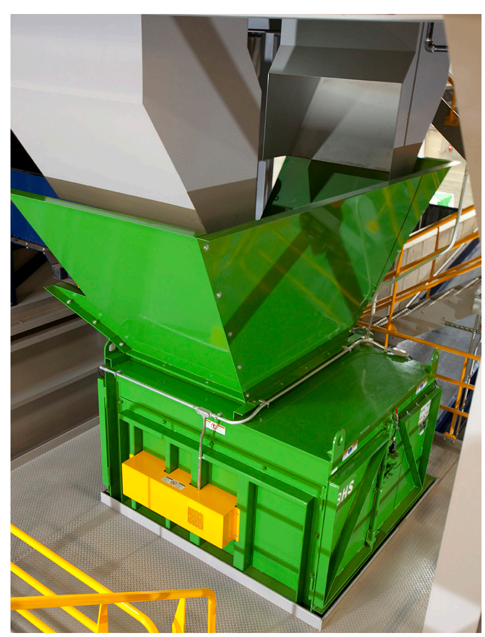




Technical Specifications

Model	BB-60	BB-72	BB-90
Capacity	up to 22 tph	up to 30 tph	up to 35 tph
Motors	10 hp , 1 hp (7.5 kW, 0.75 kW)	20 hp , 3 hp (15 kW, 2.2 kW)	20 hp , 3 hp (15 kW, 2.2 kW)
Access Doors	43"x 36" (1090 mm x 910 mm)	43"x 43" (1090 mm x 1090 mm)	43" x 52" (1090 mm x 1320 mm)
Dimensions	W 7'-7" (2.3 m) L 8'-1" (2.5 m) H 5'-2" (1.6 M)	W 8'- 1" (2.5 m) L 10'- 4" (3.1 m) H 5'-2" (1.6 m)	W 8'- 1" (2.5 m) L 11'-10" (3.6 m) H 5'-2" (1.6 m)
Shipping weight	7,900 lbs. (3,600 kg.)	10,100 lbs. (4,600 kg.)	13,100 lbs. (5,950 kg.)

Motors	Energy efficient motor with Class II gear reducer
Shafts	Two (2) counter-rotating shafts with heavy-duty double row spherical roller bearings; 3-15/16" (100mm)
Drum	Constructed of heavy-duty rolled plate with 3-15/16"(100mm) diameter, C1045 head shaft
Bearings	Dodge Type E
Controls	Control panel in NEMA 12 enclosure
Access Doors	Two (2) large access doors reinforced with steel bracing with signal latches



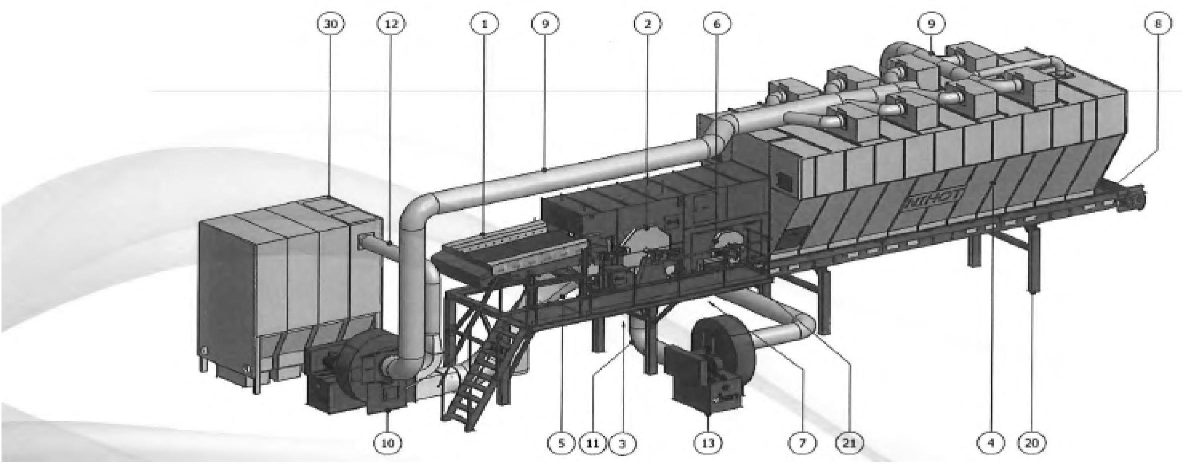
Bulk Handling Systems | 3592 West 5th Avenue | Eugene, OR 97402 USA | 1.866.688.2066 | bulkhandlingsystems.com

Equipment Detail

17 July 2018

Nihot Double Drum Separator

Application:	Input material is separated into a heavy, mid-heavy and light fraction due to an installed second rotating splitter drum and second fan with blow nozzle.
Manufacturer:	Nihot
Model:	DDS1600



			Installed Power
1.	Product Input Conveyor (PIC)	1600x 2750mm	5.5 kW
2.	First splitter drum		2.2 kW
3.	Discharge heavy fraction		
4.	Expansion Room	3600x 9000mm	
5.	First air inlet		
6.	Second splitter drum		2.2 kW
7.	Discharge mid fraction		
8.	Light Fraction Discharge Conveyor	1600x 11,250mm	9.2 kW
9.	Air return duct		
10.	First recirculation fan	2x RF(I) 60	2x 30 kW
11.	Second air inlet		
12.	Dust duct		
13.	Second recirculation fan	RF 50	18.5 kW
14.	Support construction		
15.	Stairs and maintenance platform		
30.	Filter unit	Included	

Nihot Coating Specification

Nihot equipment is built using blank-stained and galvanized plates. Blank-stained steel plates are degreased with Sigma Thinner 91-80. The layer is treated with Sigma Steel QD which consists of a zinc phosphate primer (1x 40µm).

The finishing layer is 1x Sigma Steel QD Finish and can be applied in any RAL color according to customer specification (1x 40µm).

Drum Separators

Besides the superior separation efficiency, the Nihot Drum Separators are well known for their ability of handling large volumes of light fractions. The robust construction and foolproof functionality guarantee a long lasting and trouble free operation.

SDS: Single Drum Separators

The Single Drum Separator is a highly versatile separator that processes a large variety of waste streams into two fractions; heavy and light. This high capacity separator system is capable of processing e.g.:

- Bad shredded materials
- Waste containing large materials
- A high volume percentage of light materials
- Hard and bulky soft materials

DDS: Double Drum Separators

When a three-way separation is desired or a volume separation is required, the Nihot Double Drum Separator is a good solution. The input material is separated into a heavy, mid-heavy and light fraction due to an installed second rotating splitter drum and second fan with blow nozzle.

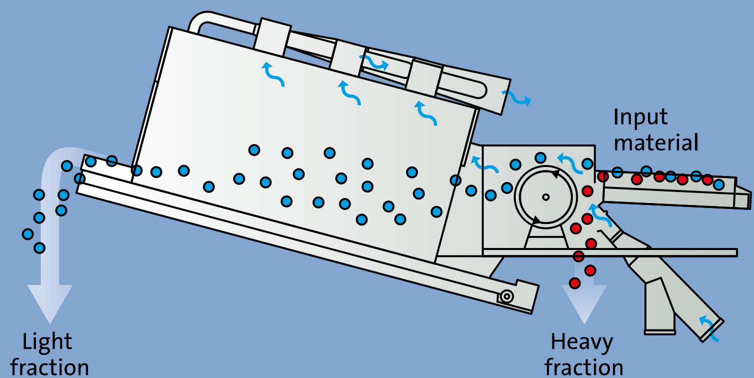
Advantages SDS & DDS

- Versatile – processes many different waste streams, including high moisture content input
- Gives control of the caloric value of the output
- Removes interferants from input, thus protecting the granulators in RDF refinement
- Low maintenance and few wear parts i.e. reduced downtime
- Can handle large fraction sizes (plastics and film)
- Low dust emission

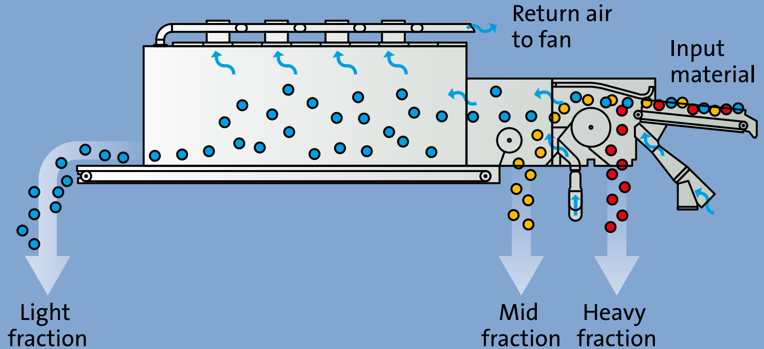
These benefits result in fast return on investment, low operating costs and superior reliability.

The operating principles

SDS: Single Drum Separator



DDS: Double Drum Separator

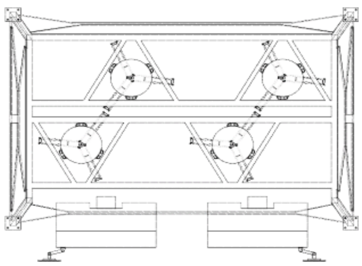


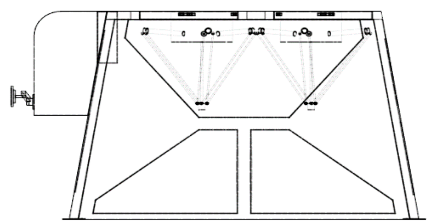
Equipment Detail

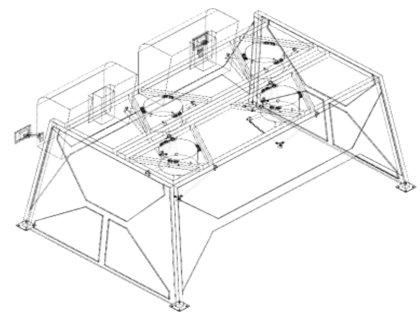
17 July 2018

Max-AI™ Autonomous QC

Application:	Identification and sorting of recyclable containers for recovery. Dual-frame, quad-robot configuration for sorting from two parallel conveyors with common chutes in between.
Manufacturer:	NRT
Model:	AQC-4



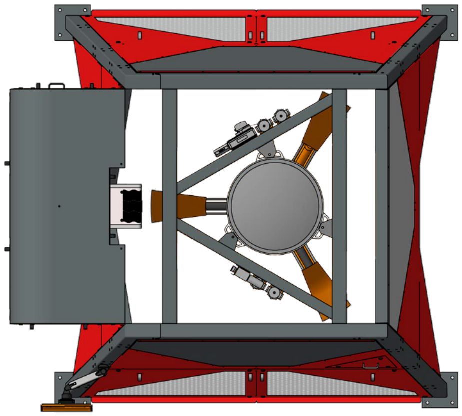




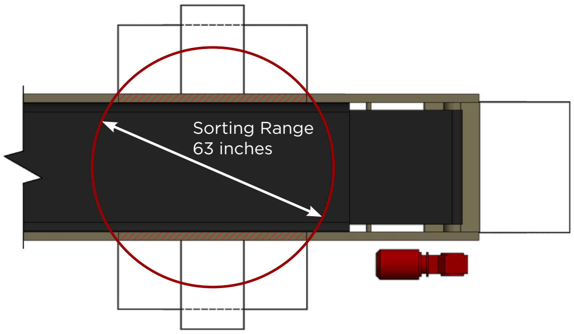
Approx. Dimensions (L x W x H)	10' x 20' x 9' (2.9m x 5.8m x 2.6m)
Machine Weight	Approx. 14,000 lbs. (6,400 kg)
Picking Rate	up to 240 picks/minute
Max Object Weight	1 lb. (0.5 kg)
Coating	powder coated with a textured finish
Structure Color	RAL 7012 (dark gray)
Conveyor Speed	180 ft./min (55 m/min)
Air Supply	160 scfm @100psig (4.5 m^3/min @ 6.9 BAR) per arm
Power Supply (By Customer)	40A 230V 50/60Hz
Delta bot robotic sorter	4x Included
UL or CE Certification	Included
Vision system and enclosure	Included
Max-AI™ neural network license	Included
Suction based grasping system	Included

MAX-AI® AUTONOMOUS QC

Max-AI® Autonomous Quality Control (AQC) sorters are the ultimate in post-sort automation. When combined with NRT optical sorters, the container sorting process is 100% autonomous and the need for human contact with waste is eliminated.



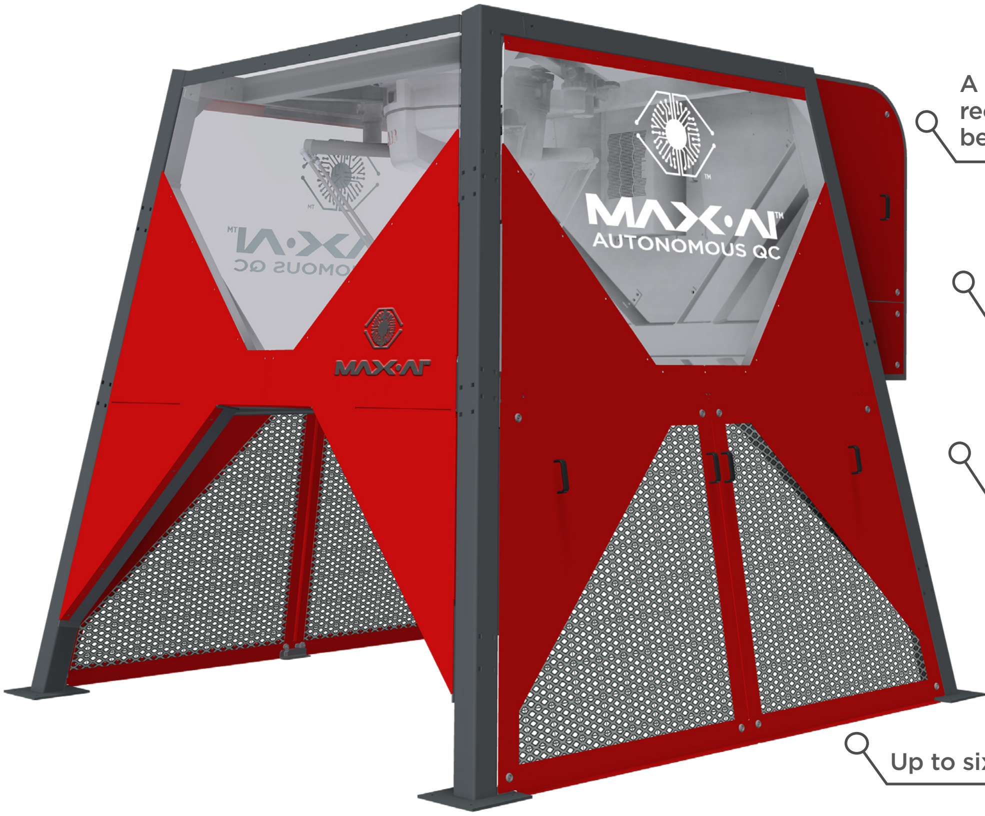
The AQC makes multiple sorting decisions autonomously; for example separating thermoform trays, aluminum, 3D fiber and residue from a stream of optically-sorted PET bottles. All of this is done at rates exceeding human capabilities and each pick is prioritized for profitability.



This advanced technology uses a machine vision system to see the material, specialized artificial intelligence to think and identify each item, and a robot to pick targeted items or contamination. Max-AI AQC sorters provide MRF operators with sustained and consistent sorting performance while improving MRF safety, recovery, product quality and operational expenses.

Max Autonomous QC

The Max AQC automates QC positions and positively recovers recyclables



A completely autonomous high-volume recovery solution. Provides additional benefit when paired with NRT sorters.

Advanced neural networks can be retrained to identify new materials as waste streams change.

Exceeds human capabilities in every metric including pick rate, accuracy, & uptime; and sustains those capabilities every minute of the day.

Picks are prioritized by value, weight, or other operator specifications. Priorities are easily adjusted when market conditions change.

Up to six discrete sorts from a single unit.

CONTAINER LINE SORTS

PET BOTTLES
PET TRAYS

HDPE-N
HDPE-C

MIXED PLASTICS

CARDBOARD

ASEPTICS/
CARTONS

ALUMINUM

MIXED PAPER

BLACK PLASTICS

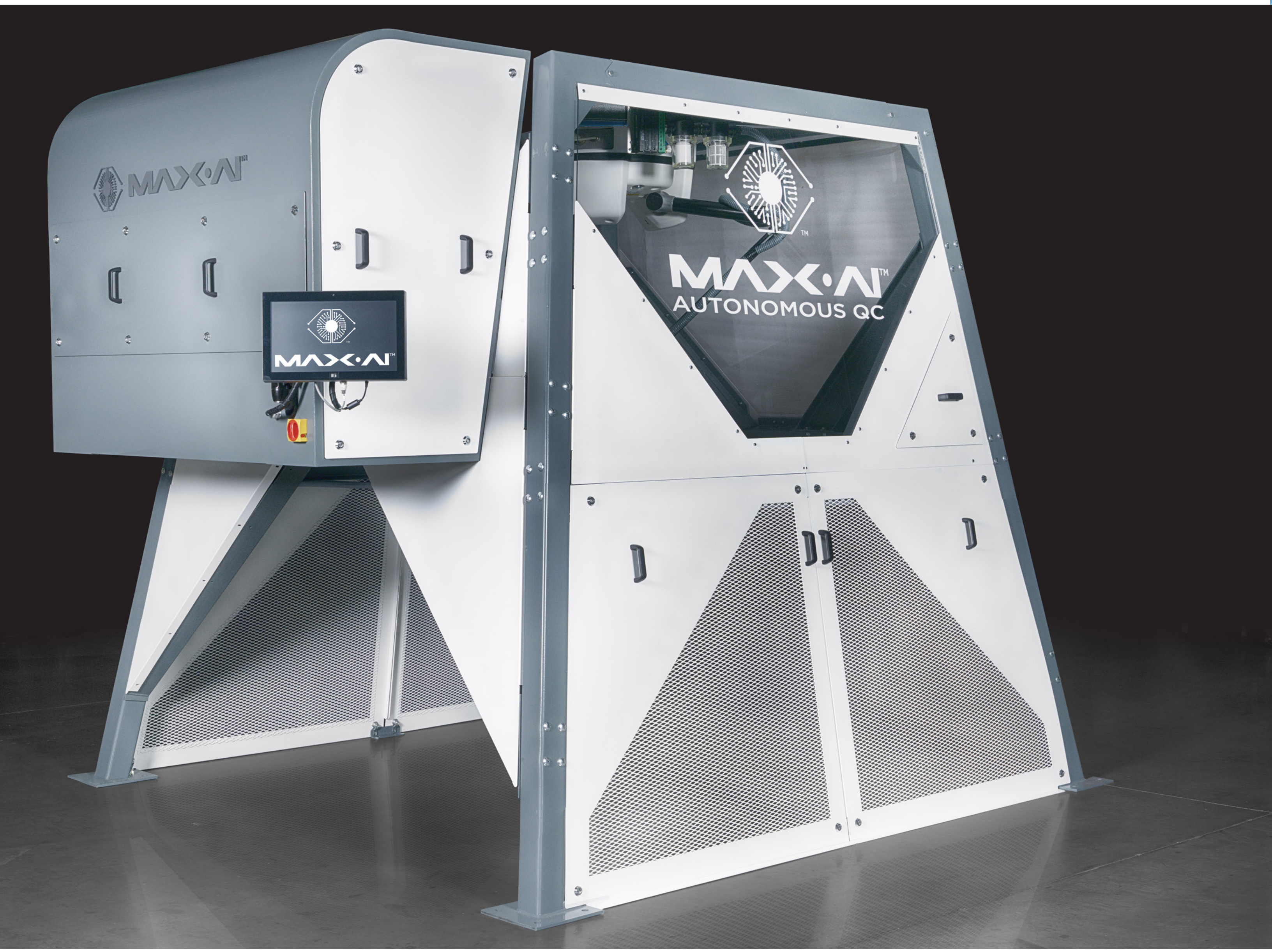
FIBER LINE SORTS AVAILABLE SOON

CONTAINERS

CARDBOARD

RESIDUE

I am Max. I was created to do this job.



"I don't get sick. I don't need breaks, lunches or days off. I work harder, longer and better than anyone else. I'm more accurate and more efficient than anyone could be. Thanks to my intelligent neural network, I'm capable of learning on the job so I can adapt to changing conditions and variables. I was created to do this job and I look forward every day to fulfilling my promise while lowering costs, improving productivity and delivering higher profits for my employers."

max-ai.com

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BHS NIHOT® nrt ZeroWaste™

Technische Daten • Technical Data • Fiche technique
EBV NES
18.05.09

STEINERT
www.steinert.de

Einbauvorschlag für Nichteisenmetallscheider
Mounting-Proposal for Non-Ferrous Metals Separator
Proposition de montage pour séparateur de métaux non-ferreux

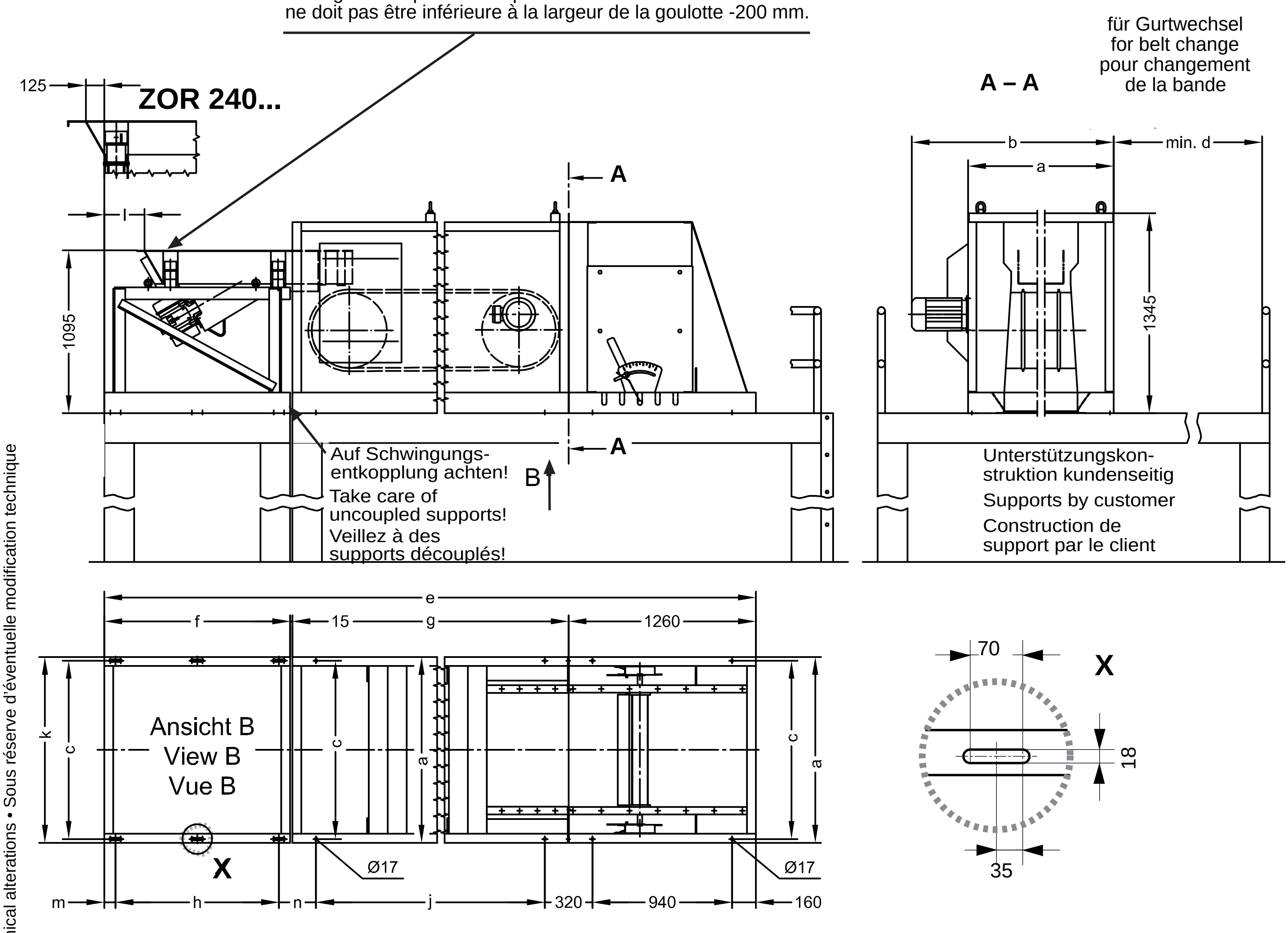
STEINERT Elektromagnetbau GmbH • Widdersdorfer Str. 329-331, D-50933 Köln • Tel.+49 (0) 221 49 84 0 • Fax +49 (0) 221 49 84 102 • sales@steinert.de

Mitgeltende Datenblätter / See additional Technical Data / Voir aussi fiches techniques: **TD ZOR • TD NES • TD ALK**

Die Materialbreite an der Übergabe darf ein Maß von Rinnenbreite -200 mm nicht unterschreiten.

The material width at the material handoff must not remain under the dimension of the pan width (-200 mm).

La largeur des produits au point de transfert des matières ne doit pas être inférieure à la largeur de la goulotte -200 mm.



Typ Type Type	Abmessungen Dimensions Dimensions															Antriebe Drives Entraînement				
		E 36...	E 50...	E 61...												Vibr. Rinne Vibr. feeder couloir vibrant	Band belt courroie	Polsystem Pole system système polaire		
	a	b	b	b	c	d	e	f	g	h	j	k	l	m	n			E 36...	E 50...	E 61...
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kW	kW	kW	kW	kW
NES 50 1.0 E...	1250	-	1560	1622	1200	1000	4625	1250	2100	2x550	2x890	1250				2 x 0,4	2,2	-	4,0	5,5
NES 75 1.0 E...	1380	-	1695	1766	1330	1250						1380				2 x 0,6	2,2	-	4,0	7,5
NES 100 2.0 E...	1630	2083	1944	2078	1580	1500						1630	270	75	250	2 x 0,8	2,2	5,5	4,0	9,2
NES 125 2.0 E...	1880	2333	2060	2328	1830	1750	5675	1500	2900	2x675	3x860	1880				2 x 1,2	2,2	5,5	5,5	9,2
NES 150 2.0 E...	2130	2583	2510	2578	2080	2000						2130				2 x 1,2	3,0	5,5	5,5	9,2
NES 200 2.0 E...	2630	-	3010	3078	2580	2500	6375	2200		3x680		2650	120	80	255	2 x 1,6	3,0	-	5,5	9,2
NES 250 300 E...	3130	-	-	3610	3080	3000	7630	2455	3900	3X765	5X720	3150	-	80	245	2 x 3,0	3,0	-	-	7,5

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Überbandmagnetscheider UME…R
Overband Magnetic Separator UME…R
Séparateur magnétique de type „Overband“ UME…R

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Bild A
picture A
vue A

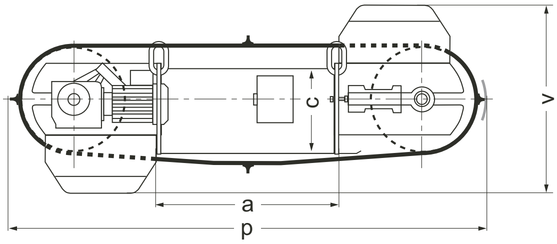


Bild B
picture B
vue B

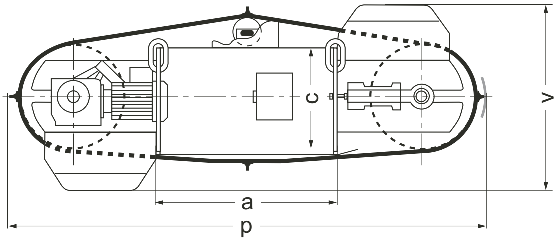
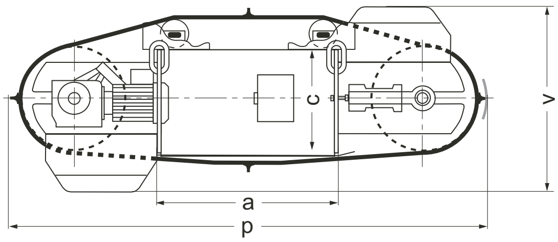
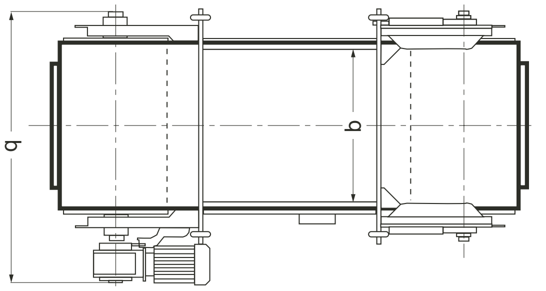


Bild C
picture C
vue C





Typ Type Type	Nenn-leistungs-aufnahme Rated power input Puissance nominale	Anschluß-spannung Operating voltage Tension de service	Abstand max. Maximum clearance Distance max. re-comandée** x	Anordnung über Förderband* Arrangement over belt width* Disposition au-dessus de la largeur de la bande* quer across trans-versale	längs in-line longitu-dinale	Abmessungen Dimensions Dimensions a	b	c	p	q	v	Bild picture vue	Motor-leistung Motor capacity Puissance du moteur	Austrags-band-geschwin-digkeit Speed of discharge belt Vitesse de la bande de debit	Gewicht ca. Weight approx. Poids env.
	kW	Volt	mm	mm	mm	mm	mm	mm	mm	mm	mm		kW	ca. m/s	kg
UME 75 90 RF	2,7		330	1000	800	915	760	430	2295	1327		A			1550
UME 90 105 RF	3,2	80	360	1200	1000	1060	910	400	2440	1507	910		3	2,1	1850
UME 125 140 RF	5,2		470	1400	1200	1370	1220	435	2744	1807		B			3150
UME 75 90 R	3,1	63	350	1000	800	880	740	415	2290	1322					1600
UME 75 110 R	3,5	75		1200		1080			2490			A			1850
UME 95 110 R	4,1	95	420		1000		940	425		1522	910		3		2250
UME 95 130 R	4,3	105		1400		1280			2690			B		2,1	2700
UME 115 130 R	6,1	95	490		1200		1140	500		1722					3550
UME 115 150 R	6,9	108		1600		1480			2890						4200
UME 135 150 R	7,8	126	560		1400	1500	1350	510	3170	2046	1000				6300
UME 135 170 R	8,3	138		1800		1700			3370		1000	C	4		6900
UME 160 175 R	12,3	208	680		1700	1725	1600	666	3395	2300	1150		5,5	1,7	10 000
UME 180 195 R	14,7	192	730	2000	2000	1950	1800	786	3620	2500	1270				15 500

* Gemuldetes Band nach DIN 22101. / * Belt with throughing angle acc. DIN 22101. / *Bande en auge selon DIN 22101.

Abst. zwischen Polfläche und Oberkante Förderband / **Clear. between pole surface and conveyour belt /Dist. entre surface de pôle et courroie du convoyeur

STEINERT

www.steinert.de

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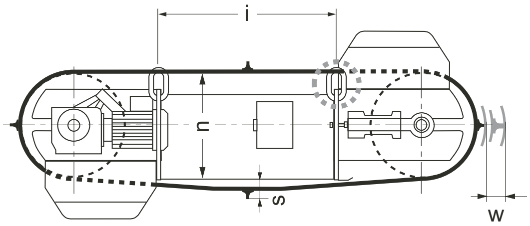
STEINERT Elektromagnetbau GmbH • Widdersdorfer Str. 329-331, D-50933 Köln • Tel.+49 (0) 221 49 84 0 • Fax +49 (0) 221 49 84 102 • sales@steinert.de

Bild A
picture A
vue A



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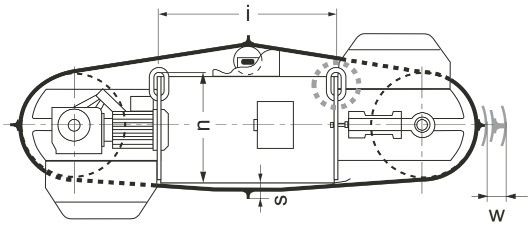

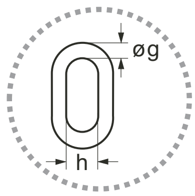

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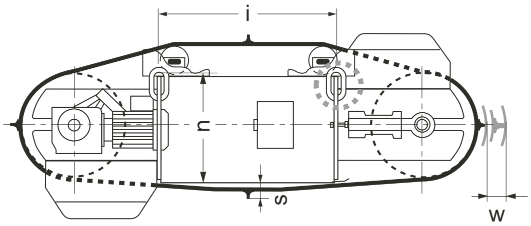
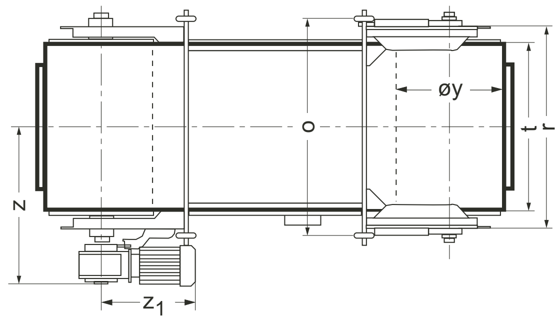


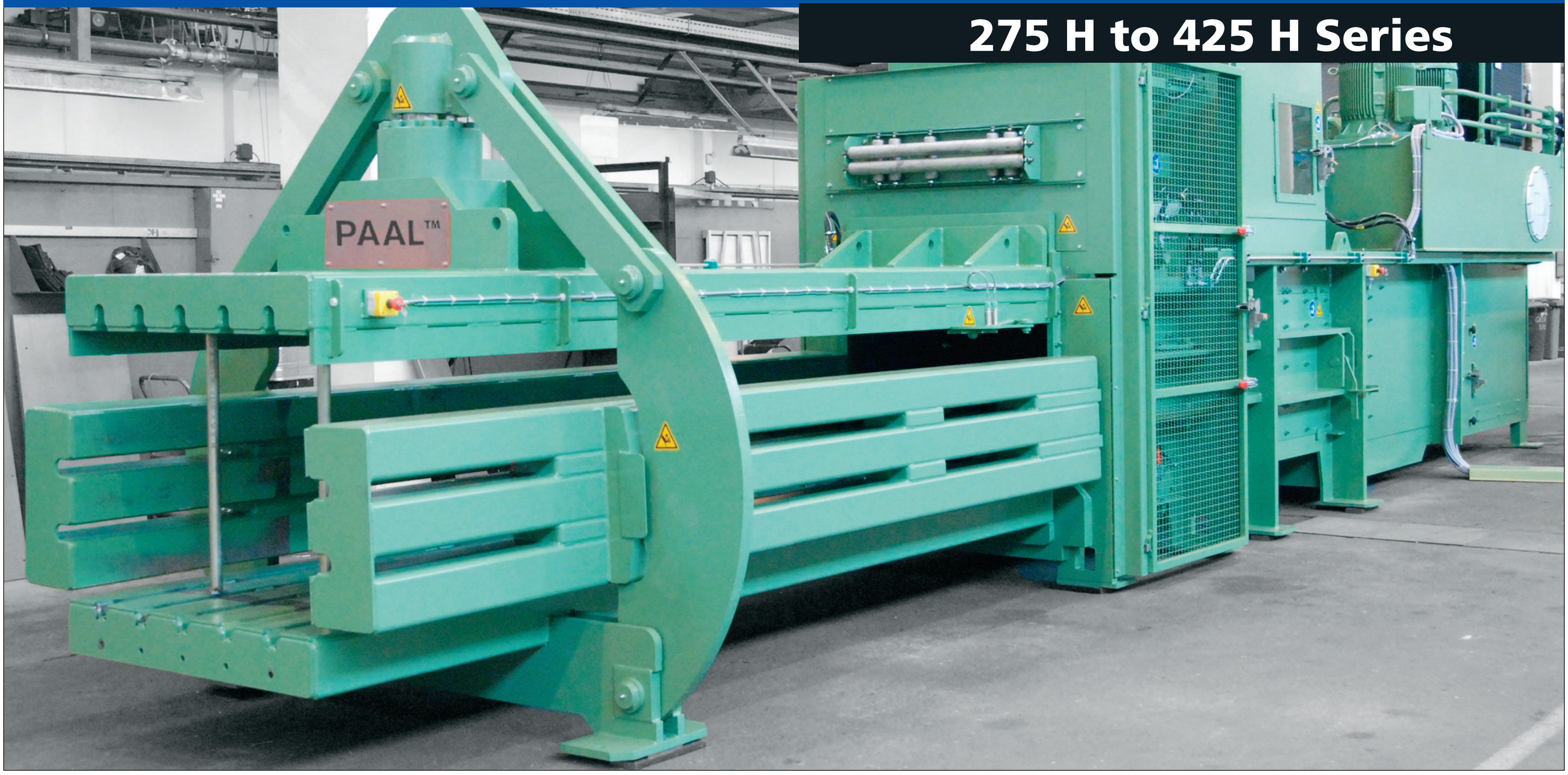


Typ Type Type	Abmessungen Dimensions Dimensions												Bild picture vue
	g	h	i	n	o	r	s	t	w	y	z	z_1	
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
UME 75 90 RF			900		1100	970	84	800			753		A
UME 90 105 RF	22	50	1045	520	1280	1150		950	50	506	843	454	
UME 125 140 RF			1350		1530	1450	124	1250			993		B
UME 75 90 R			860		1050	970	80	800			764		
UME 75 110 R			1060				85		50				A
UME 95 110 R	22	50		524	1250	1170		1000			864	454	
UME 95 130 R			1260				95						B
UME 115 130 R					1450	1370		1200		506	964		
UME 115 150 R			1460	639			100						
UME 135 150 R	22	50	1480	524	1760	1630		1400	80		1139	509	
UME 135 170 R			1680										C
UME 160 175 R	26	100	1685	814	2000	1880	110	1600			1266		
UME 180 195 R			1910	934	2200	2080		1800			1366		

Technische Änderungen vorbehalten • Subject to technical alterations • Sous réserve d'éventuelle modification technique

PAAL Konti™ Baler

275 H to 425 H Series



Kadant PAAL's Konti H channel baler features high throughput and bale weights with low energy consumption.

Features of the PAAL Konti H channel baler

- Optimized knife, stamper, and channel design
- Modern axial piston pumps with low drive power
- Advanced positional ram measurement system
- Large door at rear section of baler
- PLC offering remote access and service as well as high resolution operator panel

Benefits of the PAAL Konti H channel baler

- High throughput and bale weights
- Low energy consumption
- Easy access to tying unit via optional ladder to three-sided platform
- Simple operation and maintenance
- Low total cost of ownership

Kadant PAAL was founded in 1854 in Osnabrück, Germany. Since its introduction of the first continuously operated horizontal baler in 1960, PAAL has delivered more than 30,000 machines and today is the #1 channel baler manufacturer in Europe.

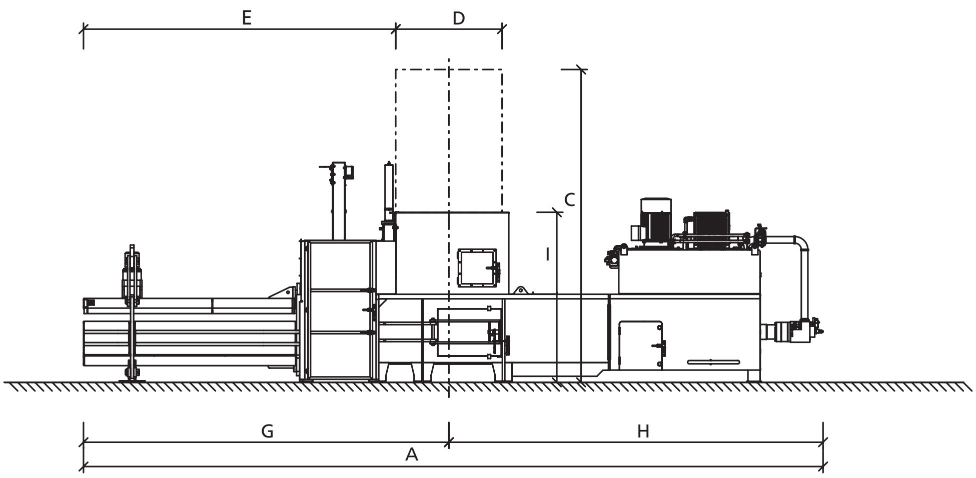
KADANT

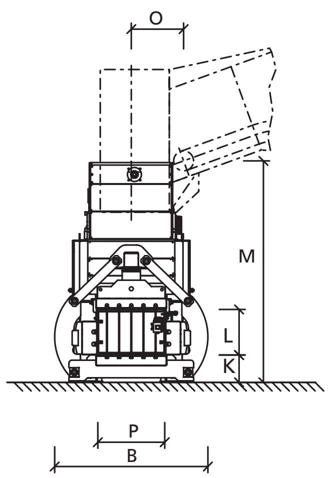
PAAL KONTI BALER 275 H TO 425 H SERIES

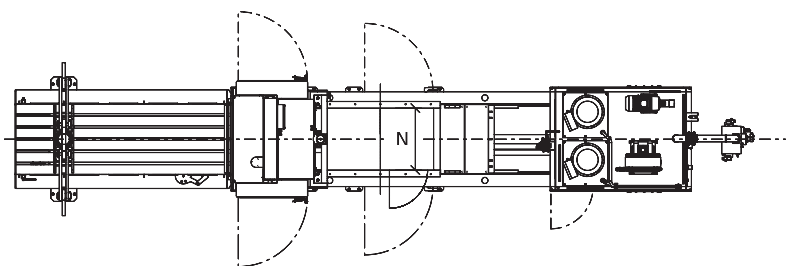
Technical data and measurements

PAAL KONTI H SERIES		275 H			325 H				425 H				
Pressing force	US tons	90			111				134				
Spec. pressing force	psi	141			174				210				
Tunnel cross section	inch	30 x 44			30 x 44				30 x 44				
Hopper opening	inch	63 x 41			69 x 41				79 x 41				
Feeding volume	yd³	2.62			2.81				3.10				
Number of wires	pieces	5			5				5				
Driving power	HP	50	74	2x 50	50	74	2x 50	2x 74	60	74	2x 50	2x 74	3x 74
Press output (ideal)	max. yd³/h	543	798	942	458	680	811	1,151	386	589	706	1,027	1,373
Press output (under load)	max. yd³/h	327	477	589	275	405	504	713	262	360	451	647	876
Press capacity (weight)													
• 59 lb/yd³ (e.g., flattened OCC)	US t/h	9.4	13.8	17.1	8.3	12.1	14.9	20.9	7.7	10.5	13.2	18.7	25.9
• 101 lb/yd³ (e.g., mixed paper)	US t/h	16.0	23.1	28.1	13.2	19.8	24.3	33.6	12.7	17.6	21.5	30.9	41.9
• 169 lb/yd³ (e.g., newspaper, magazines)	US t/h	23.7	33.6	40.8	19.8	28.7	35.3	48.0	19.8	25.9	32.5	44.6	58.4
Baler weight	US tons	28			31				39				

Dimensions are in inches.



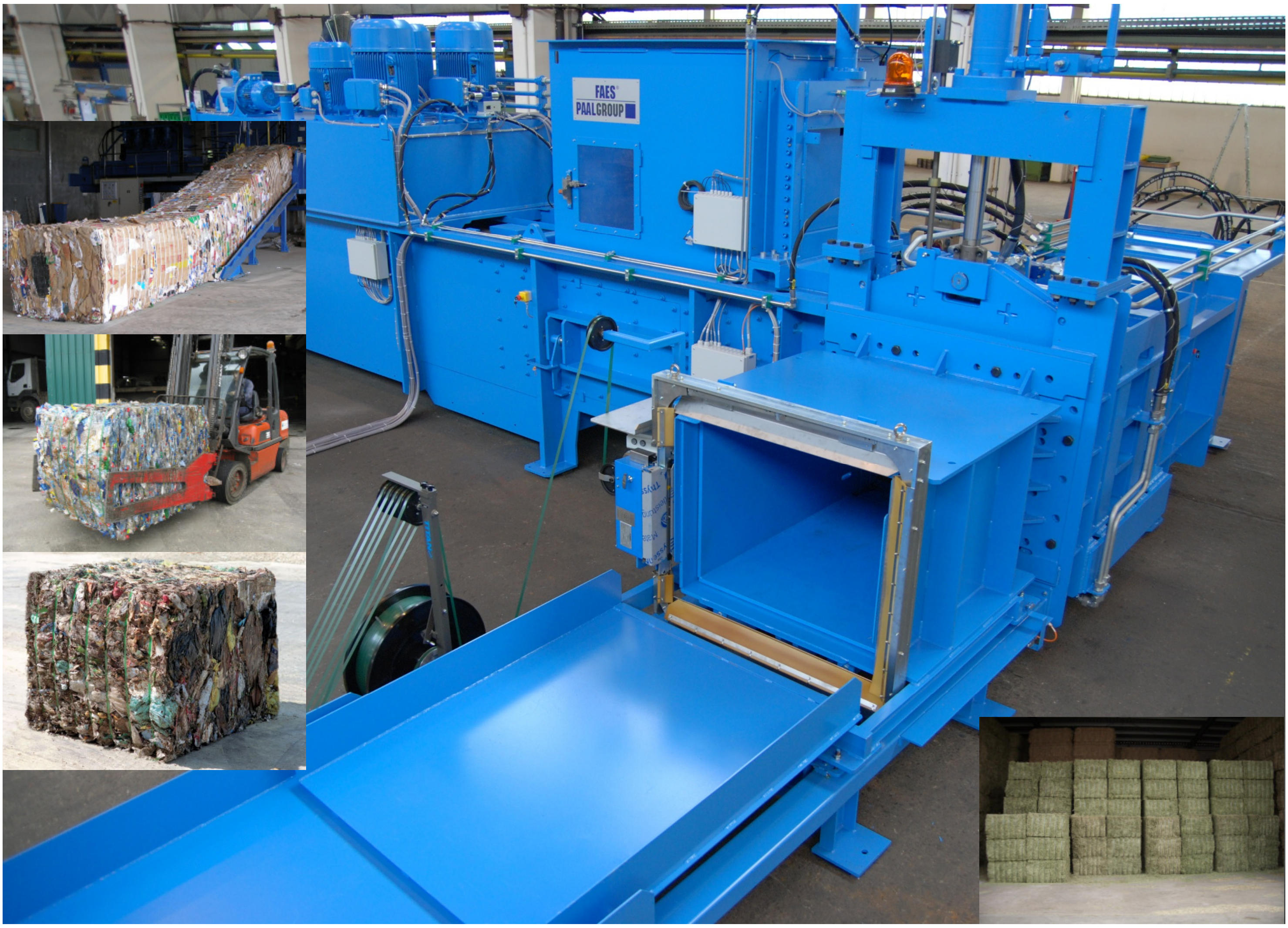




	A*	B	C	D	E	G	H*	I	K	L	M	N	O	P
KONTI 275 H	433.5	87.8	202.8	63.0	174.7	206.2	227.3	110.2	17.7	29.5	144.5	40.2	33.9	43.3
KONTI 325 H	476.0	99.6	202.8	68.9	202.2	236.7	239.3	110.2	17.7	29.5	144.5	40.2	33.9	43.3
KONTI 425 H	523.4	104.3	202.8	78.7	225.9	265.2	258.2	110.2	17.7	29.5	144.5	40.2	33.9	43.3

**Maximum length for specified hopper opening* *Dimensions are in inches.*

PAAL Konti Baler 275 H to 425 H Series-1000 (BHS US) 04/2017



HTR-B

NEW

HIGH COMPRESSION TWO-RAM BALER
WITH PLASTIC TYING SYSTEM

KĀDANT

PAAL®

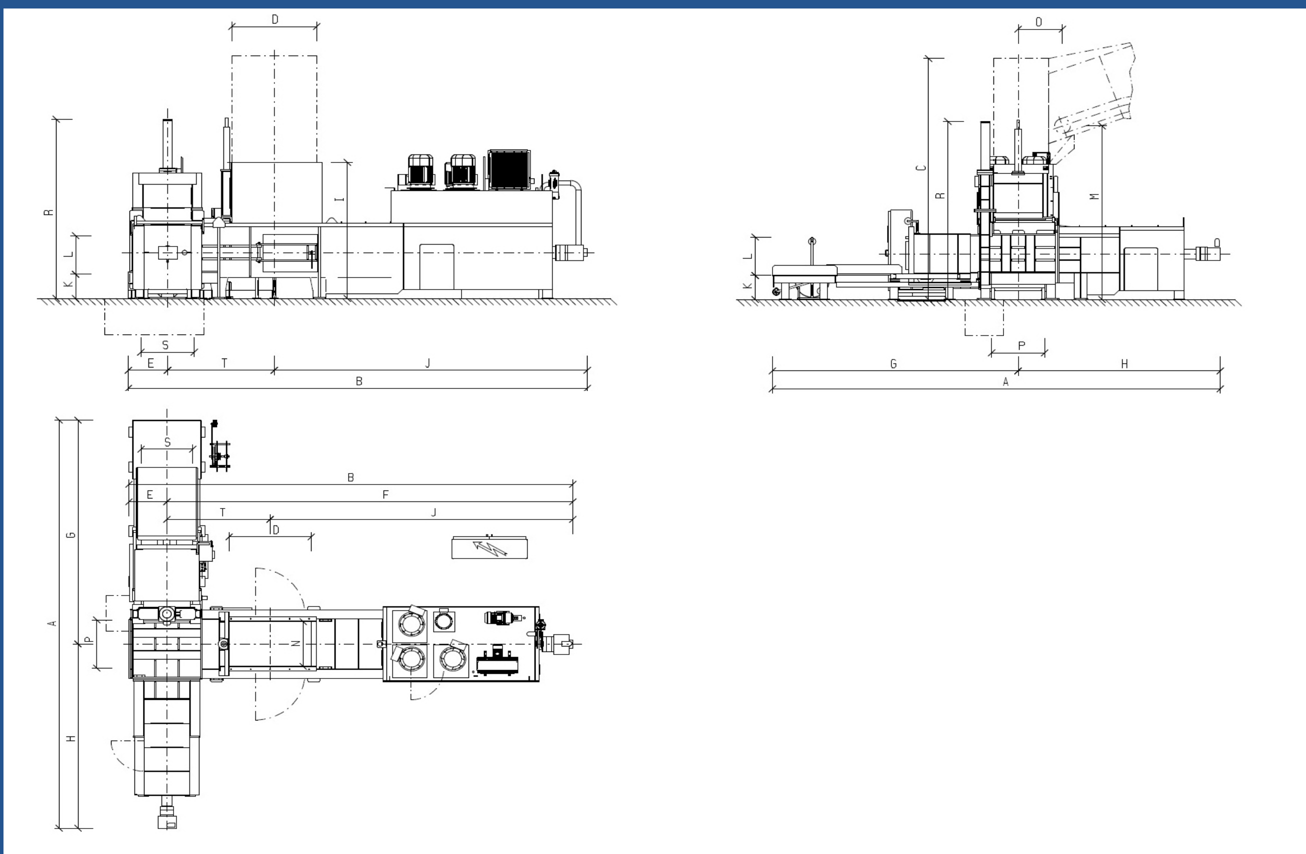
Technical data and measurements

HTR		425			700	
pressing force	t (kN)	122 (1197)			198 (1940)	
spec. pressing force	N/cm²	136			160	
press box dimension	cm	80 x 110 x 94			110 x 110 x 94	
hopper opening	cm	175 x 102			200 x 102	
number of tyings	pieces	6 or more			6 or more	
driving power	kW	55	2x 55	3x 55	2x 55	3x 55
press output (at input density of 80 kg/m^3)	max. m³/h	170	255	295	280	345
press output (at input density of 150 kg/m^3)	max. m³/h	145	225	270	235	300
press output (at input density of 200 kg/m^3)	max. m³/h	135	205	245	220	275
press capacity (weight)						
• 80 kg/m^3 e.g. alfalfa or grass	ca. t/h	14	20	24	22	27
• 150 kg/m^3 e.g. RDF	ca. t/h	22	34	40	35	45
• 200 kg/m^3 e.g. MSW	ca. t/h	27	41	49	44	55
baler weight (according to equipment)	ca. t	40			50	

Dimenssions in mm	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S	T
HTR 425	9239	9459	5360	1750	808	8651	5100	4139	3010	6451	535	800	3835	1020	920	1100	3963	940	2200
HTR 700	9423	10211	5640	2000	908	9303	5205	4218	3290	6813	535	1080	4115	1020	920	1100	4908	940	2490

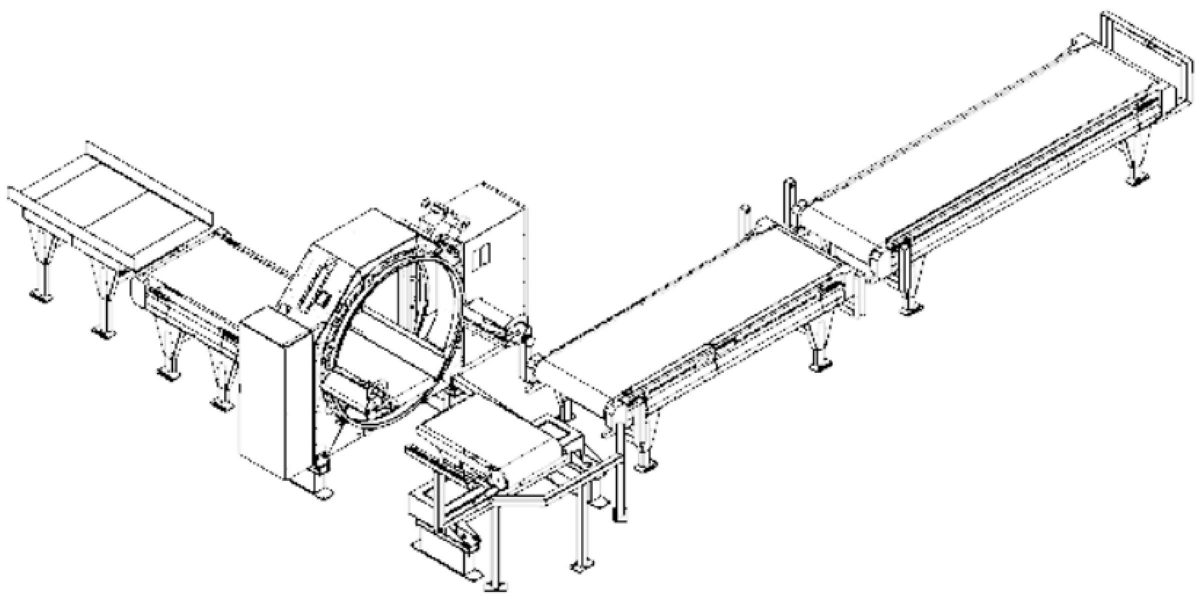
Special FEATURES of the new HTR two-ram baler:

- Multipurpose baler for compacting municipal solid waste (MSW), refuse derived fuel (RDF), recyclable material like plastic, carton, paper, etc. and agriculture material like alfalfa, grass, straw, etc. into high density bales
- Automatic binding with polyester straps incorporated on the telescopic tunnel
- Reduces operating cost: lower transportation (high bale density) and lower consumables (binding with polyester straps)
- Bales tied with polyester straps are ideal for incineration because plastic does not damage the incineration equipment as it is burned during the process
- Binding process is carried out during compaction process of next bale
- Easy operation by a new multi-functional 9” Touch-Panel with recipe management and comprehensive display of functions and data including data transfer



CW 2200-SW-750-1-5 wrapping line

Front conveyor (L=1900 mm)	1 pc
Wrapping unit	1 pc
Rear conveyor (L=4900 mm)	1 pc
Standard safety fences	1 set
Remote access device for a 3G/4G/network cable/WLAN connection	1 pc
Hydraulic system	1 pc
Electric system	1 pc
Control system	1 pc
Oil cooler	1 pc
Operation manual in English	2 pc on paper, 1 CD



TECHNICAL INFORMATION

Features

Capacity

Wrapping cycle speed is ca. 60 seconds per bale

Baler	HTR 700
Bale dimensions	
Width:	1200 mm
Height:	1200 mm
Lengths (min-max):	1300 mm
Weight max:	2000 kg
Weight min:	400 kg
Baled material:	RDF/MSW

Wrapping film

Cross Wrap recommends stretch film 25 micron, width 750 mm, max Ø 240 mm, weight max 25 kg.

Wrapping process description

* The wrapping line recognises a bale when it is coming to the first conveyor after the baler.
* The wrapping line measures the length of the bales and starts wrapping them automatically.
* After wrapping, the wrapped bale waits for the next bale on the rotation table. When the new bale has reached a certain place, the wrapped bale moves forward to the store conveyor and the new bale is wrapped vertically at the same time. Wrapping film is transferred to the next bale automatically, no manual operations are needed.
* The automatic wrapping process is optimized so that extra film is only wrapped where strongest protection is needed. The number of layers can be modified.
* When the bale has been wrapped, it can be lifted from the store conveyor with a forklift equipped with a bale clamp.
* Wrapping cycle speed is approximately 60 seconds per bale when using 5 layers of film per bale (does not include film roll change or downtime).
* The machine is designed to handle bales consisting of waste material.
* If the shape of the waste bale is not optimal, the system needs an operator to control the wrapping process.

What's next.

BHS WORLD HEADQUARTERS | **Eugene, Oregon USA** | **866-688-2066** | **sales@bhsequip.eu** | bulkhandlingsystems.com

BHS EUROPE | **Amsterdam, The Netherlands** | **+31 (0) 20 58 220 30** | **info@bhsequip.eu** | bulkhandlingsystems.com

APPENDIX F

MAILING/DISTRIBUTION LIST

Environmental Notification Form
Parallel Products of New England
100 Duchaine Boulevard
New Bedford, MA

Circulation List

Secretary Matthew A. Beaton,
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114 (2 copies)

Mass DEP
Commissioner's Office
Attn. MEPA Coordinator
One Winter Street
Boston, MA 02108

DEP/Southeast Regional Office
Attn: MEPA Coordinator
20 Riverside Drive
Lakeville, MA 02347

Massachusetts Department of Transportation
Public/Private Development Unit
10 Park Plaza
Boston, MA 02116

Massachusetts DOT District Office
District #5
Attn: MEPA Coordinator
1000 County Street
Taunton, MA 02780

Massachusetts Historical Commission
The MA Archives Building
220 Morrissey Boulevard
Boston, MA 02125

Southeastern Regional Planning and Economic Development District
88 Broadway
Taunton, MA 02780

Mayor Jonathan Mitchell
City of New Bedford
133 William Street
New Bedford, MA 02740

New Bedford City Council
Attn: Dennis Farias, Clerk of City Council
133 William Street
New Bedford, MA 02740

New Bedford Department of Planning, Housing and Community Development
Attn: Patrick J. Sullivan, Department Head
133 William Street, Room 303
New Bedford, MA 02740

New Bedford Free Public Library
613 Pleasant Street
New Bedford, MA 02740

New Bedford Conservation Commission
Attn. Michelle Paul, Director
133 William Street
New Bedford, MA 02740

City of New Bedford Health Department
Attn. Damon Chaplin, Director
1213 Purchase Street
New Bedford, MA 02740

Natural Heritage and Endangered Species Program
MA Division of Fisheries & Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

Department of Public Health (DPH)
Director of Environmental Health
250 Washington Street
Boston, MA 02115

Energy Facilities Siting Board
Attn: MEPA Coordinator
One South Station
Boston, MA 02110

Department of Energy Resources
Attn: MEPA Coordinator
100 Cambridge Street, 10th floor
Boston, MA 02114

Justin A. Chicca
Superintendent of Wastewater
1105 Shawmut Avenue
New Bedford, MA 02746

APPENDIX G

LIST OF REQUIRED PERMITS

Expanded Environmental Notification Form
Parallel Products of New England
100 Duchaine Boulevard
New Bedford, MA 02745

Required Permits

US Environmental Protection Agency

- Notice of Intent for Stormwater Discharges - prior to the start of construction, the owner must file a Notice of Intent to obtain coverage under an NPDES Storm Water Construction General Permit. This permit must be filed with the USEPA.

Massachusetts Department of Environmental Protection

- 301 CMR 11.00 – MEPA Regulations – Expanded Environmental Notification Form required under 301 CMR 11.03(9) – Solid and Hazardous Waste – New facility with a capacity greater than 150 tons per day and 301 /CMR 11.03(x) Wastewater New facility with a capacity greater than 150 tons per day
- 310 CMR 16.00 - Site Assignment For Solid Waste Facilities (BWP SW-01)
- 310 CMR 19.000 – Solid Waste Regulations – Authorization to Construct (BWP SW-05)
- 310 CMR 19.000 – Solid Waste Regulations – Authorization to Operate (BWP SW-05)
- 310 CMR 10.00 – Wetlands Protection Act Regulations – Order of Conditions and National Pollutant Discharge Elimination System for Construction Activities through USEPA

City of New Bedford, Massachusetts

- Board of Health – Site Assignment under 310 CMR 16.00
- Planning Board – Zoning By-Law - Site Plan Review
- Conservation Commission – Amended Order of Conditions

APPENDIX H

NATURAL HERITAGE & ENDANGERED SPECIES CORRESPONDENCE

Green Seal Environmental, Inc.
114 State Road, Bldg. B, Sagamore Beach, MA 02562
T: 508.888.6034 **F:** 508.888.1506
www.gseenv.com

MA-SDO Certified D/WBE, D/MBE
NH-Certified DBE
SBA Certified EDWOSB
MassDOT Certified | DCAMM Certified

December 11, 2018

DIVISION OF FISHERIES AND WILDLIFE
Natural Heritage & Endangered Species Program
Regulatory Review
1 Rabbit Hill Road
Westborough, MA 01581

To Whom It May Concern,

Green Seal Environmental, Inc. (GSE) is writing you this letter to request a determination if a project proposed for 100 Duchaine Boulevard, New Bedford, MA is located within Estimated Habitat of Rare Wildlife or Priority Habitat.

Parallell Products of New England is proposing to construct a solid waste recycling and transfer facility at the 100 Duchaine Boulevard site. A locus map and a landuse map of the proposed site are attached for your review. As part of the proposed project development, the facility must file a Site Suitability (BWP SW-01) application with MassDEP. Within the permit application, it is a requirement that the applicant correspond with Natural Heritage and Endangered Species Program of the MA Division of Fisheries & Wildlife (the "Division") for information regarding state-listed rare species in the vicinity of the above referenced site.

MassGIS indicates that there are no NHESP Estimated Habitats of Rare Wildlife and Priority Habitats of Rare Species within 1500-feet of the site. GSE has not identified any rare plant or animals or exemplary natural communities that would be adversely affected by the above noted activities. Also, we have not identified any information that would indicate an impact to a wildlife management area or an area of natural heritage on and/or adjacent to the property.

If you could provide us with a letter with respect to endangered, threatened, special concern species, or areas of natural heritage that occur on the proposed site, it would be greatly appreciated. If you have any questions or comments, please call.

Sincerely,

GREEN SEAL ENVIRONMENTAL, INC.

Whitney W. Hall P.E.
Project Manager

Attachments
Site Locus
Land Use Plan

From:	Holt, Emily (FWE)
To:	Whitney Hall
Subject:	100 Duchaine Blvd, New Bedford
Date:	Thursday, January 03, 2019 1:06:13 PM

Whitney,

I received your letter request and have determined that this project site does not occur within Estimated Habitat of Rare Wildlife or Priority Habitat as indicated in the *Massachusetts Natural Heritage Atlas* (14^{th} Edition). Therefore, the project is not required to be reviewed for compliance with the rare wildlife species section of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.37, 10.59 & 10.58(4)(b)) or the MA Endangered Species Act Regulations (321 CMR 10.18).

I will return the submitted fee to Green Seal Environmental, as the site is not subject to MESA review.

Best,

Emily Holt
Endangered Species Review Assistant
Natural Heritage & Endangered Species Program
Massachusetts Division of Fisheries & Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6385 | f: (508) 389-7890
mass.gov/nhesp

APPENDIX I

PUBLIC NOTICE DOCUMENT

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
MEPA Office

100 Cambridge St., Suite 900
Boston, MA 02114
Telephone 617-626-1020

PUBLIC NOTICE OF ENVIRONMENTAL REVIEW

PROJECT: Parallel Products of New England, LLC

LOCATION: 100 Duchaine Boulevard, New Bedford, MA

PROPONENT: Parallel Products of New England

The undersigned is submitting an Expanded Environmental Notification Form ("EENF") to the Secretary of Energy & Environmental Affairs on or before February 15, 2019.

This will initiate review of the above project pursuant to the Massachusetts Environmental Policy Act ("MEPA", M.G.L. c. 30, s.s. 61-62I). Copies of the EENF may be obtained from:
Green Seal Environmental, Inc.
Attn: Whitney Hall
114 State Road, Building B
Sagamore Beach, MA 02562
508-888-6034

Copies of the EENF are also being sent to the City Council, Department of Planning, Housing and Community Development, Health Department, Public Library and Conservation Commission in the City of New Bedford where it may be inspected.

The Secretary of Energy & Environmental Affairs will publish notice of the EENF in the Environmental Monitor, will receive public comments on the project for 37 days, and will then issue a Certificate. A site visit and consultation session on the project may also be scheduled. All persons wishing to comment on the project, or to be notified of a site visit or consultation session, should write to the Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, referencing the above project.

By Parallel Products of New England, LLC *(Proponent)*
Green Seal Environmental, Inc. *(Agent for Proponent)*

Commonwealth de Massachusetts
Departamento Executivo da Energia e do Meio Ambiente
Gabinete MEPA

100 Cambridge St., Suite 900
Boston, MA 02114
Telefone 617-626-1020

COMUNICADO PÚBLICO DE LEVANTAMENTO AMBIENTAL

PROJETO: Parallel Products of New England, LLC

LOCALIZAÇÃO: 100 Duchaine Boulevard, New Bedford, MA

PROPONENTE: Parallel Products of New England

O abaixo-assinado irá enviar um Formulário de Notificação Ambiental (EENF, na sigla em inglês) ao Secretário da Energia e do Meio Ambiente a 15 de fevereiro de 2019 ou antes dessa data.

Com isto se iniciará a análise do projeto indicado acima, seguindo a Lei sobre Políticas Ambientais de Massachusetts ("MEPA", M.G.L. c. 30, s.s. 61-62I). Para obter cópias do formulário EENF, consulte a seguinte empresa:
Green Seal Environmental, Inc.
A/c: Whitney Hall
114 State Road, Building B
Sagamore Beach, MA 02562
508-888-6034

Também serão enviadas cópias do EENF à Câmara Municipal, ao Departamento de Planeamento, Habitação e Desenvolvimento Comunitário, ao Departamento de Saúde, à Biblioteca Municipal e à Comissão de Conservação da Cidade de New Bedford, onde a inspeção poderá ocorrer.

O Secretário da Energia e do Meio Ambiente irá publicar o comunicado sobre o EENF no Monitor Ambiental, irá receber comentários públicos sobre o projeto durante 37 dias e depois irá emitir um certificado. Também poderá ser agendada uma visita ao local e uma sessão de consulta sobre o projeto. Todos os que desejem deixar um comentário sobre o projeto ou receber notificações sobre visitas ao local ou sessões de consulta devem enviar uma carta ao Secretário da Energia e do Meio Ambiente para a seguinte morada: 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, ao cuidado de: Gabinete MEPA, mencionado o projeto indicado acima.

Por: Parallel Products of New England, LLC *(Proponente)*
Green Seal Environmental, Inc. *(Representante do Proponente)*

Mancomunidad de Massachusetts
Oficina Ejecutiva de Asuntos Energéticos y Ambientales
Oficina de MEPA

100 Cambridge St., Suite 900
Boston, MA 02114
Teléfono 617-626-1020

AVISO PÚBLICO DE REVISIÓN AMBIENTAL

PROYECTO: Parallel Products of New England, LLC

UBICACIÓN: 100 Duchaine Boulevard, New Bedford, MA

PROPONENTE: Parallel Products of New England

El abajo firmante ha enviado una formulario de notificación ambiental ampliado (por sus siglas en inglés, "EENF") al Secretario de Asuntos Energéticos y Ambientales el 15 de febrero de 2019 o antes.

Con esto se iniciará la revisión del proyecto antes mencionado, en los términos de la Ley de Política Ambiental de Massachusetts (por sus siglas en inglés, "MEPA", M.G.L. c. 30, s.s. 61-62I). Pueden solicitarse copias del EENF a:
Green Seal Environmental, Inc.
Attn: Whitney Hall
114 State Road, Building B
Sagamore Beach, MA 02562
508-888-6034

También se enviarán copias del EENF al Concejo de la Ciudad, al Departamento de Planificación, Vivienda y Desarrollo Comunitario, al Departamento de Salud, a la Biblioteca Pública y a la Comisión de Conservación en la Ciudad de New Bedford, en donde puede ser inspeccionado.

El Secretario de Asuntos Energéticos y Ambientales publicará el aviso del EENF en el Monitor Ambiental, recibirá comentarios del público sobre el proyecto durante 37 días, y luego expedirá un certificado. También pueden programarse una visita al sitio y una sesión de consulta sobre el proyecto. Todas las personas que deseen hacer comentarios acerca del proyecto o recibir notificaciones sobre una visita al sitio o sesión de consulta deben escribir a: Secretary of Energy & Environmental Affairs, 100 Cambridge St., Suite 900, Boston, Massachusetts 02114, Attention: MEPA Office, haciendo referencia al proyecto antes mencionado.

Por Parallel Products of New England, LLC *(proponente)*
Green Seal Environmental, Inc. *(Agente del proponente)*

APPENDIX J

ENVIRONMENTAL JUSTICE ANALYSIS

Massachusetts Environmental Policy Act
Environmental Justice Analysis

Parallel Products of New England
New Bedford, Massachusetts

Submitted to:
PARALLEL PRODUCTS OF NEW ENGLAND, INC.
100 Duchaine Boulevard
New Bedford, MA 02745

PARALLEL PRODUCTS

Submitted by:
EPSILON ASSOCIATES, INC.
3 Mill & Main Place, Suite 250
Maynard, MA 01754

Epsilon ASSOCIATES INC.

February 7, 2019

TABLE OF CONTENTS

List of Figures

List of Tables

1.0 EXECUTIVE SUMMARY

Executive Summary

Parallel Products of New England, Inc. (PPNE) has commissioned this Environmental Justice (EJ) analysis to document that the facility proposed for 100 Duchaine Boulevard in New Bedford, Massachusetts uses all feasible measures to avoid, minimize, and reduce potential air-related impacts on EJ populations within one-mile of the proposed solid waste facility. The proposed PPNE facility exceeds the Massachusetts Environmental Policy Act (MEPA) threshold for new solid waste processing capacity of 150 or more tons per day (TPD), and the wastewater mandatory threshold of 150 or more TPD of sewage sludge, triggering the requirement for filing of an Environmental Notification Form (ENF) and a mandatory Environmental Impact Report (EIR). Any project that exceeds the ENF thresholds for solid waste or wastewater and involves a project site located within one mile of an EJ population will be required to implement enhanced public participation under MEPA.

Enhanced public participation requirements are listed below and PPNE's proposed implementation of each requirement is discussed.

Enhanced Public Participation Under MEPA:

1. *Use of alternative media outlets such as community or ethnic newspapers*: The project will publish the public notice required for the ENF in Portuguese and Spanish in local newspapers

2. *Translation of materials or interpretation services prior to and during public meetings:* The project will provide translators at the public hearing in Portuguese and Spanish

3. *Consider that when scheduling public meetings that the time of day, availability of public transportation and whether the location is child-friendly and culturally appropriate:* The project will consider these details when scheduling the public hearing.

Any project that exceeds the mandatory EIR threshold for solid waste and involves a project site located within one mile of an EJ population will be required to conduct an enhanced analysis of impacts and mitigation under MEPA.

The remainder of this report will focus on details surrounding the enhanced analysis of impacts and mitigation.

Enhanced Analysis of Impacts

As described in the 2017 Environmental Justice (EJ) Policy a project exceeding a mandatory EIR threshold for solid waste or wastewater must conduct an enhanced analysis of impacts:

An enhanced analysis of impacts and mitigation may include analysis of multiple air impacts; data on baseline public health conditions within the affected EJ population; analysis of technological, site planning, and operational alternatives to reduce impacts; and proposed on-site and off-site mitigation measures to reduce multiple impacts and increase environmental and energy benefits for the affected EJ population.

The adjacent EJ population is described in Section 2.2. The baseline public health conditions within the identified EJ population are described in Section 3. An analysis of multiple air impacts is described in Section 4. Mitigation measures designed to reduce impacts are described in Section 5.

Impacts

Parallel Products proposes a facility that avoids, minimizes, and mitigates potential EJ air-related impacts as follows:

Avoided impacts: Parallel Products has selected an industrially-zoned setting to avoid impacts to the public and is re-using significant existing infrastructure to avoid impacts associated with new construction. Material handling in enclosed areas, using best industry practices, avoids off-site impacts of air emissions and odors. Because the proposed facility will serve existing needs for material handling at a location that is closer to the sources of the materials, the project avoids transportation-related impacts currently associated with sending the materials farther by truck.

Minimized impacts: The project team evaluated and modeled dozens of potential equipment and exhaust vent/stack configurations to identify the proposed conceptual design which minimizes off-site air and odor concentrations. The proposed design optimizes the flow of material through the site, and the reuse of existing facilities, while minimizing offsite impacts in general and residential area offsite impacts in particular. Material handling loaders will be USEPA Tier certified to minimize emissions.

Mitigated impacts: Parallel Products is selecting to control odors from biosolids handling processes using wet scrubbing and ionization. Wet scrubbing can provide better control than other alternatives (e.g. biofiltration).

Comparison to Standards

The analysis shows that, under maximum expected operating conditions which include the stationary sources as well as the mobile on-site and off-site (i.e. traffic) sources and using conservative assumptions, that the project's air impacts will comply with all applicable health-protective standards. Specifically:

- The National Ambient Air Quality Standards (NAAQS) will not be exceeded. Per EPA, these standards "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.[1]"

- MassDEP has developed "health- and science-based air guidelines - known as Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) - to evaluate potential human health risks from exposures to chemicals in air.[2]" The Massachusetts AALs and TELs will not be exceeded in residential areas.

In Massachusetts, odor is regulated under 310 CMR 7.09 such that operations that emit odors shall not permit their emissions to "cause a condition of air pollution". To determine that the project is not a nuisance source of odors, the study evaluated for maximum 5-minute-averaged odor concentrations and determined that, for all locations on-site and off-site and given evaluated weather conditions, the odor concentration to be at or below 5 dilution-to-threshold (D/T). Thus the project meets the criterion published in the MassDEP draft policy for odor from composting facilities.

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1 https://www.epa.gov/criteria-air-pollutants/naaqs-table

2 https://www.mass.gov/service-details/massdep-ambient-air-toxics-guidelines

2.0 INTRODUCTION

This report documents the enhanced analysis of impacts for the proposed Parallel Products of New England (PPNE) solid waste facility to be located at 100 Duchaine Boulevard in New Bedford, Massachusetts.

2.1 Site Description

The site is an industrially zoned, approximately 71-acre parcel, located within the New Bedford Business Park. The site location and property boundaries are shown in **Figure 1** using an aerial view. The site was previously developed by Polaroid and already includes access roads, parking areas, and various buildings. Much of the existing infrastructure will be used in developing the proposed project. New buildings will be constructed for glass processing, municipal solid waste (MSW) and construction and demolition (C&D) waste tipping, and biosolids drying. The conceptual layout of the future and existing buildings is shown in **Figure 2** which presents a plan view.

The site is bounded on the west by undevelopable wetlands, to the north by several commercial or industrial operations unrelated to PPNE's project, to the east by residential neighborhoods, and to the south by a utility operations and maintenance facility.

2.2 Project Description

PPNE plans to operate several solid waste and recycling related processes at the site:

(1) Processing of redemption and recovered glass to cullet for rail haul to out-of-state recycling facilities [300 tons per day (TPD) glass handling capacity, 75,000 tons per year (TPY) throughput];

(2) Processing of MSW to recover approximately 20 percent recyclables and to bale and rail haul the post-reclamation MSW, with C&D waste, to out-of-state waste disposal facilities (1,500 TPD MSW and C&D waste handling capacity, 450,000 TPY throughput);

(3) Receipt of biosolids liquid sludge for dewatering to cake and receipt of biosolids cake, with drying of the cake to 93 percent solids for rail haul to out-of-state disposal facilities [50 dry TPD (DTPD) biosolids capacity, 15,000 dry TPY (DTPY) throughput].

While the goal is to rail haul most of the products and residuals off-site, the air emissions estimates, and related ambient impacts have been based on use of trucks to haul materials on and off-site. This will overstate the air impacts when compared to future, predominate use of rail haul.

2.3 Environmental Justice Populations

EJ populations are those segments of the population that the Executive Office of Environmental Affairs (EEA) has determined to be most at risk of being unaware of or unable to participate in environmental decision-making or to gain access to state environmental resources, or are especially vulnerable. They are defined as neighborhoods (U.S. Census Bureau census block group data for minority criteria, and American Community Survey (ACS) data for state median income and English isolation criteria) that meet *one or more* of the following:

- 25 percent of households within the census block group have a median annual household income at or below 65 percent of the statewide median income for Massachusetts; or

- 25 percent or more of the residents are minority; or

- 25 percent or more of the residents have English isolation.

EEA has designated specific areas of the state that meet one or more of the criteria above as EJ areas. Within one mile of the proposed site, there is an area designated as an EJ area for minority populations (in other words, 25 percent or more of the residents that reside in this are minority). The location of the site and areas designated as EJ areas are shown in **Figure 3**.

3.0 BASELINE HEALTH

This section describes the baseline health of the areas within one-mile of the proposed site which includes the communities of Acushnet, Dartmouth and New Bedford. The baseline health background is based on the data contained within the Massachusetts Environmental Public Health Tracking (MA EPHT) website. This website summarizes health outcomes based on data collected by the Massachusetts Division of Health Care Finance and data collected from the Massachusetts Department of Public Health (MassDPH) disease surveillance programs.

The MA EPHT website[3] contains data on a number of different health outcomes, including information on asthma hospitalizations and emergency room visits, the prevalence of asthma among school aged children, the hospitalization rate of acute myocardial infarctions, hospitalization and emergency room visits for Chronic Obstructive Pulmonary Disease (COPD), and incidence of various cancers. Each of these datasets are available at different geographies and data availability for recent years is limited. Table 3-1 describes the data reviewed for this project, the years available for review, and the geographic resolution of the health outcomes of interest. Each of these health outcomes is described further in the subsequent sections.

Table 3-1 Baseline Health Outcomes Reviewed for the Project

Health Outcome	Indicator Description	Years Available	Geographic Resolution
Asthma Hospitalizations	Age-Adjusted Rate of Asthma Hospitalizations	2000-2014	Community
Asthma Emergency Department Visits	Age-Adjusted Rate of Emergency Department Visits for Asthma	2000-2014	Community
Cancer	Standardized Incidence Ratio Summarized by Cancer Type	2000-2013 (results reported in 5-year blocks due to small numbers)	Census Tracts by Community
COPD Hospitalizations	Age Adjusted COPD Hospitalization Admission Rate	2000-2014	Community
COPD Emergency Department Visits	Age Adjusted COPD Emergency Department Visit Rate	2000-2014	Community
Acute Myocardial Infarction (AMI) Hospitalizations	Age-Adjusted Rate of AMI Hospitalizations	2000-2014	Community
Pediatric Asthma Prevalence	Prevalence of Asthma	2009-2017	By School

3 https://matracking.ehs.state.ma.us/

3.1 Asthma Baseline Health

As described on the MA EPHT website[4], asthma is an illness that impacts the respiratory tract and airways that carry oxygen into and out of the lungs. During an asthma attack, the airways constrict resulting in wheezing and difficulty breathing. Causes of asthma are unknown. However, episodes of asthma (asthma attacks) can be triggered by certain environmental factors such as air pollution, mold, pets/pet dander, and dust mites. Asthma is a common chronic disease that continues to increase in prevalence. It is the most common chronic disease in children. Massachusetts has an elevated rate of asthma compared to the national prevalence rate.

MassDPH tracks asthma in several different ways: asthma hospitalizations, emergency room visits and school health records. A statewide surveillance program for elementary and middle-aged school children administered is through school health records.

3.1.1 Asthma Hospitalizations

Asthma hospitalizations occur when an individual is admitted (i.e. stays overnight as an inpatient) to the hospital and receives treatment for asthma while hospitalized. Typically, an individual would enter the hospital through the emergency department and be admitted to the hospital as an inpatient. These individuals would be included in both the emergency department and asthma hospitalization datasets.

Data for asthma hospitalizations is only available on a community basis, and are tied to where an individual lives and not necessarily the location where the asthma attack occurred.

Rates of asthma hospitalizations are reported several ways, for this analysis the age-adjusted asthma hospitalization rate was compared to the statewide age-adjusted hospitalization rate in order to determine if the rate of asthma hospitalizations in the communities of Acushnet, Dartmouth and New Bedford were statistically-significantly-elevated compared to the statewide rate of asthma hospitalizations. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2010-2014 (the most recent data available) was examined for this analysis. The age-adjusted asthma hospitalization rates for each of these communities appears in Table 3-2 below, rates of asthma hospitalizations for Acushnet and Dartmouth are similar to the statewide rate of asthma hospitalizations. New Bedford's asthma hospitalization rates are statistically-significantly-elevated when compared to the statewide rate of asthma but the rate of asthma hospitalization has been declining over time.

[4] https://matracking.ehs.state.ma.us/Health-Data/Asthma/index.html

Table 3-2 Age-Adjusted Rate of Asthma Hospitalization Admissions Compared to the Statewide Rate

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Acushnet	2010	19	11.4 - 26.6	Similar to statewide rate
	2011	13.7	6.8 - 20.6	Similar to statewide rate
	2012	14.9	7.8 - 21.9	Similar to statewide rate
	2013	Not Shown[2]	Not Shown[2]	Not Shown[3]
	2014	12.6	5.2 - 20.1	Similar to statewide rate
Dartmouth	2010	16.1	11.6 - 20.6	Similar to statewide rate
	2011	15.9	11.8 - 20.1	Similar to statewide rate
	2012	11.3	7.8 - 14.8	Similar to statewide rate
	2013	9.8	6.4 - 13.3	Similar to statewide rate
	2014	9.3	6.2 - 12.4	Similar to statewide rate
New Bedford	2010	45.4	41.2 - 49.6	Statistically significantly higher than the statewide rate
	2011	39.2	35.2 - 43.1	Statistically significantly higher than the statewide rate
	2012	34.3	30.6 - 38	Statistically significantly higher than the statewide rate
	2013	28.5	25.1 - 31.9	Statistically significantly higher than the statewide rate
	2014	29.9	26.4 - 33.3	Statistically significantly higher than the statewide rate
Statewide	2010	15.6	15.2-15.9	Not Applicable
	2011	15.1	14.8-15.4	
	2012	13.3	13.0-13.6	
	2013	11.8	11.5-12.1	
	2014	12.0	11.8-12.3	

[1] To determine if a community's asthma hospitalization rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population.
[2] Not shown due to small numbers due to patient confidentiality considerations.

3.1.2 Asthma Emergency Department (ED) Visits

Asthma-related emergency department (ED) visits occur when an individual receives treatment in the ED for asthma. In some instances an individual may be treated and released. In other situations an individual may be admitted to the hospital for further monitoring or treatment. These individuals would be included in both the ED and asthma hospitalization datasets.

Data for asthma-related ED visits is only available on a community basis, and are tied to where an individual lives and not necessarily the location where the asthma attack occurred.

Rates of asthma-related ED visits are reported several ways, for this analysis the age-adjusted rate was used as it allows for a comparison to be made to the statewide ED rate for asthma. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2010-2014 (the most recent data available) was examined for this analysis. The age-adjusted asthma ED rates for each of these communities appears in Table 3-3 below, rates of asthma ED visits for Acushnet and Dartmouth are lower than the statewide rate of ED visits. New Bedford's asthma ED visits are statistically-significantly-elevated when compared to the statewide rate of asthma and have remained relatively unchanged in recent years.

Table 3-3 Age-Adjusted Rate of Asthma-Related ED Visits Compared to Statewide Rate

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Acushnet	2010	48.2	35.1 - 61.3	Statistically significantly lower than the statewide rate
	2011	41.8	28.7 - 54.9	Statistically significantly lower than the statewide rate
	2012	49.8	35.9 - 63.7	Statistically significantly lower than the statewide rate
	2013	37.9	25.5 - 50.3	Statistically significantly lower than the statewide rate
	2014	51.6	36.5 - 66.6	Statistically significantly lower than the statewide rate
Dartmouth	2010	37.2	30.3 - 44.1	Statistically significantly lower than the statewide rate
	2011	44.7	37.3 - 52.2	Statistically significantly lower than the statewide rate
	2012	43.7	36.1 - 51.2	Statistically significantly lower than the statewide rate
	2013	44.6	37.1 - 52.2	Statistically significantly lower than the statewide rate
	2014	51.9	43.4 - 60.4	Statistically significantly lower than the statewide rate
New Bedford	2010	113.0	106.2 - 119.8	Statistically significantly higher than the statewide rate
	2011	123.7	116.5 - 130.9	Statistically significantly higher than the statewide rate
	2012	138.1	130.5 - 145.7	Statistically significantly higher than the statewide rate
	2013	127.8	120.5 - 135.1	Statistically significantly higher than the statewide rate
	2014	136.0	128.5 - 143.5	Statistically significantly higher than the statewide rate
Statewide	2010	70.2	69.5-70.9	Not Applicable
	2011	71.7	71.0-72.4	
	2012	72.9	72.2-73.5	
	2013	68.7	68.1-69.4	
	2014	70.9	70.2-71.5	

[1] To determine if a community's asthma rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population

3.1.3 Pediatric Asthma

MassDPH tracks asthma in children who are enrolled in public and private schools in order to learn how much asthma exists and which communities may have more asthma than others. MassDPH reports the prevalence of asthma by school and community. Prevalence is a measure of the percentage of students reported to have asthma during a school year.

Prevalence of pediatric asthma is reported several ways, for this analysis public schools serving populations within one-mile of the project site were compared to the statewide prevalence for asthma. The 5-year period of 2012-2017 (the most recent data available) was examined for this analysis. The prevalence of pediatric asthma for these schools appear in Table 3-4 below, the prevalence of pediatric asthma at the elementary schools is generally statistically significantly lower than the statewide prevalence. The pediatric prevalence at the middle school is generally statistically significantly higher than the statewide prevalence.

Table 3-4 Prevalence of Pediatric Asthma by School Compared to the Statewide Rate

Town	School Year	Prevalence	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Prevalence
Casmir Pulaski School	2012-2013	6.2	4.1-8.3	Statistically significantly lower than the statewide prevalence of pediatric asthma
	2013-2014	15.2	12-18.4	Similar to the statewide prevalence
	2014-2015	5.5	3.6-7.4	Statistically significantly lower than the statewide prevalence of pediatric asthma
	2015-2016	7.7	4.9-9.1	Statistically significantly lower than the statewide prevalence of pediatric asthma
	2016-2017	8.9	6.5-11.3	Statistically significantly lower than the statewide prevalence of pediatric asthma
Campbell School	2012-2013	2.7	0.5-4.9	Statistically significantly lower than the statewide prevalence of pediatric asthma
	2013-2014	Not Shown	Not Shown	Not Shown
	2014-2015	4.8	1.8-7.8	Statistically significantly lower than the statewide prevalence of pediatric asthma
	2015-2016	8.3	4.4-12.2	Statistically significantly lower than the statewide prevalence of pediatric asthma
	2016-2017	11.9	7.4-16.4	Similar to statewide prevalence of pediatric asthma
Normandin Middle School	2012-2013	19.7	17.0-22.4	Statistically significantly higher than the statewide prevalence of pediatric asthma
	2013-2014	20.3	17.6-23.0	Statistically significantly higher than the statewide prevalence of pediatric asthma
	2014-2015	19.6	16.9-22.3	Statistically significantly higher than the statewide prevalence of pediatric asthma
	2015-2016	21.2	18.5-23.9	Statistically significantly higher than the statewide prevalence of pediatric asthma
	2016-2017	21.2	18.5-23.9	Statistically significantly higher than the statewide prevalence of pediatric asthma

Table 3-4 Prevalence of Pediatric Asthma by School Compared to the Statewide Rate (Continued)

Town	School Year	Prevalence	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Prevalence
Statewide	2012-2013	12.1	12.0-12.2	Not Applicable
	2013-2014	12.4	12.3-12.5	
	2014-2015	12.2	12.1-12.3	
	2015-2016	12.4	12.3-12.5	
	2016-2017	12.1	12.0-12.2	

[1] To determine if a school's asthma pediatric prevalence is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each prevalence. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true prevalence for the population

3.2 Cancer

As described on the MA EPHT website[5] cancer is a group of over 100 different types of diseases each with different risk factors. A risk factor is anything that increases a person's chance of developing cancer and may include hereditary conditions, medical conditions or treatments, lifestyle factors or environmental exposures. Cancer may be caused by several factors acting together over time. The World Health Organization (WHO) estimates that as much of 30% of cancer is preventable, mainly by not using tobacco, having a healthy diet, being physically active and preventing infections that may cause cancer. In general, many cancers have a long period of development.

The MA EPHT tracks cancer of more than 25 different types based on data obtained from the Massachusetts Cancer Registry. The MA EPHT website presents cancer data using two different types of statistics direct incidence ratio and a standardized incidence ratio For the purposes of this analysis the Standardized Incidence Ratio (SIR) is utilized as the direct incidence ratio is not appropriate for small populations (due to instability of small population numbers). The SIR allows for the comparison of cancer incidence in each community or census tract as a whole to the Massachusetts statewide incidence.

The SIR is the ratio of the observed number of cancer diagnoses in an area to the expected number of diagnoses multiplied by 100. An SIR of 100 indicates that the number of cancer diagnoses observed in the area of interest is equal to the number of cancer diagnoses expected in the comparison population. An SIR greater than 100 indicates that more cancer diagnoses occurred than expected, and an SIR less the 100 indicates that less cancer diagnoses occurred than expected. An SIR is accompanied by a 95% confidence interval to determine whether the SIR is statistically significant or could be due solely to chance. If the

[5] https://matracking.ehs.state.ma.us/Health-Data/Cancer/index.html

95% confidence interval does not includes 100, there is less than a 5% percent chance that the observed difference in the SIR is the result of random fluctuation in the number of observed cancer diagnoses.

Although MA EPHT data is typically reported at the census tract (i.e. neighborhood geography), the entire community of New Bedford was selected for this analysis for several reasons. The proposed facility is located in New Bedford, and, due to the limited number of observed cases of cancer, information at the census tract level was suppressed (i.e. not calculated due to patient confidentiality concerns). Results from this analysis are reported in Table 3-5 below. In general the rates of most types of cancer in New Bedford were similar or statistically significantly lower than the rates of cancer on a statewide basis. However, the rates of five types of cancer are statistically elevated compared to the statewide rates. These five cancer types are: laryngeal, liver and bile duct, lung and bronchus, pancreatic, and stomach.

Table 3-5 Incidence of Different Cancer in New Bedford Compared to the Statewide Incidence

Cancer Type	Time Period	Observed Cases	Expected Cases	Cancer SIR[1]	95% Confidence Interval	Statistical Significance Compared to Statewide Rate
Childhood Brain & Central Nervous System Cancers	2009-2013	4	4.6	88	24-225	Similar to Statewide Rate
Childhood Hodgkin Lymphomas	2009-2013	2	1.4	141	16-510	Similar to Statewide Rate
Childhood Leukemia(s)	2009-2013	2	5.7	35	4-126	Similar to Statewide Rate
Childhood Non-Hodgkin Lymphomas	2009-2013	0	1.4	Not Calculated	Not Calculated	Not Calculated
All Other Types	2009-2013	225	208.8	108	94-123	Similar to Statewide Rate
Bladder Cancer	2009-2013	44	63.9	69	50-92	Stastically significantly lower than Statewide Rate
Brain and Other Nervous System Cancers	2009-2013	32	35.4	90	62-128	Similar to Statewide Rate
Breast Cancer	2009-2013	348	389.7	89	80-99	Stastically significantly lower than Statewide Rate
Colorectal Cancer	2009-2013	229	218.5	105	92-119	Similar to Statewide Rate
Esophagus Cancer	2009-2013	42	32.4	130	93-175	Similar to Statewide Rate
Hodgkin Lymphoma	2009-2013	13	14.5	90	48-153	Similar to Statewide Rate
Kidney and Renal Pelvis Cancer	2009-2013	100	83.3	120	98-146	Similar to Statewide Rate
Laryngeal Cancer	2009-2013	39	19.1	205	145-280	Stastically significantly greater than Statewide Rate
Leukemia	2009-2013	63	70.7	75	56-98	Stastically significantly lower than Statewide Rate

Table 3-5 Incidence of Different Cancer in New Bedford Compared to the Statewide Incidence (Continued)

Cancer Type	Time Period	Observed Cases	Expected Cases	Cancer SIR[1]	95% Confidence Interval	Statistical Significance Compared to Statewide Rate
Liver and Intrahepatic Bile Duct	2009-2013	75	43.9	171	134-214	Stastically significantly greater than Statewide Rate
Lung and Bronchus Cancers	2009-2013	456	364.7	125	114-137	Stastically significantly greater than Statewide Rate
Melanoma of the Skin	2009-2013	47	114.1	41	30-55	Stastically significantly lower than Statewide Rate
Mesothelioma	2009-2013	6	6.8	88	32-192	Similar to Statewide Rate
Multiple Myeloma	2009-2013	34	36.2	94	65-131	Similar to Statewide Rate
Non-Hodgkin Lymphoma	2009-2013	92	108.5	85	68-104	Similar to Statewide Rate
Oral and Pharyngeal Cancers	2009-2013	81	64.4	126	100-156	Similar to Statewide Rate
Pancreatic Cancers	2009-2013	95	72.1	132	107-161	Stastically significantly greater than Statewide Rate
Stomach Cancer	2009-2013	65	37.7	173	133-220	Stastically significantly greater than Statewide Rate
Thyroid Cancer	2009-2013	97	96.7	100	81-122	Similar to Statewide Rate
Uterine Cancer	2009-2013	89	86.5	103	83.127	Similar to Statewide Rate

[1] The standardized incidence ratio (SIR) is the ratio of the observed number of cancer diagnoses in an area to the expected number of diagnoses multiplied by 100.

3.3 Chronic Obstructive Pulmonary Disease (COPD)

As described on the MA EPHT website[6], chronic obstructive pulmonary disease (COPD) refers to a group of diseases including emphysema and chronic bronchitis, which block airflow and can cause difficulty breathing. COPD is considered a chronic health condition that typically worsens over time. Risk factors for COPD include smoking, and long-term exposure to air pollution, secondhand smoke, dust, fumes or chemicals.

MassDPH tracks COPD in two different ways: COPD hospitalizations and emergency room visits.

6 https://matracking.ehs.state.ma.us/Health-Data/copd.html

3.3.1 COPD Hospitalizations

COPD hospitalizations occur when an individual is admitted (i.e. stays overnight as an inpatient) to the hospital and receives treatment for COPD while hospitalized. Typically, an individual would enter the hospital through the emergency department and be admitted to the hospital as an inpatient. These individuals would be included in both the emergency department and COPD hospitalization datasets.

Rates of COPD hospitalizations are reported several ways, for this analysis the age-adjusted COPD hospitalization rate was compared to the statewide age-adjusted hospitalization rate in order to determine if the rate of COPD hospitalizations in the communities of Acushnet, Dartmouth and New Bedford were statistically-significantly-elevated compared to the statewide rate of COPD hospitalizations. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2010-2014 (the most recent data available) was examined for this analysis. The age-adjusted COPD hospitalization rates for each of these communities appears in Table 3-6 below, rates of COPD hospitalizations for Acushnet and Dartmouth are generally and most recently similar to the statewide rate of COPD hospitalizations. New Bedford's COPD hospitalization rates are statistically-significantly-elevated when compared to the statewide rate of COPD, but this rate has been declining over time.

Table 3-6 Age-Adjusted Rate of COPD Hospitalization Admissions Compared to the Statewide Rate

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Acushnet	2010	45.4	31.5 - 59.4	Similar to statewide rate
	2011	45.4	31.5 - 59.3	Similar to statewide rate
	2012	21.4	11.8 - 31	Similar to statewide rate
	2013	21.9	12.3 - 31.5	Similar to statewide rate
	2014	28.1	17.3 - 38.9	Similar to statewide rate
Dartmouth	2010	31.8	25.2 - 38.4	Similar to statewide rate
	2011	44	36.3 - 51.6	Statistically significantly higher than the statewide rate
	2012	28.6	22.6 - 34.6	Similar to statewide rate
	2013	29.1	23.2 - 35.1	Similar to statewide rate
	2014	22	16.7 - 27.3	Similar to statewide rate
New Bedford	2010	78.5	72 - 85.1	Statistically significantly higher than the statewide rate
	2011	97.8	90.4 - 105.2	Statistically significantly higher than the statewide rate
	2012	78.8	72.3 - 85.3	Statistically significantly higher than the statewide rate
	2013	68.1	62.1 - 74.1	Statistically significantly higher than the statewide rate
	2014	50.4	45.2 - 55.6	Statistically significantly higher than the statewide rate

Table 3-6 Age-Adjusted Rate of COPD Hospitalization Admissions Compared to the Statewide Rate (Continued)

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Statewide	2010	32.7	32.1-33.2	Not Applicable
	2011	33.7	33.2-34.2	
	2012	29.9	29.4-30.4	
	2013	27.0	26.6-27.4	
	2014	25.0	24.6-25.5	

[1] To determine if a community's COPD hospitalization rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population.

3.3.2 COPD Emergency Department (ED) Visits

COPD-related ED visits occur when an individual receives treatment in the ED for COPD. In some instances an individual may be treated and released. In other situations an individual may be admitted to the hospital for further monitoring or treatment these individuals would be included in both the ED visits and COPD hospitalization datasets.

Rates of COPD-related ED visits are reported several ways, for this analysis the age-adjusted rate was used as it allows for a comparison to be made to the statewide ED rate for COPD. The age-adjusted rate allows for comparisons to be made between populations with different age structures. The 5-year period of 2010-2014 (the most recent data available) was examined for this analysis. The age-adjusted COPD ED rates for each of these communities appears in Table 3-7 below, rates of COPD ED visits for Acushnet and Dartmouth are lower than the statewide rate of ED visits. New Bedford's COPD ED visits are statistically-significantly-elevated when compared to the statewide rate of COPD and the rate of COPD ED visits has remained relatively unchanged over the 5-year period examined.

Table 3-7 Age-Adjusted Rate of COPD-Related ED Visits Compared to Statewide Rate

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Acushnet	2010	74.5	55.6 - 93.3	Similar to statewide rate
	2011	70.9	53 - 88.9	Similar to statewide rate
	2012	42.2	28.4 - 55.9	Statistically significantly lower than statewide rate
	2013	51	35.4 - 66.6	Similar to statewide rate
	2014	69.3	51.6 - 87	Similar to statewide rate

Table 3-7 Age-Adjusted Rate of COPD-Related ED Visits Compared to Statewide Rate (Continued)

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Dartmouth	2010	55.8	46.6 - 65	Statistically significantly lower than statewide rate
	2011	77.9	67.1 - 88.8	Similar to statewide rate
	2012	56.8	47.7 - 66	Statistically significantly lower than statewide rate
	2013	60.6	51.3 - 69.9	Similar to statewide rate
	2014	56.6	47.4 - 65.8	Similar to statewide rate
New Bedford	2010	147.8	138.6 - 157.1	Statistically significantly higher than statewide rate
	2011	184.2	173.8 - 194.7	Statistically significantly higher than statewide rate
	2012	162.4	152.7 - 172.1	Statistically significantly higher than statewide rate
	2013	147.1	138 - 156.2	Statistically significantly higher than statewide rate
	2014	150.9	141.6 - 160.1	Statistically significantly higher than statewide rate
Statewide	2010	68.2	67.4-68.9	Not Applicable
	2011	71.4	70.7-72.2	
	2012	69.8	69.1-70.6	
	2013	64.7	64.0-65.4	
	2014	62.3	61.6-63.0	

[1] To determine if a community's COPD ED rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population

3.4 Acute Myocardial Infarction (AMI)

As described on the MA EPHT website[7], an acute myocardial infarction (AMI), is also known as a heart attack. AMI, along with stroke, and other heart and blood vessel diseases are responsible for approximately 35% of all deaths in Massachusetts. There are a number of risk factors associated with AMI, including health, life style and environmental factors. Environmental factors include exposure to certain air pollutants.

MassDPH tracks AMI through hospitalizations, as nearly every AMI results in an inpatient admission.

3.4.1 AMI Hospitalizations

AMI hospitalizations occur when an individual is admitted (i.e. stays overnight as an inpatient) to the hospital and receives treatment for a heart attack while hospitalized. Typically, an individual would enter the hospital through the emergency department and be admitted to the hospital as an inpatient. These individuals would be included in both the

[7] https://matracking.ehs.state.ma.us/Health-Data/Heart_Attack_Hospitalization.html

AMI emergency department visit and AMI hospitalization datasets. However, as most AMI emergency department visits result in an admission to the hospital, MassDPH only tracks AMI hospitalizations.

Rates of AMI hospitalizations are reported several ways, for this analysis the age-adjusted AMI hospitalization rate was compared to the statewide age-adjusted hospitalization rate in order to determine if the rate of AMI hospitalizations in the communities of Acushnet, Dartmouth and New Bedford were statistically-significantly-elevated compared to the statewide rate of AMI hospitalizations. The age-adjusted rate for AMI considers individuals 35 years of age and older and allows for comparisons to be made between populations with different age structures. The 5-year period of 2010-2014 (the most recent data available) was examined for this analysis. The age-adjusted AMI hospitalization rates for each of the communities of interest appears in Table 3-8 below, rates of AMI hospitalizations for Acushnet and Dartmouth are generally similar to the statewide rate of AMI hospitalizations for most years. New Bedford's MI hospitalization rates are statistically-significantly-elevated when compared to the statewide rate of MI but have been declining over the 5-year period.

Table 3-8 Age-Adjusted Rate of Acute Myocardial Infarction Hospitalization Admissions Compared to the Statewide Rate

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Acushnet	2010	27.6	15.5 - 39.7	Similar to the statewide rate
	2011	18.8	9 - 28.7	Statistically significantly lower than the statewide rate.
	2012	26.1	14.6 - 37.5	Similar to the statewide rate
	2013	39.5	24.9 - 54.2	Similar to the statewide rate
	2014	40.9	26 - 55.8	Statistically significantly higher than the statewide rate.
Dartmouth	2010	41.4	33 - 49.7	Similar to the statewide rate
	2011	37	28.9 - 45	Similar to the statewide rate
	2012	35.2	27.4 - 42.9	Similar to the statewide rate
	2013	27.9	21.1 - 34.7	Similar to the statewide rate
	2014	29.8	23 - 36.5	Similar to the statewide rate
New Bedford	2010	48	42.3 - 53.7	Statistically significantly higher than the statewide rate.
	2011	47.3	41.7 - 52.9	Statistically significantly higher than the statewide rate.
	2012	51.9	46 - 57.8	Statistically significantly higher than the statewide rate.
	2013	41.2	35.9 - 46.4	Statistically significantly higher than the statewide rate.
	2014	39.2	34.1 - 44.3	Statistically significantly higher than the statewide rate.

Table 3-8 Age-Adjusted Rate of Acute Myocardial Infarction Hospitalization Admissions Compared to the Statewide Rate (Continued)

Town	Year	Age-Adjusted Rate (per 10,000 people)	95% Confidence Interval[1]	Statistical Significance Compared to Statewide Rate
Statewide	2010	33.0	32.4-33.5	Not Applicable
	2011	30.8	30.2-31.3	
	2012	30.1	29.5-30.6	
	2013	26.7	26.2-27.2	
	2014	24.9	24.4-25.3	

[1] To determine if a community's AMI hospitalization rate is significantly different from the state rate or if the difference may be due solely to chance, a 95% confidence interval (CI) is calculated for each rate. A 95% CI assesses the magnitude and stability of a measure. Specifically, a 95% CI is the range of estimated values that has a 95% probability of including the true rate for the population.

3.5 Baseline Health Considerations

As indicated on the MassEPHT website[8] chronic diseases are the leading cause of illness and death both nationally and in Massachusetts. Many of these diseases are believed to result from the interaction of both genes and environmental factors. Environmental factors include infectious agents (i.e. viruses and bacteria), environmental contaminants, and diet and lifestyle choices. However, the extent at which each of these individual factors contribute to the development of chronic disease is not known. The health data presented are intended to provide a basic level of understanding of the disease burden in Massachusetts communities.

[8] https://matracking.ehs.state.ma.us/Health-Data/index.html

4.0 MULTI-POLLUTANT ANALYSIS

As described in the air and odor analysis report, an analysis was conducted that accounted for the air emissions from the proposed facility. The air emissions were modeled using an air dispersion model to determine ambient air concentration impacts from the facility. The air modeling performed evaluated criteria pollutants and air toxics, terrain features, local meteorology and buildings. The air modeling has been described previously in the air and odor analysis report and was relied upon for this EJ analysis. Other pathways of exposure (i.e. water, soil) were not evaluated as the dominant exposure pathway is expected to be the air pathway and the MEPA EJ policy specifically requires evaluation of the air-related impacts of the facility.

4.1 Emissions

Emission units at the proposed facility are categorized as stationary and mobile sources and include the following broad categories: Biosolids Dryers and Building Heat Boiler, Biosolids Process Sources, Biosolids Cooling Tower, Municipal Solid Waste (MSW) Solid Waste Tipping and Processing, Glass Processing, Paved Roads, and Onsite and Off-site Mobile Sources. Mass emission rates from each of these categories of sources were conservatively modeled assuming they generally occur simultaneously at the maximum anticipated rate. The air emissions considered and the methodologies used for calculating the emission rates are described further in the air and odor analysis report.

4.2 Air Dispersion Modeling

As described in the air and odor analysis report, the AERMOD model [the United States Environmental Protection Agency (USEPA) preferred model] was utilized to generate concentrations of air pollutants outside the property boundary of the proposed project. AERMOD incorporates information including emissions, local meteorological data, orientation of buildings, stack configurations, and terrain data in order to predict concentrations of air pollutants outside the property boundary of the proposed project. Further details are described in the air and odor analysis report. Results from this analysis were used for comparison to relevant health-based standards which are described further below.

4.3 Criteria Air Pollutants

Criteria air pollutants are regulated by the USEPA through National Ambient Air Quality Standards (NAAQS). The EPA has established NAAQS standards for pollutants considered to be harmful to the public health and the environment. These standards can be further broken down into primary and secondary standards. Primary standards are intended to protect human health, including the health of “sensitive” populations such as asthmatics, children and the elderly. The secondary standards are intended to provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

USEPA has established NAAQS for the following pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), ozone (O_3), and lead (Pb). Air pollutants included in the air and odor analysis, for which NAAQS are published, are NO_2 and $PM_{2.5}$. These two pollutants have very stringent NAAQS and were therefore selected for the air dispersion modeling analysis. A detailed discussion of the selection of pollutants for analysis is included in Section 4.0 of the air and odor analysis report.

To address the NAAQS, NO_2 and $PM_{2.5}$ mass emission rates were estimated for both stationary and mobile sources at the proposed facility, ambient concentrations from all sources were modeled, and the maximum modeled concentrations were compared to the NAAQS to ensure there are no off-site exceedances.

4.4 Air Toxics

Air toxic compounds, including lead, were selected for emissions estimation based on the MassDEP Ambient Air Toxics Guidelines. In general, chemicals for which MassDEP has published allowable ambient limits (AALs) and threshold effect exposure limits (TELs), and for which specific emission factors were available, are included in the analysis.

MassDEP determines the AALs and TELS through an analysis of health effects. The first step in developing an AAL and TEL is to look at the carcinogenic and non-carcinogenic health effects of the chemicals.

Known or suspected carcinogenic health effects make up the basis of the Non-Threshold Effects Exposure Limits (NTELs) which are associated with a one in a million excess cancer risk over a lifetime of continuous exposure to the chemical.

The TEL addresses the non-cancer health effects and is intended to protect the general population from adverse health effects over a lifetime of exposure to the chemical. The TEL includes impacts on sensitive populations such as children and takes into account other pathways for exposure to the chemical than just ambient air. These other pathways that are evaluated in the TEL determination include indoor air, food, soil, and water.

MassDEP then compares the NTEL and TEL and assigns whichever concentration is lower as the AAL to make sure both cancer and non-cancer health impacts are mitigated to the fullest extent possible. For most carcinogenic compounds, AALs are typically based on the NTELs since the NTEL tends to be lower than the TEL for these compounds. For non-carcinogenic compounds, the AAL will be based on the TEL which results in the published AAL and TEL values being identical. It is important to note that exposure above an AAL or TEL does not necessarily mean there will be adverse health impacts, but rather that the risk of these adverse effects increases with the frequency of exposure above these levels.

To address the air toxics guidelines, air toxic mass emission rates were estimated for both stationary and mobile sources at the proposed facility, ambient concentrations from all sources were modeled, and the maximum modeled concentrations were compared to the AAL (on an annual average basis) and TEL (on a short-term basis) to ensure there are no exceedances in the residential neighborhoods.

4.5 Conclusions

As described above an ambient air impacts analysis was conducted to understand the impacts from the proposed facility from multiple air pollutants (two important criteria pollutants and a number of air toxics). Impacts for all pollutants were below health protective levels of concern at all residential locations based on the peak predicted level of operation of the proposed facility. Operation of this facility will not cause or contribute to any health-protective exceedances of air quality concentrations.

5.0 MITIGATION

As part of the enhanced environmental justice analysis mitigation of on-site and off-site activities must be considered. This section describes the mitigation steps that have been taken to minimize impacts on the surrounding residences.

PPNE has proposed a facility that avoids, minimizes, and mitigates potential EJ air-related impacts as follows:

The analysis shows that, under maximum expected operating conditions which include the stationary sources as well as the mobile on-site and off-site (i.e. traffic) sources and using conservative assumptions, that the project's air impacts will comply with all applicable health-protective standards. Specifically:

- The National Ambient Air Quality Standards (NAAQS) will not be exceeded. Per EPA, these standards "provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.[9]"

- MassDEP has developed "health- and science-based air guidelines - known as Ambient Air Limits (AALs) and Threshold Effect Exposure Limits (TELs) - to evaluate potential human health risks from exposures to chemicals in air.[10]" The Massachusetts AALs and TELs will not be exceeded in residential areas.

In Massachusetts, odor is regulated under 310 CMR 7.09 such that operations that emit odors shall not permit their emissions to "cause a condition of air pollution". To determine that the project is not a nuisance source of odors, the study evaluated for maximum 5-minute-averaged odor concentrations and determined that, for all locations on-site and off-site and given evaluated weather conditions, the odor concentration to be at or below 5 dilution-to-threshold (D/T). Thus the project meets the criterion published in the MassDEP draft policy for odor from composting facilities.

9 https://www.epa.gov/criteria-air-pollutants/naaqs-table

10 https://www.mass.gov/service-details/massdep-ambient-air-toxics-guidelines

Figures

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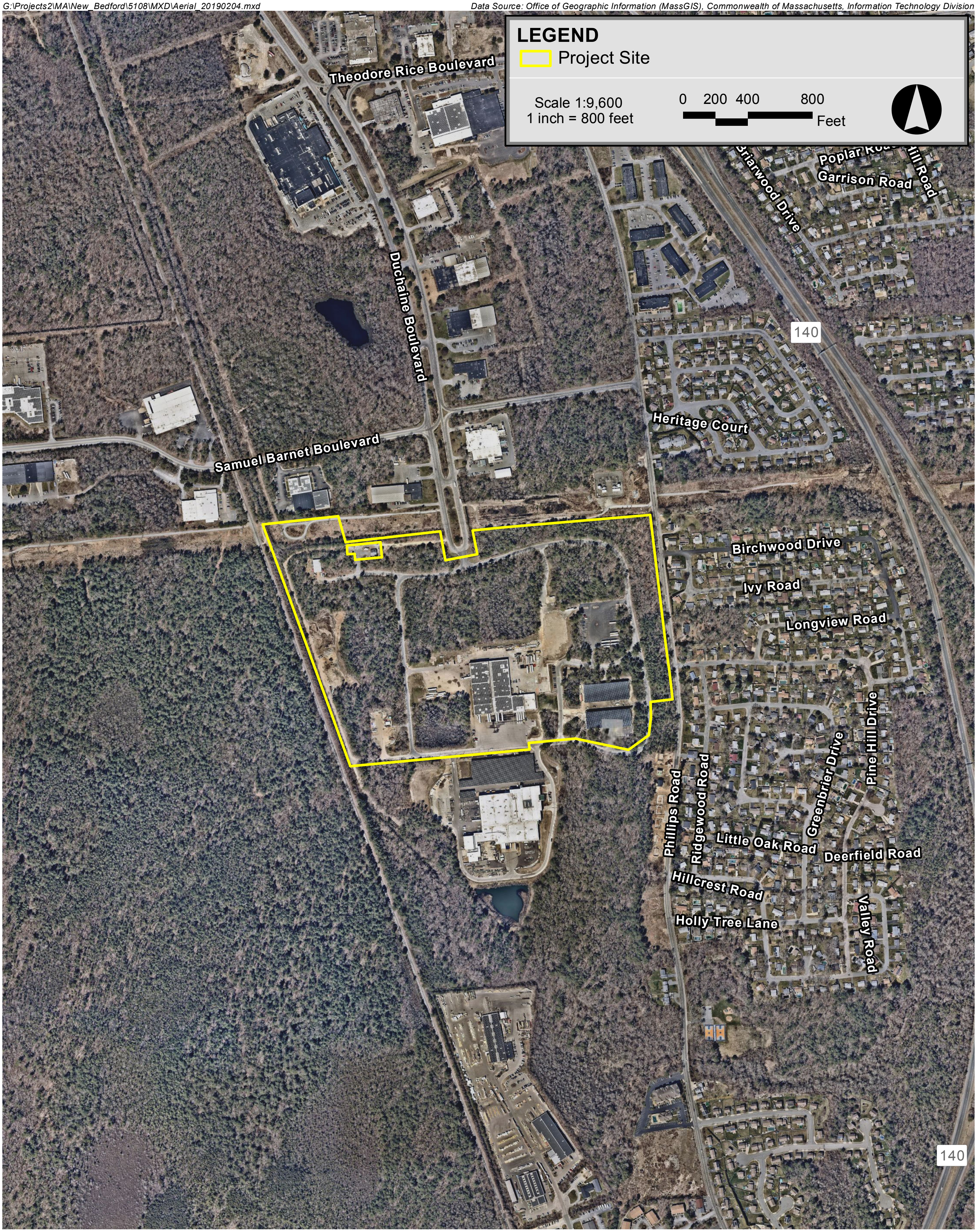
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division

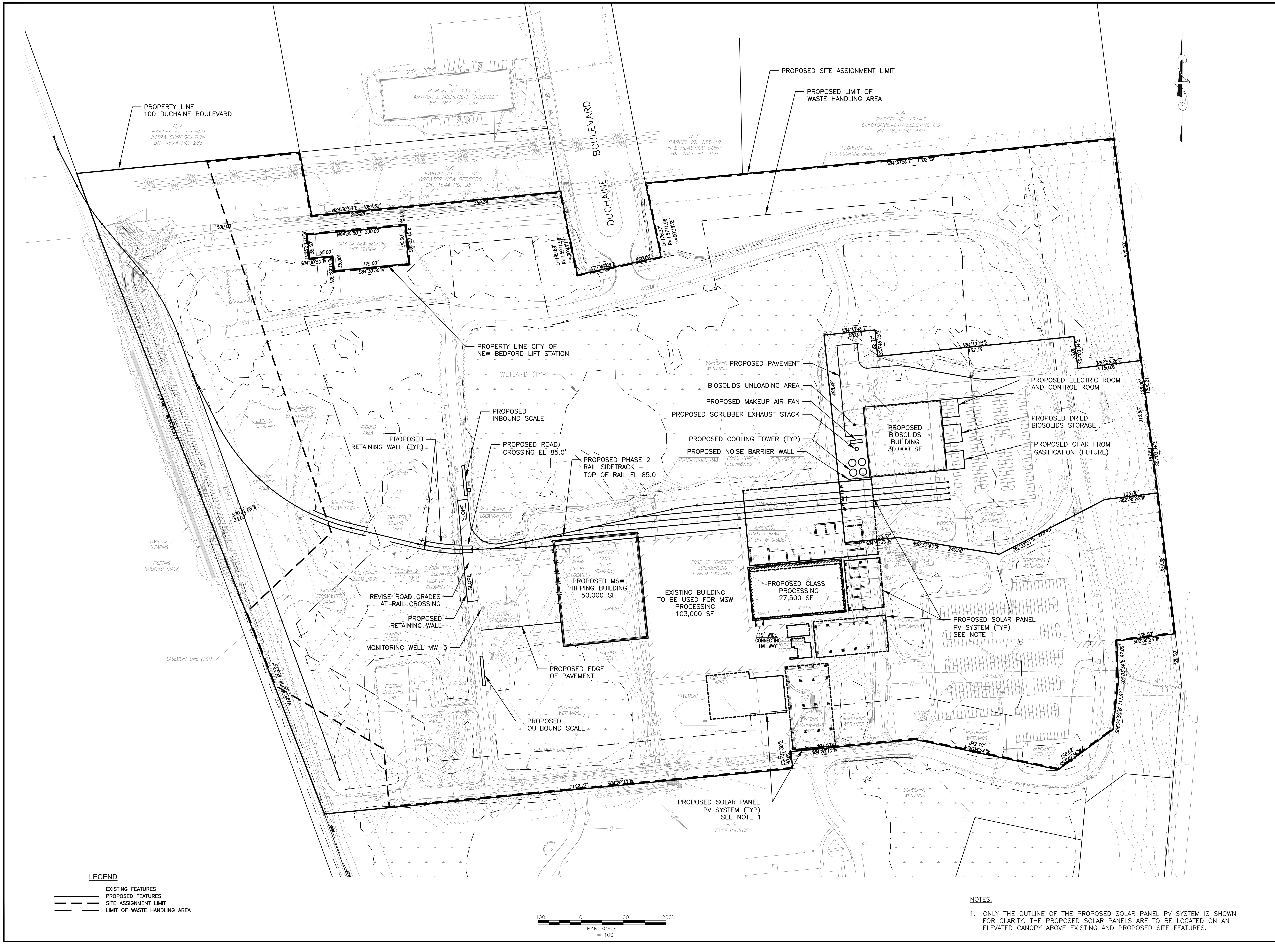


Parallel Products New Bedford, Massachusetts

Epsilon ASSOCIATES INC.

Figure 1

Aerial Locus Map



NOTES:

1. ONLY THE OUTLINE OF THE PROPOSED SOLAR PANEL PV SYSTEM IS SHOWN FOR CLARITY. THE PROPOSED SOLAR PANELS ARE TO BE LOCATED ON AN ELEVATED CANOPY ABOVE EXISTING AND PROPOSED SITE FEATURES.

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REVISIONS

NO.	DATE	COMMENT
A	2/4/2019	ISSUED FOR PERMITTING

PURPOSE: PERMITTING

LOCUS: 100 DUCHAINE BOULEVARD NEW BEDFORD, MASSACHUSETTS

PREPARED FOR: PARALLEL PRODUCTS, LLC

DRAWING TITLE: PHASE 2 SITE PLAN

CAD TECH:	CHECKED BY:
T. JANICKI	
ENGINEER:	DATE:
W. HALL	2/1/2019
	SCALE: 1"=100'
	SHEET: C2A

Figure 2
Conceptual Layout / Phase 2 Site Plan
(Green Seal Environmental, Inc.)

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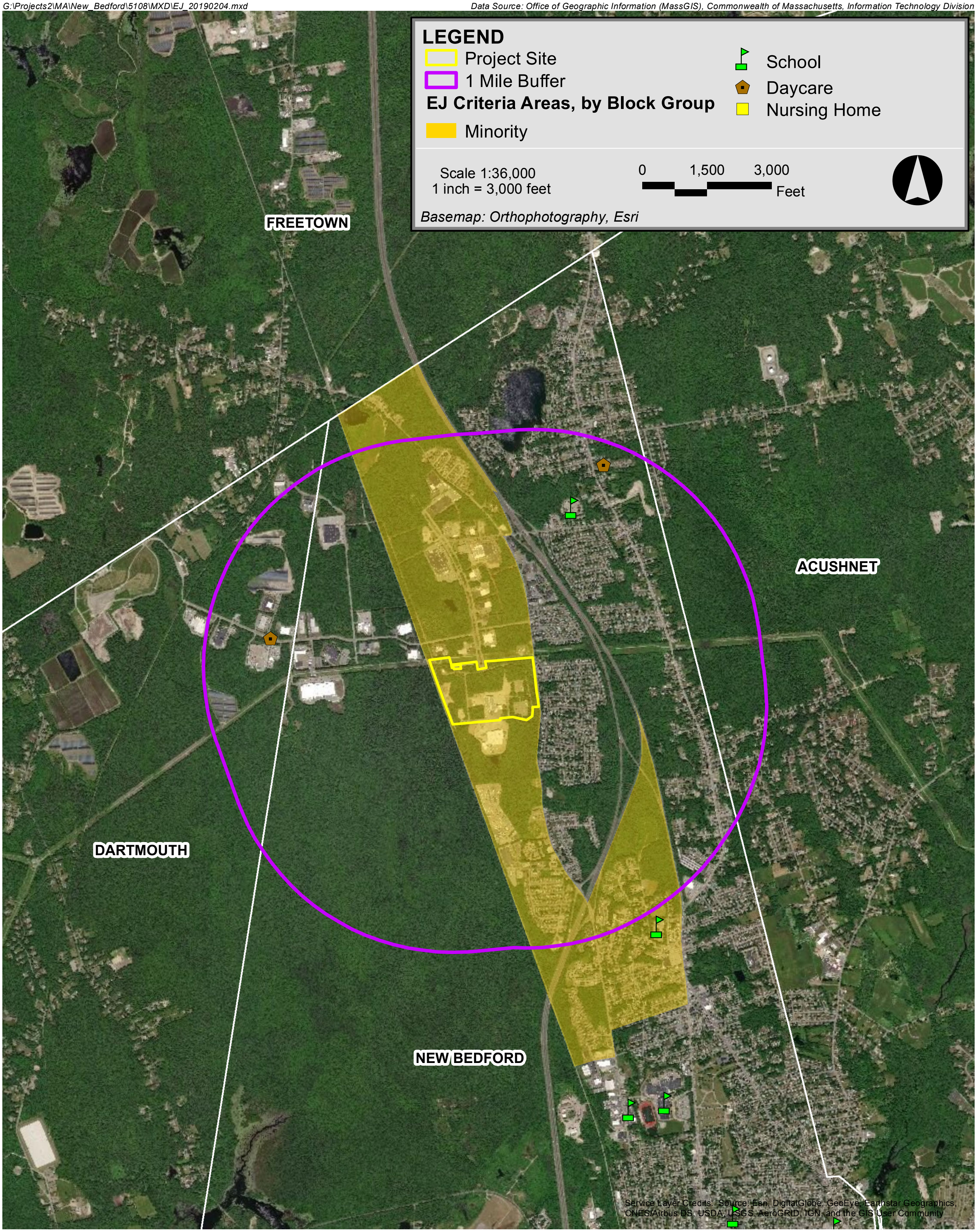
Data Source: Office of Geographic Information (MassGIS), Commonwealth of Massachusetts, Information Technology Division



Parallel Products **New Bedford, Massachusetts**

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Figure 3

Environmental Justice Areas Criteria by Block Group