

S. PORTLAND PUBLIC WORKS  
 CLASS 8 (5) DUMP BODY  $\frac{1}{2}$  PLOW (2) 2009  
 (3) 2008

DIESEL → DIESEL

9/27/18  
 deg  
 LC

## Section 7: Application Scoring Matrix

Score Assigned	Attachment	Attachment Description
10	A	<b>Mitigation Action Description:</b> Related to Maine's Beneficiary Mitigation Plan
20 avg 88%	B	<b>NOx Emission Reduction:</b> NOx emission reductions estimate using EPA's Diesel Emission Quantifier
10	C	<b>Health Benefits:</b> Maximized health benefits include: reductions in particulate matter and/or greenhouse gases; net reduction of diesel fuel use; or idle reduction strategies.
10	D	<b>Action Location:</b> Within an area with a disproportionate quantity of air pollution from diesel fleets, such as ports, rail yards, terminals, school depots/yards, and freight distribution areas.
0	E	<b>Class 1 Areas:</b> Benefits a designated federal Class 1 Area, specifically Acadia National Park, Roosevelt Campobello International Park, or the Moosehorn Wilderness Area located within the Moosehorn National Wildlife Refuge Area.
10 225,000 625,000 TR - 26.6% MATCH = 400,000	F	<b>Verified Funding:</b> Match or leveraged funding for cost sharing secured. Budget provided.
10	G	<b>Action Schedule:</b> Action implemented within two years of the award date. Schedule provided.
10	H	<b>Benefit Period:</b> Sustained emission benefits over the ten-year Trust Effective Period. Maintenance plan provided.
10	I	<b>Relevant Experience and Compliance Certification:</b> Existing administration and programmatic structure in place to implement diesel emission reduction or offset actions.

**Gates, Judy**

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**From:** Howard,Doug <Dhoward@southportland.org>  
**Sent:** Friday, September 14, 2018 3:57 PM  
**To:** Gates, Judy  
**Cc:** 'Ben Lake'; Kaylei Coombs; Rosenbach,Julie  
**Subject:** City of South Portland's application submission for Round I of the Maine VW Environmental Mitigation Action Appendix D-2 funding opportunity  
**Attachments:** South Portland Maine-VW-D-2-application-final\_signed.pdf

Dear Ms. Gates,

Please find attached the City of South Portland's application submission for Round I of the Maine VW Environmental Mitigation Action Appendix D-2 funding opportunity. If you could please confirm receipt, I would appreciate it.

Please let me know if you have any questions.

Respectfully,

***Doug Howard***

Director of Public Works

City of South Portland

929 Highland Ave

South Portland, ME 04106

Phone: 207-767-7635

For information on SP DPW projects follow me on Twitter

@SP\_DPW\_Director

NOTICE: Under Maine's Freedom of Access ("Right-to-Know") law, documents - including e-mail - in the possession of public officials about City business are classified as public records. This means if anyone asks to see it, we are required to provide it. There are very few exceptions. We welcome citizen comments and want to hear from our residents, but please keep in mind that what you write in an e-mail is not private and could show up in the local newspaper.



(For MaineDOT Use Only)

Date Application

Received

9/14/2018

Beneficiary's Project ID  
23901.10

Funding Request #

29

## Maine Volkswagen Environmental Mitigation Action Round 1 Application for Appendix D-2 Eligible Actions

- All applications for Round 1 funding are due by September 15, 2018.
- A fillable application template is available at [www.maine.gov/vw/application](http://www.maine.gov/vw/application)
- Use the list of attachments in Section 3 to ensure that your application is complete.
- Funding approvals for action(s) may be whole or partial.
- A timeline for Maine's Round 1 application process can be found at [www.maine.gov/mdot/vw/application](http://www.maine.gov/mdot/vw/application).
- For information on Maine's Diesel Emission Reduction Act (DERA) Program, go to <http://www.maine.gov/dep/air/mobile/cleandiesel.htmls>.
- For information on Zero Emission Vehicle Supply Equipment (ZEVSE), go to [www.energymaine.com](http://www.energymaine.com).
- Submit any questions through the website at [www.maine.gov/mdot/vw/application/fags](http://www.maine.gov/mdot/vw/application/fags).
- Information on the current base price for Maine school buses can be found at <https://www.maine.gov/doe/transportation/programs/buspurchase.html>

### Section 1: General Information

Action Title: City of South Portland Public Works Department Vehicle Replacements			
Action Location: Town/Territory: South Portland		County: Cumberland	
Type of Action: Repower: <input type="checkbox"/> Replacement: <input checked="" type="checkbox"/>			
Action Proponent: Doug Howard, Director of Public Works			
Action Proponent Mailing Address: 929 Highland Ave.			
City: South Portland	State: ME	Zip: 04106	County: Cumberland
Daytime Phone: (207)767-7635	Alternate Phone:		Email: dhoward@southportland.org
Authorized Agent (if different from Action Proponent): N/A			
Authorized Agent Mailing Address:			
City:	State:	Zip:	County:
Daytime Phone:	Alternate Phone:		Email:

## Section 2: Eligibility Criteria

The following categories are eligible mitigation actions pursuant to Appendix D-2 of the Environmental Mitigation Trust Agreement ([https://www.maine.gov/mdot/vw/app/Maine\\_VW\\_Eligible\\_Mitigation\\_Actions\\_1-8.pdf](https://www.maine.gov/mdot/vw/app/Maine_VW_Eligible_Mitigation_Actions_1-8.pdf)) and reflect basic eligibility criteria for consideration under this program. See Maine's Beneficiary Mitigation Plan ([www.maine.gov/mdot/vw/BMP\\_final\\_2-12-18.pdf](http://www.maine.gov/mdot/vw/BMP_final_2-12-18.pdf)) for details on eligibility. Check all that apply. Leave checkboxes blank for actions that don't apply. List individual vehicles or equipment using the table on the following page.

Check all that apply	Eligible Mitigation Actions
<input checked="" type="checkbox"/>	<b>1992-2009 engine model year Class 8 Local Freight Trucks and Port Drayage Trucks</b> repowered with any new diesel or alternate fueled engine or all-electric engine, or replaced with any new diesel or alternate fueled or all-electric vehicle, with the engine model year in which the eligible large trucks mitigation action occurs or one engine model year prior.
<input type="checkbox"/>	<b>2009 engine model year or older Class 4-8 school buses, shuttle buses, or transit buses</b> repowered with any new diesel or alternate fueled or all-electric engine, or replaced with any new diesel or all-electric vehicle, with the engine model year in which the eligible bus mitigation action occurs or one engine model year prior.
<input type="checkbox"/>	<b>Pre-Tier 4 freight switcher locomotives that operate 1000 or more hours per year</b> repowered with any new diesel or alternate fueled or all-electric freight switcher certified to meet the applicable EPA emissions standards or other more stringent equivalent state standard.
<input type="checkbox"/>	<b>Unregulated, Tier 1 or Tier 2 marine engines on ferries or tugs</b> repowered with Tier 3, Tier 4, alternate fueled, or all-electric engine, or upgraded with an EPA certified remanufacture system or an EPA verified engine upgrade.
<input type="checkbox"/>	<b>Marine shore power systems or components of such systems</b> that enable a compatible vessel's main and auxiliary engines to remain off while the vessel is at berth. Components eligible for reimbursement are limited to: cables, cable management systems, shore power coupler systems, distribution control systems, and power distribution. Subject marine shore power systems comply with international shore power design standards (ISO/IEC/IEEE 80005-1-2012 high voltage shore connection systems or the IEC/PAS 80005-3:2014 low voltage shore connection systems) and are supplied with power sourced from the local utility grid.
<input type="checkbox"/>	<b>1992-2009 engine model year Class 4-7 local freight trucks</b> repowered with a new diesel, alternate fueled, or all-electric engine, or replaced with any new diesel, alternate fueled, or all-electric vehicle, with the engine model year in which the eligible medium trucks mitigation action occurs or one engine model year prior.
<input type="checkbox"/>	<b>Tier 0, Tier 1, or Tier 2 diesel powered airport ground support equipment; and uncertified or certified to 3 g/bhp-hr or higher emissions spark ignition engine powered airport ground support equipment</b> repowered with an all-electric engine, or replaced with the same airport ground support equipment in an all-electric form.
<input type="checkbox"/>	<b>Forklifts with greater than 8000 pounds of lift capacity and port cargo handling equipment</b> repowered with an all-electric engine, or replaced with the same equipment in an all-electric form.

**Vehicles & equipment proposed for replacement or repower  
under this Eligible Mitigation Action.**  
(Leave fields blank that do not apply)

Current Vehicle Class	Current Tier (if applicable)	Current Model	Current Model Year	Mileage	Current Fuel Type	Proposed Fuel Type	Associated equipment
8	T3	Volvo, #VHD64B (20)	2009	83,673	Diesel	Diesel with 20% biodiesel blend	Dump body and plow 202934.07
8	T3	International 7500 (11)	2009	45,360	Diesel	Diesel with 20% biodiesel blend	Dump body and plow 362945.
8	T3	International 7500 (28)	2008	41,260	Diesel	Diesel with 20% biodiesel blend	Dump body and plow 491784.
8	T3	International 7500 (1)	2008	38,090	Diesel	Diesel with 20% biodiesel blend	Dump body and plow 545735.2
8	T3	International 7500 (15)	2008	36,840	Diesel	Diesel with 20% biodiesel blend	Dump body and plow 375155.1

\* Emission reduction data for model years 2007 + is not available from DEQ  
2009 vehicle Replacement with 2019 model (Diesel) reduces NOx emissions by 87.7%.  
Biodiesel emits 74% less NOx.  
A B20 blend will remove 15% emissions, so the upgrade will create a 89.5% reduction of NOx emissions (add 1.8)



### Section 3: Action Overview and Instructions

The following information provides the reviewers with background on the proposed action and will be considered as part of final decisions on what actions are funded in any given year. If an attachment is not application to the proposed action, that action is not disqualified from funding; however, Action Proponents are encouraged to provide accurate and concise answers to as many questions as possible and note why an attachment is not relevant to their proposal.

Check if attached	Scoring (for MaineDOT use)	Attachment	Attachment Description
<input checked="" type="checkbox"/>		A	<b>Mitigation Action Description:</b> Attach a no more than two-page narrative describing the action and how it relates to Maine's Beneficiary Mitigation Plan and label as "Attachment A".
<input checked="" type="checkbox"/>		B	<b>NOx Emission Reduction:</b> Estimate the NOx emission reductions from the action in terms of dollar per ton of NOx using EPA's Diesel Emission Quantifier found at <a href="https://www.epa.gov/cleandiesel/diesel-emissions-quantifier-deq">https://www.epa.gov/cleandiesel/diesel-emissions-quantifier-deq</a> or for heavy-duty vehicles <a href="http://afleet-web.es.anl.gov/hdv-emissions-calculator/">http://afleet-web.es.anl.gov/hdv-emissions-calculator/</a> . Attach a <u>separate</u> summary calculation worksheet generated by the Quantifier for <u>each</u> vehicle or piece of equipment and label as "Attachment B".
<input checked="" type="checkbox"/>		C	<b>Health Benefits:</b> Describe any health benefits <u>maximized</u> by the action <u>beyond</u> calculated NOx emission reductions as "Attachment C". Examples of maximized health benefits include: reductions in particulate matter and/or greenhouse gases; net reduction of diesel fuel use; or idle reduction strategies.
<input checked="" type="checkbox"/>		D	<b>Action Location:</b> As "Attachment D", indicate whether the action will occur in an area with a disproportionate quantity of air pollution from diesel fleets, such as ports, rail yards, terminals, school depots/yards, and freight distribution areas.
<input checked="" type="checkbox"/>		E	<b>Class 1 Areas:</b> Using the Maine map found at <a href="http://www.maine.gov/mdot/vw/application/class1">www.maine.gov/mdot/vw/application/class1</a> , note the location of the proposed action to indicate whether it will benefit a designated federal Class 1 Area, specifically Acadia National Park, Roosevelt Campobello International Park, or the Moosehorn Wilderness Area located within the Moosehorn National Wildlife Refuge Area. Include the map as "Attachment E".
<input checked="" type="checkbox"/>		F	<b>Verified Funding:</b> As "Attachment F", verify that the action has secured funding for cost sharing or leveraging by providing a commitment letter or signed agreement from a financial institution or budget committee for cost share or leveraged funding. Also, using the template in Section 4 of this application, include a general project budget indicating the amount of match to be provided by the Action Proponent.
<input checked="" type="checkbox"/>		G	<b>Action Schedule:</b> The action must be implemented within two years of the award date. Using the template provided in Section 4 of this application, provide schedule and major milestones, labeled as "Attachment G".
<input checked="" type="checkbox"/>		H	<b>Benefit Period:</b> The action must result in sustained emission benefits over the ten-year Trust Effective Period. Provide a concise description of how benefits will persist through 2027 and a maintenance plan for eligible vehicles/equipment funded under this program as "Attachment H".

Check if attached	Scoring (for MaineDOT use)	Attachment	Attachment Description
<input checked="" type="checkbox"/>		I	<b>Relevant Experience and Compliance Certification:</b> By signing provisions in "Attachment I", the Action Proponent and Authorized Agent (if applicable) verify that there is existing administration and programmatic structure in place to implement diesel emission reduction or offset actions.

## Attachment A

### Mitigation Action Description

The City of South Portland proposes to replace five (5) of its current diesel-powered vehicles with five (5) new, cleaner-burning diesel vehicles. The vehicles proposed for replacement are:

- A 2009 Volvo VHD64B Plow Truck (#20)
- A 2009 International 7500 Plow Truck (#11)
- A 2008 International 7500 Plow Truck (#28)
- A 2008 International 7500 Plow Truck (#1)
- A 2008 International 7500 Plow Truck (#15)

The five plow trucks above have the highest annual fuel use, lowest fuel economies, and highest annual mileage of the all vehicles in the City's fleet. Retiring these five vehicles early and replacing them with 2019 models with improved fuel economies and modern emissions equipment will drastically improve the fleet's overall NOx and greenhouse gas emissions. In addition, these vehicles represent some of the highest NOx-emitting vehicles in South Portland's Public Works Department fleets and offer the greatest projected NOx reductions per dollar invested in replacement - which is why the City has prioritized them for replacement under this VW Settlement funding opportunity.

In 2015, the City of South Portland took part in a biodiesel pilot in which the City operated a biodiesel blend in a number of municipal vehicles, including plow trucks. Overall, the pilot program was successful, and as a result the Department of Public Works intends to deploy a 20% biodiesel blend in these replacement plow trucks, which will help to further reduce greenhouse gas emissions. In addition, if the use of biodiesel is successful in these public works vehicles, South Portland has expressed interest in the use of biodiesel throughout the rest of their municipal fleet.

These proposed improvements directly support the State of Maine's Beneficiary Mitigation Plan goal of *"improving and protecting ambient air quality by implementing eligible mitigation projects that will achieve significant and sustained cost-effective reductions in NOx emissions."* These replacements also support the following funding priorities identified in the Plan:

- *Projects scaled to achieve the greatest NOx emission reductions or offset per dollar invested (i.e., capital cost effectiveness in dollars/ton);*
  - As described above, these proposed replacements offer the greatest projected NOx reductions per dollar invested in replacement within South Portland's fleet.
- *Projects that demonstrate community and air quality benefits;*
  - These five vehicles operate primarily within South Portland's city boundaries, and so the NOx and other criteria air pollutant emissions savings achieved through these vehicle replacements will positively impact air quality within the South Portland community.
- *Projects proposed by government and non-government entities with demonstrated experience and existing administrative and programmatic structure in place for implementing diesel emission reduction or offset projects;*
  - The City of South Portland has ample experience receiving and successfully implementing state and federal grants, and has robust administrative and programmatic structure in place to successfully implement the proposed project.



- *Projects in areas that receive a disproportionate quantity of air pollution from diesel fleets such as ports, rail yards, terminals, school depots/yards, and freight distribution areas;*
  - The five vehicles operate throughout the City of South Portland and occasionally on the grounds of school yards as described in Attachment D.
- *Projects with verified match (i.e., for projects that require a cost-share) or leveraged funding;*
  - The City of South Portland is committed to providing a 26.5% local match (which is considerably higher than the minimum 20%) in order to ensure that Maine's VW settlement funds are leveraged to achieve the greatest NOx benefits possible.
- *Projects that can be implemented within two years of the award date;*
  - The City of South Portland intends to initiate their procurement process for these replacement vehicles as soon as it is awarded funding through this opportunity. Based on delivery estimates provided by potential vendors, the City projects to have these vehicles in service within 9 months of the award date.
- *Projects with sustained emission benefits over the ten year Trust effective period.*
  - The five vehicles proposed for replacement will be retired between 5 and 6 years early, and so will achieve the most significant savings in emissions during the initial 5-6 years after the award. However, all of these vehicles will continue to remain in operation during the entire ten-year Trust effective period.

The City of South Portland has demonstrated a strong commitment to improving air quality through use of alternative fuels, alternative fuel vehicle purchasing, and petroleum and idle-reduction practices, and appreciates the opportunity to further improve community air quality in the future through the proposed project.

## Attachment B

### NOx Emission Reduction

The following screenshots provide estimated annual and lifetime results of nitrous oxide (NOx), particulate matter 2.5 (PM2.5), hydrocarbon (HC), carbon monoxide (CO), and carbon dioxide (CO2) emissions in short tons as well as lifetime cost effectiveness in dollars per short ton reduced for the five vehicles outlined in *Vehicles & equipment proposed for replacement or repower under this Eligible Mitigation Action* on page 3 of this document. The emissions calculations were derived from the Environmental Protection Agency's [Diesel Emissions Quantifier](#).

### 2009 Volvo VHD64B (20)

## Emission Results

Here are the combined results for all groups and upgrades entered for your project.<sup>1</sup>

<u>Annual Results (short tons)<sup>2</sup></u>	<b>NO<sub>x</sub></b>	<b>PM2.5</b>	<b>HC</b>	<b>CO</b>	<b>CO<sub>2</sub></b>	<b>Fuel<sup>3</sup></b>
Baseline for Upgraded Vehicles	0.050	0.000	0.001	0.005	9.1	812
Amount Reduced After Upgrades	0.043	0.000	0.001	0.003	0.4	37
Percent Reduced After Upgrades	86.0%	41.5%	46.4%	46.4%	4.6%	4.6%
 <u>Lifetime Results (short tons)<sup>2</sup></u>						
Baseline for Upgraded Vehicles	0.299	0.002	0.009	0.033	54.8	4,872
Amount Reduced After Upgrades	0.257	0.001	0.004	0.015	2.5	222
Percent Reduced After Upgrades	86.0%	41.5%	46.4%	46.4%	4.6%	4.6%
 <u>Lifetime Cost Effectiveness (\$/short ton reduced)</u>						
<b>Capital Cost Effectiveness<sup>4</sup></b> (unit & labor costs only)	\$660,393	\$255,338,117	\$42,401,612	\$11,111,893	\$68,068	
<b>Total Cost Effectiveness<sup>4</sup></b> (includes all project costs)	\$0	\$0	\$0	\$0	\$0	

<sup>1</sup> Emissions from the electrical grid are not included in the results.

<sup>2</sup> 1 short ton = 2000 lbs.

<sup>3</sup> In gallons; fuels other than ULSD have been converted to ULSD-equivalent gallons.

<sup>4</sup> Cost effectiveness estimates include only the costs which you have entered.

Remaining Life

Dump Truck: Short Haul - Single Unit | Class 8

6 years

## 2009 International 7500 (11)

### Emission Results <sup>2</sup>

Here are the combined results for all groups and upgrades entered for your project.<sup>1</sup>

<u>Annual Results (short tons)<sup>2</sup></u>	NO <sub>x</sub>	PM2.5	HC	CO	CO <sub>2</sub>	Fuel <sup>3</sup>
Baseline for Upgraded Vehicles	0.028	0.000	0.001	0.003	12.3	1,092
Amount Reduced After Upgrades	0.024	0.000	0.000	0.001	2.8	252
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	23.1%	23.1%

<u>Lifetime Results (short tons)<sup>2</sup></u>	NO <sub>x</sub>	PM2.5	HC	CO	CO <sub>2</sub>	Fuel <sup>3</sup>
Baseline for Upgraded Vehicles	0.167	0.001	0.005	0.018	73.7	6,552
Amount Reduced After Upgrades	0.144	0.000	0.002	0.009	17.0	1,512
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	23.1%	23.1%

#### Lifetime Cost Effectiveness (\$/short ton reduced)

Capital Cost Effectiveness <sup>4</sup> (unit & labor costs only)	\$1,181,077	\$454,885,826	\$75,274,607	\$19,850,580	\$9,994	
Total Cost Effectiveness <sup>4</sup> (includes all project costs)	\$0	\$0	\$0	\$0	\$0	

<sup>1</sup> Emissions from the electrical grid are not included in the results.

<sup>2</sup> 1 short ton = 2000 lbs.

<sup>3</sup> In gallons; fuels other than ULSD have been converted to ULSD-equivalent gallons.

<sup>4</sup> Cost effectiveness estimates include only the costs which you have entered.

#### Remaining Life

Dump Truck: Short Haul - Single Unit | Class 8

6 years

## 2008 International 7500 (28)

### Emission Results ?

Here are the combined results for all groups and upgrades entered for your project.<sup>1</sup>

<u>Annual Results (short tons)<sup>2</sup></u>	<b>NO<sub>x</sub></b>	<b>PM2.5</b>	<b>HC</b>	<b>CO</b>	<b>CO<sub>2</sub></b>	<b>Fuel<sup>3</sup></b>
Baseline for Upgraded Vehicles	0.023	0.000	0.001	0.003	7.8	696
Amount Reduced After Upgrades	0.020	0.000	0.000	0.001	0.1	9
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	1.3%	1.3%
<u>Lifetime Results (short tons)<sup>2</sup></u>						
Baseline for Upgraded Vehicles	0.116	0.001	0.003	0.013	39.2	3,480
Amount Reduced After Upgrades	0.100	0.000	0.002	0.006	0.5	45
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	1.3%	1.3%
<u>Lifetime Cost Effectiveness (\$/short ton reduced)</u>						
<b>Capital Cost Effectiveness<sup>4</sup></b> (unit & labor costs only)	\$1,707,020	\$655,922,355	\$108,368,156	\$28,659,924	\$335,802	
<b>Total Cost Effectiveness<sup>4</sup></b> (includes all project costs)	\$0	\$0	\$0	\$0	\$0	

<sup>1</sup> Emissions from the electrical grid are not included in the results.

<sup>2</sup> 1 short ton = 2000 lbs.

<sup>3</sup> In gallons; fuels other than ULSD have been converted to ULSD-equivalent gallons.

<sup>4</sup> Cost effectiveness estimates include only the costs which you have entered.

#### Remaining Life

Dump Truck: Short Haul - Single Unit | Class 8

5 years

## 2008 International 7500 (1)

### Emission Results <sup>?</sup>

Here are the combined results for all groups and upgrades entered for your project.<sup>1</sup>

<u>Annual Results (short tons)<sup>2</sup></u>	<b>NO<sub>x</sub></b>	<b>PM2.5</b>	<b>HC</b>	<b>CO</b>	<b>CO<sub>2</sub></b>	<b>Fuel<sup>3</sup></b>
Baseline for Upgraded Vehicles	0.021	0.000	0.001	0.002	7.7	682
Amount Reduced After Upgrades	0.019	0.000	0.000	0.001	0.5	47
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	6.9%	6.9%

<u>Lifetime Results (short tons)<sup>2</sup></u>						
Baseline for Upgraded Vehicles	0.107	0.001	0.003	0.012	38.4	3,410
Amount Reduced After Upgrades	0.093	0.000	0.001	0.006	2.6	235
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	6.9%	6.9%

#### Lifetime Cost Effectiveness (\$/short ton reduced)

<b>Capital Cost Effectiveness<sup>4</sup></b> (unit & labor costs only)	\$1,837,286	\$705,238,752	\$116,432,286	\$30,832,326	\$64,303	
<b>Total Cost Effectiveness<sup>4</sup></b> (includes all project costs)	\$0	\$0	\$0	\$0	\$0	

<sup>1</sup> Emissions from the electrical grid are not included in the results.

<sup>2</sup> 1 short ton = 2000 lbs.

<sup>3</sup> In gallons; fuels other than ULSD have been converted to ULSD-equivalent gallons.

<sup>4</sup> Cost effectiveness estimates include only the costs which you have entered.

#### Remaining Life

Dump Truck: Short Haul - Single Unit | Class 8

5 years



## 2008 International 7500 (15)

### Emission Results <sup>1</sup>

Here are the combined results for all groups and upgrades entered for your project.<sup>1</sup>

#### Annual Results (short tons)<sup>2</sup>

	NO <sub>x</sub>	PM2.5	HC	CO	CO <sub>2</sub>	Fuel <sup>3</sup>
Baseline for Upgraded Vehicles	0.021	0.000	0.001	0.002	8.0	710
Amount Reduced After Upgrades	0.018	0.000	0.000	0.001	1.1	96
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	13.5%	13.5%

#### Lifetime Results (short tons)<sup>2</sup>

Baseline for Upgraded Vehicles	0.104	0.001	0.003	0.012	39.9	3,550
Amount Reduced After Upgrades	0.090	0.000	0.001	0.005	5.4	480
Percent Reduced After Upgrades	86.1%	41.5%	46.4%	46.4%	13.5%	13.5%

#### Lifetime Cost Effectiveness (\$/short ton reduced)

Capital Cost Effectiveness <sup>4</sup> (unit & labor costs only)	\$1,894,287	\$726,786,225	\$119,952,056	\$31,782,277	\$31,481	
Total Cost Effectiveness <sup>4</sup> (includes all project costs)	\$0	\$0	\$0	\$0	\$0	

<sup>1</sup> Emissions from the electrical grid are not included in the results.

<sup>2</sup> 1 short ton = 2000 lbs.

<sup>3</sup> In gallons; fuels other than ULSD have been converted to ULSD-equivalent gallons.

<sup>4</sup> Cost effectiveness estimates include only the costs which you have entered.

#### Remaining Life

Dump Truck: Short Haul - Single Unit | Class 8

5 years

## Attachment C

### Health Benefits

The following screenshots provide estimated annual diesel particulate matter 2.5 (PM2.5) in short tons, annual benefits, and the annualized unit and labor costs for the five vehicles outlined in the *Vehicles & equipment proposed for replacement or repower under this Eligible Mitigation Action* on page 3 of this document. All calculations are determined based on figures for Cumberland County, Maine, in which all five vehicles will primarily operate. The calculations in the screenshots below were derived from the Environmental Protection Agency's [Diesel Emissions Quantifier](#). Note that while health benefits, in terms of overall particulate matter, are not significantly impactful, the action of upgrading older diesel engines to new, 2019 diesel engines will produce significant NOx, CO, and CO2 reductions (as well as reduce overall diesel fuel consumption by nearly 1,200 gallons/year through intended B20 use and fuel economy improvements), which will serve to improve overall air quality in the region as well as provide numerous health benefits relating to improved air quality.

#### 2009 Volvo VHD64B (20)

##### Health Benefits Results

County and State	Annual Diesel PM2.5 Reduction (short tons)	Annual Benefits	Annualized Unit & Labor Costs
Cumberland, Maine	0.000	\$45	-
<b>Total</b>	0.000	\$45	\$31,000

#### 2009 International 7500 (11)

##### Health Benefits Results

County and State	Annual Diesel PM2.5 Reduction (short tons)	Annual Benefits	Annualized Unit & Labor Costs
Cumberland, Maine	0.000	\$25	-
<b>Total</b>	0.000	\$25	\$31,000

**2008 International 7500 (28)****Health Benefits Results**

<b>County and State</b>	<b>Annual Diesel PM2.5 Reduction (short tons)</b>	<b>Annual Benefits</b>	<b>Annualized Unit &amp; Labor Costs</b>
<b>Cumberland, Maine</b>	0.000	\$21	-
<b>Total</b>	0.000	\$21	\$37,000

**2008 International 7500 (1)****Health Benefits Results**

<b>County and State</b>	<b>Annual Diesel PM2.5 Reduction (short tons)</b>	<b>Annual Benefits</b>	<b>Annualized Unit &amp; Labor Costs</b>
<b>Cumberland, Maine</b>	0.000	\$20	-
<b>Total</b>	0.000	\$20	\$37,000

**2008 International 7500 (15)****Health Benefits Results**

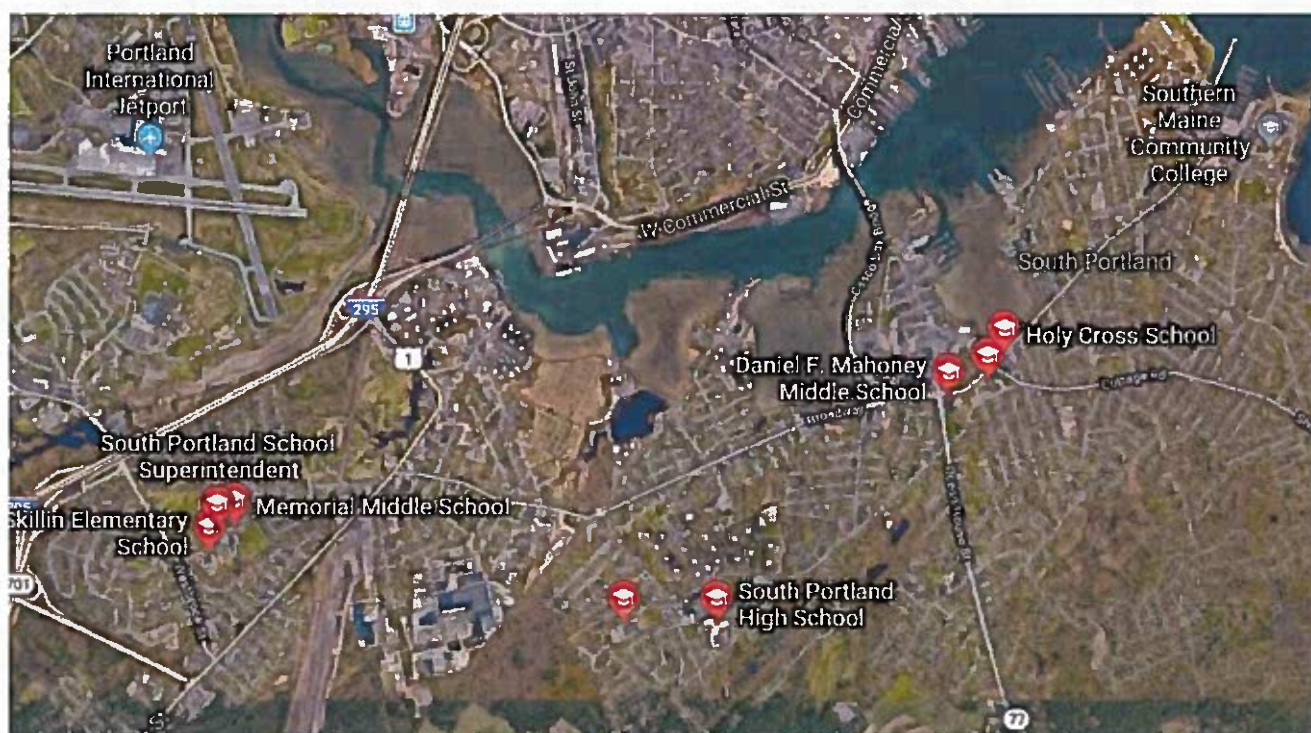
<b>County and State</b>	<b>Annual Diesel PM2.5 Reduction (short tons)</b>	<b>Annual Benefits</b>	<b>Annualized Unit &amp; Labor Costs</b>
<b>Cumberland, Maine</b>	0.000	\$19	-
<b>Total</b>	0.000	\$19	\$37,000

## Attachment D

### Action Location

The vehicles proposed to be replaced, which are outlined in the *Vehicles & equipment proposed for replacement or repower under this Eligible Mitigation Action* table on page 3 of this document, operate throughout the City of South Portland and directly in school yards for snow removal. School yards, among other locations, receive disproportionately high quantity of vehicle emissions from diesel fleets.

The five vehicles occasionally operate directly within the yards of nine schools but primarily throughout the City as previously mentioned. The nine schools that will be positively affected by the actions described in this document are the Holy Cross School, Frank I. Brown Elementary School, Daniel F. Mahoney Middle School, South Portland High School, Dyer Elementary School, Skillin Elementary School, Memorial Middle School, and Southern Maine Community College (*figure 1*). Replacing the five vehicles described in on page 3 of this document will have a positive impact on the overall air quality among school yards as well within the City of South Portland as a whole.



**Figure 1.** South Portland Schools.

## Attachment E



## Class 1 Areas

The City of South Portland, Maine, where the proposed vehicles will operate, does not lie within or 50 km from any of the four Class I locations outlined in the Maine Department of Environmental Protection [Class I Locations and AQRVs](#). South Portland is located approximately 278 km (173 miles) from Acadia National Park (*figure 4*), 400 km (248 miles) from Roosevelt Campobello International Park (*figure 5*), 375 km (233 miles) from Moosehorn National Wildlife Refuge (*figure 6*), and 150 km (93 miles) from Presidential Range/Dry River Great Gulf Wilderness Area (*figure 7*). Although the four specified class 1 areas will not be directly affected by the actions proposed in this document, decreased NOx emissions in the City of South Portland will have a positive effect, in terms of NOx reductions, on neighboring regions which may eventually influence the air quality in the four class 1 areas depicted in the maps below.



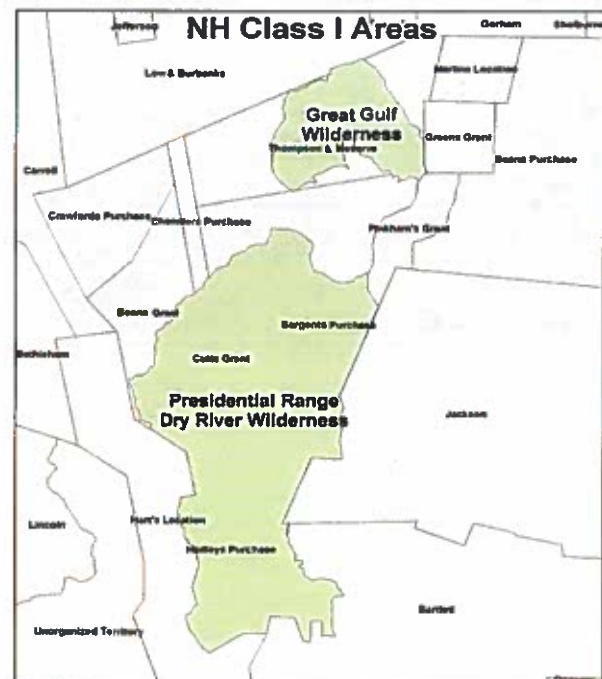
**Figure 4.** Acadia National Park



**Figure 5.** Roosevelt Campobello International Park



**Figure 6.** Moosehorn National Wildlife Refuge



**Figure 7.** NH Class I Areas



## Verified Funding

The table below (*table 1*) outlines the cost share that the City of South Portland will contribute to fund the replacement of the vehicles described in the *Vehicles & equipment proposed for replacement or repower under this Eligible Mitigation Action* table on page 3 of this document. In addition to table 1, a letter from the South Portland Public Works Finance department can be found below on page 17. Briefly, the South Portland Public Works Finance department commits to funding 26.5% (\$225,000) of the cost of actions totaling (\$850,000). The City is requesting a 73.5% cost share from Maine's VW Environmental Mitigation Settlement, equating to \$625,000.

Budget Summary		
1	Total Estimated Cost of the Proposed Action	\$850,000
2	Minimum required cost share or leverage funding for this action Percentage: 20%	\$170,000
3	Actual cost share and cost overage committed by the Action Proponent (may include local funding, grants awarded, contributions, etc.) Percentage: 26.5% Source: South Portland Public Works Finance Department	\$225,000
4	Funds requested from Maine's VW Environmental Mitigation Settlement	\$625,000

**Table 1. Action Budget Summary**

## Attachment H

### Benefit Period

The benefit period of replacing the existing five vehicles with new vehicles, having engines held to more strict emissions standards, will persist through the year 2027 and are expected to continue until the vehicles reach their estimated end of use lives in 2034 (fifteen years). Through 2027, the five new vehicles will serve to improve the air quality in which they routinely operate.

Based on the projected NOx emissions reduced by vehicle replacement detailed in previous attachments, the five vehicle replacements proposed will have a combined NOx emission reduction of 1.116 short tons, or 2,232 pounds, from the time the vehicles will be installed in 2019 through 2027; this equates to 0.124 short tons or 248 pounds per year of NOx emissions alone that will be reduced in the City of South Portland if the older vehicles sought to be replaced are taken out of service in 2019. By the time the five replacement vehicles are due to retire in 2034, they will have a combined NOx reduction of 1.86 short tons, or 3,720 pounds. Additional reductions in HC, CO, and CO2 will take place due to the vehicle replacements as well.

To keep the new vehicles running as efficiently as possible, the vehicles will be properly and routinely maintained in order to reach their full useful life. The maintenance schedules below are strictly followed and documented with current vehicles and will continue to be strictly followed and documented with the installation of new vehicles.

### Maintenance Schedules

#### 2009 Volvo VHD64B (20)

Elapsed Hours	Maintenance Performed After Elapsed Hours
200	Check oil, check oil filter, check fuel filters, check lube, check chassis, check fluids, check lights and tires
500	Change oil, change oil filter, check lube, check belts, check battery
3,000	Service transmission
Annually	Service air dryer and commercial truck inspection

#### 2009 International 7500 (11)

Elapsed Hours	Maintenance Performed After Elapsed Hours
200	Check oil, check oil filter, check fuel filters, check lube, check chassis, check fluids, check lights and tires
500	Change oil, change oil filter, check lube, check belts, check battery
3,000	Service transmission
Annually	Service air dryer and commercial truck inspection

### 2008 International 7500 (28)

Elapsed Hours	Maintenance Performed After Elapsed Hours
200	Check oil, check oil filter, check fuel filters, check lube, check chassis, check fluids, check lights and tires
500	Change oil, change oil filter, check lube, check belts, check battery
3,000	Service transmission
Annually	Service air dryer and commercial truck inspection

### 2008 International 7500 (1)

Elapsed Hours	Maintenance Performed After Elapsed Hours
200	Check oil, check oil filter, check fuel filters, check lube, check chassis, check fluids, check lights and tires
500	Change oil, change oil filter, check lube, check belts, check battery
3,000	Service transmission
Annually	Service air dryer and commercial truck inspection

### 2008 International 7500 (15)

Elapsed Hours	Maintenance Performed After Elapsed Hours
200	Check oil, check oil filter, check fuel filters, check lube, check chassis, check fluids, check lights and tires
500	Change oil, change oil filter, check lube, check belts, check battery
3,000	Service transmission
Annually	Service air dryer and commercial truck inspection

## ATTACHMENT I

### Authorized Agent Certification

The Authorized Agent certifies that they have been authorized by the Project Proponent to submit this application, that the Project Proponent agrees to all the program requirements, and that the information provided is an accurate representation of the project.

Action Proponent's Signature: N/A

Date: \_\_\_\_\_

Authorized Agent's Signature: N/A  
(if different from Action Proponent)

Date: \_\_\_\_\_

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### Action Proponent Signature

The Action Proponent certifies that the action(s) is/are accurately described in this application. Signature indicates that the action(s) comply with all requirements of the Volkswagen Environmental Mitigation Settlement, provides the designated level of cost share funds, and a willingness to enter an agreement with the Maine Department of Transportation requiring the Action Proponent to administer the project abiding to federal, State, and local requirements. The Action Proponent also accepts responsibility for submitting progress reports during the term of the project and providing future maintenance of the completed action through 2027.

Action Proponent(s): Doug Howard

Title: Director of Public Works

Phone#: (207)767-7635

Email: dhoward@southportland.org

  
Signature(s)

9/14/18  
Date