Fugitive dust emissions during construction will be mitigated, as necessary, by spraying water or application of other commercially-available dust control agents on unpaved areas subject to frequent vehicle traffic.

9.2.6.2 Emissions from Operation of the Affected Compressor Stations

Air emissions estimates for the affected compressor stations are summarized in Table 9.2-8 through 9.2-12, below. Tables 9.2-8 through 9.2-12 include the emissions from existing point sources that are affected by AIM Project modifications[4] and the proposed new point sources. Further information about the existing and new air emission sources, detailed emissions calculations, and the basis for emission rates and calculations are provided in the state air permit applications included in Appendix 9A.

TABLE 9.2-8

Stony Point Compressor Station
Project Emissions Increase Summary (TPY)

Pre-Project Actual Emissions

ID	Description	SO_2	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	CO_{2e}
None a/								

Post-Project Potential To Emit

Unit ID	Description	SO_2	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	CO_{2e}
STON TBC 08	New Mars 100 Turbine	2.0	3.8	3.8	19.0	25.0	2.4	67,997
STON TBC 09	New Mars 100 Turbine	2.0	3.8	3.8	19.0	25.0	2.4	67,997
STON ENGEN 02	New Emergency Generator	0.0 b/	0.0 b/	0.0 b/	1.0	2.0	0.9	433
STON GHTR 02	Fuel Gas Heater	0.0 b/	0.0 b/	0.0 b/	0.5	0.7	0.2	597
STON GHTR 03	Fuel Gas Heater	0.0 b/	0.0 b/	0.0 b/	0.5	0.7	0.2	597
STON GHTR 04	Fuel Gas Heater	0.0 b/	0.0 b/	0.0 b/	0.5	0.7	0.2	597
STON-PC	Piping Components	0.0	0.0	0.0	0.0	0.0	7.5	826
STON-GR	Gas Releases	0.0	0.0	0.0	0.0	0.0	9.4	8,663
	Total	*4.0*	*7.6*	*7.6*	*40.5*	*54.1*	*23.2*	*147,707*
	Contemporaneous Change in Emissions AGT Project NEI c/	*0.8*	*1.6*	*1.6*	*-15.6*	*21.7*	*1.7*	*28,874*
	Emissions Increase	**4.8**	**9.2**	**9.2**	**24.9**	**75.8**	**24.9**	**176,581**
	Major NSR Permitting Threshold d/	40	15	10	25 f/	100	25 f/	75,000 e/

a/ The existing compressor that will be restaged is not included. The compressor turbine will not be modified and there will be no effect on emissions.
b/ Less than 0.05 TPY
c/ Includes emissions changes from units at the Stony Point Compressor Station that are not part of the AIM Project but all changes to emissions units are covered in the air permit application scheduled to be filed with NYSDEC on February 28, 2014 and included in Appendix 9A.
d/ Source is an existing major source; all thresholds are PSD SPTs unless otherwise noted.
e/ Project exceeds SPT for this pollutant; therefore SNEIT applies.
f/ Source is an existing major source in nonattainment area and Project exceeds SPT for this pollutant; therefore NNSR SNEIT applies.

[4] The tables for the compressor stations in New York also identify changes to emissions from existing units that are not part of the AIM Project but are part of the same air permit applications filed with NYSDEC, consistent with the NYSDEC's permitting requirements. These applications are provided in Appendix 9A. Algonquin will complete this separate system emissions work in accordance with the terms of the permit requirements issued by the NYSDEC.

TABLE 9.2-9

Southeast Compressor Station
Project Emissions Increase Summary (TPY)

Pre-Project Actual Emissions								
ID	**Description**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**CO**	**VOC**	**CO_{2e}**
None a/								
Post-Project Potential To Emit								
Unit ID	**Description**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**CO**	**VOC**	**CO_{2e}**
SEAS TBC 06	New Taurus 70 Turbine	1.3	2.5	2.5	12.5	20.5	1.6	44,511
SEAS ENGEN 02	New Emergency Generator	0.0 b/	0.0 b/	0.0 b/	0.6	1.3	0.6	288
SEAS GHTR 02	Fuel Gas Heater	0.0 b/	0.0 b/	0.0 b/	0.5	0.7	0.2	595
SEAS GHTR 03	Fuel Gas Heater	0.0 b/	0.0 b/	0.0 b/	0.5	0.7	0.2	595
SEAS-PC	Piping Components	0.0	0.0	0.0	0.0	0.0	3.7	413
SEAS-GR	Gas Releases	0.0	0.0	0.0	0.0	0.0	4.7	4,331
	Total	*1.3*	*2.5*	*2.5*	*14.1*	*23.2*	*11.0*	*50,733*
	Contemporaneous Change in Emissions AGT Project PEP c/	*0.7*	*1.3*	*1.3*	*0.0*	*31.7*	*4.8*	*23,315*
	Emissions Increase	**2.0**	**3.8**	**3.8**	**14.1**	**54.9**	**15.8**	**74,048**
	Major NSR Permitting Threshold d/	40	15	10	40 e/	100	40 e/	75,000

a/ Existing compressors that will be restaged or where the compressor body will be replaced are not included. The compressor turbines will not be modified and there will be no effect on emissions.
b/ Less than 0.05 TPY
c/ Includes emissions changes from units at the Southeast Compressor Station that are not part of the AIM Project but all changes to emissions units are covered in the air permit application scheduled to be filed with NYSDEC on February 28, 2014 and included in Appendix 9A.
d/ Source is an existing major source; all thresholds are PSD SPTs unless otherwise noted.
e/ Source is an existing major source in nonattainment area; therefore NNSR SPT applies.

TABLE 9.2-10

Cromwell Compressor Station
Project Emissions Increase Summary (TPY)

Pre-Project Actual Emissions								
ID	**Description**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**CO**	**VOC**	**CO_{2e}**
None a/								
Post-Project Potential To Emit								
CROM TBC 09 b/	New Mars 100 Turbine	1.9	3.7	3.7	18.5	33.0	2.5	65,894
CROM ENGEN 04	New Emergency Generator	0.0 c/	0.0 c/	0.0 c/	0.8	1.6	0.7	346
CROM GHTR 03	Fuel Gas Heater	0.0 c/	0.0 c/	0.0 c/	0.5	0.7	0.2	597
CROM-PC	Piping Components	0.0	0.0	0.0	0.0	0.0	3.8	413
CROM-GR	Gas Releases	0.0	0.0	0.0	0.0	0.0	4.7	4,331
CROM-PW	Parts Washer	0.0	0.0	0.0	0.0	0.0	0.4	0.0

Although not required for permitting, Algonquin has completed supplemental air quality analyses for the new air emissions sources proposed as part of the AIM Project at the Cromwell, Chaplin and Burrillville Compressor Stations. The supplemental air quality analyses are provided to demonstrate compliance with all NAAQS at the Burrillville Compressor Station, and all other ambient air quality standards for criteria pollutants not included in the state air permit applications for the Cromwell and Chaplin Compressor Stations. (Rhode Island does not have state ambient air quality standards that differ from the NAAQS.) The supplemental air quality analyses were completed using AERSCREEN, and are provided in Appendix 9C. Additional details about the supplemental air quality analysis, including the selection of representative monitoring sites for use as background and associated modeling inputs, are provided in Appendix 9C.

9.2.6.3 Emissions from Operation of Project M&R Stations

The design of the AIM Project M&R stations is ongoing at this time and accurate emissions estimates for these stations are not available. Final equipment selection and piping configurations are needed to provide an accurate estimate, so Algonquin is providing emissions information that is considered to be representative of the emissions that could result from operation of these facilities, but will vary depending on the final design and actual operation.

The primary source of air emissions at the three new M&R stations proposed in Norwich, CT (the Oakland Heights M&R Station), Freetown, MA (the Assonet M&R Station), and Boston, MA (the West Roxbury M&R Station) will be natural gas-fired inlet gas heaters. The modifications to five existing M&R stations located in Peekskill, NY (the Peekskill M&R Station), Cortlandt, NY (the Cortlandt M&R Station), Guilford, CT (the Guilford M&R Station), Windham, CT (the Willimantic M&R Station), and New Bedford, MA (the New Bedford M&R Station) will also include new or replacement natural gas-fired inlet gas heaters. These gas heaters are expected to have rated maximum heat input capacities ranging from less than 1 MMBtu/hr up to approximately 10 MMBtu/hr. Based on the estimated emissions for similar, existing gas heaters along the Algonquin system, the potential emissions from any new heaters at the high end of this heat input capacity range are expected to be on the order of 6,500 TPY CO_2e, 8 TPY CO, 5 TPY NO_x, 1.5 TPY VOC, with the emissions of other pollutants less than 1 TPY. The potential emissions of criteria pollutants from any new heaters on the lower end of the heat input capacity range are expected to be less than 1 TPY. Actual emissions from these heaters would be even lower. Other, much smaller natural gas-fired heaters may be installed at Project M&R stations for space heat and to protect instrumentation.

Additional emissions from the operation of all Project M&R stations result from fugitive releases from piping components, such as valves and fittings, as well as "non-routine" activities, such as pigging operations and other non-routine maintenance activities requiring blowdown of either the M&R station or a section of pipeline with a terminus at the M&R station. Table 9.2-13 provides Algonquin's estimated fugitive and non-routine emissions from operation of all of the new or modified M&R stations proposed as part of the AIM Project combined. This estimate utilizes industry emission factors provided in Table 5-26 and Table 6-6 of the *Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry*, prepared by the American Petroleum Institute in August 2009 ("API *Compendium*"). The fugitive emission factor from the API *Compendium* is an average of the emissions measured at M&R stations included in a June 1996 methane emissions study completed by the Gas Research Institute and USEPA. The non-routine emissions factor was developed from the *Updated Canadian National Greenhouse Gas Inventory for 1995, Emission Factor Documentation, Technical Memorandum*, Final, October 2001, prepared by the URS Corporation. The emission factors in the API *Compendium* were adjusted based on the expected methane ("CH_4") content of the site-specific gas.

TABLE 9.2-13 **Estimated Actual Emissions from Non-Combustion Sources at Proposed M&R Stations (TPY)**		
	VOC	**CO_2e**
Fugitives	2.8	735
Non-Routine	52.6	13,928
Total	55.4	14,663

9.2.6.4 Emissions from Operation of the AIM Pipelines

Emissions from the operation of natural gas transmission pipelines result from fugitive releases from piping components. Occasionally, non-routine activities, such as maintenance activities, will require venting/blowdown of a section of pipe between valves located along the pipeline. Table 9.2-14 presents an estimate of the actual emissions from operation of the proposed AIM pipeline (approximately 38 miles of pipe), using industry emission factors provided in Table 5-26 and Table 6-6 of the API *Compendium*. The emission factors were adjusted based on the expected CH_4 content of the site-specific gas.

TABLE 9.2-14 **Estimated Actual Emissions from Proposed AIM Pipelines (TPY)**		
	VOC	**CO_2e**
Fugitives	<0.1	10
Non-Routine	2.7	708
Total	2.7	718

9.2.6.5 Construction Emissions

Algonquin has estimated construction-related emissions of criteria pollutants and greenhouse gases for the Project. Construction activities along the pipeline right-of-ways and at the aboveground facility sites will result in emissions of fugitive dust from vehicular traffic and soil disturbance, and combustion emissions from diesel and gasoline fired construction equipment. There may also be some temporary indirect emissions attributable to construction workers commuting to and from work sites during construction. Large earth-moving equipment and other mobile sources are sources of combustion-related emissions, including criteria pollutants (i.e., NO_x, CO, VOC, SO_2, and PM_{10}) and small amounts of HAPs. The majority of air emissions produced during construction activities will be PM_{10} and $PM_{2.5}$ in the form of fugitive dust in addition to CO and NO_x from construction equipment engines. However, these air quality impacts will generally be temporary and localized, and are not expected to cause or significantly contribute to an exceedance of the NAAQS.

Fugitive Dust Emissions

Fugitive dust will result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. The amount of dust generated will be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions will be greater during dry periods and in areas of fine-textured soils subject to

surface activity. Algonquin will employ proven construction-related practices to control fugitive dust such as application of water or other commercially-available dust control agents on unpaved areas subject to frequent vehicle traffic.

Table 9.2-15 provides estimates of fugitive dust emissions associated with construction activities.

TABLE 9.2-15

Fugitive Dust Emissions from Construction Activities (TPY)

Year	PM_{10}	$PM_{2.5}$
2015	54.5	5.5
2016	35.6	3.6

Construction Engine Emissions

Construction-related emission estimates are based on a typical construction equipment list, hours of operation, and vehicle miles traveled by the construction equipment and supporting vehicles for each pipeline segment of the Project and for work planned at above ground facilities and ware yards. This is a very conservative estimate based on worst case assumptions and USEPA emission factors. Nevertheless, the estimated air emissions from construction of the AIM Project are expected to be transient in nature, with negligible impact on the regional air quality. Algonquin will limit the idling of engines to a maximum of 5 minutes whenever the construction equipment is not in use. Construction equipment will be properly tuned and operated only on an as-needed basis to minimize the construction engine emissions. In addition, Algonquin will make best efforts to use ultra-low sulfur diesel in construction equipment and utilize non-road engines either retrofitted with best available technology or certified to meet USEPA's Tier IV Exhaust Emissions Standards without the need for additional retrofitting.

There also will be some emissions attributable to vehicles driven by construction workers for material deliveries to the construction site. Emission factors in grams per vehicle mile traveled for on-road vehicles were obtained from the USEPA MOVES (Motor Vehicle Emission Simulator) model. Emissions from non-road construction equipment engines used during Project construction have been estimated based on the anticipated types of non-road equipment and their associated levels of use. Emission factors in grams per horsepower-hour were obtained using the most recent version of EPA's NONROAD model (NONROAD2008a).

Table 9.2-16 summarizes the estimated emissions of criteria pollutants and total HAPs from construction equipment.

TABLE 9.2-16

Non-Road and On-Road Construction Emissions of Criteria Pollutants and HAPs (TPY)

Year	NO_x	VOC	CO	SO_2	$PM_{10}/PM_{2.5}$	Total HAPs
2015	66.2	8.1	116.6	0.1	5.1	0.4
2016	98.1	11.8	155.2	0.2	7.5	0.7

Table 9.2-17 summarizes the estimated GHG emissions from operation of construction equipment and material deliveries. For the types of sources of GHG emissions associated with Project construction, total carbon dioxide ("CO_2") is essentially the same as CO_2e.

TABLE 9.2-17 **Non-Road and On-Road Construction Emissions of Greenhouse Gases (TPY)**	
Year	**CO_2**
2015	13,879
2016	23,780

Emissions from Commuting

There also will be some emissions attributable to vehicles driven by construction workers commuting to and from the Project work site during construction. Emission factors in grams per vehicle mile traveled for on-road vehicles were obtained from the USEPA MOVES model.

Table 9.2-18 provides estimates of tailpipe emissions of criteria pollutants and total HAPs from vehicles used by commuting construction workers.

TABLE 9.2-18 **Construction Worker Commuting Emissions of Criteria Pollutants and HAPs (TPY)**						
Year	**NO_x**	**VOC**	**CO**	**SO_2**	**$PM_{10}/PM_{2.5}$**	**Total HAPs**
2015	1.6	0.4	11.1	0.02	0.05	0.2
2016	2.1	0.6	14.8	0.02	0.06	0.2

Table 9.2-19 provides estimates of emissions of GHG emissions from vehicles used by commuting construction workers.

TABLE 9.2-19 **Construction Worker Commuting Emissions of Greenhouse Gases (TPY)**	
Year	**CO_2**
2015	1,056
2016	1,381

Detailed construction emissions calculations along with the methodology and emissions factors used are provided in Appendix 9D. Table 9D-1 in Appendix 9D provides a summary of all construction related emissions.

9.2.6.6 Radon

Health studies conducted for the U.S. Department of Energy ("USDOE") and the USEPA, Office of Radiation Programs,[5] and reports prepared by Dr. Lynn R. Anspaugh[6] and Risk Sciences International

[5] Texas Eastern Transmission, LP, 141 FERC ¶ 61,043 at n. 78 (2012) (Texas Eastern) (Gogolak, C., Review of 222RN in Natural Gas Produced from Unconventional Sources. Prepared for the U.S. Department of Energy, Environmental Measurements Laboratory as DOE/EML-385, New York, New York (1980), and Johnson, R., D. Bernhardt, N. Nelson, and H. Calley, Assessment of Potential Radiological Health Effects from Radon in Natural Gas, Prepared for the U.S. Environmental Protection Agency, Office of Radiation Programs as EPA-520/1-83-004, Washington, D.C. (1973)).

[6] Id. at n. 82 (Lynn R. Anspaugh, Scientific Issues Concerning Radon in Natural Gas (July 5, 2012)).