Enclosure 1
NO_x and VOC Emissions from Construction Activities and Air Conformity Applicability,
Calvert Cliffs Unit 3,
Rev. 3,
September 2011

AECOM Environment

Submitted to:
Calvert Cliffs 3 Nuclear Project, LLC and
UniStar Nuclear Operating Services, LLC
Baltimore, MD

Submitted by:
AECOM
Chelmsford, MA
Project No. 60136676
September 2011

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1.0 Introduction

Calvert Cliffs 3 Nuclear Project LLC ("CC3") and UniStar Nuclear Operating Services, LLC ("UNO") (Co-Applicants) are proposing to construct and operate a new nuclear power unit on the existing Calvert Cliffs Nuclear Power Plant (CCNPP) site. The new unit will be designated as CCNPP Unit 3 (CC3), and will have a gross electric generation capacity of about 1,710 megawatts.

Pursuant to the General Conformity Requirements under 40 CFR 93.150 et seq, the Nuclear Regulatory Commission (NRC) as the lead federal agency is required to make a conformity determination with regard to the proposed construction and operation of CC3. The General Conformity Rule applies only in locations designated in 40 CFR Part 81 as maintenance or nonattainment areas for any criteria air pollutant. As shown in Figure 1-1, the CC3 project site in Calvert County, Maryland is located within the Washington, DC-MD-VA moderate nonattainment area for the 2008 8-hour ambient ozone standard. As such, construction-related emissions of ozone precursors, i.e., oxides of nitrogen (NO_X) and volatile organic compounds (VOC) from both direct and indirect project-related emissions have been evaluated to determine if annual emissions of these pollutants during the years of construction are above the applicable tonnage thresholds for applicability of General Conformity requirements. The applicable de minimis thresholds are 100 tons per year of NO_X and 50 tons per year of VOC emissions per 40 CFR 93.153.

Note that operation of CC3 will not result in significant generation of NO_X emissions, or significant releases of VOCs. Typical sources of NO_X during operation of CC3 will include vehicle operations (mobile sources) and periodic operation of diesel generators that are used to provide backup power (stationary sources). Potential emissions of NO_X and VOCs from CC3 stationary source operations will also be subject to restrictions imposed under the Certificate of Public Convenience and Necessity (CPCN) issued by Maryland Public Service Commission for CCNPP Unit 3 effective June 26, 2009. The CPCN constitutes the issuance of the Air Quality Minor New Source Review (NSR) Permit to Construct, and a Major Prevention of Significant Deterioration (PSD) permit that was based on review by the Power Plant Research Program (PPRP) and the Maryland Department of the Environment (MDE). Potential NO_X and VOC emissions from operations will be below de minimis threshold values listed in 40 CFR 93.153(b). Mobile source emissions from operations were estimated by proportioning the worst case year of on-road emission during construction by the ratio of operational employees to the number of construction workers. Permitted emissions from the CC3 stationary sources are 24 tpy of NO_X and 4 tpy of VOC but these emissions are specifically excluded from the requirements for a conformity determination per the exclusion found in 40 CFR 93.153(d) for major or minor new stationary sources that require a permit under the NSR program or are subject to PSD.

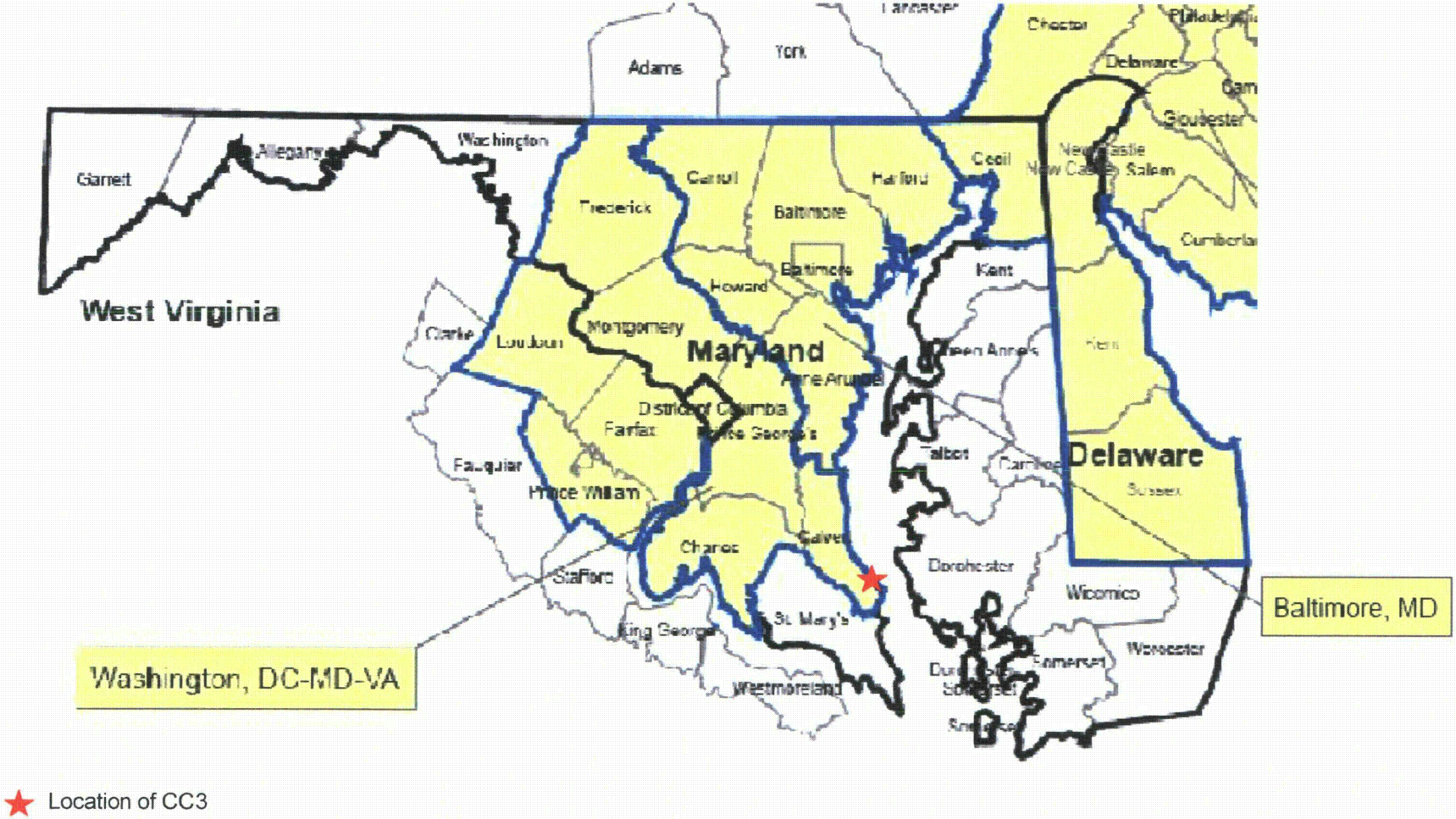
This report documents the NO_X and VOC emissions associated with the construction of CC3 for purposes of determining applicability to the federal Clean Air Act General Conformity Rule. The first revision of this report was submitted in March 2010 (Rev. 1) which updated the original version of this report filed with the NRC in December 2009 to specifically address NRC's request for a more detailed breakout of safety-related construction emissions as defined pursuant to 40 CFR Part 50.10. The December 2009 version of this report was submitted to NRC to satisfy the commitment by CC3 and UNO pursuant to CC-09-0002 (dated October 2, 2009) to provide updated construction emissions by December 11, 2009. Prior to the December 2009 submittal, estimates of construction-related emissions were provided in the CPCN Technical Reports filed with the Maryland Public Service Commission (PSC) in November 2007 and later amended in August 2008. These CPCN reports only evaluated onsite NO_X and VOC emissions related to construction and did not address indirect emissions from activities outside the construction site that are required by EPA in a formal conformity applicability analysis. Indirect activities included in this analysis are employee commuting, commercial deliveries, and emissions from

materials delivered by barge to the on-site dock. The Rev. 2 version of this report was an adjustment of the construction equipment schedule and timeline that has been revised since the earlier filings. There are no substantive changes in the conclusions from the March 2010 submittal in regards to the number of years greater than 100 tons of NO_X. There is a slight increase in the maximum NO_X in the peak construction year from 242 to 245.7. Rev. 3 was prepared for the Army Corps of Engineers (ACOE). This version of the report includes emissions specific to ACOE approvals.

1.1 Content of the Report

This report consists of four sections and two appendices. Section 2.1 presents the estimated direct and indirect VOC and NO_X emissions from construction of the project. Section 2.2 provides estimates of the indirect emissions associated with CC3 operations. Section 3 describes the methodology for the emission inventory. Technical references are provided in section 4. Appendix A contains the projected construction equipment details and hours of use for each year of construction Appendix B contains detailed emissions calculations for the direct construction equipment and indirect emissions.

Figure 1-1 Washington, DC-MD-VA and Baltimore, MD 8-hr Ozone Nonattainment Regions



★ Location of CC3

2.0 Emissions Evaluation Approach

2.1 Nuclear Regulatory Commission

Per Nuclear Regulatory Commission (NRC) regulations in 10 CFR Part 50, only certain portions of construction are considered to be under the NRC's jurisdiction. In determining the construction emissions as defined in 10 CFR Part 50.2 and Part 50.10, UniStar has developed a "Resource Utilization" approach in consultation with Bechtel. Bechtel North American Power Corporation (Bechtel) is UniStar's current project/construction engineering firm. Bechtel has developed an overall equipment list for construction of CC3 (see Appendix A). This assumption was cross-checked with actual construction schedules from two comparably-sized projects.

In this approach, construction emissions as defined by NRC are measured only from the materials associated with Safety–related structures, systems, or components (SSCs). Bulk commodity materials which are factored into the resource utilization are concrete, large and small bore hangers, small bore piping, scheduled conduit, cable tray, wire & cable, and terminations.

The evaluation of the construction and pre-construction emissions is the aggregate of non-road and on-road emissions associated with the construction of CC3. Non-road emissions are estimated using NONROAD 2008 model and on-road emissions are estimated using MOBILE 6.2 model. AECOM incorporated these two models and applied them mathematically to determine the emissions. Resource utilization is characterized as being associated with the Nuclear Island, the Turbine Island or the Balance of plant. SSC utilization can be defined as that portion of the total devoted to the Nuclear Island. Based upon the schedule, the period of safety-related construction is predicted to be 68 months beginning early in construction year 3. The calculated distribution of resource utilization during that time is distributed as follows:

Table 2-1 Resource Utilization

	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Nuclear Island	50.6%	56.1%	67.7%	82.1%	98.8%	100%
Turbine Island	2.6%	16.2%	13.7%	17.2%	1.2%	0%
Balance of Plant	46.8%	27.7%	18.6%	0.7%	0%	0%
	100%	100%	100%	100%	100%	100%

Emissions from equipment associated with safety-related activities are estimated separately from the overall emissions estimate. These are Tables B-1a and B-1b in Appendix B.

2.2 U.S. Army Corps of Engineers

Activities which are not part of the NRC-related construction or will precede the NCR related construction activities will include clearing and grubbing, grading, excavating, erection of support buildings and transmission lines, dredging, and other associated activities. These emissions are estimated in Table B-1 in Appendix B and are associated with the first two years of preconstruction.

Dredging associated with CC3 construction are considered to be the result of direct U.S. Army Corps of Engineers (USACE) action. In determining the construction emissions associated with USACE-related

dredging activities, UniStar has estimated separately those emissions from the overall emissions estimate. These are labeled as "dredging" and located in Tables B-1a, B-3b, and B-4 in Appendix B.

3.0 Emissions Estimates

3.1 Construction/Pre-Construction Emissions

Tables 3-1 and 3-2 present the total VOC and NO_X emissions estimates over the construction of the project. These are broken up into separate tables for the two ozone nonattainment regions which are affected. As seen in Figure 1-1, CC3 is located in the Washington DC-MD-VA nonattainment area, but is also close to the Baltimore nonattainment area. .

At the request of NRC, Table 3-2 presents a breakout of safety-related construction emissions as defined under 10 CFR Part 50 – Domestic Licensing for Production and Utilization Facilities. The definition of construction under 10 CFR 50.2 reads as follows:

> *Construction* or *constructing* means, for the purposes of §50.55(e), the analysis, design, manufacture, fabrication, quality assurance, placement, erection, installation, modification, inspection, or testing of a facility or activity which is subject to the regulations in this part and consulting services related to the facility or activity that are safety related.

Additional delineation of construction versus "pre-construction" activities is found under 10 CFR 50.10(a)(1) and (2) under limited work authorization. These are paraphrased below.

> (1) Activities constituting construction are the driving of piles, subsurface preparation, placement of backfill, concrete, or permanent retaining walls within an excavation, installation of foundations, or in-place assembly, erection, fabrication, or testing, which are for: safety-related structures, systems, or components (SSCs)
>
> (2) Construction does not include: Site exploration, preparation of a site for construction of a facility, including clearing of the site, grading, installation of drainage, erosion and other environmental mitigation measures, and construction of temporary roads and borrow areas; excavation; erection of support buildings building of service facilities

The level of detail to precisely breakout preconstruction and construction activities as defined by NRC is unknown at this time. Emissions reported in Table 3-2 are based on estimated equipment types expected to perform safety-related construction activities as defined in 10 CFR 50. For example groups excluded are direct or indirect emissions from motor vehicles (except concrete trucks), site preparation equipment and dredging equipment. Equipment groups included are earthmoving, compacting, cranes, forklifts, concrete/aggregate equipment, air compressors, manlifts, welding equipment, generating equipment, small capitol equipment and concrete equipment.

The equipment groups included in construction-related activities are shown in Appendix B combined with the non-safety related equipment and also separately. Since the labor (and resource) utilization is not assigned to any specific equipment, a breakdown of emissions by equipment group is not possible. Therefore, the resource utilization of the nuclear island was applied to the total estimated emissions from the safety-related construction equipment for the estimates provided in Table 3-2.

Table 3-1 CC3 Total Construction Emissions within the Washington DC-MD-VA Ozone Nonattainment Area

Year	Off-Road Diesel VOC	Off-Road Gasoline VOC	On-Road Vehicles VOC	Marine VOC	Boiler VOC	VOC (Tons)	Exceeds Conformity Threshold (Yes/No)	Off-Road Diesel NOx	Off-Road Gasoline NOx	On-Road Vehicles NOx	Marine NOx	Boiler NOx	NOx (Tons)	Exceeds Conformity Threshold (Yes/No)
1	6.0	3.8	9.2	0	0	19.1	No	83.3	0.29	9.1	0	0	92.7	No
2	7.9	3.1	17.2	0	0	28.3	No	110.0	0.3	19.6	0.0	0	129.9	Yes
3	5.3	2.1	21.8	0.45	0.05	29.7	No	79.3	1.0	29.2	8.9	4.6	122.9	Yes
4	10.8	4.1	27.8	0.11	0.05	42.8	No	163.6	2.0	35.8	2.1	4.6	208.2	Yes
5	12.5	4.8	28.7	0.11	0.05	46.1	No	190.4	2.4	46.1	2.1	4.6	245.7	Yes
6	12.4	4.7	24.3	0.11	0.05	41.6	No	188.6	2.4	37.5	2.1	4.6	235.3	Yes
7	9.8	4.7	18.1	0.11	0.00	32.6	No	147.1	2.3	23.2	2.1	0	174.8	Yes
8	5.0	3.2	8.2	0	0	16.5	No	75.7	1.5	10.9	0	0	88.1	No
9	0.6	0.6	1.1	0	0	2.2	No	8.0	0.4	1.4	0	0	9.8	No

Includes activities not defined as construction under 10 CFR 50.

Table 3-2 CC3 10 CFR 50 Construction Emissions within the Washington DC-MD-VA Ozone Nonattainment Area

Year	Off-Road Diesel VOC	Off-Road Gasoline VOC	On-Road Vehicles VOC	Marine VOC	Boiler VOC	Total VOC (Tons)	10 CFR 50 Construction Resource Utilization	10 CFR 50 Construction Emissions VOC (Tons)	Exceeds Conformity Threshold (Yes/No)
1	0	0	0	0	0	0	0.0%	0	No
2	0	0	0	0	0	0	0.0%	0	No
3	4.4	1.83	0.58	0	0	6.8	72.2%	4.9	No
4	9.6	3.59	0.67	0	0	13.9	60.5%	8.4	No
5	11.2	4.24	0.00	0	0	15.5	58.4%	9.0	No
6	11.2	4.16	0.61	0	0	16.0	80.9%	12.9	No
7	9.4	4.10	0.15	0	0	13.6	85.1%	11.6	No
8	4.9	2.71	0	0	0	7.6	100.0%	7.6	No
9	0.5	0.45	0	0	0	1.00	0.0%	0	No

Year	Off-Road Diesel NOx	Off-Road Gasoline NOx	On-Road Vehicles NOx	Marine NOx	Boiler NOx	Total NOx (Tons)	10 CFR 50 Construction Resource Utilization	10 CFR 50 Construction Emissions NOx (Tons)	Exceeds Conformity Threshold (Yes/No)
1	0	0	0	0	0	0	0.0%	0	No
2	0	0	0	0	0	0	0.0%	0	No
3	65.4	0.97	7.8	0	0	74.1	72.2%	53.5	No
4	143.9	2.04	8.1	0	0	154.0	60.5%	93.2	No
5	168.7	2.41	0.0	0	0	171.1	58.4%	99.9	No
6	168.3	2.38	6.1	0	0	176.8	80.9%	143.0	Yes
7	140.5	2.33	1.3	0	0	144.1	85.1%	122.6	Yes
8	73.8	1.50	0	0	0	75.3	100.0%	75.3	No
9	7.9	0.39	0	0	0	8.3	0.0%	0	No

As stated previously, the emissions in Table 3-2 represent the best estimate of "construction" emissions as defined by 10 CFR Part 50 and an estimate of associated resource (labor) utilization. Construction of the reactor and cooling tower are not expected to start in great capacity until Year 3. A detailed plan of construction has not yet been developed in order to specify the start of construction of individual equipment. For example, backfilling and soil compaction are considered construction so the entire group of operating earthmoving and compacting equipment is included in the emissions estimate. Other equipment groups included are compaction, cranes, forklifts, manlifts, welding equipment, concrete equipment, air compressors, pipelaying, cable laying, winches, generation equipment, and small capital equipment. Lists of diesel and gasoline equipment are presented in Appendix B, Tables B-1b and B-2b. These tables exclude some non-road engines which appear in Tables B-1a and B-2a which are not considered to be part of safety-related construction. The only on-road vehicles from Appendix B, Tables B-3a through B-3i which are assumed to be part of construction are associated with concrete/aggregates and the concrete batch plant. No marine or boiler emissions are considered to be part of safety-related construction. This is why the starting emissions of Table 3-2 are less than Table 3-1.

Based on the NRC definition of construction and estimated resource utilization by UniStar, Table 3-3 shows that the exceedances of the conformity threshold for NO_X for the years 5 through 7. This is one less year than in the previous submittal where Year 4 through Year 7 was over 100 tons of NO_X. Only non-safety related construction activities are expected to take place in Years 1, 2, and 9.

USACE related emissions are estimated to be those during the first two years of preconstruction as well as the dredging operations. Also, indirect emission from barge deliveries through the dredged areas are included.

Table 3-3 CC3 USACE Construction Emissions within the Washington DC-MD-VA Ozone Nonattainment Area

Year	Off-Road Diesel VOC	Off-Road Gasoline VOC	On-Road Vehicles VOC	Marine VOC	Boiler VOC	Total VOC (Tons)	Exceeds Conformity Threshold (Yes/No)
1	6.0	3.8	9.2	0	0	19.1	No
2	7.9	3.1	17.2	0	0	28.3	No
3	0.2	0	3.8	0.5	0	4.4	No
4	0	0	0	0.1	0	0.1	No
5	0	0	0	0.1	0	0.1	No
6	0	0	0	0.1	0	0.1	No
7	0	0	0	0.1	0	0.1	No
8	0	0	0	0	0	0	No
9	0	0	0	0	0	0	No

Year	Off-Road Diesel NOx	Off-Road Gasoline NOx	On-Road Vehicles NOx	Marine NOx	Boiler NOx	Total NOx (Tons)	Exceeds Conformity Threshold (Yes/No)
1	83.3	0.3	9.1	0	0	92.7	No
2	110.0	0.3	19.6	0	0	129.9	Yes
3	2.4	0	3.8	8.9	0	15.1	No
4	0	0	0	2.1	0	2.1	No
5	0	0	0	2.1	0	2.1	No
6	0	0	0	2.1	0	2.1	No
7	0	0	0	2.1	0	2.1	No
8	0	0	0	0	0	0	No
9	0	0	0	0	0	0	No

* Initial dredging (estimated in Year 3) comprises approximately 13.5 tons NO_X and 1.2 tons VOC. Future maintenance dredging within a 10 year period is estimated to require approximately ¼ of the original effort (3.4 tons) during any one year which is below the de-minimis threshold.

3.2 Operational Emissions

As noted in Section 1, the operational emissions from CC3 stationary sources required a permit under the PSD program. As such, these emissions are specifically excluded from the requirements for a conformity determination per the exclusion found in 40 CFR 93.153(d).

The only other emissions of NOx and VOC from CC3 operations are indirect emissions associated with vehicular emissions from employee traffic. As stated in the Phase II traffic study prepared in June 2009 (Reference 10), 363 permanent employees are expected once CC3 begins operations resulting in at most 363 additional round trips. This is very similar to the 379 round trips estimated for the construction workforce in Year 8 but well below the estimated number of peak daily round trips during construction of 3,000.

Using similar assumptions as with the construction workforce, emissions from indirect operational employee commuting are expected to be only 1.4 tons/yr of NO_X and 2.0 tons/yr of VOC in the Washington DC nonattainment area and 0.2 tons/yr of NO_X and 0.3 tons/yr of VOC in the Baltimore nonattainment area. These levels are well below the respective applicability thresholds of 100 tons/yr and 50 tons/yr.

4.0 Emission Estimation Methodology

Bechtel North American Power Corporation (Bechtel), UniStar's current project/construction engineering firm, was responsible for developing an estimate of fuel-burning equipment (non-road and on-road) needed to construct the proposed Unit 3. Bechtel provided an equipment schedule with equipment sizes and estimated annual hours of operation and as previously mentioned in Section2, this list was then used to develop a safety-related construction list of equipment. For this revision, the original construction timeline was shifted by six months. Emissions calculations based on this equipment along with indirect NO_X and VOC emissions are presented in Appendix B.

4.1 Emissions from Non-Road Equipment

Emissions from non-road equipment (mobile, portable, and stationary fuel-burning equipment) were estimated using EPA's NONROAD2008 model and methodology. Bechtel provided a study of engines with horsepower and annual hours of operation for construction of CC3. Similar to the previously submitted construction emissions from 2008, AECOM developed a spreadsheet -based approach to estimate non-road engine emissions based on the NONROAD model guidance and NONROAD model data files. This allows the emissions estimates to be thoroughly checked and allows transparency to how emissions are developed.

Applicable engine tiers for this analysis are based on the estimated usage dates and the phase-in years for engine size ranges given in Table 1 of Reference 2 for diesel engines and Tables 1 through 7 of Reference 3 for gasoline engines. The applicable SCC codes for equipment were chosen (based on engine duty and fuel type) from the list in Appendix A of Reference 4. This cross reference allowed AECOM to match equipment from Bechtel's list to the NONROAD data files which contain the steady state pollutant emission factors and load factors. Note that this methodology is slightly different than that submitted in 2008, because the NONROAD 2008 data file used here has the transient adjustment factor (TAF) built into the steady state emission factor.

The Equation involved in determining the non-road construction emissions is as follows (from Page 1 of Reference 4):

$$EF_{adj} = EFss * DF \quad \text{.....Equation 1}$$

EF_{adj} = Final emission factor used in model after adjustments to account for transient operation and deterioration (g/hp-hr)

EFss = NONROAD 2008 steady state emission factor (g/hp-hr)

DF = Deterioration factor

The deterioration factor (DF) is a function of the technology type and age of the engine.

The NONROAD methodology addresses the effects of deterioration in the engines by multiplying the steady state emission factor for each category of engine by deterioration factor (DF). The following equation (from p 19 of Reference 2 and p 3 of Reference 5) is used to calculate DF as a function of engine age

$$DF = 1 + A * (Age\ factor)^b \quad for\ Age\ Factor \leq 1 \text{.....Equation 2}$$

$$DF = 1 + A \quad for\ Age\ Factor > 1 \text{.....Equation 3}$$

Where Age factor = fraction of median life expended = (cumulative hours * load factor) / median life at full load, in hours.

A = constants for a given pollutant / technology type

b ≤ 1, for most engines or 0.5 for 2-stroke engines less than 25 Hp

Deterioration is capped at the end of an engine's median life (age factor = 1), under the assumption that an engine deteriorated to a point where any increased deterioration is offset by maintenance. For this analysis, all age factors were set to 1 ("fully deteriorated") in order to simplify the calculations.

Annual non-road emissions were estimated using the following equation from Page 1 of Reference 4

$$E_{Sta} = EF_{adj} * HP * Hours * Load\ Factor * \frac{Ton}{2000\ lb} * \frac{lb}{453.6\ g} \quad \textbf{Equation 4}$$

E_{Sta} = Annual stationary source emissions in tons

EF_{adj} = Final adjusted emission factor (g/hp-hr)

HP = Rated horsepower hp

Hours = Annual operating hours of the equipment

Load Factor = fraction of available rated power

The load factor is an adjustment included in the model to avoid grossly over counting emissions. It is the average fraction of the rated power of an engine that is expected to be actually used in annual operation. This factor takes into account idling, partial load operation, and transient operation. For instance, a 100 hp diesel powered crane has a load factor of 0.43 from the NONROAD data table based on the SCC code. This means that in normal operation, the crane is expected to use an average of 43 hp for every available 100 hp capacity. These factors are based on surveys of equipment users.

One final adjustment that is special to VOC is the conversion from total hydrocarbons (HC). The NONROAD model steady state emission factors are all in terms of HC. This is so the model has a common basis to output emissions in terms of VOC, total organic gasses (TOG), or non-methane hydrocarbons (NMHC). Reference 6 gives the conversion from HC to VOC as 1.053 for diesel engines, 1.034 for 2-stroke gasoline engines, and 0.933 for 4-stroke gasoline engines.

4.2 On-Road Vehicles

Estimation of on-road vehicular emissions was calculated with EPA's MOBILE6.2 Vehicle Emission Modeling Software. MOBILE6.2 is an emission factor model for predicting gram of emissions (VOC, and NO_X) per mile as well as other criteria and air toxic emissions from cars, trucks, and motorcycles. The MOVES model is now currently available from EPA, however the General Conformity revisions published in the Federal Register April 5, 2010 allow MOBILE6.2 to be used under the provisions of §93.159(b)(1)(ii).

> "*…. Conformity analyses for which the analysis was begun during the grace period or no more than 3 months before the* ***Federal Register*** *notice of availability of the latest emission model may continus to use the previous version of the model specified by EPA.*"

The MOVES model was made available by EPA in the Federal Register on March 2, 2010, Since the conformity analysis for CC3 was first submitted in December of 2009, well before MOVES became available, we are continuing to use the MOBILE model,

Mobile 6.2 gives emission rates in terms of grams per vehicle mile traveled. To obtain miles traveled for on-site vehicles, the estimated hours of vehicle use was multiplied by an estimated annual speed in mile/hr. Specific vehicle categories from Mobile6.2 for on-site vehicles are given in Appendix B. For employee commuting, the estimated annual number of construction employees was multiplied by a factor of 1.3 (for estimating carpooling) to get a number of vehicles. This assumption is consistent with the Phase II traffic study prepared in June 2009. Employees are assumed to have a typical daily commute which is constant for 312 working days per calendar year and have vehicles which fall into the LDGV category. The geographic breakdown was assumed to be 10% from St. Mary's County to the south and west (an attainment area for ozone), 25% from the Baltimore nonattainment area to the north, and the rest from the Washington DC-MD-VA ozone nonattainment area. The number of commercial deliveries was determined based on the expected goods to be delivered to the site during construction by truck. For this analysis, commercial deliveries are assumed to be in the HDDV8b category. Thirty percent of the commercial deliveries were assumed to come from the Baltimore nonattainment area with the balance from the Washington DC-MD-VA nonattainment area.

For indirect emissions from employee commuting and commercial deliveries, AECOM assumed a 15 year time span for the vehicle population as a reasonable estimation of typical vehicle ownership. That is, nominally beginning in 2010, the emissions model used a vehicle population mix from model years 1995-2010. This progressively increased by one year until 2018.

Fuel consumption for these vehicles is gasoline and transportation diesel as noted in Appendix B. Emissions from on-road vehicles are estimated using Equation 1.

$$E_{Mob} = VMT * EF * \frac{Ton}{2000\ lb} * \frac{lb}{453.6\ g} \quad \text{.....Equation 5}$$

E_{Mob} = On-road vehicle emissions in tons per year

VMT = Vehicle miles travelled in a year

EF = Mobile 6.2 emission factor for on road vehicles in grams/mile.

4.3 Marine Equipment

The current Calvert Cliffs Nuclear Plant has an existing barge dock on-site which UniStar plans to use for receipt of some equipment by delivery. Additionally, UniStar will be dredging some off-shore areas during the CC3 construction period. Emissions from marine equipment used in these activities are included in this emissions inventory. Ancillary on-shore equipment (such as dump trucks or cranes) related to dredging and barge deliveries are accounted for in the non-road category.

US EPA has released a final report in April 2009 describing the methodologies used for the preparation of port-related emission inventory. This report is identified as reference number 8. Equations involved in determining the emissions from the marine sources are:

$$E_{Mar} = EF_{Pol} * HP * Hours * Load\ Factor * \frac{kWh}{1.341\ HP-hr} * \frac{Ton}{2000\ lb} * \frac{lb}{453.6\ g} \quad \text{.....Equation 6}$$

Where

E_{Mar} = Annual marine emissions in tons

EF_{pol} = Emission factor in (g/kW-hr)

HP = Rated horse power (hp)

Hours = Annual operating hours

Load Factor = Fraction of available operating rated power

Emission factors, load factors, and guidance on typical engine sizes are taken from the referenced port inventory document. All of the marine dredging operations for this project occur during construction year 3 for barge dock preparation. Deliveries of materials by barge are assumed to begin in construction year 3 after dredging is completed. The dredging operations are expected to occur in a three month period, 10 hours per day, 6 days per week. Dredging is assumed to be performed by crane and dredged materials will be disposed of on-site. Deliveries of materials by barge are expected to originate at Harve de Grace, MD which is in the Baltimore nonattainment area. By ship, the distance is approximately 75 nautical miles (nm) with 18 nm assumed to occur within the state maritime zone boundaries of Calvert County and 57 nm occurring within the maritime zone boundaries of the Baltimore nonattainment area. Transportation emissions from barge deliveries were divided accordingly.

4.4 Boiler

The proposed concrete batch plant will require a small boiler (~ 20 MMBtu/hr) for the winter months to ensure the concrete does not freeze and to maintain consistency in batch preparation. The boiler is assumed to only use distillate oil for fuel. Emission factors for the boiler were taken from EPA's AP-42 document for fuel oil combustion. When operated, the boiler was assumed to operate at maximum capacity.

5.0 References

1. EPA's "MOBILE6.2 Vehicle Emission Modeling Software"

2. EPA's "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling—Compression-Ignition" NR-009c April 2004, EPA420-P-04-009.

3. EPA's "Exhaust Emission Factors for Nonroad Engine Modeling: Spark Ignition" NR-010e December 2005, EPA420-R-05-019.

4. EPA's "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling" NR-005c April 2004, EPA420-P-04-005

5. EPA's "Nonroad Spark-Ignition Engine Emission Deterioration Factors" NR-011c December 2005, EPA420-R-05-023.

6. EPA's "Conversion Factors for Hydrocarbon Emission Components" NR-002c December 2005, EPA420-R-05-015

7. EPA's "NONROAD08 Model (nonroad engines, equipment, and vehicles)"

8. US EPA / ICF International "Current Methodologies in Preparing Mobile Source Port-Related Emission inventories" Final Report April 2009.

9. EPA's AP-42 Compilation of Emission Factors, Section 3.1 Fuel Oil Combustion, 9/98

10. Traffic Impact Study at the Calvert Cliffs Nuclear Power Plant Draft Final Report, KLD Engineering, June 13, 2009 Rev. 1

Appendix A

Construction Schedule

		62	125	624	499	998	499	998	499	998	499	998	499	
4 1,872	3,744	2,808	1,404	4,680	3,120	6,240	3,120	6,240	3,120	6,240	3,120	6,240	3,120	
				3,900	4,680	9,360	4,992	9,984	5,616	11,232	6,240	12,480	5,980	
				3,432	4,888	9,776	4,992	9,984	4,992	9,984	4,992	9,984	4,992	
				2,184	3,432	6,864	3,744	7,488	3,744	7,488	3,744	7,488	2,496	
		156	312	1,872	1,248	2,496	1,248	2,496	1,248	2,496	1,248	2,496	1,248	
		468	468	1,872	2,652	5,304	3,120	6,240	3,120	6,240	2,600	5,200	1,664	
		1,123	1,123	7,300	5,241	10,483	5,241	10,483	5,241	10,483	5,179	10,358	3,432	
				1,872	2,621	5,241	3,744	7,488	3,744	7,488	3,744	7,488	3,681	
				1,123	2,059	4,118	2,995	5,990	2,995	5,990	2,995	5,990	2,433	
		374	374	1,123	2,371	4,742	3,744	7,488	3,744	7,488	3,744	7,488	2,621	
				1,497	2,371	4,742	2,995	5,990	2,995	5,990	2,995	5,990	1,872	
			234	1,872	2,340	4,680	2,808	5,616	2,808	5,616	2,808	5,616	2,808	
			234	1,872	2,340	4,680	2,808	5,616	2,808	5,616	2,808	5,616	1,872	
		194	194	1,497	1,497	2,995	1,497	2,995	1,641	3,281	1,641	3,281	1,641	
				2,246	2,080	4,160	2,995	5,990	2,995	5,990	2,995	5,990	2,609	
		156	156	2,496	4,108	8,216	4,016	8,032	4,016	8,032	4,016	8,032	4,992	
						1,684	1,497	2,995	1,497	2,995	873	1,747	374	374
2,496	4,992	2,496	1,248	5,928	11,963	23,925	17,784	35,568	18,720	37,440	18,720	37,440	8,736	
								28,080	13,508	27,016	7,904	15,808	6,448	
				5,928	5,564	11,128	6,240	12,480	6,240	12,480	6,240	12,480	2,080	
				561	530	1,061	749	1,497	749	1,497	749	1,497	749	
				62	125	249	125	249	125	249	125	249	125	
				156	312	624	312	624	312	624	312	624	312	
				312	1,664	3,328	1,872	3,744	1,872	3,744	1,872	3,744	1,196	
				1,404	2,444	4,888	2,600	5,200	2,496	4,992	1,768	3,536	1,196	
				1,404	2,444	4,888	2,600	5,200	2,496	4,992	1,222	2,444	1,092	
				312	1,352	2,704	1,352	2,704	1,352	2,704	832	1,664	468	
				936	2,288	4,576	2,496	4,992	2,496	4,992	2,028	4,056	936	
				312	1,352	2,704	1,352	2,704	1,248	2,496	780	1,560	156	
				312	624	1,248	624	1,248	624	1,248	624	624		
			187	1,123	749	1,497	749	1,497	749	1,497	749	1,497	749	1,1
				1,248	1,955	3,910	1,997	3,993	1,664	3,328	998	1,997	998	
				1,497	1,997	3,993	2,246	4,493	2,246	4,493	1,246	2,493	873	437
				1,684	2,683	5,366	2,683	5,366	2,246	4,493	2,246	4,493	936	936
				312	1,352	2,704	1,352	2,704	1,248	2,496	1,248	2,496	624	
				312	1,768	3,536	1,872	3,744	1,872	3,744	1,872	3,744	312	
				312	1,352	2,704	1,352	2,704	1,248	2,496	1,248	2,496	312	
				312	1,300	2,600	1,872	3,744	1,508	3,016	1,248	2,496	312	
		312	624	2,496	5,460	10,920	7,488	14,976	7,488	14,976	4,680	9,360	2,184	
				748	1,830	3,661	1,997	3,993	1,997	3,993	1,872	3,744	374	
		187	187	561	93	280	187							
				748	518	1,037	998	1,997	998	1,997	998	1,997	998	1,4
				2,246	2,496	4,992	2,496	4,992	2,496	4,992	2,121	4,243	998	1
				1,497	1,997	3,993	1,997	3,993	1,997	3,993	1,997	3,993		
				1,622	3,245	6,489	3,245	6,489	3,245	6,489	3,245	6,489	1,622	2,4
					5,990	11,981	8,653	17,305	7,488	14,976	5,990	1,498		
				811	2,433	4,867	3,245	6,489	3,245	6,489	3,245	6,489	2,596	3,8
					5,678	11,357	8,112	16,224	8,112	16,224	8,112	16,224	5,840	8,7
				811	1,352	2,704	3,245	6,489	3,245	6,489	3,245	6,489	2,596	3,8
				1,662	3,245	6,489	3,245	6,489	3,245	6,489	3,245	6,489	1,622	2,4
				3,744	6,864	13,728	7,488	14,976	7,488	14,976	7,488	14,976	5,616	
				1,747	4,368	8,736	5,241	10,483	5,241	10,483	5,241	10,483	4,950	
		437	437	2,620	3,203	6,406	3,494	6,989	3,494	6,989	3,494	6,989	3,349	
		437	437	2,620	4,368	8,736	10,483	20,966	15,725	31,449	16,161	32,323	7,134	
		437	437	2,620	3,203	6,406	3,494	6,989	3,494	6,989	3,494	6,989	3,203	
				873	1,456	2,912	3,494	6,989	3,494	6,989	3,494	6,989	3,057	
				748	3,245	6,489	4,493	8,985	4,493	8,985	4,493	8,985	4,368	
				624	1,872	3,744	2,496	4,992	2,496	4,992	2,496	4,992	1,248	
				3,369	5,865	11,731	7,488	14,976	7,488	14,976	7,488	14,976	7,363	
				748	3,245	6,489	4,493	8,985	4,493	8,985	4,493	8,985	4,493	6,7
				8,424	11,232	22,464	11,232	22,464	11,232	22,464	11,232	22,464	5,304	
				7,956	13,416	26,832	14,976	29,952	14,976	29,952	14,976	29,952	5,928	
						2,096	1,797	3,593	1,397	2,795	499	998		
		312	312			624 312	624	312						
		312	312	936	1,300	2,600	1,404	2,808	1,872	3,744	494	988		
				780	390	780	312	468						
		624	624	3,744	2,652	5,304	3,120	6,240	3,120	6,240	3,120	6,240	3,068	
				1,248	2,184	4,368	3,120	6,240	3,120	6,240	3,120	6,240	2,964	
				624	2,704	5,408	3,744	7,488	3,744	7,488	3,744	7,488	3,640	
				624	2,704	5,408	3,744	7,488	3,744	7,488	3,744	7,488	3,640	

					1,996		4,992	9,984		4,992	9,984	4,992	9,984	4,992	9,984	4,039	7
					2,995		4,992	9,984		4,992	9,984	4,992	9,984	4,992	9,984	3,744	
	873	1,747	873	437	3,057		5,023	10,046		5,241	10,483	5,241	10,483	5,241	10,483	4,805	
						436	1,601	3,203		1,747	3,494	1,747	3,494	1,747	3,494	1,747	
							1,601	3,203		1,747	3,494	1,747	3,494	1,747	3,494	1,747	
							2,184	4,368		2,621	5,241	2,621	5,241	2,621	5,241	2,621	
					2,839		4,292	8,584		4,368	8,736	4,368	8,736	4,368	8,736	4,368	
						873	2,766	5,533		3,494	6,989	3,494	6,989	3,494	6,989	3,494	
					8,798		17,534	35,069		27,269	54,537	27,696	55,392	7,776	15,552	12,480	
									748	5,990	11,981	7,488	14,976	7,488	14,976	2,184	
									374	3,993	7,987	5,241	10,483	5,241	10,483	3,120	
									2,995	3,744	7,488	3,744	7,488	3,744	7,488	3,557	
									1,497	1,497	2,995	1,497	2,995	1,497	2,995	1,497	
											3,931	7,925	15,849	11,169	22,339	5,768	
						748	1,872	3,744		2,246	4,493	2,246	4,493	2,246	4,493		
						748	1,872	3,744		2,246	4,493	2,246	4,493	2,246	4,493	2,246	
										749	1,497	749	1,497	749	1,497	749	
									2,246	2,246	4,493	2,246	4,493	2,246	4,493	2,246	
									1,497	1,497	2,995	1,497	2,995	1,497	2,995	1,497	
				936	9,594		11,232	22,464		11,232	22,464	11,232	22,464	11,232	22,464	11,232	
					2,340		4,212	8,424		5,616	11,232	5,616	11,232	5,616	11,232	5,616	
					2,808		5,460	10,920		7,488	14,976	7,488	14,976	7,488	14,976	7,254	
					4,212		7,254	14,508		10,218	20,436	9,896	19,792	10,296	20,592	13,173	
					5,850		11,622	23,244		16,614	33,228	16,848	33,696	16,848	33,696	15,834	
						468	702	1,404		702	1,404	702	1,404	702	1,404	702	1,0
						936	1,872	3,744		1,872	3,744	1,872	3,744	1,872	3,744	1,872	
						936	2,340	4,680		2,808	5,616	2,808	5,616	2,808	5,616	2,808	
					2,808		5,460	10,920		7,488	14,976	7,488	14,976	7,488	14,976	6,444	
						468	1,716	3,432		1,872	3,744	1,872	3,744	1,872	3,744	1,872	
						468	1,716	3,432		1,872	3,744	1,872	3,744	1,872	3,744	1,872	
						702	2,340	4,680		2,808	5,616	2,808	5,616	2,808	5,616	2,808	
						468	1,716	3,432		1,872	3,744	1,872	3,744	1,872	3,744	1,872	
					2,808		4,836	9,672		7,488	14,976	7,488	14,976	7,488	14,976	6,444	
					2,808		4,836	9,672		7,488	14,976	7,488	14,976	7,488	14,976	6,444	
			468	936	4,914		5,382	10,764		5,616	11,232	5,616	11,232	3,900	7,800	3,744	5,6
			468	936	4,914		5,382	10,764		5,616	11,232	5,616	11,232	3,900	7,800	3,744	5,6
				702	5,148		7,956	15,912		11,154	22,308	11,232	22,464	11,232	22,464	10,951	16,4
					4,914		5,538	11,076		10,218	20,436	13,229	26,459	10,296	20,592	10,150	
					6,240		4,160	8,320		4,160	8,320	4,160	8,320	4,160	3,120		
				1,040	1,040		1,040	2,080		1,040	2,080	1,040	2,080	1,040			
					6,240		4,160	8,320		4,160	8,320	4,160	8,320	4,160	3,120		
					37,440		24,960	49,920		24,960	49,920	24,960	49,920	24,960	18,720		
)	3,120	6,240	2,340														
)	2,080	4,160	1,560														
0	15,600	19,500															
)	2,080	2,600															
)	6,240	12,480	4,680														
)	3,120	6,240															
)	2,080	4,160															
)	3,120	6,240															
)	6,240	12,480															
)	6,240	12,480															
)	8,320	16,640															
)	6,240	12,480															
)	2,080	4,160															
)	4,160	8,320	3,120														
)	2,080	2,080															
)	3,120	6,240	2,340														
)	3,120	6,240	2,340														
)	2,080	4,160	1,560														
0	15,600	31,200	11,700														
)	3,120	6,240	3,120	780													
)	3,120	3,120															
)	4,160	1,040															
)	2,080	2,080															
)	3,120	3,120															
)																	
	1,040	1,040															
)	4,160	8,320															
)	3,120	6,240	3,120	1,560													
0	22,880	45,760	17,160														

Appendix B

Emissions Calculations

2270003030	Diesel	T3	85	0	0	468	936	936	936	936	967	515	0.408	0.18	3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	105	0	0	1976	5200	5616	5616	4940	2892	125	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	210	0	0	3848	7488	7696	6760	4732	2704	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	307	0	0	3848	7488	7696	6214	3536	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T4	30	0	0	1664	4056	4056	3536	2132	0	0	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	268	0	0	3224	7072	7488	7020	4992	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T4	321	0	0	1664	4056	3952	3276	1716	0	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T4	404	0	0	936	1872	1872	1872	624	0	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T4	426	0	0	2059	2246	2246	2246	2246	1123	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002048	Diesel	T3	135	0	0	3203	5907	5657	4326	2995	2995	249.6	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	80	0	0	3494	6239	6739	5739	3366	437	0	0.481	0.42	3.64	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	174	0	0	4367	8049	7612	6739	5429	936	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002072	Diesel	T4	75	0	0	1664	4056	3952	3744	3120	0	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	199	0	0	2080	5408	5616	5616	4056	0	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T4	349	0	0	1664	4056	3952	3744	2808	0	0	0.433	0.13	2.5	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	224	0	0	1612	4472	5252	4264	2808	0	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002051	Diesel	T4	302	0	312	8580	18408	22464	19656	11544	0	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002075	Diesel	T3	115	0	0	2578	5658	5990	5865	4118	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	339	0	0	1266	2035	2995	2995	2995	1498	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T3	185	0	0	4742	7488	7488	7113	5241	1747	0	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	510	0	0	3494	5990	5990	5990	3993	0	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	340	0	0	4867	9734	9734	9734	8111	2434	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	330	0	0	5990	20634	24793	20966	1497.6	0	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	340	0	0	3244	8112	9734	9734	9085	3893	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	340	0	0	5678	19469	24336	24336	22064	8761	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	600	0	0	2163	5949	9734	9734	9085	3893	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	600	0	0	4907	9734	9734	9734	8111	2434	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	500	0	0	10608	21216	22464	22464	20592	11232	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	152	0	0	6115	13977	15724	15724	15433	10899	749	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	174	0	437	6260	9900	10483	10483	10338	7945	936	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	215	0	437	7425	19219	36691	47610	39457	15517	936	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	250	0	437	6260	9900	10483	10483	10192	6406	0	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	250	0	0	2329	6406	10483	10483	7046	6864	561	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	142	0	0	3993	10982	13478	13478	13371	11731	2246	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	290	0	0	2496	6240	7488	7488	6240	3744	936	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	89	0	0	3993	10982	13478	13478	13478	6739	0	0.412	0.19	3.13	0.59	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	113	0	0	19656	33696	33696	33696	27768	11076	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	110	0	0	21372	41808	44928	44928	35880	14664	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	28	0	0	0	6738	19469	22464	17160	4368	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	65	0	0	0	4367	13228	15724	13603	6240	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	48	0	0	0	6739	11232	11232	11045	9359	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	48	0	0	0	2994	4492	4492	4492	4118	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	78	0	0	0	0	11856	27018	28107	13409	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	70	0	0	2620	5990	6739	6739	4493	0	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	75	0	0	2620	5990	6739	6739	6739	4493	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	28	0	0	0	749	2246	2246	2246	2246	749	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	32	0	0	0	4492	6739	6739	6739	6312	1364	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270006025	Diesel	T4	26	0	0	8736	14976	14976	14976	14023	7068	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270006025	Diesel	T4	35	0	0	6988	14976	14976	14976	14023	7068	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270006025	Diesel	T4	48	0	0	7987	14976	14976	14976	13728	7862	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270002039	Diesel	T4	80	0	0	0	3893	4990	3294	998	0	0	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	80	0	624	7020	8424	9360	9360	9308	8454	1738	0.408	0.3672	4.7	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	115	0	0	3432	7488	9360	9360	9204	8067	1605	0.367	0.1836	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	275	0	0	3328	9152	11232	11232	11128	9776	1872	0.367	0.1836	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	275	0	0	3328	9152	11232	11232	11128	9776	1872	0.367	0.1836	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T4	310	0	0	2496	6240	7488	7488	7488	6775	1337	0.367	0.1314	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002030	Diesel	T4	51	0	187	841	0	0	0	0	468	0	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.

0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.06	0.11	0.11	0.11	0.11	0.12	0.06
0.00	0.00	0.03	0.07	0.08	0.08	0.07	0.04	0.00	0.00	0.00	0.36	0.93	1.01	1.01	0.89	0.52	0.02
0.00	0.00	0.11	0.21	0.22	0.19	0.13	0.08	0.00	0.00	0.00	1.38	2.69	2.77	2.43	1.70	0.97	0.00
0.00	0.00	0.14	0.27	0.28	0.23	0.13	0.00	0.00	0.00	0.00	2.02	3.93	4.04	3.26	1.86	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.10	0.24	0.24	0.21	0.13	0.00	0.00
0.00	0.00	0.12	0.25	0.27	0.25	0.18	0.00	0.00	0.00	0.00	1.48	3.24	3.43	3.22	2.29	0.00	0.00
0.00	0.00	0.05	0.12	0.12	0.10	0.05	0.00	0.00	0.00	0.00	0.88	2.13	2.08	1.72	0.90	0.00	0.00
0.00	0.00	0.03	0.07	0.07	0.07	0.02	0.00	0.00	0.00	0.00	0.62	1.24	1.24	1.24	0.41	0.00	0.00
0.00	0.00	0.08	0.09	0.09	0.09	0.09	0.04	0.00	0.00	0.00	1.44	1.57	1.57	1.57	1.57	0.78	0.00
0.00	0.00	0.06	0.11	0.10	0.08	0.05	0.05	0.00	0.00	0.00	0.74	1.36	1.31	1.00	0.69	0.69	0.06
0.00	0.00	0.03	0.05	0.06	0.05	0.03	0.00	0.00	0.00	0.00	0.24	0.42	0.46	0.39	0.23	0.03	0.00
0.00	0.00	0.08	0.15	0.14	0.12	0.10	0.02	0.00	0.00	0.00	0.54	0.99	0.94	0.83	0.67	0.12	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.09	0.21	0.21	0.20	0.16	0.00	0.00
0.00	0.00	0.04	0.11	0.12	0.12	0.08	0.00	0.00	0.00	0.00	0.29	0.76	0.79	0.79	0.57	0.00	0.00
0.00	0.00	0.02	0.05	0.04	0.04	0.03	0.00	0.00	0.00	0.00	0.34	0.83	0.80	0.76	0.57	0.00	0.00
0.00	0.00	0.04	0.11	0.12	0.10	0.07	0.00	0.00	0.00	0.00	0.26	0.71	0.83	0.68	0.44	0.00	0.00
0.00	0.01	0.24	0.51	0.62	0.54	0.32	0.00	0.00	0.00	0.15	4.25	9.11	11.12	9.73	5.71	0.00	0.00
0.00	0.00	0.04	0.09	0.09	0.09	0.06	0.00	0.00	0.00	0.00	0.51	1.11	1.18	1.15	0.81	0.00	0.00
0.00	0.00	0.03	0.05	0.07	0.07	0.07	0.03	0.00	0.00	0.00	0.51	0.82	1.21	1.21	1.21	0.61	0.00
0.00	0.00	0.08	0.13	0.13	0.12	0.09	0.03	0.00	0.00	0.00	1.05	1.65	1.65	1.57	1.16	0.39	0.00
0.00	0.00	0.12	0.20	0.20	0.20	0.14	0.00	0.00	0.00	0.00	2.13	3.65	3.65	3.65	2.43	0.00	0.00
0.00	0.00	0.11	0.22	0.22	0.22	0.18	0.06	0.00	0.00	0.00	1.98	3.95	3.95	3.95	3.29	0.99	0.00
0.00	0.00	0.13	0.45	0.55	0.46	0.03	0.00	0.00	0.00	0.00	2.36	8.13	9.77	8.26	0.59	0.00	0.00
0.00	0.00	0.07	0.18	0.22	0.22	0.21	0.09	0.00	0.00	0.00	1.32	3.29	3.95	3.95	3.69	1.58	0.00
0.00	0.00	0.13	0.44	0.55	0.55	0.50	0.20	0.00	0.00	0.00	2.31	7.91	9.88	9.88	8.96	3.56	0.00
0.00	0.00	0.09	0.24	0.39	0.39	0.36	0.16	0.00	0.00	0.00	1.55	4.26	6.98	6.98	6.51	2.79	0.00
0.00	0.00	0.20	0.39	0.39	0.39	0.32	0.10	0.00	0.00	0.00	3.52	6.98	6.98	6.98	5.81	1.74	0.00
0.00	0.00	0.35	0.71	0.75	0.75	0.69	0.37	0.00	0.00	0.00	6.34	12.67	13.42	13.42	12.30	6.71	0.00
0.00	0.00	0.09	0.20	0.22	0.22	0.22	0.15	0.01	0.00	0.00	1.11	2.54	2.85	2.85	2.80	1.98	0.14
0.00	0.01	0.10	0.16	0.17	0.17	0.17	0.13	0.02	0.00	0.09	1.30	2.06	2.18	2.18	2.15	1.65	0.19
0.00	0.01	0.15	0.38	0.73	0.94	0.78	0.31	0.02	0.00	0.11	1.91	4.94	9.42	12.23	10.13	3.98	0.24
0.00	0.01	0.14	0.23	0.24	0.24	0.24	0.15	0.00	0.00	0.13	1.87	2.96	3.13	3.13	3.04	1.91	0.00
0.00	0.00	0.05	0.15	0.24	0.24	0.16	0.16	0.01	0.00	0.00	0.70	1.91	3.13	3.13	2.10	2.05	0.17
0.00	0.00	0.08	0.21	0.26	0.26	0.25	0.22	0.04	0.00	0.00	0.97	2.67	3.27	3.27	3.25	2.85	0.55
0.00	0.00	0.07	0.17	0.20	0.20	0.17	0.10	0.03	0.00	0.00	0.86	2.16	2.59	2.59	2.16	1.30	0.32
0.00	0.00	0.05	0.13	0.16	0.16	0.16	0.08	0.00	0.00	0.00	0.73	2.01	2.46	2.46	2.46	1.23	0.00
0.00	0.00	0.30	0.51	0.51	0.51	0.42	0.17	0.00	0.00	0.00	3.80	6.51	6.51	6.51	5.37	2.14	0.00
0.00	0.00	0.31	0.61	0.66	0.66	0.53	0.22	0.00	0.00	0.00	4.02	7.87	8.46	8.46	6.75	2.76	0.00
0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.13	0.38	0.44	0.34	0.09	0.00
0.00	0.00	0.00	0.01	0.03	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.20	0.60	0.72	0.62	0.28	0.00
0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.23	0.38	0.38	0.37	0.31	0.00
0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.10	0.15	0.15	0.15	0.14	0.00
0.00	0.00	0.00	0.00	0.03	0.07	0.07	0.03	0.00	0.00	0.00	0.00	0.00	0.65	1.48	1.53	0.73	0.00
0.00	0.00	0.01	0.01	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.13	0.29	0.33	0.33	0.22	0.00	0.00
0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.14	0.31	0.35	0.35	0.35	0.24	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.04	0.04	0.04	0.01
0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.10	0.15	0.15	0.15	0.14	0.03
0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.16	0.27	0.27	0.27	0.26	0.13	0.00
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.17	0.37	0.37	0.37	0.34	0.17	0.00
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.27	0.50	0.50	0.50	0.46	0.26	0.00
0.00	0.00	0.00	0.03	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.61	0.79	0.52	0.16	0.00	0.00
0.00	0.01	0.11	0.13	0.14	0.14	0.14	0.13	0.03	0.00	0.11	1.26	1.51	1.68	1.68	1.67	1.52	0.31
0.00	0.00	0.04	0.08	0.10	0.10	0.10	0.09	0.02	0.00	0.00	0.47	1.03	1.29	1.29	1.26	1.11	0.22
0.00	0.00	0.09	0.24	0.29	0.29	0.29	0.25	0.05	0.00	0.00	1.09	3.01	3.69	3.69	3.66	3.21	0.61
0.00	0.00	0.09	0.24	0.29	0.29	0.29	0.25	0.05	0.00	0.00	1.09	3.01	3.69	3.69	3.66	3.21	0.61
0.00	0.00	0.05	0.13	0.16	0.16	0.16	0.14	0.03	0.00	0.00	0.92	2.31	2.77	2.77	2.77	2.51	0.50
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.00	0.00	0.00	0.00	0.05	0.00

2270006005	Diesel	T3	86	0	0	2037	4950	5241	5241	5241	5241	1310	0.408	0.18	3	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	345	0	0	1601	4950	5241	5241	5241	5241	1310	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	200	0	0	2184	6989	7862	7862	7862	7362	1591	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T3	143	0	0	7131	12952	13104	13104	13104	12230	2621	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T3	143	0	0	3639	9027	10483	10483	10483	9734	2059	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	14	0	0	26332	62338	82233	63168	28032	36727	8825	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	8	0	0	21762	33696	33696	33696	33696	29113	4987	0.408	0.13	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	15	0	0	6552	14040	16848	16848	16848	15377	3109	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	19	0	0	8268	18408	22464	22464	22230	21862	5516	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	11	0	0	17472	39858	50076	50544	49530	42900	8424	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270006010	Diesel	T4	7	0	0	2184	5304	5616	5616	5616	5616	1404	0.408	0.5508	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270006010	Diesel	T4	15	0	0	2184	5304	5616	5616	5616	5616	1404	0.408	0.438	4.4399	0.43	1	0.027	0.008	1.027	1.008	0.
2270002039	Diesel	T4	65	0	0	3042	7488	8424	8424	8424	7889	1705	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.
2270002006	Diesel	T4	3	0	0	7644	17160	22464	22464	21420	18237	4011	0.408	0.13	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002006	Diesel	T4	3	0	0	7644	17160	22464	22464	21420	18237	4011	0.408	0.13	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270006010	Diesel	T4	24	0	0	10452	21294	33665	36755	30742	27387	5315	0.408	0.438	4.4399	0.43	1	0.027	0.008	1.027	1.008	0.
2270002081	Diesel	T4	470	0	0	10400	12480	12480	12480	3120	0	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	80	0	0	10400	12480	12480	12480	3120	0	0	0.481	0.42	3.64	0.21	1	0.027	0.008	1.027	1.008	0.
2270001030	Diesel	T4	10	5460	8580	0	0	0	0	0	0	0	0.408	0.5508	4.3	0.42	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	124	3640	5720	0	0	0	0	0	0	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270004066	Diesel	T4	75	3640	2600	0	0	0	0	0	0	0	0.408	0.1314	3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T3	354	10920	17160	0	0	0	0	0	0	0	0.367	0.17	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T4	55	5460	6240	0	0	0	0	0	0	0	0.408	0.1314	3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	96	3640	4160	0	0	0	0	0	0	0	0.412	0.19	3.13	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	145	5460	6240	0	0	0	0	0	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	308	10920	12480	0	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	250	10920	12480	0	0	0	0	0	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	380	14560	16640	0	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	513	10920	12480	0	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	258	3640	4160	0	0	0	0	0	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T3	80	7280	11440	0	0	0	0	0	0	0	0.408	0.18	3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002048	Diesel	T3	259	3640	2080	0	0	0	0	0	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002060	Diesel	T3	168	5460	3120	0	0	0	0	0	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002018	Diesel	T3	181	7280	1040	0	0	0	0	0	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T4	75	3640	2080	0	0	0	0	0	0	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	189	5460	3120	0	0	0	0	0	0	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002030	Diesel	T3	450	1560	0	0	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270004066	Diesel	T3	200	1820	1040	0	0	0	0	0	0	0	0.367	0.1836	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002051	Diesel	T3	325	5460	9360	1560	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002051	Diesel	T3	469	40040	62920	0	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	345	0	720	0	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	247	0	720	0	0	0	0	0	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	200	0	1440	0	0	0	0	0	0	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T4	66	0	720	0	0	0	0	0	0	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T3	99	0	720	0	0	0	0	0	0	0	0.408	0.18	3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	300	0	1440	0	0	0	0	0	0	0	0.367	0.17	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006025	Diesel	T4	33	0	4320	0	0	0	0	0	0	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270002081	Diesel	T3	548	0	720	0	0	0	0	0	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270001030	Diesel	T4	10	0	2160	0	0	0	0	0	0	0	0.408	0.5508	4.3	0.42	1	0.027	0.008	1.027	1.008	0.

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009.
EFss from NMIM/NONROAD08 have transient adjustment factors built in.

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.
Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for desel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Adjusted EF = Efss * TAF * DF (as stated in Note 2, EFss have TAFs built in)

0.00	0.00	0.02	0.04	0.04	0.04	0.04	0.04	0.01	0.00	0.00	0.25	0.61	0.65	0.65	0.65	0.65	0.16	
0.00	0.00	0.04	0.11	0.12	0.12	0.12	0.12	0.03	0.00	0.00	0.66	2.04	2.16	2.16	2.16	2.16	0.54	
0.00	0.00	0.03	0.09	0.10	0.10	0.10	0.10	0.02	0.00	0.00	0.52	1.67	1.88	1.88	1.88	1.76	0.38	
0.00	0.00	0.09	0.17	0.17	0.17	0.17	0.16	0.03	0.00	0.00	1.22	2.21	2.24	2.24	2.24	2.09	0.45	
0.00	0.00	0.05	0.12	0.14	0.14	0.14	0.13	0.03	0.00	0.00	0.62	1.54	1.79	1.79	1.79	1.66	0.35	
0.00	0.00	0.02	0.06	0.08	0.06	0.03	0.03	0.01	0.00	0.00	0.78	1.85	2.44	1.88	0.83	1.09	0.26	
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.36	0.55	0.55	0.55	0.55	0.48	0.08	
0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.21	0.45	0.54	0.54	0.54	0.49	0.10	
0.00	0.00	0.01	0.02	0.03	0.03	0.03	0.03	0.01	0.00	0.00	0.33	0.74	0.91	0.91	0.90	0.88	0.22	
0.00	0.00	0.01	0.03	0.04	0.04	0.04	0.03	0.01	0.00	0.00	0.41	0.93	1.17	1.18	1.16	1.00	0.20	
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.03	0.08	0.08	0.08	0.08	0.08	0.02	
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.07	0.17	0.18	0.18	0.18	0.18	0.04	
0.00	0.00	0.02	0.04	0.05	0.05	0.05	0.05	0.01	0.00	0.00	0.39	0.96	1.08	1.08	1.08	1.01	0.22	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.11	0.14	0.14	0.13	0.11	0.02	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.11	0.14	0.14	0.13	0.11	0.02	
0.00	0.00	0.06	0.11	0.18	0.20	0.17	0.15	0.03	0.00	0.00	0.53	1.08	1.71	1.87	1.57	1.39	0.27	
0.00	0.00	0.45	0.54	0.54	0.54	0.13	0.00	0.00	0.00	0.00	8.01	9.61	9.61	9.61	2.40	0.00	0.00	
0.00	0.00	0.09	0.10	0.10	0.10	0.03	0.00	0.00	0.00	0.00	0.71	0.85	0.85	0.85	0.21	0.00	0.00	
0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.05	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.34	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.62	7.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.11	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	1.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.40	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.75	6.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.36	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.67	5.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.66	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.47	10.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.67	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.59	10.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.13	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	1.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.13	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.12	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.18	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.11	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.21	0.36	0.06	0.00	0.00	0.00	0.00	0.00	0.00	3.04	5.20	0.87	0.00	0.00	0.00	0.00	0.00	0.00	
2.25	3.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	32.13	50.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
6.01	**7.88**	**5.26**	**10.75**	**12.48**	**12.39**	**9.76**	**5.05**	**0.55**	**83.29**	**110.01**	**79.27**	**163.56**	**190.42**	**188.62**	**147.13**	**75.70**	**8.00**	**Total construction sum**
0.00	**0.00**	**3.79**	**8.18**	**9.52**	**9.41**	**7.35**	**3.07**	**0.14**	**0.00**	**0.00**	**56.75**	**123.69**	**144.55**	**142.68**	**110.90**	**45.99**	**1.80**	**10 CFR 50 construction total**
6.01	**7.88**	**1.46**	**2.57**	**2.96**	**2.98**	**2.41**	**1.97**	**0.41**	**83.29**	**110.01**	**22.52**	**39.87**	**45.87**	**45.94**	**36.22**	**29.71**	**6.20**	**USACE construction total**

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009.
EFss from NMIM/NONROAD08 have transient adjustment factors built in.

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.
Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for desel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Adjusted EF = Efss * TAF * DF (as stated in Note 2, EFss have TAFs built in)

2270002069	Diesel	T3	105	0	0	1976	5200	5616	5616	4940	2892	125	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	210	0	0	3848	7488	7696	6760	4732	2704	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T3	307	0	0	3848	7488	7696	6214	3536	0	0	0.371	0.17	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T4	30	0	0	1664	4056	4056	3536	2132	0	0	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T3	268	0	0	3224	7072	7488	7020	4992	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T4	321	0	0	1664	4056	3952	3276	1716	0	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002036	Diesel	T4	404	0	0	936	1872	1872	1872	624	0	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002069	Diesel	T4	426	0	0	2059	2246	2246	2246	2246	1123	0	0.371	0.13	2.5	0.59	1	0.027	0.008	1.027	1.008	0.
2270002048	Diesel	T3	135	0	0	3203	5907	5657	4326	2995	2995	250	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	80	0	0	3494	6239	6739	5739	3366	437	0	0.481	0.42	3.64	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	174	0	0	4367	8049	7612	6739	5429	936	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002072	Diesel	T4	75	0	0	1664	4056	3952	3744	3120	0	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	199	0	0	2080	5408	5616	5616	4056	0	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T4	349	0	0	1664	4056	3952	3744	2808	0	0	0.433	0.13	2.5	0.21	1	0.027	0.008	1.027	1.008	0.
2270002066	Diesel	T3	224	0	0	1612	4472	5252	4264	2808	0	0	0.433	0.42	3.03	0.21	1	0.027	0.008	1.027	1.008	0.
2270002075	Diesel	T3	115	0	0	2578	5658	5990	5865	4118	0	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	339	0	0	1266	2035	2995	2995	2995	1498	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T3	185	0	0	4742	7488	7488	7113	5241	1747	0	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	510	0	0	3494	5990	5990	5990	3993	0	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	340	0	0	4867	9734	9734	9734	8517	2028	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	330	0	0	5990	20634	24793	20966	1497.6	0	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	340	0	0	3244	8112	9734	9734	9734	3245	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	340	0	0	5678	19469	24336	24336	23525	7301	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	600	0	0	2163	5949	9734	9734	9734	3245	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	600	0	0	4907	9734	9734	9734	8517	2028	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T4	500	0	0	10608	21216	22464	22464	20592	11232	0	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	152	0	0	6115	13977	15724	15724	15433	10899	749	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	174	0	437	6260	9900	10483	10483	10338	7945	936	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	215	0	437	7425	19219	36691	47610	39457	15517	936	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	250	0	437	6260	9900	10483	10483	10192	6406	0	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	250	0	0	2329	6406	10483	10483	7046	6864	561	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	142	0	0	3993	10982	13478	13478	13371	11731	2246	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270002045	Diesel	T3	290	0	0	2496	6240	7488	7488	6240	3744	936	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	89	0	0	3993	10982	13478	13478	13478	6739	0	0.412	0.19	3.13	0.59	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	113	0	0	19656	33696	33696	33696	27768	11076	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270003020	Diesel	T3	110	0	0	21372	41808	44928	44928	35880	14664	0	0.371	0.19	2.61	0.59	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	28	0	0	0	6738	19469	22464	17160	4368	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	65	0	0	0	4367	13228	15724	13603	6240	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	48	0	0	0	6739	11232	11232	11045	9359	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	48	0	0	0	2994	4492	4492	4492	4118	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	78	0	0	0	0	11856	27018	28107	13409	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	70	0	0	2620	5990	6739	6739	4493	0	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	75	0	0	2620	5990	6739	6739	6739	4493	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	28	0	0	0	749	2246	2246	2246	2246	749	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270003010	Diesel	T4	32	0	0	0	4492	6739	6739	6739	6312	1364	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270006025	Diesel	T4	26	0	0	8736	14976	14976	14976	14023	7068	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270006025	Diesel	T4	35	0	0	6988	14976	14976	14976	14023	7068	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270006025	Diesel	T4	48	0	0	7987	14976	14976	14976	13728	7862	0	0.481	0.13	3	0.21	1	0.027	0.008	1.027	1.008	0.
2270002039	Diesel	T4	80	0	0	0	3893	4990	3294	998	0	0	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	80	0	624	7020	8424	9360	9360	9308	8454	1738	0.408	0.3672	4.7	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	115	0	0	3432	7488	9360	9360	9204	8067	1605	0.367	0.1836	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	275	0	0	3328	9152	11232	11232	11128	9776	1872	0.367	0.1836	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T3	275	0	0	3328	9152	11232	11232	11128	9776	1872	0.367	0.1836	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006015	Diesel	T4	310	0	0	2496	6240	7488	7488	7488	6775	1337	0.367	0.1314	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270002030	Diesel	T4	51	0	187	841	0	0	0	0	468	0	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.
2270002081	Diesel	T4	30	0	0	0	3993	4492	4492	4492	3619	0	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.

0.00	0.00	0.03	0.07	0.08	0.08	0.07	0.04	0.00	0.00	0.00	0.36	0.93	1.01	1.01	0.89	0.52	0.02
0.00	0.00	0.11	0.21	0.22	0.19	0.13	0.08	0.00	0.00	0.00	1.38	2.69	2.77	2.43	1.70	0.97	0.00
0.00	0.00	0.14	0.27	0.28	0.23	0.13	0.00	0.00	0.00	0.00	2.02	3.93	4.04	3.26	1.86	0.00	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.10	0.24	0.24	0.21	0.13	0.00	0.00
0.00	0.00	0.12	0.25	0.27	0.25	0.18	0.00	0.00	0.00	0.00	1.48	3.24	3.43	3.22	2.29	0.00	0.00
0.00	0.00	0.05	0.12	0.12	0.10	0.05	0.00	0.00	0.00	0.00	0.88	2.13	2.08	1.72	0.90	0.00	0.00
0.00	0.00	0.03	0.07	0.07	0.07	0.02	0.00	0.00	0.00	0.00	0.62	1.24	1.24	1.24	0.41	0.00	0.00
0.00	0.00	0.08	0.09	0.09	0.09	0.09	0.04	0.00	0.00	0.00	1.44	1.57	1.57	1.57	1.57	0.78	0.00
0.00	0.00	0.06	0.11	0.10	0.08	0.05	0.05	0.00	0.00	0.00	0.74	1.36	1.31	1.00	0.69	0.69	0.06
0.00	0.00	0.03	0.05	0.06	0.05	0.03	0.00	0.00	0.00	0.00	0.24	0.42	0.46	0.39	0.23	0.03	0.00
0.00	0.00	0.08	0.15	0.14	0.12	0.10	0.02	0.00	0.00	0.00	0.54	0.99	0.94	0.83	0.67	0.12	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.09	0.21	0.21	0.20	0.16	0.00	0.00
0.00	0.00	0.04	0.11	0.12	0.12	0.08	0.00	0.00	0.00	0.00	0.29	0.76	0.79	0.79	0.57	0.00	0.00
0.00	0.00	0.02	0.05	0.04	0.04	0.03	0.00	0.00	0.00	0.00	0.34	0.83	0.80	0.76	0.57	0.00	0.00
0.00	0.00	0.04	0.11	0.12	0.10	0.07	0.00	0.00	0.00	0.00	0.26	0.71	0.83	0.68	0.44	0.00	0.00
0.00	0.00	0.04	0.09	0.09	0.09	0.06	0.00	0.00	0.00	0.00	0.51	1.11	1.18	1.15	0.81	0.00	0.00
0.00	0.00	0.03	0.05	0.07	0.07	0.07	0.03	0.00	0.00	0.00	0.51	0.82	1.21	1.21	1.21	0.61	0.00
0.00	0.00	0.08	0.13	0.13	0.12	0.09	0.03	0.00	0.00	0.00	1.05	1.65	1.65	1.57	1.16	0.39	0.00
0.00	0.00	0.12	0.20	0.20	0.20	0.14	0.00	0.00	0.00	0.00	2.13	3.65	3.65	3.65	2.43	0.00	0.00
0.00	0.00	0.11	0.22	0.22	0.22	0.19	0.05	0.00	0.00	0.00	1.98	3.95	3.95	3.95	3.46	0.82	0.00
0.00	0.00	0.13	0.45	0.55	0.46	0.03	0.00	0.00	0.00	0.00	2.36	8.13	9.77	8.26	0.59	0.00	0.00
0.00	0.00	0.07	0.18	0.22	0.22	0.22	0.07	0.00	0.00	0.00	1.32	3.29	3.95	3.95	3.95	1.32	0.00
0.00	0.00	0.13	0.44	0.55	0.55	0.53	0.17	0.00	0.00	0.00	2.31	7.91	9.88	9.88	9.55	2.97	0.00
0.00	0.00	0.09	0.24	0.39	0.39	0.39	0.13	0.00	0.00	0.00	1.55	4.26	6.98	6.98	6.98	2.33	0.00
0.00	0.00	0.20	0.39	0.39	0.39	0.34	0.08	0.00	0.00	0.00	3.52	6.98	6.98	6.98	6.10	1.45	0.00
0.00	0.00	0.35	0.71	0.75	0.75	0.69	0.37	0.00	0.00	0.00	6.34	12.67	13.42	13.42	12.30	6.71	0.00
0.00	0.00	0.09	0.20	0.22	0.22	0.22	0.15	0.01	0.00	0.00	1.11	2.54	2.85	2.85	2.80	1.98	0.14
0.00	0.01	0.10	0.16	0.17	0.17	0.17	0.13	0.02	0.00	0.09	1.30	2.06	2.18	2.18	2.15	1.65	0.19
0.00	0.01	0.15	0.38	0.73	0.94	0.78	0.31	0.02	0.00	0.11	1.91	4.94	9.42	12.23	10.13	3.98	0.24
0.00	0.01	0.14	0.23	0.24	0.24	0.24	0.15	0.00	0.00	0.13	1.87	2.96	3.13	3.13	3.04	1.91	0.00
0.00	0.00	0.05	0.15	0.24	0.24	0.16	0.16	0.01	0.00	0.00	0.70	1.91	3.13	3.13	2.10	2.05	0.17
0.00	0.00	0.08	0.21	0.26	0.26	0.25	0.22	0.04	0.00	0.00	0.97	2.67	3.27	3.27	3.25	2.85	0.55
0.00	0.00	0.07	0.17	0.20	0.20	0.17	0.10	0.03	0.00	0.00	0.86	2.16	2.59	2.59	2.16	1.30	0.32
0.00	0.00	0.05	0.13	0.16	0.16	0.16	0.08	0.00	0.00	0.00	0.73	2.01	2.46	2.46	2.46	1.23	0.00
0.00	0.00	0.30	0.51	0.51	0.51	0.42	0.17	0.00	0.00	0.00	3.80	6.51	6.51	6.51	5.37	2.14	0.00
0.00	0.00	0.31	0.61	0.66	0.66	0.53	0.22	0.00	0.00	0.00	4.02	7.87	8.46	8.46	6.75	2.76	0.00
0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.13	0.38	0.44	0.34	0.09	0.00
0.00	0.00	0.00	0.01	0.03	0.03	0.03	0.01	0.00	0.00	0.00	0.00	0.20	0.60	0.72	0.62	0.28	0.00
0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.23	0.38	0.38	0.37	0.31	0.00
0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.10	0.15	0.15	0.15	0.14	0.00
0.00	0.00	0.00	0.00	0.03	0.07	0.07	0.03	0.00	0.00	0.00	0.00	0.00	0.65	1.48	1.53	0.73	0.00
0.00	0.00	0.01	0.01	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.13	0.29	0.33	0.33	0.22	0.00	0.00
0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.14	0.31	0.35	0.35	0.35	0.24	0.00
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.04	0.04	0.04	0.01
0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.10	0.15	0.15	0.15	0.14	0.03
0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.16	0.27	0.27	0.27	0.26	0.13	0.00
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.17	0.37	0.37	0.37	0.34	0.17	0.00
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.27	0.50	0.50	0.50	0.46	0.26	0.00
0.00	0.00	0.00	0.03	0.04	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.61	0.79	0.52	0.16	0.00	0.00
0.00	0.01	0.11	0.13	0.14	0.14	0.14	0.13	0.03	0.00	0.11	1.26	1.51	1.68	1.68	1.67	1.52	0.31
0.00	0.00	0.04	0.08	0.10	0.10	0.10	0.09	0.02	0.00	0.00	0.47	1.03	1.29	1.29	1.26	1.11	0.22
0.00	0.00	0.09	0.24	0.29	0.29	0.29	0.25	0.05	0.00	0.00	1.09	3.01	3.69	3.69	3.66	3.21	0.61
0.00	0.00	0.09	0.24	0.29	0.29	0.29	0.25	0.05	0.00	0.00	1.09	3.01	3.69	3.69	3.66	3.21	0.61
0.00	0.00	0.05	0.13	0.16	0.16	0.16	0.14	0.03	0.00	0.00	0.92	2.31	2.77	2.77	2.77	2.51	0.50
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.00	0.00	0.00	0.00	0.05	0.00
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.24	0.27	0.27	0.27	0.21	0.00

2270006005	Diesel	T3	86	0	0	2037	4950	5241	5241	5241	5241	1310	0.408	0.18	3	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	345	0	0	1601	4950	5241	5241	5241	5241	1310	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	200	0	0	2184	6989	7862	7862	7862	7362	1591	0.367	0.13	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T3	143	0	0	7131	12952	13104	13104	13104	12230	2621	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T3	143	0	0	3639	9027	10483	10483	10483	9734	2059	0.367	0.18	2.5	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	14	0	0	26332	62338	82233	63168	28032	36727	8825	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	8	0	0	21762	33696	33696	33696	33696	29113	4987	0.408	0.13	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	15	0	0	6552	14040	16848	16848	16848	15377	3109	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270002009	Diesel	T4	19	0	0	8268	18408	22464	22464	22230	21862	5516	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270006005	Diesel	T4	11	0	0	17472	39858	50076	50544	49530	42900	8424	0.408	0.13	4.44	0.43	1	0.027	0.008	1.027	1.008	0.
2270006010	Diesel	T4	7	0	0	2184	5304	5616	5616	5616	5616	1404	0.408	0.5508	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270006010	Diesel	T4	15	0	0	2184	5304	5616	5616	5616	5616	1404	0.408	0.438	4.4399	0.43	1	0.027	0.008	1.027	1.008	0.
2270002039	Diesel	T4	65	0	0	3042	7488	8424	8424	8424	7889	1705	0.412	0.13	3	0.59	1	0.027	0.008	1.027	1.008	0.
2270002006	Diesel	T4	3	0	0	7644	17160	22464	22464	21420	18237	4011	0.408	0.13	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270002006	Diesel	T4	3	0	0	7644	17160	22464	22464	21420	18237	4011	0.408	0.13	4.3	0.43	1	0.027	0.008	1.027	1.008	0.
2270006010	Diesel	T4	24	0	0	10452	21294	33665	36755	30742	27387	5315	0.408	0.438	4.4399	0.43	1	0.027	0.008	1.027	1.008	0.

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009.
EFss from NMIM/NONROAD08 have transient adjustment factors built in.

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.
Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for desel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Adjusted EF = Efss * TAF * DF (as stated in Note 2, EFss have TAFs built in)

Note 5: Annual VOC Emissions are calculated using the following calculation (1.053 * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
1.053 is the ratio of VOC to HC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 6: Annual NOx Emissions are calculated using the following calculation (Adj. NOx emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

0.00	0.00	0.02	0.04	0.04	0.04	0.04	0.04	0.01	0.00	0.00	0.25	0.61	0.65	0.65	0.65	0.65	0.16	
0.00	0.00	0.04	0.11	0.12	0.12	0.12	0.12	0.03	0.00	0.00	0.66	2.04	2.16	2.16	2.16	2.16	0.54	
0.00	0.00	0.03	0.09	0.10	0.10	0.10	0.10	0.02	0.00	0.00	0.52	1.67	1.88	1.88	1.88	1.76	0.38	
0.00	0.00	0.09	0.17	0.17	0.17	0.17	0.16	0.03	0.00	0.00	1.22	2.21	2.24	2.24	2.24	2.09	0.45	
0.00	0.00	0.05	0.12	0.14	0.14	0.14	0.13	0.03	0.00	0.00	0.62	1.54	1.79	1.79	1.79	1.66	0.35	
0.00	0.00	0.02	0.06	0.08	0.06	0.03	0.03	0.01	0.00	0.00	0.78	1.85	2.44	1.88	0.83	1.09	0.26	
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.36	0.55	0.55	0.55	0.55	0.48	0.08	
0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.21	0.45	0.54	0.54	0.54	0.49	0.10	
0.00	0.00	0.01	0.02	0.03	0.03	0.03	0.03	0.01	0.00	0.00	0.33	0.74	0.91	0.91	0.90	0.88	0.22	
0.00	0.00	0.01	0.03	0.04	0.04	0.04	0.03	0.01	0.00	0.00	0.41	0.93	1.17	1.18	1.16	1.00	0.20	
0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.03	0.08	0.08	0.08	0.08	0.08	0.02	
0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.07	0.17	0.18	0.18	0.18	0.18	0.04	
0.00	0.00	0.02	0.04	0.05	0.05	0.05	0.05	0.01	0.00	0.00	0.39	0.96	1.08	1.08	1.08	1.01	0.22	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.11	0.14	0.14	0.13	0.11	0.02	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.11	0.14	0.14	0.13	0.11	0.02	
0.00	0.00	0.06	0.11	0.18	0.20	0.17	0.15	0.03	0.00	0.00	0.53	1.08	1.71	1.87	1.57	1.39	0.27	
0.02	**0.07**	**4.42**	**9.59**	**11.21**	**11.20**	**9.37**	**4.94**	**0.55**	**0.27**	**0.93**	**65.38**	**143.87**	**168.73**	**168.32**	**140.46**	**73.81**	**7.93**	**Total construction sum**

NOTES:

Note 1: SCC code based on Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

Note 2: Brake-specific fuel consumption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009.
EFss from NMIM/NONROAD08 have transient adjustment factors built in.

Note 3: Age factor and Deterioration factors calculated using Equation 4 from "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Age Factor = LF * cumulative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.
Deterioration Factor = 1 + (A * Age Factor^b), where b = 1 for desel engines and A is taken from Table A4 from source

Note 4: Adjusted Emission Factors for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.
Adjusted EF = Efss * TAF * DF (as stated in Note 2, EFss have TAFs built in)

Note 5: Annual VOC Emissions are calculated using the following calculation (1.053 * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)
1.053 is the ratio of VOC to HC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015.

Note 6: Annual NOx Emissions are calculated using the following calculation (Adj. NOx emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

l e	Engine Technology Type	Equipment Horsepower	Year 1 hrs	Year 2 hrs	Year 3 hrs	Year 4 hrs	Year 5 hrs	Year 6 hrs	Year 7 hrs	Year 8 hrs	Year 9 hrs	BSFC [2] lb/hp-hr	EFss (g/hp-hr) [2] HC	EFss (g/hp-hr) [2] NOx	Load Factor [2]	Age Factor [3]	"A" [3] HC	"A" [3] NOx	Deterio facto HC
ine	G4GT252	52	0	0	9234	19219	22464	22464	22339	20288	5562	0.484	0.27	0.69	0.3	1	0.64	0.15	1.640
ine	G4GT252	75	0	0	0	2994	4492	4492	4492	4493	1498	0.484	0.27	0.69	0.46	1	0.64	0.15	1.640
ine	G4N2O2	7	0	0	11466	24726	30332	30088	33765	33434	5315	0.74	4.16	2.77	0.55	1	1.095	0	2.095
ine	L4N1	11	0	0	1170	2106	2106	2106	2106	1052	0	0.693	3.91	5.25	0.78	1	1.095	0	2.095
ine	G4N1O2	3	0	0	2808	5616	5616	5616	5616	5616	1404	0.781	6.51	2.446	0.78	1	1.753	0	2.753
ine	G4N2O2	13	0	0	3276	7488	8424	8424	8424	7889	1705	0.74	4.16	2.77	0.33	1	1.095	0	2.095
ine	G4GT25	6	0	0	8268	18408	22464	22464	21420	6637	4011	0.605	3.85	8.43	0.69	1	1.095	0	2.095
ine	G4N2O	11	0	0	2184	5304	5616	5616	5616	5616	1404	0.94	5.2	3.5	0.35	1	1.095	0	2.095
ine	G4N2O2	6	0	468	11232	16380	16848	15132	11544	5616	0	0.74	4.16	2.77	0.33	1	1.095	0	2.095
ine	G4N2O2	8	0	468	11232	16380	16848	15132	11544	5616	0	0.74	4.16	2.77	0.33	1	1.095	0	2.095
ine	G4N1O2	3	0	0	13806	27066	33540	33696	33415	16427	0	0.921	6.13	2.446	0.63	1	1.753	0	2.753
ine	G2H52	3	27300	19500	0	0	0	0	0	0	0	0.608	47.98	0.91	0.59	1	0.266	0	1.266
ine	G4N1O2	6	5460	9360	780	0	0	0	0	0	0	0.781	6.51	2.446	0.62	1	1.095	0	2.095
ine	G4GT25	4	7280	8320	0	0	0	0	0	0	0	0.605	3.85	8.43	0.69	1	1.753	0	2.753

endix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

mption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009. Except forklift, aerial lift and cement/concrete equipment.

ROAD08 have transient adjustment factors built in.

oncrete/cement equipment values are from Tables 1-7 of "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition", December2005, EPA420-R-05R-019

ion factors calculated using Equation 4 from "Nonroad Spark-Ignition Engine Emission Deterioration Factors", December 2005, EPA-420-R-05-023.

ılative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.

l + (A * Age Factor^b), where b = 1 for 2-stroke engines =0.5 for 4-stroke engines and A is taken from Tables 1-7 from source

rs for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

AF * DF (as stated in Note 2, EFss have TAFs built in)

are calculated using the following calculation (VOC/HC * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

VOC to HC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015. 0.933 for 4-stoke engines and 1.034 for 2-stroke engines

re calculated using the following calculation (Adj. NOx emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

C s	VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	NOx [6] tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	
3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	
7	0.14	0.16	0.16	0.16	0.14	0.04	0.00	0.00	0.13	0.26	0.31	0.31	0.30	0.28	0.08	
0	0.05	0.07	0.07	0.07	0.07	0.02	0.00	0.00	0.00	0.09	0.14	0.14	0.14	0.14	0.05	
0	0.85	1.05	1.04	1.17	1.15	0.18	0.00	0.00	0.13	0.29	0.36	0.35	0.40	0.39	0.06	
8	0.15	0.15	0.15	0.15	0.08	0.00	0.00	0.00	0.06	0.10	0.10	0.10	0.10	0.05	0.00	
2	0.24	0.24	0.24	0.24	0.24	0.06	0.00	0.00	0.02	0.04	0.04	0.04	0.04	0.04	0.01	
3	0.29	0.32	0.32	0.32	0.30	0.07	0.00	0.00	0.04	0.10	0.11	0.11	0.11	0.10	0.02	
8	0.63	0.77	0.77	0.74	0.23	0.14	0.00	0.00	0.32	0.71	0.86	0.86	0.82	0.26	0.15	
9	0.23	0.24	0.24	0.24	0.24	0.06	0.00	0.00	0.03	0.08	0.08	0.08	0.08	0.08	0.02	
0	0.29	0.30	0.27	0.20	0.10	0.00	0.00	0.00	0.07	0.10	0.10	0.09	0.07	0.03	0.00	
7	0.39	0.40	0.36	0.27	0.13	0.00	0.00	0.00	0.09	0.13	0.14	0.12	0.09	0.05	0.00	
5	0.89	1.10	1.11	1.10	0.54	0.00	0.00	0.00	0.07	0.14	0.17	0.17	0.17	0.08	0.00	
0	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	
0	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3	**4.15**	**4.81**	**4.73**	**4.66**	**3.23**	**0.57**	**0.29**	**0.35**	**0.97**	**2.04**	**2.41**	**2.38**	**2.33**	**1.50**	**0.39**	**Total construction sum**
7	**0.18**	**0.23**	**0.23**	**0.23**	**0.21**	**0.06**	**0.00**	**0**	**0.13**	**0.35**	**0.44**	**0.44**	**0.44**	**0.41**	**0.12**	**10 CFR 50 construction total**

endix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

mption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009. Except forklift, aerial lift and cement/concrete equipment.

ROAD08 have transient adjustment factors built in.

oncrete/cement equipment values are from Tables 1-7 of "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition", December2005, EPA420-R-05R-019

ion factors calculated using Equation 4 from "Nonroad Spark-Ignition Engine Emission Deterioration Factors", December 2005, EPA-420-R-05-023.

ılative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.

l + (A * Age Factor^b), where b = 1 for 2-stroke engines =0.5 for 4-stroke engines and A is taken from Tables 1-7 from source

rs for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

AF * DF (as stated in Note 2, EFss have TAFs built in)

are calculated using the followi (VOC/HC * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

VOC to HC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015. 0.933 for 4-stoke engines and 1.034 for 2-stroke engines

ire calculated using the followi (Adj. NOx emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

; included in safety-related construction

l e	Engine Technology Type	Equipment Horsepower	Year 1 hrs	Year 2 hrs	Year 3 hrs	Year 4 hrs	Year 5 hrs	Year 6 hrs	Year 7 hrs	Year 8 hrs	Year 9 hrs	BSFC [2] lb/hp-hr	EFss (g/hp-hr) [2] HC	EFss (g/hp-hr) [2] NOx	Load Factor [2]	Age Factor [3]	"A" [3] HC	"A" [3] NOx	Deteri fac HC
line	G4GT252	52	0	0	9234	19219	22464	22464	22339	20288	5562	0.484	0.27	0.69	0.3	1	0.64	0.15	1.640
line	G4GT252	75	0	0	0	2994	4492	4492	4492	4493	1498	0.484	0.27	0.69	0.46	1	0.64	0.15	1.640
line	G4N2O2	7	0	0	11466	24726	30332	30088	33765	33434	5315	0.74	4.16	2.77	0.55	1	1.095	0	2.095
line	G4N2O2	11	0	0	1170	2106	2106	2106	2106	1052	0	0.74	4.16	2.77	0.33	1	1.095	0	2.095
line	G4N2O2	13	0	0	3276	7488	8424	8424	8424	7889	1705	0.74	4.16	2.77	0.33	1	1.095	0	2.095
line	G4GT25	6	0	0	8268	18408	22464	22464	21420	6637	4011	0.605	3.85	8.43	0.69	1	1.095	0	2.095
line	G4N2O2	6	0	468	11232	16380	16848	15132	11544	5616	0	0.74	4.16	2.77	0.33	1	1.095	0	2.095
line	G4N2O2	8	0	468	11232	16380	16848	15132	11544	5616	0	0.74	4.16	2.77	0.33	1	1.095	0	2.095
line	G4N1O2	3	0	0	13806	27066	33540	33696	33415	16427	0	0.921	6.13	2.446	0.63	1	1.753	0	2.753

endix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

mption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009. Except forklift, aerial lift and cement/concrete equipment.

ROAD08 have transient adjustment factors built in.

oncrete/cement equipment values are from Tables 1-7 of "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition", December2005, EPA420-R-05R-019

ion factors calculated using Equation 4 from "Nonroad Spark-Ignition Engine Emission Deterioration Factors", December 2005, EPA-420-R-05-023.

ılative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.

l + (A * Age Factor^b), where b = 1 for 2-stroke engines =0.5 for 4-stroke engines and A is taken from Tables 1-7 from source

rs for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

AF * DF (as stated in Note 2, EFss have TAFs built in)

are calculated using the following calculation (VOC/HC * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

VOC to HC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015. 0.933 for 4-stoke engines and 1.034 for 2-stroke engines

ire calculated using the following calculation (Adj. NOx emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

C s	VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	NOx[6] tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	
3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	
7	0.14	0.16	0.16	0.16	0.14	0.04	0.00	0.00	0.13	0.26	0.31	0.31	0.30	0.28	0.08	
0	0.05	0.07	0.07	0.07	0.07	0.02	0.00	0.00	0.00	0.09	0.14	0.14	0.14	0.14	0.05	
0	0.85	1.05	1.04	1.17	1.15	0.18	0.00	0.00	0.13	0.29	0.36	0.35	0.40	0.39	0.06	
4	0.07	0.07	0.07	0.07	0.03	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.00	
3	0.29	0.32	0.32	0.32	0.30	0.07	0.00	0.00	0.04	0.10	0.11	0.11	0.11	0.10	0.02	
8	0.63	0.77	0.77	0.74	0.23	0.14	0.00	0.00	0.32	0.71	0.86	0.86	0.82	0.26	0.15	
0	0.29	0.30	0.27	0.20	0.10	0.00	0.00	0.00	0.07	0.10	0.10	0.09	0.07	0.03	0.00	
7	0.39	0.40	0.36	0.27	0.13	0.00	0.00	0.00	0.09	0.13	0.14	0.12	0.09	0.05	0.00	
5	0.89	1.10	1.11	1.10	0.54	0.00	0.00	0.00	0.07	0.14	0.17	0.17	0.17	0.08	0.00	
3	**3.59**	**4.24**	**4.16**	**4.10**	**2.71**	**0.45**	**0.00**	**0.01**	**0.86**	**1.84**	**2.21**	**2.18**	**2.13**	**1.34**	**0.36**	**Total construction sum**

endix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", April 2004, EPA-420-P-04-005.

mption, zero hour steady state emission factor (EFss; g/hp-hr), and load factor are from NMIM/NONROAD08 model factors dated April 5, 2009. Except forklift, aerial lift and cement/concrete equipment.

ROAD08 have transient adjustment factors built in.

oncrete/cement equipment values are from Tables 1-7 of "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition", December2005, EPA420-R-05R-019

ion factors calculated using Equation 4 from "Nonroad Spark-Ignition Engine Emission Deterioration Factors", December 2005, EPA-420-R-05-023.

ılative hours / median life {where Age factor is capped at 1. For this calculation, age factor is assumed to be 1 for simplification purposes}.

l + (A * Age Factor^b), where b = 1 for 2-stroke engines =0.5 for 4-stroke engines and A is taken from Tables 1-7 from source

rs for HC and NOx are calculated using Equation 1 from, "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition", April 2004, EPA-420-P-04-009.

AF * DF (as stated in Note 2, EFss have TAFs built in)

are calculated using the followi (VOC/HC * Adj. HC emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

VOC to HC from "Conversion Factors for Hydrocarbon Components", December 2005, EPA-420-P-05-015. 0.933 for 4-stoke engines and 1.034 for 2-stroke engines

ire calculated using the followi (Adj. NOx emission factor (g/hp-hr) * horsepower * hours operated * load factor) / (2000 lb/ton * 453.6 g/lb)

Table B-3a On-Road Vehicle Emissions Year 1

Vehicle Classification	Fuel Type	Vehicle Class	SCC	Year 1 Total operated	Avg. Speed	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		Year 1 Emissions (tons)	
				hrs	mph	VMT	VOC	NOx	VOC	NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	0	30.0	0	0.743	0.571	0.00	0.00
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	3276	20.0	65,520	0.827	0.715	0.06	0.05
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	0	20.0	0	0.827	0.715	0.00	0.00
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	0	20.0	0	1.488	1.182	0.00	0.00
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	0	20.0	0	1.488	1.182	0.00	0.00
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	0	20.0	0	1.488	1.182	0.00	0.00
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	0	20.0	0	1.488	1.182	0.00	0.00
Trucks-Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	15.0	0	0.39	6.593	0.00	0.00
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	0	15.0	0	0.156	2.238	0.00	0.00
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	0	15.0	0	0.304	4.409	0.00	0.00
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	0	15.0	0	0.156	2.238	0.00	0.00
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	0	15.0	0	0.156	2.238	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.467	8.081	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.467	8.081	0.00	0.00
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	0	15.0	0	0.156	2.238	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.467	8.081	0.00	0.00
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	0	15.0	0	0.376	5.501	0.00	0.00
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	0	2.0	0	0.241	3.562	0.00	0.00
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	3432	20.0	68,640	2.595	2.727	0.20	0.21
Diesel Commercial Bus	Diesel	HDDBT	2230075	0	35.0	0	0.278	11.752	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	20.0	0	2.595	2.727	0.00	0.00
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	20.0	0	0.168	2.329	0.00	0.00
Concrete/Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.467	8.081	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.467	8.081	0.00	0.00
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	0	15.0	0	0.304	4.409	0.00	0.00
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	10.0	0	0.467	8.081	0.00	0.00
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	5460	25.0	136,500	0.168	2.329	0.03	0.35
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	5460	20.0	109,200	0.39	6.593	0.05	0.79
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	3640	25.0	91,000	0.168	2.329	0.02	0.23
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	27300	30.0	819,000	2.595	2.727	2.34	2.46

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles [3]	Round-trip Distance	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		2010 Emissions (tons) [2]	
					miles	VMT	VOC	NOx	VOC	NOx
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	639	40.0	7974720	0.743	0.571	6.53	5.02
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	0	100.0	0	0.168	2.329	0.00	0.00
						DC NA Area onroad vehicle total (direct & indirect)			**9.22**	**9.12**
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	160	20.0	998400	0.743	0.571	0.82	0.63
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	0	50.0	0	0.168	2.329	0.00	0.00
								Baltimore NA Area onroad vehicle total	**0.82**	**0.63**

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulatin g the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation (VMT (miles) * Emission factor (g/mi)) / (2000 lb/ton * 453.6 g/lb)

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 1 Onroad Emissions	Year 1 Emissions (tons)	
	VOC	NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	9.22	9.12
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	0.82	0.63
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.00	0.00

Table B-3b On-Road Vehicle Emissions Year 2

Description	Fuel Type	Vehicle Class	SCC	Year 2 Total operated	Avg.	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		Year 2 Emissions (tons)	
				hrs	mph	VMT	HC	NOx	HC	NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	62	30.0	1,860	0.612	0.47	0.00	0.00
Light Duty					0	0	0	0		
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	6552	20.0	131,040	0.666	0.611	0.10	0.09
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	0	20.0	0	0.666	0.611	0.00	0.00
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	0	20.0	0	1.243	1.234	0.00	0.00
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	0	20.0	0	1.243	1.234	0.00	0.00
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	156	20.0	3,120	1.187	0.961	0.00	0.00
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	468	20.0	9,360	1.243	1.234	0.01	0.01
Trucks -Heavy Duty					0	0	0	0		
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	1123	15.0	16,845	0.36	5.588	0.01	0.10
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	0	15.0	0	0.146	1.874	0.00	0.00
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	0	15.0	0	0.282	3.754	0.00	0.00
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	374	15.0	5,610	0.146	1.874	0.00	0.01
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	0	15.0	0	0.146	1.874	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.429	6.98	0.00	0.00
Heavy-Duty Deisel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.429	6.98	0.00	0.00
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	194	15.0	2,910	0.146	1.874	0.00	0.01
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.429	6.98	0.00	0.00
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	156	15.0	2,340	0.349	4.705	0.00	0.01
Trailers					0	0	0	0		
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072		2.0	0	0.232	3.132	0.00	0.00
Personnel Carrier					0	0	0	0		
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	7488	20.0	149,760	2.595	2.727	0.43	0.45
Diesel Commercial Bus	Diesel	HDDBT	2230075	0	35.0	0	0.264	10.469	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	20.0	0	2.595	2.727	0.00	0.00
Emergency Vehicles					0	0	0	0		
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	20.0	0	0.155	1.871	0.00	0.00
Concrete / Aggregate					0	0	0	0		
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	312	15.0	4,680	0.429	6.98	0.00	0.04
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	312	15.0	4,680	0.429	6.98	0.00	0.04
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	0	15.0	0	0.282	3.754	0.00	0.00
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	10.0	0	0.429	6.98	0.00	0.00
Site Preparation					0	0	0	0		
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	8580	25.0	214,500	0.155	1.871	0.04	0.44
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	8580	20.0	171,600	0.36	5.588	0.07	1.06
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	5720	25.0	143,000	0.155	1.871	0.02	0.29
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	42900	30.0	1,287,000	2.595	2.727	3.68	3.87
Dredging Equipment										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	18000	30.0	540000	0.36	5.588	0.21	3.33
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	4320	45.0	194400	1.243	1.234	0.27	0.26
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	4320	45.0	194400	0.666	0.611	0.14	0.13
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	720	30.0	21600	0.155	1.871	0.00	0.04

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles [3]	Round-Distance	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		2010 Emissions (tons) [2]	
					miles	VMT	VOC	NOx	VOC	NOx
Employee Commute/ Delivery					0		0	0		
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	1454	40.0	18145920	0.612	0.47	12.24	9.40
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	0	100.0	0	0.429	6.98	0.00	0.00
		DC NA Area onroad vehicle total (direct & indirect							17.24	19.59
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	364	20.0	2271360	0.612	0.47	1.53	1.18
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	0	50.0	0	0.429	6.98	0.00	0.00
							Baltimore NA Area onroad vehicle tota		1.53	1.18

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 2 Onroad Emissions		
	Year 2 Emissions (tons)	
	VOC	NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	17.24	19.59
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	1.53	1.18
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.00	0.07

Table B-3c On-Road Vehicle Emissions Year 3

Description	Fuel Type	Vehicle Class	SCC	Year 3 Total operated	Average Speed	Vehicular Miles Trav	Criteria Pollutants EFs (g/mi)[1]		Year 3 Emissions (tons)	
				hrs	mph	VMT	HC	NOx	HC	NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	1,123	30.0	33,690	0.563	0.428	0.02	0.02
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	9204	20.0	184,080	0.624	0.554	0.13	0.11
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	8580	20.0	171,600	0.624	0.554	0.12	0.10
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	8320	20.0	166,400	1.175	1.158	0.22	0.21
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	5616	20.0	112,320	1.175	1.158	0.15	0.14
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	3432	20.0	68,640	1.12	0.9	0.08	0.07
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	4992	20.0	99,840	1.175	1.158	0.13	0.13
Trucks -Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	13664	15.0	204,960	0.345	4.764	0.08	1.08
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	4493	15.0	67,395	0.14	1.601	0.01	0.12
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	3182	15.0	47,730	0.268	3.237	0.01	0.17
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	3868	15.0	58,020	0.14	1.601	0.01	0.10
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	3868	15.0	58,020	0.14	1.601	0.01	0.10
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	4446	15.0	66,690	0.41	6.028	0.03	0.44
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	4446	15.0	66,690	0.41	6.028	0.03	0.44
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	3188	15.0	47,820	0.14	1.601	0.01	0.08
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	4326	15.0	64,890	0.41	6.028	0.03	0.43
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	6760	15.0	101,400	0.331	4.054	0.04	0.45
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	0	2.0	0	0.225	2.792	0.00	0.00
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	19139	20.0	382,780	2.595	2.727	1.09	1.15
Diesel Commercial Bus	Diesel	HDDBT	2230075	0	35.0	0	0.258	9.26	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	11492	20.0	229,840	2.595	2.727	0.66	0.69
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	1091	30.0	32,730	2.595	2.727	0.09	0.10
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	187	20.0	3,740	0.148	1.556	0.00	0.01
Concrete / Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	312	15.0	4,680	0.41	6.028	0.00	0.03
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	2548	15.0	38,220	0.41	6.028	0.02	0.25
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	62400	15.0	936,000	0.268	3.237	0.28	3.34
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	62400	10.0	624,000	0.41	6.028	0.28	4.15
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.148	1.556	0.00	0.00
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	20.0	0	0.345	4.764	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.148	1.556	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles[3]	Round-Distance	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi)[1]		2010 Emissions (tons)[2]	
					miles	VMT	VOC	NOx	VOC	NOx
Employee Commute/ Delivery					0					
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	2354	40.0	29377920	0.563	0.428	18.23	13.86
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	2084	100.0	208400	0.41	6.028	0.09	1.38
								DC NA Area onroad vehicle total (direct & indirect	21.85	29.17
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	589	20.0	3675360	0.563	0.428	2.28	1.73
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	625	50.0	31250	0.41	6.028	0.01	0.21
								Baltimore NA Area onroad vehicle tota	2.30	1.94

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 3 Onroad Emissions		
	Year 3 Emissions (tons)	
	VOC	NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	21.85	29.17
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	2.30	1.94
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.58	7.77

Table B-3d On-Road Vehicle Emissions Year 4

Description	Fuel Type	Vehicle Class	SCC	Year 4 Total operated	Average Speed	Vehicular Miles Trav	Criteria Pollutants EFs (g/mi) [1]		Year 4 Emissions (tons)	
				hrs	mph	VMT	HC	NOx	HC	NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	1,497	30.0	44,910	0.52	0.391	0.03	0.02
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	9360	20.0	187,200	0.590	0.507	0.12	0.10
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	14352	20.0	287,040	0.590	0.507	0.19	0.16
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	14768	20.0	295,360	1.113	1.092	0.36	0.36
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	10608	20.0	212,160	1.113	1.092	0.26	0.26
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	3744	20.0	74,880	1.06	0.848	0.09	0.07
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	8424	20.0	168,480	1.113	1.092	0.21	0.20
Trucks -Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	15724	15.0	235,860	0.332	3.998	0.09	1.04
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	8985	15.0	134,775	0.133	1.384	0.02	0.21
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	7113	15.0	106,695	0.254	2.774	0.03	0.33
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	8486	15.0	127,290	0.133	1.384	0.02	0.19
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	7737	15.0	116,055	0.133	1.384	0.02	0.18
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	7488	15.0	112,320	0.392	5.122	0.05	0.63
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	7488	15.0	112,320	0.392	5.122	0.05	0.63
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	4492	15.0	67,380	0.133	1.384	0.01	0.10
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	7155	15.0	107,325	0.392	5.122	0.05	0.61
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	12232	15.0	183,480	0.312	3.454	0.06	0.70
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	3181	2.0	6,362	0.213	2.491	0.00	0.02
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	41709	20.0	834,180	2.595	2.727	2.39	2.51
Diesel Commercial Bus	Diesel	HDDBT	2230075	0	35.0	0	0.253	8.118	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	17368	20.0	347,360	2.595	2.727	0.99	1.04
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	1810	30.0	54,300	2.595	2.727	0.16	0.16
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	374	20.0	7,480	0.142	1.309	0.00	0.01
Concrete / Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	1560	15.0	23,400	0.392	5.122	0.01	0.13
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	4004	15.0	60,060	0.392	5.122	0.03	0.34
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	74880	15.0	1,123,200	0.254	2.774	0.31	3.43
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	74880	10.0	748,800	0.392	5.122	0.32	4.23
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.142	1.309	0.00	0.00
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	20.0	0	0.332	3.998	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.142	1.309	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles [3]	Round-Distance	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		2010 Emissions (tons) [2]	
					miles	VMT	VOC	NOx	VOC	NOx
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	3044	40.0	37989120	0.52	0.391	21.78	16.37
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	3117	100.0	311700	0.392	5.122	0.13	1.76
DC NA Area onroad vehicle total (direct & indirect									27.76	35.80

Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	761	20.0	4748640	0.52	0.391	2.72	2.05
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	935	50.0	46750	0.392	5.122	0.02	0.26
Baltimore NA Area onroad vehicle tota									2.74	2.31

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 4 Onroad Emissions		
	Year 4 Emissions (tons)	
	VOC	NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	27.76	35.80
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	2.74	2.31
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.67	8.13

Table B-3e On-Road Vehicle Emissions Year 5

Description	Fuel Type	Vehicle Class	SCC	Year 5 Total operated	Average Speed	Vehicular Miles Trav	Criteria Pollutants EFs (g/mi) [1]		Year 5 Emissions (tons)	
				hrs	mph	VMT	HC	NOx	HC	NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	1,497	30.0	44,910	0.483	0.359	0.02	0.02
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	9360	20.0	187,200	0.561	0.468	0.12	0.10
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	15600	20.0	312,000	0.561	0.468	0.19	0.16
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	14976	20.0	299,520	1.056	1.033	0.35	0.34
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	11232	20.0	224,640	1.056	1.033	0.26	0.26
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	3744	20.0	74,880	1.004	0.802	0.08	0.07
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	9360	20.0	187,200	1.056	1.033	0.22	0.21
Trucks -Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	15724	15.0	235,860	0.316	3.425	0.08	0.89
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	11232	15.0	168,480	0.128	1.188	0.02	0.22
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	8985	15.0	134,775	0.241	2.397	0.04	0.36
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	11232	15.0	168,480	0.128	1.188	0.02	0.22
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	8985	15.0	134,775	0.128	1.188	0.02	0.18
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8424	15.0	126,360	0.37	4.455	0.05	0.62
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8424	15.0	126,360	0.37	4.455	0.05	0.62
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	4636	15.0	69,540	0.128	1.188	0.01	0.09
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8985	15.0	134,775	0.37	4.455	0.05	0.66
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	12048	15.0	180,720	0.297	2.983	0.06	0.59
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	4492	2.0	8,984	0.204	2.183	0.00	0.02
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	54288	20.0	1,085,760	2.595	2.727	3.11	3.26
Diesel Commercial Bus	Diesel	HDDBT	2230075	41588	35.0	1,455,580	0.25	7.082	0.40	11.36
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	18720	20.0	374,400	2.595	2.727	1.07	1.13
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	2246	30.0	67,380	2.595	2.727	0.19	0.20
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	374	20.0	7,480	0.137	1.095	0.00	0.01
Concrete / Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	312	15.0	4,680	0.37	4.455	0.00	0.02
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	4680	15.0	70,200	0.37	4.455	0.03	0.34
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	74880	15.0	1,123,200	0.241	2.397	0.30	2.97
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	74880	10.0	748,800	0.37	4.455	0.31	3.68
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.137	1.095	0.00	0.00
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	20.0	0	0.316	3.425	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.137	1.095	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles [3]	Round-Distance	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		2010 Emissions (tons) [2]	
					miles	VMT	VOC	NOx	VOC	NOx
Employee Commute/ Delivery					0		0	0		
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	3235	40.0	40372800	0.483	0.359	21.50	15.98
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	3071	100.0	307100	0.37	4.455	0.13	1.51
								DC NA Area onroad vehicle total (direct & indirect	**28.68**	**46.09**

Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	809	20.0	5048160	0.483	0.359	2.69	2.00
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	921	50.0	46050	0.37	4.455	0.02	0.23
								Baltimore NA Area onroad vehicle tota	**2.71**	**2.22**

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 5 Onroad Emissions		
	Year 5 Emissions (tons)	
	VOC	NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	28.68	46.09
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	2.71	2.22
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.63	7.01

Table B-3f On-Road Vehicle Emissions Year 6

Description	Fuel Type	Vehicle Class	SCC	Year 6 Total operated	Average Speed	Vehicular Miles Trav	Criteria Pollutants EFs (g/mi) [1]		Year 6 Emissions (tons)	
				hrs	mph	VMT	HC	NOx	HC	NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	1,497	30.0	44,910	0.453	0.33	0.02	0.02
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	9360	20.0	187,200	0.536	0.431	0.11	0.09
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	17472	20.0	349,440	0.536	0.431	0.21	0.17
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	14976	20.0	299,520	0.997	0.97	0.33	0.32
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	11232	20.0	224,640	0.997	0.97	0.25	0.24
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	3744	20.0	74,880	0.947	0.752	0.08	0.06
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	8840	20.0	176,800	0.997	0.97	0.19	0.19
Trucks -Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	15662	15.0	234,930	0.308	2.973	0.08	0.77
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	11232	15.0	168,480	0.124	1.019	0.02	0.19
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	8985	15.0	134,775	0.232	2.073	0.03	0.31
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	11232	15.0	168,480	0.124	1.019	0.02	0.19
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	8985	15.0	134,775	0.124	1.019	0.02	0.15
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8424	15.0	126,360	0.359	3.942	0.05	0.55
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8424	15.0	126,360	0.359	3.942	0.05	0.55
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	4922	15.0	73,830	0.124	1.019	0.01	0.08
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8985	15.0	134,775	0.359	3.942	0.05	0.59
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	12048	15.0	180,720	0.286	2.587	0.06	0.52
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	3868	2.0	7,736	0.198	1.957	0.00	0.02
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	56160	20.0	1,123,200	2.595	2.727	3.21	3.38
Diesel Commercial Bus	Diesel	HDDBT	2230075	34920	35.0	1,222,200	0.247	6.117	0.33	8.24
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	18720	20.0	374,400	2.595	2.727	1.07	1.13
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	2246	30.0	67,380	2.595	2.727	0.19	0.20
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	374	20.0	7,480	0.133	0.927	0.00	0.01
Concrete / Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.359	3.942	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	4238	15.0	63,570	0.359	3.942	0.03	0.28
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	74880	15.0	1,123,200	0.232	2.073	0.29	2.57
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	74880	10.0	748,800	0.359	3.942	0.30	3.25
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.133	0.927	0.00	0.00
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	20.0	0	0.308	2.973	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.133	0.927	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles [3]	Round-Distance	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		2010 Emissions (tons) [2]	
					miles	VMT	VOC	NOx	VOC	NOx
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	2765	40.0	34507200	0.453	0.33	17.23	12.55
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	2058	100.0	205800	0.359	3.942	0.08	0.89
						DC NA Area onroad vehicle total (direct & indirect			24.32	37.49
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	691	20.0	4311840	0.453	0.33	2.15	1.57
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	617	50.0	30850	0.359	3.942	0.01	0.13
						Baltimore NA Area onroad vehicle tota			2.17	1.70

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 6 Onroad Emissions		
	Year 6 Emissions (tons)	
	VOC	NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	24.32	37.49
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	2.17	1.70
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.61	6.10

Table B-3g On-Road Vehicle Emissions Year 7

Description	Fuel Type	Vehicle Class	SCC	Year 7 Total operated	Average Speed	Vehicular Miles Trav	Criteria Pollutants EFs (g/mi) [1]		Year 7 Emissions (tons)	
				hrs	mph	VMT	HC	NOx	HC	NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	1,497	30.0	44,910	0.428	0.306	0.02	0.02
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	9360	20.0	187,200	0.514	0.404	0.11	0.08
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	18460	20.0	369,200	0.514	0.404	0.21	0.16
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	14976	20.0	299,520	0.946	0.92	0.31	0.30
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	9984	20.0	199,680	0.946	0.92	0.21	0.20
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	3744	20.0	74,880	0.896	0.712	0.07	0.06
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	6864	20.0	137,280	0.946	0.92	0.14	0.14
Trucks -Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	13790	15.0	206,850	0.301	2.578	0.07	0.59
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	11169	15.0	167,535	0.121	0.891	0.02	0.16
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	8423	15.0	126,345	0.225	1.817	0.03	0.25
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	10109	15.0	151,635	0.121	0.891	0.02	0.15
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	7862	15.0	117,930	0.121	0.891	0.02	0.12
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8424	15.0	126,360	0.349	3.401	0.05	0.47
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	7488	15.0	112,320	0.349	3.401	0.04	0.42
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	4922	15.0	73,830	0.121	0.891	0.01	0.07
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	8599	15.0	128,985	0.349	3.401	0.05	0.48
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	13024	15.0	195,360	0.278	2.261	0.06	0.49
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	2121	2.0	4,242	0.193	1.757	0.00	0.01
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	46176	20.0	923,520	2.595	2.727	2.64	2.78
Diesel Commercial Bus	Diesel	HDDBT	2230075	22256	35.0	778,960	0.24	5.21	0.21	4.47
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	14560	20.0	291,200	2.595	2.727	0.83	0.88
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	2246	30.0	67,380	2.595	2.727	0.19	0.20
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	374	20.0	7,480	0.131	0.794	0.00	0.01
Concrete / Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.349	3.401	0.00	0.00
Heavy-Duty Deisel Vehicle 8B	Diesel	HDDV8b	2230074	988	15.0	14,820	0.349	3.401	0.01	0.06
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	18720	15.0	280,800	0.225	1.817	0.07	0.56
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	18720	10.0	187,200	0.349	3.401	0.07	0.70
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.131	0.794	0.00	0.00
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	20.0	0	0.301	2.578	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.131	0.794	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles [3]	Round-Distance	Vehicular Miles Trav	Mobile 6.2 EFs (g/mi) [1]		2010 Emissions (tons) [2]	
					miles	VMT	VOC	NOx	VOC	NOx
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	2131	40.0	26594880	0.428	0.306	12.55	8.97
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	1115	100.0	111500	0.349	3.401	0.04	0.42
						DC NA Area onroad vehicle total (direct & indirect			18.06	23.23

Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	533	20.0	3325920	0.428	0.306	1.57	1.12
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	335	50.0	16750	0.349	3.401	0.01	0.06
						Baltimore NA Area onroad vehicle tota			1.58	1.18

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 7 Onroad Emissions		
	Year 7 Emissions (tons)	
	VOC	NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	18.06	23.23
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	1.58	1.18
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.15	1.32

Table B-3h On-Road Vehicle Emissions Year 8

Description	Fuel Type	Vehicle Class	SCC	Year 8 Total operating hrs	Average Speed mph	Vehicular Miles Trav VMT	Mobile 6.2 EFs (g/mi) [1] HC	Mobile 6.2 EFs (g/mi) [1] NOx	Year 8 Emissions (tons) HC	Year 8 Emissions (tons) NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	1,497	30.0	44,910	0.407	0.285	0.02	0.01
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	9360	20.0	187,200	0.494	0.381	0.10	0.08
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	15080	20.0	301,600	0.494	0.381	0.16	0.13
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	14976	20.0	299,520	0.891	0.866	0.29	0.29
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	4368	20.0	87,360	0.891	0.866	0.09	0.08
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	3744	20.0	74,880	0.843	0.669	0.07	0.06
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	4576	20.0	91,520	0.891	0.866	0.09	0.09
Trucks -Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	9859	15.0	147,885	0.295	2.183	0.05	0.36
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	9930	15.0	148,950	0.115	0.754	0.02	0.12
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	5937	15.0	89,055	0.217	1.577	0.02	0.15
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	7273	15.0	109,095	0.115	0.754	0.01	0.09
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	4599	15.0	68,985	0.115	0.754	0.01	0.06
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	7889	15.0	118,335	0.341	2.843	0.04	0.37
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	4814	15.0	72,210	0.341	2.843	0.03	0.23
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	4351	15.0	65,265	0.115	0.754	0.01	0.05
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	6714	15.0	100,710	0.341	2.843	0.04	0.32
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	11589	15.0	173,835	0.268	1.968	0.05	0.38
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	374	2.0	748	0.181	1.533	0.00	0.00
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	24782	20.0	495,640	2.595	2.727	1.42	1.49
Diesel Commercial Bus	Diesel	HDDBT	2230075	14019	35.0	490,665	0.236	4.41	0.13	2.39
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	4160	20.0	83,200	2.595	2.727	0.24	0.25
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	1978	30.0	59,340	2.595	2.727	0.17	0.18
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	374	20.0	7,480	0.127	0.682	0.00	0.01
Concrete / Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.341	2.843	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.341	2.843	0.00	0.00
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	0	15.0	0	0.217	1.577	0.00	0.00
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	10.0	0	0.341	2.843	0.00	0.00
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.127	0.682	0.00	0.00
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	20.0	0	0.295	2.183	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.127	0.682	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	2.595	2.727	0.00	0.00

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles [3]	Round-Distance miles	Vehicular Miles Trav VMT	Mobile 6.2 EFs (g/mi) [1] VOC	Mobile 6.2 EFs (g/mi) [1] NOx	2010 Emissions (tons) [2] VOC	2010 Emissions (tons) [2] NOx
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	915	40.0	11419200	0.407	0.285	5.12	3.59
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	395	100.0	39500	0.341	2.843	0.01	0.12
						DC NA Area onroad vehicle total (direct & indirect			8.20	10.88
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	229	20.0	1428960	0.407	0.285	0.64	0.45
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	119	50.0	5950	0.341	2.843	0.00	0.02
						Baltimore NA Area onroad vehicle tota			0.64	0.47

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 8 Onroad Emissions	Year 8 Emissions (tons) VOC	Year 8 Emissions (tons) NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	8.20	10.88
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	0.64	0.47
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.00	0.00

Table B-3i On-Road Vehicle Emissions Year 9

Description	Fuel Type	Vehicle Class	SCC	Year 9 operating hrs	Average Speed mph	Vehicular Miles Trav VMT	Mobile 6.2 EFs (g/mi)[1] HC	Mobile 6.2 EFs (g/mi)[1] NOx	Year 9 Emissions (tons) HC	Year 9 Emissions (tons) NOx
Automotive										
Light-Duty Gasoline Vehicle	Gasoline	LDGV	2201011	873	30.0	26,190	0.3607	0.2528	0.01	0.01
Light Duty										
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	5460	20.0	109,200	0.446	0.3376	0.05	0.04
Light-Duty Gasoline Truck 2	Gasoline	LDGT2	2201020	4680	20.0	93,600	0.446	0.3376	0.05	0.03
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	2496	20.0	49,920	0.8265	0.8286	0.05	0.05
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	0	20.0	0	0.8265	0.8286	0.00	0.00
Light-Duty Gasoline Truck 3	Gasoline	LDGT3	2201040	2184	20.0	43,680	0.7758	0.6184	0.04	0.03
Light-Duty Gasoline Truck 4	Gasoline	LDGT4	2201040	936	20.0	18,720	0.8265	0.8286	0.02	0.02
Trucks -Heavy Duty										
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	2995	15.0	44,925	0.2741	1.8497	0.01	0.09
Heavy-Duty Deisel Vehicle 2B	Diesel	HDDV2b	2230071	1925	15.0	28,875	0.1085	0.6416	0.00	0.02
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	802	15.0	12,030	0.2013	1.3391	0.00	0.02
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	1524	15.0	22,860	0.1085	0.6416	0.00	0.02
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	642	15.0	9,630	0.1085	0.6416	0.00	0.01
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	1705	15.0	25,575	0.315	2.4931	0.01	0.07
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	802	15.0	12,030	0.315	2.4931	0.00	0.03
Heavy-Duty Deisel Vehicle 2B	Diesel	LDDT12	2230060	802	15.0	12,030	0.1085	0.6416	0.00	0.01
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	1123	15.0	16,845	0.315	2.4931	0.01	0.05
Heavy-Duty Diesel Vehicle 7	Diesel	HDDV7	2230073	1203	15.0	18,045	0.2479	1.6683	0.00	0.03
Trailers										
Heavy-Duty Diesel Vehicle 5	Diesel	HDDV5	2230072	0	2.0	0	0.1754	1.3653	0.00	0.00
Personnel Carrier										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	5482	20.0	109,640	0.1085	0.6416	0.01	0.08
Diesel Commercial Bus	Diesel	HDDBT	2230075	1685	35.0	58,975	0.228	4.012	0.01	0.26
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	20.0	0	0.1085	0.6416	0.00	0.00
Emergency Vehicles										
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	361	30.0	10,830	0.1085	0.6416	0.00	0.01
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	93	20.0	1,860	0.1182	0.682	0.00	0.00
Concrete / Aggregate										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.315	2.4931	0.00	0.00
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	15.0	0	0.315	2.4931	0.00	0.00
Heavy-Duty Deisel Vehicle 6	Diesel	HDDV6	2230073	0	15.0	0	0.2013	1.3391	0.00	0.00
Concrete Batch Plant										
Heavy-Duty Diesel Vehicle 8B	Diesel	HDDV8b	2230074	0	10.0	0	0.315	2.4931	0.00	0.00
Site Preparation										
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.1182	0.5499	0.00	0.00
Heavy-Duty Diesel Vehicle 8A	Diesel	HDDV8a	2230074	0	20.0	0	0.2741	1.8497	0.00	0.00
Heavy-Duty Diesel Vehicle 3	Diesel	HDDV3	2230072	0	25.0	0	0.1182	0.5499	0.00	0.00
Light-Duty Diesel Truck 1 and 2	Diesel	LDDT12	2230060	0	30.0	0	0.1085	0.6416	0.00	0.00

Description	Fuel Type	Vehicle Class	SCC	Number of Vehicles[3]	Round-Distance miles	Vehicular Miles Trav VMT	Mobile 6.2 EFs (g/mi)[1] VOC	Mobile 6.2 EFs (g/mi)[1] NOx	2010 Emissions (tons)[2] VOC	2010 Emissions (tons)[2] NOx
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in DC NA Area	Gasoline	LDGV	2201011	163	40.0	2034240	0.3607	0.2528	0.81	0.57
Heavy-Duty Diesel Vehicle 8B in DC NA Area	Diesel	HDDV8b	2230074	0	100.0	0	0.315	2.4931	0.00	0.00
								DC NA Area onroad vehicle total (direct & indirect	1.10	1.43
Employee Commute/ Delivery										
Light-Duty Gasoline Vehicle in Balt. NA Area	Gasoline	LDGV	2201011	41	20.0	255840	0.3607	0.2528	0.10	0.07
Heavy-Duty Diesel Vehicle 8B in Balt. NA Area	Diesel	HDDV8b	2230074	0	50.0	0	0.315	2.4931	0.00	0.00
								Baltimore NA Area onroad vehicle tota	0.10	0.07

Notes

Note 1: U.S. Environmental Protection Agency "Mobile Source Emission Factor Model". Values generated by simulating the model at the project conditions

Note 2: Annual Emissions are calculated using the following calculation

Note 3: Number of vehicles is daily vehciles for employee commuting and annual number of trips for commerical deliveries

Summary of Year 9 Onroad Emissions	Year 9 Emissions (tons) VOC	Year 9 Emissions (tons) NOx
Total Onroad DC NA Area Emissions(Report in Table 3-1)	1.10	1.43
Baltimore Onroad NA Area Emissions (Reported in Table 3-2)	0.10	0.07
Onroad DC NA Area Construction Emissions (Reported in Table 3-3)	0.00	0.00

Table B-4 Marine Engine Emissions

Description	Fuel Type	Equipment Horsepower	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Load	Emission Factor (g/kW-hr) [2]		Correction Factor [3]		VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons
		hp	hrs	hrs	hrs	hrs	hrs	hrs	Factor [1]	HC (VOC)	NOx	HC	NOx	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Barge - in DC-MD-VA nonattainment area	Diesel	2400	0	135	135	135	135	135	0.79	0.50	9.8	1.00	1.00	0.00	0.11	0.11	0.11	0.11	0.11	0.00	2.06	2.06	2.06	2.06	2.06
Barge Auxiliary - in DC-MD-VA NA area	Diesel	205	0	135	135	135	135	135	0.56	0.27	6.8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.09	0.09	0.09
TugBoat - for degding activity	Diesel	1200	0	720	0	0	0	0	0.79	0.50	9.8	1.00	1.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	5.50	0.00	0.00	0.00	0.00
TugBoat Auxiliary - for dredging activity	Diesel	100	0	720	0	0	0	0	0.56	0.27	6.8	1.00	1.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00
18' Boat - for dredging activity	Gasoline	225	0	720	0	0	0	0	0.79	0.50	9.8	1.00	1.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.00	0.00
											TOTAL DC area(Tons)			**0.00**	**0.45**	**0.11**	**0.11**	**0.11**	**0.11**	**0.00**	**8.90**	**2.15**	**2.15**	**2.15**	**2.15**

Description	Fuel Type	Equipment Horsepower	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Load	Emission Factor (g/kW-hr) [2]		Correction Factor [3]		VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	VOC tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons	NOx tons
		hp	hrs	hrs	hrs	hrs	hrs	hrs	Factor [1]	HC (VOC)	NOx	HC	NOx	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Barge - in Baltimore nonattainment area	Diesel	2400	0	430	430	430	430	430	0.79	0.50	9.8	1.00	1.00	0.00	0.34	0.34	0.34	0.34	0.34	0.00	6.57	6.57	6.57	6.57	6.57
Barge Auxiliary - in Baltimore NA area	Diesel	205	0	430	430	430	430	430	0.56	0.27	6.8	1.00	1.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.28	0.28	0.28	0.28	0.28
											TOTAL Baltimore area(Tons)			**0.00**	**0.35**	**0.35**	**0.35**	**0.35**	**0.35**	**0.00**	**6.84**	**6.84**	**6.84**	**6.84**	**6.84**

NOTES:

Note 1: EPA Load Factors for Harbor Crafts from Table 3-3 of " USEPA Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories Final Report" April 2009

Note 2: Harbor Craft Emission Factors from Table 3-8 of " USEPA Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories Final Report" April 2009

Note 3: Harbor Craft Fuel Correction Factors from Offroad Diesel Fuel from Table 3-9 of " USEPA Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories Final Report" April 2009

Note 4: Annual Emissions are calculated using the following equation from Section 3.0 Harbor Craft of " USEPA Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories Final Report" April 2009

(Emission factor (g/kW-hr) * horsepower * hours operated * load factor*correction factor) / (1.341 hp-hr/kWh*2000 lb/ton * 453.59 g/lb)

Table B-5 Boiler Emissions

	Year 1 hrs	Year 2 hrs	Year 3 hrs	Year 4 hrs	Year 5 hrs	Year 6 hrs	Year 7 hrs	Year 8 hrs	Year 9 hrs
Concrete Batch Plant Auxiliary Oil-fired Boiler	0	0	3120	3120	3120	3120	0	0	0
NOx emissions (tons)	**0**	**0**	**4.62**	**4.62**	**4.62**	**4.62**	**0.00**	**0**	**0**
VOC emissions (tons)	**0**	**0**	**0.05**	**0.05**	**0.05**	**0.05**	**0.00**	**0**	**0**

Boiler Heat Input Rating	20	MMBtu/hr (assumed)	
Typical Distillate Oil HHV	0.135	MMBtu/gallon	
NOx emission factor	20	lb/1,000 gallons	AP-42 Section 1.3 9/98, Table 1.3-1
VOC emission factor	0.2	lb/1,000 gallons	AP-42 Section 1.3 9/98, Table 1.3-3

UN#11-263

Enclosure 2
Use of Baltimore area NO_x ERCs in Calvert County,
September 22, 2011

AECOM
250 Apollo Drive
Chelmsford, MA 01824-3627

978.905.2100 tel
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Memorandum

To	Dimitri Lutchenkov / UniStar Nuclear	Page	1
CC	Bob Iwanchuk		
Subject	Use of Baltimore area NO_X ERCs in Calvert County		
From	Ian Miller		
Date	September 22, 2011		

Dimitri,

Here is an analysis for the potential use of NOx ERCs created in the Baltimore ozone nonattainment area for compliance with the General Conformity requirement to offset emissions from construction of the CC3 project.

CC3 General Conformity Mitigation Measures

Emission Offsets

UniStar is proposing to use "Certified"[1] emission reduction credits (ERCs) from the adjacent Baltimore nonattainment area to fully offset emission increases from construction of the CC3 project under the auspices of §93.158(a)(2). The revisions to the General Conformity Regulations published in the April 5, 2010 Federal Register (75 FR 17254) specifically allow the use of emission reduction credits from nonattainment areas outside of the area within which the federal action is occurring. This provision is limited to nonattainment or maintenance areas which are nearby areas of equal or higher (higher meaning worse) classification provided the emissions from that area contribute to the violations, or have contributed to violations in the past, in the area where the Federal action is proposed to occur. In the preamble to the April 5, 2010 General Conformity revisions (75 FR 17266), EPA recommended that Federal agencies show the requirements of §93.158(a)(2) are met using the same techniques EPA has approved by rule or guidance for demonstrating contributing emissions in other SIP-related determinations. Such SIP documents include Reasonable Further Progress, Rate of Progress, or Attainment Demonstrations for a particular pollutant or pollutant precursor (in this case NO_X).

Evidence that the Baltimore nonattainment area influences the Washington DC-MD-VA nonattainment area is found in SIP documents from the Metropolitan Washington Air Quality Committee which prepares air quality plans for the DC-MD-VA Metropolitan Statistical Area.

[1] ERCs will be certified by Maryland Department of Environment, in accordance with COMAR 26.11.17.05.

Chapter 11 of the SIP entitled "Plan to Improve Air Quality in the Washington, CD-MD-VA Region" dated February 19, 2004 contains the attainment demonstration for the 1-hour ozone severe nonattainment classification. This chapter describes the modeling demonstration as using "... the same inventories, episodes, base inventories and procedures" for both the Washington DC-MD-VA and Baltimore nonattainment areas. The report goes on to say that the modeling demonstration was performed in this manner because "Observations of wind motions in the region indicate that emissions from one city travel enough to affect air quality in the other, often in one day. Therefore, [several SIP planning organizations][2] acceded to the U.S. Environmental Protection Agency (EPA) request for a single modeling domain including Baltimore, Washington, and their surrounding nonattainment counties." This decision was made in part because "the Baltimore and the Washington metropolitan areas are in close physical proximity and their suburban communities overlap". A single modeling domain best represents the regional transport between the two metropolitan areas.

In summary, the use of ERCs from the Baltimore nonattainment area to offset emissions increases from construction of the CC3 project is justified based on conformance with the following requirements of §93.158(a)(2).

- The Baltimore 8-hour ozone nonattainment area has the same classification as the Washington DC-MD-VA 8-hour ozone nonattainment area (both moderate) and
- The Baltimore nonattainment area contributes, or has contributed in the past to violations in the Washington DC-MD-VA nonattainment area.

Sincerely yours,

Ian Miller
ian.miller@aecom.com

[2]The District of Columbia Department of Health (DC DOH), the Virginia Department of Environmental Quality (VADEQ), and the Maryland Department of Environment (MDE), in consultation with the Metropolitan Washington Council of Governments (MWCOG), the Baltimore Metropolitan Council (BMC), and the Tri-County Council for Southern Maryland (TCC)