Appendix D

Clean Air Act: Record of Non-Applicability and Emissions Estimate

RECORD OF NON-APPLICABILITY

Environmental Analysis Branch
(CENAN-PL-E)

May 20, 2015

RECORD OF NON-APPLICABILITY (RONA)

Project Name: Montauk Point, NY
Reference: Equipment list and schedule provided by Peter Weppler (4 May 15) to Jenine Gallo via email

Project/Action Point of Contact: Peter Weppler

Begin Date: Summer 2017

End Date: Spring 2019

1. The project described above has been evaluated for Section 176 of the Clean Air Act. Project related emissions associated with the federal action were estimated to evaluate the applicability of General Conformity regulations (40CFR§93 Subpart B).

2. The requirements of this rule do not apply because the total direct and indirect emissions from this project are significantly less than the 100 tons trigger levels for NO_x, VOC, $PM_{2.5}$, or CO for each project year (40CFR§93.153(b)(1) & (2)). The estimated total NO_x emissions for the project are 21.2 tons. VOC, $PM_{2.5}$, and CO are all less than 1 ton each for the project (see attached estimates).

3. The project is presumed to conform with the General Conformity requirements and is exempted from Subpart B under 40CFR§93.153(c)(1).

Encl

Peter Weppler
Chief, Environmental Analysis Branch

Emissions have been estimated using project planning information developed by the New York District, consisting of anticipated equipment types and estimates of the horsepower and operating hours of the diesel engines powering the equipment. In addition to this planning information, conservative factors have been used to represent the average level of engine load of operating engines (load factors) and the average emissions of typical engines used to power the equipment (emission factors). The basic emission estimating equation is the following:

$$E = hrs \times LF \times EF$$

Where:

E = Emissions per period of time such as a year or the entire project.
hrs = Number of operating hours in the period of time (e.g., hours per year, hours per project).
LF = Load factor, an estimate of the average percentage of full load an engine is run at in its usual operating mode.
EF = Emission factor, an estimate of the amount of a pollutant (such as NO_x) that an engine emits while performing a defined amount of work.

In these estimates, the emission factors are in units of grams of pollutant per horsepower hour (g/hphr). For each piece of equipment, the number of horsepower hours (hphr) is calculated by multiplying the engine's horsepower by the load factor assigned to the type of equipment and the number of hours that piece of equipment is anticipated to work during the year or during the project. For example, a crane with a 250-horsepower engine would have a load factor of 0.43 (meaning on average the crane's engine operates at 43% of its maximum rated power output). If the crane were anticipated to operate 1,000 hours during the course of the project, the horsepower hours would be calculated by:

250 horsepower x 0.43 x 1,000 hours = 107,500 hphr

The emissions from diesel engines vary with the age of an engine and, most importantly, with when it was built. Newer engines of a given size and function typically emit lower levels of pollutants than older engines. The NO_x emission factors used in these calculations assume that the equipment pre-dates most emission control requirements (known as Tier 0 engines in most cases), to provide a reasonable "upper bound" to the emission estimates. If newer engines are actually used in the work, then emissions will be lower than estimated for the same amount of work. In the example of the crane engine, a NO_x emission factor of 9.5 g/hphr would be used to estimate emissions from this crane on the project by the following equation:

$$\frac{107{,}500 \text{ hphr} \times 9.5 \text{ g } NO_x/\text{hphr}}{453.59 \text{ g/lb} \times 2{,}000 \text{ lbs/ton}} = 1.1 \text{ tons of } NO_x$$

As noted above, information on the equipment types, horsepower, and hours of operation associated with the project have been obtained from the project's plans and represent current best estimates of the equipment and work that will be required. Load factors have been obtained from various sources depending on the type of equipment. Marine engine load factors are primarily from a document associated with the New York and New Jersey Harbor Deepening Project (HDP): "Marine and Land-Based Mobile Source Emission Estimates for the Consolidated Schedule of 50-Foot Deepening Project, January 2004," and from EPA's 1998 Regulatory Impact Analysis (RIA): "EPA Regulatory Impact Analysis: Control of Commercial Marine Vessels." Land-side nonroad equipment load factors are from the documentation for EPA's NONROAD emission estimating model, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling, EPA420-P-04-005, April 2004."

Emission factors have also been sourced from a variety of documents and other sources depending on engine type and pollutant. The NO_x emission factors for marine engines have been developed primarily from EPA documentation for the Category 1 and 2 standards (RIA, "Control of Emission from Marine Engines, November 1999) and are consistent with emission factors used in documenting emissions from the HDP, while the VOC emission factors for marine engines are from the Port Authority of New York and New Jersey's "2010 Multi-Facility Emissions Inventory" which represent the range of marine engines operating in the New Jersey harbor and coastal region in terms of age and regulatory tier level. Nonroad equipment NO_x emission factors have been derived from EPA emission standards and documentation, while the nonroad VOC emission factors have been based on EPA's Diesel Emissions Quantifier (DEQ, accessed at: *www.epa.gov/cleandiesel/quantifier/*), run for moderately old equipment (model year 1995). On-road vehicle emission factors have also been developed from the DEQ, assuming a mixture of Class 8, Class 6, and Class 5 (the smallest covered by the DEQ) on-road trucks.

As noted above, the emission factors have been chosen to be moderately conservative so as not to underestimate project emissions. Actual project emissions will be estimated and tracked during the course of the project and will be based on the characteristics and operating hours of the specific equipment chosen by the contractor to do the work.

The following pages summarize the estimated emissions of pollutants relevant to General Conformity, NO_x, VOC, $PM_{2.5}$, SO_2, and CO in sum for the project and by calendar year based on the schedule information also presented (in terms of operating months per year). Following this summary information are project details including the anticipated equipment and engine information developed by the New York District, the load factors and emission factors as discussed above, and the estimated emissions for the project by piece of equipment.

U.S. Army Corps of Engineers
Montauk Point, NY
General Conformity Related Emission Estimates
DRAFT
5/15/2015

Summary of Emissions

tons			
NO_x	VOC	SO_x	$PM_{2.5}$
21.18	0.43	0.01	0.36

Equipment Report			Load			grams per hphr*				tons			
10 BREAKWATERS AND SEAWALLS	Category	Horsepower	Factor	Hours	hphrs	NO_x	VOC	SO_x	$PM_{2.5}$	NO_x	VOC	SO_x	$PM_{2.5}$
Revetment Construction		(approx.)											
0002 Site Preparation													
Install Construction Berm Driving Surface													
GRADER MOTOR ARTICULATED 138 HP (103 KW) 12' (3.6 M) BLADE WIDTH	Grader	48.24	0.59	138	3,928	9.5	0.19	0.0050	0.16	0.041	0.001	0.0000	0.001
ROLLER VIBRATORY SELF-PROPELLED DOUBLE DRUM SMOOTH 6 TON (5.4 MT) 66" (1.7 M) WIDE ASPHALT COMPACTOR	Other diesel engines	48.24	0.59	137	3,899	9.5	0.19	0.0050	0.16	0.041	0.001	0.0000	0.001
TRACTOR CRAWLER (DOZER) 101 HP HYDROSTATIC W/2.60 CY POWER ANGLE TILT (PAT) BLADE (ADD ATTACHMENTS)	Dozer	270.59	0.59	101	16,124	9.5	0.19	0.0050	0.16	0.169	0.003	0.0001	0.003
Access Road Improvement													
TRACTOR CRAWLER (DOZER) 101 HP HYDROSTATIC W/2.60 CY POWER ANGLE TILT (PAT) BLADE (ADD ATTACHMENTS)	Dozer	176.47	0.59	101	10,516	9.5	0.19	0.0050	0.16	0.110	0.002	0.0001	0.002
LOADER FRONT END WHEEL 9.00 CY BUCKET ARTICULATED 4X4	Rubber tired loader	176.47	0.59	300	31,235	9.5	0.19	0.0050	0.16	0.327	0.007	0.0002	0.006
Construction Access Ramp onto Revetment													
HYDRAULIC EXCAVATOR ATTACHMENT MATERIAL HANDLING GRAPPLE 6.50CY 4-TINE/ 5-TINE (ADD 75 000 LB HYDRAULIC EXCAVATOR)	Excavator	58.82	0.59	300	10,411	9.5	0.19	0.0050	0.16	0.109	0.002	0.0001	0.002
LOADER FRONT END WHEEL 9.00 CY BUCKET ARTICULATED 4X4	Rubber tired loader	47.06	0.59	300	8,330	9.5	0.19	0.0050	0.16	0.087	0.002	0.0000	0.001
Grade Staging Areas (North & South)													
TRACTOR CRAWLER (DOZER) 341-440 HP (254-328 KW) POWERSHIFT W/UNIVERSAL BLADE	Dozer	7.84	0.59	440	2,035	9.5	0.19	0.0050	0.16	0.021	0.000	0.0000	0.000
Final Staging Area Grading & Repair													
GRADER MOTOR ARTICULATED 138 HP (103 KW) 12' (3.6 M) BLADE WIDTH	Grader	8.11	0.59	138	660	9.5	0.19	0.0050	0.16	0.007	0.000	0.0000	0.000
LOADER FRONT END WHEEL ARTICULATED 2.75 CY (2.1 M3) BUCKET 4X4	Rubber tired loader	0.30	0.59	250	44	9.5	0.19	0.0050	0.16	0.000	0.000	0.0000	0.000
LOADER/BACKHOE WHEEL 1.10 CY (0.84 M3) FRONT END BUCKET 14.6' (3.7 M) DEPTH OF HOE 24" (0.61 M) DIPPER 4X4	Backhoe	22.15	0.21	110	512	9.5	0.19	0.0050	0.16	0.005	0.000	0.0000	0.000
ROLLER VIBRATORY SELF-PROPELLED DOUBLE DRUM SMOOTH 2.7 TON (2.5 MT) 47"(3.8 M) WIDE ASPHALT COMPACTOR	Other diesel engines	8.11	0.59	36	172	9.5	0.19	0.0050	0.16	0.002	0.000	0.0000	0.000
TRACTOR CRAWLER (DOZER) 181-250 HP (135-186 KW) POWERSHIFT LGP W/UNIVERSAL BLADE	Dozer	8.11	0.59	250	1,196	9.5	0.19	0.0050	0.16	0.013	0.000	0.0000	0.000
TRACTOR CRAWLER (DOZER) 341-440 HP (254-328 KW) POWERSHIFT W/UNIVERSAL BLADE	Dozer	7.84	0.59	440	2,035	9.5	0.19	0.0050	0.16	0.021	0.000	0.0000	0.000
0003 Excavation													
Existing Stone Revetment - Cast Unusable Stone Along Toe													
HYDRAULIC EXCAVATOR CRAWLER 160 000 LB (72 575 KG) 4.50 CY (3.4 M3) BUCKET 34.8' (10.6 M) MAX DIGGING DEPTH 1	Excavator	1,176.47	0.59	500	347,059	9.5	0.19	0.0050	0.16	3.634	0.073	0.0019	0.061
Sand Along Toe - Cast Along Toe Outside Sacrificial Unusable Stone													
HYDRAULIC EXCAVATOR CRAWLER 160 000 LB (72 575 KG) 4.50 CY (3.4 M3) BUCKET 34.8' (10.6 M) MAX DIGGING DEPTH	Excavator	274.51	0.59	500	80,980	9.5	0.19	0.0050	0.16	0.848	0.017	0.0004	0.014
0004 Revetment Fill													
New to Existing Stone Tie-in 6 Ton Stone													
HYDRAULIC EXCAVATOR ATTACHMENT MATERIAL HANDLING GRAPPLE 9.00CY 4-TINE/ 5-TINE (ADD 100 000 LB HYDRAULIC EXCAVATOR)	Excavator	23.53	0.59	400	5,553	9.5	0.19	0.0050	0.16	0.058	0.001	0.0000	0.001
LOADER FRONT END WHEEL 9.00 CY BUCKET ARTICULATED 4X4	Rubber tired loader	23.53	0.59	300	4,165	9.5	0.19	0.0050	0.16	0.044	0.001	0.0000	0.001
Filter Fabric Layer													
CRANE HYDRAULIC TRUCK MOUNTED 25 TON (22.7 MT) 80' (24.4 M) BOOM 6X4	Off-road truck	294.12	0.43	225	28,456	9.5	0.19	0.0050	0.16	0.298	0.006	0.0002	0.005
LOADER/BACKHOE WHEEL 1.10 CY (0.84 M3) FRONT END BUCKET 14.6' (3.7 M) DEPTH OF HOE 24" (0.61 M) DIPPER 4X4	Rubber tired loader	45.10	0.59	110	2,927	9.5	0.19	0.0050	0.16	0.031	0.001	0.0000	0.001
LOADER FRONT END WHEEL 9.00 CY BUCKET ARTICULATED 4X4	Rubber tired loader	23.53	0.59	300	4,165	9.5	0.19	0.0050	0.16	0.044	0.001	0.0000	0.001
Unsuitable Stone Removal (Existing) - Placed at Toe													
HYDRAULIC EXCAVATOR CRAWLER 160 000 LB (72 575 KG) 4.50 CY (3.4 M3) BUCKET 34.8' (10.6 M) MAX DIGGING DEPTH	Excavator	117.65	0.59	500	34,707	9.5	0.19	0.0050	0.16	0.363	0.007	0.0002	0.006
Gravel Bedding on Filter Fabric (Above)													
HYDRAULIC EXCAVATOR CRAWLER 160 000 LB (72 575 KG) 4.50 CY (3.4 M3) BUCKET 34.8' (10.6 M) MAX DIGGING DEPTH	Excavator	52.94	0.59	500	15,617	9.5	0.19	0.0050	0.16	0.164	0.003	0.0001	0.003
LOADER FRONT END WHEEL 9.00 CY BUCKET ARTICULATED 4X4	Rubber tired loader	47.06	0.59	300	8,330	9.5	0.19	0.0050	0.16	0.087	0.002	0.0000	0.001
0005 Armor Stone													
15 Ton Stone													
HYDRAULIC EXCAVATOR ATTACHMENT MATERIAL HANDLING GRAPPLE 9.00CY 4-TINE/ 5-TINE (ADD 100 000 LB HYDRAULIC EXCAVATOR)	Excavator	2,411.76	0.59	400	569,175	9.5	0.19	0.0050	0.16	5.960	0.119	0.0031	0.100
LOADER FRONT END WHEEL 9.00 CY BUCKET ARTICULATED 4X4	Rubber tired loader	2,411.76	0.59	300	426,882	9.5	0.19	0.0050	0.16	4.470	0.089	0.0024	0.075
CRANES MECHANICAL LATTICE BOOM CRAWLER 150 TON 240' BOOM LIFTING	Crane	1,205.88	0.43	282	146,225	9.5	0.19	0.0050	0.16	1.531	0.031	0.0008	0.026
1 Ton Stone - Behind new Revetment Armor Stone & Run-up Protection													
HYDRAULIC EXCAVATOR CRAWLER 160 000 LB (72 575 KG) 4.50 CY (3.4 M3) BUCKET 34.8' (10.6 M) MAX DIGGING DEPTH	Excavator	756.30	0.59	500	223,109	9.5	0.19	0.0050	0.16	2.336	0.047	0.0012	0.039
LOADER FRONT END WHEEL 9.00 CY BUCKET ARTICULATED 4X4	Rubber tired loader	176.47	0.59	300	31,235	9.5	0.19	0.0050	0.16	0.327	0.007	0.0002	0.006
Off-Road Totals				**8,458**	**2,019,683**					**21.15**	**########**	**0.011**	**0.356**

U.S. Army Corps of Engineers
Montauk Point, NY
General Conformity Related Emission Estimates
DRAFT
5/15/2015

	Miles	grams per mile**				tons			
		NO_x	VOC	SO_x	$PM_{2.5}$	NO_x	VOC	SO_x	$PM_{2.5}$
Land Equipment Mob 3									
TRUCK HIGHWAY 50 000 LB (22 680 KG) GVW 6X4 3 AXLE (ADD ACCESSORIES)	1,242.35	9.74	2.063	0.011	0.686	0.013	0.003	0.00002	0.001
TRUCK HIGHWAY CONVENTIONAL 8 800 LB (3 992 KG) GVW 4X4 2 AXLE 3/4 TON (0.68 MT) - PICKUP 1	1,283.09	9.74	2.063	0.011	0.686	0.014	0.003	0.00002	0.001
Final Staging Area Grading & Repair									
TRUCK OPTION DUMP BODY REAR 12 CY (9.2 M3) (ADD 45 000 LB (20 412 KG) GVW TRUCK)	22.15	9.74	2.063	0.011	0.686	0.0002	0.0001	0.0000	0.0000
TRUCK HIGHWAY 45 000 LB (20 412 KG) GVW 6X4 3 AXLE (ADD ACCESSORIES)	22.15	9.74	2.063	0.011	0.686	0.0002	0.0001	0.0000	0.0000
On-Road Totals						**0.03**	**0.01**	**0.00**	**0.00**

**Emission factors from MOVES2014 for 2015, Union Co. NJ. MY 2000 single-unit short-haul truck

Total Emissions						**21.18**	**0.43**	**0.01**	**0.36**

Greenhouse gas (GHG) emissions have been estimated using project planning information developed by the New York District, consisting of anticipated equipment types and estimates of the horsepower and operating hours of the diesel engines powering the equipment. In addition to this planning information, conservative factors have been used to represent the average level of engine load of operating engines (load factors) and the average emissions of typical engines used to power the equipment (emission factors). The basic emission estimating equation is the following:

$$\mathbf{E = hrs \times LF \times EF}$$

Where:

E = Emissions per period of time such as a year or the entire project.
hrs = Number of operating hours in the period of time (e.g., hours per year, hours per project).
LF = Load factor, an estimate of the average percentage of full load an engine is run at in its usual operating mode.
EF = Emission factor, an estimate of the amount of greenhouse gas that an engine emits while performing a defined amount of work.

In these estimates, the emission factors are in units of grams of GHG per horsepower hour (g/hphr). For each piece of equipment, the number of horsepower hours (hphr) is calculated by multiplying the engine's horsepower by the load factor assigned to the type of equipment and the number of hours that piece of equipment is anticipated to work during the year or during the project. For example, a crane with a 250-horsepower engine would have a load factor of 0.43 (meaning on average the crane's engine operates at 43% of its maximum rated power output). If the crane were anticipated to operate 1,000 hours during the course of the project, the horsepower hours would be calculated by:

$$\mathbf{250 \text{ horsepower} \times 0.43 \times 1{,}000 \text{ hours} = 107{,}500 \text{ hphr}}$$

The CO_2 emission factors used in these calculations are based on locally-specific emissions data related to off-road and on-road diesel engines.[1] In the example of the crane engine, a CO_2 emission factor of 571 g/hphr would be used to estimate emissions from this crane on the project by the following equation:

$$\frac{\mathbf{107{,}500 \text{ hphr} \times 571 \text{ g } CO_2\text{/hphr}}}{\mathbf{1{,}000{,}000 \text{ g/metric ton}}} = \mathbf{61.4 \text{ metric tons (tonnes) of } CO_2}$$

As noted above, information on the equipment types, horsepower, and hours of operation associated with the project have been obtained from the project's plans and represent current best estimates of the equipment and work that will be required. Load

[1] http://www.panynj.gov/about/pdf/PANYNJ-2014%20Multi-Facility-EI-Report-1-Mar-16-scg.pdf

factors have been obtained from various sources depending on the type of equipment. Land-side non-road equipment load factors are from the documentation for EPA's NONROAD emission estimating model, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling, EPA420-P-04-005, April 2004."

The following pages summarize the estimated emissions of CO_2 in sum for the project including the anticipated equipment and engine information developed by the New York District, the load factors and emission factors as discussed above, and the estimated emissions for the project by piece of equipment.

U.S. Army Corps of Engineers
Montauk Point, NY Revetment
Greenhouse Gas Emission Estimates
2/7/2017

GHG emissions, metric tons CO_2: 1,158

Equipment Report 10 BREAKWATERS AND SEAWALLS Revetment Construction	Horsepower (approx.)	Load Factor	Hours	hphrs	CO_2 g/hphr	tonnes
0002 Site Preparation						
Install Construction Berm Driving Surface						
Grader	48.24	0.59	138	3,928	571	2
Other diesel engines	48.24	0.59	137	3,899	571	2
Dozer	270.59	0.59	101	16,124	571	9
Access Road Improvement						
Dozer	176.47	0.59	101	10,516	571	6
Rubber tired loader	176.47	0.59	300	31,235	571	18
Construction Access Ramp onto Revetment						
Excavator	58.82	0.59	300	10,411	571	6
Rubber tired loader	47.06	0.59	300	8,330	571	5
Grade Staging Areas (North & South)						
Dozer	7.84	0.59	440	2,035	571	1
Final Staging Area Grading & Repair						
Grader	8.11	0.59	138	660	571	0
Rubber tired loader	0.30	0.59	250	44	571	0
Backhoe	22.15	0.21	110	512	571	0
Other diesel engines	8.11	0.59	36	172	571	0
Dozer	8.11	0.59	250	1,196	571	1
Dozer	7.84	0.59	440	2,035	571	1
0003 Excavation						
Existing Stone Revetment - Cast Unusable Stone Along Toe						
Excavator	1,176.47	0.59	500	347,059	571	198
Sand Along Toe - Cast Along Toe Outside Sacrificial Unusable Stone						
Excavator	274.51	0.59	500	80,980	571	46
0004 Revetment Fill						
New to Existing Stone Tie-in 6 Ton Stone						
Excavator	23.53	0.59	400	5,553	571	3
Rubber tired loader	23.53	0.59	300	4,165	571	2
Filter Fabric Layer						
Off-road truck	294.12	0.43	225	28,456	571	16
Rubber tired loader	45.10	0.59	110	2,927	571	2
Rubber tired loader	23.53	0.59	300	4,165	571	2
Unsuitable Stone Removal (Existing) - Placed at Toe						
Excavator	117.65	0.59	500	34,707	571	20
Gravel Bedding on Filter Fabric (Above)						
Excavator	52.94	0.59	500	15,617	571	9
Rubber tired loader	47.06	0.59	300	8,330	571	5
0005 Armor Stone						
15 Ton Stone						
Excavator	2,411.76	0.59	400	569,175	571	325
Rubber tired loader	2,411.76	0.59	300	426,882	571	244
Crane	1,205.88	0.43	282	146,225	571	83
1 Ton Stone - Behind new Revetment Armor Stone & Run-up Protection						
Excavator	756.30	0.59	500	223,109	571	127
Rubber tired loader	176.47	0.59	300	31,235	571	18
Off-Road Totals			**8,458**	**2,019,683**		**1,153**

Land Equipment Mob 3	Miles	CO_2 g/hphr	tonnes
TRUCK HIGHWAY 50 000 LB (22 680 KG) GVW 6X4 3 AXLE (ADD ACCESSORIES)	1,242.35	1,812	2
TRUCK HIGHWAY CONVENTIONAL 8 800 LB (3 992 KG) GVW 4X4 2 AXLE 3/4 TON (0.68 M	1,283.09	1,812	2
Final Staging Area Grading & Repair			
TRUCK OPTION DUMP BODY REAR 12 CY (9.2 M3) (ADD 45 000 LB (20 412 KG) GVW TRUC	22.15	1,812	0
TRUCK HIGHWAY 45 000 LB (20 412 KG) GVW 6X4 3 AXLE (ADD ACCESSORIES)	22.15	1,812	0
On-Road Totals			**5**

CO_2 emission factors

Nonroad	571 g/hphr
Onroad	1812 g/mi at 35 mph

The nonroad engine CO2 emission factor is the average of nonroad equipment in the PANYNJ 2014 emissions inventory, representative of nonroad engines in general.
Onroad emission factor is the heavy-duty truck emisison factor in the PANYNJ 2014 emissions inventory.