US Army Corps of Engineers ®
Galveston District

General Conformity Determination for Houston Ship Channel Expansion Channel Improvement Project

Harris, Chambers, and Galveston Counties, Texas

Prepared for:

U.S. Army Corps of Engineers, Galveston District

Provided by:

The Port of Houston Authority

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1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Galveston District and the Non-Federal Sponsor (NFS), Port Houston, are proposing to implement the Recommended Plan (RP) to address reducing transportation costs while providing for safe, reliable navigation on the Houston Ship Channel (HSC) system. The RP resulted from the HSC Expansion Channel Improvement Project (HSC ECIP), a 4-year federal navigation megastudy conducted to address navigation problems and opportunities. The RP is a Federally-proposed action to dredge portions of the HSC to wider and deeper dimensions to address limitations in the existing channel that result in navigation restrictions and delays with the current and future forecasted vessel traffic and commodity movement. In accordance with the General Conformity (GC) regulations promulgated under the Clean Air Act in 40 CFR Part 93 Subpart B, Determining Conformity of Federal Actions to State or Federal Implementation Plans (EPA 2010a), this Draft General Conformity Determination (GCD) has been prepared to analyze and document the GC-related air emissions that will result from the RP and document that these emissions conform to the latest U.S. Environmental Protection Agency (EPA) approved State Implementation Plan (SIP) applicable to the Houston/Galveston/Brazoria (HGB) ozone non-attainment area (NAA).

1.1 Project Background

The HSC consists of a 50-mile, 45-foot deep, 530-foot wide channel through Galveston Bay, and upstream of Galveston Bay narrowing down and becoming shallower through segments that are 400 feet and 300 feet wide and from 45 feet down to 36 feet deep. The HSC system includes the side channels, Bayport Ship Channel (BSC) and Barbours Cut Channel (BCC). Additionally, 250-foot wide barge lanes are currently maintained on the both sides of the HSC to separate the faster, deep-draft ship traffic from the slower, shallow-draft barge traffic. At each of these major components of the system, there are a variety of navigation features such as bend easings and turning basins to allow vessels to turn into channels and turn around. The last system-wide study of the HSC was completed in 1995, with the resulting project, the Houston and Galveston Navigation Channels (HGNC) Project being constructed primarily from 2000 to 2005. The study was completed almost 25 years ago, and initiated years prior to that at a time when major container terminals and vessel traffic had just started in the system (at Barbours Cut) and before the largest planned terminal (Bayport) was planned or built. The study was also complete before the continued and most recent exponential growth in crude and refined product shipping from Houston. Since then, industry trends in both containerized and bulk liquid or gas cargo have seen a shift to substantially larger vessels. This includes trends towards larger container vessels that have essentially doubled and tripled in capacity, growing from mean a new-build size of 3,000 Twenty-Foot Equivalent Units (TEU) to between a mean of 6,000 and 9,000 TEU, and largest sizes of upwards of 18,000 TEU. Locally, the HSC is beginning to experience vessel calls in the 10,000 TEU and higher class. Also, shifts in crude and refined product tanker size in the HSC is increasingly shifting from Panamax to larger Aframax and Suezmax vessel classes. These vessels come with a variety of transit restrictions related to vessel size and channel dimension due to vessel pilot rules designed to safely guide vessels. Additionally, the upper reaches of the HSC have -37.5 feet Mean Low Lower Water (MLLW) and -41.5 feet MLLW depths that are less than the maximum depth the main HSC provides, limiting vessel draft in these reaches. The HSC ECIP study addresses the delays, draft restrictions and other problems and opportunities related to navigation identified during the study, with an RP planned to address them.

1.2 Project Description, Purpose, and Need

The RP consists of dredging to widen the HSC through the Bay and through a limited segment above Morgans Point in the upper channel, deepen the draft-restricted upper channel, widen the BSC and BCC, and improve or construct new turning features throughout the system. The project also includes dredged material placement areas (PA) and beneficial use (BU) sites to manage material dredged for the project. During the feasibility study process, the various project alternatives formulated were evaluated and two were selected for advancement to detailed evaluation. One was the National Economic Development (NED) Plan, the plan that the USACE has identified as the plan that reasonably maximizes NED benefits consistent with protecting the Nation's environment. The other was the one that the NFS prefers, termed the Locally Preferred Plan (LPP). The LPP was selected as the plan recommended for implementation, and is therefore the RP. The NED Plan is a variant of the RP that omits widening of the HSC in the Bay from Redfish Reef northward to Morgans Point, and requires bend easing and further easing of the Bayport Flare at the confluence of the HSC with the BSC. Because the NED Plan is a smaller variant that omits two major widening segments, it requires fewer cubic yards of dredging, and fewer emissions, to construct. Therefore, the LPP represents the largest that emissions could be from the HSC ECIP project. Both plans are presented to the Assistant Secretary of the Army for Civil Works [ASA(CW)] for review and approval of the LPP as the RP. The LPP and NED Plan are illustrated in **Figure 1-1**. The following summarizes the channel improvement features of the LPP (which again, is the RP):

- Widen the HSC to 700 feet through Galveston Bay from Bolivar Roads near the Entrance Channel to the BCC, and provide bend easings at four bends along the channel. The NED Plan limits the widening to the lower section of the Bay from Bolivar Roads to Redfish Reef. The widening would include shifting the current shallow draft barge lanes outward of the widened channel.
- Widen the HSC from Boggy Bayou to Greens Bayou from it current 300 to 400-foot width to 530 feet.
- Widen the BSC and BCC to 455 ft wide, and construct a combination turning basin and bend easing at the BCC. The NED Plan requires further widening of the Bayport Flare.
- Deepen the HSC from Boggy Bayou to Hunting Bayou to -46.5 ft MLLW, and from Sims Bayou to the Main Turning Basin to -41.5 ft MLLW
- Expand and shift the Brady Island Turning Basin in the upper HSC to a larger diameter.
- Construct a shoaling attenuation feature, which is a groin or jetty-like structure to be modeled and designed during preconstruction engineering and design (PED) to address excessive shoaling occurring in the Bayport Flare.

The RP would be constructed using hydraulic and mechanical dredges supported by various tender, boat, barges and scows. As discussed, the RP includes dredged material PAs and BU sites that would be constructed using the material or used to place the material. At the time of channel construction, material would be pumped by pipeline or transported by scow to upland or aquatic PA and BU sites to raise or build containment dikes, and fill the interior of sites. A variety of onshore equipment such as graders, excavators and dozers would be used to grade, shape and ditch the sites and dikes to build the features or dewater the material. Integral to the Dredged Material Placement Plan (DMMP) planned for the RP, are a variety of BU sites that will use the dredge material to construct ecological restoration features such as tidal marsh and bird islands that have been coordinated with Federal and State resource agencies. To manage the new work dredged material generated from constructing the RP, the following existing and new PAs and BU sites are proposed to be used to accept the material. These are illustrated in **Figure 1-2** through **Figure 1-6** described from the Gulf of Mexico to landward:

- Use of the existing Offshore Dredged Material Disposal Site (ODMDS) No. 1.
- Use new work material to construct the base of oyster reef mitigation pads in lower and mid Galveston Bay.
- Construct the following BU sites: two new 6 and 8-acre bird islands in the lower Bay and a new 3-bird island/tidal marsh in the middle part of the Bay. Construct a new marsh cell M12 and an unconstructed, previously authorized marsh cell M11 in the upper part of the Bay.
- Use material to repair and rehabilitate dikes at existing marsh cell M7/8/9.
- In the upper HSC, raise dikes and fill in the existing Filterbed and Glendale PAs, construct and fill a new, one-time upland PA E2 Clinton on PHA property, and beneficially use material to raise the grade of PHA property for future terminal development at BW8.

Once the RP and the above placement features are constructed, the channel would be maintained periodically through maintenance dredging over the next 50 years using the existing PAs and some of the sites created with the project material. The purpose of HSC ECIP study is to evaluate Federal interest in alternative plans (including the No-Action Plan) for reducing transportation costs while providing for safe, reliable navigation on the HSC system. Economic conditions have changed significantly since the last HSC study for both the container and bulk industry. An increase in throughput tonnage and a significant shift in average fleet size render current channel dimensions incapable of accommodating the forecasted commodity and fleet growth without significant and system-wide inefficiencies. The study evaluates and recommends measures that address current and expected inefficiencies. The needs for this project are to address problems and opportunities identified during the study including the following problems:

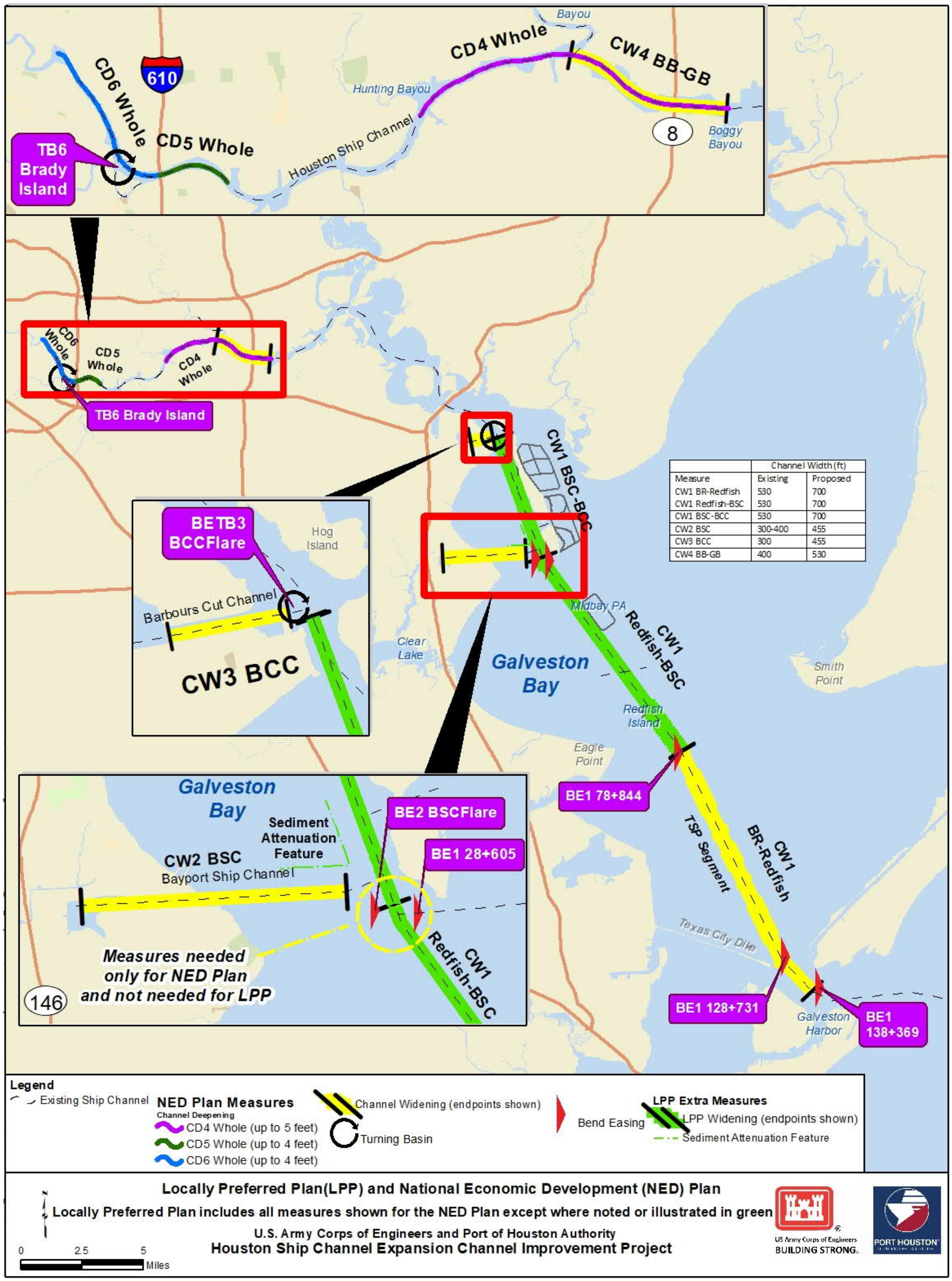
- Inefficient deep and shallow-draft vessel utilization of the HSC system resulting from existing channel depth, width, and configuration;
- Navigation safety concerns for deep and shallow-draft vessel traffic; and
- A lack of environmentally acceptable dredged material placement (PA/BU) with capacity to service the system

The following opportunities were identified:

- Reduce transportation cost of forecasted commodity volume at HSC;
- Eliminate or reduce navigation inefficiencies at HSC for existing and forecasted fleet (i.e., reduce delay times, interport movements, and transit times);
- Eliminate or reduce beam, length, and draft restrictions at HSC for forecasted fleet;

- Optimize channel configuration/design in a cost effective and environmentally acceptable manner that improves safety;
- Establish environmentally suitable PAs/BU sites for new work dredged material, as well as maintenance-dredged material;
- Reduce the environmental impacts from a new project, or protect or improve environmentally sensitive areas in the vicinity of the Federal project through BU of dredge materials; and
- Study the configuration of barge lanes and further optimize them.

The study evaluated a wide variety of widening, deepening, turning, and anchoring measures to address the problems and opportunities. Economic analysis was performed using vessel traffic and transit cost modeling. Engineering analysis was performed to establish proper channel design through ship simulation, hydrodynamic modeling, calculation of dredging and placement quantities, and estimation of construction costs. Environmental evaluation was performed including National Environmental Policy Act (NEPA) analysis and documentation, oyster reef and wetland surveys, and other impact analysis. The cost and benefit analysis identified the plans that produced the most net benefits while meeting the other objectives of the study that addressed the aforementioned problems and opportunities. The plans were evaluated following the planning procedures in USACE planning regulations for Civil Works projects. A Final Integrated Feasibility Report and Environmental Impact Statement (FIFR-EIS) has been developed as the decision document to coordinate the RP for approval and provide NEPA documentation. The RP is the project resulting from the study proposed for implementation to address those problems and opportunities.



	Channel Width (ft)	
Measure	Existing	Proposed
CW1 BR-Redfish	530	700
CW1 Redfish-BSC	530	700
CW1 BSC-BCC	530	700
CW2 BSC	300-400	455
CW3 BCC	300	455
CW4 BB-GB	400	530

Figure 1-1: The Proposed LPP and NED Plan

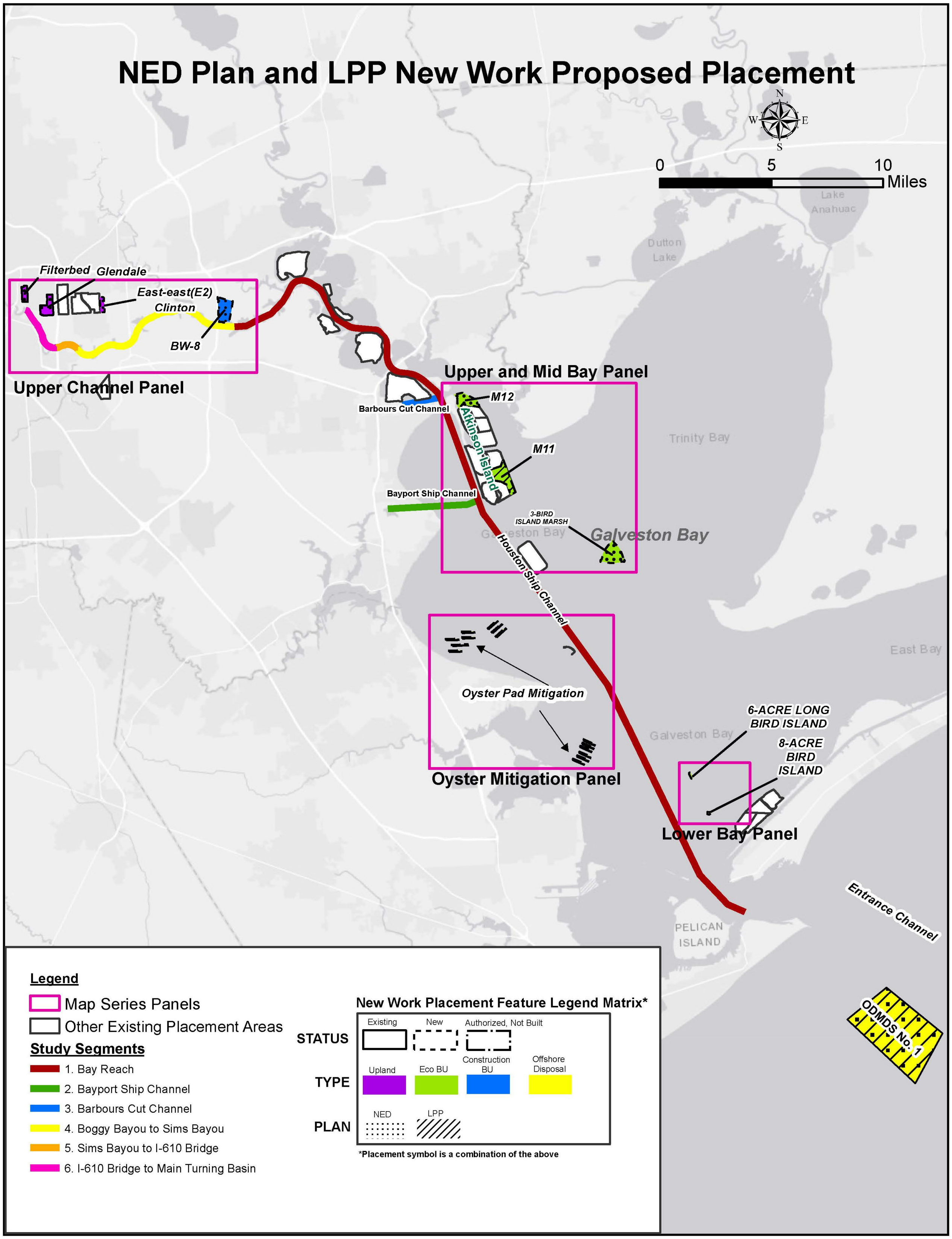


Figure 1-2: Proposed New Work Placement of the LPP and NED Plan

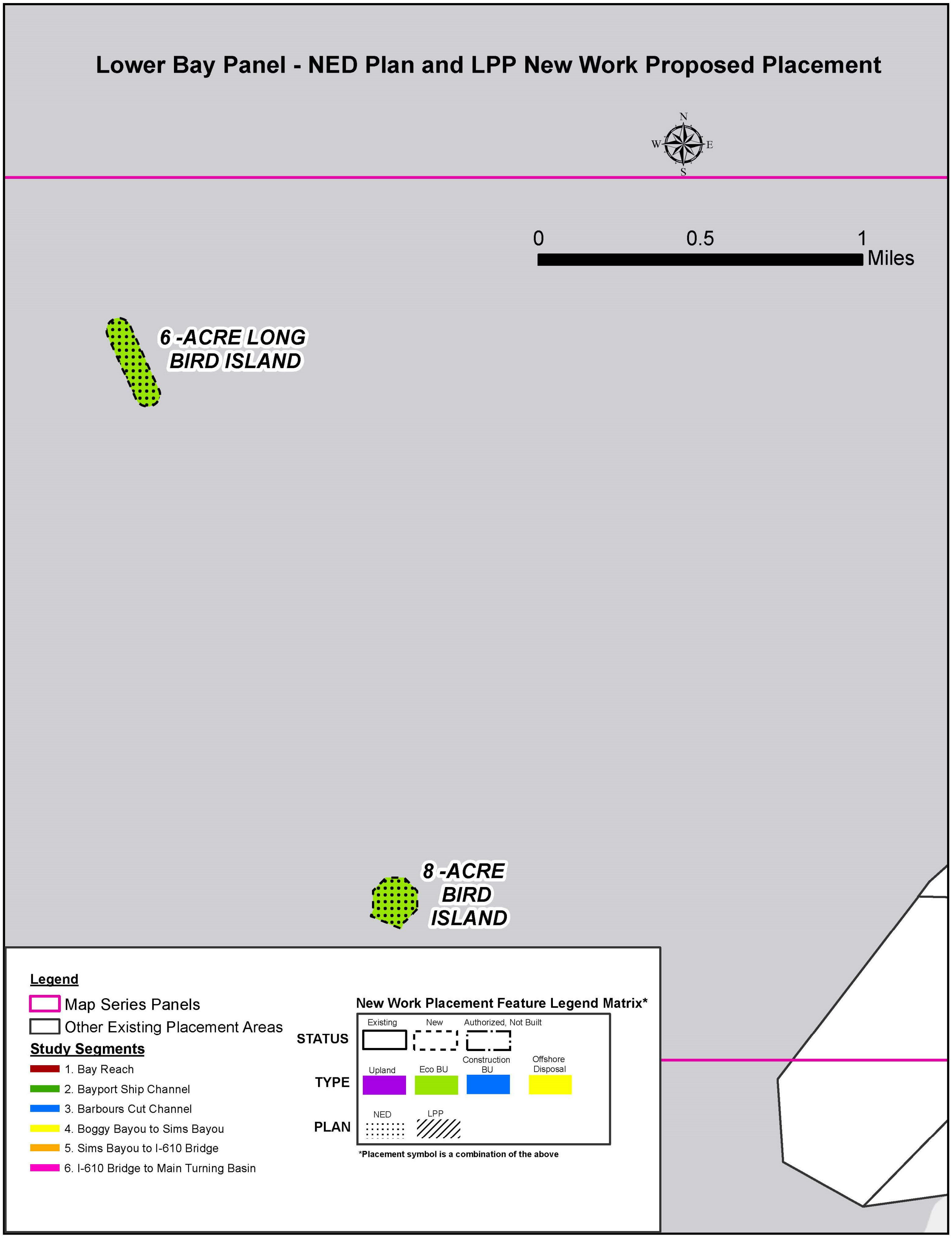


Figure 1-3: Lower Bay – Proposed New Work Placement of the LPP and NED Plan

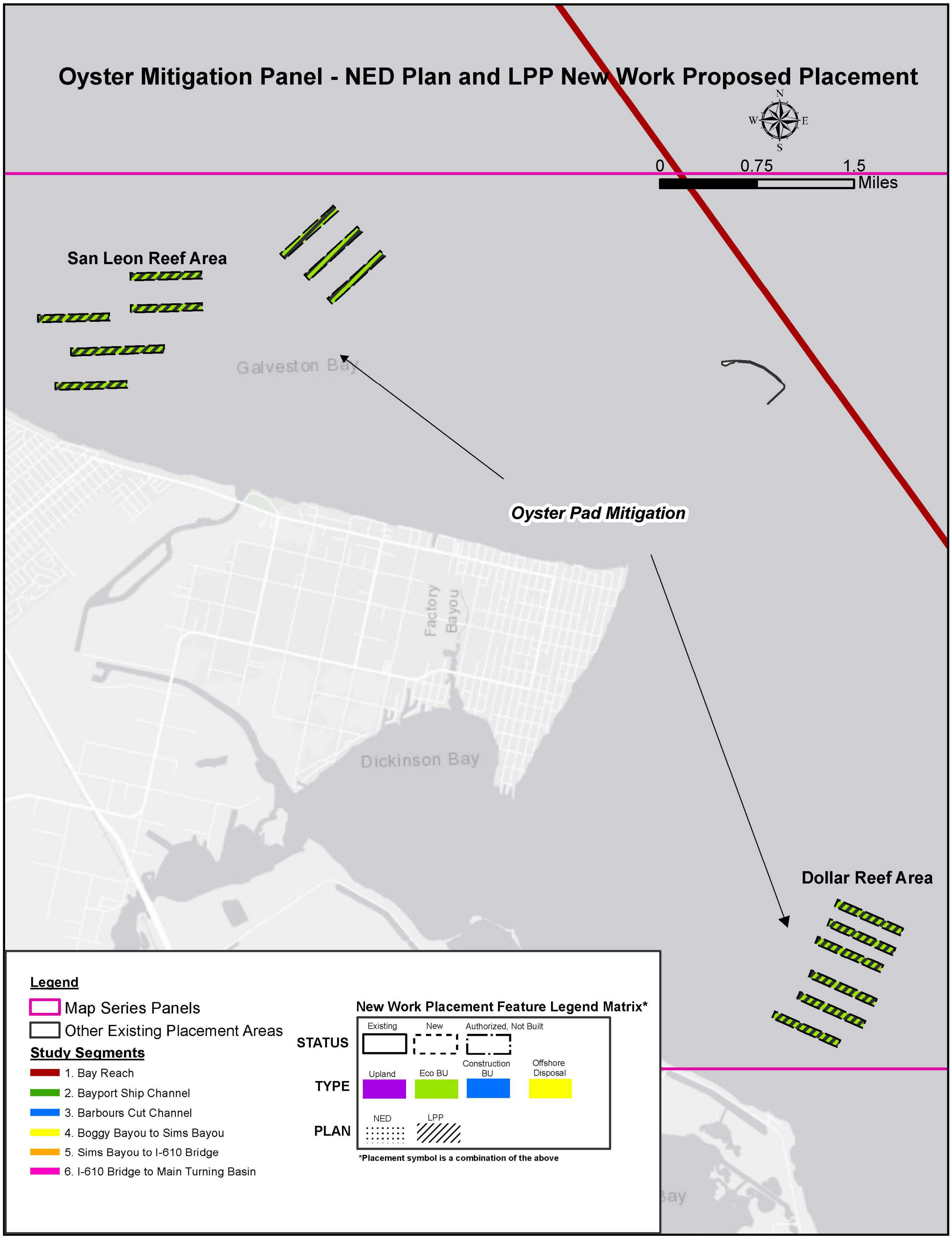


Figure 1-4: Oyster Mitigation – Proposed New Work Placement of the LPP and NED Plan

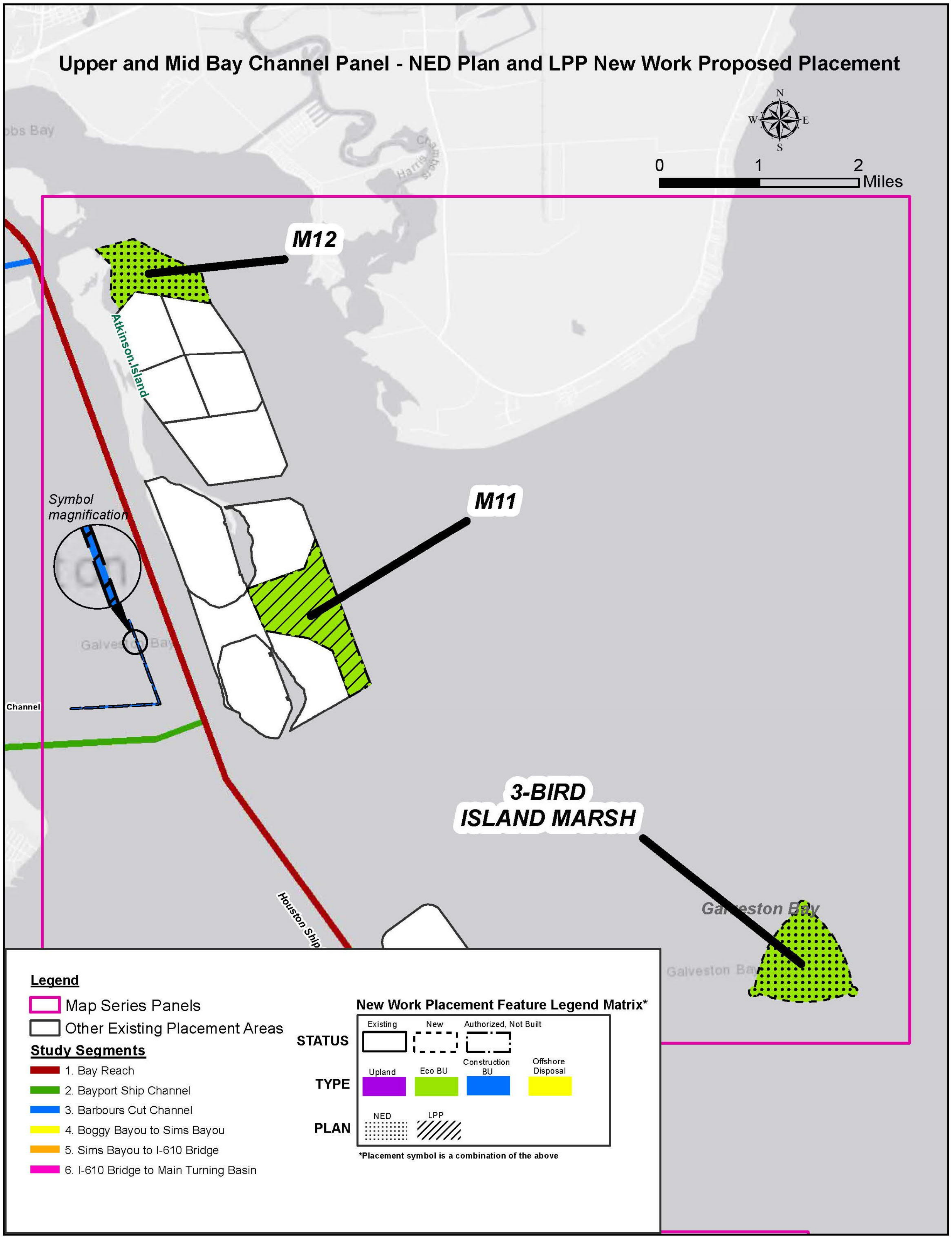


Figure 1-5: Upper and Mid Bay – Proposed New Work Placement of the LPP and NED Plan

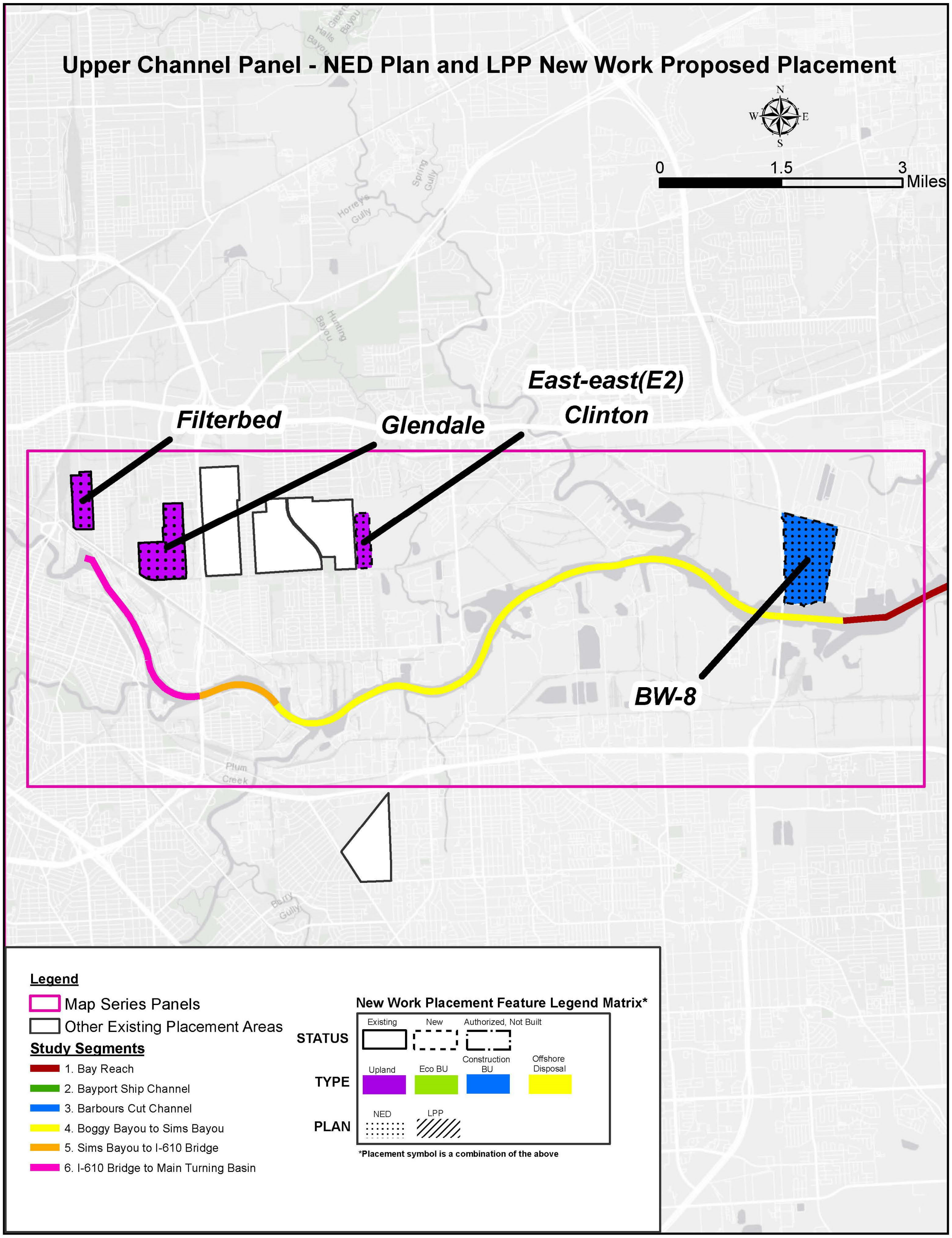


Figure 1-6: Upper HSC – Proposed New Work Placement of the LPP and NED Plan

1.3 Regulatory Background

General Conformity is a Federal regulatory program designed to ensure that actions taken by Federal entities, such as projects proposed by the USACE, do not hinder states' efforts to meet the national ambient air quality standards (NAAQS). The definition of a Federal action as specified in 40 CFR 93.152 includes "…any activity engaged in by a department, agency, or instrumentality of the Federal government, or any activity that a department, agency or instrumentality of the Federal government supports in any way, provides financial assistance for, licenses, permits, or approves, other than activities related to transportation plans, programs, and projects developed, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601et seq.)"

With regard to a dredging project such as the Proposed Project, the Federal Action consists of a Federal project being funded and implemented by the USACE, which is subject to General Conformity review. Placement of dredged material is part of the proposed Federal Action, and is subject to General Conformity. Maintenance dredging is not subject to General Conformity review.

The EPA has established a series of steps to determine whether a given Federal Action is subject to General Conformity review as follows (EPA 2010b).

1. Whether the action will occur in a nonattainment or maintenance area (see Table 1-1 below for the attainment status of the project area);
2. Whether one or more of the specific exemptions apply to the action;
3. Whether the federal agency has included the action on its list of "presumed to conform" actions;
4. Whether the total direct and indirect emissions are below or above the *de minimis* levels (see Table 1-2 below for the *de minimis* levels); and/or
5. Where the facility has an emission budget approved by the state as part of the SIP, the federal agency determines if the emissions from the proposed action are within the budget.

Regarding the proposed Federal action to implement the RP,

1. The action will be occurring in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area, which is designated as serious nonattainment for the 2008 ozone standard and marginal nonattainment of the 2015 ozone standard;
2. None of the specific exemptions apply to the action, except to the extent that any of the dredging to be carried out is maintenance dredging, which is specifically exempt;
3. The USACE has not included dredging projects on a list of "presumed to conform" actions;
4. Total direct and indirect emissions, as currently estimated, will exceed the *de minimis* level of 100 tons of oxides of nitrogen (NO_x) in a marginal nonattainment area (NAA) and 50 tons of NO_x in a serious NAA. (see Error! Reference source not found., Table 2-2, **Error! Reference source not found.**, and Table 2-4in Section 2 for estimated

project related emissions); and

5. The USACE does not possess an emissions budget approved as part of the HGB area SIP.

Based on the discussion presented above and the emissions presented below in Section 2, a General Conformity determination is required for NO_x emissions from the RP. Since the action is required to demonstrate conformity, one or more of the following conditions must be met (EPA 2010b).

1. Demonstrating that the total direct and indirect emissions are specifically identified and accounted for in the applicable SIP;
2. Obtaining a written statement from the state documenting that the total direct and indirect emissions from the action, along with all other emissions in the area, will not exceed the SIP emission budget;
3. Obtaining a written commitment from the state to revise the SIP to include the emissions from the action;
4. Obtaining a statement from the metropolitan planning organization (MPO) for the area documenting that any on-road motor vehicle emissions are included in the current regional emission analysis for the area's transportation plan or transportation improvement program;
5. Fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant or precursor in the same nonattainment or maintenance area.

A sixth potential demonstration method, conducting air quality modeling that demonstrates that the emissions will not cause or contribute to new violations of the standards, or increase the frequency or severity of any existing violations of the standards, is not available for the RP, because modeling is not acceptable for ozone nonattainment areas due to the complexity of ozone formation from precursor pollutants and the limitations of current air quality models. Of the options detailed above, the USACE elected to utilize the second option, obtaining concurrence from the Texas Commission on Environmental Quality (TCEQ) that the total direct and indirect NO_x emissions from the action will not exceed the applicable SIP emissions budget, because of the low level of emissions compared with the SIP budget, and the temporary nature of the emissions.

Table 1-1: Attainment Status of Houston-Galveston-Brazoria Area

Pollutant	Primary NAAQS	Averaging Period	Designation	Counties	Attainment Deadline
Ozone (O_3)*	0.070 ppm (2015 standard)	8-hour	Marginal Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Montgomery	August 3, 2021
	0.075 ppm (2008 standard)	8-hour	Serious Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller	July 20, 2021
Lead (Pb)	0.15 µg/m^3 (2008 standard)	Rolling 3-Month Average	Unclassifiable/ Attainment		
Carbon Monoxide (CO)	9 ppm	8-hour	Unclassifiable/ Attainment		
	35 ppm	1-hour	Unclassifiable/ Attainment		
Nitrogen Dioxide (NO_2)	0.053 ppm	Annual	Unclassifiable/ Attainment		
	100 ppb	1-hour	Unclassifiable/ Attainment		
Particulate Matter (PM_{10})	150 µg/m^3	24-hour	Unclassifiable/ Attainment		
Particulate Matter ($PM_{2.5}$)	12.0 µg/m^3(2012 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	15.0 µg/m^3(1997 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	35 µg/m^3	24-hour	Unclassifiable/ Attainment		
Sulfur Dioxide (SO_2)	0.03 ppm**	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	0.14 ppm**	24-hour	Unclassifiable/ Attainment		
	75 ppb	1-hour	Attainment/ Unclassifiable		

Table 1-2: Significant Action Thresholds in Nonattainment Areas

Ambient Pollutant	Nonattainment Status	Tons/yr
Ozone (VOCs or NO_x):		
	Serious NAA's	**50**
	Severe NAA's	25
	Extreme NAA's	10
	Other ozone NAA's outside an ozone transport region	100
	Other ozone NAA's inside an ozone transport region	
	VOC	50
	NO_x	100
Carbon monoxide:	All NAA's	100
SO_2 or NO_2	All NAA's	100
PM–10:		
	Moderate NAA's	100
	Serious NAA's	70
PM–2.5:		
	Direct emissions	100
	SO_2	100
	NO_x (unless determined not to be a significant precursor)	100
	VOC or ammonia (if determined to be significant precursors)	100
Pb:	All NAA's	25

Source of table: 40 CFR §93.153 Applicability. (Amended to include PM2.5)

The HGB nonattainment status is now classified as serious as a result of the 2008 Eight-Hour Ozone Standard Designations. This designation brings the tons-per-year down to 50 for all Ozone emissions. This change which took effect September 23, 2019 has been reflected in this report. The attainment date for serious nonattainment areas is July 20, 2021 with a 2020 attainment year.

2 PROJECT CONSTRUCTION EMISSIONS

Project construction emissions of NO_x and VOCs have been estimated because of the Project area's status as an ozone nonattainment area. The emission estimates are based on equipment and activity estimates provided by the project engineers and emission factors and other information from published sources, including the PHA's most recent air emissions inventory, *2013 Goods Movement Air Emissions Inventory* (Eastern Research Group, 2017). Use of the Goods Movement Emissions Inventory (GMEI) as a source of emission factors and other emissions-related information ensures that the emission estimates presented in this conformity determination are consistent with the PHA's port-wide inventory of air emissions.

Schedule and equipment information for the LPP has been provided by the Joint Venture of Turner Collie and Braden, Inc. and Gahagan and Bryant Associates, Inc. based on project design parameters for the plan. Information includes:

- Equipment type (dredge, barge, tug, dozer, etc.)
- Engine type (main, auxiliary, etc.)
- Engine horsepower and load factor (% of full load)
- Hours of operation for each vessel or piece of equipment

The following sections describe the different categories of emitting equipment that would be used to construct the LPP.

2.1 Dredging Equipment and Supporting Vessel Emissions

Emission sources on the dredge itself consist of diesel-fueled engines that provide power for the various operations required for dredging. The dredge is expected to be a cutter suction dredge equipped with a main engine to provide power to the cutterhead, an engine to power the ladder pump used to transport the dredged material from the substrate to the surface, an engine to move and position the ladder that guides and positions the cutterhead, and an auxiliary engine to produce electricity for power needs on the dredge. The dredging operation will also require various support vessels such as positioning tugs, crew boats, and survey boats.

The project engineers provided estimated characteristics of the diesel engines on board the dredge such as total horsepower, operating hours, and average operating loads. They also provided typical characteristics of the support vessels, including total installed horsepower and operating hours. Emission factors for all of these diesel engines were obtained from the "harbor craft" section of the GMEI, which lists emission factors for marine engines of various sizes and emission tier levels.

2.2 Dredged Material Placement Site Work

Once the dredged material has been placed in the placement area it will be moved and compacted by non-road equipment such as dozers and loaders. The project engineers provided typical horsepower, operating hours, and load factors for this type of equipment. Emission factors were based on the emission certification levels of Tier 1 non-road equipment. Dredged material placement and handling will account for a relatively small percentage (approximately 8%) of overall project construction NO_x emissions and approximately 18% of VOC emissions.

2.3 Employee Vehicle Commuting

Employee vehicle commuting will make up a very small part of overall project construction emissions, and will represent a negligible percentage of SIP emissions. As an example, the latest EPA approved SIP documentation includes on-road emissions based on 169,918,016 miles per weekday (TCEQ 2016).[1] A 100-person work force making an average 50-mile round trip commute would drive 5,000 miles per day, or 0.003% of the on-road basis of the current SIP.

2.4 Emissions Calculations and Results

Emission estimates for each engine have been based on horsepower hours (hp hrs), calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative (i.e., to be relatively high so as to calculate reasonably worst-case emission levels). Emission factors for marine engines (propulsion and auxiliary engines on dredges, tugs, work boats, etc.) are from Port Houston's most recent (2013) air emissions inventory and reflect average emissions from these engines in 2013. Emission factors for nonroad engines are based on the Tier 1 emission standards stratified by horsepower. The Tier 1 standards have been applicable since the late 1990s (year depending on horsepower) and so reflect the oldest equipment likely to be in use when the project elements take place and likely overestimate the age of equipment that will actually be used, consequently overestimating prospective emissions.

The emission factors used in calculating these emissions are presented in Table 2-1. As noted above, the emission factors are based on Tier 1 standards, which likely overestimate the emissions that would actually occur because of the introduction of Tier 2 and Tier 3 engines into the equipment that may be used on the project. While NO_x and VOC emissions have been calculated for demonstration of General Conformity related emissions, other criteria pollutants have been included for completeness. The anticipated schedule of work was used to allocate emissions to each of the project years. Table 2-2 presents a summary of emissions by year for the LPP.

[1] HGB 2008 Eight-Hour Ozone RFP SIP Revision Adopted by TCEQ 15 December 2016 and approved by EPA on 13 February 2019. See: https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/Adoption/16017SIP_HGBRFP_Ado.pdf Accessed 11 July 2019

Table 2-1: **Emission Factors Used for Nonroad and Marine Engines**

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 1 nonroad						
(11 ≤ hp < 25)	7.1	0.60	0.58	0.004	1.0	4.9
(25 ≤ hp < 50)	7.1	0.60	0.58	0.004	1.0	4.1
(50 ≤ hp < 100)	6.9	0.60	0.58	0.004	1.0	8.5
100 ≤ hp < 175	6.9	0.60	0.58	0.004	1.0	8.5
175 ≤ hp < 300	6.9	0.40	0.39	0.004	1.0	8.5
300 ≤ hp < 600	6.9	0.40	0.39	0.004	1.0	8.5
600 ≤ hp < 750	6.9	0.40	0.39	0.004	1.0	8.5
>750	6.9	0.40	0.39	0.004	1.0	8.5
Marine Cat 1 & Cat 3						
Dredging	9.3	0.23	0.22	0.004	0.1	1.80
Miscellaneous	9.1	0.23	0.22	0.004	0.1	1.78
Tug	8.7	0.23	0.22	0.004	0.1	1.74

Table 2-2: **Estimated Tier 1 Emissions from LPP, tons per year**

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	2023	850	32	31	0.47	49	470
Year 2	2024	1,330	54	52	0.77	93	870
Year 3	2025	565	22	21	0.32	35	337
Year 4	2026	535	22	21	0.30	36	340
Year 5	2027	243	11	10	0.14	19	177
Year 6	2028	129	6	5	0.08	10	94
Total		3,652	146	141	2.08	243	2,288

The results indicate that NOx emissions will be above the lowest *de minimis* threshold of 50 TPY in all 6 years for the LPP. Therefore, a formal determination of conformity would be required.

Tier 2 emissions standards for the various categories of marine engines became effective in different years dependent on the size category of the engine, with Category 2 becoming effective as late as 2007, and Category 3 in 2011. Dredge main engines displacement and horsepower typically fall into either Category 2 or 3. With more than a decade since initial effective dates, Tier 2 dredges are becoming a more common part of the national large dredge fleet. Also, Tier 2 standards for nonroad equipment, although a minor part of emissions in this project, were effective in the 2003 to 2006 range. Therefore, to provide a range of emission estimation that might be more reflective of equipment ultimately used, emissions have also been estimated for the use of Tier 2 engines rather than the Tier 1-based estimates presented above. While it is not possible to predict the actual equipment that will be brought to the project by contractors who have yet to be selected, it is more likely that equipment will be Tier 2 or newer based on when the standards were implemented. Tier 3 dredges are newer and fewer in number than Tier 2 in the domestic fleet with only a few spread amongst approximately 3 companies (some are under construction). Tier 3 push or tow boats, although expected to be a smaller percentage of the available fleet, are present in the regional fleet. To analyze the benefit to further reducing construction emissions, Tier 3-associated emissions were also estimated.

The 2013 Goods Movement Air Emissions Inventory does not include Tier 2 or 3 emission factors. Therefore, the marine factors were selected from another recent emissions inventory released by a Texas port, the 2013 Air Emissions Inventory for Port Corpus Christi, July 2015 (Port of Corpus Christi Authority 2013). Nonroad Tier 2 emission factors were based on the Tier 2 emission standards since more precise modeling would require detailed model year and other engine information that is not available. The Tier 2 emission factors used in calculating these emissions are presented in **Table 2-3** below. **Table 2-4** presents the results for the LPP using Tier 2 emission factors. The Tier 3 emission factors used in calculating these emissions are presented in Table 2-5 below. Table 2-6 presents the results for the LPP using Tier 3 emission factors.

Table 2-3: Tier 2 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 2 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
>750	4.9	0.22	0.21	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.15	0.15	0.005	1.0	2.6
175 ≤ hp < 300	4.8	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
Cat 1 and Cat 2 Tier 2						
Dredge main	6.9	0.37	0.36	0.004	0.1	1.8
Dredge aux	5.2	0.15	0.14	0.004	0.1	1.8
Tug main	6.1	0.37	0.36	0.004	0.1	1.8
Tug aux	5.2	0.15	0.14	0.004	0.1	1.8
Miscellaneous	5.2	0.15	0.14	0.004	0.1	1.8

Table 2-4: Estimated Tier 2 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	2023	583	28	27	0.47	49	228
Year 2	2024	915	41	40	0.77	93	378
Year 3	2025	393	18	17	0.32	35	155
Year 4	2026	372	16	16	0.30	36	151
Year 5	2027	167	7	7	0.14	19	72

Year 6	2028	88	4	4	0.08	10	39
Total		2,517	113	111	2.08	243	1,023

Table 2-5: Tier 3 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 3 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.22	0.21	0.005	1.0	3.7
175 ≤ hp < 300	4.9	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
>750	4.8	0.15	0.15	0.005	1.0	2.6
Marine						
Cat 1 and Cat 2 Tier 2						
Main - large dredge	6.2	0.20	0.19	0.004	0.1	3.7
Main - small dredge	5.0	0.08	0.08	0.004	0.1	3.7
Dredge auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Main - large tug	5.0	0.08	0.08	0.004	0.1	3.7
Main - small tug	4.0	0.08	0.08	0.004	0.1	3.7
Tug auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Miscellaneous	4.0	0.08	0.08	0.004	0.1	3.7

Table 2-6: Estimated Tier 3 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	2023	429	11	11	0.42	47	307
Year 2	2024	747	21	21	0.73	92	511
Year 3	2025	331	10	10	0.31	35	226
Year 4	2026	320	10	9	0.30	36	218
Year 5	2027	139	4	4	0.14	19	98
Year 6	2028	74	2	2	0.08	10	53
Total		2,039	58	58	1.99	241	1,413

The Tier 2 NO_x results indicate a reduction of approximately 30 percent for the LPP, a substantial reduction. The Tier 3 NO_x results indicate a further reduction of 18 percent from Tier 2 in the highest emission year. Though these results are substantially reduced, they still exceed the *de minimis* threshold of 50 TPY in 4 of the 5 years. Therefore, a formal determination of conformity would still be required for either plan.

Most of the emissions are from the marine category, of which dredge engines dominate. Due to the increased demand for larger-scale dredging resulting from supplemental Federal funding, and the progression of several deepening and widening projects for major channels to funding and construction, demand for new dredging capacity has resulted in a $1.5 billion dredging fleet expansion (Navingo Maritime and Offshore Media Group 2019). Several of the major dredging firms have new large cutterhead dredges planned for delivery in the next 2 years to meet industry capacity needs, including Manson, Weeks, Callan and Great Lakes Dredging and Dock (Navingo Maritime and Offshore Media Group 2019, Gerhardt 2018). Therefore, there will be an increase in dredges that meet emissions standards higher than Tier 2, and it is possible that equipment used for the proposed project could be higher tier equipment, which would further reduce the actual emissions. However, the limited population and availability of higher tier equipment may limit cost-feasible bidding for project implementation.

3 LONG-TERM EMISSIONS IMPACTS OF THE PROPOSED PROJECT

As discussed in Section 1.2, the LPP addresses multiple navigation problems and opportunities related to transportation delays, inefficiencies, and the related costs. Addressing these directly decreases the time and fuel spent transporting the commodities shipped through the HSC system, and by extension, the associated emissions from Ocean Going Vessels (OGV). The reduction of transportation costs by the measures formulated for both plans is achieved in two primary ways. One way is by reducing transportation delays in the form of slower or delayed navigation, and waiting at docks and anchorages due to navigation restrictions. Another way is to reduce inefficient delivery of cargo imposed by draft restrictions by deepening the channel to alleviate light loading of vessels. In support of the NEPA documentation of project effects, analysis was conducted to estimate the projected air pollutant emissions reductions from OGVs resulting from implementation of the LPP. The analysis and results are summarized in this section, and are described in detail in Section 3.1.8.2 of Appendix G, Environmental Supporting Document of the FIFR-EIS, and Attachment 1 to Appendix G, Houston Ship Channel Expansion Channel Improvement Project Projected Emissions Reductions.

As part of the economic analysis required for the feasibility study, detailed estimates of projected future commodities, vessel fleets, vessel movement, and associated transportation costs are conducted by navigation economists to analyze whether proposed plans are economically justified. Harborsym, the USACE's certified economic analysis computer simulation model developed by the Institute for Water Resources (IWR), is used to aid the analysis. According to the model's user manual, Harborsym is based on the creation of discrete event Monte Carlo simulations that mimic movement of vessels through a harbor (USACE IWR 2012). The model uses these event simulations along with user-defined statistical inputs to generate trips and calculate vessel transit time, loading and unloading time at docks, and docking and undocking time. A model of the harbor network that physically and statistically represents the navigation conditions of the harbor and its channels is developed as part of the analysis, and incorporates the vessel pilot rules that govern how different classes of vessels can move (one-way, two-way, loaded etc.) given the size, channel dimensions, and other navigation conditions. The model provides a detailed estimate of vessel calls (i.e. trips) and transit times by major vessel categories (i.e. tankers, containers, bulkers by different size classes) and can be used to quantify the extra or reduced time involved in transporting cargo by comparing with-project scenarios to without project conditions. An economic model for the HSC system, using Port of Houston-specific vessel fleets, current and future commodities throughput, and vessel pilot rules from the Houston Pilots Association, was developed for this study's economic analysis.

In order to maximize confidence in and utility of the emissions reduction analysis, the Harborsym output was used to support the operational air analysis. Due to the way specific channel improvements work to reduce transportation time, the reduced hours associated with certain groups of measures (e.g. channel widening, deepening) and study segments can be generally categorized as waiting (hours spent waiting at berth or anchorage) or steaming (under way using propulsion). These assumptions were used to employ the appropriate emissions factors and activity. The annual in-port reduction in these hours by vessel category and by study segment were used to estimate emissions reduced by the action alternatives. Besides in-port reductions, which would occur landward of the entrance buoy to the HSC, the proposed action alternatives would also reduce vessel transit hours and emissions seaward of the buoy in the shipping lanes of the Gulf of Mexico through the elimination of vessel trips. These reductions would take place mostly outside of the HGB NAA, but would still represent substantial emissions reductions in the North American Emissions Control Area (ECA), which encompasses the US Gulf of Mexico. In-port reductions would take place within the HGB NAA. The annual in-port reduction in hours for the Years 2029 and 2044 were used to provide a range of reduction reflecting the increasing reduction occurring as traffic increases in the future due to increased commodity demand.

To provide average vessel engine specifications for the different categories, main engine and auxiliary engine size data was obtained from world fleet vessel data from Information Handling Services (IHS) Fairplay Seaweb, a world vessel registry service. Emissions estimates were developed in accordance with EPA-standard methodologies used for port air emission inventories specified in the *Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories* (ICFI, 2009), including emissions factors for the criteria pollutants, and load factors for propulsion and auxiliary engines. Vessel speed necessary to define various estimate factors were obtained from the economic analysis information used to define vessel transit. One important condition reflected in the operational emissions reduction calculations was the difference in age and engine emissions standards of the OGVs between the larger, newer classes of vessels expected to call at the Port of Houston (POH) and the smaller, older class of vessels replaced. The main vessel category involved are Post-Panamax first (PPX1), second (PPX2) and third generation (PPX3) container vessels (aka New Panamax). The LPP would lift key restrictions that would enable PPX3 vessels that have a capacity in the 10,000 to 12,000 TEU range to call. This would enable a shift of the fleet calling at POH from being dominated by PPX1 (4,000-6,000 TEU) and PPX2 (6,000-10,000 TEU) to one dominated by PPX 2 and PPX3. The average build year of the PPX3 class (taken as PPX of 120 deadweight tons [DWT] or larger) according to the SeaWeb world fleet data is 2012 with most vessels in the 2013-2014 build year, and relatively few ships, comprising a small percentage of the world container vessel fleet. The PPX3 vessel class is relatively new with most of the future fleet of this class expected to have been built in the last few years or in future years to come. SeaWeb fleet data for those with PPX2 dimensions indicated an average build year of 2012, and an average build year of 2003 for PPX1.

Two key changes in marine emissions standards took place in 2010 that would result in reduced emissions for newer Category 3 engines. First, EPA passed regulations requiring new U.S. flagged or manufactured OGVs with Category 3 engines to meet Tier 2 standards by 2011 which would reduce NO_x from then-current standards by 15 to 25 percent. Thereafter, new engines would have to meet Tier 3 standards by 2016 which would reduce NO_x 80 percent from pre-2011 standards. Also, since 2015, all fuel produced and sold in a NAA for Category 3 engines must have fuel with sulfur content reduced to 1,000 ppm. Second, the United Nations International Maritime Organization (IMO) required all OGVs calling or traveling through the North American ECA to meet fuel and emissions standards similar to the EPA standards discussed above. Starting in 2012, fuel sulfur content was to be reduced to 10,000 ppm, and then to 1,000 ppm in 2015, and in 2016, new engines must use NO_x or other ozone precursor exhaust after-treatment systems, to achieve reduced emissions equivalent to the EPA Tier 3 standard. Future year IMO ECA adjustments in the 2009 EPA port inventory guidance were applied to the emissions factors commensurate with the future 2029 project year. Although smaller PPX1 vessels may be built in the future, the fleet age average of 2003 indicates this will be a small, niche market, as the general trend towards the larger classes will predominate, and PPX1 age in the future would likely remain older, with engines meeting lower tier standards. Therefore, the difference in emissions standards between the older

PPX1 and the shift to newer PPX2 and PPX3 vessels, was accounted for by adjusting the PPX3 vessels to reflect Tier 3 emissions standards.

Table 3-1 shows a summary of the projected in-port emissions reductions from OGVs in tons per year (tpy) for the LPP. Emissions are estimated based on vessel hourly reductions projected for the years 2029 and 2044, and pollutants of concern for this analysis include criteria pollutants nitrogen dioxide (NO_x), particulate matter 10 micrometers or less in diameter (PM_{10}), PM 2.5 micrometers or less in diameter ($PM_{2.5}$), hydrocarbon (HC) which is analogous to VOC, carbon monoxide (CO), sulfur oxides (SO_x) and greenhouse gas pollutant carbon dioxide (CO_2). Note that since these values represent reductions in emissions, higher values indicate greater reductions. For each year analyzed, calculations demonstrate a significant reduction in emissions associated with the LPP for all pollutants.

Table 3-1: Summary of In-Port Operational Emissions Reductions by the LPP

Emissions Reductions (tpy)							
Year	NO_x	PM_{10}	$PM_{2.5}$	HC	CO	SO_x	CO_2
2029	147.2	15.61	14.24	3.35	7.74	17.98	29,274
2044	334.4	31.61	28.84	6.90	16.03	36.53	59,474

The results show that the LPP, which provides full widening through the bay, and reduces the most transit delays, reduces in-port NOx emissions by greater than the *de minimis* threshold (50 TPY) throughout the project operational timespan. The annual LPP NO_x emissions reductions were interpolated between 2029 and 2044, and cumulative reductions calculated, then compared to the total conformity emissions for the LPP as shown in Table 3-2. From 2044 and forward, the underlying economic analysis assumes a steady state of commodity growth and transport, which results in the constant annual reduction from that point forward. The cumulative reduction surpasses the Tier 1 construction total of 3,652 tons presented in Table 2-2 in 2043, which means construction emissions would be offset by operational reductions in fourteen years after the project would be operational. The cumulative reduction surpasses the Tier 2 construction total of 2,517 tons presented in Table 2-4 in 2044, eleven years after the project would be operational. The cumulative reduction surpasses the Tier 3 construction total of 2,145 tons presented in **Table 2-6** in 2037, ten years after the project would be operational. Once the shift to the larger, newer vessel fleet plateaus in 2040, it would take 10 years to reach a cumulative NOx reduction that surpasses the Tier 1 emissions, 7 years to surpass the Tier 2 emissions, and 6 years to surpass the Tier 3 emissions. The results of the analysis demonstrate the positive impacts to the long-term operational emissions that can be anticipated. The removal of inefficient vessel traffic patterns and loading, and the increase in efficiency brought on by the economies of scale allowed by the increased channel size contribute to the forecasted emissions decrease.

Table 3-2: Cumulative In-Port Operational NO_x Reduction of the LPP

Year	NO_x Reduction (TPY)	Cumulative NO_x Reduction (tons)
2029	147	

Year	NO_x Reduction (TPY)	Cumulative NO_x Reduction (tons)
2030	164	311
2031	181	493
2032	198	691
2033	215	906
2034	232	1,138
2035	249	1,388
2036	266	1,654
2037	283	1,937
2038	300	2,237
2039	317	2,555
2040	334	2,889
2041	334	3,224
2042	334	3,558
2043	334	3,892
2044	334	4,227
2045	334	4,561
2046	334	4,895
2047	334	5,230
2048	334	5,564
2049	334	5,899
2050	334	6,233
2051	334	6,567
2052	334	6,902
2053	334	7,236
2054	334	7,571
2055	334	7,905
2056	334	8,239
2057	334	8,574
2058	334	8,908
2059	334	9,242
2060	334	9,577
2061	334	9,911
2062	334	10,246
2063	334	10,580
2064	334	10,914
2065	334	11,249
2066	334	11,583
2067	334	11,917
2068	334	12,252

Year	NO_x Reduction (TPY)	Cumulative NO_x Reduction (tons)
2069	334	12,586
2070	334	12,921
2071	334	13,255
2072	334	13,589
2073	334	13,924
2074	334	14,258
2075	334	14,592
2076	334	14,927
2077	334	15,261
2078	334	15,596

4 GENERAL CONFORMITY EVALUATION AND PRELIMINARY DETERMINATION

As noted in Section 1 (Introduction) and illustrated in **Error! Reference source not found.**, Table 2-2, **Error! Reference source not found.**, and Table 2-4, only emissions of NO_x exceed the applicable General Conformity threshold. Therefore, this section addresses NO_x emissions with respect to General Conformity requirements. To demonstrate whether the RP (LPP) construction NO_x emissions can be accommodated in the HGB SIP emissions budgets, the most recent EPA-approved ozone SIP demonstration documents were reviewed for emissions inventory information. In consideration of the definition and conformity determination requirements for the most recent revisions to the SIP in 40 CFR §93.152 and §93.158(a)(5)(i)(A) respectively, the latest approved revision to the SIP is the *HGB 2008 Eight-Hour Ozone RFP SIP Revision*, approved by EPA on February 13, 2019 (TCEQ 2016).

This SIP RFP demonstration was reviewed to determine the various activity categories of emissions in which the RP's construction activities will fall. While the SIP evaluates NO_x emissions from all sources, including biogenic (non-human-caused) emission sources, this evaluation focuses on the categories most relevant to the RP construction emissions, specifically the Commercial Marine and Construction and Mining categories. Employee commuting emissions would be a negligible amount of project emissions, as explained in Section 2.3, and given the size of the mobile source budget, would be an even more negligible percentage of this budget.

The NO_x emissions budget for commercial marine vessels (CMV), which constitute most of the project emissions at more than 90%, was obtained from Appendix 1, Reasonable Further Progress Demonstration Spreadsheet, to the *HGB 2008 Eight-Hour Ozone RFP SIP Revision* [RFP SIP] (TCEQ 2016). Table 4-1 below provides the uncontrolled and controlled CMV emissions inventory for the HGB NAA excerpted from Appendix 1 of the RFP SIP. The RFP SIP demonstration contained non-road mobile source category emissions, which encompasses various sub-categories of construction, mining, agricultural, and landscaping, but did not further break down emissions into the sub-categories. The RFP SIP demonstration separated oil and gas drilling rigs from this estimate into a separate estimate, and provided non-road mobile source emissions for 2017, but did not contain information for future year projections. The emissions estimated for uncontrolled (i.e. before required emissions standards and controls are applied) emissions, source reductions due to controls, and the resulting controlled emissions, are presented in Table 4-2.

Table 4-1: Statewide and HGB Area CMV Emissions, tpy

Analysis Year	NOX (tpd)		VOC (tpd)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
2011	68.95	61.61	1.59	1.59
2017	38.16	28.77	1.21	1.15

Table 4-2: HGB RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC (tons per day)

Emissions	NO_X	VOC
Uncontrolled emissions	210.26	123.21
RFP non-road source reduction	123.29	89.63
RFP controlled (post-control) emissions	86.97	33.58

The LPP marine vessel Tier 1 emissions are compared with the HGB CMV projections in Table 4-3 below. Project emissions represent no more than 11.9% of CMV emissions in any one year and make up approximately 5% of CMV emissions on average over the project work period. The project non-road equipment consists of the landside dozers, loaders and other equipment used to conduct PA site work described in Section 2.2. As discussed in that section, these emissions are a relatively minor part of the project emissions. The LPP non-road category Tier 1 emissions are compared to the HGB non-road mobile source controlled emissions in Table 4-4 below. Note, for presentation, these are shown as tons per day instead of tons per year. As shown, the project non-road source emissions represent no more than 0.26% of emissions and make up 0.1% to 0.2% of non-road emissions on average over the work period.

Table 4-3: CMV Tier 1 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	782	10,501	7.4%
2024	1,248	10,501	11.9%
2025	525	10,501	5.0%
2026	487	10,501	4.6%
2027	201	10,501	1.9%
2028	112	10,501	1.1%
All years	**3,355**	**63,006**	**5.3%**

Table 4-4: Non-Road Tier 1 Emissions (tons per day)

	LPP Landside Non-Road Emissions		SIP Controlled Non-Road Emissions for 2017		Project % of 2017 Non-Road emissions	
Year	**NOx**	**VOC**	**NOx**	**VOC**	**NOx**	**VOC**
2023	0.19	0.03	86.97	33.58	0.21%	0.08%
2024	0.22	0.03	86.97	33.58	0.26%	0.10%
2025	0.11	0.02	86.97	33.58	0.13%	0.05%
2026	0.13	0.02	86.97	33.58	0.15%	0.06%
2027	0.12	0.02	86.97	33.58	0.13%	0.05%
2028	0.05	0.01	86.97	33.58	0.05%	0.02%
All years	**0.81**	**0.12**	**521.82**	**201.48**	**0.2%**	**0.1%**

To provide comparison with the range of estimated emissions in Section 2, CMV emissions have also been compared between the LPP project based on the use of Tier 2 engines instead of the Tier 1 and the SIP emissions, in tons per year, is presented in Table 4-5 below. Project emissions are reduced to no more than 8% of CMV emissions in any one year and make up 3.7% of CMV emissions on average over the project work period. Similarly, for non-road emissions, the Tier 2 LPP emissions are compared to SIP emissions, in tons per day in Table 4-6. Project NO_x emissions are slightly reduced percentage-wise to 0.1% of SIP non-road emissions.

Table 4-5: CMV Tier 2 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	535	10,501	5.1%
2024	856	10,501	8.2%
2025	364	10,501	3.5%
2026	337	10,501	3.2%
2027	137	10,501	1.3%
2028	76	10,501	0.7%
All years	**2,306**	**63,006**	**3.7%**

Table 4-6: Non-Road Tier 2 Emissions (tons per day)

	LPP Landside Non-Road Emissions(tons per day)		SIP Controlled Non-Road Emissions for 2017 (tons per day)		Project % of 2017 Non-Road emissions	
Year	NOx	VOC	NOx	VOC	NOx	VOC
2023	0.13	0.03	86.97	33.58	0.15%	0.08%
2024	0.16	0.03	86.97	33.58	0.18%	0.10%
2025	0.08	0.02	86.97	33.58	0.09%	0.05%
2026	0.09	0.02	86.97	33.58	0.11%	0.06%
2027	0.08	0.02	86.97	33.58	0.09%	0.05%
2028	0.03	0.01	86.97	33.58	0.04%	0.02%
All years	**0.57**	**0.12**	**521.82**	**201.48**	**0.1%**	**0.1%**

The Tier 3 emissions from **Table 4-7** were also compared to the CMV SIP budget. As shown, the maximum annual emissions are no more than 7.5% of the CMV budget, and average 3.2% of the CMV budget. Comparatively, the Tier 3 emissions comprise 0.7% less of the CMV SIP budget than the Tier 1 emissions.

Table 4-7 CMV Tier 3 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	458	10,501	4.6%

2024	752	10,501	7.5%
2025	320	10,501	3.2%
2026	298	10,501	3.0%
2027	120	10,501	1.3%
2028	66	10,501	0.7%
All years	2,015	63,006	3.2%

The USACE believes that on average, the LPP emissions constitute a small percentage of the applicable SIP budgets, and the reduction in ship channel operational emissions resulting from the project's navigation improvements would produce greater long-term emissions reduction, then the emissions from this project can clearly be accommodated in the HGB SIP emission budget. The USACE has preliminarily determined that the project construction emissions can conform to the applicable HGB SIP. Therefore, USACE seeks TCEQ's concurrence with this assertion.

5 DRAFT GCD COMMENTS AND RESPONSES

The USACE will submit this Draft GCD, and issue a public notice announcing the availability of the Draft GCD for the RP for a 30-day comment period. The public notice and Draft GCD will be posted on the USACE website. Availability of the public notice and Draft GCD will be communicated to TCEQ, EPA Region 6, and the Houston-Galveston Area Council (H-GAC), which is the MPO for the HGB NAA. The Notice of Availability will be published in the Houston Chronicle and posted on the USACE website.

5.1 TCEQ, EPA, and MPO Comments

Comments and recommendations received from the TCEQ, EPA Regiona 6 and MPO, and responses to them, will be summarized in this section, once received.

5.2 Individual and Organized Groups Comments

Comments received from the public and organizations, and responses to them, will be summarized in this section, once received.

6 FINAL GENERAL CONFORMITY DETERMINATION

PENDING COMPLETION

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Attachment A

Emission Estimation Details

Appendix A – Emission Estimation Details

Project construction emissions of NO_x and VOCs have been estimated because of the Project area's status as an ozone nonattainment area. The emission estimates are based on equipment and activity estimates provided by the project engineers and emission factors and other information from published sources, including the PHA's most recent air emissions inventory, *2013 Goods Movement Air Emissions Inventory* (Eastern Research Group, 2017) and published emission standards. Use of the Goods Movement Emissions Inventory (GMEI) as a source of emission factors and other emissions-related information ensures that the emission estimates presented in this conformity determination are consistent with the PHA's port-wide inventory of air emissions.

AECOM has developed schedule and equipment information for the LPP based on project design parameters for the two plans. Information includes:

- Equipment type (dredge, barge, tug, dozer, etc.)
- Engine type (main, auxiliary, etc.)
- Engine horsepower and load factor (% of full load)
- Hours of operation for each vessel or piece of equipment

The following sections describe the different categories of emitting equipment that would be used to construct the LPP.

A.1 Equipment and Supporting Vessel Emissions

Emission sources on the dredge itself consist of diesel-fueled engines that provide power for the various operations required for dredging. The dredge is expected to be a cutter suction dredge equipped with a main engine to provide power to the cutterhead, an engine to power the ladder pump used to transport the dredged material from the substrate to the surface, an engine to move and position the ladder that guides and positions the cutterhead, and an auxiliary engine to produce electricity for power needs on the dredge. The dredging operation will also require various support vessels such as positioning tugs, crew boats, and survey boats.

The project engineers estimated characteristics of the diesel engines on board the dredge such as total horsepower, operating hours, and average operating loads. They also characterized typical parameters of the support vessels, including total installed horsepower and operating hours. Basic emission factors for the diesel engines were obtained from the "harbor craft" section of the GMEI, which lists emission factors for marine engines of various sizes and emission tier levels. Additional, advanced-tier emission factors have been based on the emission standards for the appropriately sized marine engines.

A.2 Dredged Material Placement Site Work

Once the dredged material has been placed in the placement area it will be moved and compacted by non-road equipment such as dozers and loaders. The project engineers estimated typical horsepower, operating hours, and load factors for this type of equipment. Emission factors were based on the emission certification levels of Tier 1, Tier 2, and Tier 3 non-road equipment.

Dredged material placement and handling will account for a relatively small percentage (approximately 8%) of overall project construction NO_x emissions and approximately 18% of VOC emissions.

A.3 Employee Vehicle Commuting

Employee vehicle commuting will make up a very small part of overall project construction emissions and will represent a negligible percentage of SIP emissions. As an example, the latest EPA approved SIP documentation includes on-road emissions based on 169,918,016 miles per weekday (TCEQ 2016).[1] A 100-person work force making an average 50-mile round trip commute would drive 5,000 miles per day, or 0.003% of the on-road basis of the current SIP.

A.4 Emissions Calculations and Results

Emission estimates for each engine have been based on horsepower hours (hp hrs), calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative (i.e., to be relatively high so as to calculate reasonably worst-case emission levels). Emission factors for marine engines (propulsion and auxiliary engines on dredges, tugs, work boats, etc.) are from Port Houston's most recent (2013) air emissions inventory and reflect average emissions from these engines in 2013. Emission factors for nonroad engines are based on the Tier 1, 2, and 3 emission standards stratified by horsepower. The Tier 1 standards have been applicable since the late 1990s (year depending on horsepower) and so reflect the oldest equipment likely to be in use when the project elements take place and likely overestimate the age of equipment that will actually be used, consequently overestimating prospective emissions. Emission estimates based on Tier 2 and 3 reflect the lower emissions that would result from newer engines being used for the work.

The Tier 1 emission factors used in calculating these emissions are presented in Table A-1. As noted above, the emission factors are based on Tier 1 standards, which likely overestimate the emissions that would actually occur because of the introduction of Tier 2 and Tier 3 engines into the equipment that may be used on the project. While NO_x and VOC emissions have been calculated for demonstration of General Conformity related emissions, other criteria pollutants have been included for completeness. The anticipated schedule of work was used to allocate emissions to each of the project years. Table A-2 presents a summary of emissions from Tier 1 vessels and equipment by year for the LPP.

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[1] *HGB 2008 Eight-Hour Ozone RFP SIP Revision* Adopted by TCEQ 15 December 2016 and approved by EPA on 13 February 2019. See: https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/Adoption/16017SIP_HGBRFP_Ado.pdf Accessed 11 July 2019

Table A-1: Emission Factors Used for Nonroad and Marine Engines

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 1 nonroad						
(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	7.1	0.60	0.58	0.005	1.0	4.1
(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.0	8.5
100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.0	8.5
175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.0	8.5
300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.0	8.5
600 ≤ hp < 750	6.9	0.40	0.39	0.005	1.0	8.5
>750	6.9	0.40	0.39	0.005	1.0	8.5
Marine Cat 1 and Cat 2 Tier 1						
Main - large dredge	9.3	0.23	0.22	0.004	0.1	1.8
Main - small dredge	9.3	0.23	0.22	0.004	0.1	1.8
Dredge auxiliary	7.3	0.23	0.22	0.004	0.1	1.7
Main - large tug	8.7	0.23	0.22	0.004	0.1	1.7
Main - small tug	8.7	0.23	0.22	0.004	0.1	1.7
Tug auxiliary	7.3	0.23	0.22	0.004	0.1	1.7
Miscellaneous	9.1	0.23	0.22	0.004	0.1	1.8

Table A-2: Estimated Tier 1 Emissions, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	850	32	31	0.47	49	470
Year 2	**2024**	1,330	54	52	0.77	93	870
Year 3	**2025**	565	22	21	0.32	35	337
Year 4	**2026**	535	22	21	0.30	36	340
Year 5	**2027**	243	11	10	0.14	19	177
Year 6	**2028**	129	6	5	0.08	10	94
Total		**3,652**	**146**	**141**	**2.08**	**243**	**2,288**

Tier 2 emissions standards for the various categories of marine engines became effective in different years dependent on the size category of the engine, with Category 2 becoming effective as late as 2007, and Category 3 in 2011. Dredge main engines displacement and horsepower typically fall into either Category 2 or 3. With more than a decade since initial effective dates, Tier 2 dredges are becoming a more common part of the national large dredge fleet. Also, Tier 2 standards for nonroad equipment, although a minor part of emissions in this project, were effective in the 2003 to 2006 range. Therefore, to provide a range of emission estimation that might be more reflective of equipment ultimately used, emissions have also been estimated for the use of Tier 2 engines rather than the Tier 1-based estimates presented above. While it is not possible to predict the actual equipment that will be brought to the project by contractors who have yet to be selected, it is more likely that equipment will be Tier 2 or newer based on when the standards were implemented.

The 2013 Goods Movement Air Emissions Inventory does not include Tier 2 emission factors. Therefore, the marine factors were selected from another recent emissions inventory released by a Texas port, the 2013 Air Emissions Inventory for Port Corpus Christi, July 2015 (Port of Corpus Christi Authority 2013) and on relevant emission standards. Nonroad Tier 2 emission factors were based on the Tier 2 emission standards since more precise modeling would require detailed model year and other engine information that is not available. The Tier 2 emission factors used in calculating these emissions are presented in Table A-3 below. Table A-4 presents the results for the LPP using Tier 2 emission factors.

Table A-3: Tier 2 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 2 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.22	0.21	0.005	1.0	3.7
175 ≤ hp < 300	4.9	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
>750	4.8	0.15	0.15	0.005	1.0	2.6
Cat 1 and Cat 2 Tier 2						
Dredge main - large	6.9	0.37	0.36	0.004	0.1	1.8
Dredge main - small	6.2	0.37	0.36	0.004	0.1	1.8
Dredge aux	5.2	0.15	0.14	0.004	0.1	1.8
Tug main - large	6.1	0.37	0.36	0.004	0.1	1.8
Tug main - small	5.2	0.37	0.36	0.004	0.1	1.8
Tug aux	5.2	0.15	0.14	0.004	0.1	1.8
Miscellaneous	5.2	0.15	0.14	0.004	0.1	1.8

Table A-4: Estimated Tier 2 Emissions, tons per year

		Estimated emissions, tons per year					
Year		**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**VOC**	**CO**
Year 1	**2023**	583	28	27	0.47	49	228
Year 2	**2024**	915	41	40	0.77	93	378
Year 3	**2025**	393	18	17	0.32	35	155
Year 4	**2026**	372	16	16	0.30	36	151
Year 5	**2027**	167	7	7	0.14	19	72
Year 6	**2028**	88	4	4	0.08	10	39
Total		**2,517**	**113**	**111**	**2.08**	**243**	**1,023**

Further information is provided by evaluating emissions that would be produced by the use of Tier 3 equipment and vessel engines on the project. Emission factors for these engines have been based on the relevant Tier 3 emission standards. Table A-5 presents the Tier 3 emission factors used in calculating these emissions while Table A-6 presents the emission estimates resulting from the use of Tier 3 engines and equipment on the LPP.

Table A-5: Tier 3 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**VOC**	**CO**
Tier 3 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.22	0.21	0.005	1.0	3.7
175 ≤ hp < 300	4.9	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
>750	4.8	0.15	0.15	0.005	1.0	2.6
Marine						
Cat 1 and Cat 2 Tier 2						
Main - large dredge	6.2	0.20	0.19	0.004	0.1	3.7
Main - small dredge	5.0	0.08	0.08	0.004	0.1	3.7
Dredge auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Main - large tug	5.0	0.08	0.08	0.004	0.1	3.7
Main - small tug	4.0	0.08	0.08	0.004	0.1	3.7
Tug auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Miscellaneous	4.0	0.08	0.08	0.004	0.1	3.7

Table A-6: Estimated Tier 3 Emissions, tons per year

Year		Estimated emissions, tons per year					
		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	488	12	12	0.47	49	351
Year 2	**2024**	788	22	21	0.77	93	541
Year 3	**2025**	337	10	10	0.32	35	231
Year 4	**2026**	320	10	9	0.30	36	218
Year 5	**2027**	139	4	4	0.14	19	98
Year 6	**2028**	74	2	2	0.08	10	53
Total		**2,145**	**60**	**59**	**2.08**	**243**	**1,491**

The construction schedule on which the annual emissions are based is included below in Figure A-1. An illustration of the detailed calculations of Tier 1 emissions developed for the LPP are included as Figure A-2. The Tier 2 and Tier 3 emissions were estimated in a similar manner using the appropriate emission factors.

Figure A-1: Project Schedule

LPP RECOMMENDED PLAN
HSC - Expansion Channel Improvements Project, TEXAS
2018 PRICE LEVELS

ACCT. NO	SEGMENT	CONTRACT	ACTIVITY	DURATION (MONTHS)
6	1A	1	Mitigation-Construct Oyster Reef at San Leon/Dollar Reef	5.0
12		2	NW Dredging - Bolivar Roads to Redfish to 8-Ac B.I.	2.8
12			NW Dredging - Bolivar Roads to Redfish to Long B.I.	3.2
12			NW Dredging - Mech. Dredging to ODMDS	7.6
12	4	3	Site Preparation - E2 Clinton Tract	2.6
12		4	Site Preparation - Beltway 8 Tract	4.7
12		5	NW Dredging - Greens Bayou to Sims Bayou to E2 Clinton	2.3
12			NW Dredging - Boggy Bayou to Greens Bayou to Beltway 8	7.7
6	1B & 2	6	Mitigation-Construct Oyster Reef at San Leon/Dollar Reef	8.6
12		7	NW Dredging - Mech. Dredging to ODMDS	6.2
12		8	NW Dredging - BSC + HSC to B.I. Marsh	11.3
6	1C & 3	9	Mitigation-Construct Oyster Reef at San Leon/Dollar Reef	0.3
12		10	NW Dredging - BCC to M12	6.5
12			Sweeping Cedar Bayou	0.7
6		11	NW Dredging - HSC to M7/8/9 & M11	7.3
12			NW Dredging - HSC to BSC Sed. Attn.	7.2
12	5 & 6	12	Site Preparation - Glendale PA	3.1
12		13	Site Preparation - Filterbed PA	1.5
12		14	NW Dredging - Sims Bayou to Turning Basin to Glendale	3.2
12			NW Dredging - Main Turning Basin to Filterbed	1.6

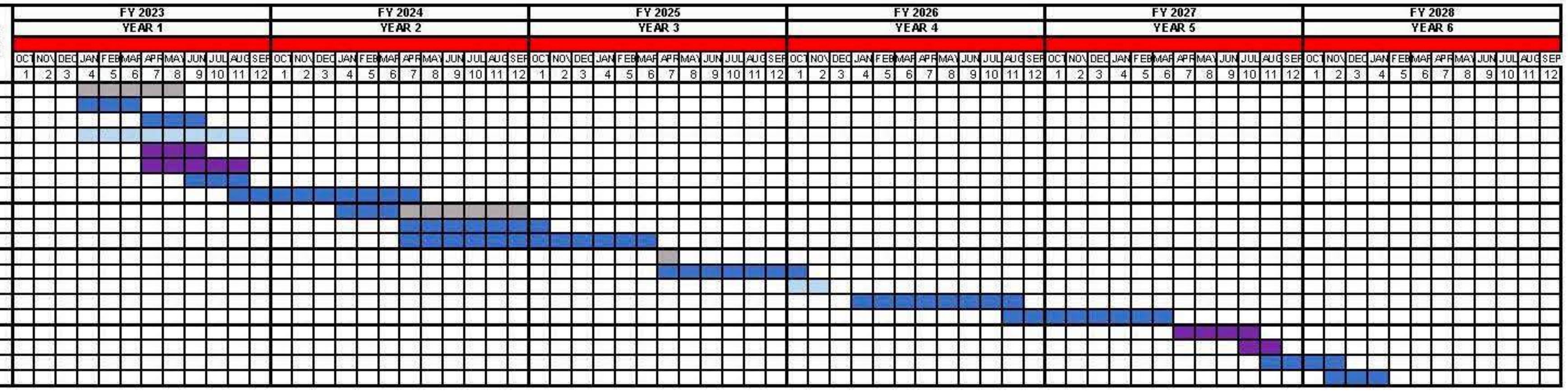

Figure A-2: Illustration of Tier 1 Emission Calculations

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year						Nonroad /	Category	Emission factors, g/hp hr					
												1	2	3	4	5	6	Marine		NOx	PM10	PM2.5	SOx	VOC	CO
CONTRACT YEAR 01 - LPP																									
NED: Segment 1 - Bolivar Roads to Redfish Reef (Station 138+369 to 100+000)																									
Pt. of CW1_Bolivar-Redfish_700		TO: 8-AC Bird Island & Long Bird Island																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.53	16	1,994,000	16	1,305	95.5	5,830,731	100%	0%	0%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					1,833,563	100%	0%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,063,467	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					3,055,939	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	1	Main Engines	5,000	0.70	16					5,347,893	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					275,034	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					366,713	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					1,050,479	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					126,057	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					137,517	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					2,521,149	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					229,195	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					2,750,345	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					343,793	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					515,690	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					114,598	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					320,874	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					57,299	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	156.3	140,668	100%	0%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					22,507	100%	0%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					844,010	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,688,019	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					717,408	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					253,203	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					262,581	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					93,779	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	16.0	66,560	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					32,640	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					83,200	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					15,360	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					3,200	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	12.0	24,960	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					62,400	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					11,520	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					2,400	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	152.0	316,160	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					790,400	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					145,920	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					30,400	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
NED: Segment 1 - Bolivar Roads to Redfish (Station 100+000 to 073+934)																									
Pt. of CW1_Bolivar-Redfish_700		TO: ODMDS																							
MechanicalDredging	Clamshell Dredge (21CY)	1	Main Engines	2,000	0.50	15	3,038,000	15	877	230.9	3,464,082	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					665,104	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tow Tug	2	Propulsion	4,500	0.80	15					24,941,391	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		2	Auxilliaries	300	0.50	24					1,662,759	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tender Tug	4	Propulsion	1,000	0.50	8					3,695,021	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					554,253	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	400	0.60	14					775,954	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.60	24					166,276	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
NED: Segment 4 - Boggy Bayou to Sims Bayou (Station 676+53 to 850+00)																									
CW4_BB-GB_530 + Pt. of CD4_Whole		TO: Beltway-8 Tract																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	143.0	1,029,600	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	124.0	1,785,600	22%	78%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	180	0.75	8	N/A	N/A	N/A	124.0	267,840	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.52	14	2,920,000	14	1,020	204.5	6,252,235	22%	78%	0%	0%	0%	0%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					3,140,840	22%	78%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.92	14					3,160,471	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					5,725,490	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	2	Main Engines	4,000	0.55	14					12,596,078	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					1,177,815	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					687,059	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					2,249,300	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					269,916	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					5,398,319	22%	78%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					490,756	22%	78%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					5,889,076	22%	78%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					736,134	22%	78%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					1,104,202	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					245,378	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					687,059	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					122,689	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	234.9	211,394	22%	78%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					33,823	22%	78%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					1,268,362	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					2,536,723	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					1,078,107	22%	78%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					380,509	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					394,601	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					140,929	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
59.8	1.48	1.41	0.026	0.64	11.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
14.8	0.46	0.44	0.008	0.20	3.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
8.1	0.47	0.46	0.006	1.17	10.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
23.2	1.35	1.31	0.017	3.37	28.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
40.7	2.36	2.30	0.029	5.90	50.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.1	0.12	0.12	0.002	0.30	2.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.8	0.16	0.16	0.002	0.40	3.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
8.0	0.46	0.45	0.006	1.16	9.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.0	0.06	0.05	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.0	0.09	0.09	0.001	0.15	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
24.2	0.64	0.61	0.011	0.28	4.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.8	0.06	0.06	0.001	0.03	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
26.4	0.70	0.67	0.012	0.30	5.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.8	0.09	0.08	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.2	0.13	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.1	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.2	0.08	0.08	0.001	0.04	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.6	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.1	0.09	0.09	0.001	0.16	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
6.4	0.37	0.36	0.005	0.93	7.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
12.8	0.74	0.73	0.009	1.86	15.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.5	0.47	0.46	0.004	0.79	6.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.9	0.11	0.11	0.001	0.28	2.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.6	0.07	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.02	0.02	0.000	0.04	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.8	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.01	0.01	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.4	0.14	0.14	0.002	0.35	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
7.6	0.20	0.19	0.003	0.09	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.5	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
26.3	1.53	1.49	0.019	3.82	32.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.1	0.29	0.29	0.004	0.73	6.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
239.2	6.32	6.05	0.110	2.75	47.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
13.4	0.42	0.40	0.007	0.18	3.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
35.4	0.94	0.90	0.016	0.41	7.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
4.5	0.14	0.13	0.002	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
7.8	0.20	0.19	0.003	0.09	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.7	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.7	0.10	0.10	0.001	0.25	2.1	6.1	0.35	0.34	0.004	0.88	7.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.0	0.17	0.17	0.002	0.44	3.7	10.6	0.61	0.60	0.008	1.53	13.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.03	0.03	0.000	0.07	0.6	1.6	0.09	0.09	0.001	0.23	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
14.2	0.35	0.34	0.006	0.15	2.8	49.9	1.23	1.18	0.021	0.54	9.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.6	0.18	0.17	0.003	0.08	1.3	19.7	0.62	0.59	0.011	0.27	4.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.3	0.31	0.30	0.004	0.77	6.6	18.7	1.08	1.06	0.014	2.71	23.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
9.7	0.56	0.55	0.007	1.40	11.9	33.9	1.96	1.91	0.025	4.91	41.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
21.3	1.23	1.20	0.015	3.09	26.2	74.5	4.32	4.21	0.054	10.80	91.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.0	0.12	0.11	0.001	0.29	2.5	7.0	0.40	0.39	0.005	1.01	8.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.2	0.07	0.07	0.001	0.17	1.4	4.1	0.24	0.23	0.003	0.59	5.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.8	0.22	0.21	0.003	0.55	4.7	13.3	0.77	0.75	0.010	1.93	16.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.03	0.03	0.000	0.07	0.6	1.6	0.09	0.09	0.001	0.23	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
11.5	0.30	0.29	0.005	0.13	2.3	40.3	1.06	1.02	0.019	0.46	8.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.03	0.03	0.000	0.01	0.2	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
12.6	0.33	0.32	0.006	0.14	2.5	43.9	1.16	1.11	0.020	0.50	8.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.3	0.04	0.04	0.001	0.02	0.3	4.6	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.5	0.06	0.06	0.001	0.03	0.5	8.6	0.22	0.21	0.004	0.10	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.01	0.01	0.000	0.01	0.1	1.9	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.5	0.04	0.04	0.001	0.02	0.3	5.4	0.14	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.3	0.01	0.01	0.000	0.00	0.1	1.0	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.4	0.03	0.03	0.000	0.05	0.4	1.3	0.11	0.11	0.001	0.18	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.1	0.00	0.00	0.000	0.01	0.0	0.2	0.02	0.02	0.000	0.03	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.1	0.12	0.12	0.002	0.31	2.6	7.5	0.43	0.42	0.005	1.09	9.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
4.3	0.25	0.24	0.003	0.62	5.3	15.0	0.87	0.85	0.011	2.17	18.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.8	0.16	0.15	0.001	0.26	2.2	6.4	0.55	0.54	0.005	0.92	7.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.6	0.04	0.04	0.000	0.09	0.8	2.3	0.13	0.13	0.002	0.33	2.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.02	0.02	0.000	0.01	0.2	3.1	0.08	0.07	0.001	0.04	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.3	0.01	0.01	0.000	0.00	0.1	1.1	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
NED: Segment 4 - Boggy Bayou to Sims Bayou (Station 850+00 to 974+08)																									
Pt. of CD4_Whole		TO: E2 Clinton																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	78.0	561,600	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	68.0	979,200	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	68.0	106,080	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	562,000	14	997	40.3	1,680,927	100%	0%	0%	0%	0%	0%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					618,450	100%	0%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					676,429	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					1,127,382	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	3	Main Engines	4,000	0.70	14					4,735,005	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		3	Auxilliaries	200	0.60	24					347,878	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					135,286	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					442,900	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					53,148	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					1,062,960	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					96,633	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					1,159,593	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					144,949	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					217,424	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					48,316	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					135,286	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					24,158	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	70.7	63,597	100%	0%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					10,176	100%	0%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					381,584	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					763,167	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					324,346	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					114,475	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					118,715	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					42,398	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
CONTRACT YEAR 02 - NED																									
LPP: Segment 1 - HSC (Station 073+934 to 042+000 +/-)																									
Pt. of CW1_Redfish-BSC_700		TO: San Leon/Dollar Reef Mitigation Sites																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.61	16	2,030,000	16	1,713	74.1	5,204,764	0%	100%	0%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					1,422,067	0%	100%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.67	16					952,785	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					2,370,111	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	2	Main Engines	5,000	0.70	16					8,295,388	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					426,620	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					284,413	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					814,726	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					97,767	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					106,655	0%	100%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					1,955,342	0%	100%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					177,758	0%	100%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					2,133,100	0%	100%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					266,637	0%	100%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					399,956	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					88,879	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					248,862	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					44,440	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					124,431	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					44,440	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	186.0	386,880	0%	100%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					967,200	0%	100%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					178,560	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					37,200	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - HSC (Station 042+000 +/- to 028+605)																									
Pt. of CW1_Redfish-BSC_700		TO: Bird Island Marsh																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.49	16	3,181,000	16	1,718	115.7	6,532,345	0%	86%	14%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					2,221,886	0%	86%	14%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,288,694	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					3,703,143	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	2	Main Engines	5,000	0.66	16					12,220,373	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					666,566	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					444,377	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					1,272,955	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					152,755	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					166,641	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					3,055,093	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					277,736	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					3,332,829	0%	86%	14%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					416,604	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					624,905	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
			Auxilliaries	50	0.50	24					0	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					388,830	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					69,434	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	130.9	117,831	0%	86%	14%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					18,853	0%	86%	14%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					706,985	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,413,971	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					600,938	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					212,096	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					219,951	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					78,554	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
4.3	0.25	0.24	0.003	0.62	5.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
7.4	0.43	0.42	0.005	1.08	9.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.8	0.07	0.07	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
17.2	0.43	0.41	0.007	0.19	3.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.0	0.16	0.15	0.003	0.07	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.1	0.30	0.29	0.004	0.75	6.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
8.6	0.50	0.48	0.006	1.24	10.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
36.0	2.09	2.04	0.026	5.22	44.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.6	0.15	0.15	0.002	0.38	3.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.0	0.06	0.06	0.001	0.15	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.4	0.20	0.19	0.002	0.49	4.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.4	0.02	0.02	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
10.2	0.27	0.26	0.005	0.12	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.8	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
11.1	0.29	0.28	0.005	0.13	2.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.2	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.2	0.06	0.05	0.001	0.03	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.4	0.03	0.03	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.9	0.17	0.16	0.002	0.42	3.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.8	0.34	0.33	0.004	0.84	7.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.5	0.21	0.21	0.002	0.36	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.05	0.05	0.001	0.13	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.2	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	53.4	1.32	1.26	0.023	0.57	10.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	11.4	0.36	0.34	0.006	0.16	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	7.2	0.42	0.41	0.005	1.05	8.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	18.0	1.05	1.02	0.013	2.61	22.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	63.1	3.66	3.57	0.046	9.14	77.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.19	0.18	0.002	0.47	4.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.12	0.002	0.31	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	6.2	0.36	0.35	0.004	0.90	7.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.07	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	18.8	0.50	0.47	0.009	0.22	3.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.05	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	20.5	0.54	0.52	0.009	0.24	4.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.07	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.0	0.10	0.10	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.06	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.03	0.03	0.001	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.17	0.17	0.002	0.43	3.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	9.3	0.25	0.23	0.004	0.11	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.05	0.04	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	57.4	1.42	1.36	0.025	0.62	11.1	9.6	0.24	0.23	0.004	0.10	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	15.3	0.48	0.46	0.008	0.21	3.7	2.6	0.08	0.08	0.001	0.03	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	8.4	0.49	0.47	0.006	1.22	10.3	1.4	0.08	0.08	0.001	0.20	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	24.1	1.40	1.36	0.017	3.50	29.7	4.0	0.23	0.23	0.003	0.58	5.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	79.7	4.62	4.50	0.058	11.55	98.1	13.3	0.77	0.75	0.010	1.92	16.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.3	0.25	0.25	0.003	0.63	5.4	0.7	0.04	0.04	0.001	0.10	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.17	0.16	0.002	0.42	3.6	0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	8.3	0.48	0.47	0.006	1.20	10.2	1.4	0.08	0.08	0.001	0.20	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.14	1.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.09	0.09	0.001	0.16	1.3	0.2	0.02	0.02	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	25.1	0.66	0.64	0.012	0.29	5.0	4.2	0.11	0.11	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.06	0.06	0.001	0.03	0.5	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	27.4	0.72	0.69	0.013	0.31	5.5	4.6	0.12	0.12	0.002	0.05	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.09	0.09	0.002	0.04	0.7	0.5	0.02	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	5.4	0.14	0.13	0.002	0.06	1.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.3	0.08	0.08	0.001	0.04	0.7	0.6	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.01	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.06	0.001	0.11	0.9	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.6	0.27	0.26	0.003	0.67	5.7	0.8	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	9.2	0.53	0.52	0.007	1.34	11.4	1.5	0.09	0.09	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.34	0.33	0.003	0.57	4.8	0.7	0.06	0.05	0.000	0.09	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.08	0.08	0.001	0.20	1.7	0.2	0.01	0.01	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.05	0.05	0.001	0.02	0.4	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	30.0	124,800	0%	86%	14%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					61,200	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					156,000	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					28,800	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					6,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	25.0	52,000	0%	86%	14%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					130,000	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					24,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					5,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 2 - BSC (Station 25+58 to 221+00)																									
Pt. of CW1_Redfish-BSC_700		TO: Bird Island Marsh																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.54	16	2,108,000	16	1,258	104.7	6,515,027	0%	50%	50%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					2,010,811	0%	50%	50%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,166,270	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					3,351,351	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	3	Main Engines	5,000	0.66	16					16,589,189	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		3	Auxilliaries	200	0.60	24					904,865	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					402,162	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					1,152,027	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					138,243	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					150,811	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					2,764,865	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					251,351	0%	50%	50%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					3,016,216	0%	50%	50%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					377,027	0%	50%	50%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					565,541	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					125,676	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					351,892	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					62,838	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	120.0	108,000	0%	50%	50%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					17,280	0%	50%	50%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					648,000	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,296,000	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					550,800	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					194,400	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					201,600	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					72,000	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	20.0	83,200	0%	50%	50%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					40,800	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	3					39,000	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	14					33,600	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					12,000	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	17.0	35,360	0%	50%	50%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	3					33,150	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	14					28,560	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					10,200	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - Bolivar Roads to Redfish (Station 100+000 to 073+934)																									
Pt. of CW1_Bolivar-Redfish_700		TO: ODMDS																							
MechanicalDredging	Clamshell Dredge (21CY)	1	Main Engines	2,000	0.50	15	2,474,000	15	877	188.1	2,820,981	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					541,628	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tow Tug	2	Propulsion	4,500	0.80	15					20,311,060	0%	86%	14%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		2	Auxilliaries	300	0.50	24					1,354,071	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tender Tug	4	Propulsion	1,000	0.50	8					3,009,046	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					451,357	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	400	0.60	14					631,900	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.60	24					135,407	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
CONTRACT YEAR 03 - NED																									
NED: Segment 3 - BCC Channel & Flare (Station 8+78 to 67+11)																									
CW3_BCC_455 + BETB3_BCCFlare		TO: Atkinson Marsh Cell M12																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.63	16	2,825,000	16	1,247	141.6	10,276,022	0%	0%	86%	14%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					2,718,524	0%	0%	86%	14%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,576,744	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					4,530,874	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.6	16					543,705	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2000	0.5	11					1,557,488	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	11					186,899	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.6	16					203,889	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.5	22					3,737,971	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.5	24					339,816	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					4,077,787	0%	0%	86%	14%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.5	24					509,723	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					764,585	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.5	24					169,908	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.6	14					475,742	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.5	24					84,954	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	172.0	154,791	0%	0%	86%	14%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					24,767	0%	0%	86%	14%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					928,745	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,857,490	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					789,433	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					278,624	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					288,943	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					103,194	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	27.0	112,320	0%	0%	86%	14%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					55,080	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	3					52,650	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	14					45,360	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					16,200	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.05	0.05	0.001	0.12	1.0	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.03	0.03	0.001	0.01	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	0.1	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.03	0.03	0.000	0.01	0.2	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	33.4	0.83	0.79	0.014	0.36	6.5	33.4	0.83	0.79	0.014	0.36	6.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	8.1	0.25	0.24	0.004	0.11	1.9	8.1	0.25	0.24	0.004	0.11	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.26	0.25	0.003	0.64	5.5	4.4	0.26	0.25	0.003	0.64	5.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	12.7	0.74	0.72	0.009	1.85	15.7	12.7	0.74	0.72	0.009	1.85	15.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	63.1	3.66	3.57	0.046	9.14	77.7	63.1	3.66	3.57	0.046	9.14	77.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.20	0.19	0.002	0.50	4.2	3.4	0.20	0.19	0.002	0.50	4.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.09	0.09	0.001	0.22	1.9	1.5	0.09	0.09	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.25	0.25	0.003	0.63	5.4	4.4	0.25	0.25	0.003	0.63	5.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.05	0.05	0.000	0.08	0.7	0.6	0.05	0.05	0.000	0.08	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	13.3	0.35	0.34	0.006	0.15	2.7	13.3	0.35	0.34	0.006	0.15	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.03	0.03	0.001	0.01	0.2	1.0	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	14.5	0.38	0.37	0.007	0.17	2.9	14.5	0.38	0.37	0.007	0.17	2.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.05	0.05	0.001	0.02	0.4	1.5	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.8	0.07	0.07	0.001	0.03	0.6	2.8	0.07	0.07	0.001	0.03	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.04	0.04	0.001	0.02	0.3	1.8	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.04	0.03	0.000	0.06	0.5	0.4	0.04	0.03	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.01	0.0	0.1	0.01	0.01	0.000	0.01	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.14	0.14	0.002	0.36	3.0	2.5	0.14	0.14	0.002	0.36	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.9	0.29	0.28	0.004	0.71	6.1	4.9	0.29	0.28	0.004	0.71	6.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.18	0.18	0.002	0.30	2.6	2.1	0.18	0.18	0.002	0.30	2.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.7	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.03	0.02	0.000	0.01	0.2	1.0	0.03	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	0.3	0.02	0.02	0.000	0.05	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.2	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	18.4	1.07	1.04	0.013	2.67	22.7	3.1	0.18	0.17	0.002	0.44	3.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.20	0.20	0.003	0.51	4.3	0.6	0.03	0.03	0.000	0.09	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	167.0	4.41	4.22	0.077	1.92	33.4	27.8	0.74	0.70	0.013	0.32	5.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	9.3	0.29	0.28	0.005	0.13	2.2	1.6	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	24.7	0.65	0.63	0.011	0.28	4.9	4.1	0.11	0.10	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.1	0.10	0.09	0.002	0.04	0.7	0.5	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	5.4	0.14	0.13	0.002	0.07	1.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.03	0.03	0.001	0.01	0.2	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	90.3	2.23	2.14	0.039	0.97	17.5	15.0	0.37	0.36	0.006	0.16	2.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.8	0.59	0.57	0.010	0.26	4.5	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.3	0.60	0.58	0.007	1.49	12.7	1.7	0.10	0.10	0.001	0.25	2.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	29.5	1.71	1.67	0.021	4.28	36.4	4.9	0.29	0.28	0.004	0.71	6.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.21	0.20	0.003	0.51	4.4	0.6	0.03	0.03	0.000	0.09	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.2	0.59	0.57	0.007	1.47	12.5	1.7	0.10	0.10	0.001	0.25	2.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.07	0.07	0.001	0.18	1.5	0.2	0.01	0.01	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.12	0.11	0.001	0.19	1.6	0.2	0.02	0.02	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	30.7	0.81	0.78	0.014	0.35	6.1	5.1	0.14	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.3	0.07	0.07	0.001	0.03	0.6	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	33.5	0.89	0.85	0.015	0.39	6.7	5.6	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.11	0.11	0.002	0.05	0.8	0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.6	0.17	0.16	0.003	0.08	1.3	1.1	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.04	0.04	0.001	0.02	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.1	0.10	0.10	0.002	0.05	0.8	0.7	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.09	0.08	0.001	0.15	1.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.1	0.35	0.34	0.004	0.88	7.5	1.0	0.06	0.06	0.001	0.15	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	12.1	0.70	0.68	0.009	1.76	14.9	2.0	0.12	0.11	0.001	0.29	2.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.1	0.45	0.43	0.004	0.75	6.3	0.9	0.07	0.07	0.001	0.12	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.11	0.10	0.001	0.26	2.2	0.3	0.02	0.02	0.000	0.04	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.06	0.06	0.001	0.03	0.5	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.05	0.4	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year						Nonroad /	Category	Emission factors, g/hp hr					
												1	2	3	4	5	6	Marine		NOx	PM10	PM2.5	SOx	VOC	CO
Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	9.0	18,720	0%	0%	100%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					46,800	0%	0%	100%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					8,640	0%	0%	100%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					1,800	0%	0%	100%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
MechanicalDredging	Clamshell Dredge (12CY)	1	Main Engines	1,750	0.50	15	N/A	N/A	N/A	22.2	291,270	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					63,913	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tow Tug	1	Propulsion	4,500	0.80	15					1,198,368	0%	0%	86%	14%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					79,891	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tender Tug	2	Propulsion	1,000	0.50	8					177,536	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		2	Auxilliaries	50	0.50	24					26,630	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	400	0.60	14					74,565	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.60	24					15,978	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - HSC (Station 028+605 to -3.94)																									
Pt. of CW1_BSC-BCC_700				TO: M11 & M789																					
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.56	16	3,800,000	16	1,463	162.3	10,472,727	0%	0%	0%	100%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					3,116,883	0%	0%	0%	100%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.67	16					2,088,312	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					5,194,805	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	1	Main Engines	5000	0.72	16					9,350,649	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	24					467,532	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.6	16					623,377	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2000	0.5	11					1,785,714	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	11					214,286	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.6	16					233,766	0%	0%	0%	100%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.5	22					4,285,714	0%	0%	0%	100%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.5	24					389,610	0%	0%	0%	100%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					4,675,325	0%	0%	0%	100%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.5	24					584,416	0%	0%	0%	100%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					876,623	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.5	24					194,805	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.6	14					545,455	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.5	24					97,403	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	223.1	200,824	0%	0%	0%	100%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					32,132	0%	0%	0%	100%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					1,204,943	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					2,409,887	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					1,024,202	0%	0%	0%	100%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					361,483	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					374,871	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					133,883	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - HSC (Station 028+605 to -3.94)																									
Pt. of CW1_BSC-BCC_700				TO: BSC Sed. Attn. Feature																					
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.60	16	1,541,000	16	1,588	60.7	4,192,141	0%	0%	0%	25%	75%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					1,164,484	0%	0%	0%	25%	75%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.67	16					780,204	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					1,940,806	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	1	Main Engines	5000	0.7	16					3,396,411	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	24					174,673	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.6	16					232,897	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2000	0.5	11					667,152	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	11					80,058	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.6	16					87,336	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.5	22					1,601,165	0%	0%	0%	25%	75%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.5	24					145,560	0%	0%	0%	25%	75%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					1,746,725	0%	0%	0%	25%	75%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.5	24					218,341	0%	0%	0%	25%	75%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					327,511	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.5	24					72,780	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.6	14					203,785	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.5	24					36,390	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	91.1	81,945	0%	0%	0%	25%	75%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					13,111	0%	0%	0%	25%	75%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					491,671	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					983,342	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					417,920	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					147,501	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					152,964	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					54,630	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	128.0	532,480	0%	0%	0%	25%	75%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					261,120	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					665,600	0%	0%	0%	25%	75%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					122,880	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					25,600	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
CONTRACT YEAR 04 - LPP																									
NED: Segment 5 - Sims Bayou to 610 Bridge (Station 1110+78 to 1160+62)																									
CD5_Whole		TO: Glendale PA																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	18.0	129,600	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	15.0	216,000	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	15.0	23,400	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	176,049	14	997	12.6	526,558	0%	0%	0%	0%	50%	50%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					193,732	0%	0%	0%	0%	50%	50%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					211,894	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					353,157	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.11	0.11	0.001	0.28	2.3	0.3	0.02	0.02	0.000	0.05	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.02	0.02	0.000	0.06	0.5	0.1	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.9	0.26	0.25	0.005	0.11	2.0	1.6	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.04	0.04	0.001	0.02	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	107.4	2.66	2.54	0.046	1.15	20.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	25.1	0.79	0.76	0.014	0.34	6.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	15.9	0.92	0.90	0.012	2.30	19.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	39.5	2.29	2.23	0.029	5.73	48.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	71.1	4.12	4.02	0.052	10.31	87.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.6	0.21	0.20	0.003	0.52	4.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.27	0.27	0.003	0.69	5.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	13.6	0.79	0.77	0.010	1.97	16.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.09	0.09	0.001	0.24	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.15	0.15	0.001	0.26	2.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	41.1	1.09	1.04	0.019	0.47	8.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	44.8	1.19	1.13	0.021	0.52	9.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.8	0.22	0.21	0.004	0.11	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.5	0.14	0.13	0.002	0.07	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.13	0.13	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.2	0.53	0.52	0.007	1.33	11.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.3	1.06	1.04	0.013	2.66	22.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.8	0.68	0.65	0.006	1.13	9.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.16	0.16	0.002	0.40	3.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.8	0.10	0.09	0.002	0.05	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.03	0.03	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.7	0.27	0.25	0.005	0.12	2.1	32.2	0.80	0.76	0.014	0.35	6.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.3	0.07	0.07	0.001	0.03	0.6	7.0	0.22	0.21	0.004	0.10	1.7	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.09	0.08	0.001	0.22	1.8	4.5	0.26	0.25	0.003	0.65	5.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5	11.1	0.64	0.63	0.008	1.60	13.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.5	0.37	0.37	0.005	0.94	8.0	19.4	1.12	1.10	0.014	2.81	23.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	1.0	0.06	0.06	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5	1.3	0.08	0.08	0.001	0.19	1.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.07	0.07	0.001	0.18	1.6	3.8	0.22	0.22	0.003	0.55	4.7	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.8	0.10	0.10	0.002	0.04	0.8	11.5	0.30	0.29	0.005	0.13	2.3	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.9	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.11	0.11	0.002	0.05	0.8	12.6	0.33	0.32	0.006	0.14	2.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	1.3	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	2.5	0.06	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.5	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.01	0.01	0.000	0.01	0.1	1.5	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.05	0.05	0.001	0.14	1.2	2.8	0.16	0.16	0.002	0.41	3.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.11	0.11	0.001	0.27	2.3	5.6	0.33	0.32	0.004	0.81	6.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.07	0.001	0.12	1.0	2.4	0.21	0.20	0.002	0.35	2.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.8	0.05	0.05	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	1.2	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.15	1.2	3.0	0.18	0.17	0.002	0.44	3.7	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.04	0.04	0.000	0.07	0.6	1.5	0.13	0.13	0.001	0.22	1.8	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.04	0.04	0.001	0.02	0.3	4.8	0.13	0.12	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.10	0.09	0.001	0.24	2.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.02	0.01	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.07	0.06	0.001	0.03	0.5	2.7	0.07	0.06	0.001	0.03	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	0.8	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.05	0.05	0.001	0.12	1.0	0.8	0.05	0.05	0.001	0.12	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.08	0.08	0.001	0.19	1.7	1.3	0.08	0.08	0.001	0.19	1.7

														% of work in year				Nonroad /		Emission factors, g/hp hr					
PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	1	2	3	4	5	6	Marine	Category	NOx	PM10	PM2.5	SOx	VOC	CO
	24"-Booster	2	Main Engines	4,000	0.68	14					960,588	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					72,650	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					42,379	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					138,740	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					16,649	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					332,977	0%	0%	0%	0%	50%	50%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					30,271	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					363,248	0%	0%	0%	0%	50%	50%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					45,406	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					68,109	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					15,135	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					42,379	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					7,568	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					21,189	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					7,568	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	12.6	11,351	0%	0%	0%	0%	50%	50%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					1,816	0%	0%	0%	0%	50%	50%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					68,109	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					136,218	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					57,893	0%	0%	0%	0%	50%	50%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					20,433	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
NED: Segment 6 - 610 Bridge to Main Turning Basin (Station 1160+62 to 1266+49)																									
Pt. of CD6_Whole + TB6_I	Pt. of CD6_Whole + TB6_Brad	TO: Glendale PA																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	76.0	547,200	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	62.0	892,800	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	62.0	96,720	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	733,529	14	997	52.6	2,193,965	0%	0%	0%	0%	50%	50%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					807,208	0%	0%	0%	0%	50%	50%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					882,883	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					1,471,472	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	2	Main Engines	4,000	0.68	14					4,002,405	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					302,703	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					176,577	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					578,078	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					69,369	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					1,387,388	0%	0%	0%	0%	50%	50%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					126,126	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					1,513,514	0%	0%	0%	0%	50%	50%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					189,189	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					283,784	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					63,063	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					176,577	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					31,532	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					88,288	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					31,532	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	83.0	74,657	0%	0%	0%	0%	50%	50%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					11,945	0%	0%	0%	0%	50%	50%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					447,944	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					895,888	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					380,752	0%	0%	0%	0%	50%	50%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					134,383	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
NED: Segment 6 - 610 Bridge to Main Turning Basin (Station 00+00 to 30+95)																									
Pt. of CD6_Whole		TO: Filterbed PA																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	47.0	338,400	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	36.0	518,400	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	36.0	56,160	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.79	14	266,671	14	1,099	17.3	805,109	0%	0%	0%	0%	0%	100%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					266,220	0%	0%	0%	0%	0%	100%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					291,179	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					485,298	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	1	Main Engines	4,000	0.70	14					679,417	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					49,916	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					58,236	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					190,653	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					22,878	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					457,566	0%	0%	0%	0%	0%	100%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					41,597	0%	0%	0%	0%	0%	100%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					499,163	0%	0%	0%	0%	0%	100%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					62,395	0%	0%	0%	0%	0%	100%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					93,593	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					20,798	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					58,236	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					10,399	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					29,118	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					10,399	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	47.7	42,959	0%	0%	0%	0%	0%	100%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					6,873	0%	0%	0%	0%	0%	100%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					257,753	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					515,506	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					219,090	0%	0%	0%	0%	0%	100%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					77,326	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5

Water
Land
% land

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5	3.7	0.21	0.21	0.003	0.53	4.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.3	0.02	0.02	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.2	0.01	0.01	0.000	0.02	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.04	0.04	0.001	0.02	0.3	1.6	0.04	0.04	0.001	0.02	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.05	0.04	0.001	0.02	0.3	1.7	0.05	0.04	0.001	0.02	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.01	0.000	0.04	0.3	0.3	0.02	0.01	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.02	0.02	0.000	0.03	0.3	0.2	0.02	0.02	0.000	0.03	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.24	0.24	0.003	0.60	5.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.8	0.39	0.38	0.005	0.98	8.4	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.06	0.06	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.2	0.28	0.27	0.005	0.12	2.2	11.2	0.28	0.27	0.005	0.12	2.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.10	0.10	0.002	0.04	0.8	3.2	0.10	0.10	0.002	0.04	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.19	0.19	0.002	0.49	4.1	3.4	0.19	0.19	0.002	0.49	4.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.6	0.32	0.32	0.004	0.81	6.9	5.6	0.32	0.32	0.004	0.81	6.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	15.2	0.88	0.86	0.011	2.21	18.8	15.2	0.88	0.86	0.011	2.21	18.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.07	0.07	0.001	0.17	1.4	1.2	0.07	0.07	0.001	0.17	1.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.000	0.10	0.8	0.7	0.04	0.04	0.000	0.10	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.12	0.002	0.32	2.7	2.2	0.13	0.12	0.002	0.32	2.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.01	0.000	0.04	0.3	0.3	0.02	0.01	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.7	0.18	0.17	0.003	0.08	1.3	6.7	0.18	0.17	0.003	0.08	1.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.02	0.02	0.000	0.01	0.1	0.5	0.02	0.02	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.3	0.19	0.18	0.003	0.08	1.5	7.3	0.19	0.18	0.003	0.08	1.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	0.8	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.04	0.03	0.001	0.02	0.3	1.4	0.04	0.03	0.001	0.02	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.9	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.4	0.01	0.01	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.3	0.02	0.02	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.01	0.0	0.0	0.00	0.00	0.000	0.01	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.10	0.10	0.001	0.25	2.1	1.7	0.10	0.10	0.001	0.25	2.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.20	0.19	0.002	0.49	4.2	3.4	0.20	0.19	0.002	0.49	4.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.13	0.12	0.001	0.21	1.8	1.4	0.13	0.12	0.001	0.21	1.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.07	0.6	0.5	0.03	0.03	0.000	0.07	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.6	0.15	0.15	0.002	0.37	3.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.23	0.22	0.003	0.57	4.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.04	0.04	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.3	0.20	0.20	0.004	0.09	1.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.07	0.06	0.001	0.03	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.13	0.002	0.32	2.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.2	0.30	0.29	0.004	0.75	6.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.02	0.02	0.000	0.06	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.08	0.08	0.001	0.21	1.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.03	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.12	0.11	0.002	0.05	0.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.8	0.13	0.12	0.002	0.06	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.02	0.02	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.01	0.01	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.03	0.03	0.000	0.05	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.11	0.11	0.001	0.28	2.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.23	0.22	0.003	0.57	4.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.14	0.14	0.001	0.24	2.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.03	0.03	0.000	0.09	0.7
849.9	32.09	31.00	0.469	48.54	470.4	1329.6	54.12	52.39	0.767	93.24	869.8	565.2	22.09	21.36	0.316	35.44	337.3	534.8	21.61	20.91	0.305	36.24	340.0	242.8	10.55	10.22	0.144	19.33	176.6	129.5	5.62	5.44	0.077	10.28	93.9
782.4	27.8	26.8	0.4	38.8	387.4	1248.1	49.0	47.4	0.7	81.4	769.5	524.9	19.5	18.8	0.3	29.6	287.7	486.5	18.5	17.9	0.3	29.2	280.7	200.6	7.9	7.7	0.1	13.2	124.7	112.4	4.5	4.4	0.1	7.8	73.0
67.5	4.3	4.2	0.0	9.8	83.0	81.6	5.2	5.0	0.1	11.8	100.3	40.3	2.6	2.5	0.0	5.8	49.6	48.3	3.1	3.0	0.0	7.0	59.3	42.1	2.6	2.6	0.0	6.1	51.9	17.0	1.1	1.1	0.0	2.5	20.9
8%	13%	13%	10%	20%	18%	6%	10%	10%	8%	13%	12%	7%	12%	12%	9%	16%	15%	9%	14%	15%	11%	19%	17%	17%	25%	25%	21%	32%	29%	13%	20%	20%	16%	24%	22%

NOTICE OF AVAILABILITY OF THE HOUSTON SHIP CHANNEL EXPANSION CHANNEL IMPROVEMENT PROJECTDRAFT GENERAL CONFORMITY DETERMINATION Interested parties are hereby notified of and provided an opportunity to comment on the Draft General Conformity Determination (DGCD), provided as Appendix J to the Integrated Feasibility Report-Environmental Impact Statement. In accordance with Title 40 of the Code of Federal Regulations, Chapter I, Subchapter C, Part 93, Section 93.156(b), notice is hereby provided that the DGCD contains a description of the proposed Federal action and the Federal agency's draft conformity determination. The DGCD is available at https://www.swg.usace.army.mil/Business-With-Us/Planning-Environmental-Branch/Documents-for-Public-Review/ Written comments on the DGCD must be postmarked by December 23, 2019.Comments may be mailed or emailed to: GALVESTON DISTRICT, CORPS OF ENGINEERS, ATTN: DR. HARMON BROWN, P.O. BOX 1229 GALVESTON, TEXAS 77553 or harmon.brown@usace.army.mil **Publish Dates:** 11/22/2019-12/6/2019

US Army Corps of Engineers ®
Galveston District

Final General Conformity Determination for Houston Ship Channel Expansion Channel Improvement Project

Harris, Chambers, and Galveston Counties, Texas

Prepared for:

U.S. Army Corps of Engineers, Galveston District

Provided by:

The Port of Houston Authority

Prepared by:

Starcrest Consulting Group, LLC and the Joint Venture of Turner Collie & Braden Inc. and Gahagan & Bryant Associates, Inc.

December 2019

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1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Galveston District and the Non-Federal Sponsor (NFS), Port Houston, are proposing to implement the Recommended Plan (RP) to address reducing transportation costs while providing for safe, reliable navigation on the Houston Ship Channel (HSC) system. The RP resulted from the HSC Expansion Channel Improvement Project (HSC ECIP), a 4-year federal navigation megastudy conducted to address navigation problems and opportunities. The RP is a Federally-proposed action to dredge portions of the HSC to wider and deeper dimensions to address limitations in the existing channel that result in navigation restrictions and delays with the current and future forecasted vessel traffic and commodity movement. In accordance with the General Conformity (GC) regulations promulgated under the Clean Air Act in 40 CFR Part 93 Subpart B, Determining Conformity of Federal Actions to State or Federal Implementation Plans (EPA 2010a), this Final General Conformity Determination (GCD) has been prepared to analyze and document the GC-related air emissions that will result from the RP and document that project emissions will conform to the latest U.S. Environmental Protection Agency (EPA) approved State Implementation Plan (SIP) applicable to the Houston/Galveston/Brazoria (HGB) ozone non-attainment area (NAA).

1.1 Project Background

The HSC consists of a 50-mile, 45-foot deep, 530-foot wide channel through Galveston Bay, and upstream of Galveston Bay narrowing down and becoming shallower through segments that are 400 feet and 300 feet wide and from 45 feet down to 36 feet deep. The HSC system includes the side channels, Bayport Ship Channel (BSC) and Barbours Cut Channel (BCC). Additionally, 250-foot wide barge lanes are currently maintained on the both sides of the HSC to separate the faster, deep-draft ship traffic from the slower, shallow-draft barge traffic. At each of these major components of the system, there are a variety of navigation features such as bend easings and turning basins to allow vessels to turn into channels and turn around. The last system-wide study of the HSC was completed in 1995, with the resulting project, the Houston and Galveston Navigation Channels (HGNC) Project being constructed primarily from 2000 to 2005. The study was completed almost 25 years ago, and initiated years prior to that at a time when major container terminals and vessel traffic had just started in the system (at Barbours Cut) and before the largest planned terminal (Bayport) was planned or built. The study was also complete before the continued and most recent exponential growth in crude and refined product shipping from Houston. Since then, industry trends in both containerized and bulk liquid or gas cargo have seen a shift to substantially larger vessels. This includes trends towards larger container vessels that have essentially doubled and tripled in capacity, growing from mean a new-build size of 3,000 Twenty-Foot Equivalent Units (TEU) to between a mean of 6,000 and 9,000 TEU, and largest sizes of upwards of 18,000 TEU. Locally, the HSC is beginning to experience vessel calls in the 10,000 TEU and higher class. Also, shifts in crude and refined product tanker size in the HSC is increasingly shifting from Panamax to larger Aframax and Suezmax vessel classes. These vessels come with a variety of transit restrictions related to vessel size and channel dimension due to vessel pilot rules designed to safely guide vessels. Additionally, the upper reaches of the HSC have -37.5 feet Mean Low Lower Water (MLLW) and -41.5 feet MLLW depths that are less than the maximum depth the main HSC provides, limiting vessel draft in these reaches. The HSC ECIP study addresses the delays, draft restrictions and other problems and opportunities related to navigation identified during the study, with an RP planned to address them.

1.2 Project Description, Purpose, and Need

The RP consists of dredging to widen the HSC through the Bay and through a limited segment above Morgans Point in the upper channel, deepen the draft-restricted upper channel, widen the BSC and BCC, and improve or construct new turning features throughout the system. The project also includes dredged material placement areas (PA) and beneficial use (BU) sites to manage material dredged for the project. During the feasibility study process, the various project alternatives formulated were evaluated and two were selected for advancement to detailed evaluation. One was the National Economic Development (NED) Plan, the plan that the USACE has identified as the plan that reasonably maximizes NED benefits consistent with protecting the Nation's environment. The other was the one that the NFS prefers, termed the Locally Preferred Plan (LPP). The LPP was selected as the plan recommended for implementation, and is therefore the RP. The NED Plan is a variant of the RP that omits widening of the HSC in the Bay from Redfish Reef northward to Morgans Point, and requires bend easing and further easing of the Bayport Flare at the confluence of the HSC with the BSC. Because the NED Plan is a smaller variant that omits two major widening segments, it requires fewer cubic yards of dredging, and fewer emissions, to construct. Therefore, the LPP represents the largest that emissions could be from the HSC ECIP project. Both plans are presented to the Assistant Secretary of the Army for Civil Works [ASA(CW)] for review and approval of the LPP as the RP. The LPP and NED Plan are illustrated in **Figure 1-1**. The following summarizes the channel improvement features of the LPP (which again, is the RP):

- Widen the HSC to 700 feet through Galveston Bay from Bolivar Roads near the Entrance Channel to the BCC, and provide bend easings at four bends along the channel. The NED Plan limits the widening to the lower section of the Bay from Bolivar Roads to Redfish Reef. The widening would include shifting the current shallow draft barge lanes outward of the widened channel.
- Widen the HSC from Boggy Bayou to Greens Bayou from its current 300 to 400-foot width to 530 feet.
- Widen the BSC and BCC to 455 ft wide, and construct a combination turning basin and bend easing at the BCC. The NED Plan requires further widening of the Bayport Flare.
- Deepen the HSC from Boggy Bayou to Hunting Bayou to -46.5 ft MLLW, and from Sims Bayou to the Main Turning Basin to -41.5 ft MLLW
- Expand and shift the Brady Island Turning Basin in the upper HSC to a larger diameter.
- Construct a shoaling attenuation feature, which is a groin or jetty-like structure to be modeled and designed during preconstruction engineering and design (PED) to address excessive shoaling occurring in the Bayport Flare.

The RP would be constructed using hydraulic and mechanical dredges supported by various tender, boat, barges and scows. As discussed, the RP includes dredged material PAs and BU sites that would be constructed using the material or used to place the material. At the time of channel construction, material would be pumped by pipeline or transported by scow to upland or aquatic PA and BU sites to raise or build containment dikes, and fill the interior of sites. A variety of onshore equipment such as graders, excavators and dozers would be used to grade, shape and ditch the sites and dikes to build the features or dewater the material. Integral to the Dredged Material Placement Plan (DMMP) planned for the RP, are a variety of BU sites that will use the dredge material to construct ecological restoration features such as tidal marsh and bird islands that have been coordinated with Federal and State resource agencies. To manage the new work dredged material generated from constructing the RP, the following existing and new PAs and BU sites are proposed to be used to accept the material. These are illustrated in **Figure 1-2** through **Figure 1-6** described from the Gulf of Mexico to landward:

- Use of the existing Offshore Dredged Material Disposal Site (ODMDS) No. 1.
- Use new work material to construct the base of oyster reef mitigation pads in lower and mid Galveston Bay.
- Construct the following BU sites: two new 6 and 8-acre bird islands in the lower Bay and a new 3-bird island/tidal marsh in the middle part of the Bay. Construct a new marsh cell M12 and an unconstructed, previously authorized marsh cell M11 in the upper part of the Bay.
- Use material to repair and rehabilitate dikes at existing marsh cell M7/8/9.
- In the upper HSC, raise dikes and fill in the existing Filterbed and Glendale PAs, construct and fill a new, one-time upland PA E2 Clinton on PHA property, and beneficially use material to raise the grade of PHA property for future terminal development at BW8.

Once the RP and the above placement features are constructed, the channel would be maintained periodically through maintenance dredging over the next 50 years using the existing PAs and some of the sites created with the project material. The purpose of HSC ECIP study is to evaluate Federal interest in alternative plans (including the No-Action Plan) for reducing transportation costs while providing for safe, reliable navigation on the HSC system. Economic conditions have changed significantly since the last HSC study for both the container and bulk industry. An increase in throughput tonnage and a significant shift in average fleet size render current channel dimensions incapable of accommodating the forecasted commodity and fleet growth without significant and system-wide inefficiencies. The study evaluates and recommends measures that address current and expected inefficiencies. The needs for this project are to address problems and opportunities identified during the study including the following problems:

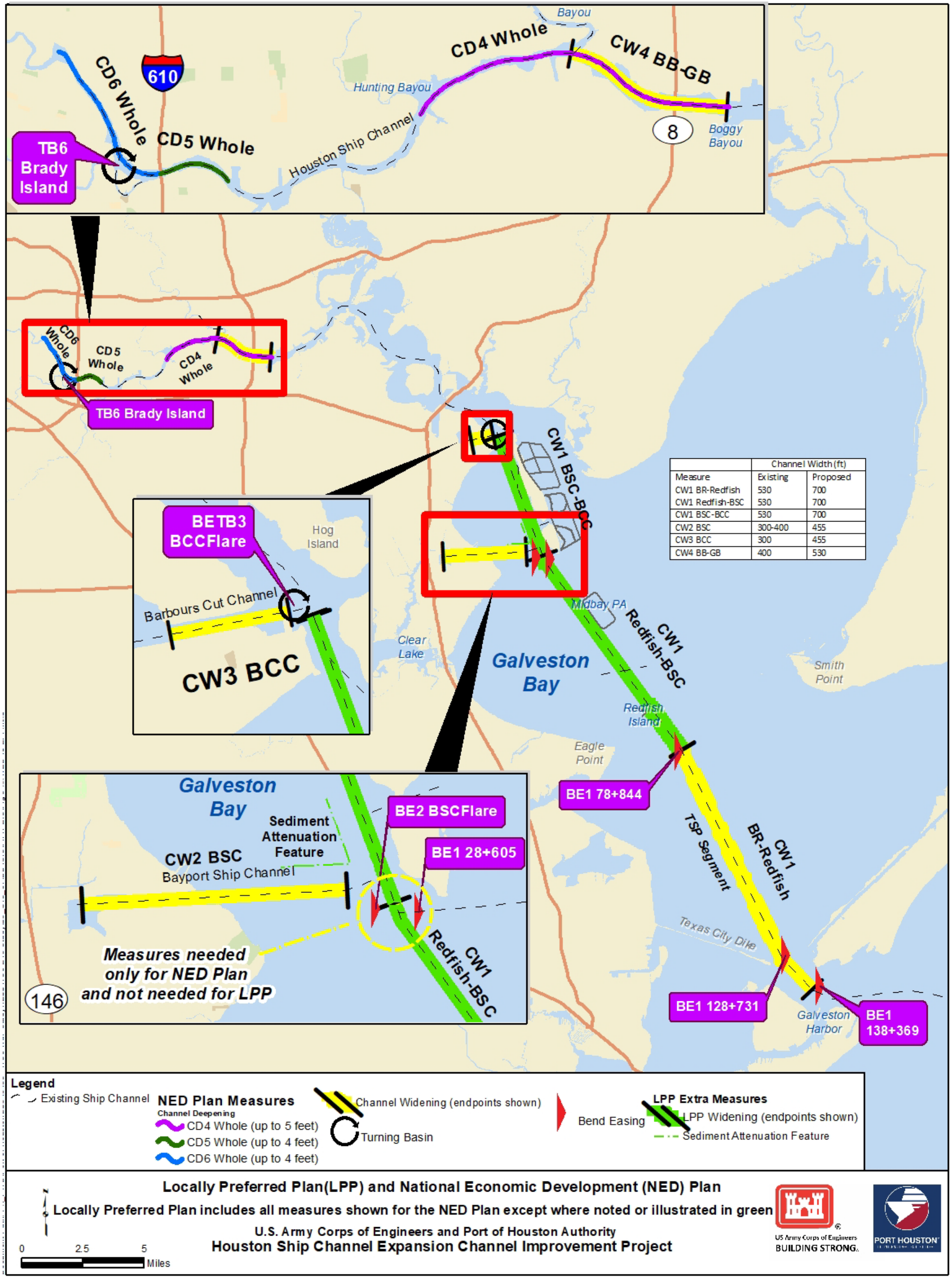
- Inefficient deep and shallow-draft vessel utilization of the HSC system resulting from existing channel depth, width, and configuration;
- Navigation safety concerns for deep and shallow-draft vessel traffic; and
- A lack of environmentally acceptable dredged material placement (PA/BU) with capacity to service the system

The following opportunities were identified:

- Reduce transportation cost of forecasted commodity volume at HSC;
- Eliminate or reduce navigation inefficiencies at HSC for existing and forecasted fleet (i.e., reduce delay times, interport movements, and transit times);
- Eliminate or reduce beam, length, and draft restrictions at HSC for forecasted fleet;

- Optimize channel configuration/design in a cost effective and environmentally acceptable manner that improves safety;
- Establish environmentally suitable PAs/BU sites for new work dredged material, as well as maintenance-dredged material;
- Reduce the environmental impacts from a new project, or protect or improve environmentally sensitive areas in the vicinity of the Federal project through BU of dredge materials; and
- Study the configuration of barge lanes and further optimize them.

The study evaluated a wide variety of widening, deepening, turning, and anchoring measures to address the problems and opportunities. Economic analysis was performed using vessel traffic and transit cost modeling. Engineering analysis was performed to establish proper channel design through ship simulation, hydrodynamic modeling, calculation of dredging and placement quantities, and estimation of construction costs. Environmental evaluation was performed including National Environmental Policy Act (NEPA) analysis and documentation, oyster reef and wetland surveys, and other impact analysis. The cost and benefit analysis identified the plans that produced the most net benefits while meeting the other objectives of the study that addressed the aforementioned problems and opportunities. The plans were evaluated following the planning procedures in USACE planning regulations for Civil Works projects. A Final Integrated Feasibility Report and Environmental Impact Statement (FIFR-EIS) has been developed as the decision document to coordinate the RP for approval and provide NEPA documentation. The RP is the project resulting from the study proposed for implementation to address those problems and opportunities.



	Channel Width (ft)	
Measure	Existing	Proposed
CW1 BR-Redfish	530	700
CW1 Redfish-BSC	530	700
CW1 BSC-BCC	530	700
CW2 BSC	300-400	455
CW3 BCC	300	455
CW4 BB-GB	400	530

Figure 1-1: The Proposed LPP and NED Plan

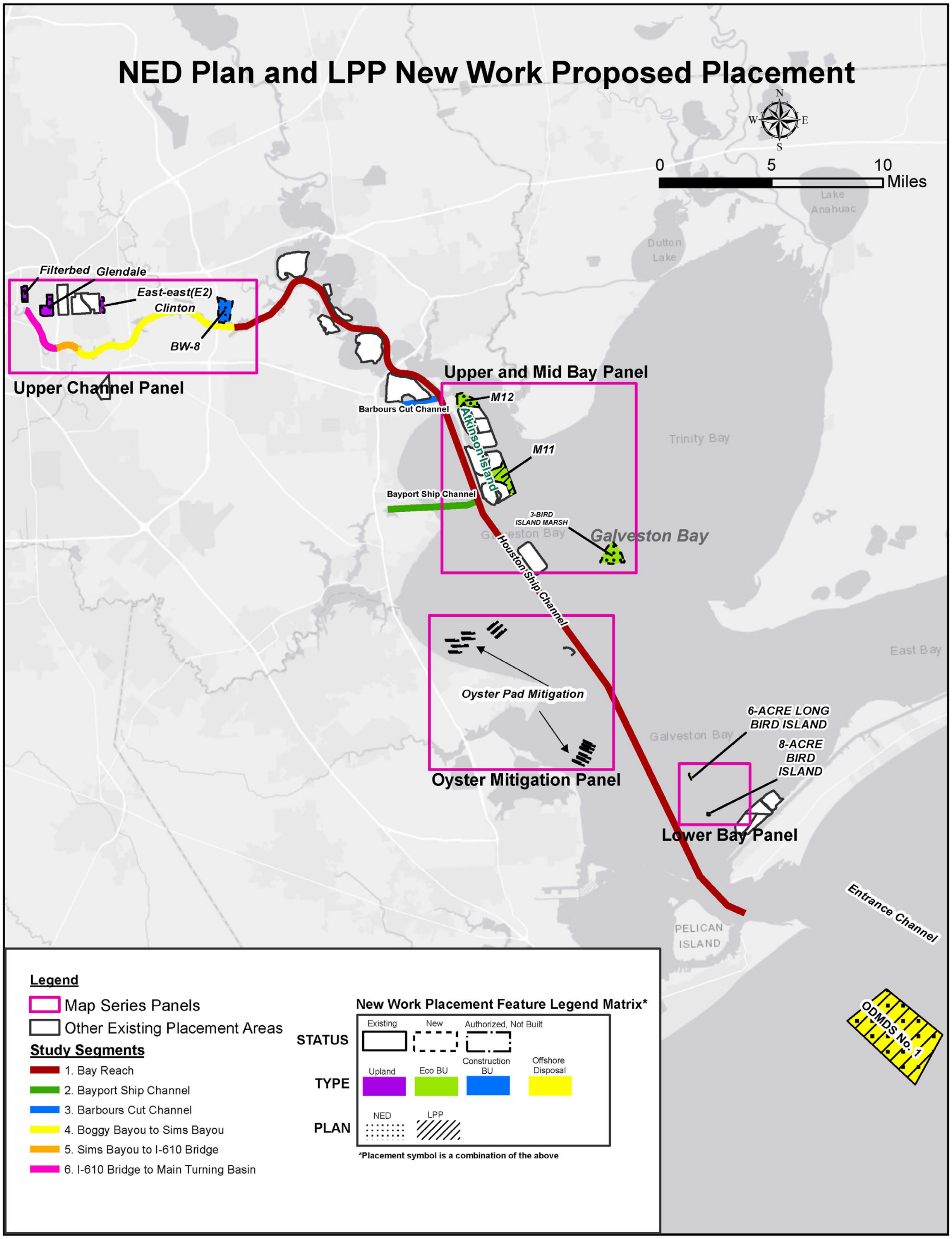


Figure 1-2: Proposed New Work Placement of the LPP and NED Plan

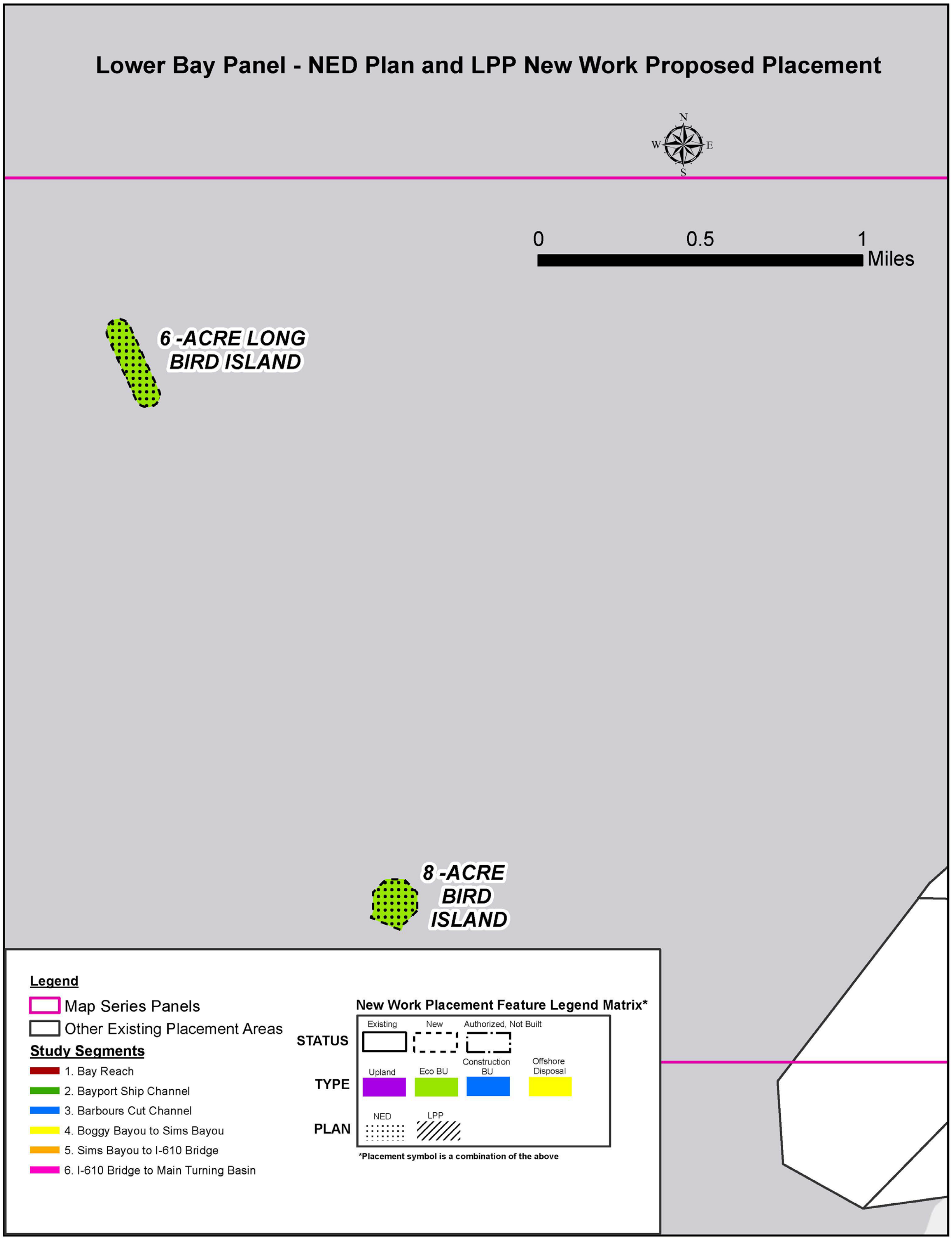


Figure 1-3: Lower Bay – Proposed New Work Placement of the LPP and NED Plan

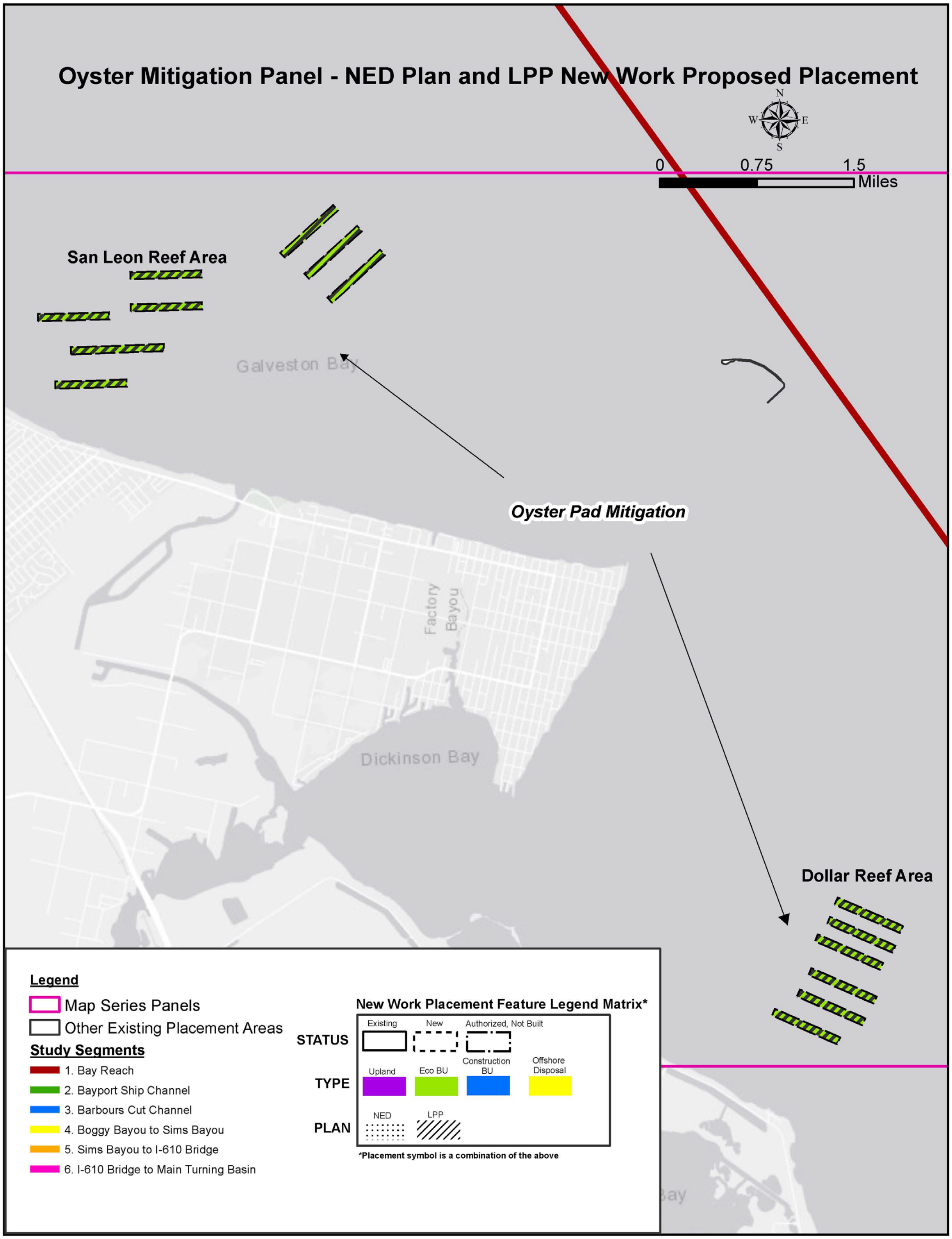


Figure 1-4: Oyster Mitigation – Proposed New Work Placement of the LPP and NED Plan

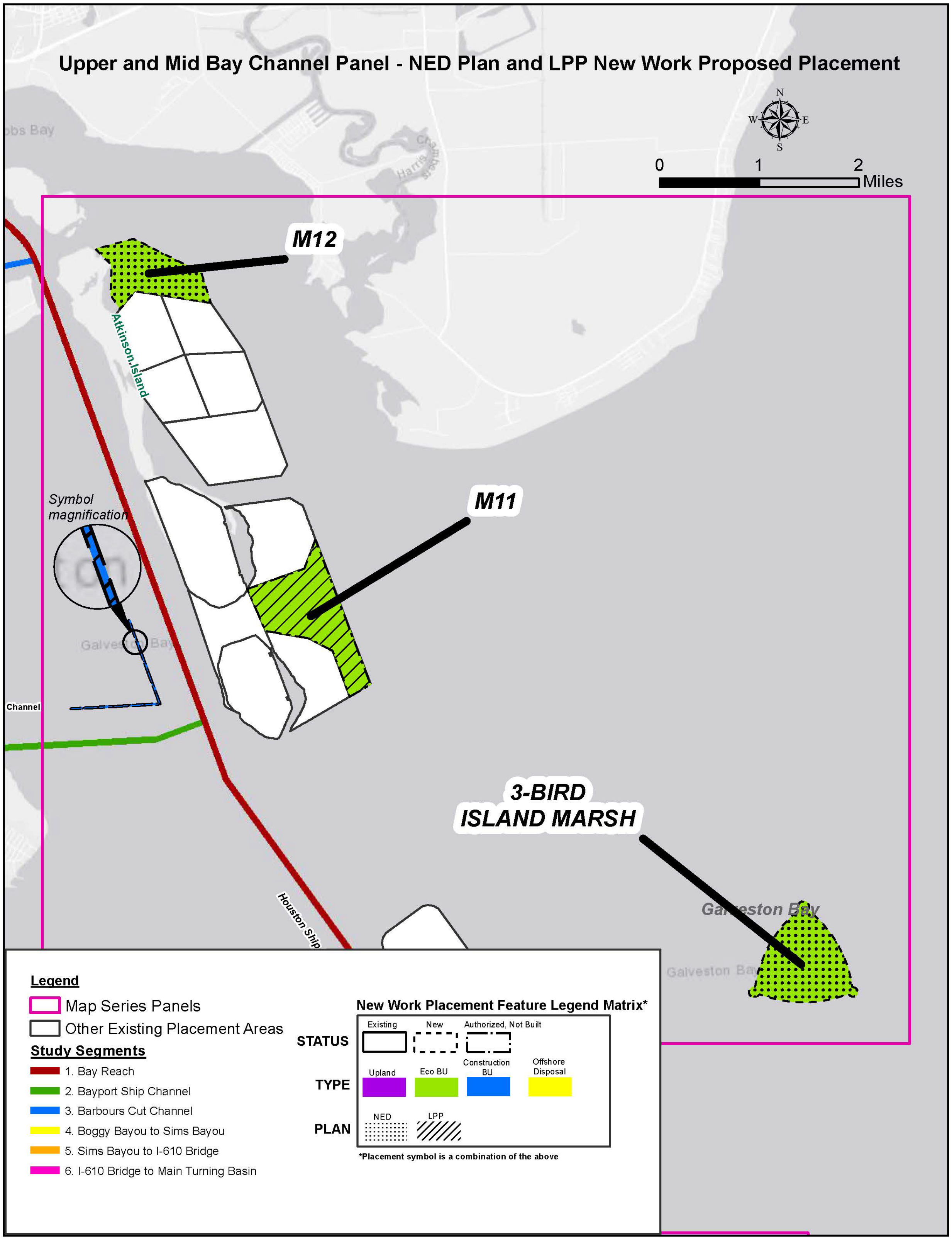


Figure 1-5: Upper and Mid Bay – Proposed New Work Placement of the LPP and NED Plan

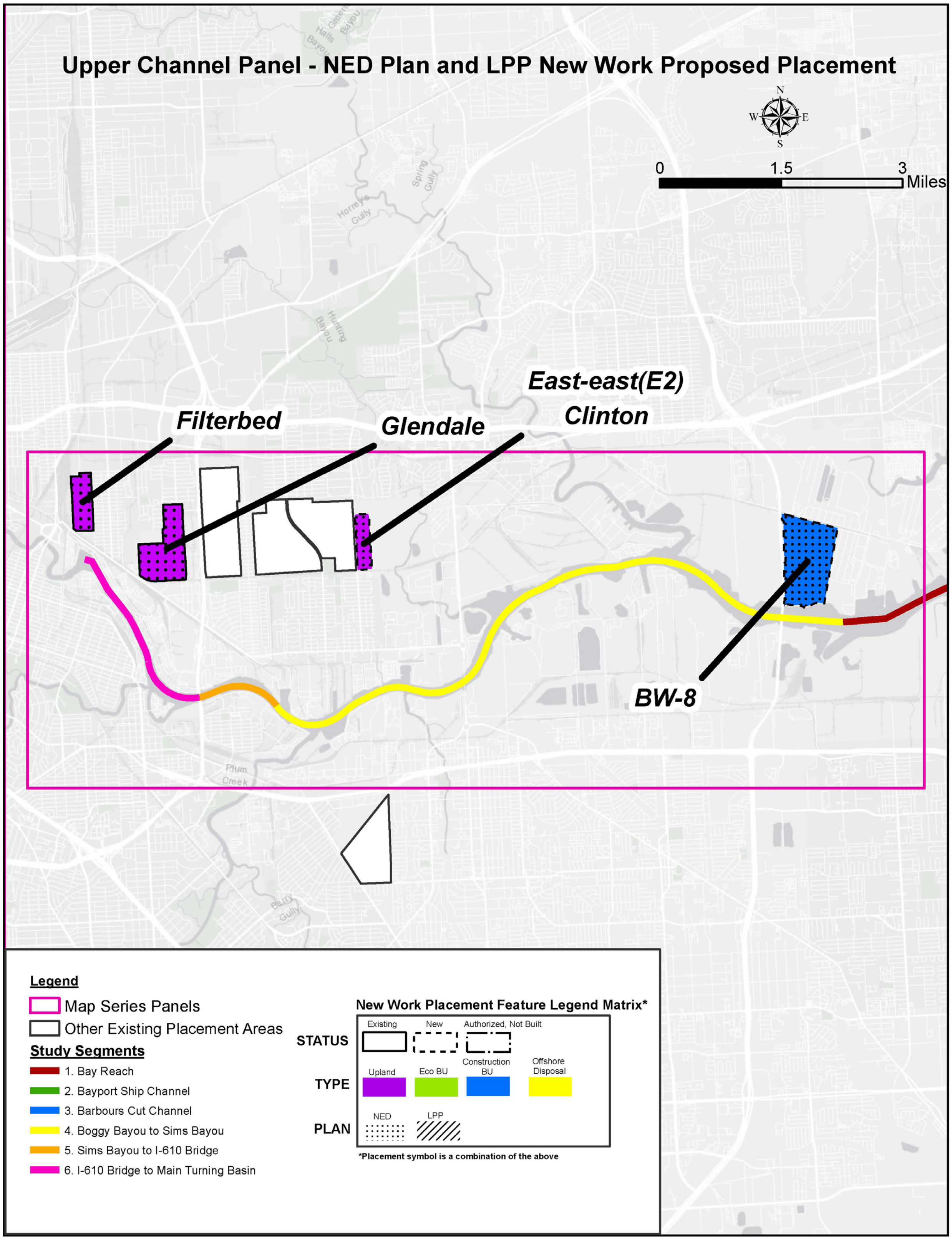


Figure 1-6: Upper HSC – Proposed New Work Placement of the LPP and NED Plan

1.3 Regulatory Background

General Conformity is a Federal regulatory program designed to ensure that actions taken by Federal entities, such as projects proposed by the USACE, do not hinder states' efforts to meet the national ambient air quality standards (NAAQS). The definition of a Federal action as specified in 40 CFR 93.152 includes "…any activity engaged in by a department, agency, or instrumentality of the Federal government, or any activity that a department, agency or instrumentality of the Federal government supports in any way, provides financial assistance for, licenses, permits, or approves, other than activities related to transportation plans, programs, and projects developed, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601et seq.)"

With regard to a dredging project such as the Proposed Project, the Federal Action consists of a Federal project being funded and implemented by the USACE, which is subject to General Conformity review. Placement of dredged material is part of the proposed Federal Action, and is subject to General Conformity. Maintenance dredging is not subject to General Conformity review.

The EPA has established a series of steps to determine whether a given Federal Action is subject to General Conformity review as follows (EPA 2010b).

1. Whether the action will occur in a nonattainment or maintenance area (see **Table 1-1** below for the attainment status of the project area);
2. Whether one or more of the specific exemptions apply to the action;
3. Whether the federal agency has included the action on its list of "presumed to conform" actions;
4. Whether the total direct and indirect emissions are below or above the *de minimis* levels (see **Table 1-2** below for the *de minimis* levels); and/or
5. Where the facility has an emission budget approved by the state as part of the SIP, the federal agency determines if the emissions from the proposed action are within the budget.

1.3.1 Federal Action Applicability

Regarding the proposed Federal action to implement the RP,

1. The action will be occurring in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area, which is designated as serious nonattainment for the 2008 ozone standard and marginal nonattainment of the 2015 ozone standard;
2. None of the specific exemptions apply to the action, except to the extent that any of the dredging to be carried out is maintenance dredging, which is specifically exempt;
3. The USACE has not included dredging projects on a list of "presumed to conform" actions;
4. Total direct and indirect emissions, as currently estimated, will exceed the *de minimis* level of 100 tons of oxides of nitrogen (NO_x) in a marginal nonattainment area (NAA)

and 50 tons of NO_x in a serious NAA. (see **Table 2-2**, **Table 2-4**, and **Table 2-6** in Section 2 for estimated project related emissions); and

5. The USACE does not possess an emissions budget approved as part of the HGB area SIP.

1.3.2 Consistency Determination Options

Based on the discussion presented above and the emissions presented below in Section 2, a General Conformity determination is required for NO_x emissions from the RP. Since the action is required to demonstrate conformity, one or more of the following conditions must be met (EPA 2010b).

1. Demonstrating that the total direct and indirect emissions are specifically identified and accounted for in the applicable SIP;
2. Obtaining a written statement from the state documenting that the total direct and indirect emissions from the action, along with all other emissions in the area, will not exceed the SIP emission budget;
3. Obtaining a written commitment from the state to revise the SIP to include the emissions from the action;
4. Obtaining a statement from the metropolitan planning organization (MPO) for the area documenting that any on-road motor vehicle emissions are included in the current regional emission analysis for the area's transportation plan or transportation improvement program;
5. Fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant or precursor in the same nonattainment or maintenance area.

A sixth potential demonstration method, conducting air quality modeling that demonstrates that the emissions will not cause or contribute to new violations of the standards, or increase the frequency or severity of any existing violations of the standards, is not available for the RP, because modeling is not acceptable for ozone nonattainment areas due to the complexity of ozone formation from precursor pollutants and the limitations of current air quality models. Of the options detailed above, the USACE elected to utilize the fifth option, obtaining concurrence from the Texas Commission on Environmental Quality (TCEQ) through fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant or precursor in the same nonattainment or maintenance area.

Table 1-1: Attainment Status of Houston-Galveston-Brazoria Area

Pollutant	Primary NAAQS	Averaging Period	Designation	Counties	Attainment Deadline
Ozone (O_3)*	0.070 ppm (2015 standard)	8-hour	Marginal Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Montgomery	August 3, 2021
	0.075 ppm (2008 standard)	8-hour	Serious Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller	July 20, 2021
Lead (Pb)	0.15 µg/m^3 (2008 standard)	Rolling 3-Month Average	Unclassifiable/ Attainment		
Carbon Monoxide (CO)	9 ppm	8-hour	Unclassifiable/ Attainment		
	35 ppm	1-hour	Unclassifiable/ Attainment		
Nitrogen Dioxide (NO_2)	0.053 ppm	Annual	Unclassifiable/ Attainment		
	100 ppb	1-hour	Unclassifiable/ Attainment		
Particulate Matter (PM_{10})	150 µg/m^3	24-hour	Unclassifiable/ Attainment		
Particulate Matter ($PM_{2.5}$)	12.0 µg/m^3(2012 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	15.0 µg/m^3(1997 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	35 µg/m^3	24-hour	Unclassifiable/ Attainment		
Sulfur Dioxide (SO_2)	0.03 ppm**	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	0.14 ppm**	24-hour	Unclassifiable/ Attainment		
	75 ppb	1-hour	Attainment/ Unclassifiable		

Table 1-2: Significant Action Thresholds in Nonattainment Areas

Ambient Pollutant	Nonattainment Status	Tons/yr
Ozone (VOCs or NO_x):		
	Serious NAA's	**50**
	Severe NAA's	25
	Extreme NAA's	10
	Other ozone NAA's outside an ozone transport region	100
	Other ozone NAA's inside an ozone transport region	
	VOC	50
	NO_x	100
Carbon monoxide:	All NAA's	100
SO_2 or NO_2	All NAA's	100
PM–10:		
	Moderate NAA's	100
	Serious NAA's	70
PM–2.5:		
	Direct emissions	100
	SO_2	100
	NO_x (unless determined not to be a significant precursor)	100
	VOC or ammonia (if determined to be significant precursors)	100
Pb:	All NAA's	25

Source of table: 40 CFR §93.153 Applicability. (Amended to include PM2.5)

The HGB nonattainment status is now classified as serious as a result of the 2008 Eight-Hour Ozone Standard Designations. This designation brings the tons-per-year down to 50 for all Ozone emissions. This change which took effect September 23, 2019 has been reflected in this report. The attainment date for serious nonattainment areas is July 20, 2021 with a 2020 attainment year.

2 PROJECT CONSTRUCTION EMISSIONS

Project construction emissions of NO_x and VOCs have been estimated because of the Project area's status as an ozone nonattainment area. The emission estimates are based on equipment and activity estimates provided by the project engineers and emission factors and other information from published sources, including the PHA's most recent air emissions inventory, *2013 Goods Movement Air Emissions Inventory* (Eastern Research Group, 2017). Use of the Goods Movement Emissions Inventory (GMEI) as a source of emission factors and other emissions-related information ensures that the emission estimates presented in this conformity determination are consistent with the PHA's port-wide inventory of air emissions.

Schedule and equipment information for the LPP has been provided by the Joint Venture of Turner Collie and Braden, Inc. and Gahagan and Bryant Associates, Inc. based on project design parameters for the plan. Information includes:

- Equipment type (dredge, barge, tug, dozer, etc.)
- Engine type (main, auxiliary, etc.)
- Engine horsepower and load factor (% of full load)
- Hours of operation for each vessel or piece of equipment

The following sections describe the different categories of emitting equipment that would be used to construct the LPP.

2.1 Dredging Equipment and Supporting Vessel Emissions

Emission sources on the dredge itself consist of diesel-fueled engines that provide power for the various operations required for dredging. The dredge is expected to be a cutter suction dredge equipped with a main engine to provide power to the cutterhead, an engine to power the ladder pump used to transport the dredged material from the substrate to the surface, an engine to move and position the ladder that guides and positions the cutterhead, and an auxiliary engine to produce electricity for power needs on the dredge. The dredging operation will also require various support vessels such as positioning tugs, crew boats, and survey boats.

The project engineers provided estimated characteristics of the diesel engines on board the dredge such as total horsepower, operating hours, and average operating loads. They also provided typical characteristics of the support vessels, including total installed horsepower and operating hours. Emission factors for all of these diesel engines were obtained from the "harbor craft" section of the GMEI, which lists emission factors for marine engines of various sizes and emission tier levels.

2.2 Dredged Material Placement Site Work

Once the dredged material has been placed in the placement area it will be moved and compacted by non-road equipment such as dozers and loaders. The project engineers provided typical horsepower, operating hours, and load factors for this type of equipment. Emission factors were based on the emission certification levels of Tier 1 non-road equipment. Dredged material placement and handling will account for a relatively small percentage (approximately 8%) of overall project construction NO_x emissions and approximately 18% of VOC emissions.

2.3 Employee Vehicle Commuting

Employee vehicle commuting will make up a very small part of overall project construction emissions, and will represent a negligible percentage of SIP emissions. As an example, the latest EPA approved SIP documentation includes on-road emissions based on 169,918,016 miles per weekday (TCEQ 2016).[1] A 100-person work force making an average 50-mile round trip commute would drive 5,000 miles per day, or 0.003% of the on-road basis of the current SIP.

2.4 Emissions Calculations and Results

Emission estimates for each engine have been based on horsepower hours (hp hrs), calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative (i.e., to be relatively high so as to calculate reasonably worst-case emission levels). Emission factors for marine engines (propulsion and auxiliary engines on dredges, tugs, work boats, etc.) are from Port Houston's most recent (2013) air emissions inventory and reflect average emissions from these engines in 2013. Emission factors for nonroad engines are based on the Tier 1 emission standards stratified by horsepower. The Tier 1 standards have been applicable since the late 1990s (year depending on horsepower) and so reflect the oldest equipment likely to be in use when the project elements take place and likely overestimate the age of equipment that will actually be used, consequently overestimating prospective emissions.

The emission factors used in calculating these emissions are presented in **Table 2-1**. As noted above, the emission factors are based on Tier 1 standards, which likely overestimate the emissions that would actually occur because of the introduction of Tier 2 and Tier 3 engines into the equipment that may be used on the project. While NO_x and VOC emissions have been calculated for demonstration of General Conformity related emissions, other criteria pollutants have been included for completeness. The anticipated schedule of work was used to allocate emissions to each of the project years. **Table 2-2** presents a summary of emissions by year for the LPP.

[1] *HGB 2008 Eight-Hour Ozone RFP SIP Revision* Adopted by TCEQ 15 December 2016 and approved by EPA on 13 February 2019. See: https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/Adoption/16017SIP_HGBRFP_Ado.pdf Accessed 11 July 2019

Table 2-1: Emission Factors Used for Nonroad and Marine Engines

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 1 nonroad						
(11 ≤ hp < 25)	7.1	0.60	0.58	0.004	1.0	4.9
(25 ≤ hp < 50)	7.1	0.60	0.58	0.004	1.0	4.1
(50 ≤ hp < 100)	6.9	0.60	0.58	0.004	1.0	8.5
100 ≤ hp < 175	6.9	0.60	0.58	0.004	1.0	8.5
175 ≤ hp < 300	6.9	0.40	0.39	0.004	1.0	8.5
300 ≤ hp < 600	6.9	0.40	0.39	0.004	1.0	8.5
600 ≤ hp < 750	6.9	0.40	0.39	0.004	1.0	8.5
>750	6.9	0.40	0.39	0.004	1.0	8.5
Marine Cat 1 & Cat 3						
Dredging	9.3	0.23	0.22	0.004	0.1	1.80
Miscellaneous	9.1	0.23	0.22	0.004	0.1	1.78
Tug	8.7	0.23	0.22	0.004	0.1	1.74

Table 2-2: Estimated Tier 1 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	850	32	31	0.47	49	470
Year 2	**2024**	1,330	54	52	0.77	93	870
Year 3	**2025**	565	22	21	0.32	35	337
Year 4	**2026**	535	22	21	0.30	36	340
Year 5	**2027**	243	11	10	0.14	19	177
Year 6	**2028**	129	6	5	0.08	10	94
Total		**3,652**	**146**	**141**	**2.08**	**243**	**2,288**

The results indicate that NOx emissions will be above the lowest *de minimis* threshold of 50 TPY in all 6 years for the LPP. In addition the results indicate that VOC emissions will be above the lowest *de minimis* threshold of 50 TPY in 2024. Therefore, a formal determination of conformity would be required.

Tier 2 emissions standards for the various categories of marine engines became effective in different years dependent on the size category of the engine, with Category 2 becoming effective as late as 2007, and Category 3 in 2011. Dredge main engines displacement and horsepower typically fall into either Category 2 or 3. With more than a decade since initial effective dates, Tier 2 dredges are becoming a more common part of the national large dredge fleet. Also, Tier 2 standards for nonroad equipment, although a minor part of emissions in this project, were effective in the 2003 to 2006 range. Therefore, to provide a range of emission estimation that might be more reflective of equipment ultimately used, emissions have also been estimated for the use of Tier 2 engines rather than the Tier 1-based estimates presented above. While it is not possible to predict the actual equipment that will be brought to the project by contractors who have yet to be selected, it is more likely that equipment will be Tier 2 or newer based on when the standards were implemented. Tier 3 dredges are newer and fewer in number than Tier 2 in the domestic fleet with only a few spread amongst approximately 3 companies (some are under construction). Tier 3 push or tow boats, although expected to be a smaller percentage of the available fleet, are present in the regional fleet. To analyze the benefit to further reducing construction emissions, Tier 3-associated emissions were also estimated.

The 2013 Goods Movement Air Emissions Inventory does not include Tier 2 or 3 emission factors. Therefore, the marine factors were selected from another recent emissions inventory released by a Texas port, the 2013 Air Emissions Inventory for Port Corpus Christi, July 2015 (Port of Corpus Christi Authority 2013). Nonroad Tier 2 emission factors were based on the Tier 2 emission standards since more precise modeling would require detailed model year and other engine information that is not available. The Tier 2 emission factors used in calculating these emissions are presented in **Table 2-3** below. **Table 2-4** presents the results for the LPP using Tier 2 emission factors. The Tier 3 emission factors used in calculating these emissions are presented in **Table 2-5** below. **Table 2-6** presents the results for the LPP using Tier 3 emission factors.

Table 2-3: Tier 2 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 2 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
>750	4.9	0.22	0.21	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.15	0.15	0.005	1.0	2.6
175 ≤ hp < 300	4.8	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
Cat 1 and Cat 2 Tier 2						
Dredge main	6.9	0.37	0.36	0.004	0.1	1.8
Dredge aux	5.2	0.15	0.14	0.004	0.1	1.8
Tug main	6.1	0.37	0.36	0.004	0.1	1.8
Tug aux	5.2	0.15	0.14	0.004	0.1	1.8
Miscellaneous	5.2	0.15	0.14	0.004	0.1	1.8

Table 2-4: Estimated Tier 2 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	583	28	27	0.47	49	228
Year 2	**2024**	915	41	40	0.77	93	378
Year 3	**2025**	393	18	17	0.32	35	155

Year 4	**2026**	372	16	16	0.30	36	151
Year 5	**2027**	167	7	7	0.14	19	72
Year 6	**2028**	88	4	4	0.08	10	39
Total		**2,517**	**113**	**111**	**2.08**	**243**	**1,023**

Table 2-5: Tier 3 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**VOC**	**CO**
Tier 3 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.22	0.21	0.005	1.0	3.7
175 ≤ hp < 300	4.9	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
>750	4.8	0.15	0.15	0.005	1.0	2.6
Marine						
Cat 1 and Cat 2 Tier 2						
Main - large dredge	6.2	0.20	0.19	0.004	0.1	3.7
Main - small dredge	5.0	0.08	0.08	0.004	0.1	3.7
Dredge auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Main - large tug	5.0	0.08	0.08	0.004	0.1	3.7
Main - small tug	4.0	0.08	0.08	0.004	0.1	3.7
Tug auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Miscellaneous	4.0	0.08	0.08	0.004	0.1	3.7

Table 2-6: Estimated Tier 3 Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**VOC**	**CO**
Year 1	**2023**	429	11	11	0.42	47	307
Year 2	**2024**	747	21	21	0.73	92	511
Year 3	**2025**	331	10	10	0.31	35	226
Year 4	**2026**	320	10	9	0.30	36	218
Year 5	**2027**	139	4	4	0.14	19	98
Year 6	**2028**	74	2	2	0.08	10	53
Total		**2,039**	**58**	**58**	**1.99**	**241**	**1,413**

The Tier 2 NO_x results indicate a reduction of approximately 30 percent for the LPP, a substantial reduction. The Tier 3 NO_x results indicate a further reduction of 18 percent from Tier 2 in the highest emission year. Though these results are substantially reduced, they still exceed the *de minimis* threshold of 50 TPY in 4 of the 5 years. Therefore, a formal determination of conformity would still be required for either plan. This conformity determination is based on Tier 1 equipment and is a conservative analysis based on the unknown availability of Tier 2 and Tier 3 equipment at the time of construction. If Tier 2 or 3 equipment is available, and used for construction, then emissions may be lower and the requirements for offsets could be reduced accordingly.

Most of the emissions are from the marine category, of which dredge engines dominate. Due to the increased demand for larger-scale dredging resulting from supplemental Federal funding, and the progression of several deepening and widening projects for major channels to funding and construction, demand for new dredging capacity has resulted in a $1.5 billion dredging fleet expansion (Navingo Maritime and Offshore Media Group 2019). Several of the major dredging firms have new large cutterhead dredges planned for delivery in the next 2 years to meet industry capacity needs, including Manson, Weeks, Callan and Great Lakes Dredging and Dock (Navingo Maritime and Offshore Media Group 2019, Gerhardt 2018). Therefore, there will be an increase in dredges that meet emissions standards higher than Tier 2, and it is possible that equipment used for the proposed project could be higher tier equipment, which would further reduce the actual emissions. However, the limited population and availability of higher tier equipment may limit cost-feasible bidding for project implementation.

3 LONG-TERM EMISSIONS IMPACTS OF THE PROPOSED PROJECT

As discussed in Section 1.2, the LPP addresses multiple navigation problems and opportunities related to transportation delays, inefficiencies, and the related costs. Addressing these directly decreases the time and fuel spent transporting the commodities shipped through the HSC system, and by extension, the associated emissions from Ocean Going Vessels (OGV). The reduction of transportation costs by the measures formulated for both plans is achieved in two primary ways. One way is by reducing transportation delays in the form of slower or delayed navigation, and waiting at docks and anchorages due to navigation restrictions. Another way is to reduce inefficient delivery of cargo imposed by draft restrictions by deepening the channel to alleviate light loading of vessels. In support of the NEPA documentation of project effects, analysis was conducted to estimate the projected air pollutant emissions reductions from OGVs resulting from implementation of the LPP. The analysis and results are summarized in this section, and are described in detail in Section 3.1.8.2 of Appendix G, Environmental Supporting Document of the FIFR-EIS, and Attachment 1 to Appendix G, Houston Ship Channel Expansion Channel Improvement Project Projected Emissions Reductions.

As part of the economic analysis required for the feasibility study, detailed estimates of projected future commodities, vessel fleets, vessel movement, and associated transportation costs are conducted by navigation economists to analyze whether proposed plans are economically justified. Harborsym, the USACE's certified economic analysis computer simulation model developed by the Institute for Water Resources (IWR), is used to aid the analysis. According to the model's user manual, Harborsym is based on the creation of discrete event Monte Carlo simulations that mimic movement of vessels through a harbor (USACE IWR 2012). The model uses these event simulations along with user-defined statistical inputs to generate trips and calculate vessel transit time, loading and unloading time at docks, and docking and undocking time. A model of the harbor network that physically and statistically represents the navigation conditions of the harbor and its channels is developed as part of the analysis, and incorporates the vessel pilot rules that govern how different classes of vessels can move (one-way, two-way, loaded etc.) given the size, channel dimensions, and other navigation conditions. The model provides a detailed estimate of vessel calls (i.e. trips) and transit times by major vessel categories (i.e. tankers, containers, bulkers by different size classes) and can be used to quantify the extra or reduced time involved in transporting cargo by comparing with-project scenarios to without project conditions. An economic model for the HSC system, using Port of Houston-specific vessel fleets, current and future commodities throughput, and vessel pilot rules from the Houston Pilots Association, was developed for this study's economic analysis.

In order to maximize confidence in and utility of the emissions reduction analysis, the Harborsym output was used to support the operational air analysis. Due to the way specific channel improvements work to reduce transportation time, the reduced hours associated with certain groups of measures (e.g. channel widening, deepening) and study segments can be generally categorized as waiting (hours spent waiting at berth or anchorage) or steaming (under way using propulsion). These assumptions were used to employ the appropriate emissions factors and activity. The annual in-port reduction in these hours by vessel category and by study segment were used to estimate emissions reduced by the action alternatives. Besides in-port reductions, which would occur landward of the entrance buoy to the HSC, the proposed action alternatives would also reduce vessel transit hours and emissions seaward of the buoy in the shipping lanes of the Gulf of Mexico through the elimination of vessel trips. These reductions would take place mostly outside of the HGB NAA, but would still represent substantial emissions reductions in the North American Emissions Control Area (ECA), which encompasses the US Gulf of Mexico. In-port reductions would take place within the HGB NAA. The annual in-port reduction in hours for the Years 2029 and 2044 were used to provide a range of reduction reflecting the increasing reduction occurring as traffic increases in the future due to increased commodity demand.

To provide average vessel engine specifications for the different categories, main engine and auxiliary engine size data was obtained from world fleet vessel data from Information Handling Services (IHS) Fairplay Seaweb, a world vessel registry service. Emissions estimates were developed in accordance with EPA-standard methodologies used for port air emission inventories specified in the *Current Methodologies in Preparing Mobile Source Port-Related Emission Inventories* (ICFI, 2009), including emissions factors for the criteria pollutants, and load factors for propulsion and auxiliary engines. Vessel speed necessary to define various estimate factors were obtained from the economic analysis information used to define vessel transit. One important condition reflected in the operational emissions reduction calculations was the difference in age and engine emissions standards of the OGVs between the larger, newer classes of vessels expected to call at the Port of Houston (POH) and the smaller, older class of vessels replaced. The main vessel category involved are Post-Panamax first (PPX1), second (PPX2) and third generation (PPX3) container vessels (aka New Panamax). The LPP would lift key restrictions that would enable PPX3 vessels that have a capacity in the 10,000 to 12,000 TEU range to call. This would enable a shift of the fleet calling at POH from being dominated by PPX1 (4,000-6,000 TEU) and PPX2 (6,000-10,000 TEU) to one dominated by PPX 2 and PPX3. The average build year of the PPX3 class (taken as PPX of 120 deadweight tons [DWT] or larger) according to the SeaWeb world fleet data is 2012 with most vessels in the 2013-2014 build year, and relatively few ships, comprising a small percentage of the world container vessel fleet. The PPX3 vessel class is relatively new with most of the future fleet of this class expected to have been built in the last few years or in future years to come. SeaWeb fleet data for those with PPX2 dimensions indicated an average build year of 2012, and an average build year of 2003 for PPX1.

Two key changes in marine emissions standards took place in 2010 that would result in reduced emissions for newer Category 3 engines. First, EPA passed regulations requiring new U.S. flagged or manufactured OGVs with Category 3 engines to meet Tier 2 standards by 2011 which would reduce NO_x from then-current standards by 15 to 25 percent. Thereafter, new engines would have to meet Tier 3 standards by 2016 which would reduce NO_x 80 percent from pre-2011 standards. Also, since 2015, all fuel produced and sold in a NAA for Category 3 engines must have fuel with sulfur content reduced to 1,000 ppm. Second, the United Nations International Maritime Organization (IMO) required all OGVs calling or traveling through the North American ECA to meet fuel and emissions standards similar to the EPA standards discussed above. Starting in 2012, fuel sulfur content was to be reduced to 10,000 ppm, and then to 1,000 ppm in 2015, and in 2016, new engines must use NO_x or other ozone precursor exhaust after-treatment systems, to achieve reduced emissions equivalent to the EPA Tier 3 standard. Future year IMO ECA adjustments in the 2009 EPA port inventory guidance were applied to the emissions factors commensurate with the future 2029 project year. Although smaller PPX1 vessels may be built in the future, the fleet age average of 2003 indicates this will be a small, niche market, as the general trend towards the larger classes will predominate, and PPX1 age in the future would likely remain older, with engines meeting lower tier standards. Therefore, the difference in emissions standards between the older

PPX1 and the shift to newer PPX2 and PPX3 vessels, was accounted for by adjusting the PPX3 vessels to reflect Tier 3 emissions standards.

Table 3-1 shows a summary of the projected in-port emissions reductions from OGVs in tons per year (tpy) for the LPP. Emissions are estimated based on vessel hourly reductions projected for the years 2029 and 2044, and pollutants of concern for this analysis include criteria pollutants nitrogen dioxide (NO_x), particulate matter 10 micrometers or less in diameter (PM_{10}), PM 2.5 micrometers or less in diameter ($PM_{2.5}$), hydrocarbon (HC) which is analogous to VOC, carbon monoxide (CO), sulfur oxides (SO_x) and greenhouse gas pollutant carbon dioxide (CO_2). Note that since these values represent reductions in emissions, higher values indicate greater reductions. For each year analyzed, calculations demonstrate a significant reduction in emissions associated with the LPP for all pollutants.

Table 3-1: Summary of In-Port Operational Emissions Reductions by the LPP

Emissions Reductions (tpy)							
Year	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**HC**	**CO**	**SO_x**	**CO_2**
2029	147.2	15.61	14.24	3.35	7.74	17.98	29,274
2044	334.4	31.61	28.84	6.90	16.03	36.53	59,474

The results show that the LPP, which provides full widening through the bay, and reduces the most transit delays, reduces in-port NOx emissions by greater than the *de minimis* threshold (50 TPY) throughout the project operational timespan. The annual LPP NO_x emissions reductions were interpolated between 2029 and 2044, and cumulative reductions calculated, then compared to the total conformity emissions for the LPP as shown in **Table 3-2**. From 2044 and forward, the underlying economic analysis assumes a steady state of commodity growth and transport, which results in the constant annual reduction from that point forward. The cumulative reduction surpasses the Tier 1 construction total of 3,652 tons presented in **Table 2-2** in 2043, which means construction emissions would be offset by operational reductions in fourteen years after the project would be operational. The cumulative reduction surpasses the Tier 2 construction total of 2,517 tons presented in **Table 2-4** in 2044, eleven years after the project would be operational. The cumulative reduction surpasses the Tier 3 construction total of 2,145 tons presented in **Table 2-6** in 2037, ten years after the project would be operational. Once the shift to the larger, newer vessel fleet plateaus in 2040, it would take 10 years to reach a cumulative NOx reduction that surpasses the Tier 1 emissions, 7 years to surpass the Tier 2 emissions, and 6 years to surpass the Tier 3 emissions. The results of the analysis demonstrate the positive impacts to the long-term operational emissions that can be anticipated. The removal of inefficient vessel traffic patterns and loading, and the increase in efficiency brought on by the economies of scale allowed by the increased channel size contribute to the forecasted emissions decrease.

Table 3-2: Cumulative In-Port Operational NO_x Reduction of the LPP

Year	**NO_x Reduction (TPY)**	**Cumulative NO_x Reduction (tons)**
2029	147	

Year	NO_x Reduction (TPY)	Cumulative NO_x Reduction (tons)
2030	164	311
2031	181	493
2032	198	691
2033	215	906
2034	232	1,138
2035	249	1,388
2036	266	1,654
2037	283	1,937
2038	300	2,237
2039	317	2,555
2040	334	2,889
2041	334	3,224
2042	334	3,558
2043	334	3,892
2044	334	4,227
2045	334	4,561
2046	334	4,895
2047	334	5,230
2048	334	5,564
2049	334	5,899
2050	334	6,233
2051	334	6,567
2052	334	6,902
2053	334	7,236
2054	334	7,571
2055	334	7,905
2056	334	8,239
2057	334	8,574
2058	334	8,908
2059	334	9,242
2060	334	9,577
2061	334	9,911
2062	334	10,246
2063	334	10,580
2064	334	10,914
2065	334	11,249
2066	334	11,583
2067	334	11,917
2068	334	12,252

Year	NO_x Reduction (TPY)	Cumulative NO_x Reduction (tons)
2069	334	12,586
2070	334	12,921
2071	334	13,255
2072	334	13,589
2073	334	13,924
2074	334	14,258
2075	334	14,592
2076	334	14,927
2077	334	15,261
2078	334	15,596

4 GENERAL CONFORMITY EVALUATION AND PRELIMINARY DETERMINATION

As noted in Section 1 (Introduction) and illustrated in **Table 2-2**, **Table 2-4**, and **Table 2-6**, emissions of NO_x and VOC exceed the applicable General Conformity threshold. However, VOC is only exceeded in Year 2. To demonstrate whether the RP (LPP) construction VOC and NO_x emissions can be accommodated in the HGB SIP emissions budgets, the most recent EPA-approved ozone SIP demonstration documents were reviewed for emissions inventory information. In consideration of the definition and conformity determination requirements for the most recent revisions to the SIP in 40 CFR §93.152 and §93.158(a)(5)(i)(A) respectively, the latest approved revision to the SIP is the *HGB 2008 Eight-Hour Ozone RFP SIP Revision*, approved by EPA on February 13, 2019 (TCEQ 2016). The conformity evaluation and preliminary determination presented below were coordinated with TCEQ.

This SIP RFP demonstration was reviewed to determine the various activity categories of emissions in which the RP's construction activities will fall. While the SIP evaluates NO_x emissions from all sources, including biogenic (non-human-caused) emission sources, this evaluation focuses on the categories most relevant to the RP construction emissions, specifically the Commercial Marine and Construction and Mining categories. Employee commuting emissions would be a negligible amount of project emissions, as explained in Section 2.3, and given the size of the mobile source budget, would be an even more negligible percentage of this budget.

The NO_x emissions budget for commercial marine vessels (CMV), which constitute most of the project emissions at more than 90%, was obtained from Appendix 1, Reasonable Further Progress Demonstration Spreadsheet, to the *HGB 2008 Eight-Hour Ozone RFP SIP Revision* [RFP SIP] (TCEQ 2016). **Table 4-1** below provides the uncontrolled and controlled CMV emissions inventory for the HGB NAA excerpted from Appendix 1 of the RFP SIP. The RFP SIP demonstration contained non-road mobile source category emissions, which encompasses various sub-categories of construction, mining, agricultural, and landscaping, but did not further break down emissions into the sub-categories. The RFP SIP demonstration separated oil and gas drilling rigs from this estimate into a separate estimate, and provided non-road mobile source emissions for 2017, but did not contain information for future year projections. The emissions estimated for uncontrolled (i.e. before required emissions standards and controls are applied) emissions, source reductions due to controls, and the resulting controlled emissions, are presented in **Table 4-2**.

Table 4-1: Statewide and HGB Area CMV Emissions, tpy

Analysis Year	NOX (tpd)		VOC (tpd)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
2011	68.95	61.61	1.59	1.59
2017	38.16	28.77	1.21	1.15

Table 4-2: HGB RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_X and VOC (tons per day)

Emissions	NO_X	VOC
Uncontrolled emissions	210.26	123.21
RFP non-road source reduction	123.29	89.63
RFP controlled (post-control) emissions	86.97	33.58

The LPP marine vessel Tier 1 emissions are compared with the HGB CMV projections in **Table 4-3** below. Project emissions represent no more than 11.9% of CMV emissions in any one year and make up approximately 5% of CMV emissions on average over the project work period. The project non-road equipment consists of the landside dozers, loaders and other equipment used to conduct PA site work described in Section 2.2. As discussed in that section, these emissions are a relatively minor part of the project emissions. The LPP non-road category Tier 1 emissions are compared to the HGB non-road mobile source controlled emissions in **Table 4-4** below. Note, for presentation, these are shown as tons per day instead of tons per year. As shown, the project non-road source emissions represent no more than 0.26% of emissions and make up 0.1% to 0.2% of non-road emissions on average over the work period. These emissions, nevertheless, do not conform to the budgets in the SIP and alternative means of conformance would be needed.

Table 4-3: CMV Tier 1 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	782	10,501	7.4%
2024	1,248	10,501	11.9%
2025	525	10,501	5.0%
2026	487	10,501	4.6%
2027	201	10,501	1.9%
2028	112	10,501	1.1%
All years	**3,355**	**63,006**	**5.3%**

Table 4-4: Non-Road Tier 1 Emissions (tons per day)

	LPP Landside Non-Road Emissions		SIP Controlled Non-Road Emissions for 2017		Project % of 2017 Non-Road emissions	
Year	NOx	VOC	NOx	VOC	NOx	VOC
2023	0.19	0.03	86.97	33.58	0.21%	0.08%
2024	0.22	0.03	86.97	33.58	0.26%	0.10%
2025	0.11	0.02	86.97	33.58	0.13%	0.05%
2026	0.13	0.02	86.97	33.58	0.15%	0.06%
2027	0.12	0.02	86.97	33.58	0.13%	0.05%
2028	0.05	0.01	86.97	33.58	0.05%	0.02%
All years	**0.81**	**0.12**	**521.82**	**201.48**	**0.2%**	**0.1%**

To provide comparison with the range of estimated emissions in Section 2, CMV emissions have also been compared between the LPP project based on the use of Tier 2 engines instead of the Tier 1 and the SIP emissions, in tons per year, is presented in **Table 4-5** below. Project emissions are reduced to no more than 8% of CMV emissions in any one year and make up 3.7% of CMV emissions on average over the project work period. Similarly, for non-road emissions, the Tier 2 LPP emissions are compared to SIP emissions, in tons per day in **Table 4-6**. Project NO_x emissions are slightly reduced percentage-wise to 0.1% of SIP non-road emissions. The use of Tier 2 equipment does not reduce emissions enough to conform to the budgets in the SIP and alternative means of conformance would be needed.

Table 4-5: CMV Tier 2 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	535	10,501	5.1%
2024	856	10,501	8.2%
2025	364	10,501	3.5%
2026	337	10,501	3.2%
2027	137	10,501	1.3%
2028	76	10,501	0.7%
All years	**2,306**	**63,006**	**3.7%**

Table 4-6: Non-Road Tier 2 Emissions (tons per day)

	LPP Landside Non-Road Emissions(tons per day)		SIP Controlled Non-Road Emissions for 2017 (tons per day)		Project % of 2017 Non-Road emissions	
Year	**NOx**	**VOC**	**NOx**	**VOC**	**NOx**	**VOC**
2023	0.13	0.03	86.97	33.58	0.15%	0.08%
2024	0.16	0.03	86.97	33.58	0.18%	0.10%
2025	0.08	0.02	86.97	33.58	0.09%	0.05%
2026	0.09	0.02	86.97	33.58	0.11%	0.06%
2027	0.08	0.02	86.97	33.58	0.09%	0.05%
2028	0.03	0.01	86.97	33.58	0.04%	0.02%
All years	**0.57**	**0.12**	**521.82**	**201.48**	**0.1%**	**0.1%**

The Tier 3 emissions from **Table 4-7** were also compared to the CMV SIP budget. As shown, the maximum annual emissions are no more than 7.5% of the CMV budget, and average 3.2% of the CMV budget. Comparatively, the Tier 3 emissions comprise 0.7% less of the CMV SIP budget than the Tier 1 emissions. The use of Tier 3 equipment does not reduce emissions enough to conform to the budgets in the SIP and alternative means of conformance would be needed.

Table 4-7 CMV Tier 3 NOx Emissions (tpy)

Year	LPP	SIP	% of SIP LPP
2023	458	10,501	4.6%
2024	752	10,501	7.5%
2025	320	10,501	3.2%
2026	298	10,501	3.0%
2027	120	10,501	1.3%
2028	66	10,501	0.7%
All years	**2,015**	**63,006**	**3.2%**

The initial conclusion that because LPP emissions constitute a small percentage of the applicable SIP budgets, and the reduction in ship channel operational emissions resulting from the project's navigation improvements would produce greater long-term emissions reduction that the emissions from this project could be accommodated in the HGB SIP emission budget were shown to be not valid. The option to purchase DERCs to fully offset VOC and NO_x exceedances has been elected to achieve conformity.

5 DRAFT GCD COMMENTS AND RESPONSES

The USACE submitted the Draft GCD, and issued a public notice announcing the availability of the Draft GCD for the RP for a 30-day comment period on Nov 22, 2019. The public notice and Draft GCD was posted on the USACE website and published in the Houston Chronicle the same day. Availability of the public notice and Draft GCD was communicated to TCEQ, and EPA Region 6. The Notice of Availability for the Final GCD will be published in the Houston Chronicle and posted on the USACE website.

5.1 TCEQ, EPA, and MPO Comments

Comments and recommendations received from the TCEQ, EPA Region 6 and MPO, and responses to them, will be summarized in this section, once received.

5.1.1 TCEQ Comments

Teleconferences with the TCEQ discussing the project construction emissions and consistency determination options were held initially on 18 October 2019, and subsequent calls through 4 December 2019. Based on initial coordination and discussion of the Draft GCD with the TCEQ, it was determined that Options 2, 3 and 5 listed in **Section 1.3.2** would be considered further to support a determination of consistency with the SIP. At the time of the issuance of the DGCD, Option 2 was being pursued, which is obtaining a written statement from the state documenting that the total direct and indirect emissions from the action, along with all other emissions in the area, will not exceed the SIP emission budget. However this would not result in concurrence because project emissions are too great to be accommodated within the applicable SIP budget.

Once it became apparent that pursuing Option 2 was not a viable path to concurrence the project team selected to pursue offsetting construction emissions, which is consistent with Option 5, fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant or precursor in the same nonattainment area. It could involve implementing emissions reductions from other USACE or NFS projects that are quantifiable, consistent with the applicable SIP demonstrations, and are surplus to reductions required by, and credited to, other applicable SIP provisions. Alternately, it could involve purchasing offset credits generated by other projects. Offset credits for NO_x and VOC have been generated by a variety of industry sources in the HGB NAA, such as power plants and refineries, for sale on a brokered market, including those meant to address temporary emissions sources such as the RP construction emissions. These credits have resulted from quantified and approved emissions reduction measures such as plant retirement, fuel switching, or pollution controls that produce net reductions in criteria pollutant emissions. These credits are known as Discreet Emissions Reduction Credits (DERC). The USACE and the NFS have elected to include this commitment, which is explained in further detail in **Section 6**.

Following receipt of the commitment to acquire DERCs, if it becomes necessary, the TCEQ issued a letter agreement (provided in Attachment B), that the purchase of DERCs as an offsetting strategy would meet general conformity requirements and conform to the SIP.

5.2 Individual and Organized Groups Comments

Comments received from the public and organizations, and responses to them, will be summarized in this section, once received.

6 FINAL GENERAL CONFORMITY DETERMINATION

The potential project construction emissions have been presented in Section 2 and in **Table 2-2**, **Table 2-4**, and **Table 2-6** for assumption of equipment meeting Tiers 1, 2 and 3 emissions standards respectively. Tier 1 is the oldest equipment expected to be practically used in project implementation. The feasibility of using construction equipment higher than Tier 1 would be further determined during PED. The total project emissions of NOx and VOC associated with Tier 1, represent the maximum amount of emissions expected from project construction. These would occur over the 6-year construction period currently conceived by the USACE. The NFS is exploring options for implementing the project with a faster construction schedule under existing authorities allowing NFS construction. This may involve compression of several years of construction into fewer years, to be determined during the PED phase. Regardless of the schedule compression, the Tier 1 total would constitute the maximum amount of offset credits that would be required to be purchased if no other options to reduce emissions or consistency determination were exercised. Current DERC market information indicates that more than 30,000 tons of temporary NOx credits and 980 tons of VOC credits are available, well in excess what is needed for this project. To determine the maximum credits that would be required, the total tons for years that exceed de minimis were summed. For NOx, every year exceeds de minimis, and the total of 3,652 tons would be required. Therefore, under a compressed schedule, all years associated with this total would continue to be subject to the offset and would not be affected by schedule compression. For VOC, under the USACE schedule, the Year 2 total of 93 tons would be required. Under schedule compression by the NFS, the first four years of the schedule are more likely to be compressed into fewer years to cause those years to exceed de minimis, which would involve the Years 1 through 4 total of 213 tons. As a conservative estimate, all 243 tons of the VOC emissions would be at maximum subject to offset, although less likely.

Table 6-1: Tier 1 NOx and VOC Emissions for Offset Credit Estimation

Year		Estimated emissions (tons per year)* NO_x	VOC
Year 1	**2023**	***850***	49
Year 2	**2024**	***1,330***	***93***
Year 3	**2025**	***565***	35
Year 4	**2026**	***535***	36
Year 5	**2027**	***243***	19
Year 6	**2028**	***129***	10
Total		***3,652***	**243**

*Bolded, italicized values indicate tons that would be subject to offsets.

It is also is possible that if higher tier equipment is feasible in procurement, that the necessary credits could be reduced if the other options to achieve a determination of consistency with the SIP do not become feasible. To provide a commitment to acquire offsetting DERCs presently available in the marketplace, the NFS, Port Houston, has committed in a letter to the TCEQ provided in Attachment C to ensure that adequate DERC emission credits would be acquired before the HSC ECIP-related construction emissions occur to ensure compliance with General Conformity if other consistency determination options are not realized, and offset credits are required. With the receipt of the TCEQ letter of agreement and the commitments to acquire the necessary credits the USACE has determined that the HSC ECIP project will conform to the SIP for purposes of a Federal determination of General Conformity.

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Attachment A

Emission Estimation Details

Appendix A – Emission Estimation Details

Project construction emissions of NO_x and VOCs have been estimated because of the Project area's status as an ozone nonattainment area. The emission estimates are based on equipment and activity estimates provided by the project engineers and emission factors and other information from published sources, including the PHA's most recent air emissions inventory, *2013 Goods Movement Air Emissions Inventory* (Eastern Research Group, 2017) and published emission standards. Use of the Goods Movement Emissions Inventory (GMEI) as a source of emission factors and other emissions-related information ensures that the emission estimates presented in this conformity determination are consistent with the PHA's port-wide inventory of air emissions.

AECOM has developed schedule and equipment information for the LPP based on project design parameters for the two plans. Information includes:

- Equipment type (dredge, barge, tug, dozer, etc.)
- Engine type (main, auxiliary, etc.)
- Engine horsepower and load factor (% of full load)
- Hours of operation for each vessel or piece of equipment

The following sections describe the different categories of emitting equipment that would be used to construct the LPP.

A.1 Equipment and Supporting Vessel Emissions

Emission sources on the dredge itself consist of diesel-fueled engines that provide power for the various operations required for dredging. The dredge is expected to be a cutter suction dredge equipped with a main engine to provide power to the cutterhead, an engine to power the ladder pump used to transport the dredged material from the substrate to the surface, an engine to move and position the ladder that guides and positions the cutterhead, and an auxiliary engine to produce electricity for power needs on the dredge. The dredging operation will also require various support vessels such as positioning tugs, crew boats, and survey boats.

The project engineers estimated characteristics of the diesel engines on board the dredge such as total horsepower, operating hours, and average operating loads. They also characterized typical parameters of the support vessels, including total installed horsepower and operating hours. Basic emission factors for the diesel engines were obtained from the "harbor craft" section of the GMEI, which lists emission factors for marine engines of various sizes and emission tier levels. Additional, advanced-tier emission factors have been based on the emission standards for the appropriately sized marine engines.

A.2 Dredged Material Placement Site Work

Once the dredged material has been placed in the placement area it will be moved and compacted by non-road equipment such as dozers and loaders. The project engineers estimated typical horsepower, operating hours, and load factors for this type of equipment. Emission factors were based on the emission certification levels of Tier 1, Tier 2, and Tier 3 non-road equipment.

Dredged material placement and handling will account for a relatively small percentage (approximately 8%) of overall project construction NO_x emissions and approximately 18% of VOC emissions.

A.3 Employee Vehicle Commuting

Employee vehicle commuting will make up a very small part of overall project construction emissions and will represent a negligible percentage of SIP emissions. As an example, the latest EPA approved SIP documentation includes on-road emissions based on 169,918,016 miles per weekday (TCEQ 2016).[1] A 100-person work force making an average 50-mile round trip commute would drive 5,000 miles per day, or 0.003% of the on-road basis of the current SIP.

A.4 Emissions Calculations and Results

Emission estimates for each engine have been based on horsepower hours (hp hrs), calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative (i.e., to be relatively high so as to calculate reasonably worst-case emission levels). Emission factors for marine engines (propulsion and auxiliary engines on dredges, tugs, work boats, etc.) are from Port Houston's most recent (2013) air emissions inventory and reflect average emissions from these engines in 2013. Emission factors for nonroad engines are based on the Tier 1, 2, and 3 emission standards stratified by horsepower. The Tier 1 standards have been applicable since the late 1990s (year depending on horsepower) and so reflect the oldest equipment likely to be in use when the project elements take place and likely overestimate the age of equipment that will actually be used, consequently overestimating prospective emissions. Emission estimates based on Tier 2 and 3 reflect the lower emissions that would result from newer engines being used for the work.

The Tier 1 emission factors used in calculating these emissions are presented in Table A-1. As noted above, the emission factors are based on Tier 1 standards, which likely overestimate the emissions that would actually occur because of the introduction of Tier 2 and Tier 3 engines into the equipment that may be used on the project. While NO_x and VOC emissions have been calculated for demonstration of General Conformity related emissions, other criteria pollutants have been included for completeness. The anticipated schedule of work was used to allocate emissions to each of the project years. Table A-2 presents a summary of emissions from Tier 1 vessels and equipment by year for the LPP.

[1] *HGB 2008 Eight-Hour Ozone RFP SIP Revision* Adopted by TCEQ 15 December 2016 and approved by EPA on 13 February 2019. See: https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/Adoption/16017SIP_HGBRFP_Ado.pdf Accessed 11 July 2019

Table A-1: Emission Factors Used for Nonroad and Marine Engines

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 1 nonroad						
(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	7.1	0.60	0.58	0.005	1.0	4.1
(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.0	8.5
100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.0	8.5
175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.0	8.5
300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.0	8.5
600 ≤ hp < 750	6.9	0.40	0.39	0.005	1.0	8.5
>750	6.9	0.40	0.39	0.005	1.0	8.5
Marine **Cat 1 and Cat 2 Tier 1**						
Main - large dredge	9.3	0.23	0.22	0.004	0.1	1.8
Main - small dredge	9.3	0.23	0.22	0.004	0.1	1.8
Dredge auxiliary	7.3	0.23	0.22	0.004	0.1	1.7
Main - large tug	8.7	0.23	0.22	0.004	0.1	1.7
Main - small tug	8.7	0.23	0.22	0.004	0.1	1.7
Tug auxiliary	7.3	0.23	0.22	0.004	0.1	1.7
Miscellaneous	9.1	0.23	0.22	0.004	0.1	1.8

Table A-2: Estimated Tier 1 Emissions, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	850	32	31	0.47	49	470
Year 2	**2024**	1,330	54	52	0.77	93	870
Year 3	**2025**	565	22	21	0.32	35	337
Year 4	**2026**	535	22	21	0.30	36	340
Year 5	**2027**	243	11	10	0.14	19	177
Year 6	**2028**	129	6	5	0.08	10	94
Total		**3,652**	**146**	**141**	**2.08**	**243**	**2,288**

Tier 2 emissions standards for the various categories of marine engines became effective in different years dependent on the size category of the engine, with Category 2 becoming effective as late as 2007, and Category 3 in 2011. Dredge main engines displacement and horsepower typically fall into either Category 2 or 3. With more than a decade since initial effective dates, Tier 2 dredges are becoming a more common part of the national large dredge fleet. Also, Tier 2 standards for nonroad equipment, although a minor part of emissions in this project, were effective in the 2003 to 2006 range. Therefore, to provide a range of emission estimation that might be more reflective of equipment ultimately used, emissions have also been estimated for the use of Tier 2 engines rather than the Tier 1-based estimates presented above. While it is not possible to predict the actual equipment that will be brought to the project by contractors who have yet to be selected, it is more likely that equipment will be Tier 2 or newer based on when the standards were implemented.

The 2013 Goods Movement Air Emissions Inventory does not include Tier 2 emission factors. Therefore, the marine factors were selected from another recent emissions inventory released by a Texas port, the 2013 Air Emissions Inventory for Port Corpus Christi, July 2015 (Port of Corpus Christi Authority 2013) and on relevant emission standards. Nonroad Tier 2 emission factors were based on the Tier 2 emission standards since more precise modeling would require detailed model year and other engine information that is not available. The Tier 2 emission factors used in calculating these emissions are presented in Table A-3 below. Table A-4 presents the results for the LPP using Tier 2 emission factors.

Table A-3: Tier 2 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 2 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.22	0.21	0.005	1.0	3.7
175 ≤ hp < 300	4.9	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
>750	4.8	0.15	0.15	0.005	1.0	2.6
Cat 1 and Cat 2 Tier 2						
Dredge main - large	6.9	0.37	0.36	0.004	0.1	1.8
Dredge main - small	6.2	0.37	0.36	0.004	0.1	1.8
Dredge aux	5.2	0.15	0.14	0.004	0.1	1.8
Tug main - large	6.1	0.37	0.36	0.004	0.1	1.8
Tug main - small	5.2	0.37	0.36	0.004	0.1	1.8
Tug aux	5.2	0.15	0.14	0.004	0.1	1.8
Miscellaneous	5.2	0.15	0.14	0.004	0.1	1.8

Table A-4: Estimated Tier 2 Emissions, tons per year

Year		Estimated emissions, tons per year					
		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	583	28	27	0.47	49	228
Year 2	**2024**	915	41	40	0.77	93	378
Year 3	**2025**	393	18	17	0.32	35	155
Year 4	**2026**	372	16	16	0.30	36	151
Year 5	**2027**	167	7	7	0.14	19	72
Year 6	**2028**	88	4	4	0.08	10	39
Total		**2,517**	**113**	**111**	**2.08**	**243**	**1,023**

Further information is provided by evaluating emissions that would be produced by the use of Tier 3 equipment and vessel engines on the project. Emission factors for these engines have been based on the relevant Tier 3 emission standards. Table A-5 presents the Tier 3 emission factors used in calculating these emissions while Table A-6 presents the emission estimates resulting from the use of Tier 3 engines and equipment on the LPP.

Table A-5: Tier 3 Emission Factors, g/hp-hr

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 3 nonroad						
(11 ≤ hp < 25)	5.6	0.60	0.58	0.005	1.0	4.9
(25 ≤ hp < 50)	5.6	0.45	0.44	0.005	1.0	4.1
(50 ≤ hp < 100)	5.6	0.30	0.29	0.005	1.0	3.7
100 ≤ hp < 175	4.9	0.22	0.21	0.005	1.0	3.7
175 ≤ hp < 300	4.9	0.15	0.15	0.005	1.0	2.6
300 ≤ hp < 600	4.8	0.15	0.15	0.005	1.0	2.6
600 ≤ hp < 750	4.8	0.15	0.15	0.005	1.0	2.6
>750	4.8	0.15	0.15	0.005	1.0	2.6
Marine						
Cat 1 and Cat 2 Tier 2						
Main - large dredge	6.2	0.20	0.19	0.004	0.1	3.7
Main - small dredge	5.0	0.08	0.08	0.004	0.1	3.7
Dredge auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Main - large tug	5.0	0.08	0.08	0.004	0.1	3.7
Main - small tug	4.0	0.08	0.08	0.004	0.1	3.7
Tug auxiliary	4.0	0.08	0.08	0.004	0.1	3.7
Miscellaneous	4.0	0.08	0.08	0.004	0.1	3.7

Table A-6: Estimated Tier 3 Emissions, tons per year

Year		Estimated emissions, tons per year NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2023**	488	12	12	0.47	49	351
Year 2	**2024**	788	22	21	0.77	93	541
Year 3	**2025**	337	10	10	0.32	35	231
Year 4	**2026**	320	10	9	0.30	36	218
Year 5	**2027**	139	4	4	0.14	19	98
Year 6	**2028**	74	2	2	0.08	10	53
Total		**2,145**	**60**	**59**	**2.08**	**243**	**1,491**

The construction schedule on which the annual emissions are based is included below in Figure A-1. An illustration of the detailed calculations of Tier 1 emissions developed for the LPP are included as Figure A-2. The Tier 2 and Tier 3 emissions were estimated in a similar manner using the appropriate emission factors.

Figure A-1: Project Schedule

LPP RECOMMENDED PLAN
HSC - Expansion Channel Improvements Project, TEXAS
2018 PRICE LEVELS

ACCT. NO	SEGMENT	CONTRACT	ACTIVITY	DURATION (MONTHS)
6	1A	1	Mitigation-Construct Oyster Reef at San Leon/Dollar Reef	5.0
12		2	NW Dredging - Bolivar Roads to Redfish to 8-Ac B.I.	2.8
12			NW Dredging - Bolivar Roads to Redfish to Long B.I.	3.2
12			NW Dredging - Mech. Dredging to ODMDS	7.6
12	4	3	Site Preparation - E2 Clinton Tract	2.6
12		4	Site Preparation - Beltway 8 Tract	4.7
12		5	NW Dredging - Greens Bayou to Sims Bayou to E2 Clinton	2.3
12			NW Dredging - Boggy Bayou to Greens Bayou to Beltway 8	7.7
6	1B & 2	6	Mitigation-Construct Oyster Reef at San Leon/Dollar Reef	8.6
12		7	NW Dredging - Mech. Dredging to ODMDS	6.2
12		8	NW Dredging - BSC + HSC to B.I. Marsh	11.3
6	1C & 3	9	Mitigation-Construct Oyster Reef at San Leon/Dollar Reef	0.3
12		10	NW Dredging - BCC to M12	6.5
12			Sweeping Cedar Bayou	0.7
6		11	NW Dredging - HSC to M7/8/9 & M11	7.3
12			NW Dredging - HSC to BSC Sed. Attn.	7.2
12	5 & 6	12	Site Preparation - Glendale PA	3.1
12		13	Site Preparation - Filterbed PA	1.5
12		14	NW Dredging - Sims Bayou to Turning Basin to Glendale	3.2
12			NW Dredging - Main Turning Basin to Filterbed	1.6

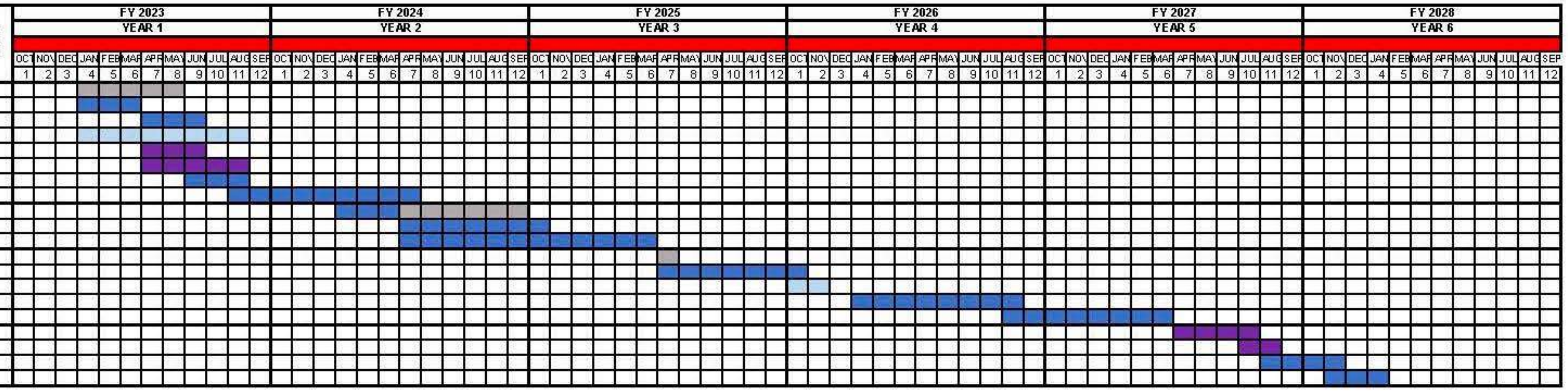

Figure A-2: Illustration of Tier 1 Emission Calculations

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
CONTRACT YEAR 01 - LPP																									
NED: Segment 1 - Bolivar Roads to Redfish Reef (Station 138+369 to 100+000)																									
Pt. of CW1_Bolivar-Redfish_700		TO: 8-AC Bird Island & Long Bird Island																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.53	16	1,994,000	16	1,305	95.5	5,830,731	100%	0%	0%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					1,833,563	100%	0%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,063,467	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					3,055,939	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	1	Main Engines	5,000	0.70	16					5,347,893	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					275,034	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					366,713	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					1,050,479	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					126,057	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					137,517	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					2,521,149	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					229,195	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					2,750,345	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					343,793	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					515,690	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					114,598	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					320,874	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					57,299	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	156.3	140,668	100%	0%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					22,507	100%	0%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					844,010	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,688,019	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					717,408	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					253,203	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					262,581	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					93,779	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	16.0	66,560	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					32,640	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					83,200	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					15,360	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					3,200	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	12.0	24,960	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					62,400	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					11,520	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					2,400	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	152.0	316,160	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					790,400	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					145,920	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					30,400	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
NED: Segment 1 - Bolivar Roads to Redfish (Station 100+000 to 073+934)																									
Pt. of CW1_Bolivar-Redfish_700		TO: ODMDS																							
MechanicalDredging	Clamshell Dredge (21CY)	1	Main Engines	2,000	0.50	15	3,038,000	15	877	230.9	3,464,082	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					665,104	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tow Tug	2	Propulsion	4,500	0.80	15					24,941,391	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		2	Auxilliaries	300	0.50	24					1,662,759	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tender Tug	4	Propulsion	1,000	0.50	8					3,695,021	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					554,253	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	400	0.60	14					775,954	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.60	24					166,276	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
NED: Segment 4 - Boggy Bayou to Sims Bayou (Station 676+53 to 850+00)																									
CW4_BB-GB_530 + Pt. of CD4_Whole		TO: Beltway-8 Tract																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	143.0	1,029,600	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	124.0	1,785,600	22%	78%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	180	0.75	8	N/A	N/A	N/A	124.0	267,840	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.52	14	2,920,000	14	1,020	204.5	6,252,235	22%	78%	0%	0%	0%	0%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					3,140,840	22%	78%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.92	14					3,160,471	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					5,725,490	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	2	Main Engines	4,000	0.55	14					12,596,078	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					1,177,815	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					687,059	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					2,249,300	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					269,916	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					5,398,319	22%	78%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					490,756	22%	78%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					5,889,076	22%	78%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					736,134	22%	78%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					1,104,202	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					245,378	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					687,059	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					122,689	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	234.9	211,394	22%	78%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					33,823	22%	78%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					1,268,362	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					2,536,723	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					1,078,107	22%	78%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					380,509	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					394,601	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					140,929	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
59.8	1.48	1.41	0.026	0.64	11.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
14.8	0.46	0.44	0.008	0.20	3.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
8.1	0.47	0.46	0.006	1.17	10.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
23.2	1.35	1.31	0.017	3.37	28.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
40.7	2.36	2.30	0.029	5.90	50.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.1	0.12	0.12	0.002	0.30	2.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.8	0.16	0.16	0.002	0.40	3.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
8.0	0.46	0.45	0.006	1.16	9.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.0	0.06	0.05	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.0	0.09	0.09	0.001	0.15	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
24.2	0.64	0.61	0.011	0.28	4.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.8	0.06	0.06	0.001	0.03	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
26.4	0.70	0.67	0.012	0.30	5.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.8	0.09	0.08	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.2	0.13	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.1	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.2	0.08	0.08	0.001	0.04	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.6	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.1	0.09	0.09	0.001	0.16	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
6.4	0.37	0.36	0.005	0.93	7.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
12.8	0.74	0.73	0.009	1.86	15.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.5	0.47	0.46	0.004	0.79	6.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.9	0.11	0.11	0.001	0.28	2.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.6	0.07	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.02	0.02	0.000	0.04	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.8	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.01	0.01	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.4	0.14	0.14	0.002	0.35	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
7.6	0.20	0.19	0.003	0.09	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.5	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
26.3	1.53	1.49	0.019	3.82	32.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.1	0.29	0.29	0.004	0.73	6.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
239.2	6.32	6.05	0.110	2.75	47.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
13.4	0.42	0.40	0.007	0.18	3.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
35.4	0.94	0.90	0.016	0.41	7.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
4.5	0.14	0.13	0.002	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
7.8	0.20	0.19	0.003	0.09	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.7	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.7	0.10	0.10	0.001	0.25	2.1	6.1	0.35	0.34	0.004	0.88	7.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.0	0.17	0.17	0.002	0.44	3.7	10.6	0.61	0.60	0.008	1.53	13.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.03	0.03	0.000	0.07	0.6	1.6	0.09	0.09	0.001	0.23	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
14.2	0.35	0.34	0.006	0.15	2.8	49.9	1.23	1.18	0.021	0.54	9.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.6	0.18	0.17	0.003	0.08	1.3	19.7	0.62	0.59	0.011	0.27	4.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.3	0.31	0.30	0.004	0.77	6.6	18.7	1.08	1.06	0.014	2.71	23.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
9.7	0.56	0.55	0.007	1.40	11.9	33.9	1.96	1.91	0.025	4.91	41.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
21.3	1.23	1.20	0.015	3.09	26.2	74.5	4.32	4.21	0.054	10.80	91.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.0	0.12	0.11	0.001	0.29	2.5	7.0	0.40	0.39	0.005	1.01	8.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.2	0.07	0.07	0.001	0.17	1.4	4.1	0.24	0.23	0.003	0.59	5.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.8	0.22	0.21	0.003	0.55	4.7	13.3	0.77	0.75	0.010	1.93	16.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.03	0.03	0.000	0.07	0.6	1.6	0.09	0.09	0.001	0.23	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
11.5	0.30	0.29	0.005	0.13	2.3	40.3	1.06	1.02	0.019	0.46	8.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.03	0.03	0.000	0.01	0.2	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
12.6	0.33	0.32	0.006	0.14	2.5	43.9	1.16	1.11	0.020	0.50	8.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.3	0.04	0.04	0.001	0.02	0.3	4.6	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.5	0.06	0.06	0.001	0.03	0.5	8.6	0.22	0.21	0.004	0.10	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.01	0.01	0.000	0.01	0.1	1.9	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.5	0.04	0.04	0.001	0.02	0.3	5.4	0.14	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.3	0.01	0.01	0.000	0.00	0.1	1.0	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.4	0.03	0.03	0.000	0.05	0.4	1.3	0.11	0.11	0.001	0.18	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.1	0.00	0.00	0.000	0.01	0.0	0.2	0.02	0.02	0.000	0.03	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.1	0.12	0.12	0.002	0.31	2.6	7.5	0.43	0.42	0.005	1.09	9.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
4.3	0.25	0.24	0.003	0.62	5.3	15.0	0.87	0.85	0.011	2.17	18.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.8	0.16	0.15	0.001	0.26	2.2	6.4	0.55	0.54	0.005	0.92	7.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.6	0.04	0.04	0.000	0.09	0.8	2.3	0.13	0.13	0.002	0.33	2.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.02	0.02	0.000	0.01	0.2	3.1	0.08	0.07	0.001	0.04	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.3	0.01	0.01	0.000	0.00	0.1	1.1	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
NED: Segment 4 - Boggy Bayou to Sims Bayou (Station 850+00 to 974+08)																									
Pt. of CD4_Whole		TO: E2 Clinton																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	78.0	561,600	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	68.0	979,200	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	68.0	106,080	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	562,000	14	997	40.3	1,680,927	100%	0%	0%	0%	0%	0%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					618,450	100%	0%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					676,429	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					1,127,382	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	3	Main Engines	4,000	0.70	14					4,735,005	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		3	Auxilliaries	200	0.60	24					347,878	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					135,286	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					442,900	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					53,148	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					1,062,960	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					96,633	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					1,159,593	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					144,949	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					217,424	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					48,316	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					135,286	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					24,158	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	70.7	63,597	100%	0%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					10,176	100%	0%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					381,584	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					763,167	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					324,346	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					114,475	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					118,715	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					42,398	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
CONTRACT YEAR 02 - NED																									
LPP: Segment 1 - HSC (Station 073+934 to 042+000 +/-)																									
Pt. of CW1_Redfish-BSC_700		TO: San Leon/Dollar Reef Mitigation Sites																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.61	16	2,030,000	16	1,713	74.1	5,204,764	0%	100%	0%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					1,422,067	0%	100%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.67	16					952,785	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					2,370,111	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	2	Main Engines	5,000	0.70	16					8,295,388	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					426,620	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					284,413	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					814,726	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					97,767	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					106,655	0%	100%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					1,955,342	0%	100%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					177,758	0%	100%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					2,133,100	0%	100%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					266,637	0%	100%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					399,956	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					88,879	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					248,862	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					44,440	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					124,431	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					44,440	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	186.0	386,880	0%	100%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					967,200	0%	100%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					178,560	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					37,200	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - HSC (Station 042+000 +/- to 028+605)																									
Pt. of CW1_Redfish-BSC_700		TO: Bird Island Marsh																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.49	16	3,181,000	16	1,718	115.7	6,532,345	0%	86%	14%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					2,221,886	0%	86%	14%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,288,694	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					3,703,143	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	2	Main Engines	5,000	0.66	16					12,220,373	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					666,566	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					444,377	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					1,272,955	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					152,755	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					166,641	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					3,055,093	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					277,736	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					3,332,829	0%	86%	14%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					416,604	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					624,905	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
			Auxilliaries	50	0.50	24					0	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					388,830	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					69,434	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	130.9	117,831	0%	86%	14%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					18,853	0%	86%	14%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					706,985	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,413,971	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					600,938	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					212,096	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					219,951	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					78,554	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
4.3	0.25	0.24	0.003	0.62	5.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
7.4	0.43	0.42	0.005	1.08	9.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.8	0.07	0.07	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
17.2	0.43	0.41	0.007	0.19	3.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.0	0.16	0.15	0.003	0.07	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.1	0.30	0.29	0.004	0.75	6.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
8.6	0.50	0.48	0.006	1.24	10.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
36.0	2.09	2.04	0.026	5.22	44.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.6	0.15	0.15	0.002	0.38	3.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.0	0.06	0.06	0.001	0.15	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
3.4	0.20	0.19	0.002	0.49	4.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.4	0.02	0.02	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
10.2	0.27	0.26	0.005	0.12	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.8	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
11.1	0.29	0.28	0.005	0.13	2.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.2	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.2	0.06	0.05	0.001	0.03	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.4	0.03	0.03	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.9	0.17	0.16	0.002	0.42	3.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
5.8	0.34	0.33	0.004	0.84	7.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
2.5	0.21	0.21	0.002	0.36	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.9	0.05	0.05	0.001	0.13	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
1.2	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	53.4	1.32	1.26	0.023	0.57	10.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	11.4	0.36	0.34	0.006	0.16	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	7.2	0.42	0.41	0.005	1.05	8.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	18.0	1.05	1.02	0.013	2.61	22.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	63.1	3.66	3.57	0.046	9.14	77.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.19	0.18	0.002	0.47	4.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.12	0.002	0.31	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	6.2	0.36	0.35	0.004	0.90	7.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.07	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	18.8	0.50	0.47	0.009	0.22	3.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.05	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	20.5	0.54	0.52	0.009	0.24	4.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.07	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.0	0.10	0.10	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.06	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.03	0.03	0.001	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.17	0.17	0.002	0.43	3.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	9.3	0.25	0.23	0.004	0.11	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.05	0.04	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	57.4	1.42	1.36	0.025	0.62	11.1	9.6	0.24	0.23	0.004	0.10	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	15.3	0.48	0.46	0.008	0.21	3.7	2.6	0.08	0.08	0.001	0.03	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	8.4	0.49	0.47	0.006	1.22	10.3	1.4	0.08	0.08	0.001	0.20	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	24.1	1.40	1.36	0.017	3.50	29.7	4.0	0.23	0.23	0.003	0.58	5.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	79.7	4.62	4.50	0.058	11.55	98.1	13.3	0.77	0.75	0.010	1.92	16.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.3	0.25	0.25	0.003	0.63	5.4	0.7	0.04	0.04	0.001	0.10	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.17	0.16	0.002	0.42	3.6	0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	8.3	0.48	0.47	0.006	1.20	10.2	1.4	0.08	0.08	0.001	0.20	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.14	1.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.09	0.09	0.001	0.16	1.3	0.2	0.02	0.02	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	25.1	0.66	0.64	0.012	0.29	5.0	4.2	0.11	0.11	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.06	0.06	0.001	0.03	0.5	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	27.4	0.72	0.69	0.013	0.31	5.5	4.6	0.12	0.12	0.002	0.05	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.09	0.09	0.002	0.04	0.7	0.5	0.02	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	5.4	0.14	0.13	0.002	0.06	1.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.3	0.08	0.08	0.001	0.04	0.7	0.6	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.01	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.06	0.001	0.11	0.9	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.6	0.27	0.26	0.003	0.67	5.7	0.8	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	9.2	0.53	0.52	0.007	1.34	11.4	1.5	0.09	0.09	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.34	0.33	0.003	0.57	4.8	0.7	0.06	0.05	0.000	0.09	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.08	0.08	0.001	0.20	1.7	0.2	0.01	0.01	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.05	0.05	0.001	0.02	0.4	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	30.0	124,800	0%	86%	14%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					61,200	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					156,000	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					28,800	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					6,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	25.0	52,000	0%	86%	14%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					130,000	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					24,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					5,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 2 - BSC (Station 25+58 to 221+00)																									
Pt. of CW1_Redfish-BSC_700		TO: Bird Island Marsh																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.54	16	2,108,000	16	1,258	104.7	6,515,027	0%	50%	50%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					2,010,811	0%	50%	50%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,166,270	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					3,351,351	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	3	Main Engines	5,000	0.66	16					16,589,189	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		3	Auxilliaries	200	0.60	24					904,865	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	16					402,162	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					1,152,027	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					138,243	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.60	16					150,811	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					2,764,865	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					251,351	0%	50%	50%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					3,016,216	0%	50%	50%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					377,027	0%	50%	50%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					565,541	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					125,676	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					351,892	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					62,838	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	120.0	108,000	0%	50%	50%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					17,280	0%	50%	50%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					648,000	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,296,000	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					550,800	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					194,400	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					201,600	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					72,000	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	20.0	83,200	0%	50%	50%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					40,800	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	3					39,000	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	14					33,600	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					12,000	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	17.0	35,360	0%	50%	50%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	3					33,150	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	14					28,560	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					10,200	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - Bolivar Roads to Redfish (Station 100+000 to 073+934)																									
Pt. of CW1_Bolivar-Redfish_700		TO: ODMDS																							
MechanicalDredging	Clamshell Dredge (21CY)	1	Main Engines	2,000	0.50	15	2,474,000	15	877	188.1	2,820,981	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					541,628	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tow Tug	2	Propulsion	4,500	0.80	15					20,311,060	0%	86%	14%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		2	Auxilliaries	300	0.50	24					1,354,071	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tender Tug	4	Propulsion	1,000	0.50	8					3,009,046	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					451,357	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	400	0.60	14					631,900	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.60	24					135,407	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
CONTRACT YEAR 03 - NED																									
NED: Segment 3 - BCC Channel & Flare (Station 8+78 to 67+11)																									
CW3_BCC_455 + BETB3_BCCFlare		TO: Atkinson Marsh Cell M12																							
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.63	16	2,825,000	16	1,247	141.6	10,276,022	0%	0%	86%	14%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					2,718,524	0%	0%	86%	14%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.58	16					1,576,744	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					4,530,874	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.6	16					543,705	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2000	0.5	11					1,557,488	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	11					186,899	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.6	16					203,889	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.5	22					3,737,971	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.5	24					339,816	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					4,077,787	0%	0%	86%	14%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.5	24					509,723	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					764,585	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.5	24					169,908	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.6	14					475,742	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.5	24					84,954	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	172.0	154,791	0%	0%	86%	14%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					24,767	0%	0%	86%	14%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					928,745	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					1,857,490	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					789,433	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					278,624	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					288,943	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					103,194	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	27.0	112,320	0%	0%	86%	14%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					55,080	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	3					52,650	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	14					45,360	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					16,200	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.05	0.05	0.001	0.12	1.0	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.03	0.03	0.001	0.01	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	0.1	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.03	0.03	0.000	0.01	0.2	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	33.4	0.83	0.79	0.014	0.36	6.5	33.4	0.83	0.79	0.014	0.36	6.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	8.1	0.25	0.24	0.004	0.11	1.9	8.1	0.25	0.24	0.004	0.11	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.26	0.25	0.003	0.64	5.5	4.4	0.26	0.25	0.003	0.64	5.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	12.7	0.74	0.72	0.009	1.85	15.7	12.7	0.74	0.72	0.009	1.85	15.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	63.1	3.66	3.57	0.046	9.14	77.7	63.1	3.66	3.57	0.046	9.14	77.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.20	0.19	0.002	0.50	4.2	3.4	0.20	0.19	0.002	0.50	4.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.09	0.09	0.001	0.22	1.9	1.5	0.09	0.09	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.25	0.25	0.003	0.63	5.4	4.4	0.25	0.25	0.003	0.63	5.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.05	0.05	0.000	0.08	0.7	0.6	0.05	0.05	0.000	0.08	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	13.3	0.35	0.34	0.006	0.15	2.7	13.3	0.35	0.34	0.006	0.15	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.03	0.03	0.001	0.01	0.2	1.0	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	14.5	0.38	0.37	0.007	0.17	2.9	14.5	0.38	0.37	0.007	0.17	2.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.05	0.05	0.001	0.02	0.4	1.5	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.8	0.07	0.07	0.001	0.03	0.6	2.8	0.07	0.07	0.001	0.03	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.04	0.04	0.001	0.02	0.3	1.8	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.04	0.03	0.000	0.06	0.5	0.4	0.04	0.03	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.01	0.0	0.1	0.01	0.01	0.000	0.01	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.14	0.14	0.002	0.36	3.0	2.5	0.14	0.14	0.002	0.36	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	4.9	0.29	0.28	0.004	0.71	6.1	4.9	0.29	0.28	0.004	0.71	6.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.18	0.18	0.002	0.30	2.6	2.1	0.18	0.18	0.002	0.30	2.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.7	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.03	0.02	0.000	0.01	0.2	1.0	0.03	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	0.3	0.02	0.02	0.000	0.05	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.2	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	18.4	1.07	1.04	0.013	2.67	22.7	3.1	0.18	0.17	0.002	0.44	3.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.20	0.20	0.003	0.51	4.3	0.6	0.03	0.03	0.000	0.09	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	167.0	4.41	4.22	0.077	1.92	33.4	27.8	0.74	0.70	0.013	0.32	5.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	9.3	0.29	0.28	0.005	0.13	2.2	1.6	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	24.7	0.65	0.63	0.011	0.28	4.9	4.1	0.11	0.10	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.1	0.10	0.09	0.002	0.04	0.7	0.5	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	5.4	0.14	0.13	0.002	0.07	1.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.03	0.03	0.001	0.01	0.2	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	90.3	2.23	2.14	0.039	0.97	17.5	15.0	0.37	0.36	0.006	0.16	2.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.8	0.59	0.57	0.010	0.26	4.5	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.3	0.60	0.58	0.007	1.49	12.7	1.7	0.10	0.10	0.001	0.25	2.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	29.5	1.71	1.67	0.021	4.28	36.4	4.9	0.29	0.28	0.004	0.71	6.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.21	0.20	0.003	0.51	4.4	0.6	0.03	0.03	0.000	0.09	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.2	0.59	0.57	0.007	1.47	12.5	1.7	0.10	0.10	0.001	0.25	2.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.07	0.07	0.001	0.18	1.5	0.2	0.01	0.01	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.12	0.11	0.001	0.19	1.6	0.2	0.02	0.02	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	30.7	0.81	0.78	0.014	0.35	6.1	5.1	0.14	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.3	0.07	0.07	0.001	0.03	0.6	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	33.5	0.89	0.85	0.015	0.39	6.7	5.6	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.11	0.11	0.002	0.05	0.8	0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.6	0.17	0.16	0.003	0.08	1.3	1.1	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.04	0.04	0.001	0.02	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.1	0.10	0.10	0.002	0.05	0.8	0.7	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.09	0.08	0.001	0.15	1.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.1	0.35	0.34	0.004	0.88	7.5	1.0	0.06	0.06	0.001	0.15	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	12.1	0.70	0.68	0.009	1.76	14.9	2.0	0.12	0.11	0.001	0.29	2.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.1	0.45	0.43	0.004	0.75	6.3	0.9	0.07	0.07	0.001	0.12	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.11	0.10	0.001	0.26	2.2	0.3	0.02	0.02	0.000	0.04	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.06	0.06	0.001	0.03	0.5	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.05	0.4	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	9.0	18,720	0%	0%	100%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					46,800	0%	0%	100%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					8,640	0%	0%	100%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					1,800	0%	0%	100%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
MechanicalDredging	Clamshell Dredge (12CY)	1	Main Engines	1,750	0.50	15	N/A	N/A	N/A	22.2	291,270	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					63,913	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tow Tug	1	Propulsion	4,500	0.80	15					1,198,368	0%	0%	86%	14%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					79,891	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tender Tug	2	Propulsion	1,000	0.50	8					177,536	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		2	Auxilliaries	50	0.50	24					26,630	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	400	0.60	14					74,565	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.60	24					15,978	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - HSC (Station 028+605 to -3.94)																									
Pt. of CW1_BSC-BCC_700			TO: M11 & M789																						
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.56	16	3,800,000	16	1,463	162.3	10,472,727	0%	0%	0%	100%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					3,116,883	0%	0%	0%	100%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.67	16					2,088,312	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					5,194,805	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	1	Main Engines	5000	0.72	16					9,350,649	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	24					467,532	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.6	16					623,377	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2000	0.5	11					1,785,714	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	11					214,286	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.6	16					233,766	0%	0%	0%	100%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.5	22					4,285,714	0%	0%	0%	100%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.5	24					389,610	0%	0%	0%	100%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					4,675,325	0%	0%	0%	100%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.5	24					584,416	0%	0%	0%	100%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					876,623	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.5	24					194,805	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.6	14					545,455	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.5	24					97,403	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	223.1	200,824	0%	0%	0%	100%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					32,132	0%	0%	0%	100%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					1,204,943	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					2,409,887	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					1,024,202	0%	0%	0%	100%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					361,483	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					374,871	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					133,883	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
LPP: Segment 1 - HSC (Station 028+605 to -3.94)																									
Pt. of CW1_BSC-BCC_700			TO: BSC Sed. Attn. Feature																						
Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.60	16	1,541,000	16	1,588	60.7	4,192,141	0%	0%	0%	25%	75%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	1,000	0.80	24					1,164,484	0%	0%	0%	25%	75%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	0.67	16					780,204	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	16					1,940,806	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	30"-Booster	1	Main Engines	5000	0.7	16					3,396,411	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	24					174,673	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.6	16					232,897	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2000	0.5	11					667,152	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.6	11					80,058	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Spill Barge	1	Auxilliaries	150	0.6	16					87,336	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.5	22					1,601,165	0%	0%	0%	25%	75%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.5	24					145,560	0%	0%	0%	25%	75%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					1,746,725	0%	0%	0%	25%	75%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.5	24					218,341	0%	0%	0%	25%	75%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					327,511	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.5	24					72,780	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.6	14					203,785	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.5	24					36,390	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	91.1	81,945	0%	0%	0%	25%	75%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					13,111	0%	0%	0%	25%	75%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					491,671	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					983,342	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					417,920	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					147,501	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Survey/Crewboat	1	Propulsion	200	0.60	14					152,964	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					54,630	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	128.0	532,480	0%	0%	0%	25%	75%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	8					261,120	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Work Tug	1	Main Power	1,000	0.65	8					665,600	0%	0%	0%	25%	75%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
	Survey/Crewboat	1	Propulsion	200	0.60	8					122,880	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	8					25,600	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
CONTRACT YEAR 04 - LPP																									
NED: Segment 5 - Sims Bayou to 610 Bridge (Station 1110+78 to 1160+62)																									
CD5_Whole		TO: Glendale PA																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	18.0	129,600	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	15.0	216,000	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	15.0	23,400	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	176,049	14	997	12.6	526,558	0%	0%	0%	0%	50%	50%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					193,732	0%	0%	0%	0%	50%	50%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					211,894	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					353,157	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.11	0.11	0.001	0.28	2.3	0.3	0.02	0.02	0.000	0.05	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.02	0.02	0.000	0.06	0.5	0.1	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.9	0.26	0.25	0.005	0.11	2.0	1.6	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.04	0.04	0.001	0.02	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	107.4	2.66	2.54	0.046	1.15	20.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	25.1	0.79	0.76	0.014	0.34	6.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	15.9	0.92	0.90	0.012	2.30	19.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	39.5	2.29	2.23	0.029	5.73	48.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	71.1	4.12	4.02	0.052	10.31	87.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.6	0.21	0.20	0.003	0.52	4.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.27	0.27	0.003	0.69	5.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	13.6	0.79	0.77	0.010	1.97	16.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.09	0.09	0.001	0.24	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.15	0.15	0.001	0.26	2.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	41.1	1.09	1.04	0.019	0.47	8.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	44.8	1.19	1.13	0.021	0.52	9.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.8	0.22	0.21	0.004	0.11	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.5	0.14	0.13	0.002	0.07	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.13	0.13	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.2	0.53	0.52	0.007	1.33	11.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.3	1.06	1.04	0.013	2.66	22.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.8	0.68	0.65	0.006	1.13	9.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.16	0.16	0.002	0.40	3.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.8	0.10	0.09	0.002	0.05	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.03	0.03	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.7	0.27	0.25	0.005	0.12	2.1	32.2	0.80	0.76	0.014	0.35	6.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.3	0.07	0.07	0.001	0.03	0.6	7.0	0.22	0.21	0.004	0.10	1.7	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.09	0.08	0.001	0.22	1.8	4.5	0.26	0.25	0.003	0.65	5.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5	11.1	0.64	0.63	0.008	1.60	13.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.5	0.37	0.37	0.005	0.94	8.0	19.4	1.12	1.10	0.014	2.81	23.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	1.0	0.06	0.06	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5	1.3	0.08	0.08	0.001	0.19	1.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.07	0.07	0.001	0.18	1.6	3.8	0.22	0.22	0.003	0.55	4.7	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.8	0.10	0.10	0.002	0.04	0.8	11.5	0.30	0.29	0.005	0.13	2.3	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.9	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.11	0.11	0.002	0.05	0.8	12.6	0.33	0.32	0.006	0.14	2.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	1.3	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	2.5	0.06	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.5	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.01	0.01	0.000	0.01	0.1	1.5	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.05	0.05	0.001	0.14	1.2	2.8	0.16	0.16	0.002	0.41	3.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.11	0.11	0.001	0.27	2.3	5.6	0.33	0.32	0.004	0.81	6.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.07	0.001	0.12	1.0	2.4	0.21	0.20	0.002	0.35	2.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.8	0.05	0.05	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	1.2	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.15	1.2	3.0	0.18	0.17	0.002	0.44	3.7	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.04	0.04	0.000	0.07	0.6	1.5	0.13	0.13	0.001	0.22	1.8	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.04	0.04	0.001	0.02	0.3	4.8	0.13	0.12	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.10	0.09	0.001	0.24	2.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.02	0.01	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.07	0.06	0.001	0.03	0.5	2.7	0.07	0.06	0.001	0.03	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	0.8	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.05	0.05	0.001	0.12	1.0	0.8	0.05	0.05	0.001	0.12	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.08	0.08	0.001	0.19	1.7	1.3	0.08	0.08	0.001	0.19	1.7

PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
	24"-Booster	2	Main Engines	4,000	0.68	14					960,588	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					72,650	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					42,379	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					138,740	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					16,649	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					332,977	0%	0%	0%	0%	50%	50%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					30,271	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					363,248	0%	0%	0%	0%	50%	50%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					45,406	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					68,109	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					15,135	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					42,379	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					7,568	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					21,189	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					7,568	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	12.6	11,351	0%	0%	0%	0%	50%	50%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					1,816	0%	0%	0%	0%	50%	50%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					68,109	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					136,218	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					57,893	0%	0%	0%	0%	50%	50%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					20,433	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
NED: Segment 6 - 610 Bridge to Main Turning Basin (Station 1160+62 to 1266+49)																									
Pt. of CD6_Whole + TB6_	Pt. of CD6_Whole + TB6_Brad	TO: Glendale PA																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	76.0	547,200	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	62.0	892,800	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	62.0	96,720	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	733,529	14	997	52.6	2,193,965	0%	0%	0%	0%	50%	50%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					807,208	0%	0%	0%	0%	50%	50%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					882,883	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					1,471,472	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	2	Main Engines	4,000	0.68	14					4,002,405	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		2	Auxilliaries	200	0.60	24					302,703	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					176,577	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					578,078	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					69,369	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					1,387,388	0%	0%	0%	0%	50%	50%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					126,126	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					1,513,514	0%	0%	0%	0%	50%	50%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					189,189	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					283,784	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					63,063	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					176,577	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					31,532	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					88,288	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					31,532	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	83.0	74,657	0%	0%	0%	0%	50%	50%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					11,945	0%	0%	0%	0%	50%	50%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					447,944	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					895,888	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					380,752	0%	0%	0%	0%	50%	50%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					134,383	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
NED: Segment 6 - 610 Bridge to Main Turning Basin (Station 00+00 to 30+95)																									
Pt. of CD6_Whole		TO: Filterbed PA																							
PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	47.0	338,400	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	36.0	518,400	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
	Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	36.0	56,160	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.79	14	266,671	14	1,099	17.3	805,109	0%	0%	0%	0%	0%	100%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
		1	Auxilliaries	800	0.80	24					266,220	0%	0%	0%	0%	0%	100%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
		1	Ladder Pump	1,200	1.00	14					291,179	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Cutter & Swing	2,500	0.80	14					485,298	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
	24"-Booster	1	Main Engines	4,000	0.70	14					679,417	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	24					49,916	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Anchor Barge	2	Auxilliaries	200	0.60	14					58,236	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Derrick Barge	1	Main Engines	2,000	0.50	11					190,653	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
		1	Auxilliaries	200	0.60	11					22,878	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Tender Tug	4	Propulsion	600	0.50	22					457,566	0%	0%	0%	0%	0%	100%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
		4	Auxilliaries	50	0.50	24					41,597	0%	0%	0%	0%	0%	100%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	Tow Tug	1	Propulsion	4,500	0.80	8					499,163	0%	0%	0%	0%	0%	100%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
		1	Auxilliaries	300	0.50	24					62,395	0%	0%	0%	0%	0%	100%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
	25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					93,593	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		2	Auxilliaries	50	0.50	24					20,798	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Crewboat	1	Propulsion	400	0.60	14					58,236	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					10,399	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
	Survey/Crewboat	1	Propulsion	200	0.60	14					29,118	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1	Auxilliaries	50	0.50	24					10,399	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	47.7	42,959	0%	0%	0%	0%	0%	100%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
	Light Towers	2	N/A	8	0.50	18					6,873	0%	0%	0%	0%	0%	100%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
	D6 Dozer	2	N/A	200	0.75	18					257,753	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	Marsh Hoe	4	N/A	200	0.75	18					515,506	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
	325 LR Excavator	2	N/A	170	0.75	18					219,090	0%	0%	0%	0%	0%	100%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
	Field Truck	1	N/A	180	0.50	18					77,326	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5

Water
Land
% land

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons					
NOx	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5	3.7	0.21	0.21	0.003	0.53	4.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.3	0.02	0.02	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.2	0.01	0.01	0.000	0.02	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.04	0.04	0.001	0.02	0.3	1.6	0.04	0.04	0.001	0.02	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.05	0.04	0.001	0.02	0.3	1.7	0.05	0.04	0.001	0.02	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.01	0.000	0.04	0.3	0.3	0.02	0.01	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.02	0.02	0.000	0.03	0.3	0.2	0.02	0.02	0.000	0.03	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.24	0.24	0.003	0.60	5.1	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.8	0.39	0.38	0.005	0.98	8.4	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.06	0.06	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.2	0.28	0.27	0.005	0.12	2.2	11.2	0.28	0.27	0.005	0.12	2.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.10	0.10	0.002	0.04	0.8	3.2	0.10	0.10	0.002	0.04	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.19	0.19	0.002	0.49	4.1	3.4	0.19	0.19	0.002	0.49	4.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.6	0.32	0.32	0.004	0.81	6.9	5.6	0.32	0.32	0.004	0.81	6.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	15.2	0.88	0.86	0.011	2.21	18.8	15.2	0.88	0.86	0.011	2.21	18.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.07	0.07	0.001	0.17	1.4	1.2	0.07	0.07	0.001	0.17	1.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.000	0.10	0.8	0.7	0.04	0.04	0.000	0.10	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.12	0.002	0.32	2.7	2.2	0.13	0.12	0.002	0.32	2.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.01	0.000	0.04	0.3	0.3	0.02	0.01	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.7	0.18	0.17	0.003	0.08	1.3	6.7	0.18	0.17	0.003	0.08	1.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.02	0.02	0.000	0.01	0.1	0.5	0.02	0.02	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.3	0.19	0.18	0.003	0.08	1.5	7.3	0.19	0.18	0.003	0.08	1.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	0.8	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.04	0.03	0.001	0.02	0.3	1.4	0.04	0.03	0.001	0.02	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.9	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.4	0.01	0.01	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.3	0.02	0.02	0.000	0.04	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.01	0.0	0.0	0.00	0.00	0.000	0.01	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.10	0.10	0.001	0.25	2.1	1.7	0.10	0.10	0.001	0.25	2.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.20	0.19	0.002	0.49	4.2	3.4	0.20	0.19	0.002	0.49	4.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.13	0.12	0.001	0.21	1.8	1.4	0.13	0.12	0.001	0.21	1.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.07	0.6	0.5	0.03	0.03	0.000	0.07	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.6	0.15	0.15	0.002	0.37	3.2	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.23	0.22	0.003	0.57	4.9	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.04	0.04	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.3	0.20	0.20	0.004	0.09	1.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.07	0.06	0.001	0.03	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.13	0.002	0.32	2.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.2	0.30	0.29	0.004	0.75	6.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.02	0.02	0.000	0.06	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.08	0.08	0.001	0.21	1.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.03	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.12	0.11	0.002	0.05	0.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.8	0.13	0.12	0.002	0.06	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.02	0.02	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.01	0.01	0.000	0.01	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.03	0.03	0.000	0.05	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.11	0.11	0.001	0.28	2.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.23	0.22	0.003	0.57	4.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.14	0.14	0.001	0.24	2.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.03	0.03	0.000	0.09	0.7
849.9	32.09	31.00	0.469	48.54	470.4	1329.6	54.12	52.39	0.767	93.24	869.8	565.2	22.09	21.36	0.316	35.44	337.3	534.8	21.61	20.91	0.305	36.24	340.0	242.8	10.55	10.22	0.144	19.33	176.6	129.5	5.62	5.44	0.077	10.28	93.9
782.4	27.8	26.8	0.4	38.8	387.4	1248.1	49.0	47.4	0.7	81.4	769.5	524.9	19.5	18.8	0.3	29.6	287.7	486.5	18.5	17.9	0.3	29.2	280.7	200.6	7.9	7.7	0.1	13.2	124.7	112.4	4.5	4.4	0.1	7.8	73.0
67.5	4.3	4.2	0.0	9.8	83.0	81.6	5.2	5.0	0.1	11.8	100.3	40.3	2.6	2.5	0.0	5.8	49.6	48.3	3.1	3.0	0.0	7.0	59.3	42.1	2.6	2.6	0.0	6.1	51.9	17.0	1.1	1.1	0.0	2.5	20.9
8%	13%	13%	10%	20%	18%	6%	10%	10%	8%	13%	12%	7%	12%	12%	9%	16%	15%	9%	14%	15%	11%	19%	17%	17%	25%	25%	21%	32%	29%	13%	20%	20%	16%	24%	22%

Attachment B

TCEQ Letter of Agreement

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 6, 2019

Colonel Timothy Vail
Commander and District Engineer
USACE Galveston District
P.O. Box 1229
Galveston, TX 77553-1229

Subject: Agreement on General Conformity Determination Plan

Dear Colonel Vail:

A *Draft General Conformity Determination for Houston Ship Channel Expansion Channel Improvement Project* (draft determination) was received by the Texas Commission on Environmental Quality (TCEQ) from the United States Army Corps of Engineers (USACE) for review and concurrence. The draft determination concerns a proposed project to deepen and widen the Houston Ship Channel to allow greater access for large ocean-going vessels and would take place in Chambers, Galveston, and Harris Counties. As discussed in more detail below, the TCEQ agrees with the USACE's revised path forward to budget and plan for the use of emissions offsets with discrete emissions reduction credits (DERC) in combination with other available compliance tools and strategies to assure CAA compliance.

TCEQ staff reviewed the draft determination and found that projected nitrogen oxides (NO_X) emissions for each year of the project and the projected volatile organic compounds (VOC) emissions for the second year of the project would result in a level of emissions which, together with all other emissions in the nonattainment area, would exceed the emissions budgets in the applicable state implementation plan (SIP) revision,[1] the *Houston-Galveston-Brazoria Reasonable Further Progress State Implementation Plan Revision for the 2008 Eight-Hour Ozone Standard Nonattainment Area.* Comparison of project emissions to emissions budgets in the applicable SIP revision is only one of the means of determining general conformity under 40 CFR §93.158, and the TCEQ discussed with the USACE, the Port of Houston Authority (the non-federal project sponsor), and the United States Environmental Protection Agency other available means of determining general conformity provided for in the federal general conformity regulations. Other methods for demonstrating conformity that were considered included a commitment from the TCEQ to include the project in an upcoming SIP revision, the USACE implementing mitigation measures, the USACE implementing an emission offset strategy in the nonattainment area, or using a combination of these methods.

On December 3, 2019, the USACE confirmed its intent to implement an emissions offset strategy that relies on the purchase of DERCs in an amount equal to the latest and most conservative project emissions estimates.[2] The USACE determined that purchasing DERCs to offset the proposed Houston Ship Channel expansion project is the most cost-effective means

[1] As required by 40 CFR §93.158(a)(5)(i)(A)
[2] Table 2-2: *Estimated Tier 1 Emissions from LPP, tons per year* of the November 2019 draft of the USACE general conformity determination bases projected project emissions on the use of Tier 1 equipment; however, the TCEQ acknowledges that the use of cleaner equipment may reduce project emissions and the associated necessary offsets. The TCEQ understands that the USACE will apprise the TCEQ of changes in project emissions as the proposed project is finalized.

of determining general conformity, and the TCEQ agrees that this path is one by which this proposed project may successfully meet federal general conformity requirements. On December 5, 2019, the TCEQ received and is currently reviewing a second revised draft determination from the USACE that includes a description of its emissions offset strategy that relies on the purchase of DERCs. The TCEQ understands that offsetting project emissions is the most likely path for a general conformity determination. However, further discussions with USACE and the Port of Houston Authority may determine that other methods could be used to comply with general conformity regulations and that a revision to the conformity determination would be sought, if needed. The TCEQ expects to be able to provide a letter of concurrence on the revised draft determination by December 20, 2019.

The TCEQ acknowledges that completion of the proposed project has potential emissions reduction benefits associated with reducing transportation delays in the Houston Ship Channel. The TCEQ understands that the USACE is the approving federal agency for this proposed project and will ensure compliance with the National Environmental Policy Act and the Federal Clean Air Act general conformity requirements, and the TCEQ looks forward to further assisting the USACE as it pursues its current path to general conformity approval. Please contact Ms. Jamie Zech of Air Quality Division staff at 512-239-3935 or jamie.zech@tceq.texas.gov.

Sincerely,

Donna F. Huff, Director
Air Quality Division

cc: Roger Guenther, Port of Houston Authority
David Garcia, Air and Radiation Division Director, EPA Region 6

Attachment C

NFS Letter of Commitment for DERC Acquisition

PORT HOUSTON
THE INTERNATIONAL PORT OF TEXAS™

December 4, 2019

Mr. Toby Baker
Executive Director
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

Dear Mr. Baker:

On Tuesday, November 26, 2019, the Port of Houston Authority (Port Houston) and the U.S. Army Corps of Engineers (USACE) learned that the Texas Commission on Environmental Quality (TCEQ) is unable to provide a positive General Conformity Determination — without additional actions being taken — for the Houston Ship Channel Expansion Channel Improvement Project (HSC-ECIP). To meet Port Houston's top priority of bringing this nationally significant project to reality, we are committed to working with the TCEQ to address any remaining General Conformity actions.

Since 2010, Port Houston has partnered with members of Congress, the USACE, private industry stakeholders, and state and federal resource agencies to develop a feasibility report for necessary and critical improvements to the 52-mile Houston Ship Channel. The improvements first being considered nearly a decade ago have become more urgent with new economic realities and rapid growth in Texas and the United States. The Houston region is the epicenter of midstream energy production and massive petrochemical manufacturing investments, resulting in more jobs and increased exports. Imports are also growing due to distribution center investments and the growing Texas population. Finally, the global maritime industry is experiencing growth in vessel size, providing greater efficiency, environmental benefits, and more cost-effective supply chains. As a result, critical improvements are necessary to the Houston Ship Channel to accommodate this growth, ensure safe and efficient two-way vessel traffic, and maintain its value for Texas and the nation.

The USACE feasibility study evaluating the proposed channel improvements is in its final stages and is expected to result in a Chief's Report to Congress, with recommendations on authorizing the project. It is critical that the Chief's Report be completed in time to be included in the Water Resources Development Act, or WRDA legislation, being developed by Congress for consideration in 2020.

To address the current General Conformity matters, several possible solutions have been identified, including the option of acquiring offsetting Discrete Emission Reduction Credits (DERCs) that are presently available in the marketplace. By this letter, and to maintain project schedule, **Port Houston is committed to ensure that adequate DERCs will be acquired before the ECIP related construction emissions occur to ensure compliance with the General Conformity regulations. Port Houston also understands that if the USACE, the TCEQ and Port Houston identify an equally acceptable alternative in the future then that measure may be substituted for the purchasing of DERCs. With this commitment, Port Houston requests that the TCEQ issue a concurrence letter so that this much needed project can proceed in a timely manner.**

Thank you for your continued partnership. Please do not hesitate to contact me or my team if you have questions or need additional information.

Sincerely,

Roger Guenther

Cc: Donna Huff, Director of Air Quality Division - TCEQ
Tonya Baer, Deputy Director of the Office of Air - TCEQ
Colonel Timothy Vail, Commander and District Engineer Galveston District – USACE
Richard Byrnes, Chief Infrastructure Officer – Port Houston

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 10, 2019

Colonel Timothy Vail
Commander and District Engineer
USACE Galveston District
P.O. Box 1229
Galveston, TX 77553-1229

Subject: General Conformity Determination Concurrence

Dear Colonel Vail:

This letter concerns the Final General Conformity Determination for the Houston Ship Channel Expansion Channel Improvement Project in Harris, Chambers, and Galveston Counties, which was submitted by the United States Army Corps of Engineers (USACE) and received by the Texas Commission on Environmental Quality (TCEQ) on December 5, 2019. The TCEQ reviewed the determination in accordance with the general conformity requirements provided in Title 40 Code of Federal Regulations Part 93, Subpart B, and the TCEQ concurs that the proposed project meets general conformity requirements based on an emissions offsetting strategy.

The proposed project is located in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area, which is currently classified by the United States Environmental Protection Agency (EPA) as serious for the 2008 eight-hour ozone National Ambient Air Quality Standard (NAAQS) and marginal for the 2015 eight-hour ozone NAAQS. A federal general conformity emissions threshold of 50 tons per year of ozone precursors (nitrogen oxides (NO_X) and volatile organic compounds (VOC)) applies according to the higher, serious, classification. The USACE presented an emissions analysis[1] showing that project construction would occur over six years. In accordance with 40 CFR §93.153(b), for all project construction years, 2023 through 2028, general conformity analysis is required for NO_X emissions, and general conformity analysis is required for VOC emissions for the second project construction year, 2024.

In consultation with the TCEQ and its non-federal project sponsor, the Port of Houston Authority, the USACE determined that general conformity requirements would be met for this project through implementation of an emissions offset strategy that relies on the purchase of discrete emissions reduction credits (DERC) in an amount equal to the current, most conservative project emissions estimates. The Port of Houston Authority, in a letter to the TCEQ dated December 4, 2019 (enclosed), committed to ensure the acquisition of adequate DERCs for this project to comply with general conformity requirements. The TCEQ, in a letter to the USACE dated December 6, 2019 (enclosed), affirmed that an offsetting strategy that relied on the purchase and retirement of DERCs could meet general conformity requirements. After review of the USACE's final conformity determination, the TCEQ concurs that the project would meet federal general conformity requirements in accordance with 40 CFR §93.158(a)(2).

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[1] See Table 2-2: *Estimated Tier 1 Emissions from LPP, tons per year* of the USACE general conformity determination.

The TCEQ understands that the USACE's conservative emissions estimates are based on the use of Tier 1 equipment and that the use of cleaner equipment (Tier 2 and Tier 3) may lower projected emissions and, subsequently, the amount of DERCs required to offset emissions. The TCEQ also understands that further discussions with USACE and the Port of Houston Authority may determine that other methods could be used to comply with general conformity regulations, in which case, general conformity would be re-evaluated. The TCEQ appreciates appropriate updates as this project progresses. For assistance on this matter, please contact Jamie Zech at 512-239-3935 or jamie.zech@tceq.texas.gov.

Sincerely,

Donna F. Huff, Director
Air Quality Division

Enclosures

cc: Roger Guenther, Port of Houston Authority
David Garcia, Air and Radiation Division Director, EPA Region 6

PORT HOUSTON
THE INTERNATIONAL PORT OF TEXAS™

December 4, 2019

Mr. Toby Baker
Executive Director
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087

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The USACE feasibility study evaluating the proposed channel improvements is in its final stages and is expected to result in a Chief's Report to Congress, with recommendations on authorizing the project. It is critical that the Chief's Report be completed in time to be included in the Water Resources Development Act, or WRDA legislation, being developed by Congress for consideration in 2020.

111 East Loop North • Houston, Texas 77029 • 713-670-2400 • PortHouston.com

To address the current General Conformity matters, several possible solutions have been identified, including the option of acquiring offsetting Discrete Emission Reduction Credits (DERCs) that are presently available in the marketplace. By this letter, and to maintain project schedule**, Port Houston is committed to ensure that adequate DERCs will be acquired before the ECIP related construction emissions occur to ensure compliance with the General Conformity regulations. Port Houston also understands that if the USACE, the TCEQ and Port Houston identify an equally acceptable alternative in the future then that measure may be substituted for the purchasing of DERCs. With this commitment, Port Houston requests that the TCEQ issue a concurrence letter so that this much needed project can proceed in a timely manner.**

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Roger Guenther

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Colonel Timothy Vail, Commander and District Engineer Galveston District – USACE
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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 6, 2019

Colonel Timothy Vail
Commander and District Engineer
USACE Galveston District
P.O. Box 1229
Galveston, TX 77553-1229

Subject: Agreement on General Conformity Determination Plan

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Sincerely,

Donna F. Huff, Director
Air Quality Division

cc: Roger Guenther, Port of Houston Authority
David Garcia, Air and Radiation Division Director, EPA Region 6

NOTICE OF AVAILABILITY OF THE HOUSTON SHIP CHANNEL EXPANSION CHANNEL IMPROVEMENT PROJECTFINAL GENERAL CONFORMITY DETERMINATION Interested parties are hereby notified of and provided an opportunity to comment on the Final General Conformity Determination (FGCD), providedas Appendix J to the Integrated Feasibility Report-Environmental Impact Statement. In accordance with Title 40 of the Code of Federal Regulations, Chapter I, Subchapter C, Part 93, Section 93.156(b), notice is hereby provided that the FGCD contains a description of the proposed Federal action and the Federal agency's final conformity determination. The FGCD isavailable at https://www.swg.usace.army.mil/Business-With-Us/Planning-Environmental-Branch/Documents-for-Public-Review/ Comments may be mailed or emailed to: GALVESTON DISTRICT, CORPS OF ENGINEERS, ATTN: DR. HARMON BROWN, P.O. BOX 1229 GALVESTON, TEXAS 77553 or harmon.brown@usace.army.mil **Publish Dates:** 1/8/2020 1-1/22/2020

US Army Corps
of Engineers ®
Galveston District

Final Revised General Conformity Determination for Houston Ship Channel Expansion Channel Improvement Project

Harris, Chambers, and Galveston Counties, Texas

Prepared for:

U.S. Army Corps of Engineers, Galveston District

Provided by:

The Port of Houston Authority

Prepared by:

Starcrest Consulting Group, LLC and the Joint Venture of Turner Collie & Braden Inc. and Gahagan & Bryant Associates, Inc.

December 2020

Table of Contents

1 INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Galveston District and the Non-Federal Sponsor (NFS), Port Houston, are proposing to implement the Recommended Plan (RP) to address reducing transportation costs while providing for safe, reliable navigation on the Houston Ship Channel (HSC) system. The RP resulted from the HSC Expansion Channel Improvement Project (HSC ECIP), a 4-year federal navigation megastudy conducted to address navigation problems and opportunities. The RP is a Federally-proposed action to dredge portions of the HSC to wider and deeper dimensions to address limitations in the existing channel that result in navigation restrictions and delays with the current and future forecasted vessel traffic and commodity movement. In accordance with the General Conformity (GC) regulations promulgated under the Clean Air Act in 40 CFR Part 93 Subpart B, Determining Conformity of Federal Actions to State or Federal Implementation Plans (EPA 2010a), a Final General Conformity Determination (GCD) was prepared in December 2019 to analyze and document the GC-related air emissions that will result from the RP as planned by USACE and document that project emissions will conform to the latest U.S. Environmental Protection Agency (EPA) approved State Implementation Plan (SIP) applicable to the Houston/Galveston/Brazoria (HGB) ozone non-attainment area (NAA). The RP was found to conform due to the NFS commitment to offset emissions by purchasing Discrete Emissions Reduction Credits but the GCD also acknowledged that a revised GCD may be sought if other methods to comply with the general conformity regulations were developed. As such, since December 2019 additional analysis was developed because the most recently approved EPA SIP revision is a Reasonable Further Progress (RFP) SIP. An RFP SIP is a plan that demonstrates that sources in the area will achieve annual incremental emissions reductions as are necessary to ensure attainment as expeditiously as possible. To demonstrate RFP, emission inventories are categorized as on-road mobile, non-road mobile, area, and stationary emissions. These are the categories of emissions that TCEQ determined most appropriate for allocating general conformity budgets. This determination of appropriate emission inventory categories and protocol for allocating the budgets in an RFP SIP had not been completed at the time of the December 2019 GCD. This updated general conformity determination revises the December 2019 GCD to incorporate the additional analysis by TCEQ as well as updated project emissions data to show that the RP conforms to the latest EPA approved SIP for the HGB ozone nonattainment area.

1.1 Project Background

The HSC consists of a 50-mile, 45-foot deep, 530-foot wide channel through Galveston Bay, and upstream of Galveston Bay narrowing down and becoming shallower through segments that are 400 feet and 300 feet wide and from 45 feet down to 36 feet deep. The HSC system includes the side channels, Bayport Ship Channel (BSC) and Barbours Cut Channel (BCC). Additionally, 250-foot wide barge lanes are currently maintained on the both sides of the HSC to separate the faster, deep-draft ship traffic from the slower, shallow-draft barge traffic. At each of these major components of the system, there are a variety of navigation features such as bend easings and turning basins to allow vessels to turn into channels and turn around. The last system-wide study of the HSC was completed in 1995, with the resulting project, the Houston and Galveston Navigation Channels (HGNC) Project being constructed primarily from 2000 to 2005. The study was completed almost 25 years ago, and initiated years prior to that at a time when major container terminals and vessel traffic had just started in the system (at Barbours Cut) and before the largest planned terminal (Bayport) was planned or built. The study was also complete before the continued and most recent exponential growth in crude and refined product shipping from Houston. Since then, industry trends in both containerized and bulk liquid or gas cargo have seen a shift to substantially larger vessels. This includes trends towards larger container vessels that have essentially doubled and tripled in capacity, growing from mean a new-build size of 3,000 Twenty-Foot Equivalent Units (TEU) to between a mean of 6,000 and 9,000 TEU, and largest sizes of upwards of 18,000 TEU. Locally, the HSC is beginning to experience vessel calls in the 10,000 TEU and higher class. Also, shifts in crude and refined product tanker size in the HSC is increasingly shifting from Panamax to larger Aframax and Suezmax vessel classes. These vessels come with a variety of transit restrictions related to vessel size and channel dimension due to vessel pilot rules designed to safely guide vessels. Additionally, the upper reaches of the HSC have -37.5 feet Mean Low Lower Water (MLLW) and -41.5 feet MLLW depths that are less than the maximum depth the main HSC provides, limiting vessel draft in these reaches. The HSC ECIP study addresses the delays, draft restrictions and other problems and opportunities related to navigation identified during the study, with an RP planned to address them.

1.2 Project Description, Purpose, and Need

The RP consists of dredging to widen the HSC through the Bay and through a limited segment above Morgans Point in the upper channel, deepen the draft-restricted upper channel, widen the BSC and BCC, and improve or construct new turning features throughout the system. The project also includes dredged material placement areas (PA) and beneficial use (BU) sites to manage material dredged for the project. During the feasibility study process, the various project alternatives formulated were evaluated and two were selected for advancement to detailed evaluation. While both plans equally protected the Nation's environment to the extent possible, the National Economic Development (NED) Plan maximized NED benefits for the Nation and was selected by the USACE. The other plan, termed the Locally Preferred Plan (LPP), was the one preferred by the NFS for implementation and therefore was submitted for consideration to the Assistant Secretary of the Army for Civil Works [ASA(CW)] and approved for consideration as the RP on August 9, 2019 . The LPP Plan is illustrated in **Figure 1-1**. The following summarizes the channel improvement features of the LPP (which again, is the RP):

- Widen the HSC to 700 feet through Galveston Bay from Bolivar Roads near the Entrance Channel to the BCC, and provide bend easings at four bends along the channel. The NED Plan limits the widening to the lower section of the Bay from Bolivar Roads to Redfish Reef. The widening would include shifting the current shallow draft barge lanes outward of the widened channel.
- Widen the HSC from Boggy Bayou to Greens Bayou from its current 300 to 400-foot width to 530 feet.
- Widen the BSC and BCC to 455 ft wide, and construct a combination turning basin and bend easing at the BCC. The LPP eliminated the NED Plan requirement to further widen the Bayport Flare, a feature requiring significant maintenance after construction.
- Deepen the HSC from Boggy Bayou to Hunting Bayou to -46.5 ft MLLW, and from Sims Bayou to the Main Turning Basin to -41.5 ft MLLW
- Expand and shift the Brady Island Turning Basin in the upper HSC to a larger diameter.

The RP would be constructed using hydraulic and mechanical dredges supported by various tender, boat, barges and scows. As discussed, the RP includes dredged material PAs and BU sites that would be constructed using the material or used to place the material. At the time of channel construction, material would be pumped by pipeline or transported by scow to upland or aquatic PA and BU sites to raise or build containment dikes and fill the interior of sites. A variety of onshore equipment such as graders, excavators and dozers would be used to grade, shape and ditch the sites and dikes to build the features or dewater the material. Integral to the Dredged Material Placement Plan (DMMP) planned for the RP, are a variety of BU sites that will use the dredge material to construct ecological restoration features such as tidal marsh and bird islands that have been coordinated with Federal and State resource agencies. To manage the new work dredged material generated from constructing the RP, the following existing and new PAs and BU sites are proposed to be used to accept the material. These are illustrated in **Figure 1-2** described from the Gulf of Mexico to landward:

- Use of the existing Offshore Dredged Material Disposal Site (ODMDS) No. 1 for materials of poor engineering quality.
- Use new work material to construct the base of oyster reef mitigation pads in lower and mid Galveston Bay.
- Construct the following BU sites: two new 6 and 8-acre bird islands in the lower Bay and a new 3-bird island/tidal marsh in the middle part of the Bay. Construct a new marsh cell M12 and an unconstructed, previously authorized marsh cell M11 in the upper part of the Bay.
- Use material to repair and rehabilitate dikes at existing marsh cell M7/8/9.
- In the upper HSC, raise dikes and fill in the existing Filterbed and Glendale PAs, construct and fill a new, one-time upland PA E2 Clinton on PHA property, and beneficially use material to raise the grade of PHA property for future terminal development at BW8.

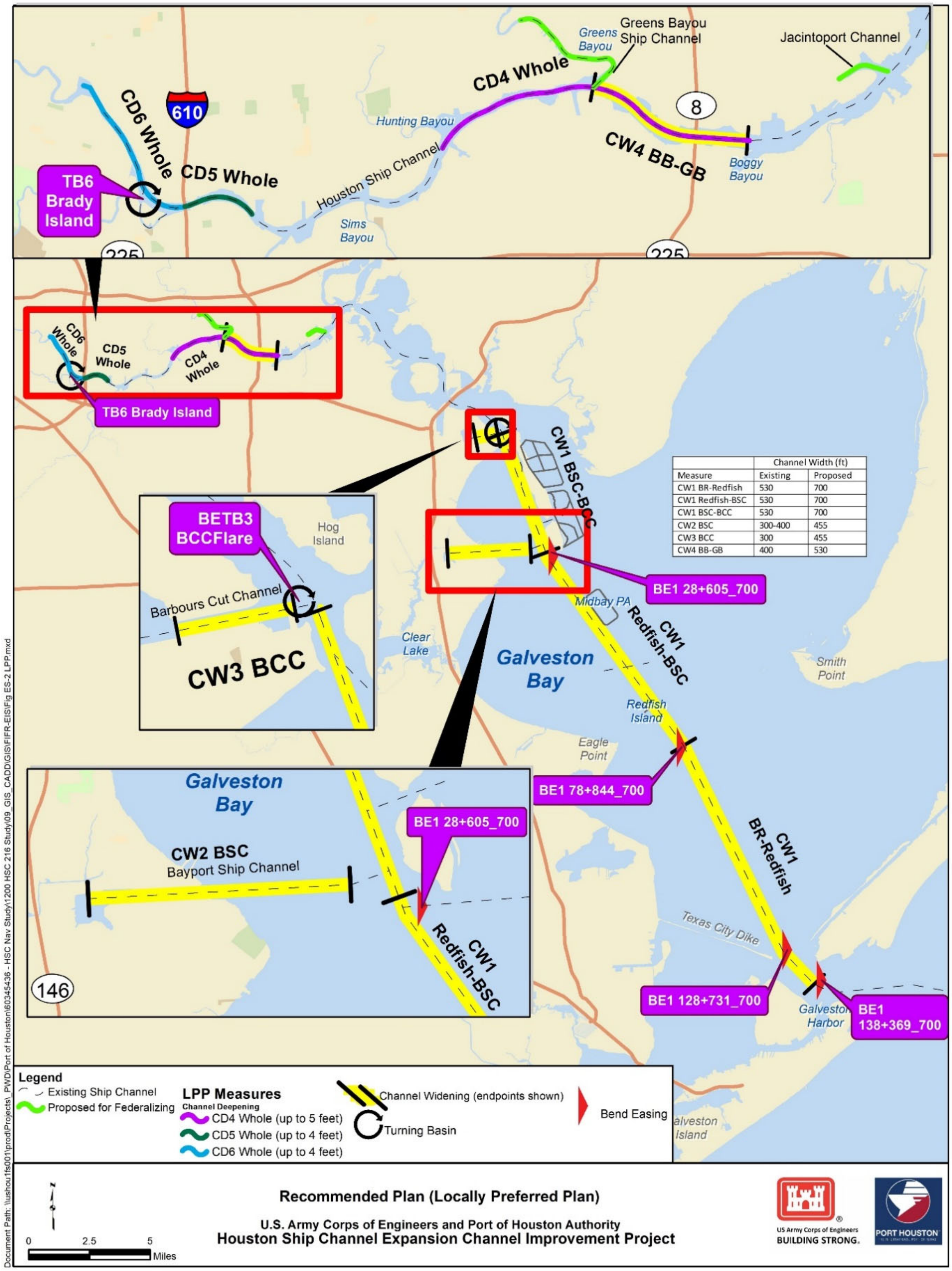
Once the RP and the above placement features are constructed, the channel would be maintained periodically through maintenance dredging over the next 50 years using the existing PAs and some of the sites created with the project material. The purpose of HSC ECIP study is to evaluate Federal interest in alternative plans (including the No-Action Plan) for reducing transportation costs while providing for safe, reliable navigation on the HSC system. Economic conditions have changed significantly since the last HSC study for both the container and bulk industry. An increase in throughput tonnage and a significant shift in average fleet size render current channel dimensions incapable of accommodating the forecasted commodity and fleet growth without significant and system-wide inefficiencies. The study evaluates and recommends measures that address current and expected inefficiencies. The needs for this project are to address problems and opportunities identified during the study including the following problems:

- Inefficient deep and shallow-draft vessel utilization of the HSC system resulting from existing channel depth, width, and configuration;
- Navigation safety concerns for deep and shallow-draft vessel traffic; and
- A lack of environmentally acceptable dredged material placement (PA/BU) with capacity to service the system

The following opportunities were identified:

- Reduce transportation cost of forecasted commodity volume at HSC;
- Eliminate or reduce navigation inefficiencies at HSC for existing and forecasted fleet (i.e., reduce delay times, interport movements, and transit times);
- Eliminate or reduce beam, length, and draft restrictions at HSC for forecasted fleet;
- Optimize channel configuration/design in a cost effective and environmentally acceptable manner that improves safety;
- Establish environmentally suitable PAs/BU sites for new work dredged material, as well as maintenance-dredged material;
- Reduce the environmental impacts from a new project, or protect or improve environmentally sensitive areas in the vicinity of the Federal project through BU of dredge materials; and
- Study the configuration of barge lanes and further optimize them.

The study evaluated a wide variety of widening, deepening, turning, and anchoring measures to address the problems and opportunities. Economic analysis was performed using vessel traffic and transit cost modeling. Engineering analysis was performed to establish proper channel design through ship simulation, hydrodynamic modeling, calculation of dredging and placement quantities, and estimation of construction costs. Environmental evaluation was performed including National Environmental Policy Act (NEPA) analysis and documentation, oyster reef and wetland surveys, and other impact analysis. The cost and benefit analysis identified the plans that produced the most net benefits while meeting the other objectives of the study that addressed the aforementioned problems and opportunities. The plans were evaluated following the planning procedures in USACE planning regulations for Civil Works projects. A Final Integrated Feasibility Report and Environmental Impact Statement (FIFR-EIS) has been developed as the decision document to coordinate the RP for approval and provide NEPA documentation. The RP is the project resulting from the study proposed for implementation to address those problems and opportunities.



	Channel Width (ft)	
Measure	Existing	Proposed
CW1 BR-Redfish	530	700
CW1 Redfish-BSC	530	700
CW1 BSC-BCC	530	700
CW2 BSC	300-400	455
CW3 BCC	300	455
CW4 BB-GB	400	530

Figure 1-1: The Proposed LPP Plan

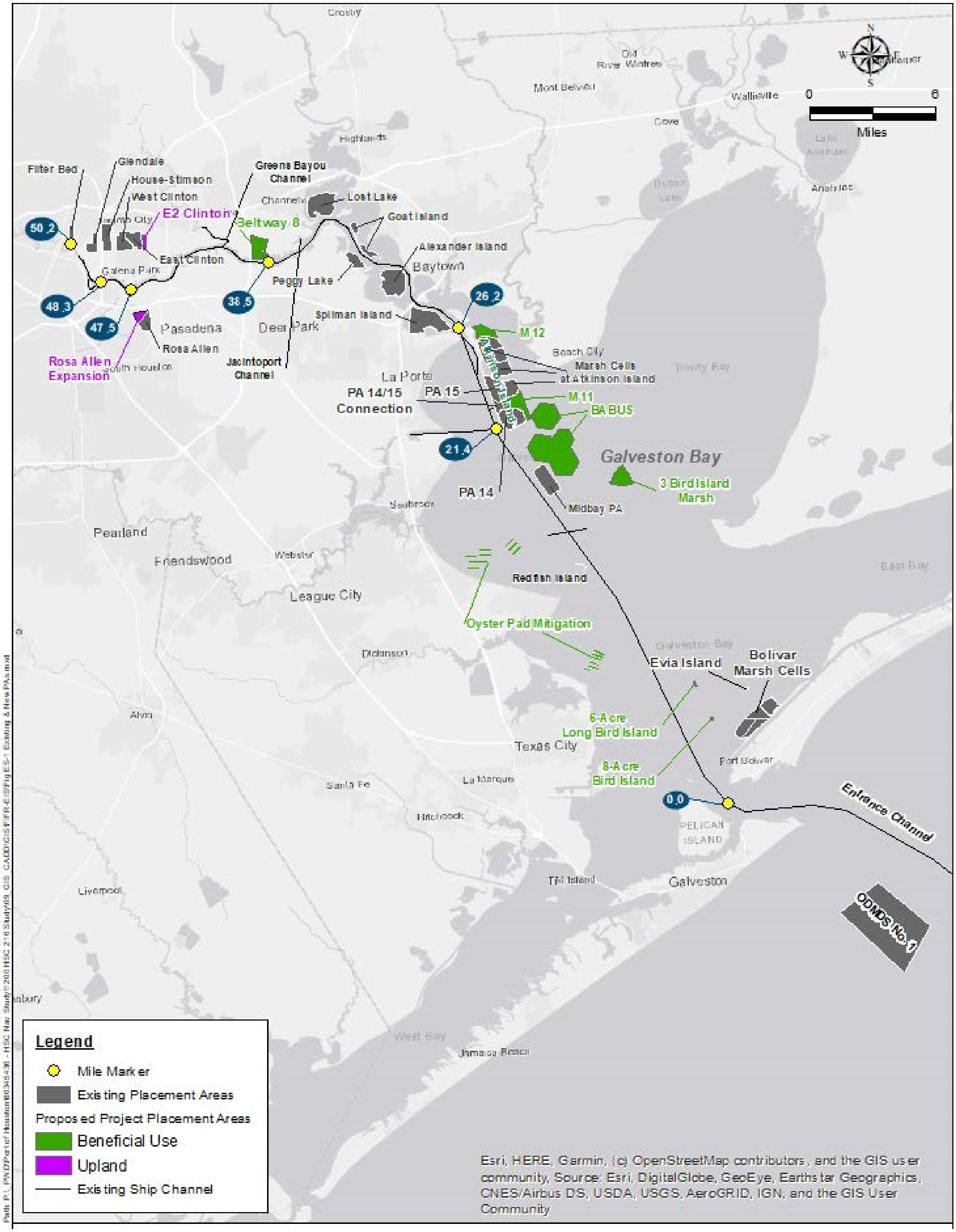


Figure 1-2: Proposed New Work Placement of the LPP Plan

1.3 Regulatory Background

General Conformity is a Federal regulatory program designed to ensure that actions taken by Federal entities, such as projects proposed by the USACE, conform to states' approved plans to meet the national ambient air quality standards (NAAQS). The definition of a Federal action as specified in 40 CFR 93.152 includes "...any activity engaged in by a department, agency, or instrumentality of the Federal government, or any activity that a department, agency or instrumentality of the Federal government supports in any way, provides financial assistance for, licenses, permits, or approves, other than activities related to transportation plans, programs, and projects developed, funded, or approved under title 23 U.S.C. or the Federal Transit Act (49 U.S.C. 1601et seq.)"

With regard to a dredging project such as the Proposed Project, the Federal Action consists of a Federal project being funded and implemented by the USACE, which is subject to General Conformity review. Placement of dredged material is part of the proposed Federal Action, and is subject to General Conformity. Maintenance dredging is not subject to General Conformity review.

The EPA has established a series of steps to determine whether a given Federal Action is subject to General Conformity review as follows (EPA 2010b).

1. Whether the action will occur in a nonattainment or maintenance area (see **Table 1-1** below for the attainment status of the project area);
2. Whether one or more of the specific exemptions apply to the action;
3. Whether the federal agency has included the action on its list of "presumed to conform" actions;
4. Whether the total direct and indirect emissions are below or above the *de minimis* levels (see **Table 1-2** below for the *de minimis* levels); and/or
5. Where the facility has an emission budget approved by the state as part of the SIP, the federal agency determines if the emissions from the proposed action are within the budget.

1.3.1 Federal Action Applicability

Regarding the proposed Federal action to implement the RP,

1. The action will be occurring in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area, which is designated as serious nonattainment for the 2008 ozone standard and marginal nonattainment of the 2015 ozone standard;
2. None of the specific exemptions apply to the action, except to the extent that any of the dredging to be carried out is maintenance dredging, which is specifically exempt;
3. The USACE has not included dredging projects on a list of "presumed to conform" actions;
4. Total direct and indirect emissions, as currently estimated, will exceed the *de minimis* level of 100 tons of oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in a

marginal nonattainment area (NAA)and 50 tons of NO_x and VOC in a serious NAA. (see **Table 2-2** in Section 2 for estimated project related emissions); and

5. The USACE does not possess an emissions budget approved as part of the HGB area SIP.

1.3.2 Consistency Determination Options

Based on the discussion presented above and the emissions presented below in Section 2, a General Conformity determination is required for NO_x and VOC emissions from the RP. Since the action is required to demonstrate conformity, one or more of the following conditions must be met (EPA 2010b).

1. Demonstrating that the total direct and indirect emissions are specifically identified and accounted for in the applicable SIP;
2. Obtaining a written statement from the state documenting that the total direct and indirect emissions from the action, along with all other emissions in the area, will not exceed the SIP emission budget;
3. Obtaining a written commitment from the state to revise the SIP to include the emissions from the action;
4. Obtaining a statement from the metropolitan planning organization (MPO) for the area documenting that any on-road motor vehicle emissions are included in the current regional emission analysis for the area's transportation plan or transportation improvement program;
5. Fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant or precursor in the same nonattainment or maintenance area.

A sixth potential demonstration method, conducting air quality modeling that demonstrates that the emissions will not cause or contribute to new violations of the standards, or increase the frequency or severity of any existing violations of the standards, is not available for the RP, because modeling is not acceptable for ozone nonattainment areas due to the complexity of ozone formation from precursor pollutants and the limitations of current air quality models. Of the options detailed above, the USACE elected to utilize the second option, obtaining concurrence from the TCEQ that the total direct and indirect NO_x and VOC emissions from the action will not exceed the applicable SIP emissions budget.

Table 1-1: Attainment Status of Houston-Galveston-Brazoria Area

Pollutant	Primary NAAQS	Averaging Period	Designation	Counties	Attainment Deadline
Ozone (O_3)*	0.070 ppm (2015 standard)	8-hour	Marginal Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Montgomery	August 3, 2021
	0.075 ppm (2008 standard)	8-hour	Serious Nonattainment	Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller	July 20, 2021
Lead (Pb)	0.15 µg/m^3 (2008 standard)	Rolling 3-Month Average	Unclassifiable/ Attainment		
Carbon Monoxide (CO)	9 ppm	8-hour	Unclassifiable/ Attainment		
	35 ppm	1-hour	Unclassifiable/ Attainment		
Nitrogen Dioxide (NO_2)	0.053 ppm	Annual	Unclassifiable/ Attainment		
	100 ppb	1-hour	Unclassifiable/ Attainment		
Particulate Matter (PM_{10})	150 µg/m^3	24-hour	Unclassifiable/ Attainment		
Particulate Matter ($PM_{2.5}$)	12.0 µg/m^3(2012 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	15.0 µg/m^3(1997 standard)	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	35 µg/m^3	24-hour	Unclassifiable/ Attainment		
Sulfur Dioxide (SO_2)	0.03 ppm**	Annual (Arithmetic Mean)	Unclassifiable/ Attainment		
	0.14 ppm**	24-hour	Unclassifiable/ Attainment		
	75 ppb	1-hour	Attainment/ Unclassifiable		

Table 1-2: Significant Action Thresholds in Nonattainment Areas

Ambient Pollutant		Nonattainment Status Tons/yr
Ozone (VOCs or NO_x):		
	Serious NAA's	**50**
	Severe NAA's	25
	Extreme NAA's	10
	Other ozone NAA's outside an ozone transport region	100
	Other ozone NAA's inside an ozone transport region	
	VOC	50
	NO_x	100
Carbon monoxide:	All NAA's	100
SO_2 or NO_2	All NAA's	100
PM–10:		
	Moderate NAA's	100
	Serious NAA's	70
PM–2.5:		
	Direct emissions	100
	SO_2	100
	NO_x (unless determined not to be a significant precursor)	100
	VOC or ammonia (if determined to be significant precursors)	100
Pb:	All NAA's	25

Source of table: 40 CFR §93.153 Applicability. (Amended to include PM2.5)

The HGB nonattainment status is now classified as serious as a result of the 2008 Eight-Hour Ozone Standard Designations. This designation brings the tons-per-year down to 50 for all Ozone emissions. This change which took effect September 23, 2019 has been reflected in this report. The attainment date for serious nonattainment areas is July 20, 2021 with a 2020 attainment year.

2 PROJECT CONSTRUCTION EMISSIONS

Project construction emissions of NO_x and VOCs have been estimated because of the Project area's status as an ozone nonattainment area. The emission estimates are based on equipment and activity estimates provided by the project engineers and emission factors and related information from EPA's September 2020 *Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions* report, and other published emission standards. Use of the EPA's report as a source of marine emission factors and other emissions-related information ensures that the emission estimates presented in this conformity determination are consistent with EPA guidance.

Schedule and equipment information for the LPP has been provided by the Joint Venture of Turner Collie and Braden, Inc. and Gahagan and Bryant Associates, Inc. based on project design parameters for the plan. Information includes:

- Equipment type (dredge, barge, tug, dozer, etc.)
- Engine type (main, auxiliary, etc.)
- Engine horsepower and load factor (% of full load)
- Hours of operation for each vessel or piece of equipment

The following sections describe the different categories of emitting equipment that would be used to construct the LPP.

2.1 Dredging Equipment and Supporting Vessel Emissions

Emission sources on the dredge itself consist of diesel-fueled engines that provide power for the various operations required for dredging. The dredge is expected to be a cutter suction dredge equipped with a main engine to provide power to the cutterhead, an engine to power the ladder pump used to transport the dredged material from the substrate to the surface, an engine to move and position the ladder that guides and positions the cutterhead, and an auxiliary engine to produce electricity for power needs on the dredge. The dredging operation will also require various support vessels such as positioning tugs, crew boats, and survey boats.

The project engineers provided estimated characteristics of the diesel engines on board the dredge such as total horsepower, operating hours, and average operating loads. They also provided typical characteristics of the support vessels, including total installed horsepower and operating hours. Emission factors for all of these diesel engines were obtained from Table H.7 in the EPA September 2020 report, which lists average emission factors for harbor craft marine engines by emission tier levels.

2.2 Dredged Material Placement Site Work

Once the dredged material has been placed in the placement area it will be moved and compacted by non-road equipment such as dozers and loaders. The project engineers provided typical horsepower, operating hours, and load factors for this type of equipment. Emission factors were based on the emission certification levels of Tier 1 non-road equipment. Dredged material placement and handling will account for a relatively small percentage (approximately 8%) of overall project construction NO_x emissions and approximately 18% of VOC emissions.

2.3 Employee Vehicle Commuting

Employee vehicle commuting will make up a very small part of overall project construction emissions and will represent a negligible percentage of SIP emissions. As an example, the latest EPA approved SIP documentation includes on-road emissions based on 169,918,016 miles per weekday (TCEQ 2016).[1] A 100-person work force making an average 50-mile round trip commute would drive 5,000 miles per day, or 0.003% of the on-road basis of the current SIP.

2.4 Emissions Calculations and Results

Emission estimates for each engine have been based on horsepower hours (hp hrs), calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative (i.e., to be relatively high so as to calculate reasonably worst-case emission levels). Emission factors for marine engines (propulsion and auxiliary engines on dredges, tugs, work boats, etc.) are from the September 2020 EPA reportPort Houston's most recent (2013) air emissions inventory and reflect average emissions from these engines in 2013. Emission factors for nonroad engines are based on the Tier 1 emission standards stratified by horsepower. The Tier 1 standards have been applicable since the late 1990s (year depending on horsepower) and so reflect the oldest equipment likely to be in use when the project elements take place and represent a conservative assumption about the age of equipment that will actually be used and the corresponding prospective emissions.

The emission factors used in calculating these emissions are presented in **Table 2-1**. As noted above, the emission factors are based on Tier 1 standards, which represent a conservative estimate of the emissions that would actually occur because of the introduction of Tier 2 and Tier 3 engines into the equipment that may be used on the project. The General Conformity Determination is based on the conservative assumption of all equipment being Tier 1. While the chosen contractors may utilize equipment that will be a mix of Tier 1, 2, and 3, the General Conformity analysis cannot assume a less conservative equipment mix due to the limited availability of equipment as a result of the increased dredging activity that will be occurring over the next several years. While NO_x and VOC emissions have been calculated for demonstration of General Conformity related emissions, other criteria pollutants have been included for completeness. The anticipated schedule of work was used to allocate emissions to each of the project years. **Table 2-2** presents a summary of emissions by year for the LPP.

[1] *HGB 2008 Eight-Hour Ozone RFP SIP Revision* Adopted by TCEQ 15 December 2016 and approved by EPA on 13 February 2019. See: https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/Adoption/16017SIP_HGBRFP_Ado.pdf Accessed 11 July 2019

Table 2-1: Emission Factors Used for Nonroad and Marine Engines

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Nonroad						
$(11 \leq hp < 25)$	7.1	0.60	0.58	0.004	1.0	4.9
$(25 \leq hp < 50)$	7.1	0.60	0.58	0.004	1.0	4.1
$(50 \leq hp < 100)$	6.9	0.60	0.58	0.004	1.0	8.5
$100 \leq hp < 175$	6.9	0.60	0.58	0.004	1.0	8.5
$175 \leq hp < 300$	6.9	0.40	0.39	0.004	1.0	8.5
$300 \leq hp < 600$	6.9	0.40	0.39	0.004	1.0	8.5
$600 \leq hp < 750$	6.9	0.40	0.39	0.004	1.0	8.5
>750	6.9	0.40	0.39	0.004	1.0	8.5
Marine Cat 1 & Cat 2						
Main - large	7.2	0.19	0.19	0.005	0.2	1.2
Main - small	7.2	0.19	0.19	0.005	0.2	1.2
Dredge auxiliary	7.2	0.19	0.19	0.005	0.2	1.2
Main - large tug	7.2	0.19	0.19	0.005	0.2	1.2
Main - small tug	7.2	0.19	0.19	0.005	0.2	1.2
Tug auxiliary	7.2	0.19	0.19	0.005	0.2	1.2
Miscellaneous	7.2	0.19	0.19	0.005	0.2	1.2

Table 2-2: Estimated Emissions from LPP, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2021**	392	18	17	0.27	39	315
Year 2	**2022**	1,473	60	59	1.00	119	930
Year 3	**2023**	1,473	60	59	1.00	119	930
Year 4	**2024**	1,473	60	59	1.00	119	930
Year 5	**2025**	724	34	33	0.50	71	579

The conservative inclusion of three years with peak emissions ensures that conformity analysis will remain accurate even if the Project's schedule should be delayed. Additionally, the annual estimates provided are estimates, and while they are conservative, emissions may be greater or lesser in any given year. Conformity is being determined for the project as a whole rather than each individual project year.

The results indicate that NOx emissions will be above the lowest *de minimis* threshold of 50 TPY in all five years for the LPP. In addition the results indicate that VOC emissions will be above the lowest *de minimis* threshold of 50 TPY in 2022-2025. Therefore, a formal determination of conformity would be required.

Tier 2 emissions standards for the various categories of marine engines became effective in different years dependent on the size category of the engine, with Category 2 becoming effective as late as 2007, and Category 3 in 2011. Dredge main engines displacement and horsepower typically fall into either Category 2 or 3. However, as noted above, while the contractors chosen to work on the HSC ECIP may utilize a mix of Tier 1, 2, and 3 equipment, because availability of equipment may be limited, the General Conformity analysis cannot assume a less conservative equipment mix.

3 GENERAL CONFORMITY EVALUATION AND PRELIMINARY DETERMINATION

As noted in Section 1 (Introduction) and illustrated in **Table 2-2**, emissions of NO_x and VOC exceed the applicable General Conformity threshold. To demonstrate whether the RP (LPP) construction VOC and NO_x emissions can be accommodated in the HGB SIP emissions budgets, the most recent EPA-approved ozone SIP demonstration documents were reviewed for emissions inventory information. In consideration of the definition and conformity determination requirements for the most recent revisions to the SIP in 40 CFR §93.152 and §93.158(a)(5)(i)(A) respectively, the latest approved revision to the SIP is the *HGB 2008 Eight-Hour Ozone RFP SIP Revision*, approved by EPA on February 13, 2019 (TCEQ 2016). The conformity evaluation and preliminary determination presented below were coordinated with TCEQ.

This SIP RFP demonstration was reviewed to determine the various activity categories of emissions in which the RP's construction activities will fall. While the SIP evaluates NO_x and VOC emissions from all sources, including biogenic (non-human-caused) emission sources, this evaluation focuses on the Non-Road Mobile Source category. Employee commuting emissions would be a negligible amount of project emissions, as explained in Section 2.3, and given the size of the mobile source budget, would be an even more negligible percentage of this budget.

The NO_x emissions budget for non-road mobile sources was obtained from Appendix 1, Reasonable Further Progress Demonstration Spreadsheet, to the *HGB 2008 Eight-Hour Ozone RFP SIP Revision* [RFP SIP] (TCEQ 2016). **Table 3-1** below provides the uncontrolled and controlled non-road mobile source emissions inventory for the HGB NAA excerpted from Appendix 1 of the RFP SIP. The emissions estimated for uncontrolled (i.e. before required emissions standards and controls are applied) emissions, source reductions due to controls, and the resulting controlled emissions, are presented in **Table 3-2**.

Table 3-1: Statewide and HGB Area Non-Road Mobile Source Emissions

Analysis Year	NOX (tpd)		VOC (tpd)	
	Uncontrolled	Controlled	Uncontrolled	Controlled
2011	216.46	142.44	112.54	49.78
2017	210.26	86.97	123.21	33.58

Table 3-2: HGB RFP 2017 Non-Road Mobile Source Emissions and Reductions Summary for NO_x and VOC (tons per day)

Emissions	NO_x	VOC
Uncontrolled emissions	210.26	123.21
RFP non-road source reduction	123.29	89.63
RFP controlled (post-control) emissions	86.97	33.58

The LPP non-road category Tier 1 emissions are compared to the HGB non-road mobile source controlled emissions in **Table 3-3** below. Note, the conservative inclusion of three years with peak emissions ensures that the conformity analysis will remain accurate even if the Project's schedule should be delayed. As shown in Table 3-3, the project VOC non-road source emissions represent no more than 0.97% of emissions in any given project year. Regarding the project NOx emissions, as listed in Table 3-3 those emissions represent a maximum of 4.6% of emissions in any given project year.

Table 3-3: Non-Road Emissions (tons per day)

	LPP Non-Road Emissions		SIP Controlled Non-Road Emissions for 2017		Project % of 2017 Non-Road emissions	
Year	NOx	VOC	NOx	VOC	NOx	VOC
2021	1.07	0.11	86.97	33.58	1.2%	0.32%
2022	4.04	0.33	86.97	33.58	4.6%	0.97%
2023	4.04	0.33	86.97	33.58	4.6%	0.97%
2024	4.04	0.33	86.97	33.58	4.6%	0.97%
2025	1.98	0.19	86.97	33.58	2.3%	0.58%

After analysis, the VOC emissions can be accommodated in the applicable SIP. After conducting additional analysis of the excess emissions reductions included in the SIP, TCEQ concluded that the total direct and indirect NO_x emissions from the action will not exceed the allocated SIP emissions budget.

Since both VOC and NOx project emissions can be accommodated in the applicable SIP, this project is compliant with the general conformity regulations.

4 DRAFT GCD COMMENTS AND RESPONSES

The USACE submitted the Draft GCD and issued a public notice announcing the availability of the Draft GCD for the RP for a 30-day comment period. The public notice and Draft GCD was posted on the USACE website and published in the Houston Chronicle. Availability of the public notice and

Draft GCD was communicated to TCEQ, EPA Region 6, and the Houston-Galveston Area Council (H-GAC).

4.1 TCEQ, EPA, and MPO Comments

The TCEQ issued a concurrence letter on October 22, 2020 (provided in Attachment B) agreeing with the USACE determination that the total direct and indirect emissions from the proposed action will not exceed the emissions budget specified in the applicable SIP.

No agency comments were received on the draft GCD during the comment period.

4.2 Individual and Organized Groups Comments

Comment letters were received from 46 individuals or entities. These included two form letters and variants of those form letters, as well as comments jointly from the Environmental Defense Fund and Healthy Ports Coalition, and four letters in support of the project. The comments and responses are summarized below.

1. Commenters expressed concern about the health effects of existing levels of air emissions in the vicinity of the Houston Ship Channel, including reference to studies showing that children who live within 2 miles of the Houston Ship Channel are 56% more likely to develop a specific type of leukemia than children who live just 10 miles away.

Response:

The long-term net effect of the Houston Ship Channel Expansion Channel Improvement Project (the project) is a reduction of NOx, volatile organic compounds (VOCs), and other air emissions. The studies drawing an association regarding leukemia generally focused on VOCs, such as 1,3 butadiene, which come from many sources. Sources of VOCs include stationary sources and motor vehicle exhaust. As TCEQ has explained, the Houston-Galveston-Brazoria (HGB) area has made considerable progress in controlling ozone pollution and its precursors, including decreases as large as 42% for VOC observed from 2007 through 2016. In particular, studies have shown decreases in 1,3 butadiene and other highly-reactive VOCS (HRVOCs), which have led to decreasing ozone values in the HGB area. See Conceptual Model for the HGB Attainment Demonstration Sip Revision for the 2008 Eight-Hour Ozone Standard, Project Number 2019-077-SIP-NR (Adopted March 4, 2020). From 1991 through 2019, the HGB population increased by 83%, while the eight-hour ozone design values decreased by 35%. From 2000 through 2019, the HGB population increased by 50%, while the eight-hour ozone design value decreased by 28%. TCEQ, Air Quality Successes - Texas Metropolitan Areas, HGB: Ozone & Population.[2]

Further, while there will be short-term VOC emissions in implementing the project, even when using conservative assumptions, the project VOC emissions represent no more than 0.97% of emissions in any given project year. *See* GCD at pdf p. 142 of 170 (Oct. 2020). In addition, the longer-term impact of the project will be a reduction in VOCs. The estimated hydrocarbon reductions achieved as a result of the Project range from 3.35 tons per year by 2029 to 6.90 tons per year by 2044. *See* FIFR-EIS Appx. G, Attachment 1 at p. 1 (Nov. 2019).

[2] Available at https://www.tceq.texas.gov/airquality/airsuccess/airsuccessmetro.

2. Commenters expressed concern that the project will increase pollution and cause more asthma, respiratory disease, and cancer. They also expressed concern that the emissions will worsen pollution standard violations and cause new violations of standards. Air emissions are referred to as a "zero-sum game" and these commenters assert that industry may have to make up the difference, at a much higher per ton cost or face more strict regulations and potentially higher fees because the increased emissions could delay compliance with the 2008 and 2015 ozone standards given that the project is scheduled during the same period when the HGB area will need to show attainment of the 2008 ozone standard or be designated as "severe" nonattainment.

Response:

General Conformity is a Federal regulatory program designed to ensure that actions taken by Federal entities, such as projects proposed by the USACE, conform to states' approved plans to meet the national ambient air quality standards (NAAQS). The Clean Air Act (CAA), as amended in 1990, regulates air emissions from area, stationary, and mobile sources, and requires the EPA to set NAAQS for pollutants considered harmful to public health and the environment, protecting public health with an adequate margin of safety, including the health of sensitive populations such as asthmatics, children, and the elderly. Currently, there are air quality standards for six "criteria" pollutants designated by EPA: carbon monoxide, nitrogen dioxide, ozone, lead, sulfur oxides, and inhalable and fine airborne particulate matter (PM10 and PM2.5 respectively). The HGB area currently meets all the EPA NAAQS except for ozone, for which NOx and VOC emissions are the precursors.

The long-term net effect of completing the project is a reduction of NOx and VOC emissions. The project focuses on improving the efficiency and safety of vessel traffic and opening up Port facilities to a larger, modern fleet of ocean-going vessels (OGVs), which will decrease the time and fuel spent transporting cargo on the Houston Ship Channel. The channel widening and deepening will: 1) reduce delays from slower navigation, waiting at docks and anchorages (congestion); 2) reduce the need to light-load vessels to meet draft restrictions; and 3) enable a shift in the fleet utilizing the Port to larger, newer OGVs with more stringent emissions standards. The project will also improve navigation safety.

The estimated reductions in NOx achieved as a result of the project range from 147.2 tons per year by 2029 to 334.4 tons per year by 2044. *See* FIFR-EIS Appx. G, Attachment 1 at p. 1. The cumulative effect of the annual reductions achieved by the project is expected to exceed the total construction emissions within 14 years after the project becomes operational.

Project construction air emissions will be temporary and, even using conservative assumptions, can be accommodated in the HGB State Implementation Plan (SIP) emissions budget, as determined by USACE with TCEQ concurrence. The approved SIP contains emissions inventories for the pollutants to estimate the emissions from all sources in the HGB area to comprehensively account for the regulated pollutant to demonstrate how compliance with the NAAQS will be achieved.

3. Commenters asserted that the Corps and Port Houston should be required to offset the project's air emissions. Some commenters stated that there should be no net increase in pollutants.

Response:

The HGB non-attainment area currently meets all the EPA NAAQS, except for ozone, for which NOx and VOC emissions are the precursors. The HGB area has made considerable progress in controlling ozone pollution. Trends show that ozone and its precursors decreased from 2007 through 2016. Eight-hour ozone design values decreased by 18% from 2007 through 2016. Large NOX decreases, some as large as 60%, were observed throughout the HGB area during that same time. Precursors that affect ozone in the HGB area have been studied extensively. HRVOC concentrations have been shown to affect ozone formation more than other VOC concentrations. Studies have shown that decreases in HRVOC have led to decreasing ozone values in the HGB area. See Conceptual Model for the HGB Attainment Demonstration Sip Revision for the 2008 Eight-Hour Ozone Standard, Project Number 2019-077-SIP-NR (Adopted March 4, 2020). From 1991 through 2019, the HGB population increased by 83%, while the eight-hour ozone design values decreased by 35%. From 2000 through 2019, the HGB population increased by 50%, while the eight-hour ozone design value decreased by 28%. TCEQ, Air Quality Successes - Texas Metropolitan Areas, HGB: Ozone & Population.

The long-term net effect of the project is a reduction of NOx and VOC air emissions. The cumulative effect of the annual reductions achieved by the project is expected to exceed the total construction emissions within 14 years after the project becomes operational.

General Conformity is a Federal regulatory program designed to ensure that actions taken by Federal entities, such as projects proposed by the USACE, conform to states' approved plans to meet the NAAQs. Because the action will be occurring in the HGB ozone nonattainment area, which is designated as serious nonattainment for the 2008 ozone standard and marginal nonattainment of the 2015 ozone standard and the total direct and indirect emissions, as currently estimated, will exceed the regulatory de minimis levels for NOx and VOC, a General Conformity determination is required for NOx and VOC emissions, which can be made by satisfying one of five different conditions. GCD p. 8 (2020); 40 CFR §93.158. Of those options, the project emissions were confirmed to satisfy the second option: obtaining concurrence from the TCEQ that the total direct and indirect NOx and VOC emissions from the action will not exceed the applicable SIP emissions budget.

Accordingly, requiring a full offset of those emissions is not a requirement to demonstrate conformity under the applicable regulations. Project construction air emissions of NOx and VOC will be temporary and can be accommodated in the HGB SIP emissions budget, as determined by USACE with TCEQ concurrence, even using conservative assumptions.

4. Commenters requested that the Corps and Port Houston provide supplemental monitoring near the Ship Channel and downwind from construction activities. One commenter further described that this monitoring should include a system to evaluate the air quality monitoring data, and a reporting system so that impacted communities can access the data in real time and be notified of spikes in emissions, and monitored for PM2.5, NOx, black carbon, and VOCs including toxics like benzene, arsenic, and formaldehyde.

Response:

Supplemental monitoring is also not a regulatory option for the GCD. The ambient air quality monitoring system in the HGB area is among the most extensive in the nation. In 2016, the HGB area had 31 total ozone monitors that collected data from 2007 through 2016, with 21 of those monitors being used for regulatory purposes to report to EPA. More generally, TCEQ receives and posts data from over 70 air quality monitoring stations in HGB. In addition to ozone and other criteria pollutants, TCEQ maintains a monitoring network specific to air toxics, including 12 TCEQ sites with 24-hour canister VOC sampling, 6 sites maintained by Houston Regional Monitoring (HRM), and 3 sites maintained by the Texas City/La Marque Community Air Monitoring Network.[3] Many of these monitors are located in residential and non-industrial locations adjacent to the Houston Ship Channel. The construction emissions associated with the project are mainly exhaust from dredges working in the navigation channels. In light of the short-term, intermittent, and spatially distributed nature of the project emissions, supplemental monitoring associated with the project would not reasonably distinguish project emissions from the many other emissions with similar characteristics (e.g., motor vehicle exhaust) in the broader airshed.

5. Aside from increases in air emissions, commenters also expressed concern about increased traffic, which may be referring to trucks and rail traffic.

Response:

The federal action for this project, consists of the deepening and widening of the Houston Ship Channel, including the direct and indirect emissions associated with the dredging activity. The project would involve modifications only to the existing channels and waterways (and dredged placement/beneficial use areas) and would not add or modify any landside facilities that process cargo, such as berths, cranes, docks, storage areas, (i.e. "backlands") or related handling equipment (e.g. rubber tired gantry cranes, hustlers, stackers etc.). The project would not add or enhance any intermodal transfer facilities such as portside rail and truck yards. Further, the General Conformity Regulation defines indirect emissions as those emissions that, among other things, the Federal agency can not only reasonably foresee, but also practically control and exercise continuing program responsibility over. *See* 40 CFR 93.152. Throughout the preamble to the General Conformity Regulation, EPA reiterates that "it is unreasonable to expect Federal agencies to control indirect emissions over which they have no continuing authority to control," and that inclusion of such emissions in general conformity determinations could "unreasonably restrict Federal actions so that they are generally prohibited in areas with air quality problems." 58 Fed. Reg. 63,214, 63219-20 (Nov. 30, 1993). EPA provides numerous examples of emissions that would fall outside of the relevant agency's ability to control and program responsibility. One such example is construction of a shopping center that requires a wetland to be filled. Although the USACE has authority over the filling activity and would be required to evaluate emissions associated with the filling operation, the USACE "could not practicably maintain control over and would not have a continuing program responsibility to control indirect emissions from subsequent construction, operation, or use of that shopping center." 58 Fed. Reg. 63,214, 63,223 (Nov. 30, 1993). Therefore, "only those emissions from the equipment and motor vehicles used in the filling operation, support

[3] Source: TCEQ website.

equipment, and emissions from the movement of the fill material itself would be included in the [general conformity] analysis." *Id.* Although it may well have been foreseeable that operation of the shopping center could cause increased emissions from, for example, trucks hauling merchandise to the mall, it would be impracticable for USACE to attempt to account for and mitigate those emissions when its program responsibility only extends to the filling of the wetland(s).

For the Port Houston dredging project, the potential emissions from truck or rail traffic are neither practically controllable by the USACE nor subject to the USACE's continuing program responsibility. Therefore, such emissions are not required to be included in the GCD for this project.

6. Commenters requested that there be investment in the health of nearby communities.

Response:

Port Houston has invested in projects that will help reduce emissions which will be a benefit to the public health. This includes, for example, using renewable energy provided by solar power, updating lighting to LEDs, purchasing hybrid-electric rubber-tire gantry (RTG) cranes, purchasing electric cars, and a recent purchase of an electric terminal tractor. Furthermore, since 2003 Port Houston has used $7.5 million in state and federal air quality grants for 175 projects that reduced 176 annual tons of NOx and recently was awarded a grant for over $1 million that will be used to replace 16 terminal tractors with newer, less emitting terminal tractors.

Port Houston has also made improvements at Bayport and Barbours Cut container terminals that reduce idling emissions by allowing for faster processing of the trucks as they enter and leave the terminals, including implementing Optical Character Recognition at both terminals, traffic improvements at/near the Bayport Container Terminal, and a truck pre-advise program that will allow for the gate transaction to be processed online before the truck is sent to the terminal.

7. Commenters asserted that allowing the use of older equipment was a decision made because newer equipment is "considered too expensive" or because older equipment is "least expensive."

Response:

Project construction air emissions of NOx and VOC will be temporary and can be accommodated in the HGB SIP emissions budget, as determined by USACE with TCEQ concurrence, even using conservative assumptions. The conservative assumptions about the mix of equipment tiers in the dredging equipment are not based on cost, but on availability. While the chosen contractors may use equipment that will be a mix of equipment tiers, the General Conformity analysis does not assume a less conservative equipment mix for purposes of confirming that the emissions can be accommodated in the SIP emissions budget.

8. A commenter asserted that Texas Commission on Environmental Quality's conclusion that the project emissions conform with the Reasonable Further Progress SIP Revision for the HGB 2008 Eight-Hour Ozone Nonattainment Area was based on outdated and flawed data and should be reconsidered. According to this comment, the "2016 SIP inventory used in the Conformity Determination estimated that marine NOx emissions in the HGB were 10,501 tons per year when, in fact, EPA and TCEQ now agree marine emissions are 26,118 tons per year.[4] This means that the marine sector is already exceeding the 2016 SIP RFP NOx budget by 15,617 tons, and the additional 1,473 tons from the 2024 dredging emissions increases the likelihood of a violation of the ozone standards."

Response:

The GCD is based on the relevant emissions budget in the latest EPA-approved SIP applicable to the HGB ozone non-attainment area. Project construction air emissions of NOx and VOC will be temporary and can be accommodated in the SIP emissions budget, as determined by USACE with TCEQ concurrence, even using conservative assumptions. The marine sector emissions figure cited by the commenter was not used in the latest EPA-approved SIP and has not been integrated into the SIP planning process for the HGB area.

9. A commenter asserts that the NOx emissions from the dredging operation would be equivalent to the emissions from a new petroleum refinery or power plant.

Response:

The analogy to stationary sources is inaccurate. Refineries and power plants are stationary sources emitting over decades.

Project construction air emissions will be temporary and, even using conservative assumptions, can be accommodated in the HGB SIP emissions budget, as determined by USACE with TCEQ concurrence. The approved SIP contains emissions inventories for the pollutants to estimate the emissions from all sources in the HGB area to comprehensively account for the regulated pollutant to demonstrate how compliance with the NAAQS will be achieved.

In the long run, the estimated reductions in NOx achieved as a result of the project range from 147.2 tons per year by 2029 to 334.4 tons per year by 2044. *See* FIFR-EIS Appx. G, Attachment 1 at p. 1. The cumulative effect of the annual reductions achieved by the project is expected to exceed the total construction emissions within 14 years after the project becomes operational.

10. Commenters noted that in a December 6, 2019 letter, TCEQ informed the Corps that the increased emissions would exceed the SIP budget and agreed that DERCs could be used to mitigate these emissions and questioned why on October 22, 2020, TCEQ reversed its position and concurred with the Corps position that no mitigation was required, even though TCEQ stated, in the letter, that the NOx emissions (1,473 tpy) and VOC emissions (119 tpy) exceeded the general conformity de minimis threshold. Commenters also noted Corps and Port Houston statements in connection with the 2019 Final General Conformity Determination, which relied on emission offsets through DERCs.

Response:

In accordance with the General Conformity (GC) regulations promulgated under the Clean Air Act in 40 CFR Part 93 Subpart B, Determining Conformity of Federal Actions to State or Federal Implementation Plans (EPA 2010a), a Final General Conformity Determination was

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[4] U.S. EPA. 2017 National Emissions Inventory.

prepared in December 2019 to analyze and document the GC-related air emissions that will result from the project as planned by USACE and document that project emissions will conform to the latest EPA approved SIP applicable to the HGB ozone non-attainment area. The project was found to conform due to Port Houston's commitment to offset emissions by purchasing Discrete Emissions Reduction Credits but the December 2019 GCD also acknowledged that a revised GCD may be sought if other methods to comply with the general conformity regulations were developed. As such, since December 2019 additional analysis was developed because the most recently approved EPA SIP revision is a Reasonable Further Progress (RFP) SIP. An RFP SIP is a plan that demonstrates that sources in the area will achieve annual incremental emissions reductions as are necessary to ensure attainment as expeditiously as possible. To demonstrate RFP, emission inventories are categorized as on-road mobile, non-road mobile, area, and stationary emissions. These are the categories of emissions that TCEQ determined most appropriate for allocating general conformity budgets. This determination of appropriate emission inventory categories and protocol for allocating the budgets in an RFP SIP had not been completed at the time of the December 2019 GCD. The updated general conformity determination revised the December 2019 GCD to incorporate the additional analysis by TCEQ as well as updated project emissions data to show that the project conforms to the latest EPA approved SIP for the HGB ozone nonattainment area.

The project emissions are compared to the HGB non-road mobile source-controlled emissions in the GCD. USACE determined, with TCEQ concurrence, that the VOC emissions can be accommodated in the applicable SIP and that given appropriate analysis of the excess emissions reductions included in the SIP, the total direct and indirect NOx emissions from the project will not exceed the allocated SIP emissions budget.

11. Commenters noted and summarized preliminary results of a health impact study that will be completed in 2021, which was undertaken by the Houston Advanced Research Center and Texas A&M University and commissioned by Public Citizen and the Healthy Port Communities Coalition addressing the increased PM2.5 emissions from the project.

Response:

The HGB is an attainment area for all NAAQS for particulate matter. The estimates for particulate matter emissions associated with the project show that even with conservative assumptions, PM2.5 is estimated to be no higher than 59 tpy and PM10 is estimated to be no higher than 60 tpy, well below the conformity review thresholds that would apply if the area were a nonattainment or maintenance area for these pollutants.

In addition, the computer modeling study asserted by the commenter as drawing an association between PM2.5 increases and health effects is described in the comment as not yet complete. Its inputs, outputs and assumptions were not made available for review.

12. A commenter recommended that Port Houston, as the project sponsor, create a $16 million fund to repower tugboat engines in the HSC, which could mitigate the dredging emissions, generate substantial positive publicity, and have benefits to air quality in the HSC for years to come, referring to an approached used by the Port Authority of NY and NJ for mitigation requirements for their dredging project.

Response:

The current action is limited to a determination of conformity to the latest EPA-approved SIP. USACE has made its General Conformity Determination by obtaining concurrence from the TCEQ that the total direct and indirect NOx and VOC emissions from the action will not exceed the applicable SIP emissions budget. Projects like those cited by the commenter are not required to demonstrate conformity to the SIP in the present case. In the case of the New York/New Jersey demonstration, the repowering approach was needed because the project emissions could not be accommodated in the relevant SIP.

In addition, the commenter's statements imply that tug and tow boats in the HGB area in 2020 are in a similar condition to those in NY/NJ in 2004, when in fact HGB area companies have already been executing their own voluntary and continuous engine upgrade programs. For example, since 2000 Kirby Corp has reduced Tier 0 engines by 98% and Tier 1 engines by 37% while increasing Tier 2 engines by 94% and Tier 3 engines by 30% (source: Kirby Sustainability Report, July 2020), and G&H Towing fleet comprises approximately 60% Tier 3 and Tier 4 engines today and is continuing to upgrade (source: company contact). The recent improvements to the HGB area fleet makes the approach less relevant.

13. A commenter requested that the Corps make the voluntary measures suggested by the TCEQ in its concurrence letter be made mandatory and noted statements by Port Houston in a newspaper op-ed piece referring to "adopting best management practices for emissions reduction, <u>which the port is incorporating into its plans</u>."

Response:

USACE has made its General Conformity Determination by obtaining concurrence from the TCEQ that the total direct and indirect NOx and VOC emissions from the action will not exceed the applicable SIP emissions budget.

It is inaccurate to characterize the Port Houston op-ed as suggesting that all the TCEQ suggestions for voluntary measures were adopted without distinction, when the discussion is expressly of incorporating best management practices. TCEQ's example of a best management practice is directing contractors to fuel vehicles late in the day during ozone season. That and other voluntary best management practices dovetail with the Port Houston's broader environmental goals and objectives.

14. A commenter expressed concern for impacts to natural resources like birds, turtles, snakes, trees, wetlands and alligators and over fragmentation of the land.

Response:

Habitat impacts, mitigation, and beneficial use of dredged material to restore habitat for some of the commented resources (e.g. birds, wetlands, water quality) are addressed in the FIFR-EIS. With respect to air quality, the long-term project effect on air emissions will be a net decrease due to reductions in operational emissions.

15. Commenters expressing support for the project referred to the efficiency, safety, and air quality benefits. The commenters indicate that by increasing the efficiency of vessel transits to and from the Port, the project will result in long-term air quality improvements that build upon and complement ongoing air quality improvement efforts by Port Houston and other stakeholders in the Greater Houston community. They explain that the expeditious completion of the HSC ECIP would greatly improve the safety and efficiency of channel operations by enabling continued safe two-way vessel traffic through bend easing, larger turning basins and barge lanes, and a wider and deeper channel. The expected lessening of restrictions will result in less waiting at docks, less idling, and more efficient use of harbor assist tug horsepower - all of which result in long-term air quality improvements. The air quality impacts from a more efficient channel also build on improvements being made by vessel owners and port facilities that are expecting a more modern fleet of vessels.

Response:

Comment noted.

5 FINAL GENERAL CONFORMITY DETERMINATION

Sections 2 and 3 presented the estimated emissions from construction of the project, and compared them to the latest EPA approved SIP emissions budgets for the relevant emissions categories. In summary, the annual project construction emissions constitute between 1.2% and 4.6% for NO_x, and between 0.32% and 0.97% for VOC, of the Controlled Non-Road Emissions budget of the EPA-approved HGB SIP. Though the emissions exceed the *de minimis* conformity threshold for NO_x and VOC, they were determined in coordination with the TCEQ to be emissions that can be accommodated in the currently-approved SIP. Specifically, the magnitude of VOCs, at less than 1 percent, could be accommodated by the allocated VOC emissions budget of the approved SIP. For NO_x, TCEQ conducted additional analysis and review of excess emissions reductions contained in the SIP. When considering the excess emissions reductions, they determined the project construction NO_x emissions could be accommodated in the currently-approved SIP.

The USACE presented the estimated preliminary NO_x and VOC project construction emissions and comparison with the SIP to the TCEQ in a September 2019 Draft GCD, and subsequent teleconferences from October through December 2019, during agency coordination prior to issuance of the Final IFR-EIS for State and Agency Review. A Final General Conformity Determination was prepared in December 2019 to analyze and document the GC-related air emissions that will result from the project as planned by USACE and document that project emissions will conform to the latest EPA approved SIP applicable to the HGB ozone non-attainment area. The project was found to conform due to Port Houston's commitment to offset emissions by purchasing Discrete Emissions Reduction Credits but the December 2019 GCD also acknowledged that a revised GCD may be sought if other methods to comply with the general conformity regulations were developed. As such, since December 2019 additional analysis was developed because the most recently approved EPA SIP revision is a Reasonable Further Progress (RFP) SIP. An RFP SIP is a plan that demonstrates that sources in the area will achieve annual incremental emissions reductions as are necessary to ensure attainment as expeditiously as possible. To demonstrate RFP, emission inventories are categorized as on-road mobile, non-road mobile, area, and stationary emissions. These are the categories of emissions that TCEQ determined most appropriate for allocating general conformity budgets. This determination of appropriate emission inventory categories and protocol for allocating the budgets in an RFP SIP had not been completed at the time of the December 2019 GCD. The updated general conformity determination revised the December 2019 GCD to incorporate the additional analysis by TCEQ as well as updated project emissions data to show that the project conforms to the latest EPA approved SIP for the HGB ozone nonattainment area.

In 2020, more detailed construction design, quantities, and scheduling resulted in a need to revise estimated emissions and issue a revised Draft GCD and additional analysis was made of options for demonstrating conformity. TCEQ determined that the total direct and indirect NOx emissions, when considering the excess emissions reductions included in the SIP, and VOC emissions from the project would not exceed the allocated SIP emissions budget. This preliminary determination was included in the October 2020 Draft GCD, noticed publicly on November 20, 2020.

The TCEQ issued an October 22, 2020 General Conformity Concurrence for the Houston Ship Channel Expansion Channel Improvement Project, Harris, Chambers, and Galveston Counties, Texas. TCEQ concurred that general conformity was demonstrated pursuant to 40 CFR §93.158(a)(5)(i)(A), which requires that the state determine and document that the total direct and indirect emissions from the proposed action will not exceed the emissions budget specified in the applicable SIP. The emissions budget used for to demonstrate conformity was allocated from the Reasonable Further Progress SIP Revision for the HGB 2008 Eight-Hour Ozone Nonattainment Area, adopted by the TCEQ December 15, 2016 and approved by the EPA February 13, 2019 (84 FR 3708). Based on this budget, the TCEQ concurred with the USACE's draft determination that the project will conform to the Texas SIP.

The USACE has determined that the Proposed Project will conform to the applicable state implementation plan pursuant to the General Conformity Regulations in 40 CFR Part 93, Subpart B, which specifies at 40 CFR 93.158(a)(5)(i)(A) that the state must make a determination and document that the total of direct and indirect emissions from the action, or portion thereof, would result in a level of emissions which, together with all other emissions in the HGB NAA, would not exceed the emissions budgets specified in the SIP. The determination was made considering the coordination of the revised project emissions in the October 2020 Draft GCD, and the concurrence of the TCEQ that these emissions could be accommodated in the currently approved SIP. Therefore, it is determined that the project emissions resulting from the Federal action will result in a level of emissions, which, together with all other emissions in the HGB NAA, would not exceed the emissions budgets specified in the SIP, and the action can be considered to conform with the HGB NAA SIP. The determination and the availability of this Final General Conformity Determination will be advertised in a public notice within 30 days of its issuance, in accordance with the requirements in 40 CFR Part 93.

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Attachment A

Emission Estimation Details

Appendix A – Emission Estimation Details

Project construction emissions of NO_x and VOCs have been estimated because of the Project area's status as an ozone nonattainment area. The emission estimates are based on equipment and activity estimates provided by the project engineers and emission factors and related information from EPA's September 2020 *Methodologies for Estimating Port-Related and Goods Movement Mobile Source Emissions* report, and other published emission standards. Use of the EPA's report as a source of marine emission factors and other emissions-related information ensures that the emission estimates presented in this conformity determination are consistent with EPA guidance.

AECOM has developed schedule and equipment information for the LPP based on project design parameters for the two plans. Information includes:

- Equipment type (dredge, barge, tug, dozer, etc.)
- Engine type (main, auxiliary, etc.)
- Engine horsepower and load factor (% of full load)
- Hours of operation for each vessel or piece of equipment

The following sections describe the different categories of emitting equipment that would be used to construct the LPP.

A.1 Equipment and Supporting Vessel Emissions

Emission sources on the dredge itself consist of diesel-fueled engines that provide power for the various operations required for dredging. The dredge is expected to be a cutter suction dredge equipped with a main engine to provide power to the cutterhead, an engine to power the ladder pump used to transport the dredged material from the substrate to the surface, an engine to move and position the ladder that guides and positions the cutterhead, and an auxiliary engine to produce electricity for power needs on the dredge. The dredging operation will also require various support vessels such as positioning tugs, crew boats, and survey boats.

The project engineers estimated characteristics of the diesel engines on board the dredge such as total horsepower, operating hours, and average operating loads. They also characterized typical parameters of the support vessels, including total installed horsepower and operating hours. Emission factors for the diesel engines were obtained from Table H.7 in the EPA September 2020 draft report, which lists average emission factors for harbor craft marine engines by emission tier levels.

A.2 Dredged Material Placement Site Work

Once the dredged material has been placed in the placement area it will be moved and compacted by non-road equipment such as dozers and loaders. The project engineers estimated typical horsepower, operating hours, and load factors for this type of equipment. Emission factors were based on the emission certification levels of Tier 1 non-road equipment. Dredged material placement and handling will account for a relatively small percentage (approximately 8%) of overall project construction NO_x emissions and approximately 18% of VOC emissions.

A.3 Employee Vehicle Commuting

Employee vehicle commuting will make up a very small part of overall project construction emissions and will represent a negligible percentage of SIP emissions. As an example, the latest EPA approved SIP documentation includes on-road emissions based on 169,918,016 miles per weekday (TCEQ 2016).[5] A 100-person work force making an average 50-mile round trip commute would drive 5,000 miles per day, or 0.003% of the on-road basis of the current SIP.

A.4 Emissions Calculations and Results

Emission estimates for each engine have been based on horsepower hours (hp hrs), calculated by multiplying horsepower by load factor by operating hours, multiplied by emission factors in units of grams per horsepower hour (g/hp hr). Emission factors have been chosen for marine and other nonroad engines to be relatively conservative (i.e., to be relatively high so as to calculate reasonably worst-case emission levels). Emission factors for marine engines (propulsion and auxiliary engines on dredges, tugs, work boats, etc.) are from the September 2020 EPA report . Emission factors for nonroad engines are based on the Tier 1 emission standards stratified by horsepower.

The Tier 1 emission factors used in calculating these emissions are presented in Table A-1. As noted above, the emission factors are based on Tier 1 standards, While NO_x and VOC emissions have been calculated for demonstration of General Conformity related emissions, other criteria pollutants have been included for completeness. The anticipated schedule of work was used to allocate emissions to each of the project years. Table A-2 presents a summary of emissions from Tier 1 vessels and equipment by year for the LPP.

[5] *HGB 2008 Eight-Hour Ozone RFP SIP Revision* Adopted by TCEQ 15 December 2016 and approved by EPA on 13 February 2019. See: https://www.tceq.texas.gov/assets/public/implementation/air/sip/hgb/HGB_2016_AD_RFP/RFP/Adoption/16017SIP_HGBRFP_Ado.pdf Accessed 11 July 2019

Table A-1: Emission Factors Used for Nonroad and Marine Engines

	grams per hp-hr					
	NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Tier 1 nonroad						
$(11 \leq hp < 25)$	7.1	0.60	0.58	0.005	1.0	4.9
$(25 \leq hp < 50)$	7.1	0.60	0.58	0.005	1.0	4.1
$(50 \leq hp < 100)$	6.9	0.60	0.58	0.005	1.0	8.5
$100 \leq hp < 175$	6.9	0.60	0.58	0.005	1.0	8.5
$175 \leq hp < 300$	6.9	0.40	0.39	0.005	1.0	8.5
$300 \leq hp < 600$	6.9	0.40	0.39	0.005	1.0	8.5
$600 \leq hp < 750$	6.9	0.40	0.39	0.005	1.0	8.5
>750	6.9	0.40	0.39	0.005	1.0	8.5
Marine Cat 1 and Cat 2 Tier 1						
Main - large dredge	7.2	0.19	0.19	0.005	0.2	1.2
Main - small dredge	7.2	0.19	0.19	0.005	0.2	1.2
Dredge auxiliary	7.2	0.19	0.19	0.005	0.2	1.2
Main - large tug	7.2	0.19	0.19	0.005	0.2	1.2
Main - small tug	7.2	0.19	0.19	0.005	0.2	1.2
Tug auxiliary	7.2	0.19	0.19	0.005	0.2	1.2
Miscellaneous	7.2	0.19	0.19	0.005	0.2	1.2

Table A-2: Estimated Tier 1 Emissions, tons per year

		Estimated emissions, tons per year					
Year		NO_x	PM_{10}	$PM_{2.5}$	SO_x	VOC	CO
Year 1	**2021**	392	18	17	0.27	39	315
Year 2	**2022**	1,473	60	59	1.00	119	930
Year 3	**2023**	1,473	60	59	1.00	119	930
Year 4	**2024**	1,473	60	59	1.00	119	930
Year 5	**2025**	724	34	33	0.50	71	579

The construction schedule on which the annual emissions are based is included below in Figure A-1. An illustration of the detailed calculations of Tier 1 emissions developed for the LPP are included as Figure A-2.

Port Houston
HSC - Expansion Channel Improvements Project
Construction Emission Estimates
August 2020
Emissions from compressed schedule

LPP CONSTRUCTION SCHEDULE 3 MIDDLE

Segment	Item	Duration	Days of work per year								2021						2022
		(days)	2021	2022	2023	2024	2025	2026	2027	2028	NOx	PM10	PM2.5	SOx	VOC	CO	NOx
1A	NW Dredging - BR-RF - 8-AC Bird Island	86	86								121.7	5.0	4.9	0.1	8.6	80.3	
1A	NW Dredging - BR-RF - Long Bird Island	98	36	62							50.7	2.1	2.0	0.0	3.6	33.5	87.4
1A	Oyster Mitigation - BR-RF	152	152								12.7	0.4	0.4	0.0	0.5	5.2	
1A	NW Dredging - BR-RF Mech. to ODMDS	231	122	109							176.0	5.2	5.0	0.1	4.3	52.7	157.3
1B	NW Dredging - RF-BSC Mech. to ODMDS	188		188													218.7
1B	Oyster Mitigation - RF-BSC & BSC-BCC	260	122	138							8.1	0.3	0.3	0.0	0.3	3.4	9.2
1B	NW Dredging - RF-BSC - Bird Island Marsh	206		187	19												312.0
2	NW Dredging - BSC - Bird Island Marsh	138			138												
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	223			208	15											
~~1C~~	~~NW Dredging - BSC-BCC - Sed. Attn. Feature~~					~~0~~											
3	NW Dredging - BCC - M12	221	122	99							190.0	6.9	6.6	0.1	9.6	95.1	154.1
3	Oyster Mitigation - BCC	0	0														
4	Site Preparation - E2 Clinton	78	78								26.8	1.6	1.6	0.0	3.7	31.2	
4	Site Preparation - Beltway 8 Tract	143	143								70.7	4.2	4.1	0.0	9.5	81.4	
4	NW Dredging - GB-Carpenters Bayou	71	44	27							66.3	2.9	2.8	0.0	5.5	49.9	40.7
4	NW Dredging - BB-GB	235		235													425.9
5	Site Preparation - Glendale PA	94					94										
5	NW Dredging - SB-TB	96					96										
6	Site Preparation - Filterbed PA	47					47										
6	NW Dredging - TB	48					48										
		2,615	905	1,045	365	15	285	0	0	0	723.0	28.6	27.6	0.4	45.5	432.7	1,405.2

					2023						2024						2025			
PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx
3.6	3.5	0.1	6.2	57.6																
4.7	4.5	0.1	3.8	47.1																
9.0	8.7	0.1	16.1	148.7																
0.3	0.3	0.0	0.4	3.8																
13.5	13.1	0.2	24.9	227.8	31.7	1.4	1.3	0.0	2.5	23.1										
					361.9	16.2	15.7	0.2	31.4	282.9										
					410.5	16.8	16.2	0.2	28.6	266.8	29.6	1.2	1.2	0.0	2.1	19.2				
5.6	5.4	0.1	7.8	77.2																
1.8	1.7	0.0	3.4	30.6																
17.5	17.0	0.2	31.2	289.0																
																	2.8	0.2	0.2	0.0
																	31.8	1.4	1.3	0.0
																	18.6	1.1	1.1	0.0
																	182.5	7.9	7.7	0.1
55.9	54.1	0.8	93.7	881.8	804.2	34.3	33.2	0.5	62.5	572.9	29.6	1.2	1.2	0.0	2.1	19.2	235.7	10.6	10.3	0.1

		2026											
VOC	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**VOC**	**CO**
								121.7	5.0	4.9	0.1	8.6	80.3
								138.1	5.7	5.5	0.1	9.8	91.1
								12.7	0.4	0.4	0.0	0.5	5.2
								333.3	9.9	9.5	0.2	8.1	99.7
								218.7	9.0	8.7	0.1	16.1	148.7
								17.3	0.6	0.5	0.0	0.7	7.2
								343.7	14.8	14.4	0.2	27.5	250.9
								361.9	16.2	15.7	0.2	31.4	282.9
								440.1	18.0	17.4	0.3	30.6	286.1
								~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~	~~0.0~~
								344.1	12.5	12.0	0.2	17.3	172.3
								0.0	0.0	0.0	0.0	0.0	0.0
								26.8	1.6	1.6	0.0	3.7	31.2
								70.7	4.2	4.1	0.0	9.5	81.4
								106.9	4.6	4.5	0.1	8.9	80.5
								425.9	17.5	17.0	0.2	31.2	289.0
0.4	3.5							2.8	0.2	0.2	0.0	0.4	3.5
2.5	22.8							31.8	1.4	1.3	0.0	2.5	22.8
2.7	23.0							18.6	1.1	1.1	0.0	2.7	23.0
14.6	133.4							182.5	7.9	7.7	0.1	14.6	133.4
20.2	182.6	0.0	0.0	0.0	0.0	0.0	0.0	3,197.7	130.6	126.4	1.8	223.9	2,089.3

Total emissions by segment from origian USACE schedule

Segment	Item	NOx	PM10	PM2.5	SOx	VOC	CO
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Islar	259.9	10.7	10.4	0.1	18.4	171.4
1A	Oyster Mitigation - BR-RF	12.7	0.4	0.4	0.0	0.5	5.2
1A	NW Dredging - BR-RF Mech. to ODMDS	333.3	9.9	9.5	0.2	8.1	99.7
1B	NW Dredging - RF-BSC Mech. to ODMDS	218.7	9.0	8.7	0.1	16.1	148.7
1B	Oyster Mitigation - RF-BSC & BSC-BCC	17.3	0.6	0.5	0.0	0.7	7.2
1B	NW Dredging - RF-BSC - Bird Island Marsh	343.7	14.8	14.4	0.2	27.5	250.9
2	NW Dredging - BSC - Bird Island Marsh	361.9	16.2	15.7	0.2	31.4	282.9
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	440.1	18.0	17.4	0.3	30.6	286.1
~~1C~~	~~NW Dredging - BSC-BCC - Sed. Attn. Feature~~	~~182.0~~	~~7.4~~	~~7.2~~	~~0.1~~	~~12.5~~	~~117.3~~
3	NW Dredging - BCC - M12	344.1	12.5	12.0	0.2	17.3	172.3
3	Oyster Mitigation - BCC	0.7	0.0	0.0	0.0	0.0	0.3
4	Site Preparation - E2 Clinton	26.8	1.6	1.6	0.0	3.7	31.2
4	Site Preparation - Beltway 8 Tract	70.7	4.2	4.1	0.0	9.5	81.4
4	NW Dredging - GB-Carpenters Bayou	106.9	4.6	4.5	0.1	8.9	80.5
4	NW Dredging - BB-GB	425.9	17.5	17.0	0.2	31.2	289.0
5	Site Preparation - Glendale PA	2.8	0.2	0.2	0.0	0.4	3.5
5	NW Dredging - SB-TB	31.8	1.4	1.3	0.0	2.5	22.8
6	Site Preparation - Filterbed PA	18.6	1.1	1.1	0.0	2.7	23.0
6	NW Dredging - TB	182.5	7.9	7.7	0.1	14.6	133.4
		3,380.4	138.0	133.6	1.9	236.5	2,206.8
		3,380.4	138.0	133.6	1.9	236.5	2,206.8
		1.000	1.000	1.000	1.000	1.000	1.000
		0.0	0.0	0.0	0.0	0.0	0.0

Emmission by Segment with new Local Sponsr schedule

Segment	Item	Duration (days)	Total tons NOx	PM10	PM2.5	SOx	VOC	CO	Tons/day QC check NOx	PM10	PM2.5	SOx	VOC	CO
1A	NW Dredging - BR-RF - 8-AC Bird Island	86	121.7	5.0	4.9	0.1	8.6	80.3	1.41	0.058	0.056	0.0008	0.100	0.93
1A	NW Dredging - BR-RF - Long Bird Island	98	138.1	5.7	5.5	0.1	9.8	91.1	1.41	0.058	0.056	0.0008	0.100	0.93
1A	Oyster Mitigation - BR-RF	152	12.7	0.4	0.4	0.0	0.5	5.2	0.08	0.003	0.003	0.0000	0.003	0.03
1A	NW Dredging - BR-RF Mech. to ODMDS	231	333.3	9.9	9.5	0.2	8.1	99.7	1.44	0.043	0.041	0.0007	0.035	0.43
1B	NW Dredging - RF-BSC Mech. to ODMDS	188	218.7	9.0	8.7	0.1	16.1	148.7	1.16	0.048	0.046	0.0007	0.085	0.79
1B	Oyster Mitigation - RF-BSC & BSC-BCC	260	17.3	0.6	0.5	0.0	0.7	7.2	0.07	0.002	0.002	0.0000	0.003	0.03
1B	NW Dredging - RF-BSC - Bird Island Marsh	206	343.7	14.8	14.4	0.2	27.5	250.9	1.67	0.072	0.070	0.0010	0.133	1.22
2	NW Dredging - BSC - Bird Island Marsh	138	361.9	16.2	15.7	0.2	31.4	282.9	2.62	0.117	0.114	0.0016	0.227	2.05
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	223	440.1	18.0	17.4	0.3	30.6	286.1	1.97	0.081	0.078	0.0011	0.137	1.28
~~1C~~	~~NW Dredging - BSC-BCC - Sed. Attn. Feature~~	~~219~~	~~182.0~~	~~7.4~~	~~7.2~~	~~0.1~~	~~12.5~~	~~117.3~~	~~0.83~~	~~0.034~~	~~0.033~~	~~0.0005~~	~~0.057~~	~~0.54~~
3	NW Dredging - BCC - M12	221	344.1	12.5	12.0	0.2	17.3	172.3	1.56	0.056	0.054	0.0008	0.078	0.78
3	Oyster Mitigation - BCC	9	0.7	0.0	0.0	0.0	0.0	0.3	0.08	0.003	0.002	0.0000	0.003	0.03
4	Site Preparation - E2 Clinton	78	26.8	1.6	1.6	0.0	3.7	31.2	0.34	0.021	0.020	0.0002	0.047	0.40

4	Site Preparation - Beltway 8 Tract	143	70.7	4.2	4.1	0.0	9.5	81.4		0.49	0.029	0.029	0.0003	0.067	0.57
4	NW Dredging - GB-Carpenters Bayou	71	106.9	4.6	4.5	0.1	8.9	80.5		1.51	0.066	0.064	0.0009	0.125	1.14
4	NW Dredging - BB-GB	235	425.9	17.5	17.0	0.2	31.2	289.0		1.81	0.075	0.072	0.0011	0.133	1.23
5	Site Preparation - Glendale PA	94	2.8	0.2	0.2	0.0	0.4	3.5		0.03	0.002	0.002	0.0000	0.004	0.04
5	NW Dredging - SB-TB	96	31.8	1.4	1.3	0.0	2.5	22.8		0.33	0.014	0.014	0.0002	0.026	0.24
6	Site Preparation - Filterbed PA	47	18.6	1.1	1.1	0.0	2.7	23.0		0.40	0.024	0.023	0.0003	0.057	0.49
6	NW Dredging - TB	48	182.5	7.9	7.7	0.1	14.6	133.4		3.82	0.166	0.161	0.0023	0.306	2.79
		2843	3,380.4	138.0	133.6	1.9	236.5	2,206.8		1.19	0.049	0.047	0.0007	0.083	0.78

Original USACE Schedule

			PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
			CONTRACT YEAR 01																									
			Segment 1 - Bolivar Roads to Redfish Reef (Station 138+369 to 100+000)																									
			Pt. of CW1_Bolivar-Redfish_700		TO: 8-AC Bird Island & Long Bird Island																							
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island		Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.53	16	1,994,000	16	1,305	95.5	5,830,731	100%	0%	0%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Auxilliaries	1,000	0.80	24					1,833,563	100%	0%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Ladder Pump	1,200	0.58	16					1,063,467	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Cutter & Swing	2,500	0.80	16					3,055,939	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			30"-Booster	1	Main Engines	5,000	0.70	16					5,347,893	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Auxilliaries	200	0.60	24					275,034	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Anchor Barge	2	Auxilliaries	200	0.60	16					366,713	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Derrick Barge	1	Main Engines	2,000	0.50	11					1,050,479	100%	0%	0%	0%	0%	0%	Nonroad	≥750	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Auxilliaries	200	0.60	11					126,057	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Spill Barge	1	Auxilliaries	150	0.60	16					137,517	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Tender Tug	4	Propulsion	600	0.50	22					2,521,149	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				4	Auxilliaries	50	0.50	24					229,195	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Tow Tug	1	Propulsion	4,500	0.80	8					2,750,345	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Auxilliaries	300	0.50	24					343,793	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					515,690	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				2	Auxilliaries	50	0.50	24					114,598	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Crewboat	1	Propulsion	400	0.60	14					320,874	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Auxilliaries	50	0.50	24					57,299	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	156.3	140,668	100%	0%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island	Land		Light Towers	2	N/A	8	0.50	18					22,507	100%	0%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island	Land		D6 Dozer	2	N/A	200	0.75	18					844,010	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island	Land		Marsh Hoe	4	N/A	200	0.75	18					1,688,019	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island	Land		325 LR Excavator	2	N/A	170	0.75	18					717,408	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island	Land		Field Truck	1	N/A	180	0.50	18					253,203	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Survey/Crewboat	1	Propulsion	200	0.60	14					262,581	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Auxilliaries	50	0.50	24					93,779	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island		Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	16.0	66,560	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			325 LR Excavator	2	N/A	170	0.75	8					32,640	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Work Tug	1	Main Power	1,000	0.65	8					83,200	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island			Survey/Crewboat	1	Propulsion	200	0.60	8					15,360	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF - 8-AC Bird Island & Long Bird Island				1	Auxilliaries	50	0.50	8					3,200	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	Oyster Mitigation - BR-RF		Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	12.0	24,960	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
1A	Oyster Mitigation - BR-RF			Work Tug	1	Main Power	1,000	0.65	8					62,400	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1A	Oyster Mitigation - BR-RF			Survey/Crewboat	1	Propulsion	200	0.60	8					11,520	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	Oyster Mitigation - BR-RF				1	Auxilliaries	50	0.50	8					2,400	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	Oyster Mitigation - BR-RF		Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	152.0	316,160	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
1A	Oyster Mitigation - BR-RF			Work Tug	1	Main Power	1,000	0.65	8					790,400	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1A	Oyster Mitigation - BR-RF			Survey/Crewboat	1	Propulsion	200	0.60	8					145,920	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	Oyster Mitigation - BR-RF				1	Auxilliaries	50	0.50	8					30,400	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
		1a	Segment 1 - Bolivar Roads to Redfish (Station 100+000 to 073+934)																									
			Pt. of CW1_Bolivar-Redfish_700		TO: ODMDS																							
1A	NW Dredging - BR-RF Mech. to ODMDS		MechanicalDredging	Clamshell Dredge (21CY)	1	Main Engines	2,000	0.50	15	3,038,000	15	877	230.9	3,464,082	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF Mech. to ODMDS				1	Auxilliaries	200	0.60	24					665,104	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1A	NW Dredging - BR-RF Mech. to ODMDS			Tow Tug	2	Propulsion	4,500	0.80	15					24,941,391	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF Mech. to ODMDS				2	Auxilliaries	300	0.50	24					1,662,759	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF Mech. to ODMDS			Tender Tug	4	Propulsion	1,000	0.50	8					3,695,021	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF Mech. to ODMDS				4	Auxilliaries	50	0.50	24					554,253	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1A	NW Dredging - BR-RF Mech. to ODMDS			Survey/Crewboat	1	Propulsion	400	0.60	14					775,954	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1A	NW Dredging - BR-RF Mech. to ODMDS				1	Auxilliaries	50	0.60	24					166,276	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4		4	Segment 4 - Boggy Bayou to Sims Bayou (Station 676+53 to 850+00)																									
4			CW4_BB-GB_530 + Pt. of CD4_Whole		TO: Beltway-8 Tract																							
4	Site Preparation - Beltway 8 Tract	Land	PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	143.0	1,029,600	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - Beltway 8 Tract	Land		Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	124.0	1,785,600	22%	78%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - Beltway 8 Tract	Land		Field Truck	2	N/A	180	0.75	8	N/A	N/A	N/A	124.0	267,840	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB		Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.52	14	2,920,000	14	1,020	204.5	6,252,235	22%	78%	0%	0%	0%	0%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
4	NW Dredging - BB-GB				1	Auxilliaries	800	0.80	24					3,140,840	22%	78%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - BB-GB				1	Ladder Pump	1,200	0.92	14					3,160,471	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB				1	Cutter & Swing	2,500	0.80	14					5,725,490	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB			24"-Booster	2	Main Engines	4,000	0.55	14					12,596,078	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB				2	Auxilliaries	200	0.60	24					1,177,815	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB			Anchor Barge	2	Auxilliaries	200	0.60	14					687,059	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB			Derrick Barge	1	Main Engines	2,000	0.50	11					2,249,300	22%	78%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB				1	Auxilliaries	200	0.60	11					269,916	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - BB-GB			Tender Tug	4	Propulsion	600	0.50	22					5,398,319	22%	78%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - BB-GB				4	Auxilliaries	50	0.50	24					490,756	22%	78%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - BB-GB			Tow Tug	1	Propulsion	4,500	0.80	8					5,889,076	22%	78%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - BB-GB				1	Auxilliaries	300	0.50	24					736,134	22%	78%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - BB-GB			25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					1,104,202	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	NW Dredging - BB-GB				2	Auxilliaries	50	0.50	24					245,378	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	NW Dredging - BB-GB			Crewboat	1	Propulsion	400	0.60	14					687,059	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	NW Dredging - BB-GB				1	Auxilliaries	50	0.50	24					122,689	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	Site Preparation - Beltway 8 Tract	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	234.9	211,394	22%	78%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
4	Site Preparation - Beltway 8 Tract	Land		Light Towers	2	N/A	8	0.50	18					33,823	22%	78%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
4	Site Preparation - Beltway 8 Tract	Land		D6 Dozer	2	N/A	200	0.75	18					1,268,362	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - Beltway 8 Tract	Land		Marsh Hoe	4	N/A	200	0.75	18					2,536,723	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - Beltway 8 Tract	Land		325 LR Excavator	2	N/A	170	0.75	18					1,078,107	22%	78%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
4	Site Preparation - Beltway 8 Tract	Land		Field Truck	1	N/A	180	0.50	18					380,509	22%	78%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - Beltway 8 Tract			Survey/Crewboat	1	Propulsion	200	0.60	14					394,601	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	Site Preparation - Beltway 8 Tract				1	Auxilliaries	50	0.50	24					140,929	22%	78%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons						Total emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
59.8	1.48	1.41	0.026	0.64	11.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	59.8	1.5	1.4	0.0	0.6	11.6
14.8	0.46	0.44	0.008	0.20	3.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	14.8	0.5	0.4	0.0	0.2	3.5
8.1	0.47	0.46	0.006	1.17	10.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.1	0.5	0.5	0.0	1.2	10.0
23.2	1.35	1.31	0.017	3.37	28.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	23.2	1.3	1.3	0.0	3.4	28.6
40.7	2.36	2.30	0.029	5.90	50.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	40.7	2.4	2.3	0.0	5.9	50.1
2.1	0.12	0.12	0.002	0.30	2.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.1	0.1	0.0	0.3	2.6
2.8	0.16	0.16	0.002	0.40	3.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.8	0.2	0.2	0.0	0.4	3.4
8.0	0.46	0.45	0.006	1.16	9.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.0	0.5	0.5	0.0	1.2	9.8
1.0	0.06	0.05	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.1	0.1	0.0	0.1	1.2
1.0	0.09	0.09	0.001	0.15	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.1	0.1	0.0	0.2	1.3
24.2	0.64	0.61	0.011	0.28	4.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	24.2	0.6	0.6	0.0	0.3	4.8
1.8	0.06	0.06	0.001	0.03	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.1	0.1	0.0	0.0	0.4
26.4	0.70	0.67	0.012	0.30	5.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	26.4	0.7	0.7	0.0	0.3	5.3
2.8	0.09	0.08	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.8	0.1	0.1	0.0	0.0	0.7
5.2	0.13	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.2	0.1	0.1	0.0	0.1	1.0
1.1	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.0	0.0	0.0	0.0	0.2
3.2	0.08	0.08	0.001	0.04	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.1	0.1	0.0	0.0	0.6
0.6	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.0	0.0	0.0	0.0	0.1
1.1	0.09	0.09	0.001	0.16	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.1	0.1	0.0	0.2	1.3
0.2	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.1
6.4	0.37	0.36	0.005	0.93	7.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.4	0.4	0.4	0.0	0.9	7.9
12.8	0.74	0.73	0.009	1.86	15.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	12.8	0.7	0.7	0.0	1.9	15.8
5.5	0.47	0.46	0.004	0.79	6.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.5	0.5	0.5	0.0	0.8	6.7
1.9	0.11	0.11	0.001	0.28	2.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.1	0.1	0.0	0.3	2.4
2.6	0.07	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.6	0.1	0.1	0.0	0.0	0.5
0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.0	0.0	0.0	0.0	0.2
0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.1	0.6
0.2	0.02	0.02	0.000	0.04	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.3
0.8	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.0	0.0	0.0	0.0	0.2
0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.2	0.01	0.01	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.2
0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.0	0.0	0.0	0.0	0.1
0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2.4	0.14	0.14	0.002	0.35	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.4	0.1	0.1	0.0	0.3	3.0
7.6	0.20	0.19	0.003	0.09	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.6	0.2	0.2	0.0	0.1	1.5
1.5	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.0	0.0	0.0	0.0	0.3
0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
26.3	1.53	1.49	0.019	3.82	32.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	26.3	1.5	1.5	0.0	3.8	32.5
5.1	0.29	0.29	0.004	0.73	6.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.1	0.3	0.3	0.0	0.7	6.2
239.2	6.32	6.05	0.110	2.75	47.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	239.2	6.3	6.0	0.1	2.7	47.8
13.4	0.42	0.40	0.007	0.18	3.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	13.4	0.4	0.4	0.0	0.2	3.2
35.4	0.94	0.90	0.016	0.41	7.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	35.4	0.9	0.9	0.0	0.4	7.1
4.5	0.14	0.13	0.002	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.5	0.1	0.1	0.0	0.1	1.1
7.8	0.20	0.19	0.003	0.09	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.8	0.2	0.2	0.0	0.1	1.5
1.7	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.0	0.0	0.0	0.0	0.3
1.7	0.10	0.10	0.001	0.25	2.1	6.1	0.35	0.34	0.004	0.88	7.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.8	0.5	0.4	0.0	1.1	9.6
3.0	0.17	0.17	0.002	0.44	3.7	10.6	0.61	0.60	0.008	1.53	13.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	13.6	0.8	0.8	0.0	2.0	16.7
0.5	0.03	0.03	0.000	0.07	0.6	1.6	0.09	0.09	0.001	0.23	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.1	0.1	0.0	0.3	2.5
14.2	0.35	0.34	0.006	0.15	2.8	49.9	1.23	1.18	0.021	0.54	9.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	64.1	1.6	1.5	0.0	0.7	12.4
5.6	0.18	0.17	0.003	0.08	1.3	19.7	0.62	0.59	0.011	0.27	4.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	25.3	0.8	0.8	0.0	0.3	6.0
5.3	0.31	0.30	0.004	0.77	6.6	18.7	1.08	1.06	0.014	2.71	23.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	24.0	1.4	1.4	0.0	3.5	29.6
9.7	0.56	0.55	0.007	1.40	11.9	33.9	1.96	1.91	0.025	4.91	41.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	43.5	2.5	2.5	0.0	6.3	53.6
21.3	1.23	1.20	0.015	3.09	26.2	74.5	4.32	4.21	0.054	10.80	91.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	95.8	5.6	5.4	0.1	13.9	118.0
2.0	0.12	0.11	0.001	0.29	2.5	7.0	0.40	0.39	0.005	1.01	8.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.0	0.5	0.5	0.0	1.3	11.0
1.2	0.07	0.07	0.001	0.17	1.4	4.1	0.24	0.23	0.003	0.59	5.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.2	0.3	0.3	0.0	0.8	6.4
3.8	0.22	0.21	0.003	0.55	4.7	13.3	0.77	0.75	0.010	1.93	16.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	17.1	1.0	1.0	0.0	2.5	21.1
0.5	0.03	0.03	0.000	0.07	0.6	1.6	0.09	0.09	0.001	0.23	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.1	0.1	0.0	0.3	2.5
11.5	0.30	0.29	0.005	0.13	2.3	40.3	1.06	1.02	0.019	0.46	8.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	51.8	1.4	1.3	0.0	0.6	10.4
0.9	0.03	0.03	0.000	0.01	0.2	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.1	0.1	0.0	0.1	0.9
12.6	0.33	0.32	0.006	0.14	2.5	43.9	1.16	1.11	0.020	0.50	8.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	56.5	1.5	1.4	0.0	0.6	11.3
1.3	0.04	0.04	0.001	0.02	0.3	4.6	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.9	0.2	0.2	0.0	0.1	1.4
2.5	0.06	0.06	0.001	0.03	0.5	8.6	0.22	0.21	0.004	0.10	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.1	0.3	0.3	0.0	0.1	2.2
0.5	0.01	0.01	0.000	0.01	0.1	1.9	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.1	0.1	0.0	0.0	0.5
1.5	0.04	0.04	0.001	0.02	0.3	5.4	0.14	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.9	0.2	0.2	0.0	0.1	1.3
0.3	0.01	0.01	0.000	0.00	0.1	1.0	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.0	0.0	0.0	0.0	0.2
0.4	0.03	0.03	0.000	0.05	0.4	1.3	0.11	0.11	0.001	0.18	1.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.1	0.1	0.0	0.2	2.0
0.1	0.00	0.00	0.000	0.01	0.0	0.2	0.02	0.02	0.000	0.03	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.2
2.1	0.12	0.12	0.002	0.31	2.6	7.5	0.43	0.42	0.005	1.09	9.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.6	0.6	0.5	0.0	1.4	11.9
4.3	0.25	0.24	0.003	0.62	5.3	15.0	0.87	0.85	0.011	2.17	18.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	19.3	1.1	1.1	0.0	2.8	23.8
1.8	0.16	0.15	0.001	0.26	2.2	6.4	0.55	0.54	0.005	0.92	7.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.2	0.7	0.7	0.0	1.2	10.1
0.6	0.04	0.04	0.000	0.09	0.8	2.3	0.13	0.13	0.002	0.33	2.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.2	0.2	0.0	0.4	3.6
0.9	0.02	0.02	0.000	0.01	0.2	3.1	0.08	0.07	0.001	0.04	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.0	0.1	0.1	0.0	0.0	0.8
0.3	0.01	0.01	0.000	0.00	0.1	1.1	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.0	0.0	0.0	0.0	0.3

				PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year						Nonroad /	Category	Emission factors, g/hp hr					
																1	2	3	4	5	6	Marine		NOx	PM10	PM2.5	SOx	VOC	CO
4			4	Segment 4 - Boggy Bayou to Sims Bayou (Station 850+00 to 974+08)																									
4				Pt. of CD4_Whole		TO: E2 Clinton																							
4	Site Preparation - E2 Clinton	Land		PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	78.0	561,600	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - E2 Clinton	Land			Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	68.0	979,200	100%	0%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - E2 Clinton	Land			Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	68.0	106,080	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou			Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	562,000	14	997	40.3	1,680,927	100%	0%	0%	0%	0%	0%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
4	NW Dredging - GB-Carpenters Bayou					1	Auxilliaries	800	0.80	24					618,450	100%	0%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - GB-Carpenters Bayou					1	Ladder Pump	1,200	1.00	14					676,429	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou					1	Cutter & Swing	2,500	0.80	14					1,127,382	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou				24"-Booster	3	Main Engines	4,000	0.70	14					4,735,005	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou					3	Auxilliaries	200	0.60	24					347,878	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou				Anchor Barge	2	Auxilliaries	200	0.60	14					135,286	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou				Derrick Barge	1	Main Engines	2,000	0.50	11					442,900	100%	0%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou					1	Auxilliaries	200	0.60	11					53,148	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	NW Dredging - GB-Carpenters Bayou				Tender Tug	4	Propulsion	600	0.50	22					1,062,960	100%	0%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - GB-Carpenters Bayou					4	Auxilliaries	50	0.50	24					96,633	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - GB-Carpenters Bayou				Tow Tug	1	Propulsion	4,500	0.80	8					1,159,593	100%	0%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - GB-Carpenters Bayou					1	Auxilliaries	300	0.50	24					144,949	100%	0%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
4	NW Dredging - GB-Carpenters Bayou				25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					217,424	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	NW Dredging - GB-Carpenters Bayou					2	Auxilliaries	50	0.50	24					48,316	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	NW Dredging - GB-Carpenters Bayou				Crewboat	1	Propulsion	400	0.60	14					135,286	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	NW Dredging - GB-Carpenters Bayou					1	Auxilliaries	50	0.50	24					24,158	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	Site Preparation - E2 Clinton	Land		Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	70.7	63,597	100%	0%	0%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
4	Site Preparation - E2 Clinton	Land			Light Towers	2	N/A	8	0.50	18					10,176	100%	0%	0%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
4	Site Preparation - E2 Clinton	Land			D6 Dozer	2	N/A	200	0.75	18					381,584	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - E2 Clinton	Land			Marsh Hoe	4	N/A	200	0.75	18					763,167	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - E2 Clinton	Land			325 LR Excavator	2	N/A	170	0.75	18					324,346	100%	0%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
4	Site Preparation - E2 Clinton	Land			Field Truck	1	N/A	180	0.50	18					114,475	100%	0%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
4	Site Preparation - E2 Clinton				Survey/Crewboat	1	Propulsion	200	0.60	14					118,715	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4	Site Preparation - E2 Clinton					1	Auxilliaries	50	0.50	24					42,398	100%	0%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
4				**CONTRACT YEAR 02**																									
1B			1b	Segment 1 - HSC (Station 073+934 to 042+000 +/-)																									
1B				Pt. of CW1_Redfish-BSC_700		TO: San Leon/Dollar Reef Mitigation Sites																							
1B	NW Dredging - RF-BSC Mech. to ODMDS			Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.61	16	2,030,000	16	1,713	74.1	5,204,764	0%	100%	0%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
1B	NW Dredging - RF-BSC Mech. to ODMDS					1	Auxilliaries	1,000	0.80	24					1,422,067	0%	100%	0%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC Mech. to ODMDS					1	Ladder Pump	1,200	0.67	16					952,785	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS					1	Cutter & Swing	2,500	0.80	16					2,370,111	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS				30"-Booster	2	Main Engines	5,000	0.70	16					8,295,388	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS					2	Auxilliaries	200	0.60	24					426,620	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS				Anchor Barge	2	Auxilliaries	200	0.60	16					284,413	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS				Derrick Barge	1	Main Engines	2,000	0.50	11					814,726	0%	100%	0%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS					1	Auxilliaries	200	0.60	11					97,767	0%	100%	0%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS				Spill Barge	1	Auxilliaries	150	0.60	16					106,655	0%	100%	0%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1B	NW Dredging - RF-BSC Mech. to ODMDS				Tender Tug	4	Propulsion	600	0.50	22					1,955,342	0%	100%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC Mech. to ODMDS					4	Auxilliaries	50	0.50	24					177,758	0%	100%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC Mech. to ODMDS				Tow Tug	1	Propulsion	4,500	0.80	8					2,133,100	0%	100%	0%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC Mech. to ODMDS					1	Auxilliaries	300	0.50	24					266,637	0%	100%	0%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC Mech. to ODMDS				25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					399,956	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC Mech. to ODMDS					2	Auxilliaries	50	0.50	24					88,879	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC Mech. to ODMDS				Crewboat	1	Propulsion	400	0.60	14					248,862	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC Mech. to ODMDS					1	Auxilliaries	50	0.50	24					44,440	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC Mech. to ODMDS				Survey/Crewboat	1	Propulsion	200	0.60	14					124,431	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC Mech. to ODMDS					1	Auxilliaries	50	0.50	24					44,440	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	Oyster Mitigation - RF-BSC & BSC-BCC			Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	186.0	386,880	0%	100%	0%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
1B	Oyster Mitigation - RF-BSC & BSC-BCC				Work Tug	1	Main Power	1,000	0.65	8					967,200	0%	100%	0%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1B	Oyster Mitigation - RF-BSC & BSC-BCC				Survey/Crewboat	1	Propulsion	200	0.60	8					178,560	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	Oyster Mitigation - RF-BSC & BSC-BCC					1	Auxilliaries	50	0.50	8					37,200	0%	100%	0%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B			1b	Segment 1 - HSC (Station 042+000 +/- to 028+605)																									
1B				Pt. of CW1_Redfish-BSC_700		TO: Bird Island Marsh																							
1B	NW Dredging - RF-BSC - Bird Island Marsh			Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.49	16	3,181,000	16	1,718	115.7	6,532,345	0%	86%	14%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
1B	NW Dredging - RF-BSC - Bird Island Marsh					1	Auxilliaries	1,000	0.80	24					2,221,886	0%	86%	14%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC - Bird Island Marsh					1	Ladder Pump	1,200	0.58	16					1,288,694	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh					1	Cutter & Swing	2,500	0.80	16					3,703,143	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh				30"-Booster	2	Main Engines	5,000	0.66	16					12,220,373	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh					2	Auxilliaries	200	0.60	24					666,566	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh				Anchor Barge	2	Auxilliaries	200	0.60	16					444,377	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh				Derrick Barge	1	Main Engines	2,000	0.50	11					1,272,955	0%	86%	14%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh					1	Auxilliaries	200	0.60	11					152,755	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh				Spill Barge	1	Auxilliaries	150	0.60	16					166,641	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh				Tender Tug	4	Propulsion	600	0.50	22					3,055,093	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC - Bird Island Marsh					4	Auxilliaries	50	0.50	24					277,736	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC - Bird Island Marsh				Tow Tug	1	Propulsion	4,500	0.80	8					3,332,829	0%	86%	14%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC - Bird Island Marsh					1	Auxilliaries	300	0.50	24					416,604	0%	86%	14%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC - Bird Island Marsh				25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					624,905	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC - Bird Island Marsh						Auxilliaries	50	0.50	24					0	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC - Bird Island Marsh				Crewboat	1	Propulsion	400	0.60	14					388,830	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC - Bird Island Marsh					1	Auxilliaries	50	0.50	24					69,434	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC - Bird Island Marsh	Land		Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	130.9	117,831	0%	86%	14%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh	Land			Light Towers	2	N/A	8	0.50	18					18,853	0%	86%	14%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
1B	NW Dredging - RF-BSC - Bird Island Marsh	Land			D6 Dozer	2	N/A	200	0.75	18					706,985	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh	Land			Marsh Hoe	4	N/A	200	0.75	18					1,413,971	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh	Land			325 LR Excavator	2	N/A	170	0.75	18					600,938	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh	Land			Field Truck	1	N/A	180	0.50	18					212,096	0%	86%	14%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh				Survey/Crewboat	1	Propulsion	200	0.60	14					219,951	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC - Bird Island Marsh					1	Auxilliaries	50	0.50	24					78,554	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons						Total emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
4.3	0.25	0.24	0.003	0.62	5.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.3	0.2	0.2	0.0	0.6	5.3
7.4	0.43	0.42	0.005	1.08	9.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.4	0.4	0.4	0.0	1.1	9.2
0.8	0.07	0.07	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.1	0.1	0.0	0.1	1.0
17.2	0.43	0.41	0.007	0.19	3.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	17.2	0.4	0.4	0.0	0.2	3.3
5.0	0.16	0.15	0.003	0.07	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.0	0.2	0.1	0.0	0.1	1.2
5.1	0.30	0.29	0.004	0.75	6.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.1	0.3	0.3	0.0	0.7	6.3
8.6	0.50	0.48	0.006	1.24	10.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.6	0.5	0.5	0.0	1.2	10.6
36.0	2.09	2.04	0.026	5.22	44.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	36.0	2.1	2.0	0.0	5.2	44.4
2.6	0.15	0.15	0.002	0.38	3.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.6	0.2	0.1	0.0	0.4	3.3
1.0	0.06	0.06	0.001	0.15	1.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.1	0.1	0.0	0.1	1.3
3.4	0.20	0.19	0.002	0.49	4.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.2	0.2	0.0	0.5	4.1
0.4	0.02	0.02	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.1	0.5
10.2	0.27	0.26	0.005	0.12	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.2	0.3	0.3	0.0	0.1	2.0
0.8	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.0	0.0	0.0	0.0	0.2
11.1	0.29	0.28	0.005	0.13	2.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.1	0.3	0.3	0.0	0.1	2.2
1.2	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.0	0.0	0.0	0.0	0.3
2.2	0.06	0.05	0.001	0.03	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.1	0.1	0.0	0.0	0.4
0.5	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.0	0.1
1.4	0.03	0.03	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.0	0.0	0.0	0.0	0.3
0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0
0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.1	0.6
0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.1
2.9	0.17	0.16	0.002	0.42	3.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.2	0.2	0.0	0.4	3.6
5.8	0.34	0.33	0.004	0.84	7.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.8	0.3	0.3	0.0	0.8	7.2
2.5	0.21	0.21	0.002	0.36	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.2	0.2	0.0	0.4	3.0
0.9	0.05	0.05	0.001	0.13	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.1	0.0	0.0	0.1	1.1
1.2	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.0	0.0	0.0	0.0	0.2
0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	53.4	1.32	1.26	0.023	0.57	10.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	53.4	1.3	1.3	0.0	0.6	10.3
0.0	0.00	0.00	0.000	0.00	0.0	11.4	0.36	0.34	0.006	0.16	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.4	0.4	0.3	0.0	0.2	2.7
0.0	0.00	0.00	0.000	0.00	0.0	7.2	0.42	0.41	0.005	1.05	8.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.2	0.4	0.4	0.0	1.1	8.9
0.0	0.00	0.00	0.000	0.00	0.0	18.0	1.05	1.02	0.013	2.61	22.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.0	1.0	1.0	0.0	2.6	22.2
0.0	0.00	0.00	0.000	0.00	0.0	63.1	3.66	3.57	0.046	9.14	77.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	63.1	3.7	3.6	0.0	9.1	77.7
0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.19	0.18	0.002	0.47	4.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.2	0.2	0.0	0.5	4.0
0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.12	0.002	0.31	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.1	0.1	0.0	0.3	2.7
0.0	0.00	0.00	0.000	0.00	0.0	6.2	0.36	0.35	0.004	0.90	7.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.2	0.4	0.4	0.0	0.9	7.6
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.0	0.0	0.0	0.1	0.9
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.07	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.1	0.1	0.0	0.1	1.0
0.0	0.00	0.00	0.000	0.00	0.0	18.8	0.50	0.47	0.009	0.22	3.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.8	0.5	0.5	0.0	0.2	3.8
0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.05	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	20.5	0.54	0.52	0.009	0.24	4.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	20.5	0.5	0.5	0.0	0.2	4.1
0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.07	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.1	0.1	0.0	0.0	0.5
0.0	0.00	0.00	0.000	0.00	0.0	4.0	0.10	0.10	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.0	0.1	0.1	0.0	0.0	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.06	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.1	0.1	0.0	0.0	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.03	0.03	0.001	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.17	0.17	0.002	0.43	3.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.2	0.2	0.0	0.4	3.6
0.0	0.00	0.00	0.000	0.00	0.0	9.3	0.25	0.23	0.004	0.11	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.3	0.2	0.2	0.0	0.1	1.9
0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.05	0.04	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.0	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	57.4	1.42	1.36	0.025	0.62	11.1	9.6	0.24	0.23	0.004	0.10	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	67.0	1.7	1.6	0.0	0.7	13.0
0.0	0.00	0.00	0.000	0.00	0.0	15.3	0.48	0.46	0.008	0.21	3.7	2.6	0.08	0.08	0.001	0.03	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	17.9	0.6	0.5	0.0	0.2	4.3
0.0	0.00	0.00	0.000	0.00	0.0	8.4	0.49	0.47	0.006	1.22	10.3	1.4	0.08	0.08	0.001	0.20	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.8	0.6	0.6	0.0	1.4	12.1
0.0	0.00	0.00	0.000	0.00	0.0	24.1	1.40	1.36	0.017	3.50	29.7	4.0	0.23	0.23	0.003	0.58	5.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	28.2	1.6	1.6	0.0	4.1	34.7
0.0	0.00	0.00	0.000	0.00	0.0	79.7	4.62	4.50	0.058	11.55	98.1	13.3	0.77	0.75	0.010	1.92	16.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	92.9	5.4	5.3	0.1	13.5	114.5
0.0	0.00	0.00	0.000	0.00	0.0	4.3	0.25	0.25	0.003	0.63	5.4	0.7	0.04	0.04	0.001	0.10	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.1	0.3	0.3	0.0	0.7	6.2
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.17	0.16	0.002	0.42	3.6	0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.2	0.2	0.0	0.5	4.2
0.0	0.00	0.00	0.000	0.00	0.0	8.3	0.48	0.47	0.006	1.20	10.2	1.4	0.08	0.08	0.001	0.20	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.7	0.6	0.5	0.0	1.4	11.9
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.14	1.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.1	0.1	0.0	0.2	1.4
0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.09	0.09	0.001	0.16	1.3	0.2	0.02	0.02	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.1	0.1	0.0	0.2	1.6
0.0	0.00	0.00	0.000	0.00	0.0	25.1	0.66	0.64	0.012	0.29	5.0	4.2	0.11	0.11	0.002	0.05	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	29.3	0.8	0.7	0.0	0.3	5.9
0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.06	0.06	0.001	0.03	0.5	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.1	0.1	0.0	0.0	0.5
0.0	0.00	0.00	0.000	0.00	0.0	27.4	0.72	0.69	0.013	0.31	5.5	4.6	0.12	0.12	0.002	0.05	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	32.0	0.8	0.8	0.0	0.4	6.4
0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.09	0.09	0.002	0.04	0.7	0.5	0.02	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.1	0.1	0.0	0.0	0.8
0.0	0.00	0.00	0.000	0.00	0.0	5.4	0.14	0.13	0.002	0.06	1.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.3	0.2	0.2	0.0	0.1	1.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	3.3	0.08	0.08	0.001	0.04	0.7	0.6	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.1	0.1	0.0	0.0	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.01	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.06	0.001	0.11	0.9	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.1	0.1	0.0	0.1	1.1
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	4.6	0.27	0.26	0.003	0.67	5.7	0.8	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.4	0.3	0.3	0.0	0.8	6.6
0.0	0.00	0.00	0.000	0.00	0.0	9.2	0.53	0.52	0.007	1.34	11.4	1.5	0.09	0.09	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.8	0.6	0.6	0.0	1.6	13.2
0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.34	0.33	0.003	0.57	4.8	0.7	0.06	0.05	0.000	0.09	0.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.6	0.4	0.4	0.0	0.7	5.6
0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.08	0.08	0.001	0.20	1.7	0.2	0.01	0.01	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.1	0.1	0.0	0.2	2.0
0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.05	0.05	0.001	0.02	0.4	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.1	0.1	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.0	0.0	0.0	0.0	0.2

			PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs			% of work in year				Nonroad / Marine	Category	Emission factors, g/hp hr					
															1	2	3	4	5	6			NOx	PM10	PM2.5	SOx	VOC	CO
1B	NW Dredging - RF-BSC - Bird Island Marsh		Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	30.0	124,800	0%	86%	14%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh			325 LR Excavator	2	N/A	170	0.75	8					61,200	0%	86%	14%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1B	NW Dredging - RF-BSC - Bird Island Marsh			Work Tug	1	Main Power	1,000	0.65	8					156,000	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1B	NW Dredging - RF-BSC - Bird Island Marsh			Survey/Crewboat	1	Propulsion	200	0.60	8					28,800	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	NW Dredging - RF-BSC - Bird Island Marsh				1	Auxilliaries	50	0.50	8					6,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	Oyster Mitigation - RF-BSC & BSC-BCC		Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	25.0	52,000	0%	86%	14%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
1B	Oyster Mitigation - RF-BSC & BSC-BCC			Work Tug	1	Main Power	1,000	0.65	8					130,000	0%	86%	14%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1B	Oyster Mitigation - RF-BSC & BSC-BCC			Survey/Crewboat	1	Propulsion	200	0.60	8					24,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1B	Oyster Mitigation - RF-BSC & BSC-BCC				1	Auxilliaries	50	0.50	8					5,000	0%	86%	14%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2		2	LPP: Segment 2 - BSC (Station 25+58 to 221+00)																									
2			Pt. of CW1_Redfish-BSC_700			TO: Bird Island Marsh																						
2	NW Dredging - BSC - Bird Island Marsh		Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.54	16	2,108,000	16	1,258	104.7	6,515,027	0%	50%	50%	0%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
2	NW Dredging - BSC - Bird Island Marsh				1	Auxilliaries	1,000	0.80	24					2,010,811	0%	50%	50%	0%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
2	NW Dredging - BSC - Bird Island Marsh				1	Ladder Pump	1,200	0.58	16					1,166,270	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh				1	Cutter & Swing	2,500	0.80	16					3,351,351	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			30"-Booster	3	Main Engines	5,000	0.66	16					16,589,189	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh				3	Auxilliaries	200	0.60	24					904,865	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			Anchor Barge	2	Auxilliaries	200	0.60	16					402,162	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			Derrick Barge	1	Main Engines	2,000	0.50	11					1,152,027	0%	50%	50%	0%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh				1	Auxilliaries	200	0.60	11					138,243	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			Spill Barge	1	Auxilliaries	150	0.60	16					150,811	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			Tender Tug	4	Propulsion	600	0.50	22					2,764,865	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
2	NW Dredging - BSC - Bird Island Marsh				4	Auxilliaries	50	0.50	24					251,351	0%	50%	50%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
2	NW Dredging - BSC - Bird Island Marsh			Tow Tug	1	Propulsion	4,500	0.80	8					3,016,216	0%	50%	50%	0%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
2	NW Dredging - BSC - Bird Island Marsh				1	Auxilliaries	300	0.50	24					377,027	0%	50%	50%	0%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
2	NW Dredging - BSC - Bird Island Marsh			25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					565,541	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	NW Dredging - BSC - Bird Island Marsh				2	Auxilliaries	50	0.50	24					125,676	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	NW Dredging - BSC - Bird Island Marsh			Crewboat	1	Propulsion	400	0.60	14					351,892	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	NW Dredging - BSC - Bird Island Marsh				1	Auxilliaries	50	0.50	24					62,838	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	NW Dredging - BSC - Bird Island Marsh	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	120.0	108,000	0%	50%	50%	0%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh	Land		Light Towers	2	N/A	8	0.50	18					17,280	0%	50%	50%	0%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
2	NW Dredging - BSC - Bird Island Marsh	Land		D6 Dozer	2	N/A	200	0.75	18					648,000	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh	Land		Marsh Hoe	4	N/A	200	0.75	18					1,296,000	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh	Land		325 LR Excavator	2	N/A	170	0.75	18					550,800	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh	Land		Field Truck	1	N/A	180	0.50	18					194,400	0%	50%	50%	0%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			Survey/Crewboat	1	Propulsion	200	0.60	14					201,600	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	NW Dredging - BSC - Bird Island Marsh				1	Auxilliaries	50	0.50	24					72,000	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	NW Dredging - BSC - Bird Island Marsh		Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	20.0	83,200	0%	50%	50%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			325 LR Excavator	2	N/A	170	0.75	8					40,800	0%	50%	50%	0%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
2	NW Dredging - BSC - Bird Island Marsh			Work Tug	1	Main Power	1,000	0.65	3					39,000	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
2	NW Dredging - BSC - Bird Island Marsh			Survey/Crewboat	1	Propulsion	200	0.60	14					33,600	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	NW Dredging - BSC - Bird Island Marsh				1	Auxilliaries	50	0.50	24					12,000	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	Oyster Mitigation - RF-BSC & BSC-BCC		Cultch S.P.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	17.0	35,360	0%	50%	50%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
2	Oyster Mitigation - RF-BSC & BSC-BCC			Work Tug	1	Main Power	1,000	0.65	3					33,150	0%	50%	50%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
2	Oyster Mitigation - RF-BSC & BSC-BCC			Survey/Crewboat	1	Propulsion	200	0.60	14					28,560	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
2	Oyster Mitigation - RF-BSC & BSC-BCC				1	Auxilliaries	50	0.50	24					10,200	0%	50%	50%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
			CONTRACT YEAR 03 - NED																									
3			NED: Segment 3 - BCC Channel & Flare (Station 8+78 to 67+11)																									
3			CW3_BCC_455 + BETB3_BCCFlare			TO: Atkinson Marsh Cell M12																						
3	NW Dredging - BCC - M12		Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.63	16	2,825,000	16	1,247	141.6	10,276,022	0%	0%	86%	14%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
3	NW Dredging - BCC - M12				1	Auxilliaries	1,000	0.80	24					2,718,524	0%	0%	86%	14%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12				1	Ladder Pump	1,200	0.58	16					1,576,744	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12				1	Cutter & Swing	2,500	0.80	16					4,530,874	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12			Anchor Barge	2	Auxilliaries	200	0.6	16					543,705	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12			Derrick Barge	1	Main Engines	2000	0.5	11					1,557,488	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12				1	Auxilliaries	200	0.6	11					186,899	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12			Spill Barge	1	Auxilliaries	150	0.6	16					203,889	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
3	NW Dredging - BCC - M12			Tender Tug	4	Propulsion	600	0.5	22					3,737,971	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12				4	Auxilliaries	50	0.5	24					339,816	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12			Tow Tug	1	Propulsion	4,500	0.80	8					4,077,787	0%	0%	86%	14%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12				1	Auxilliaries	300	0.5	24					509,723	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12			25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					764,585	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12				2	Auxilliaries	50	0.5	24					169,908	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12			Crewboat	1	Propulsion	400	0.6	14					475,742	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12				1	Auxilliaries	50	0.5	24					84,954	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	172.0	154,791	0%	0%	86%	14%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
3	NW Dredging - BCC - M12	Land		Light Towers	2	N/A	8	0.50	18					24,767	0%	0%	86%	14%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
3	NW Dredging - BCC - M12	Land		D6 Dozer	2	N/A	200	0.75	18					928,745	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12	Land		Marsh Hoe	4	N/A	200	0.75	18					1,857,490	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12	Land		325 LR Excavator	2	N/A	170	0.75	18					789,433	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
3	NW Dredging - BCC - M12	Land		Field Truck	1	N/A	180	0.50	18					278,624	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12			Survey/Crewboat	1	Propulsion	200	0.60	14					288,943	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12				1	Auxilliaries	50	0.50	24					103,194	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12		Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	27.0	112,320	0%	0%	86%	14%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12			325 LR Excavator	2	N/A	170	0.75	8					55,080	0%	0%	86%	14%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
3	NW Dredging - BCC - M12			Work Tug	1	Main Power	1,000	0.65	3					52,650	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12			Survey/Crewboat	1	Propulsion	200	0.60	14					45,360	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12				1	Auxilliaries	50	0.50	24					16,200	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons						Total emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.05	0.05	0.001	0.12	1.0	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.1	0.1	0.0	0.1	1.2
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.1	0.6
0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.03	0.03	0.001	0.01	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	0.1	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.1	0.5
0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.03	0.03	0.000	0.01	0.2	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	33.4	0.83	0.79	0.014	0.36	6.5	33.4	0.83	0.79	0.014	0.36	6.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	66.8	1.7	1.6	0.0	0.7	12.9
0.0	0.00	0.00	0.000	0.00	0.0	8.1	0.25	0.24	0.004	0.11	1.9	8.1	0.25	0.24	0.004	0.11	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	16.2	0.5	0.5	0.0	0.2	3.9
0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.26	0.25	0.003	0.64	5.5	4.4	0.26	0.25	0.003	0.64	5.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.9	0.5	0.5	0.0	1.3	10.9
0.0	0.00	0.00	0.000	0.00	0.0	12.7	0.74	0.72	0.009	1.85	15.7	12.7	0.74	0.72	0.009	1.85	15.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	25.5	1.5	1.4	0.0	3.7	31.4
0.0	0.00	0.00	0.000	0.00	0.0	63.1	3.66	3.57	0.046	9.14	77.7	63.1	3.66	3.57	0.046	9.14	77.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	126.2	7.3	7.1	0.1	18.3	155.4
0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.20	0.19	0.002	0.50	4.2	3.4	0.20	0.19	0.002	0.50	4.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.9	0.4	0.4	0.0	1.0	8.5
0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.09	0.09	0.001	0.22	1.9	1.5	0.09	0.09	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.1	0.2	0.2	0.0	0.4	3.8
0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.25	0.25	0.003	0.63	5.4	4.4	0.25	0.25	0.003	0.63	5.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.8	0.5	0.5	0.0	1.3	10.8
0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.1	0.1	0.0	0.2	1.3
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.05	0.05	0.000	0.08	0.7	0.6	0.05	0.05	0.000	0.08	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.1	0.1	0.0	0.2	1.4
0.0	0.00	0.00	0.000	0.00	0.0	13.3	0.35	0.34	0.006	0.15	2.7	13.3	0.35	0.34	0.006	0.15	2.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	26.5	0.7	0.7	0.0	0.3	5.3
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.03	0.03	0.001	0.01	0.2	1.0	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.1	0.1	0.0	0.0	0.5
0.0	0.00	0.00	0.000	0.00	0.0	14.5	0.38	0.37	0.007	0.17	2.9	14.5	0.38	0.37	0.007	0.17	2.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	28.9	0.8	0.7	0.0	0.3	5.8
0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.05	0.05	0.001	0.02	0.4	1.5	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.0	0.1	0.1	0.0	0.0	0.7
0.0	0.00	0.00	0.000	0.00	0.0	2.8	0.07	0.07	0.001	0.03	0.6	2.8	0.07	0.07	0.001	0.03	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.7	0.1	0.1	0.0	0.1	1.1
0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.04	0.04	0.001	0.02	0.3	1.8	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.1	0.1	0.0	0.0	0.7
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.04	0.03	0.000	0.06	0.5	0.4	0.04	0.03	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.1	0.1	0.0	0.1	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.01	0.0	0.1	0.01	0.01	0.000	0.01	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.14	0.14	0.002	0.36	3.0	2.5	0.14	0.14	0.002	0.36	3.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.9	0.3	0.3	0.0	0.7	6.1
0.0	0.00	0.00	0.000	0.00	0.0	4.9	0.29	0.28	0.004	0.71	6.1	4.9	0.29	0.28	0.004	0.71	6.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.9	0.6	0.6	0.0	1.4	12.1
0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.18	0.18	0.002	0.30	2.6	2.1	0.18	0.18	0.002	0.30	2.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.4	0.4	0.0	0.6	5.2
0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.7	0.04	0.04	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.1	0.1	0.0	0.2	1.8
0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.03	0.02	0.000	0.01	0.2	1.0	0.03	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.1	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	0.3	0.02	0.02	0.000	0.05	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.0	0.0	0.0	0.1	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.2	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	90.3	2.23	2.14	0.039	0.97	17.5	15.0	0.37	0.36	0.006	0.16	2.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	105.3	2.6	2.5	0.0	1.1	20.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.8	0.59	0.57	0.010	0.26	4.5	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	21.9	0.7	0.7	0.0	0.3	5.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.3	0.60	0.58	0.007	1.49	12.7	1.7	0.10	0.10	0.001	0.25	2.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	12.0	0.7	0.7	0.0	1.7	14.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	29.5	1.71	1.67	0.021	4.28	36.4	4.9	0.29	0.28	0.004	0.71	6.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	34.5	2.0	1.9	0.0	5.0	42.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.21	0.20	0.003	0.51	4.4	0.6	0.03	0.03	0.000	0.09	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.1	0.2	0.2	0.0	0.6	5.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.2	0.59	0.57	0.007	1.47	12.5	1.7	0.10	0.10	0.001	0.25	2.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.8	0.7	0.7	0.0	1.7	14.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.07	0.07	0.001	0.18	1.5	0.2	0.01	0.01	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.1	0.1	0.0	0.2	1.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.12	0.11	0.001	0.19	1.6	0.2	0.02	0.02	0.000	0.03	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.1	0.1	0.0	0.2	1.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	30.7	0.81	0.78	0.014	0.35	6.1	5.1	0.14	0.13	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	35.8	0.9	0.9	0.0	0.4	7.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.3	0.07	0.07	0.001	0.03	0.6	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.1	0.1	0.0	0.0	0.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	33.5	0.89	0.85	0.015	0.39	6.7	5.6	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	39.1	1.0	1.0	0.0	0.4	7.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.5	0.11	0.11	0.002	0.05	0.8	0.6	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.1	0.1	0.1	0.0	0.1	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.6	0.17	0.16	0.003	0.08	1.3	1.1	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.7	0.2	0.2	0.0	0.1	1.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.04	0.04	0.001	0.02	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.1	0.10	0.10	0.002	0.05	0.8	0.7	0.02	0.02	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.8	0.1	0.1	0.0	0.1	0.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.09	0.08	0.001	0.15	1.2	0.2	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.1	0.1	0.0	0.2	1.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.1	0.35	0.34	0.004	0.88	7.5	1.0	0.06	0.06	0.001	0.15	1.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.1	0.4	0.4	0.0	1.0	8.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	12.1	0.70	0.68	0.009	1.76	14.9	2.0	0.12	0.11	0.001	0.29	2.5	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	14.1	0.8	0.8	0.0	2.0	17.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.1	0.45	0.43	0.004	0.75	6.3	0.9	0.07	0.07	0.001	0.12	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.0	0.5	0.5	0.0	0.9	7.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.11	0.10	0.001	0.26	2.2	0.3	0.02	0.02	0.000	0.04	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.1	0.1	0.0	0.3	2.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.5	0.06	0.06	0.001	0.03	0.5	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.9	0.1	0.1	0.0	0.0	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.001	0.11	0.9	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.0	0.0	0.0	0.1	1.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.05	0.4	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.1	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0

			PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year						Nonroad /	Category	Emission factors, g/hp hr					
															1	2	3	4	5	6	Marine		NOx	PM10	PM2.5	SOx	VOC	CO
3	Oyster Mitigation - BCC		Cultch Mit.Install	Barge Mounted Crane	1	Main Power	400	0.65	8	N/A	N/A	N/A	9.0	18,720	0%	0%	100%	0%	0%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
3	Oyster Mitigation - BCC			Work Tug	1	Main Power	1,000	0.65	8					46,800	0%	0%	100%	0%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
3	Oyster Mitigation - BCC			Survey/Crewboat	1	Propulsion	200	0.60	8					8,640	0%	0%	100%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	Oyster Mitigation - BCC				1	Auxilliaries	50	0.50	8					1,800	0%	0%	100%	0%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12		MechanicalDredging	Clamshell Dredge (12CY)	1	Main Engines	1,750	0.50	15	N/A	N/A	N/A	22.2	291,270	0%	0%	86%	14%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12				1	Auxilliaries	200	0.60	24					63,913	0%	0%	86%	14%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
3	NW Dredging - BCC - M12			Tow Tug	1	Propulsion	4,500	0.80	15					1,198,368	0%	0%	86%	14%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12				1	Auxilliaries	300	0.50	24					79,891	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12			Tender Tug	2	Propulsion	1,000	0.50	8					177,536	0%	0%	86%	14%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12				2	Auxilliaries	50	0.50	24					26,630	0%	0%	86%	14%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
3	NW Dredging - BCC - M12			Survey/Crewboat	1	Propulsion	400	0.60	14					74,565	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
3	NW Dredging - BCC - M12				1	Auxilliaries	50	0.60	24					15,978	0%	0%	86%	14%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
			LPP: Segment 1 - HSC (Station 028+605 to -3.94)																									
			Pt. of CW1_BSC-BCC_700			TO: M11 & M789																						
1C	NW Dredging - BSC-BCC - M11 & M7/8/9		Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.56	16	3,800,000	16	1,463	162.3	10,472,727	0%	0%	0%	100%	0%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Auxilliaries	1,000	0.80	24					3,116,883	0%	0%	0%	100%	0%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Ladder Pump	1,200	0.67	16					2,088,312	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Cutter & Swing	2,500	0.80	16					5,194,805	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			30"-Booster	1	Main Engines	5000	0.72	16					9,350,649	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Auxilliaries	200	0.6	24					467,532	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			Anchor Barge	2	Auxilliaries	200	0.6	16					623,377	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			Derrick Barge	1	Main Engines	2000	0.5	11					1,785,714	0%	0%	0%	100%	0%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Auxilliaries	200	0.6	11					214,286	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			Spill Barge	1	Auxilliaries	150	0.6	16					233,766	0%	0%	0%	100%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			Tender Tug	4	Propulsion	600	0.5	22					4,285,714	0%	0%	0%	100%	0%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				4	Auxilliaries	50	0.5	24					389,610	0%	0%	0%	100%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			Tow Tug	1	Propulsion	4,500	0.80	8					4,675,325	0%	0%	0%	100%	0%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Auxilliaries	300	0.5	24					584,416	0%	0%	0%	100%	0%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					876,623	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				2	Auxilliaries	50	0.5	24					194,805	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			Crewboat	1	Propulsion	400	0.6	14					545,455	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Auxilliaries	50	0.5	24					97,403	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	223.1	200,824	0%	0%	0%	100%	0%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	Land		Light Towers	2	N/A	8	0.50	18					32,132	0%	0%	0%	100%	0%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	Land		D6 Dozer	2	N/A	200	0.75	18					1,204,943	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	Land		Marsh Hoe	4	N/A	200	0.75	18					2,409,887	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	Land		325 LR Excavator	2	N/A	170	0.75	18					1,024,202	0%	0%	0%	100%	0%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9	Land		Field Truck	1	N/A	180	0.50	18					361,483	0%	0%	0%	100%	0%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - M11 & M7/8/9			Survey/Crewboat	1	Propulsion	200	0.60	14					374,871	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - M11 & M7/8/9				1	Auxilliaries	50	0.50	24					133,883	0%	0%	0%	100%	0%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
			LPP: Segment 1 - HSC (Station 028+605 to -3.94)																									
			Pt. of CW1_BSC-BCC_700			TO: BSC Sed. Attn. Feature																						
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature		Dredging	30" Cutter Suction Dredge	1	Main Engines	7,200	0.60	16	1,541,000	16	1,588	60.7	4,192,141	0%	0%	0%	25%	75%	0%	Marine	Dredge main - large	9.3	0.23	0.22	0.004	0.10	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Auxilliaries	1,000	0.80	24					1,164,484	0%	0%	0%	25%	75%	0%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Ladder Pump	1,200	0.67	16					780,204	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Cutter & Swing	2,500	0.80	16					1,940,806	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			30"-Booster	1	Main Engines	5000	0.7	16					3,396,411	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Auxilliaries	200	0.6	24					174,673	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Anchor Barge	2	Auxilliaries	200	0.6	16					232,897	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Derrick Barge	1	Main Engines	2000	0.5	11					667,152	0%	0%	0%	25%	75%	0%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Auxilliaries	200	0.6	11					80,058	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Spill Barge	1	Auxilliaries	150	0.6	16					87,336	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Tender Tug	4	Propulsion	600	0.5	22					1,601,165	0%	0%	0%	25%	75%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				4	Auxilliaries	50	0.5	24					145,560	0%	0%	0%	25%	75%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Tow Tug	1	Propulsion	4,500	0.80	8					1,746,725	0%	0%	0%	25%	75%	0%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Auxilliaries	300	0.5	24					218,341	0%	0%	0%	25%	75%	0%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			25ft Shallow Draft Workboat	2	Propulsion	450	0.5	12					327,511	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				2	Auxilliaries	50	0.5	24					72,780	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Crewboat	1	Propulsion	400	0.6	14					203,785	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Auxilliaries	50	0.5	24					36,390	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	91.1	81,945	0%	0%	0%	25%	75%	0%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature	Land		Light Towers	2	N/A	8	0.50	18					13,111	0%	0%	0%	25%	75%	0%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature	Land		D6 Dozer	2	N/A	200	0.75	18					491,671	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature	Land		Marsh Hoe	4	N/A	200	0.75	18					983,342	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature	Land		325 LR Excavator	2	N/A	170	0.75	18					417,920	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature	Land		Field Truck	1	N/A	180	0.50	18					147,501	0%	0%	0%	25%	75%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Survey/Crewboat	1	Propulsion	200	0.60	14					152,964	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Auxilliaries	50	0.50	24					54,630	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature		Rock S.P.Install	Barge Mounted Crane	2	Main Power	400	0.65	8	N/A	N/A	N/A	128.0	532,480	0%	0%	0%	25%	75%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			325 LR Excavator	2	N/A	170	0.75	8					261,120	0%	0%	0%	25%	75%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Work Tug	1	Main Power	1,000	0.65	8					665,600	0%	0%	0%	25%	75%	0%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature			Survey/Crewboat	1	Propulsion	200	0.60	8					122,880	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
1C	NW Dredging - BSC-BCC - Sed. Attn. Feature				1	Auxilliaries	50	0.50	8					25,600	0%	0%	0%	25%	75%	0%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
			CONTRACT YEAR 04 - LPP																									
			NED: Segment 5 - Sims Bayou to 610 Bridge (Station 1110+78 to 1160+62)																									
			CD5_Whole			TO: Glendale PA																						
5	Site Preparation - Glendale PA	Land	PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	18.0	129,600	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
5	Site Preparation - Glendale PA	Land		Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	15.0	216,000	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
5	Site Preparation - Glendale PA	Land		Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	15.0	23,400	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
5	NW Dredging - SB-TB		Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	176,049	14	997	12.6	526,558	0%	0%	0%	0%	50%	50%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
5	NW Dredging - SB-TB				1	Auxilliaries	800	0.80	24					193,732	0%	0%	0%	0%	50%	50%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
5	NW Dredging - SB-TB				1	Ladder Pump	1,200	1.00	14					211,894	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB				1	Cutter & Swing	2,500	0.80	14					353,157	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons						Total emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.02	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.11	0.11	0.001	0.28	2.3	0.3	0.02	0.02	0.000	0.05	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.1	0.1	0.0	0.3	2.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.02	0.02	0.000	0.06	0.5	0.1	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.1	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.9	0.26	0.25	0.005	0.11	2.0	1.6	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.5	0.3	0.3	0.0	0.1	2.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.04	0.04	0.001	0.02	0.3	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.02	0.02	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	107.4	2.66	2.54	0.046	1.15	20.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	107.4	2.7	2.5	0.0	1.2	20.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	25.1	0.79	0.76	0.014	0.34	6.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	25.1	0.8	0.8	0.0	0.3	6.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	15.9	0.92	0.90	0.012	2.30	19.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	15.9	0.9	0.9	0.0	2.3	19.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	39.5	2.29	2.23	0.029	5.73	48.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	39.5	2.3	2.2	0.0	5.7	48.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	71.1	4.12	4.02	0.052	10.31	87.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	71.1	4.1	4.0	0.1	10.3	87.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.6	0.21	0.20	0.003	0.52	4.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.6	0.2	0.2	0.0	0.5	4.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.27	0.27	0.003	0.69	5.8	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.3	0.3	0.0	0.7	5.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	13.6	0.79	0.77	0.010	1.97	16.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	13.6	0.8	0.8	0.0	2.0	16.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.09	0.09	0.001	0.24	2.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.1	0.1	0.0	0.2	2.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.15	0.15	0.001	0.26	2.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.2	0.1	0.0	0.3	2.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	41.1	1.09	1.04	0.019	0.47	8.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	41.1	1.1	1.0	0.0	0.5	8.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.1	0.10	0.09	0.002	0.04	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.1	0.1	0.1	0.0	0.0	0.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	44.8	1.19	1.13	0.021	0.52	9.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	44.8	1.2	1.1	0.0	0.5	9.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.15	0.14	0.003	0.06	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.7	0.1	0.1	0.0	0.1	1.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.8	0.22	0.21	0.004	0.11	1.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.8	0.2	0.2	0.0	0.1	1.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.05	0.05	0.001	0.02	0.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.0	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.5	0.14	0.13	0.002	0.07	1.1	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.5	0.1	0.1	0.0	0.1	1.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.13	0.13	0.001	0.22	1.9	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.1	0.1	0.0	0.2	1.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.2	0.53	0.52	0.007	1.33	11.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	9.2	0.5	0.5	0.0	1.3	11.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.3	1.06	1.04	0.013	2.66	22.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	18.3	1.1	1.0	0.0	2.7	22.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.8	0.68	0.65	0.006	1.13	9.6	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.8	0.7	0.7	0.0	1.1	9.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.16	0.16	0.002	0.40	3.4	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.2	0.2	0.0	0.4	3.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.8	0.10	0.09	0.002	0.05	0.7	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.8	0.1	0.1	0.0	0.0	0.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.03	0.03	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	10.7	0.27	0.25	0.005	0.12	2.1	32.2	0.80	0.76	0.014	0.35	6.2	0.0	0.00	0.00	0.000	0.00	0.0	43.0	1.1	1.0	0.0	0.5	8.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.3	0.07	0.07	0.001	0.03	0.6	7.0	0.22	0.21	0.004	0.10	1.7	0.0	0.00	0.00	0.000	0.00	0.0	9.4	0.3	0.3	0.0	0.1	2.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.09	0.08	0.001	0.22	1.8	4.5	0.26	0.25	0.003	0.65	5.5	0.0	0.00	0.00	0.000	0.00	0.0	5.9	0.3	0.3	0.0	0.9	7.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5	11.1	0.64	0.63	0.008	1.60	13.6	0.0	0.00	0.00	0.000	0.00	0.0	14.8	0.9	0.8	0.0	2.1	18.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.5	0.37	0.37	0.005	0.94	8.0	19.4	1.12	1.10	0.014	2.81	23.9	0.0	0.00	0.00	0.000	0.00	0.0	25.8	1.5	1.5	0.0	3.7	31.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.05	0.4	1.0	0.06	0.06	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.1	0.1	0.0	0.2	1.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5	1.3	0.08	0.08	0.001	0.19	1.6	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.1	0.1	0.0	0.3	2.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.07	0.07	0.001	0.18	1.6	3.8	0.22	0.22	0.003	0.55	4.7	0.0	0.00	0.00	0.000	0.00	0.0	5.1	0.3	0.3	0.0	0.7	6.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.03	0.03	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.0	0.0	0.0	0.1	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.1	0.1	0.0	0.1	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.8	0.10	0.10	0.002	0.04	0.8	11.5	0.30	0.29	0.005	0.13	2.3	0.0	0.00	0.00	0.000	0.00	0.0	15.4	0.4	0.4	0.0	0.2	3.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.9	0.03	0.03	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.11	0.11	0.002	0.05	0.8	12.6	0.33	0.32	0.006	0.14	2.5	0.0	0.00	0.00	0.000	0.00	0.0	16.8	0.4	0.4	0.0	0.2	3.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	1.3	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	1.8	0.1	0.1	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	2.5	0.06	0.06	0.001	0.03	0.5	0.0	0.00	0.00	0.000	0.00	0.0	3.3	0.1	0.1	0.0	0.0	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.5	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.01	0.01	0.000	0.01	0.1	1.5	0.04	0.04	0.001	0.02	0.3	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.1	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.5	0.04	0.04	0.000	0.07	0.6	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.1	0.1	0.0	0.1	0.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.01	0.01	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.05	0.05	0.001	0.14	1.2	2.8	0.16	0.16	0.002	0.41	3.5	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.2	0.2	0.0	0.5	4.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.9	0.11	0.11	0.001	0.27	2.3	5.6	0.33	0.32	0.004	0.81	6.9	0.0	0.00	0.00	0.000	0.00	0.0	7.5	0.4	0.4	0.0	1.1	9.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.07	0.07	0.001	0.12	1.0	2.4	0.21	0.20	0.002	0.35	2.9	0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.3	0.3	0.0	0.5	3.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.8	0.05	0.05	0.001	0.12	1.0	0.0	0.00	0.00	0.000	0.00	0.0	1.1	0.1	0.1	0.0	0.2	1.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	1.2	0.03	0.03	0.001	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.00	0.1	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.15	1.2	3.0	0.18	0.17	0.002	0.44	3.7	0.0	0.00	0.00	0.000	0.00	0.0	4.1	0.2	0.2	0.0	0.6	5.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.04	0.04	0.000	0.07	0.6	1.5	0.13	0.13	0.001	0.22	1.8	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.2	0.2	0.0	0.3	2.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.04	0.04	0.001	0.02	0.3	4.8	0.13	0.12	0.002	0.06	1.0	0.0	0.00	0.00	0.000	0.00	0.0	6.4	0.2	0.2	0.0	0.1	1.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.9	0.02	0.02	0.000	0.01	0.2	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
																																				0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.06	0.06	0.001	0.14	1.2	0.0	0.00	0.00	0.000	0.00	0.0	1.0	0.1	0.1	0.0	0.1	1.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.10	0.09	0.001	0.24	2.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.1	0.1	0.0	0.2	2.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.02	0.01	0.000	0.03	0.2	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.7	0.07	0.06	0.001	0.03	0.5	2.7	0.07	0.06	0.001	0.03	0.5	5.4	0.1	0.1	0.0	0.1	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	0.8	0.02	0.02	0.000	0.01	0.2	1.6	0.0	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.05	0.05	0.001	0.12	1.0	0.8	0.05	0.05	0.001	0.12	1.0	1.6	0.1	0.1	0.0	0.2	2.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.3	0.08	0.08	0.001	0.19	1.7	1.3	0.08	0.08	0.001	0.19	1.7	2.7	0.2	0.2	0.0	0.4	3.3

			PART	EQUIPMENT	QTY.	SUB-PART	HP	%USED	HR/DAY	CY	PROD. HRS.	CY/HR	OPER.DAYS	hp hrs	% of work in year 1	2	3	4	5	6	Nonroad / Marine	Category	Emission factors, g/hp hr NOx	PM10	PM2.5	SOx	VOC	CO
5	NW Dredging - SB-TB			24"-Booster	2	Main Engines	4,000	0.68	14					960,588	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB				2	Auxilliaries	200	0.60	24					72,650	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB			Anchor Barge	2	Auxilliaries	200	0.60	14					42,379	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB			Derrick Barge	1	Main Engines	2,000	0.50	11					138,740	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB				1	Auxilliaries	200	0.60	11					16,649	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB			Tender Tug	4	Propulsion	600	0.50	22					332,977	0%	0%	0%	0%	50%	50%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
5	NW Dredging - SB-TB				4	Auxilliaries	50	0.50	24					30,271	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
5	NW Dredging - SB-TB			Tow Tug	1	Propulsion	4,500	0.80	8					363,248	0%	0%	0%	0%	50%	50%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
5	NW Dredging - SB-TB				1	Auxilliaries	300	0.50	24					45,406	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
5	NW Dredging - SB-TB			25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					68,109	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
5	NW Dredging - SB-TB				2	Auxilliaries	50	0.50	24					15,135	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
5	NW Dredging - SB-TB			Crewboat	1	Propulsion	400	0.60	14					42,379	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
5	NW Dredging - SB-TB				1	Auxilliaries	50	0.50	24					7,568	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
5	NW Dredging - SB-TB			Survey/Crewboat	1	Propulsion	200	0.60	14					21,189	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
5	NW Dredging - SB-TB				1	Auxilliaries	50	0.50	24					7,568	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
5	NW Dredging - SB-TB	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	12.6	11,351	0%	0%	0%	0%	50%	50%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
5	NW Dredging - SB-TB	Land		Light Towers	2	N/A	8	0.50	18					1,816	0%	0%	0%	0%	50%	50%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
5	NW Dredging - SB-TB	Land		D6 Dozer	2	N/A	200	0.75	18					68,109	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB	Land		Marsh Hoe	4	N/A	200	0.75	18					136,218	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
5	NW Dredging - SB-TB	Land		325 LR Excavator	2	N/A	170	0.75	18					57,893	0%	0%	0%	0%	50%	50%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
5	NW Dredging - SB-TB	Land		Field Truck	1	N/A	180	0.50	18					20,433	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
			NED: Segment 6 - 610 Bridge to Main Turning Basin (Station 1160+62 to 1266+49)																									
			Pt. of CD6_Whole + TB6_I	Pt. of CD6_Whole + TB6_Brad		TO: Glendale PA																						
6	Site Preparation - Filterbed PA	Land	PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	76.0	547,200	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	Site Preparation - Filterbed PA	Land		Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	62.0	892,800	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
6	Site Preparation - Filterbed PA	Land		Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	62.0	96,720	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
6	NW Dredging - TB		Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.71	14	733,529	14	997	52.6	2,193,965	0%	0%	0%	0%	50%	50%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
6	NW Dredging - TB				1	Auxilliaries	800	0.80	24					807,208	0%	0%	0%	0%	50%	50%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB				1	Ladder Pump	1,200	1.00	14					882,883	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB				1	Cutter & Swing	2,500	0.80	14					1,471,472	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			24"-Booster	2	Main Engines	4,000	0.68	14					4,002,405	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB				2	Auxilliaries	200	0.60	24					302,703	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			Anchor Barge	2	Auxilliaries	200	0.60	14					176,577	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			Derrick Barge	1	Main Engines	2,000	0.50	11					578,078	0%	0%	0%	0%	50%	50%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB				1	Auxilliaries	200	0.60	11					69,369	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			Tender Tug	4	Propulsion	600	0.50	22					1,387,388	0%	0%	0%	0%	50%	50%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB				4	Auxilliaries	50	0.50	24					126,126	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB			Tow Tug	1	Propulsion	4,500	0.80	8					1,513,514	0%	0%	0%	0%	50%	50%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB				1	Auxilliaries	300	0.50	24					189,189	0%	0%	0%	0%	50%	50%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB			25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					283,784	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB				2	Auxilliaries	50	0.50	24					63,063	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB			Crewboat	1	Propulsion	400	0.60	14					176,577	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB				1	Auxilliaries	50	0.50	24					31,532	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB			Survey/Crewboat	1	Propulsion	200	0.60	14					88,288	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB				1	Auxilliaries	50	0.50	24					31,532	0%	0%	0%	0%	50%	50%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	83.0	74,657	0%	0%	0%	0%	50%	50%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
6	NW Dredging - TB	Land		Light Towers	2	N/A	8	0.50	18					11,945	0%	0%	0%	0%	50%	50%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
6	NW Dredging - TB	Land		D6 Dozer	2	N/A	200	0.75	18					447,944	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB	Land		Marsh Hoe	4	N/A	200	0.75	18					895,888	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB	Land		325 LR Excavator	2	N/A	170	0.75	18					380,752	0%	0%	0%	0%	50%	50%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
6	NW Dredging - TB	Land		Field Truck	1	N/A	180	0.50	18					134,383	0%	0%	0%	0%	50%	50%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
			NED: Segment 6 - 610 Bridge to Main Turning Basin (Station 00+00 to 30+95)																									
			Pt. of CD6_Whole			TO: Filterbed PA																						
6	Site Preparation - Filterbed PA	Land	PAPrep.	D6 Dozer	6	N/A	200	0.75	8	N/A	N/A	N/A	47.0	338,400	0%	0%	0%	0%	100%	0%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	Site Preparation - Filterbed PA	Land		Dragline	4	N/A	600	0.75	8	N/A	N/A	N/A	36.0	518,400	0%	0%	0%	0%	100%	0%	Nonroad	300 ≤ hp < 600	6.9	0.40	0.39	0.005	1.00	8.5
6	Site Preparation - Filterbed PA	Land		Field Truck	2	N/A	130	0.75	8	N/A	N/A	N/A	36.0	56,160	0%	0%	0%	0%	100%	0%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
6	NW Dredging - TB		Dredging	24" Cutter Suction Dredge	1	Main Engines	4,200	0.79	14	266,671	14	1,099	17.3	805,109	0%	0%	0%	0%	0%	100%	Marine	Dredge main - small	9.3	0.23	0.22	0.004	0.10	1.8
6	NW Dredging - TB				1	Auxilliaries	800	0.80	24					266,220	0%	0%	0%	0%	0%	100%	Marine	Dredge aux	7.3	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB				1	Ladder Pump	1,200	1.00	14					291,179	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB				1	Cutter & Swing	2,500	0.80	14					485,298	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			24"-Booster	1	Main Engines	4,000	0.70	14					679,417	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB				1	Auxilliaries	200	0.60	24					49,916	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			Anchor Barge	2	Auxilliaries	200	0.60	14					58,236	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			Derrick Barge	1	Main Engines	2,000	0.50	11					190,653	0%	0%	0%	0%	0%	100%	Nonroad	>750	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB				1	Auxilliaries	200	0.60	11					22,878	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB			Tender Tug	4	Propulsion	600	0.50	22					457,566	0%	0%	0%	0%	0%	100%	Marine	Tug main - small	8.7	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB				4	Auxilliaries	50	0.50	24					41,597	0%	0%	0%	0%	0%	100%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB			Tow Tug	1	Propulsion	4,500	0.80	8					499,163	0%	0%	0%	0%	0%	100%	Marine	Tug main - large	8.7	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB				1	Auxilliaries	300	0.50	24					62,395	0%	0%	0%	0%	0%	100%	Marine	Tug aux	7.3	0.23	0.22	0.004	0.10	1.7
6	NW Dredging - TB			25ft Shallow Draft Workboat	2	Propulsion	450	0.50	12					93,593	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB				2	Auxilliaries	50	0.50	24					20,798	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB			Crewboat	1	Propulsion	400	0.60	14					58,236	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB				1	Auxilliaries	50	0.50	24					10,399	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB			Survey/Crewboat	1	Propulsion	200	0.60	14					29,118	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB				1	Auxilliaries	50	0.50	24					10,399	0%	0%	0%	0%	0%	100%	Marine	Miscellaneous	9.1	0.23	0.22	0.004	0.11	1.8
6	NW Dredging - TB	Land	Shaping &Grading	400A Welder	2	N/A	50	0.50	18	N/A	N/A	N/A	47.7	42,959	0%	0%	0%	0%	0%	100%	Nonroad	(50 ≤ hp < 100)	6.9	0.60	0.58	0.005	1.00	8.5
6	NW Dredging - TB	Land		Light Towers	2	N/A	8	0.50	18					6,873	0%	0%	0%	0%	0%	100%	Nonroad	(11 ≤ hp < 25)	7.1	0.60	0.58	0.005	1.00	4.9
6	NW Dredging - TB	Land		D6 Dozer	2	N/A	200	0.75	18					257,753	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB	Land		Marsh Hoe	4	N/A	200	0.75	18					515,506	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5
6	NW Dredging - TB	Land		325 LR Excavator	2	N/A	170	0.75	18					219,090	0%	0%	0%	0%	0%	100%	Nonroad	100 ≤ hp < 175	6.9	0.60	0.58	0.005	1.00	8.5
6	NW Dredging - TB	Land		Field Truck	1	N/A	180	0.50	18					77,326	0%	0%	0%	0%	0%	100%	Nonroad	175 ≤ hp < 300	6.9	0.40	0.39	0.005	1.00	8.5

Water
Land
% land
Possible duplicate work

		1	2	3	4	5	6
hphr	421,644,274	96,769,046	154,655,623	64,638,854	61,678,763	28,616,689	15,285,298
NOx g/hphr*	9						
tons	4,179	959	1,533	641	611	284	152
* Order-of-magnitude for quick estimate							
Quick / actual		1.13	1.15	1.13	1.14	1.17	1.17

Year 1 emissions, tons						Year 2 emissions, tons						Year 3 emissions, tons						Year 4 emissions, tons						Year 5 emissions, tons						Year 6 emissions, tons						Total emissions, tons					
NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO	NOx	PM10	PM2.5	SOx	VOC	CO
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5	3.7	0.21	0.21	0.003	0.53	4.5	7.3	0.4	0.4	0.0	1.1	9.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.3	0.02	0.02	0.000	0.04	0.3	0.6	0.0	0.0	0.0	0.1	0.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.02	0.2	0.2	0.01	0.01	0.000	0.02	0.2	0.3	0.0	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6	1.1	0.1	0.1	0.0	0.2	1.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.01	0.1	0.1	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.6	0.04	0.04	0.001	0.02	0.3	1.6	0.04	0.04	0.001	0.02	0.3	3.2	0.1	0.1	0.0	0.0	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.05	0.04	0.001	0.02	0.3	1.7	0.05	0.04	0.001	0.02	0.3	3.5	0.1	0.1	0.0	0.0	0.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1	0.7	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.01	0.1	0.0	0.00	0.00	0.000	0.01	0.1	0.1	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.01	0.000	0.04	0.3	0.3	0.02	0.01	0.000	0.04	0.3	0.5	0.0	0.0	0.0	0.1	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.08	0.6	0.5	0.03	0.03	0.000	0.08	0.6	1.0	0.1	0.1	0.0	0.2	1.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.02	0.02	0.000	0.03	0.3	0.2	0.02	0.02	0.000	0.03	0.3	0.4	0.0	0.0	0.0	0.1	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.1	0.1	0.00	0.00	0.000	0.01	0.1	0.2	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.24	0.24	0.003	0.60	5.1	0.0	0.00	0.00	0.000	0.00	0.0	4.2	0.2	0.2	0.0	0.6	5.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.8	0.39	0.38	0.005	0.98	8.4	0.0	0.00	0.00	0.000	0.00	0.0	6.8	0.4	0.4	0.0	1.0	8.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.06	0.06	0.001	0.11	0.9	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.1	0.1	0.0	0.1	0.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	11.2	0.28	0.27	0.005	0.12	2.2	11.2	0.28	0.27	0.005	0.12	2.2	22.5	0.6	0.5	0.0	0.2	4.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.2	0.10	0.10	0.002	0.04	0.8	3.2	0.10	0.10	0.002	0.04	0.8	6.5	0.2	0.2	0.0	0.1	1.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.19	0.19	0.002	0.49	4.1	3.4	0.19	0.19	0.002	0.49	4.1	6.7	0.4	0.4	0.0	1.0	8.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.6	0.32	0.32	0.004	0.81	6.9	5.6	0.32	0.32	0.004	0.81	6.9	11.2	0.6	0.6	0.0	1.6	13.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	15.2	0.88	0.86	0.011	2.21	18.8	15.2	0.88	0.86	0.011	2.21	18.8	30.4	1.8	1.7	0.0	4.4	37.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.2	0.07	0.07	0.001	0.17	1.4	1.2	0.07	0.07	0.001	0.17	1.4	2.3	0.1	0.1	0.0	0.3	2.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.7	0.04	0.04	0.000	0.10	0.8	0.7	0.04	0.04	0.000	0.10	0.8	1.3	0.1	0.1	0.0	0.2	1.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.12	0.002	0.32	2.7	2.2	0.13	0.12	0.002	0.32	2.7	4.4	0.3	0.2	0.0	0.6	5.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.01	0.000	0.04	0.3	0.3	0.02	0.01	0.000	0.04	0.3	0.5	0.0	0.0	0.0	0.1	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	6.7	0.18	0.17	0.003	0.08	1.3	6.7	0.18	0.17	0.003	0.08	1.3	13.3	0.4	0.3	0.0	0.2	2.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.02	0.02	0.000	0.01	0.1	0.5	0.02	0.02	0.000	0.01	0.1	1.0	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	7.3	0.19	0.18	0.003	0.08	1.5	7.3	0.19	0.18	0.003	0.08	1.5	14.5	0.4	0.4	0.0	0.2	2.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.8	0.02	0.02	0.000	0.01	0.2	0.8	0.02	0.02	0.000	0.01	0.2	1.5	0.0	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.04	0.03	0.001	0.02	0.3	1.4	0.04	0.03	0.001	0.02	0.3	2.8	0.1	0.1	0.0	0.0	0.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.01	0.01	0.000	0.00	0.1	0.6	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.9	0.02	0.02	0.000	0.01	0.2	1.8	0.0	0.0	0.0	0.0	0.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.01	0.01	0.000	0.01	0.1	0.4	0.01	0.01	0.000	0.01	0.1	0.9	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.2	0.00	0.00	0.000	0.00	0.0	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.02	0.02	0.000	0.04	0.3	0.3	0.02	0.02	0.000	0.04	0.3	0.6	0.0	0.0	0.0	0.1	0.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.01	0.0	0.0	0.00	0.00	0.000	0.01	0.0	0.1	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.10	0.10	0.001	0.25	2.1	1.7	0.10	0.10	0.001	0.25	2.1	3.4	0.2	0.2	0.0	0.5	4.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.4	0.20	0.19	0.002	0.49	4.2	3.4	0.20	0.19	0.002	0.49	4.2	6.8	0.4	0.4	0.0	1.0	8.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.4	0.13	0.12	0.001	0.21	1.8	1.4	0.13	0.12	0.001	0.21	1.8	2.9	0.3	0.2	0.0	0.4	3.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.03	0.03	0.000	0.07	0.6	0.5	0.03	0.03	0.000	0.07	0.6	1.0	0.1	0.1	0.0	0.1	1.3
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.6	0.15	0.15	0.002	0.37	3.2	0.0	0.00	0.00	0.000	0.00	0.0	2.6	0.1	0.1	0.0	0.4	3.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.23	0.22	0.003	0.57	4.9	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.2	0.2	0.0	0.6	4.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.04	0.04	0.000	0.06	0.5	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.0	0.0	0.0	0.1	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	8.3	0.20	0.20	0.004	0.09	1.6	8.3	0.2	0.2	0.0	0.1	1.6
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.1	0.07	0.06	0.001	0.03	0.5	2.1	0.1	0.1	0.0	0.0	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.2	0.13	0.13	0.002	0.32	2.7	2.2	0.1	0.1	0.0	0.3	2.7
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.7	0.21	0.21	0.003	0.53	4.5	3.7	0.2	0.2	0.0	0.5	4.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	5.2	0.30	0.29	0.004	0.75	6.4	5.2	0.3	0.3	0.0	0.7	6.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.02	0.02	0.000	0.06	0.5	0.4	0.0	0.0	0.0	0.1	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.4	0.03	0.03	0.000	0.06	0.5	0.4	0.0	0.0	0.0	0.1	0.5
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.5	0.08	0.08	0.001	0.21	1.8	1.5	0.1	0.1	0.0	0.2	1.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.03	0.2	0.2	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.4	0.12	0.11	0.002	0.05	0.9	4.4	0.1	0.1	0.0	0.1	0.9
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	4.8	0.13	0.12	0.002	0.06	1.0	4.8	0.1	0.1	0.0	0.1	1.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.5	0.02	0.02	0.000	0.01	0.1	0.5	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.9	0.02	0.02	0.000	0.01	0.2	0.9	0.0	0.0	0.0	0.0	0.2
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.2	0.01	0.01	0.000	0.00	0.0	0.2	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.01	0.01	0.000	0.01	0.1	0.6	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.01	0.01	0.000	0.00	0.1	0.3	0.0	0.0	0.0	0.0	0.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.00	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.3	0.03	0.03	0.000	0.05	0.4	0.3	0.0	0.0	0.0	0.0	0.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.1	0.00	0.00	0.000	0.01	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	2.0	0.11	0.11	0.001	0.28	2.4	2.0	0.1	0.1	0.0	0.3	2.4
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	3.9	0.23	0.22	0.003	0.57	4.8	3.9	0.2	0.2	0.0	0.6	4.8
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	1.7	0.14	0.14	0.001	0.24	2.1	1.7	0.1	0.1	0.0	0.2	2.1
0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.0	0.00	0.00	0.000	0.00	0.0	0.6	0.03	0.03	0.000	0.09	0.7	0.6	0.0	0.0	0.0	0.1	0.7
849.9	32.09	31.00	0.469	48.54	470.4	1329.6	54.12	52.39	0.767	93.24	869.8	565.2	22.09	21.36	0.316	35.44	337.3	534.8	21.61	20.91	0.305	36.24	340.0	242.8	10.55	10.22	0.144	19.33	176.6	129.5	5.62	5.44	0.077	10.28	93.9	3651.8	146.1	141.3	2.1	243.1	2288.0
782.4	27.8	26.8	0.4	38.8	387.4	1248.1	49.0	47.4	0.7	81.4	769.5	524.9	19.5	18.8	0.3	29.6	287.7	486.5	18.5	17.9	0.3	29.2	280.7	200.6	7.9	7.7	0.1	13.2	124.7	112.4	4.5	4.4	0.1	7.8	73.0	3354.9	127.1	122.9	1.9	200.1	1923.1
67.5	4.3	4.2	0.0	9.8	83.0	81.6	5.2	5.0	0.1	11.8	100.3	40.3	2.6	2.5	0.0	5.8	49.6	48.3	3.1	3.0	0.0	7.0	59.3	42.1	2.6	2.6	0.0	6.1	51.9	17.0	1.1	1.1	0.0	2.5	20.9	296.9	18.9	18.4	0.2	43.0	364.9
8%	13%	13%	10%	20%	18%	6%	10%	10%	8%	13%	12%	7%	12%	12%	9%	16%	15%	9%	14%	15%	11%	19%	17%	17%	25%	25%	21%	32%	29%	13%	20%	20%	16%	24%	22%	8%	13%	13%	10%	18%	16%
0.0	0.0	0.0	0.0	0.0	0.0	232.7	6.9	6.6	0.1	5.6	69.6	38.8	1.1	1.1	0.0	0.9	11.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	271.4	8.0	7.7	0.1	6.6	81.2
																																				3380.4	138.0	133.6	1.9	236.5	2206.8

Attachment B

TCEQ Letter of Agreement

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 22, 2020

Colonel Timothy Vail
Commander and District Engineer
USACE Galveston District
P.O. Box 1229
Galveston, TX 77553-1229

Via Email

Subject: General Conformity Concurrence for the Houston Ship Channel Expansion Channel Improvement Project, Harris, Chambers, and Galveston Counties, Texas

Dear Colonel Vail:

The Texas Commission on Environmental Quality (TCEQ) completed its review of the Draft General Conformity Determination for the Houston Ship Channel Expansion Channel Improvement Project in Harris, Chambers, and Galveston Counties that was received September 9, 2020 as well as the subsequent revisions received October 19, 2020. The TCEQ reviewed the action in accordance with the general conformity requirements established in Title 40 Code of Federal Regulations (CFR) Part 93 Subpart B and concurs with the determination submitted by the United States Army Corps of Engineers (USACE) that the project conforms to the Texas State Implementation Plan (SIP).

The proposed action is located in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area, which is currently classified by the United States Environmental Protection Agency (EPA) as serious for the 2008 eight-hour ozone National Ambient Air Quality Standard (NAAQS) and marginal for the 2015 eight-hour ozone NAAQS. General conformity requirements apply according to the serious classification because that is the more stringent standard. The USACE presented data demonstrating that the proposed action would result in nitrogen oxides (NO_X) emissions that exceed the general conformity *de minimis* threshold of 50 tons per year (tpy) in project years 2021 through 2025, with estimated emissions of 1,473 tpy in three of those years. The proposed action is also expected to result in volatile organic compounds emissions that exceed the general conformity *de minimis* threshold in project years 2022 through 2025, with estimated emissions of 119 tpy in three of those years.

The general conformity demonstration for this action relies on 40 CFR §93.158(a)(5)(i)(a), which requires that the state determine and document that the total direct and indirect emissions from the proposed action will not exceed the emissions budget specified in the applicable SIP. The general conformity emissions budget used for this demonstration was allocated from the *Reasonable Further Progress SIP Revision for the HGB 2008 Eight-Hour Ozone Nonattainment Area*, adopted by the TCEQ December 15, 2016 and approved by the EPA February 13, 2019 (84 FR 3708). Based on the general conformity emissions budget allocated from the applicable SIP, the TCEQ concurs with the USACE's determination.

Although the USACE sufficiently demonstrated conformity for this project, the TCEQ suggests adoption of pollution prevention and/or reduction measures, such as those listed below, in conjunction with this and future projects:

- Encourage construction contractors to apply for Texas Emissions Reduction Plan grants;
- Establish bidding conditions that give preference to contractors who proactively limit air pollutant emissions and idling of construction vehicles;
- Direct construction contractors to exercise air quality best management practices such as fueling vehicles late in the day during ozone season;
- Direct contractors and operators to use newer, lower emissions vehicles and equipment whenever possible;
- Select equipment based on lowest NO_x emissions instead of lowest price; and
- Purchase and permanently retire surplus NO_x offsets prior to commencement of operations.

Thank you for providing the information necessary to evaluate the proposed action. We appreciate any appropriate updates as this project progresses, and we look forward to working with you on upcoming projects affecting air quality in Texas. If you require further assistance on this matter, please contact Jamie Zech of the Air Quality Division at 512-239-3935 or jamie.zech@tceq.texas.gov.

Sincerely,

Donna F. Huff, Director
Air Quality Division

cc: Guy Donaldson, Branch Chief, EPA Region 6 Air & Radiation Division