Texas City Channel Deepening Project

Draft General Conformity Determination

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USACE – GALVESTION DISTRICT, TEXAS CITY CHANNEL DEEPENING PROJECT
CLEAN AIR ACT DRAFT GENERAL CONFORMITY DETERMINATION

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LIST OF ABREVIATIONS

CAA ..... Clean Air Act
CFR ..... Code of Federal Regulations
CO ..... Carbon Monoxide
GCR ..... General Conformity Rule
HC ..... Hydrocarbons
HP ..... Horsepower
mmBtu ..... Million British Thermal Units
NAAQS ..... National Ambient Air Quality Standards
NO_X ..... Oxides of Nitrogen
NSR ..... Non-Attainment New Source Review
O_3 ..... Ozone
Pb ..... Airborne Lead
PM ..... Particulate Matter
$PM_{2.5}$ ..... Particulate Matter with an Equivalent Aerodynamic Diameter Less Than 2.5 um
PM_{10} ..... Particulate Matter with an Equivalent Aerodynamic Diameter Less Than 10 um
PSD ..... Prevention of Significant Deterioration
PX ..... Post Exchange
SIP ..... State Implementation Plan
SO_2 ..... Sulfur Dioxide
TPY ..... Tons Per Year
USEPA ..... United States Environmental Protection Agency
TCEQ ..... Texas Commission on Environmental Quality
VOC ..... Volatile Organic Compounds

LIST OF DEFINITIONS

AP-42:
AP 42 is a compilation of air pollution emission factors and background information prepared by the EPA for various emission sources. These documents include a literature review, emissions factor methodologies and reference materials. An emissions factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. These factors are usually expressed as the weight of pollutant divided by a unit weight, volume, distance, or duration of the activity emitting the pollutant (e.g., kilograms of particulate emitted per megagram of coal burned). Such factors facilitate estimation of emissions from various sources of air pollution.

Clean Air Act (CAA):
The Clean Air Act is the comprehensive Federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

Criteria Air Pollutant:
A criteria pollutant is a pollutant for which an air quality standard has been established under the Clean Air Act (CAA). Under the requirements of the Clean Air Act and its amendments, USEPA established standards, known as the National Ambient Air Quality Standards (NAAQS), for six (6) criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), inhalable particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb).

***De Minimis* Emission Levels:**
Threshold rates of emissions which have been established for federal actions with the potential to have significant air quality impacts. A formal conformity determination is required when the annual direct and indirect emissions from a federal action, occurring in a non-attainment or maintenance area, equals or exceeds the *de minimis* level.

Federal Action:
Federal action", as defined in 30 TAC 101.30 of the Texas Administrative Code (TAC), means 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. Activities related to transportation plans, programs, and projects developed, funded, or approved under Title 23 USC or the Federal Transit Act (49 USC §§1601 et seq.) are not considered to be federal actions under general conformity. Where the federal action is a permit, license, or other approval for some aspect of a nonfederal undertaking, the relevant activity is the part, portion, or phase of the nonfederal undertaking that required the federal permit, license, or approval.

General Conformity:
Section 176(c) of the Clean Air Act prohibits Federal entities from taking actions in non-attainment or maintenance areas which do not conform to the State implementation plan (SIP) for the attainment and maintenance of the national ambient air quality standards (NAAQS). Therefore, the purpose of conformity is to (1) ensure Federal activities do not interfere with the budgets in the SIPs; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of the NAAQS

National Ambient Air Quality Standards (NAAQS):

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. The Clean Air Act established two types of national air quality standards. ***Primary standards*** set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. ***Secondary standards*** set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings. The EPA Office of Air Quality Planning and Standards (OAQPS) has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants.

Non-Attainment Area:

A non-attainment area is any area that does not meet the federal air quality standard because of exceedances of any of the National Ambient Air Quality Standards for the six criteria pollutants.

EPA NONROAD Model:

EPA model which establishes emission factors for off road mobile sources. It's primary use is for estimation of air pollution inventories by professional mobile source modelers, such as state air quality officials and consultants.

Ozone:

Ozone is a gas composed of three atoms of oxygen. Ozone occurs both in the Earth's upper atmosphere and at ground level. Ozone can be good or bad, depending on where it is found. In the Earth's lower atmosphere, near ground level, ozone is formed when pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants, and other sources chemically react in the presence of sunlight. Ozone at ground level is a harmful air pollutant. Ground-level ozone is formed when ozone precursors react in the atmosphere in the presence of sunlight. Various adverse health affects are associated with elevated ozone levels in the lower atmosphere including respiratory and lung irritation/disease.

Ozone Precursors:

NO_X and VOCs are called ozone precursors. Motor vehicle exhaust, industrial emissions, and chemical solvents are the major sources of these chemicals. Nitrogen oxides (NO_X) and volatile organic compounds (VOCs), such as xylene, react in the atmosphere in the presence of sunlight to form Ozone.

State Implementation Plan (SIP):

The federal Clean Air Act addresses the nation's chronic air pollution problems by requiring states to submit State Implementation Plans (SIPs) to the U.S. Environmental Protection Agency. These plans detail the steps that the states are taking to bring their air quality into compliance with federal standards. In certain cases, the Clean Air Act requires specific air pollution control programs. The State Implementation Plan is essentially each individual state's plan for complying with the federal Clean Air Act.

SECTION 1 INTRODUCTION

The United States Army Corps of Engineers has retained the services of the Berger/EA-JV to perform a general conformity analysis with respect to the Texas City Channel Deepening project in Galveston County, Texas. In support of the environmental assessment for this project, the JV prepared a conformity analysis for the proposed project pursuant to the Clean Air Act 176(c)(1), to assess emissions from the project and to demonstrate conformance with the Texas State Implementation Plan (SIP) for the Houston-Galveston-Brazoria Area. The objective of the conformity analysis is to insure that the proposed action will not violate the emissions allowance of the SIP, USEPA and Texas air quality standards.

1.1 Description of Project

The Texas City Channel is a Federal deep-draft navigation project serving the port of Texas City in Galveston County, Texas. The existing project consists of a channel 40 feet deep, 400 feet wide and about 6.75 miles long, from Bolivar Roads to a turning basin at Texas City, 40 feet deep, 1,000 feet to 1,200 feet wide and 4,253 feet long; and an Industrial Canal, 40 feet deep and 300-400 feet wide extending a distance of 1.7 miles southwestward from the south end of Texas City Turning Basin, and a turning basin, 40 feet deep, 1,000 feet wide and 1,150 feet long. The Texas City Channel is protected from cross currents and shoaling by the Texas City Dike, which consists of a pile dike 28,200 feet long, parallel to and north of the channel; and a rubble-mound dike, 27,600 feet long, along the southerly side of the pile dike. The 40-foot channel was completed in June 1967. Widening and realigning of the Texas City Turning Basin and enlargement through widening and deepening of the Industrial Canal and basins was initiated in July 1980 and completed in June 1982. The only work remaining is deferred construction consisting of widening the Industrial Canal from 250 feet to 300 feet at 40 feet depth.

Section 201 of the Water Resources Development Act (WRDA) of 1986, Public Law 99-662, dated 17 November 1986, authorized the Texas City Channel 50-Foot project. Work authorized by WRDA 1986 provided for deepening the Texas City Turning Basin to 50 feet, enlarging the 6.7-mile long Texas City Channel to 50 feet by 600 feet, deepening the Bolivar Roads Channel and Inner Bar Channel to 50 feet, deepening the Outer Bar and Galveston Entrance Channels to 52 feet, and extending the Galveston Entrance Channel to a 52-foot depth for 4.1 miles at a width of 800 feet and a additional reach at a width of 600 feet to the 52- foot contour in the Gulf of Mexico. Establishment of 600 acres of wetland and development of water-oriented recreational facilities on a 90-acre enlargement of the Texas City Dike were also authorized.

The current Recommended Plan calls for deepening the Texas City Channel to a depth of 45-feet and maintaining the existing 400-feet bottom width for approximately 7 miles of channel including the turning basin (see attachment regarding construction quantity, equipment and schedule information). For the purposes of this analysis, the project has been divided into three phases based upon contracts: 1) Pelican Island Levee Construction, 2) Rock Groin Construction, and 3) Levees 2, 3, 4 and 5. No overlap of the three (3) contracts is anticipated. For the purposed of this analysis, the proposed action is defined as construction activities related to the Texas City Channel expansion.

1.2 Clean Air Conformity

The 1990 amendments to the Clean Air Act (CAA) require federal agencies to conform to SIPs in non-attainment areas (such as the Houston-Galveston-Brazoria Area). SIPs are state air quality regulations that provide for the implementation, maintenance, and enforcement of the National Ambient Air Quality Standards (NAAQS) and include emission limitations and control measures to attain and maintain the NAAQS. Federal agencies are required to determine if proposed actions conform to the applicable SIP.

The US Environmental Protection Agency (USEPA) has developed two conformity regulations for transportation and non-transportation projects. Transportation projects are governed by the "transportation conformity" regulations (40 CFR Parts 51 and 93). Non-transportation projects are governed by the "general conformity" regulations (40 CFR Parts 6, 51 and 93) described in the final rule for *Determining Conformity of General Federal Actions to State or Federal Implementation Plans.* Since the proposed project is a non-transportation project, only the general conformity rule applies.

1.3 Outline

Section 2 of the report contains a discussion of the conformity regulations and how they apply to the project. Section 3 describes the analysis used to make the conformity determination. Section 4 presents the conclusion of the analysis.

SECTION 2 GENERAL CONFORMITY

2.1 Attainment and Non-attainment Areas

The General Conformity Rule applies to federal actions occurring in regions designated as being in non-attainment for the NAAQS or attainment areas subject to maintenance plans (maintenance areas). A criteria pollutant is a pollutant for which an air quality standard has been established under the CAA. Under the requirements of the Clean Air Act (CAA) and its amendments, USEPA established standards, known as the NAAQS, for six (6) criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), inhalable particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb).

Non-attainment designation is based on the exceedances or violations of the air quality standard established for a criteria air pollutant. A maintenance plan establishes measures to control emissions so as to ensure that the air quality standard is maintained in areas that have been redesignated as attainment from a previous non-attainment status. The proposed action would take place in the Houston-Galveston-Brazoria Area (HGA), Galveston County, TX, which is located in an area currently designated as moderate non-attainment for O_3 and in attainment for the other criteria pollutants. O_3 is principally formed through chemical reactions of NO_x and VOC in the atmosphere therefore, only emissions of NO_x and VOC are included in the analysis. No maintenance areas are located in the vicinity of the project.

2.2 *De Minimis* Emission Levels

Threshold *(de minimis)* rates of emissions have been established for federal actions with the potential to have significant air quality impacts. Based upon the preliminary air conformity analysis completed December 1, 2005 by Berger, it was determined that construction of the proposed plan and schedule would generate air emissions above *de minimis* levels specified in 40 CFR 93.153(b)(1) for non-attainment areas 40 CFR 93.153(c)(1). Per the provisions of 40 CFR 93.150, a formal conformity determination is required when the annual direct and indirect emissions from a federal action, occurring in a non-attainment or maintenance area, equals or exceeds the *de minimis* level. Table 2-2 lists the *de minimis* levels by pollutant, while Table 2-3 lists ozone attainment classification and *de minimis* levels for specific counties/areas in Texas as provided by the Texas Commission on Environmental Quality (TCEQ). Since the project is located in a moderate O_3 non-attainment area, only the 100 tons per year of VOC or NO_x threshold applies.

2.3 Regional Significance

A federal action that does not exceed the threshold emission rates of criteria pollutants may still be subject to a general conformity determination if the direct and indirect emissions from the action exceed ten percent of the total emissions inventory for a particular criteria pollutant in a non-attainment or maintenance area. If the emissions exceed this ten-percent threshold, the federal action is considered to be a "regionally significant" activity, and thus, the general conformity rules apply.

2.4 SIP Emissions Inventory

The NO_X emission inventory is based on the combined 2004 Statewide Diesel Construction NonRoad Mobile Emissions for the eight counties which make up the Houston-Galveston-Brazoria Area. This inventory was provided by Karla Hardison of the TCEQ Mobile Source Monitoring Department and was taken from the 2004 HGB SIP. The 2004 NO_X emission inventory for the HGB area is 10,338.70 tons. As per TCEQ guidance a 2.5 % annual growth rate can be applied to estimate specific years of interest as a general default. As discussed in the previous section, if emissions from the project are below ten percent of the emission inventory for that year then the project is not considered to be "regionally significant". Table 2-1 details total NO_X emissions by calendar year for the duration of the project and compares these emissions to the adjusted NO_X NonRoad Mobile Source Emission Inventory.

Table 2-1
Summary Total NO_X Emissions

Year	Total Emissions (tons/year)	HGB NO_X Emission Inventory (tons/year)	% of Inventory
	NO_X		
2008	420.95	11,411.99	3.69
2009	123.01	11,697.29	1.05
2010	1,176.06	11,989.72	9.81
2011	438.60	12,289.46	3.57
2012	87.33	12,596.70	0.69

* 2.5% annual growth rate applied to NO_X emissions inventory for each year as per Karla Hardison of the TCEQ Mobile Source Monitoring Department.

Table 2-2
***De Minimis* Emission Levels for Applicable Air Pollutants**

Pollutant	Non-attainment Designation	TPY
Ozone	Serious	50
	Severe	25
	Extreme	10
	Other non-attainment areas outside ozone transport region	100*
	Marginal and Moderate non-attainment areas inside ozone transport region (VOC / NOx)	50/100**
Carbon Monoxide	All	100
Sulfur Dioxide	All	100
Lead	All	25
Nitrogen Dioxide	All	100
Particulate Matter	Moderate	100
	Serious	70

Notes:
* Applies to ozone precursors – volatile organic compounds (VOC) and nitrogen oxides.(NO_x)
** VOC/NO_x
*** Galveston County has a non-attainment designation of moderate for Ozone

Table 2-3
Attainment Classification/*De Minimis* Emission Levels for Texas

Area	Classification	VOC tpy	NOx tpy
Houston-Galveston-Brazoria (8-county area)	Moderate ozone non-attainment	100	100
Beaumont–Port Arthur (3-county area)	Moderate ozone non-attainment	100	100
Dallas–Fort Worth (9-county area)	Moderate ozone non-attainment	100	100

SECTION 3 ANALYSIS

The conformity analysis examines the impacts of the net direct and indirect emissions resulting from the project. Direct emissions are emissions of a criteria pollutant or its precursors that are caused or initiated by a federal action and occur at the same time and place as the action. Indirect emissions, occurring later in time and/or further removed in distance from the action itself, must be included in the determination if both of the following apply; the federal agency can practicably control the emissions and has continuing program responsibility to maintain control and the emissions caused by the federal action are reasonably foreseeable. In the case of this action, there are not expected to be any associated indirect emissions and only direct emissions are considered.

3.1 Activities Included in this Action

Assumptions and equipment schedules were based on those provided by the Galveston District. The project was assumed to take place during the period from 2008 to 2012. A list of equipment and their assumed operating schedule was provided by ACOE on a per contract basis. The majority of construction activities will be marine based and a very small group of people (approximately 25) will actually commute to and from the site on a daily basis. As such, traffic emissions do not need to be included since there is a negligible increase in passenger trips for the project. A summary of the emission estimates for operational sources is presented in Table 3-1. Detailed emission calculations for these sources are presented in Appendix A. Emissions have been broken down by land based and marine based equipment and then further categorized by calendar year.

Since the action refers to construction projects, only construction activities-related air emissions were analyzed. VOC and NO_X emissions from construction would result from the following potential activities:

- Use of construction equipment.
- Use of amphibious dredging equipment.

In estimating NO_x and VOC emissions, dredging was assumed to take place 24 hours a day / 7 days a week while other construction activities were assumed to take place 8 hours a day / 5 days a week. The usage of equipment and the duration of activities for construction were determined based on information provided by the Galveston District. The increase in emissions was then calculated using the USEPA provided guidance and emission factors.

3.2 Emissions Determination

Emission factors for the dredges were obtained from the USEPA, Office of Mobile Sources "Technical Highlights, Emission Factors for Locomotives" report dated December 1997. 2000 Fleet Average Emission Factors for All Locomotives were used in order to be representative of an engine that would be typically used in a dredge suitable for the Texas City Project. That assumption is based on a review of information available from potential bidders. Tier 0 standards apply to these factors due to the age of the engines used in a typical dredge. Emission factors for

the 30" booster pumps were obtained using USEPA AP-42 factors for diesel engines. Emission factors for other construction equipment typical of this type of project were obtained using the USEPA NONROAD Emission Factors for 2005 inventory file and the USEPA guidance document AP-42. This file provides emission factors and other information from the draft NONROAD2004 model for the 2005 calendar year and was suggested for use in estimating of emissions from non-road construction equipment by the USEPA. Tier 2/3 level emission factors were used only for land based equipment, which account for a small minority of the emissions associated with this project. It is assumed that contractors will rent land-based/construction equipment and thus these factors are considered to be representative of the equipment to be used. All other factors used were consistent with Tier 0 level. Additionally, information was used from the USEPA regulatory document "Final Regulatory Impact Analysis: Control of Emissions from Marine Diesel Engines" along with guidance directly from USEPA personnel. This document was suggested by the USEPA for use in estimating of emissions from marine engines.

The General Conformity Rule requires that potential emissions generated by any project-related demolition or construction activity and/or increased operational activities be determined on an annual basis and compared to the annual *de minimis* levels for those pollutants (or their precursors) for which the area is classified as non-attainment or maintenance. Emissions attributable to operational activities and construction were analyzed for NO_X and VOC.

In estimating operational-related dredging, 2000 Fleet Average Emission Factors for All Locomotives obtained from the USEPA, Office of Mobile Sources "Technical Highlights, Emission Factors for Locomotives" report dated December 1997 were used. In estimating operational-related tug, booster pump, track hoe, dragline, dozer and other equipment emissions, the USEPA AP-42 emission factors or NONROAD Emission Factors were used if other emissions information was not provided. Emissions from the operation of the equipment are assumed to be released during the dredging activities over the duration of the project on a per contract basis. Total emissions were calculated for each contract and then each calendar year from 2008 to 2012. Depending on contract duration, emissions may occur in one calendar year only or several. The majority of emissions are expected to occur during 2008 and 2010 when the dredging cycles for Contract 1 and Contract 3 are expected to occur. Table 3-1 provides total emissions per calendar year for the project duration (2008 to 2012) along with additionally separating emissions for each year by equipment type (i.e. land or marine based). Table 3-1 also compares project emissions with the combined 2004 Statewide Diesel Construction NonRoad Mobile Emission budget provided by Karla Hardison of the TCEQ Mobile Source Monitoring Department and taken from the 2004 HGB SIP. Emissions from each year are less than 10% of the budget.

In estimating construction-related NO_X and VOC emissions, the usage of equipment, the likely duration of each activity, and manpower estimates for each activity for the construction were determined based on information provided by the Galveston District and the past field experience for similar types of dredging projects. For the proposed dredging project, equipment operating parameters (engine horsepower and operating hours) were based upon conservative estimates provided by the Galveston District. All equipment was assumed to be diesel-powered unless otherwise noted. Pieces of equipment to be used for the dredging include, but are not limited to; dozers, amphibious backhoes, dredges engines and dredge booster pumps.

Estimates of construction equipment emissions were based on the estimated hours of usage and emission factors for each source. Emission factors in grams of pollutant per hour per horsepower were multiplied by the estimated running time and equipment associated average horsepower provided by the USEPA to calculate total grams of pollutant from each piece of equipment. Finally, these total grams of pollutant were converted to tons of pollutant.

The USEPA recommends the following formula to calculate hourly emissions from nonroad engine sources:

$M_i = N \times HP \times LF \times E_{Fi}$

Where:
M_i = mass of emissions of pollutants.
N = source population (units).
HP = average rated horsepower.
LF = typical load factor.
E_{Fi} = average emissions of pollutant per unit of use (e.g., grams per horsepower-hour).

It should be noted that the dredging and construction activities associated with the Texas City Channel project were previously accounted for in the Final General Conformity Determination for Texas City's Proposed Shoal Point Container Terminal, November 2002 (U.S. Army Corps of Engineers, Galveston District, Final Environmental Impact Statement for Texas City's Proposed Shoal Point Container Terminal, Volume II, Appendix H-9, November 2002). This project included construction of an access road, a wharf, container yard and dredging of the channel, berthing areas, and turning basin. Emissions associated with dredging and related construction activities were assumed to occur in Phase II of the project (2006 and 2007).

The conformity determination for the Shoal Point Container Terminal project was previously approved. "By letter dated September 9, 2002, the TNRCC provided a Conditional General Conformity Certification for the proposed project stating that construction emissions are accounted for in the applicable SIP based on information provided to date." Therefore, these emissions were already accounted for and should not be included in the Texas City Channel emission calculations.

There are two main differences between the Shoal Point Container Terminal and Texas City Channel Dredging project. The Texas City Channel Dredging project includes only dredging and construction activities related to the deepening of the Texas City Channel while the Shoal Point Container Terminal project included these activities as well as additional construction activities associated with construction of an access road, wharf and container yard. Additionally, the Shoal Point Container Terminal project assumed use of electric powered dredges for the dredging portion of the project, while the Texas City Channel project is assuming use of diesel powered dredges. As such, dredging related emissions included in the Shoal Point Container Terminal Conformity Determination are significantly less than the calculations included in this report. NO_X emissions associated with dredging and dredging related activities which were included in the Shoal Point Container Terminal Conformity Determination were 46.2 tons during 2006 and 6.2 tons per year during 2007. VOC emissions associated with dredging and dredging

related activities which were included in the Shoal Point Container Terminal Conformity Determination were 8.9 tons during 2006 and 0.9 tons per year during 2007. The emissions included in this report were reduced by these amounts during 2010 as the vast majority of emissions associated with the Texas City Channel project occurred during this year.

Based upon this analysis, only annual emissions of NO_X exceed the *de minimis* thresholds and only during 2008, 2009, 2010 and 2011. Complete details of emissions calculations used in the analysis are presented in Appendix A.

Table 3-1
Summary Total Emissions

Year	Marine Based Emissions (tons/year)		Land Based Emissions (tons/year)		Total Emissions (tons/year)		HGB NO_X Emission Inventory (tons/year)	% of Inventory
	VOC	NO_X	VOC	NO_X	VOC	NO_X		
2008	15.41	403.95	0.97	17.00	16.38	420.95	11,411.99	3.69
2009	5.02	114.61	0.48	8.41	5.50	123.01	11,697.29	1.05
2010	42.44	1,171.28	0.38	4.79	42.82	1,176.06	11,989.72	9.81
2011	19.06	437.00	0.13	1.60	19.19	438.60	12,289.46	3.57
2012	4.94	87.33	0.00	0.00	4.94	87.33	12,596.70	0.69

* 2.5% annual growth rate applied to NO_X emissions inventory for each year as per Karla Hardison of the TCEQ Mobile Source Monitoring Department.

SECTION 4 CONCLUSION

The Texas City Channel is a Federal deep-draft navigation project serving the port of Texas City in Galveston County, Texas. The Galveston District of the Army Corp of Engineers is proposing the deepening the Texas City Channel. The Proposed Project has been divided into three phases based upon contracts: 1) Pelican Island Levee Construction, 2) Rock Groin Construction, and 3) Levees 2, 3, 4 and 5. No overlap of the three (3) contracts is anticipated.

Under the general conformity rule, emissions resulting from a proposed federal action must be compared to the applicable *de minimis* levels on an annual basis. As shown in this analysis, the emission values for the proposed action exceed the *de minimis* criteria of 100 TPY for NO_X during the years of 2008 through 2011, therefore a formal conformity determination was prepared. The formal analysis included a comprehensive emissions determination which detailed emissions based on contract, year and equipment type. This formal analysis determined that the project will be in conformity with the HGB SIP based upon the following:

- Emissions for each year are less than the designated emission inventory presented in the SIP.

- Emissions from the action for each year are below ten percent of the total construction emissions inventory for both NO_X and VOC's based on the 2004 SIP for the Houston-Galveston-Brazoria Area.

As a result, this project is not considered to be a "regionally significant" activity, and thus the project construction emissions conform to the SIP.

APPENDIX A

DETAILED EMISSION CALCULATIONS

Texas City Channel 45-Foot Deepening Project Construction Activities

Marine Based Emissions								
				Emission Factor (g/hp-hr)		Emissions (tons)		
Type	**Activity**	**Hours of Operation**	**Horse power (HP)**	VOC	NO_X	VOC	NO_X	**% of Total Emissions**
CONTRACT 1: PELICAN ISLAND LEVEE CONSTRUCTION								
Dredging Cycle (Duration = 3 months)								
30" Dredge	Dredging	1500	9000	0.52	13.16	7.73	195.66	11.19%
	Idle	675	3000	0.52	13.16	1.16	29.35	1.68%
30" Booster Pump	Dredging	1500	7500	0.32	10.89	3.96	134.93	7.72%
	Idle			0.32	10.89	0.00	0.00	0.00%
Dredging Tugs (3 @ 500hp each)	Dredging	1500	1500	0.3	5.3	0.74	13.13	0.75%
Spill Barge	Construction	300	165	0.42	6.05	0.02	0.33	0.02%
Dragline	Dredging	450	165	0.42	6.05	0.03	0.49	0.03%
Amphibious Track Hoe	Construction	132	290	1.71	7.59	0.07	0.32	0.02%
Crewboat	Construction	270	400	0.3	5.3	0.04	0.63	0.04%
Rock Placement (Duration 4 months, 4 month delay)								
Crewboat	Construction	360	400	0.3	5.3	0.05	0.84	0.05%
Dragline (4600 Manitowoc	Construction	1200	680			0.00	0.00	0.00%
Outboard Skiff	Construction	480	90	0.3	5.3	0.01	0.25	0.01%
River Tug	Construction	480	4000	0.3	5.3	0.63	11.21	0.64%
	Idle	2400	1200	0.3	5.3	0.95	16.81	0.96%
					Contract Total	**15.41**	**403.95**	23.11%
CONTRACT 2: ROCK GROIN CONSTRUCTION								
Dredging Cycle (Duration = 6 months)								
24" Dredge	Dredging	1500	3400	0.52	13.16	2.92	73.92	4.23%
	Idle	675	1200	0.52	13.16	0.46	11.74	0.67%
Dredging Tugs (3 @ 500hp each)	Dredging	1500	1500	0.3	5.3	0.74	13.13	0.75%

Crewboat	Construction	540	400	0.3	5.3	0.07	1.26	0.07%
Rock Placement (Duration = 2 months, 4 month delay)								
Crewboat	Construction	180	400	0.3	5.3	0.02	0.42	0.02%
Dragline (4600 Manitowoc	Construction	600	680			0.00	0.00	0.00%
Outboard Skiff	Construction	240	90	0.3	5.3	0.01	0.13	0.01%
River Tug	Construction	240	4000	0.3	5.3	0.32	5.60	0.32%
	Idle	1200	1200	0.3	5.3	0.48	8.41	0.48%
					Contract Total	**5.02**	**114.61**	6.56%
CONTRACT 3: LEVEES 2, 3, 4 & 5 CONSTRUCTION								
Dredging Cycle (Duration = 16 months)								
30" Dredge	Dredging	8000	9000	0.52	13.16	41.23	1043.52	59.70%
	Idle	3600	3000	1	13.16	11.89	156.53	8.95%
30" Booster Pump	Dredging	4000	7500	0.32	10.89	10.57	359.80	20.58%
Dredging Tugs (3 @ 500hp each)	Dredging	6400	1500	0.3	5.3	3.17	56.04	3.21%
Spill Barge	Dredging	1600	165	0.42	6.05	0.12	1.76	0.10%
	Idle			0.42	6.05	0.00	0.00	0.00%
Dragline	Construction	2400	165	0.42	6.05	0.18	2.64	0.15%
Amphibious Track Hoe	Construction	4480	290	1.71	7.59	2.45	10.86	0.62%
Crewboat	Construction	180	400	0.3	5.3	0.02	0.42	0.02%
Rock Placement (Duration = 16 months, 4 Month Delay)								
Crewboat	Construction	1440	400	0.3	5.3	0.19	3.36	0.19%
Dragline (4600 Manitowoc	Construction	4800	680			0.00	0.00	0.00%
Outboard Skiff	Construction	1920	90	0.3	5.3	0.06	1.01	0.06%
River Tug	Construction	1920	4000	0.3	5.3	2.54	44.83	2.56%
	Idle	9600	1200	0.3	5.3	3.81	67.24	3.85%
					Contract Total	**76.24**	**1748.01**	100.00%
					Project Total	**96.67**	**2266.57**	
					2008 Emissions (Contract 1 -Dredging Cycle and Rock Placement)	**15.41**	**403.95**	17.8%
					2009 Emissions (Contract 2 -Dredging Cylce and Rock Placement)	**5.02**	**114.61**	5.1%
					2010 Emissions (Contract 3 -1st 3 quarters of Dredging Cycle)	**52.24**	**1223.68**	54.0%
					2011 Emissions (Contract 3 -last qtr of dredging cycle, delay, 1st qtr of rock placement)	**19.06**	**437.00**	19.3%
					2012 Emissions (Contract 3-last 3 quarters of rock placement)	**4.94**	**87.33**	3.9%

Texas City Channel 45-Foot Deepening Project Construction Activities

Land Based Emissions								
				Emission Factor (g/hp-hr)		Emissions (tons)		
Type	**Activity**	**Hours of Operation**	**Horse power (HP)**	VOC	NO_X	VOC	NO_X	**% of Total Emissions**
CONTRACT 1: PELICAN ISLAND LEVEE CONSTRUCTION								
Dredging Cycle (Duration = 3 months)								
Wide Track Dozer	Construction	132	185	0.56	6.99	0.02	0.19	1.11%
Rock Placement (Duration 4 months, 4 month delay)								
Excavator (330 Cat) - 2	Construction	1200	220			0.00	0.00	0.00%
	Idle	2400	1200	0.3	5.3	0.95	16.81	98.89%
					Contract Total	**0.97**	**17.00**	100.00%
CONTRACT 2: ROCK GROIN CONSTRUCTION								
Dredging Cycle (Duration = 6 months)								
Rock Placement (Duration = 2 months, 4 month delay)								
Excavator (330 Cat) - 2	Construction	1200	220			0.00	0.00	0.00%
	Idle	1200	1200	0.3	5.3	0.48	8.41	100.00%
					Contract Total	**0.48**	**8.41**	100.00%
CONTRACT 3: LEVEES 2, 3, 4 & 5 CONSTRUCTION								
Dredging Cycle (Duration = 16 months)								
Wide Track Dozer	Construction	4480	185	0.56	6.99	0.51	6.38	100.00%
Rock Placement (Duration = 16 months, 4 Month Delay)								
Excavator (330 Cat) - 2	Construction	9600	220			0.00	0.00	0.00%
					Contract Total	**0.51**	**6.38**	100.00%
					Project Total	**1.95**	**31.78**	
					2008 Emissions (Contract 1 -Dredging Cycle and Rock Placement)	**0.97**	**17.00**	53.5%
					2009 Emissions (Contract 2 -Dredging Cylce and Rock Placement)	**0.48**	**8.41**	26.4%
					2010 Emissions (Contract 3 -1st 3 quarters of Dredging Cycle)	**0.38**	**4.79**	15.1%
					2011 Emissions (Contract 3 -last qtr of dredging cycle, delay, 1st qtr of rock placement)	**0.13**	**1.60**	5.0%
					2012 Emissions (Contract 3-last 3 quarters of rock placement)	**0.00**	**0.00**	0.0%

Total Annual Emissions for All Equipment			
	(tons)		% of Total Emissions
	VOC	NO_X	
Total Emissions for 2008	**16.38**	**420.95**	18.3%
Total Emissions for 2009	**5.50**	**123.01**	5.4%
Total Emissions for 2010	**42.82**	**1176.06**	51.2%
Total Emissions for 2011	**19.19**	**438.60**	19.1%
Total Emissions for 2012	**4.94**	**87.33**	3.8%

* VOC and NOx emissions for 2010 were reduced by 9.8 tons and 52.4 tons respectively due to the fact that these emissions were previously accounted for based on the Shoal Point Terminal Conformity Determination.