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Document Name:

Port of Houston Bayport Terminal Wharf and Dredging Special Conditions

Organization/Agency Responsible:

Port of Houston Authority

Contact:

Dana Blume
Environmental Program Coordinator
Port of Houston Authority
(713) 670-2805
dblume@poha.com

and

Mark Vincent
Project Manager Supervisor
Port of Houston Authority
(713) 670-2820
mvincent@poha.com

Description: Port of Houston Bayport Terminal Wharf and Dredging Special Conditions

The contract language was developed and has been successfully implemented at the Port of Houston's Bayport Container and Cruise Terminal -- a new terminal under construction since January 2007. The Port committed to general conformity (GC) standards(25 tons NOx/year) without being required to do so. As a result, the terminal is being built under general conformity standards. This commitment forced contractors to be innovative in reducing equipment emissions. Clean contractors were not necessarily the least expensive contractors. It's been estimated the Port paid in excess of \$8 million dollars for clean contractor measures.

23. Inspection Services:

The Wharf and Dredging Contractor shall notify the Chief Engineer and Construction Manager 24 hours prior to expected time for operations requiring inspection services. Additionally, the Wharf and Dredging Contractor shall sign and acknowledge the Inspector's report.

24. Emission Control Plan

24.1 **Background**

The following contract language is intended to ensure compliance with the Federal Clean Air Act. The Clean Air Act states that all projects that require federal approval conform to the local area's plan to achieve compliance with air quality standards unless the project will emit less than a specified minimum emissions threshold or is otherwise exempt. If the project will emit less than the threshold amount, then it is not considered to be a major project and it can be presumed to conform to the area's compliance plan. The Houston-Galveston area is not in attainment with the air quality standard for ozone. Because the Bayport Project is located in the Houston-Galveston area and because the Project requires a wharf construction permit from the U.S. Army Corps of Engineers ("Corps") (*i.e.*, federal approval), the associated emissions from this work must either be below the relevant emissions threshold or it must be demonstrated in some other manner that the Project's emissions conform to the Houston area's plan to achieve attainment.

Ozone is formed from a combination of volatile organic compounds and nitrogen oxide (NOx) compounds reacting in the atmosphere. The combustion of fossil fuels (such as operating a diesel engine) is a source of NOx. The applicable emissions threshold that determined whether or not the Project will be a major project was 25 tons of NOx in any consecutive 12 month period. The Port of Houston Authority has committed to the Corps that the Bayport project will satisfy this emissions threshold.

The Port will carefully and thoroughly evaluate proposals, including the intent and extent to which air emissions plans achieve goals. The Port has included an Air Emissions Calculator that must be used by the Proposer to make this demonstration. This calculator simplifies the process for the Proposer by requiring the Proposer only to input the following variables: type of equipment; engine size (horsepower); model year; additional emissions controls; and the hours of use. Based on these inputs, the calculator determines the total emissions. The Proposer then can compare projections to the project goal, and modify plans as necessary to minimize emissions.

The Port of Houston Authority is constructing other elements of the Bayport Complex that generate emissions counted against the total 25 ton threshold. The total emissions budget allowable for the Cruise Wharf and Dredging is reflected in the Emissions Calculator, and is lower than the threshold because of other, concurrent construction.

24.2 Obligations of Proposer

With the signing and submittal of this proposal, including the completed Air Emissions Calculator, the Proposer agrees that it, its employees, subcontractors, assignees, etc. will operate in strict conformance with their proposal plan by not deviating from the inputs made in the submitted Air Emissions Calculator (e.g. types of equipment, hours used, etc.) so as to cause an increase in the cumulative 12-month emissions total without pre-approval by the Port. In reviewing any deviation, the Port will calculate the impact to the emissions goal. The Proposer certifies and warrants that the information given in the Air Emissions Calculator is accurate and that any technologies, techniques, or methods used to reduce emissions to stay within the emissions threshold (other than those technologies specifically listed below) are approved by the Texas Commission on Environmental Quality (TCEQ), the U.S. Environmental Protection Agency (EPA), or the California Air Resources Board (CARB). The Port has provided a list of pre-approved emissions technologies located in the Instructions for Emissions Calculator, however, if the Proposer chooses a different technology, such technology and its emission control effectiveness must be approved by EPA, TCEQ, or CARB.

The Port encourages each Proposer to participate in the Texas Emission Reduction Program. The Port will assist the successful Proposer in seeking a grant under this program if the Proposer chooses to participate. More information about this program is available through the TCEQ.

24.3 Instructions for Emissions Calculator

The calculator is a tool to estimate the emissions of nitrogen oxides (NOx) that will result from the wharf and dredging construction contract. The goal is to keep contract-related NOx emissions and other emissions associated with the Federal action less than 25 tons in any one-year period. For the purpose of this calculator a year is any **12 consecutive months**.

Applicable Construction Tasks: List and report all engines used directly for:

1. Wet material excavation (dredging) and material movement, including those that power the dredging activity directly, such as a diesel engine on a mechanical dredge or a diesel generator that may run electric dredging equipment, support equipment engines on tug or towboats that may move or maneuver the dredge, or diesel engines that drive air compressors. **Electrification of dredge equipment and pumps may be required to meet emissions requirements.**
2. Conveyance of dredged material from wet excavation to point of initial deposit in a disposal area.
3. Construction of the wharf in water.
4. Placement of riprap.
5. Construction of mooring structures located in water.
6. Other potential tasks that impact waters of the U.S.

**Bayport Cruise Terminal Construction - Phase I
Wharf and Dredging
Special Conditions**

Non-applicable tasks: Do not list engines or report hours of operation associated with:

1. Excavation of dry material, including conveyance of the material to disposal areas. This includes dry material excavated above MHW seaward of wharf construction performed in the dry.
2. Non-wharf construction including drying, compaction, or haul and final placement of stockpiled material, construction of berms, storm water control features, and access roads.
3. Wharf tie-back structures.
4. Stand by periods for any equipment (when engines not in use will be turned off).
5. Construction of segments of the wharf on land (in the dry).

The calculator requires knowledge of the equipment to be used on the project, including the engine horsepower and year of manufacture (its model year). If an engine is model year 2000 or newer you will also need to know whether it is a "Tier 2" or "Tier 3" engine. These lower-emission engines were introduced starting in 2000 but not all engines made in 2000 or after are Tier 2. Finally, engines considered to be "marine engines" (for example, a tug boat's propulsion engine) do not have "Tier" ratings.

The calculator consists of worksheets (spreadsheets) within a Microsoft® Excel workbook. Several of the worksheets are for information about the equipment you will be operating, such as type and number of pieces of equipment, horsepower, and expected number of hours of operation. Operating hours are those hours that the diesel engine is actually running or operating (not the total time spent onsite) and will be entered for each period of work. Dredging and related equipment will be entered on one worksheet, and wharf construction related equipment will be entered on the other. The remaining worksheet calculates and summarizes the estimated emissions from the equipment information entered into the other two worksheets. No entries are to be made on this worksheet.

The information worksheets for dredging and wharf construction have spaces to enter information on the engines on specific types of equipment, and some blank lines to add other engines. For each engine type that will be operated, enter the number of identical engines in the correct "Tier" column, the horsepower rating of each of the engines, and the number of hours each engine will operate during the each month of construction of the contract. (If identical engines will operate for different numbers of hours per month, enter the engines on separate lines). The calculator is designed so that you cannot add or delete rows or columns.

If you will be using an emission control technology such as a fuel emulsion or a catalytic converter to reduce NOx emissions, there is a column on the worksheet to enter the percent NOx reduction that the technology is recognized to achieve. At present, there are 3 technologies that have been recognized for this project, listed in the following table:

Emission Reduction Technology	NOx Control Efficiency Credit
PuriNOx® Fuel Emulsion	19%
CleanAIR Systems Catalytic Converter	50%
Extengine / KleenAir Systems Catalytic Converter	75%

**Bayport Cruise Terminal Corridor - Phase I
Wharf and Dredging
Special Conditions**

Other NOx emission control devices or systems may be used but emission control effectiveness must be recognized by the US EPA, the TCEQ, or the California Air Resources Board. Verification of the emission control system's recognition must be provided by the proposer.

Following is a realistic example of the calculator completed for one option. The example assumes the use of PuriNOx fuel emulsion or Extengine/KleenAir Systems Catalytic Converter for all on-road and off-road equipment, which results in a significant NOx emission reduction for that equipment. It is important to note that this example is intended as a guide and is not to be used as the basis of a Proposer's calculator inputs. Proposer must rely upon its own data for such inputs.

24.4 Proposal Evaluation Process

The Port Authority staff will evaluate the Emissions Control Plan as a component of Instructions to Proposers, Paragraph 27, Award of Contract, Item 3, Benefit to Port Authority.

Bayport Construction Project
Air Emissions Calculator Example
Emission Summary

Enter project information below:

Project Name: Bayport Cruise Terminal
Project Start Date: Sep-05 (month/year)
Project Area: na acres
Jurisdictional Wetland Area: na acres

Monthly Summary

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Emissions (tons) per month

	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06
Dredging	1.54	1.55	1.54	1.55	1.55	1.52	1.86	1.84	1.86	1.84	1.86	1.86
Wharf	0.04	0.28	0.43	0.15	0.15	0.30	0.30	0.15	0.00	0.04	0.04	0.37
Total	2.77	3.02	3.16	2.58	2.58	2.70	3.04	2.87	2.74	1.88	1.90	2.23

	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07
Dredging	1.54	1.55	1.54	1.55	1.55	1.52	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.33	0.18	0.00	0.37	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.87	1.73	1.54	1.92	1.92	1.89	0.00	0.00	0.00	0.00	0.00	0.00

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Annual Rolling Average (tons per year on a monthly basis)

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Emissions (tons) per Year*

	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06
Dredging	1.54	3.09	4.63	6.18	7.73	9.25	11.11	12.95	14.81	16.65	18.51	20.37
Wharf	0.04	0.32	0.75	0.90	1.05	1.35	1.65	1.80	1.80	1.84	1.88	2.25
Total	2.77	5.78	8.94	11.52	14.11	16.81	19.86	22.73	23.47	27.35	29.25	31.48

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	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07
Dredging	20.37	20.37	20.37	20.37	20.37	20.37	18.51	16.67	14.81	12.97	11.11	9.25
Wharf	2.5	2.1	2.1	2	1.5	1.52	1.5	2.0	2.07	2.03	1.99	1.62
Total	22.87	22.47	22.47	22.37	21.87	21.89	20.01	18.67	16.88	15.00	13.10	10.87

Annualized Emissions (first 11 months)*

Emissions (tons)

	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06
Dredging	18.48	18.54	18.52	18.54	18.55	18.50	19.05	19.43	19.75	19.98	20.19
Wharf	0.48	1.92	3.00	2.70	2.52	2.70	2.83	2.70	2.40	2.21	2.05
Total	18.96	20.46	21.52	21.24	21.07	21.20	21.87	22.13	22.15	22.19	22.24

* Emissions for the first 11 months are cumulative emissions, month to date. These emissions are annualized by multiplying the emissions to date by (12/# of months). For example, the annualized emissions for the 4th month of the project are calculated by multiplying the 4th month cumulative total by (12/4).

Bayport Construction Project
Air Emissions Calculator
Emission Summary

Enter project information below:

Project Name: _____
Project Start Date: Jun-04 (month/year)
Project Area: _____ acres
Jurisdictional Wetland Area: _____ acres

Monthly Summary data from Draft PHA monthly NOx calc (26Jul05)_BHW-no_rounding.xls

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Emissions (tons) per month

Q1 - Q4	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05
Dredging	0.00	0.00	0.00	0.75	0.75	0.75	1.10	1.10	1.10	1.63	1.63	1.63
Wharf	0.02	0.02	0.02	0.09	0.09	0.09	0.13	0.13	0.13	0.24	0.24	0.24
Backlands	0.00	0.00	0.00	0.03	0.03	0.03	0.39	0.39	0.39	0.00	0.00	0.00
Total	0.02	0.02	0.02	0.86	0.86	0.86	1.62	1.62	1.62	1.87	1.87	1.87

Q5 - Q8	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06
Dredging	0.73	0.73	0.73	0.88	0.88	0.88	0.68	0.68	0.68	0.68	0.68	0.68
Wharf	0.30	0.30	0.30	0.31	0.31	0.31	0.20	0.20	0.20	0.20	0.20	0.20
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.03	1.03	1.03	1.19	1.19	1.19	0.88	0.88	0.88	0.88	0.88	0.88

	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07
Dredging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00											

	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08
Dredging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00											

	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09
Dredging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00											

	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10
Dredging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00											

Bayport Construction Project
Air Emissions Calculator
Emission Summary

Enter project information below:

Project Name: _____
Project Start Date: Jun-04 (month/year)
Project Area: _____ acres
Jurisdictional Wetland Area: _____ acres

Annual Rolling Average (tons per year on a monthly basis)

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Emissions (tons) per Year*

	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05
Dredging	0.00	0.00	0.00	0.75	1.49	2.24	3.33	4.43	5.52	7.15	8.78	10.41
Wharf	0.02	0.04	0.06	0.15	0.23	0.32	0.45	0.59	0.72	0.95	1.19	1.43
Backlands	0.00	0.00	0.00	0.03	0.07	0.10	0.49	0.88	1.27	1.27	1.27	1.27
Total	0.02	0.04	0.06	0.93	1.79	2.66	4.28	5.89	7.51	9.38	11.24	13.11

	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06
Dredging	11.14	11.86	12.59	12.72	12.85	12.99	12.57	12.16	11.75	10.80	9.85	8.90
Wharf	1.70	1.98	2.26	2.48	2.71	2.93	3.00	3.07	3.14	3.10	3.07	3.03
Backlands	1.27	1.27	1.27	1.24	1.20	1.17	0.78	0.39	0.00	0.00	0.00	0.00
Total	14.11	15.12	16.12	16.44	16.76	17.09	16.35	15.62	14.88	13.90	12.92	11.94

	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07
Dredging	8.18	7.45	6.73	5.85	4.97	4.09	3.41	2.73	2.05	1.36	0.68	0.00
Wharf	2.73	2.43	2.13	1.83	1.52	1.21	1.01	0.80	0.60	0.40	0.20	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	10.91	9.89	8.86	7.67	6.49	5.30	4.42	3.53	2.65	1.76	0.88	0.00

	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08
Dredging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00											

	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09
Dredging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00											

	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10
Dredging	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wharf	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Backlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00											

Annualized Emissions (first 11 months)*

Emissions (tons)

	Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05
Dredging	0.00	0.00	0.00	2.24	3.58	4.47	5.71	6.64	7.36	8.58	9.58
Wharf	0.26	0.26	0.26	0.45	0.56	0.64	0.78	0.88	0.96	1.15	1.30
Backlands	0.00	0.00	0.00	0.10	0.16	0.21	0.84	1.32	1.69	1.52	1.38
Total	0.26	0.26	0.26	2.79	4.30	5.32	7.33	8.84	10.02	11.25	12.26

* Emissions for the first 11 months are cumulative emissions, month to date. These emissions are annualized by multiplying the emissions to date by (12/# of months). For example, the annualized emissions for the 4th month of the project are calculated by multiplying the 4th month cumulative total by (12/4).

25. **Noise Mitigation and Reduction Planning and Proposal:**

25.1 Background

The Federal permit for the Bayport Terminal Complex prohibits excessive noise (defined as greater than 55 dBA Leq (hourly)) from 10:00 PM to 7:00 AM, as measured at the property line of the noise receptor. The terminal development is subject to municipal ordinances, which may restrict construction and other noise to less than 75dBA peak at the property line. PHA monitors sound levels with sensors installed near the north and southeast property lines to verify sound levels associated with project construction. The Port of Houston Authority is strongly committed to minimizing construction impacts to surrounding communities.

25.2 Noise Control Plan

25.2.1 Proposer will submit with its Proposal a plan for pile driving noise reduction and mitigation, using the form provided in this section. The Contractor's pile driving noise reduction and mitigation plan will be evaluated under Instructions to Proposers, Paragraph 27, Award of Contract, Item 3, Benefit to the Port Authority.

25.2.2 The Contractor shall submit a comprehensive construction noise control plan after award and prior to initiation of construction for PHA approval that describes its efforts to minimize sound impacts, including those caused by pile driving and other construction activities. The Noise Control Plan will include, as a minimum, the following information:

Construction Noise Control Plan Elements

1. Brief description of the project construction work, including:
 - a. Project Name and Contractor
 - b. Statement of work and methods
2. List of major equipment planned for use in the project, with estimated sound level contributions at 50 feet. *Attach "Pile Driving Noise Reduction and Mitigation Plan" submitted with the Contractor's proposal as a component of the overall noise control plan.*
3. Describe noise reduction equipment and methods that will be used to minimize or avoid excessive noise contributions. Contractor shall consider use of electric equipment when practicable; noise barriers or baffles; and siting equipment so as to minimize sound contributions. Additional mitigation concepts that can be included in Contractor's plan include:
 - a. Equipment shutdown when not in use
 - b. Routing and traffic patterns of equipment
 - c. Use of broadband backup alarms
 - d. Sizing equipment to be appropriate to the task
4. Other discussion elements as necessary