



New Bedford Harbor Superfund Site  
U.S. Army Corps of Engineers New England District  
Draft Final Ambient Air Monitoring Plan for Remediation Activities  
Revision 2  
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## New Bedford Harbor Superfund Site

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### Document history and status

Revision	Date	Description	By	Review	Approved
2	4/25/2018	2018 Ambient Air Monitoring Plan incorporates edits made by EPA to update the plan to replace the Public Exposure Tracking System (PETS) with the Risk Tracking System (RTS) for tracking carcinogenic and non-carcinogenic risk.	Jacobs; EPA		

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## Acronyms and Abbreviations

AAL	allowable ambient limit
BMP	Best Management Practices
CAD	confined aquatic disposal
CDF	confined disposal facility
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
Foster Wheeler	Foster Wheeler Environmental Corporation
HQ	hazard quotient
Jacobs	Jacobs Engineering Group, Inc.
LHCC	Lower Harbor CAD Cell
mg/kg	milligrams per kilogram
mg/m <sup>3</sup>	milligrams per cubic meter of air
mg/kg-day	milligrams per kilogram per day
NAE	U.S. Army Corps of Engineers – New England District
ng/m <sup>3</sup>	nanograms per cubic meter of air
OU	operable unit
OVM	organic vapor monitor
PAL	perimeter action limit
PAV	perimeter assessment value
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PETS	Public Exposure Tracking System
PID	photoionization detector
PM	particulate matter
ppm	parts per million
PUF	polyurethane foam

RAM	respirable aerosol monitor
RBG	risk based goals
RTS	risk tracking system
TAT	turn-around-time
TCE	trichloroethene
TERC	Total Environmental Restoration Contract
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound
WWTP	waste water treatment plant

## 1.0 Introduction

This work plan describes the ambient air sampling program for the New Bedford Harbor Superfund Site and presents the locations, sampling strategies, and exposure limits for monitoring remedial activities in the Harbor. The sampling strategy follows the *Final Plan for the Sampling of Ambient Air PCB Concentrations to Support Decisions to Ensure the Protection of the Public During Remediation Activities*, Revision No. 3 by Jacobs Engineering Group, Inc. (Jacobs, 2006b). This *Draft Final Ambient Air Monitoring Plan for Remedial Activities*, Revision No. 5 (Air Monitoring Plan 2018) supersedes the previous version (Jacobs, 2015) and sets the actions necessary to match the remedial approaches forthcoming over the next several years. The knowledge and experience gathered over the past 14 years of harbor remediation and air monitoring have enabled refinements that are incorporated in this Air Monitoring Plan 2018 update to further ensure that public health will continue to be protected as the project moves into an accelerated schedule.

### 1.1 Site Setting

The New Bedford Harbor Superfund Site is located in Bristol County, Massachusetts (Figure 1-1), approximately 55 miles south of Boston, and is bordered by the towns of Acushnet and Fairhaven on the east side of New Bedford Harbor, and by the City of New Bedford and the Town of Dartmouth on the west. From north to south, the Site extends from the upper reaches of the Acushnet River estuary through New Bedford's commercial port and into Buzzards Bay. The Harbor is geographically divided into three areas and comprises approximately 18,000 acres. The "Upper Harbor" refers to that portion of the Harbor north of the Coggeshall Street Bridge and is approximately 187 acres in size. The "Lower Harbor" refers to that part of the Harbor south of the Coggeshall Street Bridge and north of the Hurricane Barrier comprising approximately 850 acres. The "Outer Harbor" is that portion of the Harbor south of the Hurricane Barrier and is approximately 17,000 acres in size. The sediments in the harbor are contaminated with high levels of polychlorinated biphenyls (PCBs) from the industrial development surrounding the harbor. From the 1940s through the 1970s, electrical capacitor manufacturing plants discharged PCBs into New Bedford Harbor and its estuaries. In the mid-1970s U.S. Environmental Protection Agency (EPA) sampling identified PCBs in the river and harbor sediments greater than 100,000 milligrams per kilogram (mg/kg). In 1979, the Massachusetts Department of Public Health prohibited fishing and shell-fishing from the river and harbor due to the high levels of PCB contamination found in the harbor and in the seafood from the area. The site was included on the National Priorities List in September 1983 as one of the most contaminated PCB sites in the United States.

Removal of PCB-contaminated sediment in the Upper and Lower Harbors was selected as the remedial action for the New Bedford Harbor Site in accordance with the 1998 Record of Decision (ROD) (EPA 1998). The focus of the ROD is to reduce PCB concentrations in the sediment in subtidal and intertidal areas. PCBs in sediment are bioavailable to the food chain and consumption of contaminated seafood is the primary human health risk driver at the site. An institutional control that bans the taking of fish in the Upper and Lower Harbor and restricts the taking of fish and shellfish in the outer harbor is in effect.

The current remedial approach includes subtidal dredging and management of contaminated sediments and treatment of filtrate, which includes de-sanding, dewatering, and wastewater treatment operations; mechanical excavation of intertidal areas along the shorelines; and mechanical excavation and transport of sediments to a confined aquatic disposal (CAD) cell in the Lower Harbor (Figure 1-2).

Although PCB emission sources have not been a major risk driver for the New Bedford Harbor Site, a comprehensive ambient air monitoring program has been implemented to monitor PCBs in the air and ensure that inhalation exposures remain below risk thresholds. Given the ability of PCBs to volatilize and the highly contaminated nature of sediments in New Bedford Harbor, air monitoring will be conducted to provide an adequate and protective ambient air monitoring network. The air monitoring network allows for the tracking of chronic exposure and risk over time for the purpose of protecting the public from inhalation exposures related to remediation activity and to verify and update air dispersion models conducted for the site.

PCB emission sources at New Bedford Harbor consist of background and remediation sources. The background sources include the following:

- PCB contaminated harbor mudflat and intertidal sediments, and
- point or land sources with PCB contamination.

The volatilization of PCBs from exposed un-remediated sediments, and other sources of PCB emissions in the vicinity, contributes to the current background ambient air levels. Remediation sources include airborne PCBs that may be released due to disturbance of harbor sediments as a result of remediation activities.

During the Baseline Ambient Air Sampling and Analysis Program, (which was conducted from June 1999 through May 2000 for EPA), Foster Wheeler Environmental Corporation (Foster Wheeler 2001a) collected ambient air samples from six baseline sampling stations on a monthly basis. Foster Wheeler derived a yearly average from the data collected at these stations. Jacobs derived quarterly average concentrations for the same air stations and continues to use quarterly averages for determining ambient background concentrations.

## 1.2 Plan Development History

EPA produced two major plans that have assessed the potential for health impacts associated with emissions of volatile PCBs during the remediation of PCB impacted sediments and the development of a cumulative exposure budgeting program that ensures the protection of public health. The development of the health-based cumulative exposure budgets is presented in the *Draft Final Development of PCB Air Action Levels for the Protection of the Public* (Foster Wheeler 2001a) (the Development Document). The principal components associated with the implementation of the cumulative exposure tracking program are described in the document *Draft Final Implementation Plan for the Protection of the Public from Volatilized PCBs during Contaminated Sediment Remediation at the New Bedford Harbor Superfund Site* (Foster Wheeler 2001b) (the Implementation Plan). The Implementation Plan provided guidelines for

implementing the principal components of an air sampling program including: locating sampling stations, collecting air samples, evaluating air sample data, tracking cumulative exposures, and recommending appropriate responses to reduce or mitigate potential PCB inhalation exposures to the public. Foster Wheeler prepared the original Air Management Plan entitled *Draft Plan for the Sampling of Ambient Air PCB Concentrations to Support Decisions to Ensure the Protection of the Public during Remediation Activities, New Bedford Harbor Superfund Site, New Bedford Harbor, Massachusetts* (Foster Wheeler 2003) under U.S. Army Corps of Engineers (USACE) Total Environmental Restoration Contract (TERC) No. DACW33-94-D-0002 (Foster Wheeler 2003). In January 2004, prior to the initiation of full-scale remediation activities, the USACE – New England District (NAE) modified the Plan (Revision No. 2 to the Plan) to incorporate changes in the remediation approach, primarily using hydraulic dredging rather than mechanical (Jacobs 2005). The third revision (Plan Revision No.3) of the Air Management Plan was issued in 2006 and modified the Plan to incorporate changes based on the results of the 2004 and 2005 ambient air sampling program, the results of the 2005 air modeling efforts (Jacobs 2005) that utilized previous modeling programs, and historical air data (Jacobs 2006b). Additionally, in the Plan Revision No. 3, the allowable ambient limits (AALs) were recalculated for the increased exposure duration to 26 years to account for the estimated period of performance of the remedy. These recalculations of the AALs resulted in lower, more conservative AALs and were used until this revision. Air Monitoring Plan Revision No. 4 (Jacobs 2015) expedited overall remediation schedule from 26 years to 18 years; extended the dredge season from the previous average of 45 dredge days per year to a projected annual average of approximately 100 to 170 days per year; incorporated Lower Harbor mechanical dredging and submarine cable removal activities; and presented the rationale for identifying sample locations and the overall sampling strategy for collecting ambient air PCB, volatile organic compounds (VOCs), and/or particulate matter (PM) concentration data during remediation activities beginning in 2015.

### 1.3 Reason for Revisions

This Air Monitoring Plan Revision No. 5 adds a Risk Tracking System (RTS) for tracking of carcinogenic and non-carcinogenic risk to replace the previously used Public Exposure Tracking System (PETS);

### 1.4 Upcoming Remedial Activities

Remediation of contaminated sediments in New Bedford Harbor will consist of a multi-phase approach using several sediment removal strategies to address contaminated sediments in the harbor. Hybrid dredging will be employed in the upper harbor where sediment is mechanically removed from the harbor bottom and then hydraulically piped to facilities for processing prior to shipment offsite. Contaminated sediment will be piped to a desanding facility and subsequently to a dewatering facility. The sand and filter cake that is produced will be shipped to a licensed off-site disposal facility. The on-site waste water treatment plant (WWTP) will treat the process water and the treated water will be returned to the lower harbor. Mechanical dredging will be employed for the removal of all lower harbor sediments, those sediments to be placed in the LHCC and additional locations where hydraulic dredging is impractical. In contrast to hybrid dredging, mechanical dredging does not include follow-on sediment processing. Subtidal sediments collected by mechanical dredging will be placed in scows for transport and subsequent disposal in the EPA's Lower Harbor CAD Cell. Mechanical excavation will be used to remove

PCB contaminated sediments in the intertidal areas and the shoreline areas within the Upper Harbor and in the Lower Harbor. These intertidal and shoreline sediments will be ultimately transported to a licensed off-site facility for disposal.

## 1.5 Objectives of the Plan

The objective of this Plan is to describe the ambient air monitoring program that will be implemented to support decisions to minimize risk to the public in terms of cumulative exposure from volatile and particulate contamination released to the air during remediation activities. In the process of remedial operations, vapor phase PCBs above background concentrations could be released into the atmosphere and transported to neighboring communities. Additionally, there is a limited potential of remedial activities to release VOC and respirable particulate matter into the atmosphere. Actions to monitor and control releases of PCBs as well as any VOCs or PM that may be released during remedial operations are discussed within this plan. This Plan update presents the monitoring and reporting program that will be implemented to protect public health from chronic exposure to PCBs and acute exposure to VOCs and PM during the next phase of harbor remediation activities.

## 1.6 Plan Layout

This Air Monitoring Plan is divided into seven sections. Section 1.0 provides an overview of the air monitoring program, background on the New Bedford Harbor Site, and a brief discussion of remedial activities. Section 2.0 presents the risk based goals (RBGs), provides an overall summary of cumulative exposure budgeting and tracking, and discusses the role of atmospheric dispersion modeling in support of this Air Monitoring Plan. This section also includes the derivation of the carcinogenic and non-carcinogenic Risk Tracking System (RTS) process. The carcinogenic and non-carcinogenic RTS process for ambient air PCB was updated and incorporated into the Air Monitoring Plan consistent with similar PCB remediation projects in the United States. Section 3.0 addresses the development of the time series of airborne PCB concentrations, presents the ambient air monitoring station locations and explains the basis for the locations. It also specifies the use of a network of sampling station locations to collect the data needed to track potential risks relative to the established risk limits. The selection of locations, sampling methods and sampling frequencies for the sampling stations based on specific remedial actions are explained. Section 4.0 discusses Best Management Practices to be implemented to reduce impacts to ambient air quality during remedial actions. Section 5.0 discusses reporting procedures for each of the constituents monitored and general frequencies for each. Section 6.0 discusses the role of annual review of the Air Monitoring Plan. Section 7.0 lists the references cited in this Air Monitoring Plan.

## 2.0 Exposure Determination

This section describes the process for defining the cumulative exposure and risk for a sampling location and how the ambient air PCB data will be tracked considering both carcinogenic and non-carcinogenic risk. This section also addresses concentrations of VOCs and PM that will be monitored to protect nearby residents from acute exposures to these contaminants.

### 2.1 PCBs

The ambient air PCB concentrations have been measured at locations around the remediation area since 1999, and these data have been used for the determination of cumulative exposures over time. Since 2004, ambient air data have been collected to identify and track air quality trends at sampling locations affected by remedial activities in the upper and lower harbors. These trends are in turn, providing projected cumulative carcinogenic and noncarcinogenic risks at nearby potential points of public exposure. Ambient air concentrations, RBGs, air dispersion modeling, and cumulative exposure concentrations are presented in this section.

#### 2.1.1 Ambient Concentrations

Background ambient concentrations of PCBs in air are attributable to existing conditions in the Harbor, such as volatilization of PCBs from sediments exposed due to tidal action as well as other sources of PCBs. During the baseline ambient air sampling and analysis program, (which was conducted from June 1999 through May 2000), Foster Wheeler collected background air samples from six sampling stations on a monthly basis for EPA (Foster Wheeler 2001c). In some cases the samples were collected on a more frequent basis. From these data, a yearly average baseline value from the ambient background data was derived for these stations and is presented in the Development Document (Foster Wheeler 2001a).

Since 2005 quarterly average PCB concentrations that reflect seasonal variability have been used to supplement periods of non-activity, that is, when air monitoring did not occur (data gaps). The baseline air quality stations and the associated quarterly baseline concentrations are presented in [Table 2-1](#).

#### 2.1.2 History of Risk Based Goals for Carcinogenic and Non-Carcinogenic Effects

The AALs typically represent the concentration of a contaminant in the ambient air to which a person could be exposed over a specified period of time without adverse health effects, which originally was set at 5 and 10 years (Foster Wheeler 2001a), and then increased to 26 years (Jacobs 2006b), as explained in the paragraph below. The Development Document (Foster Wheeler 2001a) presents the development and calculation of the AALs originally used to evaluate cumulative exposures to airborne PCBs. The AALs for PCBs were developed considering child and adult resident and commercial worker receptors. The selection of the appropriate AAL depended on the type of receptors at the potential exposure point (see Section 3.2 of this Air Monitoring Plan). Appropriate body weights, breath (lung) volumes, and exposure durations were assumed for each receptor. The AALs are a direct function of the potential duration of exposure.

In the 2006 update to the Air Monitoring Plan, the AALs were revised to account for a longer duration of remedial actions of 26 years (Jacobs 2006b). This increased duration results in the calculated AALs being more conservative (lower) exposure values. Applying 26 years of exposure results in AALs for a child resident and commercial worker of 202 and 344 nanograms of total PCBs per cubic meter of air (ng/m<sup>3</sup>), respectively. The results of air monitoring conducted since 2002 have been tracked against these AALs to calculate the cumulative exposure budget at each monitoring station, as documented in annual data summary reports.

The approach for tracking human health risk from exposure to PCBs in air previously used at New Bedford Harbor tracked a cumulative exposure budget over time to evaluate the potential cancer risk from periodic increases in PCB concentrations associated with dredging or other disturbance of sediments. Due to the complexity of the previous tracking system, with associated difficulty in understanding by the public, and updates to PCB toxicity factors, it was decided to simplify the risk tracking process as described in the following sections.

### **2.1.3 Development of Risk Based Goals for Carcinogenic and Noncarcinogenic Effects**

In this Air Monitoring Plan update, the technical risk assessment approach to the original methodology for derivation of AALs has been modified slightly and is incorporated to adopt approaches updated by the EPA. The term Ambient Allowable Limit (AAL) has been changed to the term risk based goals (RBGs). In the past, the AAL was construed to be an air concentration that could not be exceeded, whereas the RBG is understood to be an air concentration when averaged over time will not result in unacceptable excess cancer risks or noncancer hazards. This change in the conceptual approach reflects current risk assessment methodologies.

The methodology described in [Appendix A](#), was used to calculate the cancer risk and non-cancer hazards and trigger levels for the following receptors:

- child resident over the most recent six years (non-cancer),
- long-term resident from childhood to adult over the entire sampling period since beginning sampling (cancer),
- short-term worker over the most recent six years (non-cancer), and
- long-term worker over the entire sampling period since beginning sampling (cancer).

The exposure duration of six years for a child resident was chosen because it is the minimum exposure duration for chronic exposures and coincides with the EPA default exposure duration for a young child (birth to age 6), the most sensitive receptor. EPA's current default exposure duration is 6 years for a child resident, 20 years for an adult resident (for a total of 26 years), and 25 years for an adult worker.

Using the approach presented for the evaluation of cancer risk and non-cancer hazards ([Appendix A](#)), RBGs and trigger levels have been derived for the New Bedford Harbor cleanup.

Receptor	RBG Non-cancer (ng/m <sup>3</sup> )	RBG Cancer (ng/m <sup>3</sup> )	1 <sup>st</sup> Trigger (ng/m <sup>3</sup> )	2 <sup>nd</sup> Trigger (ng/m <sup>3</sup> )
Child/Adult resident	110	202	110 <sup>1</sup>	330 <sup>2</sup>
Long-term worker	Not Applicable	344	344 <sup>3</sup>	1100 <sup>3</sup>

Notes:

<sup>1</sup> HQ=1

<sup>2</sup> HQ=3

<sup>3</sup> ECLR= 1E-05

Consistent with risk management guidance for Comprehensive Environmental Response, Compensation, and Liability Act sites (EPA 1990), the risk management criteria for dredging activity will be hazard quotient (HQ) values approaching HQ=1 and an excess lifetime cancer risk (ELCR) values of 1E-05. The first RBG trigger for PCBs is 110 ng/m<sup>3</sup> based on non-cancer hazards for a child resident. The 110 ng/m<sup>3</sup> level was approved by EPA for the Hudson River PCBs Superfund Site. The second trigger for non-cancer hazards to a child resident has been set at 330 ng/m<sup>3</sup> (HQ=3). The RBG for long-term workers in industrial settings is based on a cancer risk of 1E-05 over the working lifetime of the worker. All of the triggers presented are to maintain exposures below a chronic non-cancer risk limit of HQ = 1 and a cancer risk limit of 1E-05. Exceedance of any trigger will result in the evaluation of mitigation options that are described in Section 3.3.1.

#### 2.1.4 Air Dispersion Modeling

Air dispersion modeling has been conducted for pilot studies and for remedial dredging activities at New Bedford Harbor. Both Foster Wheeler and Jacobs have performed air dispersion modeling utilizing EPA's Industrial Source Complex Model for the purpose of predicting concentrations of ambient air PCBs generated by dredging and the associated treatment facilities. The historical results of the modeling efforts are described in detail from Foster Wheeler (2001b) and Jacobs (2005b, 2006a, 2007, 2008a, 2009, 2010, 2011, 2012 and 2014). This air dispersion modeling approach will continue for the duration of air sampling operations conducted under this remedial action program.

From 2004 to 2017, Jacobs conducted annual dispersion modeling for two purposes. The first was to aid in the placement of sampling stations and to predict the ambient air concentrations at locations a distance away from the various remediation and background source areas. As site-specific air sampling data has been collected at various receptor locations, the air modeling was refined to more closely represent the actual site sampling results in an effort to improve model predictions. The second was to further refine the location and concentration of maximum ground impact (i.e., the highest ground level ambient air concentration of PCBs released during remedial activities). Because the modeling results were primarily based on the dispersion of documented source concentrations, it was critical that the initial model input

data reflect the maximum starting source concentrations to avoid underestimating the potential exposure to downwind receptors. Subsequently through 2014, integrated ambient PCB results continue to support the fact that both Area C desanding plant (Stations 47, 48, and 49) and the Area D WWTP (Stations 50, 51, and 52) do not significantly impact air quality as once thought from initial modeling assumptions (Table 2-2).

The Jacobs 2005 air dispersion modeling incorporated hydraulic and mechanical dredging, changes in the remediation strategy (PCB mass removal techniques) along with the changes in the source areas, which were different from the input sources used in the Foster Wheeler model. Jacobs classified the source areas into two following categories: background sources and remediation emission sources (Jacobs 2005). The identified background source areas included the following:

- harbor mudflat and intertidal sediments;
- point or area land sources with previous PCB sediments;
- PCB-contaminated soil piles;
- holding ponds for PCB contaminated sediments; and
- a source at Aerovox.

The assumed remediation emission sources in the model are sources that only contribute contamination to the atmosphere during periods of active remediation. They include dredging operations, debris removal activities, and releases from the desanding plant operated in Area C and the WWTP operated in Area D. The Jacobs modeling efforts in 2005 and 2006 considered these data and made adjustments in model calibration accordingly.

### **2.1.5 Cumulative Exposure Tracking**

The cumulative exposure Risk Tracking System process provides a benchmark for comparison with a time series of airborne PCB concentrations to evaluate potential inhalation risks to the public. The series of PCB concentrations at a location have been established using a combination of actual sample results and baseline or assumed values. The established cumulative exposure tracking methodology will continue until initiation of the changes described herein, and thence until the remedial action is complete. Previously, a limited number of stations were tracked against a cancer risk exposure budget. Now, all stations will be tracked to the cancer and noncancer risk limits.

Since the initiation of full-scale remediation activities in 2004, Jacobs has performed the calculations utilizing a spreadsheet developed by Foster Wheeler called Public Exposure Tracking System (PETS) as presented in the Implementation Plan (Foster Wheeler 2001b). A brief standardized summary report has been generated for each sampling station that uses real data collected following each sampling event or baseline concentrations. That report contained the current plot of the comparison of the cumulative exposures to the established budget line and a review of any triggers present during that sampling period. Further details are presented in the Implementation Plan (Foster Wheeler 2001b). The completed 2015

PETS curves are found in [Appendix A](#) of the 2014-2015 Air Monitoring Report (Jacobs 2017). None of the budgets have been exceeded since the inception of tracking the cumulative exposure budgets.

Going forward with this work plan, potential risks to a residential child will be calculated based on the 6-year rolling average air concentration starting with the first six years of historic measured air results. Because data acquisition has not been constant over time, this air tracking process assumes that the concentration is the same for each day after an actual measurement, until the next actual measurement is made. The risks will be calculated for a 1-6-year old residential child for stations in residential areas and for an adult worker exposed for up to 25 years to the 6-year rolling average air concentration for stations in commercial areas. The stations and their receptors are identified in Section 3.2. The details of the risk calculations are provided in [Appendix A](#).

## 2.2 Volatile Organic Compounds

The rationale and methods taken to monitor for Volatile Organic Compounds (VOCs) were successfully conducted during the 2008 remedial activities at the former Aerovox facility shoreline. The same approach will be applied during future remedial activities at the Aerovox intertidal area and Cell #1. VOCs will be monitored using a photoionization detector (PID) with a 10.6 electron volt (eV) lamp measuring the chemicals of concern as total VOCs. An exposure limit of 1 part per million (ppm) total VOCs will trigger monitoring for specific VOCs including tetrachloroethene (PCE), trichloroethene (TCE), hydrogen sulfide and vinyl chloride. Should readings on the PID and/or colorimetric tubes exceed action levels, organic vapor monitors (OVMs) will be deployed around the perimeter of the site with samples being submitted to the analytical laboratory for testing. For each of these, the ceiling exposure limit, perimeter assessment value (PAV), and perimeter action limit (PAL) will be evaluated based on industrial hygiene practices and threshold limits set by the American Conference of Governmental Industrial Hygienists. [Table 3-3](#) presents the various thresholds for the chemicals of concern and Section 3.3 provides more details of air sampling activities for VOCs. Likewise, the PALs for VOCs are considered protective of the general public beyond the site perimeter as the PALs are one or two orders of magnitude below the EPA's Acute Exposure Guideline Levels. An exceedance of a PAL would result in work stoppage.

## 2.3 Respirable Particulates

Respirable Particulate Monitoring will be initiated at all work sites where intertidal remediation is taking place such as wetlands and during the excavation of material stored in Cell #1. A ceiling of 0.15 mg/m<sup>3</sup> will be used to evaluate short term exposure (15-minute average). A PAV of 0.3 milligram per cubic meter (mg/m<sup>3</sup>) of air will be used to evaluate and initiate dust control measures and a PAL of 0.075 mg/m<sup>3</sup> will be used as the trigger to stop all work and reassess work practices and increase control measures.

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## 3.0 PCB Sampling Network

This section presents the network of sampling station locations that have been used and that will be used consistent with this Revision No. 5 in providing data for tracking cumulative exposure budgets relative to potential public exposure points around New Bedford Harbor. This section also identifies the monitoring schemes for each dredging and excavation scenario that may release airborne contaminants and includes the rationale for responding to contaminant levels that exceed prescribed guidelines.

### 3.1 Station and Receptor Locations

Locations of potential receptors (Figure 3-1) for airborne PCBs were developed to facilitate air modeling and are the primary consideration when selecting a sampling location based on remedial activities. Other key considerations in selecting sampling locations include:

- previously located sampling stations selected through the historical Air Management Plans;
- receptors' proximity to and downwind from remediation activities;
- site accessibility; and
- wind rose data.

Meteorological conditions were considered when selecting a monitoring network for PCB air sampling stations. Prevailing wind directions at different times of the year were determined by site-specific meteorological data collected to date:

- Summer – Prevailing winds are from the south or southwest (off the ocean, toward the land), and would generally transport PCBs toward the north or northeast;
- Fall – Prevailing winds are typically from either the northwest or the south/southwest, and would generally transport PCBs toward the southeast or the north/northeast, respectively;
- Winter – Prevailing winds are from the northwest (off the land, toward the ocean) with secondary peak winds from the northeast and southeast, and would generally transport PCBs toward the southeast; and
- Spring – Prevailing winds are transitional, but most typically from either the northwest with secondary easterly component winds (north or south of east), and would generally transport PCBs toward the southeast or components of the west, respectively.

The site monitoring locations have been selected previously based on three criteria, (1) a receptor's proximity to remedial activity, (2) site accessibility, and (3) meteorological patterns. Evaluating additional work in the Lower Harbor, five additional locations were identified based on those three criteria (Figure 3-3). These five additional locations supplement the three existing Lower Harbor locations in providing a more comprehensive network of air sampling stations during Lower Harbor remedial operations.

## 3.2 Sampling Locations

Table 3-1 identifies the ambient air sampling locations. The historical ambient air sampling locations are presented in Figure 3-2 for the Upper and Lower Harbor. Figure 3-4 shows the density of the available sampling network for ambient PCBs based on major remedial activities. Each major remedial action is listed on Table 3-2 along with the sampling stations anticipated for sample collection during that action. There are any number of combinations of stations for use depending on the remedial action and their locations. Not all sample stations will be used for every remedial action, but the intent is to collect samples that are representative of possible exposures to residential and commercial receptors in the vicinity of active remedial activities.

Stations that may be used to monitor airborne contamination from remediation of PCB contaminated sediments include (Figure 3-4, Table 3-1):

Station 24—Aerovox—Commercial—located along the western shoreline of upper New Bedford Harbor—used to monitor hydraulic dredging activities in the upper harbor adjacent for former Aerovox facility.

Station 25—Manomet/Cliftex—Residential—located off of Manomet Street on west side of harbor adjacent to two condominium complexes—used to monitoring dredging in the upper harbor.

Station 27—Porter—Residential—located in open field on east side of harbor—used to monitor dredging activities in the upper harbor, contributions of contaminants from mudflats on the east side of the harbor, and for future excavation activities in the wetlands.

Station 30—Fibre Leather—Commercial—located on west side of harbor in open area adjacent to industrial complex—used to monitor dredging activities in the upper harbor.

Station 42—NSTAR North—Commercial—located in open field adjacent to NSTAR substation—used to monitor dredging activities in the upper harbor.

Station 43—Veranda—Residential—located in residential neighborhood at end of Veranda Avenue on east side of harbor—used for background and to monitor long range effects of dredging in the upper harbor.

Station 44—Taber—Residential—located adjacent to water pump house at the end of Taber Street on east side of harbor—used to monitor activities in the lower harbor, the LHCC in particular.

Station 46—Coffin—Residential—located on west side of harbor near cove and adjacent to residential neighborhood and Riverside park—used to monitor dredging activities in the upper harbor.

Stations 47, 48, and 49—Area C—Commercial—located near the Area C desanding building depending on prevailing wind direction—used to monitor desanding activities during active hydraulic dredging and to monitor emissions from the Pilot CDF and Cell #1.

Stations 50, 51, and 52—Area D—Commercial—located near the Area D dewatering building depending on prevailing wind direction—used to monitor dewatering and water treatment activities during active hydraulic dredging.

Station 53—Hydraulic Dredge—Point Source—used for dispersion modeling data.

Station 55—Aerovox West—Residential—located on west side of former Aerovox building adjacent to residential neighborhood on Belleville Avenue—used to monitor impacts to residential area from hydraulic dredging and any residual effects from the former factory.

Station 56—Acushnet Park—Residential—located north of Wood Street on east bank of the Acushnet River in Acushnet Park—originally used to monitor north of Wood Street excavation activities, currently used during hydraulic dredging.

Station 58—Pearl—Residential—located at Pearl Street to monitor impacts from Area D operations.

Station 59—Popes—Commercial—Located on Popes Island to monitor impacts from the LHCC filling and mechanical dredging in the lower harbor.

Station 60—Washburn—Residential—located on the west bank of the harbor, south of the I-195 bridge to monitor mechanical dredging near this location.

Station 62—Century House—Residential—located on east bank of the harbor in parking lot of Century House Restaurant—used to monitor hydraulic dredging activities in the upper harbor and to monitor exposed mudflats on the east side of the harbor.

Station 64—Pilgrim—Residential—located on city property at the end of Pilgrim Avenue on east side of the lower harbor—used to monitor activities in the lower harbor, such as Area D and the LHCC.

Station 65—CAD Cell Dredge—located on mechanical dredge as point source for dispersion modeling.

Station 66—Huddleston—Residential—located west of the Fairhaven High School to monitor LHCC activities.

Station 67—Revere—Commercial—located on the east side of the lower harbor to monitor LHCC activities.

### **3.3 Summary of Ambient Air Sampling Activities**

Ambient air samples for PCB analyses will be collected using sample methods as specified in EPA Method TO-10A [using low volume polyurethane foam (PUF)]. Portable air monitoring devices will be deployed to pre-selected locations based on the activity and the aerial coverage needed to assess the release of airborne contamination. Each of the air samples will be collected using a calibrated and programmed BGI brand PQ-100 air sampling pump. The calibrated sampling pump has a mass flow controller to accurately ( $\pm 2$  percent) adjust the 5-liter per minute flow rate based on the calibrated standard temperature and pressure. The media is a 22 millimeter Supelco Orbo-1500 PUF/XAD-2/PUF sample tube with a 32 millimeter quartz microfiber filter as the lead media. The locations of the PUF samplers is flexible since each sampler is battery operated and capable of operating greater than 24 hours without loss of air flow or pump fault due to media loading. The samplers are mounted on tripods to meet an inlet height requirement of approximately 4-6 feet, a range comparable to adult/child breathing zone height. At sites where samplers are co-located, the sampler spacing is approximately 2 meters. For security purposes, fencing may be installed around the samplers.

Samples will be collected over a 24-hour period. It is anticipated that the start time will be between 7 a.m. and 2 p.m. The sample media will be installed the day the sampling starts and a quality control check of the samplers will be done to insure they are operating as calibrated. Each sampler will be programmed to run for 24 hours. After the 24-hour run is completed, the sample media will be retrieved within one hour.

Concentrations of VOCs will be monitored in the breathing zone (4 to 6 ft) using a MultiRAE multi-gas meter such as a photoionization detector (PID) at 10.6 eV. This device can be used for oxygen and lower explosive limit (LEL) plus total VOCs and hydrogen sulfide. An initial trigger of 1 ppm above background for VOCs will prompt VOC monitoring using colorimetric tubes for vinyl chloride, TCE, and tetrachloroethene (PCE). While PIDs and colorimetric tubes can provide real-time results, an alternative method like organic vapor monitor such as 3M 3500 or equivalent can provide a less timely but more reliable estimate of VOC concentrations in the affected area.

Particulates will be monitored in the breathing zone using a respirable aerosol monitor (RAM), a two-wavelength nephelometric monitor with a light scattering sensing configuration optimized for the measurement of the fine particle fraction (10 micron or less) of airborne dust under ambient conditions.

All instrumentation will be calibrated to manufacturer recommendations. Any instruments that cannot meet calibration criteria will be sent for repair and factory recalibration. Where sampling media is used, the media will be within its useful life (not expired) and the media will be used according to the EPA, National Institute of Occupational Safety and Health, or Occupational Safety and Health Administration method for the contaminant of concern. All laboratories under contract to analyze the media will have current certifications and accreditations as required.

### **3.3.1 Upper Harbor Hybrid Dredging-Upper Harbor Mechanical Dredging-Lower Harbor Mechanical Dredging**

Air monitoring for dredging activities in the upper and lower harbor locations will be conducted to determine airborne PCBs levels during dredging activities. As currently planned, hybrid dredging will be used only in the Upper Harbor for the removal of PCB impacted sediments. However, mechanical dredging is planned in both the upper and lower harbors with deposition of dredged materials in the Lower Harbor CAD Cell. A flow chart for the air monitoring program for PCB sampling is presented in [Figure 3-5](#).

Prior to dredging, a set of samples will be collected to understand ambient air conditions and provide a comparison to previously modeled results. This initial monitoring event will provide exposure tracking data prior to dredging. The sampling network will consist of monitoring locations that have been used for previous air monitoring investigations or new locations in the lower harbor that have been added to accommodate updated dredging activities ([Table 3-2](#), [Figure 3-5](#)).

After the pre-dredge sampling event, the next set of samples will be collected from the same pre-dredge network of stations and the operating dredge on a monthly basis, approximately two weeks into dredging. The initial sample analysis will be scheduled for a 20-day turnaround time (TAT) for results. Should the receptor specific second trigger be exceeded, the impacted sampling station will be resampled during the

next monthly round and the analysis will be scheduled for a 10-day TAT. Should this expedited sample result in an exceedance of the second trigger level again, the station will be resampled immediately with a 10-day TAT for analysis. One post-demobilization round of sampling will be collected from the station network no sooner than two weeks on a 20-day TAT after the completion of dredging. Refer to Section 5.0 for the full reporting process.

### **3.3.2 Aerovox Near-shore Area and Cell #1 Excavation**

In 2008, remedial operations along the former Aerovox shoreline were monitored for airborne PCBs, VOCs and respirable PM. Future operations in the Aerovox Near-shore area and Cell #1 excavation may potentially release similar constituents thus impacting air quality in the surrounding community. Airborne PCBs will be monitored using the existing monitoring network and follow procedures as outlined in Section 3.3.1 for dredging ([Table 3-2](#)). PCB sampling frequency will be bi-weekly initially and, pending no exceedances of the applicable second trigger, the sampling frequency for PCBs can be adjusted to monthly sample collection. The flow diagram of air monitoring activities for remedial excavation is presented in [Figure 3-6](#).

The monitoring of VOCs will be performed using real time instrumentation and passive dosimetry, as necessary. There are three available methods for the measurement and detection of VOCs; PIDs, colorimetric tubes, and passive dosimeters. PIDs provide real time results for total VOCs in local air quality. Colorimetric tubes are used to determine the compounds from the total VOC readings with vinyl chloride, TCE and PCE being measured and compared to their ceiling values. The ceiling value is a 5-minute measurement unique to each compound ([Table 3-3](#)). OVMs are passive dosimeters that measure 8-hour time weighted average of more specific VOCs and are dispersed around the perimeter of the work zone. The OVM method has limited use because laboratory analysis is required of the media and the results are not immediate. The colorimetric tube or OVM methods are typically used to validate the PID readings. Suspended particulates will be monitored using a RAM which provides real time results.

VOC and particulate monitoring will incorporate PIDs and RAMs and will be used as the primary means to collect data on a daily basis to measure potential operational impacts to air quality. The PIDs and RAMs will be placed around the site either on stationary fixtures or carried by hand to monitor the air quality in the breathing zone in proximity to the excavation activities. The initial trigger points will be 1 ppm for VOCs, 1 ppm for hydrogen sulfide gas, and 0.75 ng/m<sup>3</sup> for respirable particulates. If the initial trigger is exceeded for more than 15 minutes, colorimetric tubes will be used to differentiate the total VOCs. If a ceiling limit is reached for a specific compound passive dosimeters (OVMs) will be placed upwind, downwind, and crosswind around the perimeter of the work site. The media in the passive dosimeter will be analyzed to include the VOC contaminants PCE, TCE, vinyl chloride, and cis-1,2-dichloroethene ([Table 3-3](#)). If concentrations exceed the short term exposure limit, then the PAV for that compound will be evaluated. If the concentrations exceed the PAV, then the PAL will be evaluated. If the concentrations exceed the PAL, then work will be suspended until corrective action is employed to bring the PAL to concentrations at or below the PAV. This information is summarized in [Tables 3-2, 3-3](#), and [Figure 3-6](#).

Monitoring for VOCs and particulates will be conducted every day during active excavation. Should ceilings be exceeded, sampling via OVMs will be conducted weekly around the perimeter of the site. If any triggers are initiated, the results will be reported to NAE and EPA as discussed in Section 5.0.

### 3.3.3 Shoreline and Intertidal Remediation

Contaminant transport in New Bedford Harbor affected not only deep channel sediments, but low lying mudflat areas where contaminants were deposited as a result of alluvial transport and tidal influences. PCB contaminated sediments were deposited on these landforms which resulted in contamination in some intertidal and shoreline areas of the harbor. The mudflats and wetlands pose a continuing threat for the release of airborne contaminants as the areas can dry and become a source of airborne PCBs and particulates. Disturbance of these wetlands during excavation can accelerate this process potentially liberating airborne contaminants. Numerous wetland sediment core samples have been collected over the years to characterize the vertical and lateral extent of contamination along the shorelines of the City of New Bedford and Towns of Acushnet and Fairhaven.

Monitoring for PCBs will follow the same procedure as outlined in Section 3.3.1 using the existing monitoring network. However, the sampling frequency will be modified based on the concentrations of PCBs in soil to be excavated along the shoreline or in the mudflats. During remediation of areas where sediment concentrations exceed 5,000 mg/kg, PCB air sampling will be conducted weekly. Sampling media will be sent to an offsite laboratory using a 10-day TAT. As presented in Section 3.3.1, should an air sample location exceed the second trigger level, an additional sampling event will be completed at the affected station. This sample will also be subjected to a 10-day TAT (Table 3-3, Figure 3-7).

There is no indication that VOCs are contaminants of concern along the shoreline and mudflats of New Bedford Harbor. Only VOC screening will be conducted during excavation of the mudflat, intertidal or shoreline areas.

During remediation of areas with PCB sediment concentrations greater than 500 mg/kg PM sampling will be conducted. Sediment sample results will be used to determine a feasible air monitoring approach using real-time PM air sampling during the remediation of the shoreline systems. Based on PCB sediment concentrations, calculations were made to establish action levels for particulates that will be used as a surrogate concentration for PCBs that may be anticipated due to the potential generation of airborne particulate matter from remedial operations. The formula used for this calculation is from the American Industrial Hygiene Association.

The calculation for the air monitoring approach is:

$$AL = [10^6 \text{ mg/kg}] * [EL (\text{mg/m}^3)] / [C (\text{mg/kg})] * [SF]$$

Where:

- AL = action level

- EL = exposure limit of contaminant
- C = sediment concentration
- SF = Safety Factor

In all cases the airborne exposure limit used is 110 ng/m<sup>3</sup> or about 0.0001 mg/m<sup>3</sup>. Various sediment concentrations ranging from 500 mg/kg to 20,000 mg/kg were used to develop action levels based on the sediment concentrations to be excavated. The Safety Factor used was two (2). This safety factor was used because it was assumed that 100 percent of the airborne particulates were composed of sediments contaminated with PCBs and to reflect uncertainty in the extent of contamination. As determined for PCB monitoring, sediment concentrations greater than 500 mg/kg would serve as the lower threshold value for PM sampling.

**Calculated Results of Air Action Levels Based on Surrogate Sediment PCB Concentrations**

Sediment Concentrations (mg/kg)	Air Action Level (µg/m <sup>3</sup> )
500	100
1,000	50
5,000	10
7,500	7
10,000	5
20,000	2.5

Particulates will be monitored to assess impacts during excavation of the mudflat and shoreline areas. Where soil concentrations of PCBs are greater than 500 mg/kg, PM sampling will be conducted daily. RAMs will be placed around the areas of excavation to monitor the release of PM as a result of remedial activities. Particulate matter as PCBs will be monitored to assess any potential air quality impacts during the excavation of mudflat and shoreline areas where sediment concentrations are greater than 500 mg/kg. To delineate an area considered representative of the core sample results, a twenty-five foot radius was selected to denote the impacted sediments from that sample. During the remediation of sediments within the radius, surrogate PM sampling will be conducted while those sediments are handled.

When intertidal and shoreline areas are being excavated, direct-read area PM monitoring will be used to measure airborne concentrations above background. Typically, three monitors may be placed around the work area at an up-wind, down-wind and cross-wind location. The intent is to have at least one monitor adjacent to a residential receptor to monitor the air quality. The sampling layout for ambient PCBs as PM at these locations will be modified dependent on sediment concentrations, meteorological conditions, and proximity to residential receptors.

The direct-read instrument readings for the RAM will be compared to the calculated results of air action levels. If any of the ambient readings are more than double the applicable calculated air action level for a 15-minute averaging time on the meter, Jacobs will conduct an evaluation of the source and mitigation measures and report the findings to the on-site NAE Project Engineer and EPA (Tables 3-2, 3-3 and Figure 3-7).

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## 4.0 Best Management Practices

BMPs will be employed for each of the activities including hybrid dredging, mechanical dredging, subtidal excavation and near shore excavation to mitigate release of contaminants to the air. There may be occasions when site conditions such as higher sediment concentrations, elevated solar radiation, elevated air temperature, lower wind speed, and other influences can produce unwanted air quality impacts. BMPs were developed to mitigate these impacts and will be employed as needed to reduce airborne contamination.

### 4.1 Hybrid Dredging and Debris Removal

Hybrid dredging is an activity that can contribute to airborne contamination. The mechanical environmental bucket is enclosed but breaks the surface of the water; the hydraulic transport system remains under water during dredging activities and contaminated sediment is contained within the pipeline as it is transported to the desanding and dewatering facilities. However, there are methods that can reduce impact from the sediment phase to the airborne phase:

- The proper use of oil boom is a key method in controlling the release of oil on the water. Oil can be released from the sediment when disturbed by the excavator during debris removal or by the hydraulic dredge. This agitates the sediment and some oil can be released to the surface during this operation. To mitigate this effect, an oil boom will be deployed to surround the perimeter of the hydraulic dredge or debris removal barge. This boom serves as the first point of contact with any oil released from the sediment and absorbs the oil in order to mitigate ambient air releases. A second 'layer' of oil booms will be deployed around the perimeter of the working dredge zone to capture any oil that is not captured by the boom around the dredge or barge.
- Should the RBG for a station be exceeded, continuous oil sheen be observed within the dredge area during dredging or debris removal, or the existing oil boom be unable to maintain control of the sheen, additional oil booms will be deployed in a double "V" configuration within the working dredge zone. Each of the points of the "V" will be in line with the tidal flow of the river so that the oil boom collects oils that are spreading within the dredge zone. This configuration will work during the ebb and flow tidal changes to catch errant oils. The angle of the "V" can be changed to accommodate varying flows within the river and reduce the surface area available for PCB volatilization. This oil boom placement will bolster as needed, the perimeter boom during tidal fluctuations in the river.
- Oil booms will be changed on a frequent schedule based on visual oil impact, thus better managing any floating oil or sheen and reducing the potential for air quality impacts. Used oil booms will be routinely collected and placed in plastic bags for off-site disposal.

### 4.2 Mechanical Dredging

Subtidal excavation is currently planned for sites around New Bedford Harbor. This activity involves mechanical dredging to remove contaminated sediment from the bottom of the harbor, load it into scows, and transport the material for disposition in the LHCC. Several practices and techniques can be employed to mitigate airborne releases and reduce exposure as follows:

- Use of oil boom on the inside perimeter of the silt curtain to absorb any oils released during the filling of the LHCC.
- Maintenance of sediment in a wet state to limit the exposure of contaminants to air. Assuring the scow will not sit once the decanted water is removed to ensure sediment does not desiccate in order to reduce the chance that contaminants become airborne.

- Careful placement of contaminated sediment in the scow. By avoiding “dead drops” there is lesser disturbance to the sediment reducing suspension of contaminated materials into the air.

BMPs and their effectiveness will be documented at a minimum during ambient air sampling activities.

### 4.3 Cell #1 Sediment Removal

Over the course of the New Bedford Harbor Superfund Program, several operations including Field Design, North Lobe, North of Wood Street remediation and Aerovox mechanical excavation have used Cell #1 as an interim CDF for contaminated materials. In general, the materials placed in Cell #1 have concentrations of PCBs up to approximately 10,000 ppm. The last such materials were stabilized sediment deposited in 2008 and topped with six to eight inches of clean fill material. Under the operable unit 1 (OU1) cleanup plan, the material currently stored in Cell #1 will be removed and disposed off-site. If treatment to stabilize the materials is required prior to shipment, the operation will be conducted using engineering controls appropriate for the treatment method. Lime will not be used to stabilize spoils due to its high heat of reaction and the potential for volatilizing PCBs into the ambient air. The intent is to minimize volatilization and spread of contamination to the surrounding area. Work methods appropriate for the site conditions will dictate the type and combination of BMPs used:

- Material will be kept moist to the extent possible. Sediments and soils will be worked wet whenever possible, stockpiles will be allowed to drain but not dry out, and drier materials may be comingled with wet materials prior to load out;
- Visible oil and or oil sheens will be collected for disposal with impacted spoils and areas that may produce an oil sheen overnight will be covered with polyethylene sheeting or other means to reduce potential air quality impacts; and
- Areas that have sediment results greater than 5,000 mg/kg may need to be addressed when meteorological conditions do not exacerbate the release of airborne contamination. For example, the timeframe for addressing high sediment concentrations are ideally late fall through early spring when ambient temperatures and solar radiation impacts are lower and reduce the incidence of airborne contamination.

### 4.4 Mechanical Excavation (Near-Shore and Shoreline)

Several nearshore, mudflat and intertidal areas around New Bedford Harbor, in particular, the Aerovox Near-shore area has become contaminated as a result of discharge of PCBs to the harbor. Intertidal and shoreline areas above applicable OU1 cleanup levels will require remediation. The primary remedial method is excavation of the impacted sediments and soils and removal for off-site disposal. Work methods appropriate for the site conditions will dictate the type and combination of BMPs used:

- Material will be kept moist to the extent possible. Sediments and soils will be worked wet whenever possible, stockpiles will be allowed to drain but not dry out, and drier materials may be comingled with wet ones prior to load out;
- Visible oil and or oil sheens will be collected for disposal with impacted spoils and areas that may produce an oil sheen overnight will be covered with polyethylene sheeting or other means to reduce potential air quality impacts;
- Areas that have sediment core results greater than 5,000 mg/kg may need to be addressed when meteorological conditions do not exacerbate the release of airborne contamination. For example, the

timeframe for addressing high sediment concentrations are ideally late fall through early spring when ambient temperatures and solar radiation impacts are lower and reduce the incidence of airborne contamination;

- Lime will not be used to stabilize spoils due to its high heat of reaction and the potential for volatilizing PCBs into the ambient air; and
- Shoreline remediation will entail constructing access roads to the excavation boundary of the wetlands for truck and equipment access. As much as is feasible, excavated sediments will be direct loaded into dump trucks for disposal. There will be areas where the spoils will be gravity drained before final shipment off site. During this dewatering event there is the possibility of drying of the spoils pile. At no time will any of the work areas be allowed to produce visible dust. Dust control will be routinely deployed in particular on the access roads.

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## 5.0 Reporting

Activities that may generate airborne contamination will be monitored using the methods, procedures, and guidelines presented in this work plan. Data generated during these activities will be reported as part of the overall remediation process. Reporting considerations will vary according to the remedial action taken (hydraulic/mechanical dredging, subtidal excavation, and intertidal excavation), the constituents monitored, and any action taken to mitigate risk due to airborne contamination. This reporting process is based on the contaminant of concern, its potential for impacting air quality, and the air sampling and analytical method used.

### 5.1 Integrated PCB Results

Airborne PCBs are and will be routinely monitored for all phases of remediation in New Bedford Harbor. There are two means by which the total PCB concentration for each air station is evaluated. One means is against a set of trigger levels and the other means is evaluating the PCB concentration against the RBGs. The trigger levels and RBG values are presented in Section 2.1.2.

When an ambient air result is less than the first trigger level for the applicable receptor, the result will be entered into the RTS and reported monthly. If an ambient air result is greater than the first applicable trigger level, but less than the second applicable trigger level, RTS, a report on the operational and meteorological conditions for the day of sampling will be generated to evaluate contributing factors. If the second trigger level is exceeded, in addition to the first trigger level, the station will be resampled. Should a third consecutive sample result exceed the second trigger, controls and meteorological conditions will be evaluated to determine if the exceedances can be mitigated by implementing Best Management Practices (BMPs). These BMPs may entail modifying dredging activities or performing dredging under more amenable meteorological conditions. A technical memorandum will be prepared detailing BMPs and/or operational changes implemented.

All ambient air results will be entered into the RTS. However, whenever an ambient air result is greater than an applicable trigger level, the RTS will be used to calculate the updated cancer and non-cancer cumulative risks to demonstrate the cumulative exposure remains below the risk based goals. This information will be reported immediately after the RTS is updated. When the RTS risk remains below the first trigger risk limit (HQ = 1; ELCR = 1E-05) or the sampling period, no further action is necessary. Should the risk exceed two times the risk limit (i.e. HQ = 2; ELCR=2E-05) for the sampling period, available operational changes or BMPs will be implemented. A technical memorandum will be prepared detailing BMPs and/or operation changes that were implemented. If the second trigger risk limits are exceeded for the sampling period and if conditions cannot be met to lower the incidence of airborne PCBs due to dredging and related activities, then work will be temporarily suspended in the vicinity of the station of concern and further options will be evaluated. A discussion of Best Management Practices for hydraulic and mechanical dredging is found in Section 4.0. This information is summarized in [Table 3-2](#) with the logic flow chart found in [Figure 3-5](#).

If any RBGs or trigger levels are exceeded during the course of PCB monitoring, the NAE and EPA will be notified immediately about the concentrations and the actions that will be used to further assess the airborne risk at those stations. For more immediate reporting, Jacobs will have two business days to review the preliminary data received from the laboratory and report the preliminary analytical results to the NAE and EPA. The preliminary data will be noted as unvalidated and posted by the EPA on the New Bedford Harbor Superfund website at <http://www2.epa.gov/new-bedford-harbor/new-bedford-harbor-cleanup-plans-technical-documents->

[and-environmental-data](http://www2.epa.gov/new-bedford-harbor/new-bedford-harbor-cleanup-plans-technical-documents-and-environmental-data). Likewise, once data are validated (approximately 6 weeks after the release of preliminary tabulated data) the validated tabulated data will be released to the EPA, who will in turn post the validated results on the New Bedford Harbor Superfund website at <http://www2.epa.gov/new-bedford-harbor/new-bedford-harbor-cleanup-plans-technical-documents-and-environmental-data>.

Stations that will be used to construct RTS graphs for commercial worker cancer risk include:

- Station 24—Aerovox
- Station 30—Fibre Leather
- Station 42—NSTAR
- Station 47—Area C
- Station 50—Area D
- Station 59—Popes
- Station 67—Revere

Stations that will be used to construct RTS graph for child resident cancer risk and non-cancer hazard include:

- Station 25—Manomet
- Station 27—Porter
- Station 43—Veranda
- Station 44—Taber
- Station 46—Coffin
- Station 55—Aerovox West
- Station 56—Acushnet Park
- Station 58—Pearl
- Station 60—Washburn
- Station 64—Pilgrim
- Station 66—Huttleston

Data collected from the various air monitoring stations will be used to construct the RTS graphs to determine when cumulative risks may be approaching trigger values. The validated data will be uploaded into the RTS. The RTS graphs represent the risk to either a commercial worker or a child/adult resident versus the 6-year rolling average air concentration. Separate RTS graphs will be developed for each receptor to track cumulative cancer risk and non-cancer hazard. Examples of the previously used PETS curves (completed through 2013) are presented in [Appendix C](#) for understanding the previous approach. Examples of the new RTS graphs are also presented in [Appendix C](#). All PCB monitoring results will be compiled in an air monitoring report when directed by the EPA.

## 5.2 Volatile Organic Compounds

The monitoring of VOCs will occur only during the near-shore area excavation of the former Aerovox facility and as part of the excavation of Cell #1. The readings for total VOCs as determined by the PID will be tabulated daily and reported to the EPA and NAE similarly as the integrated PCB results are reported. The key difference for VOC reporting is the reporting of any exceedances of the limits discussed in Section 2.2. Once the laboratory results are obtained, the results will be placed in the tabulated data sheet for the sample collection day and reported to the NAE and EPA. This approach has been used satisfactorily in 2008 for similar operations. At the end of the remedial activity, the results will be tabulated and distributed to the NAE and EPA. The data will then be summarized in the air monitoring report.

## 5.3 Respirable Particulate Matter Sampling

PM sampling is expected to be used in three of the remedial operations; intertidal and shoreline (wetlands) excavation, former Aerovox facility near-shore area excavation and the excavation of Cell #1 in the immediate area of the work. These three operations have the potential to generate PM that can locally impact air quality due to their proximity to receptors as well as the potentially dry nature of the material disturbed. These data will be collected daily by a RAM and results reported to the EPA and NAE. The key difference for PM reporting is the reporting of any exceedances of the limits discussed in Section 2.3. The results will be presented in tabular format at the end of the day and summarized in the annual air monitoring report.

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## 6.0 Annual Review

During the project, it is anticipated that the plans for remediation will continue to be updated in response to changes in the project. The approach outlined in this document will be reviewed annually as the remediation of the Harbor progresses to ensure that it remains appropriate for accomplishing the stated objectives of the Air Monitoring Plan. Based upon this annual review, changes to the sampling approach may be appropriate and can be incorporated as a modification to this document.

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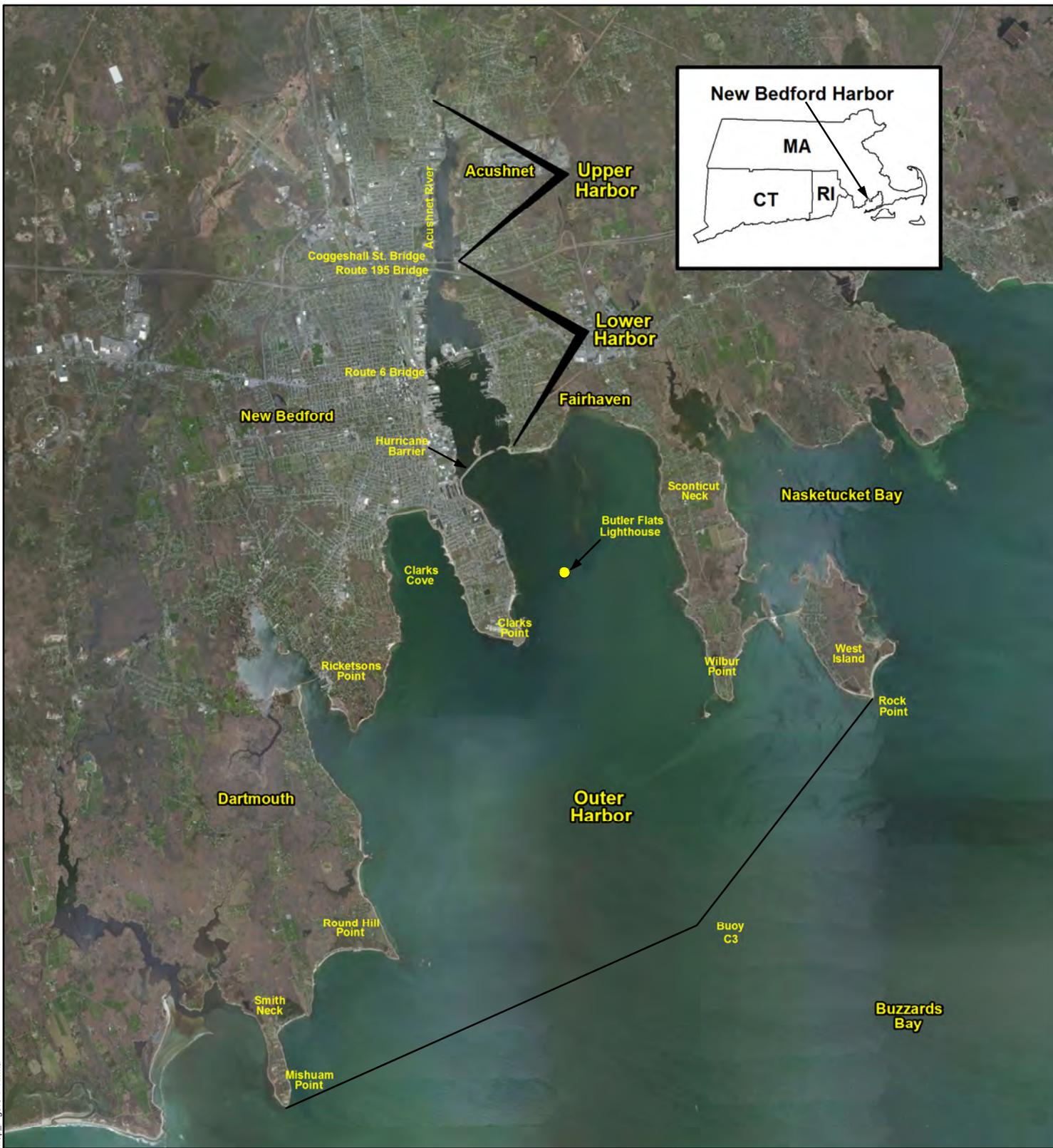
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# Figures



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**Legend**



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**JACOBS**<sup>TM</sup>

**Site Location Map**

New Bedford Harbor Superfund Site

NAME: jpicuito Date: 4/2/2015

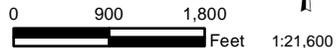
**Figure 1-1**



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Aerial Photography MASSGIS 2014

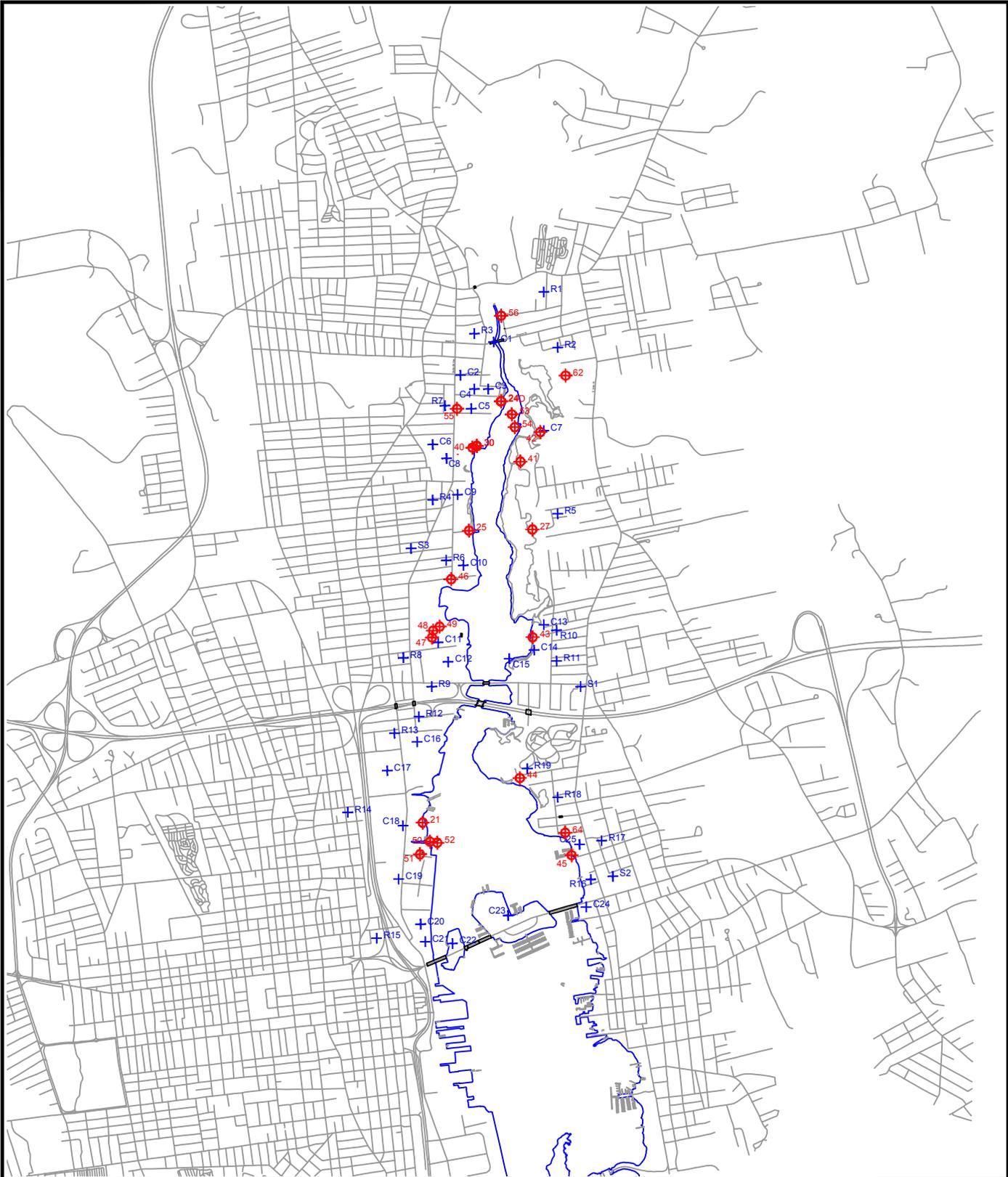


New Bedford Harbor  
Points of Interest

New Bedford Harbor Superfund Site

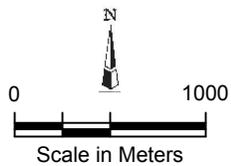
NAME: jacobn Date: 4/9/2015 Figure 1-2

USGS



**Legend**

-  Air Monitoring Station
-  Discrete Receptors



**JACOBS™**

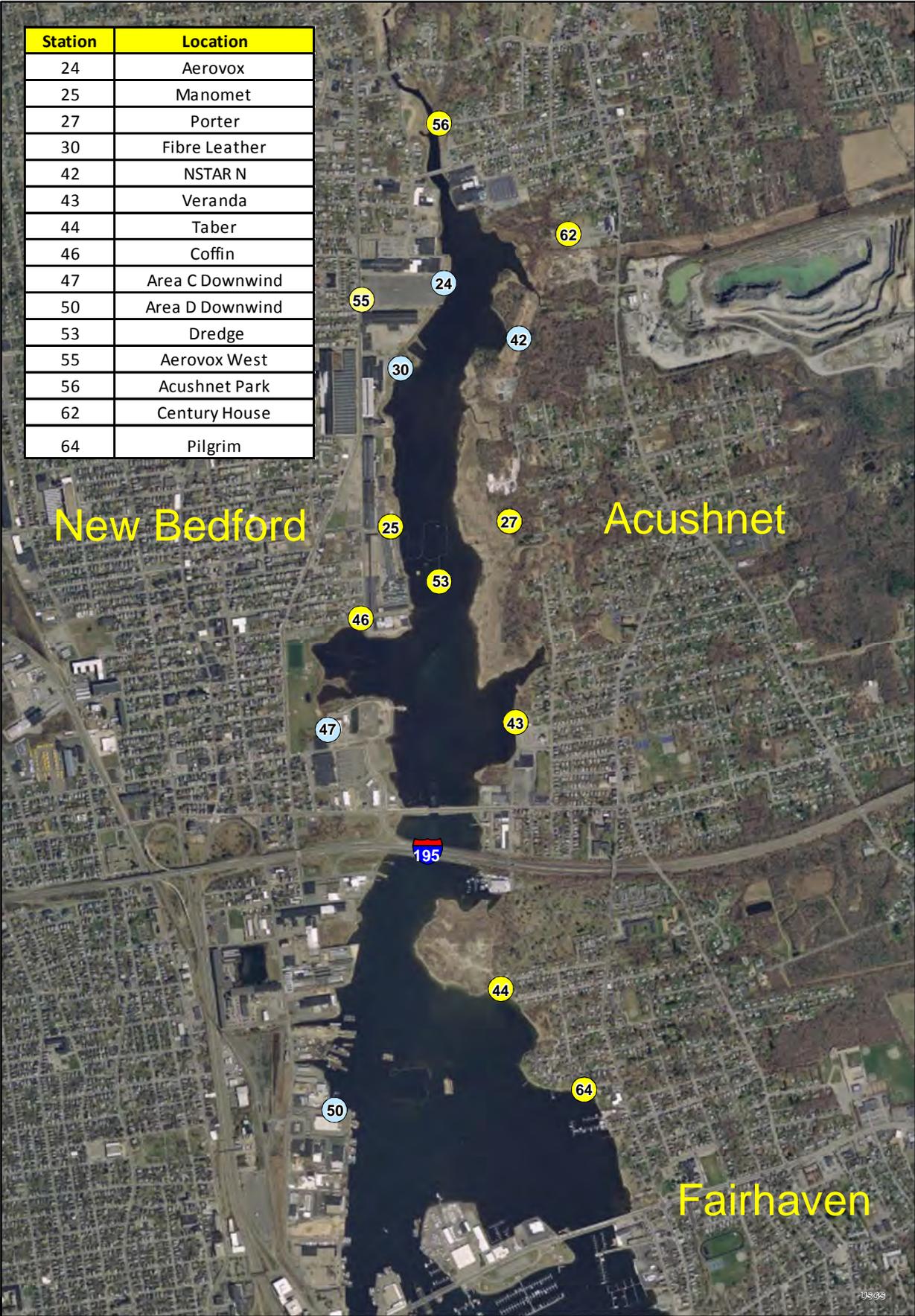
**Discrete Receptors for  
Air Dispersion Modeling**

New Bedford Harbor Superfund Site  
New Bedford, Massachusetts

06/18/14 DF  
Fig19 Receptor Locs.dwg

**Figure 3-1**

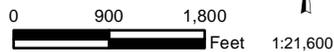
Station	Location
24	Aerovox
25	Manomet
27	Porter
30	Fibre Leather
42	NSTAR N
43	Veranda
44	Taber
46	Coffin
47	Area C Downwind
50	Area D Downwind
53	Dredge
55	Aerovox West
56	Acushnet Park
62	Century House
64	Pilgrim



**Legend**

- Residential Ambient Air Sampling Station Location
- Commercial Ambient Air Sampling Station Location

Aerial Photography MASSGIS 2014



**JACOBS**

Historical Ambient Air  
Sampling Station  
Locations

New Bedford Harbor Superfund Site

NAME: jacobbs Date: 4/2015

Figure 3-2

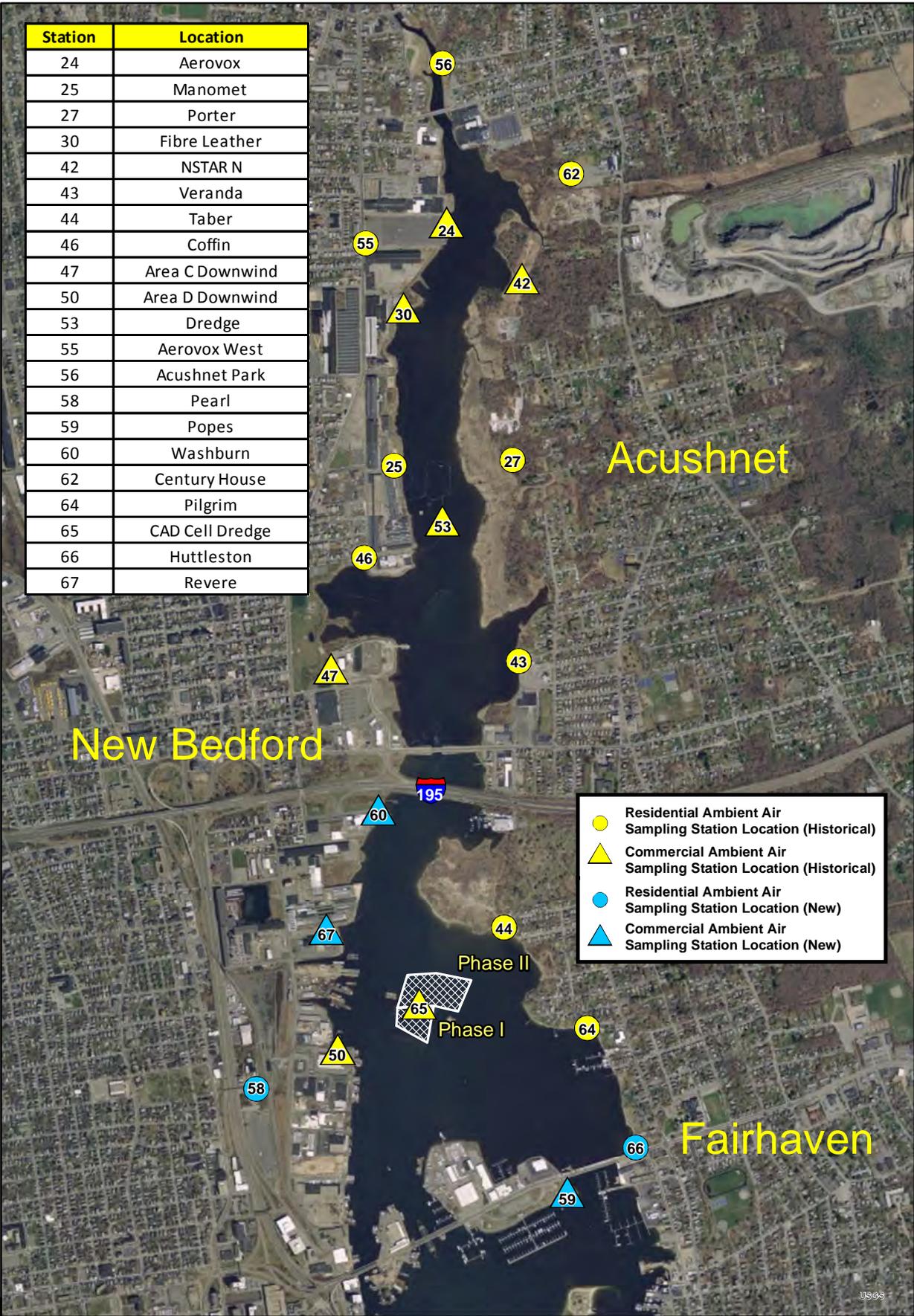
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<b>Legend</b>  EPA CAD CELL	 44 TABER	 60 WASHBURN	 67 REVERE	  1:9,600	 Lower Harbor Ambient Air Sampling Station Locations New Bedford Harbor Superfund Site <small>NAME: jacobls Date: 8/2015</small>
	 50 AREA D	 64 PILGRIM	 65 LH DREDGE		

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 Aerial Photography MASSGIS 2014

Station	Location
24	Aerovox
25	Manomet
27	Porter
30	Fibre Leather
42	NSTAR N
43	Veranda
44	Taber
46	Coffin
47	Area C Downwind
50	Area D Downwind
53	Dredge
55	Aerovox West
56	Acushnet Park
58	Pearl
59	Popes
60	Washburn
62	Century House
64	Pilgrim
65	CAD Cell Dredge
66	Huttleston
67	Revere



	Residential Ambient Air Sampling Station Location (Historical)
	Commercial Ambient Air Sampling Station Location (Historical)
	Residential Ambient Air Sampling Station Location (New)
	Commercial Ambient Air Sampling Station Location (New)

**Legend**

	EPA CAD CELL
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Aerial Photography MASSGIS 2014



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**JACOBS**

Available Ambient Air Sampling Station Locations

New Bedford Harbor Superfund Site

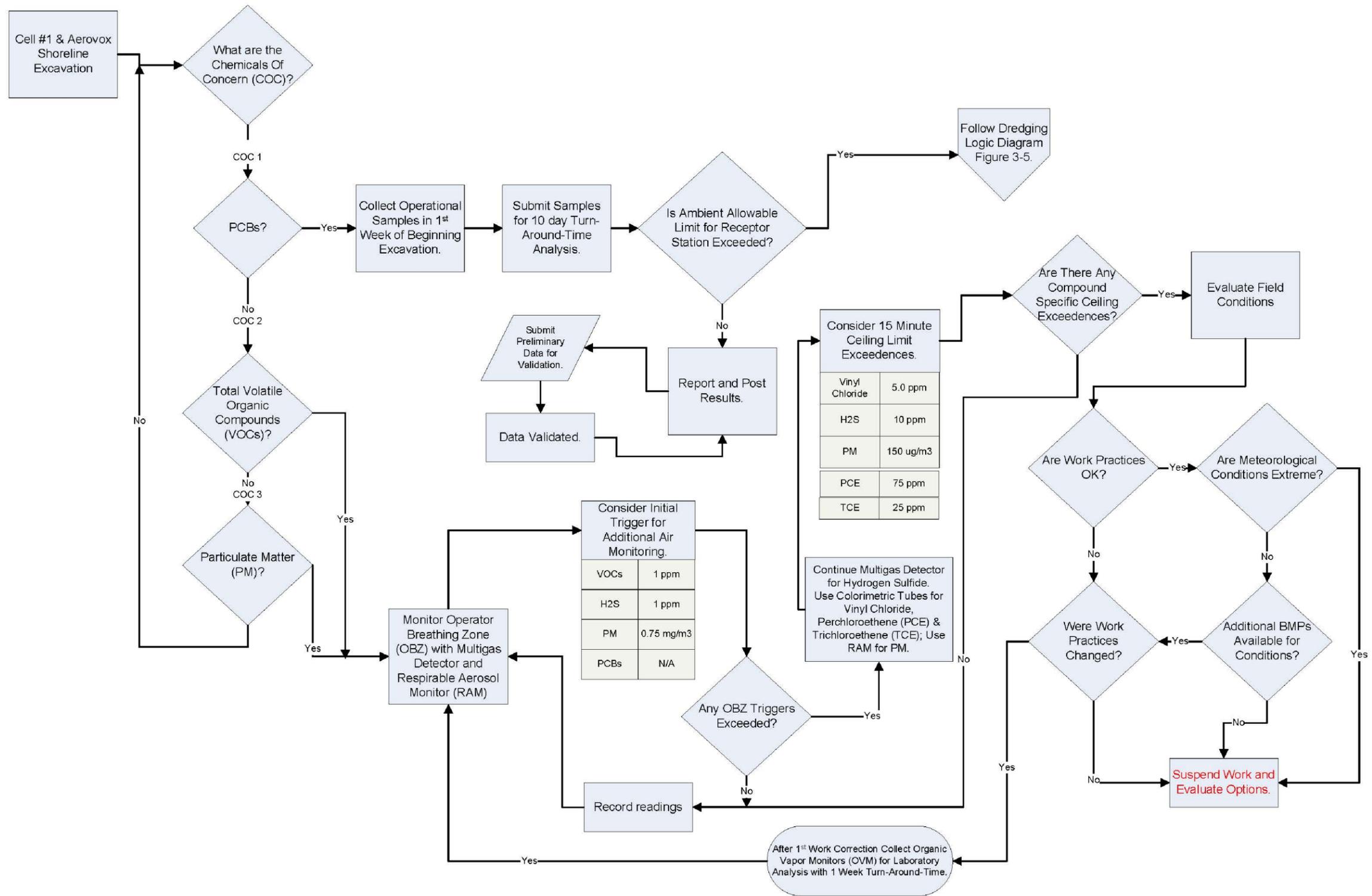
NAME: jacobbs

DATE: 8/2/2015

Figure 3-4

Path: Y:\NBH\Projects\356G\00\12015008\BAACG\SNBH\_ambient\_sampling\_stations\_Figure\_3-4B.mxd





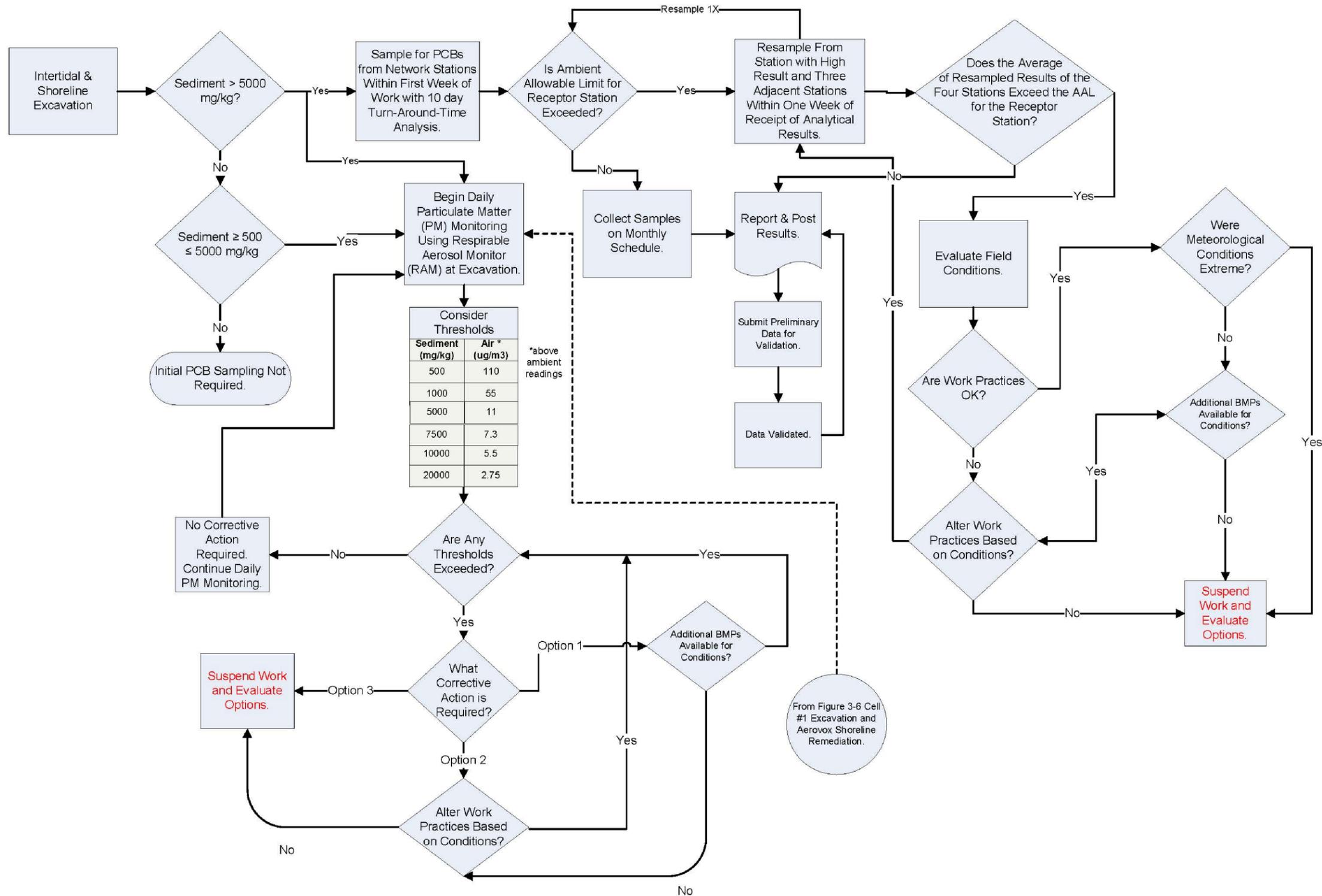
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**Legend**



Sampling Logic for Cell #1 and Aerovox Shoreline Excavations

New Bedford Harbor Superfund Site



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**Legend**



**Sampling Logic for Intertidal and Shoreline Excavation**

New Bedford Harbor Superfund Site

# Tables

**Table 2-1**  
**Quarterly Average PCB Background Concentrations at the Baseline**  
**Sampling Locations at New Bedford Harbor**

Baseline Air Quality Site Number <sup>1</sup>	Air Quality Site Location	2005 Air Monitoring Station	Quarterly PCB Background Concentration Averages (ng/m <sup>3</sup> ) <sup>1, 2</sup>
21	CDF D Area	50, 51, and 52	3.2, 35, 46, and 22
23	Acushnet Substation	42	9.9, 29, 31, and 24
24 and 24D	Aerovox	24	32, 76, 130, 67
25	Cliftex (Manomet)	25 and 46	3.2, 35, 46, and 22
26	Sawyer Street	47, 48, and 49	89, 61, 33, and 43
40	Wood Street	55 and 56 <sup>3</sup>	5.2

Notes:

<sup>1</sup> Quarterly average PCB background concentrations were presented in Appendix D: (Average/Maximum Total PCB Concentrations) of the March 2001 FW document titled *Final Annual Report Baseline Ambient Air Sampling & Analysis, 1 June 1999 – 30 May 2000, Operable Unit #1, New Bedford Harbor Superfund Site, New Bedford, Massachusetts* (FW 2001c).

<sup>2</sup> The quarterly averages represent the following quarterly timeframes for each year: December-February; March-May; June-August; and September-November.

<sup>3</sup> The concentration for Stations 55 and 56 reflects a maximum concentration for Station 40 (Wood Street). Quarterly average PCB concentrations were not available for Station 40 from the 1999 through 2000 FW sampling event.

**Table 2-2  
Ambient Air Monitoring Program - Total Detectable PCB Homologues  
New Bedford Harbor Superfund Site**

Sampling Date	PCB Concentration by Location (ng/m <sup>3</sup> in 24-hour time-weighted average)																			Activity Period					
	24 Aerovox	25 Manomet	25 Cliftex	27 Porter	30 Fibre Leather	42 NSTAR North	43 Veranda	44 Taber	46 Coffin	Area C			Area D			53 Dredge	55 Aerovox West	56 Acushnet Park	57 Riverside Park		61 South Fence	62 Century House	63 Boathouse	64 Pilgrim	65 LHCC Dredge
											47	48	49	50	51	52									
12/29/14	NS	NS		NS	NS	NS	NS	0.980	NS	NS	NS	NS	0.504	NS	NS	NS	NS	NS					1.646/1.90	3.47	Rapid TAT data. Lower Harbor CAD Cell Construction Phase II (top of CAD Cell dredging). Unvalidated data.
12/18/14	NS	NS		NS	NS	NS	NS	1.00	NS	NS	NS	NS	0.49	NS	NS	NS	NS	NS					2.27	3.50/4.59d	Rapid turn around time (TAT) data. Lower Harbor CAD Cell Construction Phase II (top of CAD Cell dredging). Reissue of data due to error in laboratory calculations. Unvalidated data.
12/15/2014	6.7	7.2		0.73	5.6	2.3	3.6	1.6	2.7	4.4	NS	NS	3.7/4.3d	NS	NS	NS	1.6	0.51					1.1	4.7	Lower Harbor CAD Cell Construction Phase II (top of CAD Cell dredging). Off-season data collection included on January 5, 2015 as received from laboratory. Validated data.
11/4/2014	43	21.4		9.9	26.8	8.9	17.41	24.2	21	4.85	NS	NS	7.43	NS	NS	NS	4.38	7.05					15.72/5.19d	NS	2014 Post-Dredge Operation for Upper Harbor. Pre-Dredge sampling for the Lower Harbor CAD Cell Phase II (#44, 50 and 64). Validated data.
10/6/2014	150	98/110d		5.2	180	3.6	17	21	70	21	NS	NS	21	NS	NS	90	NS	NA					12	NS	2014 Hydraulic Dredging in Areas L & S.
9/3/2014	91	44		9.1	39	36	53	12/10d	10	20	NS	NS	11	NS	NS	100	NS	3.8					11		2014 Hydraulic Dredging in Area R-east.
8/5/2014	75	72		8	61	17	37	17	42	55	NS	NS	23	NS	NS	260	NS	4.9					8.5		2014 Hydraulic Dredging in Area R-east.
7/8/2014	82	25		23	36	19	43	34	24	33/33d	NS	NS	22	NS	NS	110	NS	4.2					15		2014 Hydraulic Dredging in Area R-east.
6/16/2014	200	90		12/13d	100	25	35	27	50	25	NS	NS	20	NS	NS	320	NS	21					8.6		2014 Hydraulic Dredging in Area R.
5/7/2014	56.9	32.6		NS	33.8	10.86	29.7	24.3	38.28	13.38	NS	NS	10.96	NS	NS	194	NS	7.01					11.56		2014 Hydraulic Dredging in Area R.
3/18/2014	17	5.8		0.36/0.42d	4.5	2.2	1.7	0.41	ND	3.3	NS	NS	2.8	NS	NS	NS	NS	0.14					0.22		2014 Pre-Dredge Samples for the Upper Harbor.
3/18/2014								0.41					2.8										0.22	NS	Post-Dredge Samples for the Lower Harbor.
12/19/2014								2.32					3.5/3.02d										3.13	0.89	
12/4/2013								3.31/3.0d					0.643										2.16	3.57	Lower Harbor CAD Cell Construction Phase 1 (top of CAD Cell dredging)
11/20/2013								2.17					3.55										1.68/2.0d	6.21	
9/25/2013	25.6	26.5		2.65	14.7	8.05	11.2	NS	4.1	NS	NS	NS	13.3/12.8d	NS	NS	NS	NS	NS					NS		2013 Post-Dredge Operation.
8/20/2013	230	130		15	160	18	61	NS	60/57d	29	NS	NS	29	NS	NS	240	NS	NS					NS		2013 Hydraulic Dredging in Area P.
7/16/2013	240	110		8.1	130	22	36	16	48	110	NS	NS	69	NS	NS	510	NS	NS					14.4		2013 Hydraulic Dredging in Area P.
3/26/2013	14	1.4		3.2	NS	6.6	8.3	1.1	0.65	NS	NS	NS	NS	NS	0.49	NS	NS	NS					1.8/1.8d		2013 Pre-Dredge Samples for the Upper Harbor.
3/26/2013								1.1							0.49								1.8/1.8d	NS	2013 Pre-Dredge Samples for the Lower Harbor.
10/1/2012	98	18		17/18d	25	17	87		18	NS	NS	14	0.56	NS	NS	NS	15	NS			NA				2012 Post Dredge Operation; Sample at Station 62 had insufficient air volume and was not analyzed. Due to several vandalized samples this station has been discontinued.
8/21/2012	67	28		23	17	19	67		14/16d	NS	NS	20	4	NS	NS	NA	0.00033	NS				18			2012 Hydraulic Dredging in Area P; Sample at Station 53 had insufficient air volume and was not analyzed.
7/16/2012	220	1.2		24/24d	110	36	140		26	NS	NS	57	10	NS	NS	280	10	NS				3.3			2012 Hydraulic Dredging in Area L.
7/2/2012	NA	NA		NA	NA	NA	NA		NA	NS	NS	NA	NA	NS	NS	NA	NA	NA				NA			All samples collected were voided due to out of temperature specification upon arrival at laboratory.
5/21/2012	51	NS	67/66d	0.81	NS	NS	NS		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS				0.0029			2012 Pre-Dredge Samples; Station 27 is a new location in 2012 season for eastern residential receptor.
10/11/2011	36	NS	NS		42	10	18		11	NS	NS	25	17	NS	NS	NS	420	18				0.29			2011 Post-Dredge Operation.
9/14/2011	480	NS	NS		120	29	61		93	NS	NS	220	0.62	NS	NS	460	28	57				NS			2011 Hydraulic Dredging in Area N. Sample at Station 62 was tampered and not analyzed.
8/23/2011	280	NS	NS		60	80	94		NS	NS	NS	220/200d	16	NS	NS	1800	48	13				52			2011 Hydraulic Dredging in Area K.
7/26/2011	NS	NS	NS		NS	NS	NS		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS				NS	51		Excavation of Area Q.
7/13/2011	1100	NS	NS		130	40	43		43	NS	NS	78	110	NS	NS	1000/1100d	79	25				6.7	NS		2011 Hydraulic Dredging in Area K.
5/25/2011	56	NS	NS		NS	NS	NS		NS	NS	NS	NS	NS	NS	NS	NS	93/97d	NS				0.68	25		2011 Pre-Dredge Samples; Station 63 is a new location in 2011 season for Area Q.
10/13/2010	80	NS	NS		36	9	7.4		21	NS	NS	24	4.4	NS	NS	NS	19	5.9				1.1	NS		2010 Post-Dredge Operation.
8/18/2010	1800	NS	NS		300	25	36		31	NS	NS	130	37	NS	NS	560/580d	200	11				13			
7/20/2010	270	NS	NS		29	NS	26		47	NS	NS	79/73d	37.0	NS	NS	450	93	26				2.7			2010 Hydraulic Dredging.
6/30/2010	120.0	NS	NS		7.3	0.0013	82.0		13	NS	NS	32	3.3	NS	NS	230	3.20	12.0				44/41d			
5/21/2010	86	NS	NS		NS	0.042	NS		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS				ND/NDd			2010 Pre-Dredge Samples.
5/13/2010	void	NS	NA		NS	void	NS		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS				void			2010 pre-dredge samples. Sample location at Century House Restaurant (#62) in Acushnet added at the direction of the EPA. Samples taken on 5/13/10 were damaged during shipment.
12/16/2009	3.3	NS	NS		0.134	23.8	9.12		0.171	NS	NS	1.78	NS	0.184	NS	NS	0.372/0.353d	0.63							2009 Post-Dredge Operation.
11/9/2009	45.2	NS	NS		20.4/31d	25.3	55.2		32.8	NS	NS	51.8	NS	2.92	NS	205.1	8.31	17.2							
10/14/2009	48.79	NS	NS		11.77	17.92	10.01		8.8/6.07d	NS	NS	13.26	NS	3.75	NS	0.13	10.00	2.62							
9/17/2009	160	NS	NS		24	2.2	51		13	NS	NS	35	NS	42	NS	180	14	10/9.8d							
8/13/2009	130	NS	NS		21	14	49		14	NS	NS	32	NS	31	NS	130	28/30d	20							2009 Hydraulic Dredging.
7/13/2009	130	NS	NS		18	39	110		36	NS	NS	77/76d	NS	5.3	NS	290	7.4	6							
6/16/2009	150	NS	NS		77	10	33		35	43	NS	NS	NS	NS	NS	120	33	8.2							
11/10/2008	NS	NS	NS		NS	NS	15		1.3	NS	NS	6.2	NS	ND	NS	NS	NS	NS				0.11			2008 Post-Dredge Operation.



**Table 3-1  
Available Ambient Air Stations New Bedford Harbor Superfund Site**

Location	Name	Type	Description	Easting	Northing
21	New Bedford Welding	A	Original background station	814013.00	2696913.00
24	Aerovox	A	Riverside NE corner	815574.00	2706941.00
25	Manomet	A	Also has been used as Cliftex	814907.00	2703854.00
27	Porter	A	On Francis Street	816405.00	2703925.00
30	Fibre Leather	A	Shoreline at boulder	815029.00	2705861.00
40	Titleist	A	Wood Street	815827.10	2707958.83
41	NSTAR Substation	A	East side	816074.00	2705524.00
42	NSTAR N	A	North of substation on road	816524.00	2706236.00
43	Veranda (Bus Terminal)	A	Parking Lot	816482.00	2701377.00
44	Taber	A	Taber Street Pumping Station	816299.14	2697997.14
45	Cozy Cove	A	Discontinued. Replaced by station 64	817660.46	2696229.34
46	Coffin	A	Coffin Ave	814526.25	2702691.52
47	Area C Downwind	A	Area C	814106.50	2701284.13
48	Area C Crosswind	A	Area C	813935.15	2701567.19
49	Area C Upwind	A	Area C	814279.00	2701564.00
50	Area D Downwind	A	Area D	814190.12	2696462.84
51	Area D Crosswind	A	Area D	813858.00	2696500.00
52	Area D Upwind	A	Area D	813994.44	2696189.80
53	Dredge	A	Upper Harbor	Varies by year	Varies by year
55	Aerovox West	A	Hadley & Belleville	814540.00	2706728.00
56	Acushnet Park	A	By shower on fenceline	815519.00	2708962.00
57	Riverside Park	A	At Park bench	813944.73	2702070.81
58	Pearl	A	NB Career Center	813157.94	2695954.03
59	Popes	A	Popes Island (north side)	815507.09	2695226.63
60	Washburn	A	I-195 easement	814710.07	2699497.33
61	South Fence	A	For mechanical dredge at Aerovox	815347.24	2706523.80
62	Century House	A	At parking lot/field	817152.98	2707558.15
63	Boat House	A	Area Q mech dredge	814733.64	2701176.71
64	Pilgrim	A	Pilgrim Street Pumping Station	817354.78	2696724.25
65	LHCC Dredge	A	Dredging by others	Varies by year	Varies by year
66	Huttleston	A	Parkway before Fairhaven H.S.	817964.46	2695208.57
67	Revere	A	Located on West Side Lower Harbor		

**Table 3-2  
Remedial Action Sampling Schemes**

Remedial Action	Location	Sampling Stations Available for Use	Contaminant of Concern	Sampling Method	Sampling Frequency	Resampling Criteria
Hydraulic Dredging	Upper Harbor	24,25,27,30,42,43,44,46,47,48,49,50,51,52,53,55,56,64	PCBs	TO 10A	Monthly	Any one station with result greater than Risk Based Goal (RBG) will be resampled.
Mechanical Dredging and LHCC Filling	Upper Harbor	27,43,44,47,48,49,50,51,52,57,58,59,60,63,64,65,66	PCBs	TO 10A	Monthly	Any one station with result greater than RBG will be resampled.
Mechanical Dredging and LHCC Filling	Lower Harbor	27,43,44,50,51,52,58,59,60,64,65,66	PCBs	TO 10A	Monthly	Any one station with result greater than RBG will be resampled.
Former Aerovox Shoreline Excavation	Upper Harbor	24,25,27,30,40,43,46,55,56,57,61	PCBs	TO 10A	Biweekly/Monthly	Any one station with result greater than RBG will be resampled.
			VOCs	PID/OVM	Daily/Weekly	Refer to Table3-3
			PM <sub>10</sub>	Nephelometer	Daily	
Cell #1 Excavation	Upper Harbor	25,27,43,46,47,48,49,57	PCBs	TO 10A	Biweekly/Monthly	Any one station with result greater than RBG will be resampled.
			VOCs	PID/OVM	Daily/Weekly	Refer to Table3-3
			PM <sub>10</sub>	Nephelometer	Daily	
Shoreline Remediation	Upper Harbor	24,25,27,30,40,42,43,46,47,48,49,55,56,57,60,61,63,64	PCBs	TO 10A	Sediment < 5000 mg/kg - Monthly; Sediment >5000 mg/kg - Weekly	Any one station with result greater than RBG will be resampled.
			PM <sub>10</sub>	Nephelometer	Daily	Refer to Table3-3
Shoreline Remediation	Lower Harbor	43,44,48,48,49,50,51,52,58,59,60,61,63,64,65,66	PCBs	TO 10A	Sediment < 5000 mg/kg - Monthly; Sediment >5000 mg/kg - Weekly	Any one station with result greater than RBG will be resampled.
			PM <sub>10</sub>	Nephelometer	Daily	Refer to Table3-3

Notes:

PCBs - polychlorinated biphenyls

TO 10A - EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Air

ng/m<sup>3</sup> - nanograms per cubic meter of air

mg/kg - milligrams per kilogram

PID - photoionization detector with a 10.6 eV lamp

PM<sub>10</sub> - particulate matter 10 microns or less in diameter

OVM - organic vapor monitor (3M 3500 or equivalent)

**Table 3-3  
Results and Associated Action Limits for Remedial Actions  
of the Former Aerovox Shoreline and Interim CDF (Cell #1)**

Contaminants	Greatest Observed Concentration in Sediment	Greatest Observed Concentration in Air While Hydraulically Dredging Off Aerovox	Exposure Limits <sup>1</sup>			
			Total VOCs	STEL <sup>2</sup>	PAV <sup>3</sup>	PAL <sup>4</sup>
Perchloroethene	240 ppm <sup>5</sup>	30 ppm	1 ppm	25 ppm	5 ppm	10 ppm
Trichloroethene	22,000 ppm	30 ppm	1 ppm	10 ppm	5 ppm	10 ppm
Hydrogen sulfide	Not Measured	400 ppm	1 ppm	1 ppm	1 ppm	0.5 ppm
Particulate Matter (PM <sub>10</sub> )	Not Measured	0.2 mg/m <sup>3</sup>		0.15 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	0.075 mg/m <sup>3</sup>
Vinyl Chloride	320 ppm	0.69 ppm	1 ppm	1 ppm	No detections	No detections
Polychlorinated biphenyls	20,000 ppm	0.286 mg/m <sup>3</sup>		0.5 mg/m <sup>3</sup> <sup>6</sup>	0.35 mg/m <sup>3</sup>	0.25 mg/m <sup>3</sup>
cis-1,2-Dichloroethene	2,200 ppm	33 ppm	1 ppm	200 ppm	150 ppm	100 ppm

<sup>1</sup> The first threshold for Total VOCs is one part per million sustained for 15 minutes on the PID (10.6eV). If this threshold is achieved, colorimetric tubes for specific chemicals of concern (VOCs) will be used to determine the STEL. If the STEL is achieved then the PAV will be measured. If the PAV is achieved, operations will be reviewed for sources of VOCs. At the same time, the PAL will be measured. If the PAL is achieved, work will be suspended until corrective action has brought the PAL to or below the PAV.

<sup>2</sup> STEL is the short-term exposure limit based on 15 minutes of exposure up to four times in a work shift.

<sup>3</sup> PAV = perimeter assessment value; evaluate and observe conditions.

<sup>4</sup> PAL = perimeter action limit; suspend operations and mitigate to PAV or less.

<sup>5</sup> ppm – parts per million by volume

<sup>6</sup> mg/m<sup>3</sup> - milligrams per cubic meter of air

# **Appendix A**

## **Derivation of Risk Based Goals for Airborne PCBs**

## Appendix A: Derivation of Risk-Based Goals for Air-Borne PCBs

This appendix summarizes the derivation of risk-based goals for air-borne PCBs for the New Bedford Harbor Superfund Site, specifically, the derivation of the original allowable ambient limit by Foster Wheeler (Foster Wheeler 2001), subsequent changes made by Jacobs (Jacobs 2006), development of “Quality of Life Performance Standards” (QoLPS) for the Hudson River PCB Superfund Site (EPA 2004), and potential risk-based goals following EPA’s current guidance for inhalation risk assessment (EPA 2009).

### A.1 Foster Wheeler PCB Allowable Ambient Limits

Foster Wheeler (2001) derived the initial PCB Ambient Air Limits to address the potential impact to the public health due to the incremental amount of volatile PCBs that may be released during remediation of New Bedford Harbor. Foster Wheeler determined that the non-threshold effect exposure limit (i.e., based on potential cancer risk) was more stringent than the threshold effect limit (i.e., based on non-cancer effects). The derivation of the non-threshold effect limit (NTEL) is presented in the following paragraphs.

Non-threshold exposure effect limits were calculated for a child resident, adult resident, and commercial worker (Table A.1). The NTELS were calculated for the adult resident and commercial worker using the following equation:

$$NTEL_{Adult} = \frac{(TR)(BW)(AT_c)(CV)}{(EF)(ED)(IR)(CSF)} \quad \text{Eq. A.1}$$

Where:

$NTEL_{Adult}$	=	Non-threshold Effects Exposure Limit for carcinogenic effects (ng/m <sup>3</sup> )
$TR$	=	Target Risk Level (unitless)
$BW$	=	Body Weight (kg)
$AT_c$	=	Averaging Time, carcinogenic (days)
$CV$	=	Conversion Factor (1,000,000 ng/mg)
$EF$	=	Exposure Frequency (days/year)
$ED$	=	Exposure Duration (years)
$IR$	=	Inhalation Rate (m <sup>3</sup> /day)
$CSF$	=	Cancer Slope Factor for Total PCBs or a Specific Congener ((mg/kg-day) <sup>-1</sup> )

The NTEL for the child resident receptor used an age-adjusted approach for an exposure duration of 10 years. The age-adjustment accounted for 6 years as a child and 4 years as an adult. The age-adjusted equation for the NTEL for a child resident is:

$$NTEL_{Child} = \frac{\left( \frac{(TR)(AT_c)(CV)}{(EF)(CSF)} \right)}{\left( \frac{(IR_c)ED_c}{BW_c} \right) + \left( \frac{(IR_a)ED_a}{BW_a} \right)} \quad \text{Eq. A.2}$$

Where:

$NTEL_{child}$	=	Non-threshold Effects Exposure Limit for carcinogenic effects (ng/m <sup>3</sup> )
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<i>TR</i>	=	Target Risk Level ( $10^{-5}$ unitless)
<i>BW<sub>c</sub></i>	=	Body Weight, child (kg)
<i>BW<sub>a</sub></i>	=	Body Weight, adult (kg)
<i>AT<sub>c</sub></i>	=	Averaging Time, carcinogenic (days)
<i>CV</i>	=	Conversion Factor (1,000,000 ng/mg)
<i>EF</i>	=	Exposure Frequency (days/year)
<i>ED<sub>c</sub></i>	=	Exposure Duration, child (years)
<i>ED<sub>a</sub></i>	=	Exposure Duration, adult (years)
<i>IR<sub>s</sub></i>	=	Inhalation Rate, child ( $m^3/day$ )
<i>IR<sub>a</sub></i>	=	Inhalation Rate, adult ( $m^3/day$ )
<i>CSF</i>	=	Cancer Slope Factor for Total PCBs or a Specific Congener ( $(0.4 \text{ mg/kg-day})^{-1}$ )

### **A.1.1 Exposure Assumptions**

The exposure assumptions for the child resident, adult resident, and commercial worker are as follows:

#### Child Resident

Exposure Duration	10 years (6 as a child plus 4 as an adult)
Exposure Frequency	350 days/year
Body Weight	15 kg (child), 70 kg (adult)
Averaging time	25,550 days
Inhalation Rate	12 $m^3/day$ (child)

#### Adult Resident

Exposure Duration	10 years
Exposure Frequency	350 days/year
Body Weight	70 kg
Averaging time	25,550 days
Inhalation Rate	20 $m^3/day$

#### Commercial Worker

Exposure Duration	10 years
Exposure Frequency	250 days/year
Body Weight	70 kg
Averaging time	25,550 days
Inhalation Rate	20 $m^3/day$

### **A.1.2 Results of the Non-Threshold Effect Exposure Limit Calculations**

Using the equations and assumptions presented above, the NTEL values for the three receptors are:

Child Resident	409 $ng/m^3$
Adult Resident	639 $ng/m^3$
Commercial Worker	894 $ng/m^3$

The ambient air limits to be tracked for the project were, therefore, 409 ng/m<sup>3</sup> for a residential receptor, and 894 ng/m<sup>3</sup> for a commercial worker.

## A.2 Jacobs' Revisions to the Ambient Air Limits

Jacobs Engineering revised the sampling plan for ambient Air PCB concentrations (Jacobs 2006) to incorporate changes in the remediation approach, specifically, an increase in the project duration to 26 years.

Using the methodology developed by Foster Wheeler and incorporating an increase in the project duration from 10 years to 26 years, the allowable ambient limits for the child resident and commercial worker were recalculated to 202 and 344 ng/m<sup>3</sup>, respectively. These risk-based goals have been used to track cumulative exposure budgets since 2006.

## A.3 Hudson River PCB Superfund Site QoLPS

In 2004, EPA issued the *Hudson River PCBs Superfund Site Quality of Life Performance Standards* (EPA 2004). This document presented the performance standards, including air quality, that were developed by USEPA in accordance with the 2002 Record of Decision for the Site.

The performance standard for air quality addressed the potential exposure of both adults and children in the project area to emissions from the project. The standard prescribed emission thresholds or ambient concentrations that limited the pollutants that could be emitted during remedial activities. The primary air pollutant for the project was PCBs.

The performance standard for PCB air emissions were primarily based upon risk assessments and calculations that were developed using information from the USEPA's consensus database for toxicity information, the Integrated Risk Information System (IRIS), and thresholds established for other projects. To provide protection from both cancer risk and non-cancer hazard, a 24-hour standard was established for daily monitoring of the project. Where commercial and residential areas are mixed, the residential standard for PCBs was applied. The residential standard also applied to commercial or industrial locations where children may be present for extended periods of time (i.e., schools, day care facilities) (EPA 2004).

There are no federal or state regulatory standards for daily PCB emissions. The daily standard was developed using the IRIS Reference Dose for non-cancer health effects specific for Aroclor 1016, yielding a concentration of 0.11 µg/m<sup>3</sup> for a child resident (0 to 6 years old) (EPA 2004).

### A.3.1 Calculation of QoLPS for Ambient Air

The ambient air QoLPS for the Hudson River Site for noncancer effects was calculated using the following equation:

$$QoLPS = \frac{(THQ)(BW)(AT)}{(EF)(ED)(IR)(CV)(1/RfD)} \quad \text{Eq. A.3}$$

Where:

<i>QoLPS</i>	=	Quality of Life Performance Standard (ng/m <sup>3</sup> )
<i>THQ</i>	=	Target Hazard Quotient (1.0 unitless)
<i>BW</i>	=	Body Weight (kg)
<i>AT</i>	=	Averaging Time, noncarcinogenic (days)
<i>CV</i>	=	Conversion Factor (0.001 µg/mg)
<i>EF</i>	=	Exposure Frequency (days/year)
<i>ED</i>	=	Exposure Duration (years)
<i>IR</i>	=	Inhalation Rate (m <sup>3</sup> /day)
<i>RfD</i>	=	Reference Dose for Total PCBs or a Specific Congener (0.00007 mg/kg-day)

### A.3.2 Exposure Assumptions

The exposure assumptions for the child resident are as follows:

Exposure Duration 6 years  
 Exposure Frequency 350 days/year  
 Body Weight 15 kg (child)  
 Averaging time 365 days  
 Inhalation Rate 10 m<sup>3</sup>/day

Therefore, the QoLPS for the Hudson River PCB Superfund Site based on protection of children exposed to air-borne PCBs is 0.11 µg/m<sup>3</sup> or 110 ng/m<sup>3</sup> (Table A.3).

### A.4 Calculation of Risk-Based Goals Following Updated EPA Guidance

This section presents the derivation of potential risk-based goals for air-borne PCBs following EPA's current guidance for evaluation of risk to human health via inhalation of air-borne contaminants. The methodology previously used to calculate cancer and non-cancer risk exposure budget levels at New Bedford Harbor and the Hudson River PCBs Superfund Site is outdated due to a change in EPA inhalation risk assessment methods (EPA 2009) for calculating cancer risk and non-cancer hazards.

The revised methodology described below may be used to derive the risk-based goals for cancer risk from the inhalation of total PCBs. Dioxin-like PCBs have been detected in air monitoring samples and determined not to pose an unacceptable cancer risk (Foster Wheeler 2003, and See [Attachment B](#) - EPA 2015), therefore, early warning levels will not be derived for dioxin-like PCBs.

The revised approach was used to calculate the risk-based goals for the following receptors:

- 1) child resident over the most recent six years ,
- 2) long-term resident from childhood to adult over the entire sampling period since beginning sampling,
- 3) short-term worker over the most recent six years, and
- 4) long-term worker over the entire sampling period since beginning sampling

The exposure duration of six years for a child resident was chosen because it is the minimum exposure duration for chronic risk and coincides with the EPA default exposure duration for a young child (birth to age 6), the most sensitive receptor for non-cancer hazards. EPA's current default exposure duration is 6 years for a child resident, 20 years for an adult resident (for a total of 26 years), and 25 years for a worker.

Cancer risk is expressed as the Excess Lifetime Cancer Risk (ELCR), which is calculated as the product of the cancer potency of the chemical, expressed as an Inhalation Unit Risk (IUR), and the Lifetime Average Daily Concentration (LADC). The IUR is derived by EPA, preferably, or other agencies and represents the probability of cancer associated with a unit exposure concentration. The IUR for total PCBs is 1.0E-04 ( $\mu\text{g}/\text{m}^3$ )<sup>-1</sup>, which is the IUR for Low Risk PCBs. The ELCR is calculated according to the following equation:

$$RBG_c = \frac{(TR)}{(EF)(ED)(ET)(CF1)(CF2)(IUR)} \quad \text{Eq. A.5}$$

Where:

TR = Target Risk ( $10^{-5}$ )

RBG<sub>c</sub> = Carcinogenic Risk-Based Goal for PCBs in air ( $\text{ng}/\text{m}^3$ )

CF1 = Conversion Factor 1 (0.001  $\mu\text{g}/\text{ng}$ )

ET = Exposure Time (hr/day)

CF2 = Conversion Factor 2 (4.17E-02 day/hr)

EF = Days per year

ED = years

IUR = Inhalation Unit Risk ( $(1.0\text{E}-04 \mu\text{g}/\text{m}^3)^{-1}$ )

**EPA default exposure assumptions for calculation of cancer risk are tabulated below:**

Receptor	Exposure Time (hour/day)	Exposure Frequency (day/year)	Exposure Duration (year)
Resident-child	24	350	6
Resident-adult	24	350	20
Worker-short term	8	250	6
Worker-long term	8	250	25

Using the approach presented above the following potential risk-based goals have been derived for the New Bedford Harbor cleanup (Table A.4):

Child Resident	Cancer based RBG = 1,167 $\text{ng}/\text{m}^3$
Adult Resident	Cancer based RBG = 350 $\text{ng}/\text{m}^3$
Short-term Worker	Cancer based RBG = 5,110 $\text{ng}/\text{m}^3$
Long-term Worker	Cancer based RBG = 2, 044 $\text{ng}/\text{m}^3$ .

These goals are higher and, therefore, less stringent than those being used on the project and are provided for reference only.

### A.5 Uncertainty Analysis

This section discusses the uncertainties associated with the proposed RBGs based on the potential use of upper reference point toxicity values for PCBs and their effect on calculated RBGs, and modeling of potential particulate emissions.

Selection of the appropriate toxicity values for PCBs is associated with uncertainty. EPA's Cancer Dose-Response Assessment document (EPA 1996) and IRIS database (EPA 2015) provide a mid-tier cancer slope factor of 0.4 per mg/kg-d based on tumor incidence in rats that were exposed to Aroclor-1242. EPA (1996, 2015) states that this mid-tier toxicity value is appropriate for evaluating exposure via inhalation of vapors, and it is the slope factor that was used in the derivation of the original non-threshold RBGs presented in the 2001 Development Document (Foster Wheeler, 2001), as discussed in Section A.2 and A.3. EPA (1996, 2015) also indicates that for early life exposures and inhalation of dust or aerosols it may be appropriate to use an upper reference point cancer slope factor of 2 per mg/kg-d, which is based on tumor incidence in rats that were exposed to Aroclor-1254.

However, to provide information on the range of potential RBGs, the more stringent cancer toxicity values were plugged into the equations presented above to evaluate the potential effect on the calculated RBGs. RBGs were calculated for a child resident using the upper reference point toxicity values. RBGs based on cancer endpoints was 220 ng/m<sup>3</sup> compared to the currently proposed RBGs of 202 ng/m<sup>3</sup> for cancer and 110 ng/m<sup>3</sup> for noncancer endpoints. Since the proposed RBG for cancer is lower than the RBG calculated using the upper reference point toxicity value, the proposed RBG is still considered protective.

Modeling of potential particulate emissions during remedial actions at New Bedford Harbor, conducted by Jacobs (2015) and expounded upon by AECOM indicates that particulate emissions during remedial actions and the resulting air borne PCB concentrations are minimal compared to the ambient background. Similarly, modeling of vapor phase emissions of PCBs was conducted by Jacobs (2010). This modeling indicated that vapor phase emissions of PCBs and the resultant exposures would be below the proposed RBGs. The evaluation of particulate and vapor phase emissions of PCBs supports the use of the mid-tier cancer slope factor based on Aroclor 1242 and the noncancer reference dose based on Aroclor 1016 for deriving RBGs for the New Bedford Harbor air monitoring program.

Based on the derivation of RBGs for early life exposures to air borne PCBs using upper reference point toxicity values, and the comparison to these RBGs with the proposed RBGs calculated using the middle reference point toxicity values indicates that the proposed RBGs are within EPA's criteria for making risk management decisions. Additionally, an evaluation of the modeling of particulate and vapor phase PCB emissions supports the selection of the RBGs calculated using the middle reference point toxicity values.

## **A.6 Risk-Based Goals for PCBs in Air**

Consistent with risk management criteria for CERCLA sites (EPA 1990), the risk management criteria for the project will be HQ values approaching HQ =1 and ELCR values approaching 1E-05. For consistency with the project history and decisions made for protection of public health at other sites, RBGs have been selected for the site based on potential residential exposures. The first RBG for PCBs is 110 ng/m<sup>3</sup> based on non-cancer hazards for a child resident derived for the Hudson River PCBs Superfund Site. The second RBG for PCBs is 344 ng/m<sup>3</sup> based on cancer risk for a long-term worker derived by Jacobs in 2006. An additional RBG for residential receptors based on potential cancer endpoints (202 ng/m<sup>3</sup>) will be evaluated, however, the RBG based on non-cancer exposures is more stringent and will be the basis for the evaluation of the need to modify site work.

## **References**

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**Table A-1**

**Original Allowable Ambient Limits (AALs) - Cancer (From Foster Wheeler 2001 Development Document - provided for informational purposes only)  
New Bedford Harbor Superfund Site**

**Adult Resident-Cancer NTEL - 10 year exposure duration**

Chemical	TR	BW	AT-c	CV	IR	EF	ED	CSF	NTEL <sub>Adult</sub>
	Unitless	kg	(day)	ng/mg	m <sup>3</sup> /day	(day/yr)	(yr)	(mg/kg-day) <sup>-1</sup>	ng/m <sup>3</sup>
PCBs	1.E-05	70	25550	1.E+06	20	350	10	4.0E-01	639

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

BW = Body Weight

AT = Averaging Time

CV = Conversion Factor

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

CSF = Cancer Slope Factor (low risk and persistence CSF for PCBs)

NTEL<sub>Adult</sub> = Non-threshold Effects Exposure Limit

$$NTEL_{Adult} = (TR * BW * AT * CV) / (EF * ED * IR * CSF)$$

**Child Resident-Cancer NTEL - 10 year exposure duration**

Chemical	TR	AT-c	CV	EF	CSF	IR <sub>c</sub>	ED <sub>c</sub>	BW <sub>c</sub>	IR <sub>a</sub>	ED <sub>a</sub>	BW <sub>a</sub>	NTEL <sub>Child</sub>
	Unitless	(day)	ng/mg	(day/yr)	(mg/kg-day) <sup>-1</sup>	m <sup>3</sup> /day	(yr)	kg	m <sup>3</sup> /day	(yr)	kg	ng/m <sup>3</sup>
PCBs	1.E-05	25550	1.E+06	350	4.0E-01	8.3	6	15	2.E+01	4	70	409

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

AT = Averaging Time

CV = Conversion Factor

EF = Exposure Frequency

CSF = Cancer Slope Factor (low risk and persistence CSF for PCBs)

IR<sub>c</sub> = Inhalation Rate, child

IR<sub>a</sub> = Inhalation Rate, adult

ED<sub>c</sub> = Exposure Duration, child

ED<sub>a</sub> = Exposure Duration, adult

BW<sub>c</sub> = Body Weight, child

BW<sub>a</sub> = Body Weight, adult

NTEL<sub>Child</sub> = Non-threshold Effects Exposure Limit

$$NTEL_{Child} = [(TR * AT * CV) / (EF * CSF)] / [(IR_c * ED_c) / BW_c + (IR_a * ED_a) / BW_a]$$

**Table A-1**

**Original Allowable Ambient Limits (AALs) - Cancer (From Foster Wheeler 2001 Development Document - provided for informational purposes only)  
New Bedford Harbor Superfund Site**

**Commercial Worker-Cancer NTEL - 10 year exposure duration**

Chemical	TR Unitless	BW kg	AT-c (day)	CV ng/mg	IR m <sup>3</sup> /day	EF (day/yr)	ED (yr)	CSF (mg/kg-day) <sup>-1</sup>	NTEL <sub>Adult</sub> ng/m <sup>3</sup>
PCBs	1.E-05	70	25550	1.E+06	2.E+01	250	10	4.0E-01	894

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

BW = Body Weight

AT = Averaging Time

CV = Conversion Factor

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

CSF = Cancer Slope Factor (low risk and persistence CSF for PCBs)

NTEL<sub>Adult</sub> = Non-threshold Effects Exposure Limit

$$NTEL_{Adult} = (TR * BW * AT * CV) / (EF * ED * IR * CSF)$$

**Table A-2**  
**Risk-Based Goals for Air - Cancer - Non-Threshold Effects Exposure Limit (NTEL) (Jacobs 2006 Revision)**  
**New Bedford Harbor Superfund Site**

**Child/Adult Resident-Cancer RBG - 26 year exposure duration**

Chemical	TR	AT-c	CV	EF	CSF	IR <sub>c</sub>	ED <sub>c</sub>	BW <sub>c</sub>	IR <sub>a</sub>	ED <sub>a</sub>	BW <sub>a</sub>	RBG <sub>Child/Adult Resid</sub>
	Unitless	(day)	ng/mg	(day/yr)	(mg/kg-day) <sup>-1</sup>	m <sup>3</sup> /day	(yr)	kg	m <sup>3</sup> /day	(yr)	kg	ng/m <sup>3</sup>
PCBs	1.E-05	25550	1.E+06	350	4.0E-01	8.3	6	15	2.E+01	20	70	202

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

AT = Averaging Time

CV = Conversion Factor

EF = Exposure Frequency

CSF = Cancer Slope Factor (low risk and persistence CSF for PCBs)

IR<sub>c</sub> = Inhalation Rate, child

IR<sub>a</sub> = Inhalation Rate, adult

ED<sub>c</sub> = Exposure Duration, child

ED<sub>a</sub> = Exposure Duration, adult

BW<sub>c</sub> = Body Weight, child

BW<sub>a</sub> = Body Weight, adult

RBG = Risk-Based Goal

$$RBG_{Child} = [(TR * AT * CV) / (EF * CSF)] / [(IR_c * ED_c) / BW_c + (IR_a * ED_a) / BW_a]$$

**Commercial Worker-Cancer RBG - 26 year exposure duration**

Chemical	TR	BW	AT-c	CV	IR	EF	ED	CSF	RBG <sub>Adult Worker</sub>
	Unitless	kg	(day)	ng/mg	m <sup>3</sup> /day	(day/yr)	(yr)	(mg/kg-day) <sup>-1</sup>	ng/m <sup>3</sup>
PCBs	1.E-05	70	25550	1.E+06	2.E+01	250	26	4.0E-01	344

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

BW = Body Weight

AT = Averaging Time

CV = Conversion Factor

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

CSF = Cancer Slope Factor (low risk and persistence CSF for PCBs)

RBG = Risk-Based Goal

$$RBG_{Adult\ Worker} = (TR * BW * AT * CV) / (EF * ED * IR * CSF)$$

**Table A-3  
Risk-Based Goals for Air - Noncancer - Quality of Life Performance Standard  
New Bedford Harbor Superfund Site**

**Child Resident - 6 year exposure duration**

Chemical	THQ Unitless	BW kg	AT (day)	EF (day/yr)	ED (yr)	IR m <sup>3</sup> /day	CV mg/ng	RfD (mg/kg-day)	RBG ng/m <sup>3</sup>
PCBs	1.E+00	15	2190	350	6	1.E+01	1.E-06	7.0E-05	110

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

BW = Body Weight

AT = Averaging Time

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

CV = Conversion Factor

RfD = Reference Dose (Aroclor 1016)

RBG = Risk-Based Goal

$$RBG = (THQ * BW * AT) / (EF * ED * IR * CV * 1 / RfD)$$

*Note: From Hudson River Dredging Quality of Life Performance Standard (QoLPS)*

**Table A-4**  
**Risk-Based Goals for Air - Cancer - Using EPA 2009 Inhalation Guidance Methodology (provided for informational purposes only)**  
**New Bedford Harbor Superfund Site**

**Child/Adult Resident-Cancer RBG - 26 year exposure duration**

Chemical	TR Unitless	AT day	EF (day/yr)	ED (yr)	ET hour/day	CF1 ng/ug	CF2 day/hr	IUR (ug/m <sup>3</sup> ) <sup>-1</sup>	RBG <sub>age group</sub> ng/m <sup>3</sup>	RBG <sub>Child/Adult Resid</sub> ng/m <sup>3</sup>
PCBs	1.E-05	25500	350	20	24	1.E-03	4.17E-02	1.0E-04	364	280
PCBs	1.E-05	25500	350	6	24	1.E-03	4.17E-02	1.0E-04	1214	

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

BW = Body Weight

AT = Averaging Time

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

CV = Conversion Factor

IUR = Inhalation Unit Risk (low risk and persistence CSF for PCBs)

RBG = Risk Based Goal

$$RBG_{age\ group} = (TR*AT)/(EF*ED*ET*CF1*CF2*IUR)$$

$$RBG_{Child/Adult\ Resid} = 1/(1/RBG_{child} + 1/RBG_{adult})$$

**Short-term Worker-Cancer RBG - 6 year exposure duration**

Chemical	TR Unitless	AT day	EF (day/yr)	ED (yr)	ET hour/day	CF1 ng/ug	CF2 day/hr	IUR (ug/m <sup>3</sup> ) <sup>-1</sup>	RBG ng/m <sup>3</sup>
PCBs	1.E-05	25500	250	6	8	1.E-03	4.17E-02	1.0E-04	5100

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

BW = Body Weight

AT = Averaging Time

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

CV = Conversion Factor

IUR = Inhalation Unit Risk (low risk and persistence CSF for PCBs)

RBG = Risk Based Goal

$$RBG=(TR*AT)/(EF*ED*ET*CF1*CF2*IUR)$$

**Table A-4**  
**Risk-Based Goals for Air - Cancer - Using EPA 2009 Inhalation Guidance Methodology (provided for informational purposes only)**  
**New Bedford Harbor Superfund Site**

**Long-term Worker-Cancer RBG - 25 year exposure duration**

Chemical	TR Unitless	AT day	EF (day/yr)	ED (yr)	ET hour/day	CF1 ng/ug	CF2 day/hr	IUR (ug/m <sup>3</sup> ) <sup>-1</sup>	RBG ng/m <sup>3</sup>
PCBs	1.E-05	25500	250	25	8	1.E-03	4.17E-02	1.0E-04	1224

PCBs = Polychlorinated Biphenyls

TR = Target Risk Level

BW = Body Weight

AT = Averaging Time

IR = Inhalation Rate

EF = Exposure Frequency

ED = Exposure Duration

CV = Conversion Factor

IUR = Inhalation Unit Risk (low risk and persistence CSF for PCBs)

RBG = Risk Based Goal

$$RBG = (TR * AT) / (EF * ED * ET * CF1 * CF2 * IUR)$$

**Appendix B**  
**Evaluation by the EPA of the Relative  
Contribution of Risk from Dioxin-like  
Congeners**

## DRAFT TECHNICAL MEMORANDUM

To: Ginny Lombardo  
From: Richard Sugatt  
Date: July 2, 2015  
Subject: Relative contribution of dioxin-like PCB congeners to inhalation risk of total PCBs for worst-case Station 24 at New Bedford Harbor

The purpose of this technical memorandum is to update the evaluation of whether the inhalation risk due to dioxin-like PCB congeners is significant relative to the risk due to total PCBs. This issue was addressed previously in the December 2001 “Draft Final Development of PCB Air Action Levels for the Protection of the Public, New Bedford Harbor Superfund Site, New Bedford Harbor, Massachusetts” (FWEC, 2001). FWEC (2001) concluded that, at a maximum, the small quantity of dioxin-like PCB congeners are associated with approximately the same level of potential inhalation cancer risk as the remaining 98.7% of the airborne mass of total PCBs. Due to the conservative nature of the assessment (i.e. assuming nondetects occurred at ½ the detection limit, somewhat elevated detection limits for the low concentration congener results, and use of exposure assumptions for the most potentially impacted individual, etc.), it was recommended not to adjust the “allowable ambient limit”, although it was recommended that congener analysis be performed on a periodic basis once remediation begins to reassess the contribution of any dioxin-like PCB congeners.

The measured concentrations of total PCBs (tPCBs) and dioxin Toxicity Equivalents (TEQ) of dioxin-like PCBs in 60 air samples taken from June, 1999 to September, 2013 at Station 24 (Aerovox) were compiled and are presented in Table 1. This station is likely to have the highest concentrations of airborne PCBs so it is representative of worst-case conditions for both tPCBs and TEQ. As shown in table 1, the simple average concentrations were 341 ng/m<sup>3</sup> tPCB and 0.00146 ng/m<sup>3</sup> TEQ. The time-weighted total PCB averages are much lower (see PETs curve reports); therefore, the simple average concentrations result in higher calculated risks.

### Cancer Risk

Inhalation cancer risks of the average concentration of tPCBs and TEQ were calculated for a combined adult and child resident, using the exposure assumptions and equation provided in Table 2. According to the EPA IRIS file on PCBs (Section II.C.3), for inhalation of evaporated congeners, the middle-tier slope factor (0.4 per (mg/kg)/day) can be converted to an inhalation unit risk (IUR) of  $1 \times 10^{-4}$  per ug/m<sup>3</sup>. This IUR was used for calculation of cancer risk of tPCBs. The IRIS IUR for 2, 3, 7, 8-TCDD (2, 3, 7, 8-tetrachlorodibenzodioxin) (38 per ug/m<sup>3</sup>) was used for calculation of cancer risk of PCB TEQ.

As shown in Table 2, the elevated lifetime cancer risk (ELCR) of dioxin-like PCB TEQ (2.0E-05) is slightly higher, but functionally equivalent to the ELCR of tPCB (1.2E-05) with regard to risk management. PCB TEQ cancer risk is about 1.7 times higher than tPCB cancer risk and about 63% of the combined tPCB and TEQ ELCR. These differences are not considered significant because the combined cancer risk would be only about two times higher than the tPCB cancer risk alone. This factor is well within the same order of magnitude, given the uncertainty associated with the toxicity factors and conservativeness of the exposure factors.

### Non-Cancer Risk

Inhalation non-cancer risks of the average concentrations of tPCBs and PCB TEQ were calculated separately for an adult resident and a child resident, using the exposure assumptions and equations in Table 3. Noncancer risk of dioxin-like PCBs, with concentrations expressed as total Toxic Equivalents

(TEQ), was calculated using the IRIS inhalation Reference Concentration (RfC<sub>i</sub>) for 2, 3, 7, 8-TCDD (4.0E-05 ug/m<sup>3</sup>). Because there is no inhalation Reference Concentration (RfC<sub>i</sub>) for PCBs other than individual dioxin-like PCBs, route-to-route extrapolation from the oral route to the inhalation route was used. The oral Reference Dose (RfD<sub>o</sub>) for Aroclor 1016 (7.0E-05 mg/kg-day) was used because the congener pattern of baseline air samples (Table 3-2 in FWEC, 2001) is closer to Aroclor 1016 than to Aroclor 1254, the only other PCB mixture with an IRIS-issued RfD<sub>o</sub>. In addition, the chlorine weight % is higher in Aroclor 1254 (54%) than in Aroclor 1016 (41%)(Table 1 in Frame et al, 1996). There is a high level of uncertainty concerning the use of route-to-route extrapolation, but, in the absence of an RfC<sub>i</sub> for total PCBs, this approach is considered useful for the purpose of evaluating the relative contribution of total PCBs to noncancer risk, compared with dioxin-like PCBs. The non-cancer inhalation toxicity of PCBs is currently under reassessment by EPA. The IRIS RfC<sub>i</sub> for 2, 3, 7, 8-TCDD (4 x 10<sup>-5</sup> ug/m<sup>3</sup>) was used to calculate non-cancer inhalation risk of dioxin-like PCBs.

The non-cancer risks of PCB TEQ were HQ =0.035 for the child resident and 0.12 for the adult resident. The non-cancer risks of tPCBs were HQ = 3.1 for the child resident and 0.97 for the adult resident. The HQ for tPCBs was higher than the HQ for PCB TEQ by a factor of about 86 (3.1/0.035) for the child resident and by a factor of about 8 (0.97/0.12) for the adult resident. As described elsewhere, the most stringent risk-based concentration is 110 ng/m<sup>3</sup> total PCBs for a HQ =1 for the child resident. For the child resident, the HQ due to dioxin-like PCBs is only about 1% of the HQ for tPCBs; therefore, the risk due to dioxin-like PCBs is not considered significant relative to the risk of tPCBs. In the absence of an RfC<sub>i</sub> values for tPCBs, these results indicate that dioxin-like PCBs make an insignificant contribution to non-cancer risk for the most sensitive receptor.

The results of this reevaluation indicate that 1) the slightly higher risk of dioxin-like PCBs (less than two-fold) compared to tPCBs is not significant for risk management purposes, given uncertainty and conservativeness of toxicity and exposure factors, and 2) non-cancer risk of dioxin-like PCBs is insignificant compared to tPCBs for the most sensitive receptor, whose risk will drive risk management actions at New Bedford Harbor Superfund site.

Therefore, it is recommended that the air monitoring program continue to evaluate cancer and non-cancer risks of tPCBs without regard to dioxin-like PCB congeners. It is recommended that this recommendation be reevaluated as the EPA reassessment of non-cancer inhalation toxicity of PCBs proceeds.

## References

- Foster Wheeler Environmental Corporation (FWEC). 2001. *Draft Final Development of PCB Air Action Levels for the Protection of the Public*, New Bedford Harbor Superfund Site, New Bedford Harbor, Massachusetts. December, 2001.
- Frame, G. M. et al. 1996. *Comprehensive, Quantitative, Congener-Specific Analyses of Eight Aroclors and Complete PCB Congener Assignments on DB-1 Capillary Columns*. *Chemosphere* 33(4): 603-623.
- U.S. Environmental Protection Agency (EPA). 1994. *Methods for Derivation of Inhalation Reference Concentrations and Application of Inhalation Dosimetry*. EPA/600/8-90/066F. October, 1994.

**Table 1**  
**Station 24-New Bedford Harbor Air Monitoring Data**

Monitoring Data			
Sample No.	Sample Date	Total PCBs (ng/m <sup>3</sup> )	Total PCB-TEQ (ng/m <sup>3</sup> )
06049924	06/04/99	230	4.74E-04
06109924	06/10/99	96	2.33E-04
06169924	06/16/99	110	2.67E-04
06229924	06/22/99	150	4.86E-04
07069924	07/06/99	160	9.97E-04
07109924	07/10/99	74	5.18E-05
07229924	07/22/99	120	2.10E-03
07289924	07/28/99	140	1.30E-04
08039924	08/03/99	130	7.07E-05
08099924	08/09/99	120	5.53E-05
08159924	08/15/99	110	2.06E-05
08219924	08/21/99	88	3.00E-02
10089924	10/08/99	74	2.35E-04
03150024	03/15/00	68	2.53E-05
04040024	04/04/00	73	4.66E-02
04170024	04/17/00	57	1.33E-05
A-090804-24	09/08/04	1000	1.79E-04
A-091304-24	09/13/04	1400	1.06E-04
A-092204-24	09/22/04	590	1.05E-04
A-092704-24	09/27/04	790	2.73E-04
A-101804-24	10/18/04	560	4.93E-05
A-110404-24	11/04/04	0.13	0.00E+00
A-091405-24	09/14/05	1500	7.92E-04
A-092205-24	09/22/05	180	4.72E-06
A-092805-24	09/28/05	380	1.07E-05
A-100505-24	10/05/05	1800	4.53E-04
A-102705-24	10/27/05	15	1.31E-06
A-111705-24	11/17/05	16	9.57E-07
A-122805-24	12/28/05	83	4.24E-06
A-083006-24	08/30/06	1600	7.54E-04
100506-24	10/04/06	2400	9.97E-05
A111806-24	11/18/06	41	2.41E-06
082007-24	08/20/07	280	4.82E-05
A-091707-24	09/17/07	180	1.61E-05
A110807-24	11/08/07	20	5.52E-07
A-061609-24	06/16/09	150	1.25E-05
A-071309-24	07/13/09	130	2.28E-05
081309-24	08/13/09	130	2.71E-05
091709-24	09/17/09	160	9.67E-06
101409-24	10/14/09	49	4.83E-06

**Table 1**  
**Station 24-New Bedford Harbor Air Monitoring Data**

Monitoring Data			
Sample No.	Sample Date	Total PCBs (ng/m <sup>3</sup> )	Total PCB-TEQ (ng/m <sup>3</sup> )
110909-24	11/09/09	45	4.45E-06
A121609-24	12/16/09	2.6	3.12E-07
A052110-24	05/21/10	85	1.30E-04
A063010-24	06/30/10	110	2.90E-04
A072010-24	07/20/10	270	8.07E-05
A081810-24	08/18/10	1800	2.79E-04
A101310-24	10/13/10	80	7.82E-06
A052511-24	05/25/11	56	2.70E-05
A071311-24	07/13/11	1000	1.43E-04
A082311-24	08/23/11	280	1.15E-03
A091411-24	09/14/11	480	2.22E-05
A101111-24	10/11/11	36	1.32E-05
A052112-24	05/21/12	51	2.20E-06
A071612-24	07/16/12	220	2.94E-05
A082112-24	08/21/12	67	2.20E-06
A100112-24	10/01/12	98	7.03E-06
A032613-24	03/26/13	14	1.06E-06
A071613-24	07/16/13	240	5.68E-04
A082013-24	08/20/13	230	2.73E-05
A092513-24	09/25/13	26	3.11E-06
AVERAGE:		3.41E+02	1.46E-03

**Table 2  
Cancer Risk-Station 24 New Bedford Harbor**

Child and Adult Resident-Cancer Risk

Chemical	CA (ng/m <sup>3</sup> )	CF1 (ug/ng)	ET (hr/day)	CF2 (day/hr)	EF (day/yr)	ED <sub>c</sub> (yr)	ED <sub>a</sub> (yr)	AT-c (day)	IUR (ug/m <sup>3</sup> ) <sup>-1</sup>	ELCR
tPCBs	3.41E+02	0.001	24	4.2E-02	350	6	20	25550	1.0E-04	1.2E-05
TEQ	1.46E-03	0.001	24	4.2E-02	350	6	20	25550	3.8E+01	2.0E-05

Total PCB & TEQ: 3.2E-05

$$ELCR = ((CA * CF1 * ET * CF2 * EF * ED_a * 1 / AT-c) * IUR) + ((CA * CF1 * ET * CF2 * EF * ED_c * 1 / AT-c) * IUR)$$

CA = Concentration in air

CF1 = Conversion Factor 1 (ug/ng)

ET = Exposure Time

CF2 = Conversion Factor 2 (day/hr)

EF = Exposure Frequency

ED<sub>c</sub> = Exposure Duration-child

ED<sub>a</sub> = Exposure Duration-adult

AT-c = Averaging Time-cancer

IUR = Inhalation Unit Risk

ELCR = Elevated Lifetime Cancer Risk

TEQ = dioxin Toxicity Equivalent

**Table 3**  
**Noncancer Risk-Station 24 New Bedford Harbor**

Child Resident-Noncancer Risk of Dioxin-like PCBs TEQ using Inhalation RfC for 2, 3, 7, 8-TCDD

Chemical	CA (ng/m <sup>3</sup> )	ET (hr/day)	EF (day/yr)	ED (yr)	CF1 (ug/ng)	CF2 (day/hr)	AT-nc (day)	RfC (ug/m <sup>3</sup> )	HQ (unitless)
TEQ	1.46E-03	24	350	6	0.001	4.2E-02	2190	4.0E-05	3.5E-02

$$HQ = (CA * CF1 * CF2 * ET * EF * ED * 1 / AT-nc) / RfC$$

Child Resident-Noncancer Risk of Total PCB using Oral RfD of Aroclor 1016 and route-to-route extrapolation

Chemical	CA (ng/m <sup>3</sup> )	ET (hr/day)	EF (day/yr)	ED (yr)	CF2 (day/hr)	CF3 (mg/ng)	IR <sub>c</sub> (m <sup>3</sup> /d)	AT-nc (day)	BW <sub>c</sub> (kg)	RfD (mg/kg-day)	HQ (unitless)
tPCBs	341	24	350	6	4.2E-02	1.0E-06	10	2190	15	7.0E-05	3.1E+00

$$HQ = (CA * EF * ED * IR * CF3 * 1 / AT-nc * 1 / BW) / RfD$$

Adult Resident-Noncancer Risk of Dioxin-like PCBs TEQ using Inhalation RfC for 2, 3, 7, 8-TCDD

Chemical	CA (ng/m <sup>3</sup> )	ET (hr/day)	EF (day/yr)	ED (yr)	CF1 (ug/ng)	CF2 (day/hr)	AT-nc (day)	RfC (ug/m <sup>3</sup> )	HQ
TEQ	1.46E-03	24	350	20	0.001	4.2E-02	2190	4.0E-05	1.2E-01

$$HQ = (CA * CF1 * CF2 * ET * EF * ED * 1 / AT-nc) / RfC$$

Adult Resident-Noncancer Risk of Total PCB using Oral RfD of Aroclor 1016 and route-to-route extrapolation

Chemical	CA (ng/m <sup>3</sup> )	ET (hr/day)	EF (day/yr)	ED (yr)	CF2 (day/hr)	CF3 (mg/ng)	IR <sub>a</sub> (m <sup>3</sup> /d)	AT-nc (day)	BW <sub>a</sub> (kg)	RfD (mg/kg-day)	HQ
tPCBs	341	24	350	20	4.2E-02	1.0E-06	20	8760	80	7.0E-05	9.7E-01

$$HQ = (CA * EF * ED * IR * CF3 * 1 / AT-nc * 1 / BW) / RfD$$

CA = Concentration in air

CF1 = Conversion Factor 1 (ug/ng)

CF2 = Conversion Factor 2 (day/hr)

CF3 = Conversion Factor 3 (mg/ng)

ET = Exposure Time

EF = Exposure Frequency

ED = Exposure Duration

IR<sub>a</sub> = Inhalation Rate-Adult

IR<sub>c</sub> = Inhalation Rate-child

BW<sub>a</sub> = Body Weight-adult

BW<sub>c</sub> = Body Weight-child

AT-nc = Averaging Time-noncancer

RfC = inhalation Reference Concentration

RfD = oral Reference Dose

HQ = Hazard Quotient

TEQ = dioxin Toxicity Equivalent

tPCBs = total Polychlorinated Biphenyls

2, 3, 7, 8-TCDD = 2, 3, 7, 8-Tetrachlorodibenzodioxin

# **Appendix C**

## **RTS Example**

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Station: 43 Veranda  
 Background: 4.7 ng/m3

Hazard Quotient (HQ) = (ng PCB/m<sup>3</sup>\*350 days/yr\*6 yr\*10 m<sup>3</sup>/day\*1/2190 days\*1/15 kg)/7E-05 mg/kg/day (see 2nd spreadsheet)  
 Note: HQ is calculated with average concentration at 2190 days  
 Incremental Lifetime Cancer Risk (ILCR) = (ng PCB/m<sup>3</sup>\*350 days/yr\*ED\*1E-03 ug/ng\*1/25550 days\*(2e-05 ug/m<sup>3</sup>)<sup>-1</sup>)  
 Note: ILCR is calculated using rolling 6-yr average air concentration and cumulative exposure duration (ED)

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
08/21/08	0	Dredge				31.66	31.66						
08/22/08	1	Dredge					31.66	31.66		2.74E-03			
08/23/08	2	Dredge					31.66	31.66		5.48E-03			
08/24/08	3	Dredge					31.66	31.66		8.22E-03			
08/25/08	4	Dredge					31.66	31.66		1.10E-02			
08/26/08	5	Dredge					31.66	31.66		1.37E-02			
08/27/08	6	Dredge					31.66	31.66		1.64E-02			
08/28/08	7	Dredge					31.66	31.66		1.92E-02			
08/29/08	8	Dredge					31.66	31.66		2.19E-02			
08/30/08	9	Dredge					31.66	31.66		2.47E-02			
08/31/08	10	Dredge					31.66	31.66		2.74E-02			
09/01/08	11	Dredge					31.66	31.66		3.01E-02			
09/02/08	12	Dredge					31.66	31.66		3.29E-02			
09/03/08	13	Dredge					31.66	31.66		3.56E-02			
09/04/08	14	Dredge					31.66	31.66		3.84E-02			
09/05/08	15	Dredge					31.66	31.66		4.11E-02			
09/06/08	16	Dredge					31.66	31.66		4.38E-02			
09/07/08	17	Dredge					31.66	31.66		4.66E-02			
09/08/08	18	Dredge					31.66	31.66		4.93E-02			
09/09/08	19	Dredge					31.66	31.66		5.21E-02			
09/10/08	20	Dredge					31.66	31.66		5.48E-02			
09/11/08	21	Dredge					31.66	31.66		5.75E-02			
09/12/08	22	Dredge					31.66	31.66		6.03E-02			
09/13/08	23	Dredge					31.66	31.66		6.30E-02			
09/14/08	24	Dredge					31.66	31.66		6.58E-02			
09/15/08	25	Dredge					31.66	31.66		6.85E-02			
09/16/08	26	Dredge					31.66	31.66		7.12E-02			
09/17/08	27	Dredge					31.66	31.66		7.40E-02			
09/18/08	28	Dredge					31.66	31.66		7.67E-02			
09/19/08	29	Dredge					31.66	31.66		7.95E-02			
09/20/08	30	Dredge					31.66	31.66		8.22E-02			
09/21/08	31	Dredge					31.66	31.66		8.49E-02			
09/22/08	32	Dredge					31.66	31.66		8.77E-02			
09/23/08	33	Dredge					31.66	31.66		9.04E-02			
09/24/08	34	Dredge				18	18	18.00		9.32E-02			
09/25/08	35	Dredge					18	18.00		9.59E-02			
09/26/08	36	Dredge					18	18.00		9.86E-02			
09/27/08	37	Dredge					18	18.00		1.01E-01			
09/28/08	38	Dredge					18	18.00		1.04E-01			
09/29/08	39	Dredge					18	18.00		1.07E-01			
09/30/08	40	Dredge					18	18.00		1.10E-01			
10/01/08	41	Dredge					18	18.00		1.12E-01			
10/02/08	42	Dredge					18	18.00		1.15E-01			
10/03/08	43	Dredge					18	18.00		1.18E-01			
10/04/08	44	Dredge					18	18.00		1.21E-01			
10/05/08	45	Dredge					18	18.00		1.23E-01			
10/06/08	46	Dredge					18	18.00		1.26E-01			
10/07/08	47	Dredge					18	18.00		1.29E-01			
10/08/08	48	Dredge					18	18.00		1.32E-01			
10/09/08	49	Dredge					18	18.00		1.34E-01			
10/10/08	50	Dredge					18	18.00		1.37E-01			
10/11/08	51	Dredge					18	18.00		1.40E-01			
10/12/08	52	Dredge					18	18.00		1.42E-01			
10/13/08	53	Dredge					18	18.00		1.45E-01			
10/14/08	54	Dredge					18	18.00		1.48E-01			
10/15/08	55	Dredge					18	18.00		1.51E-01			
10/16/08	56	Dredge					18	18.00		1.53E-01			
10/17/08	57	Dredge					18	18.00		1.56E-01			
10/18/08	58	Dredge					18	18.00		1.59E-01			
10/19/08	59	Dredge					18	18.00		1.62E-01			
10/20/08	60	Dredge					18	18.00		1.64E-01			
10/21/08	61	Dredge					18	18.00		1.67E-01			
10/22/08	62	Dredge					18	18.00		1.70E-01			
10/23/08	63	Dredge					18	18.00		1.73E-01			
10/24/08	64	Dredge					18	18.00		1.75E-01			
10/25/08	65	Dredge					18	18.00		1.78E-01			
10/26/08	66	Dredge					18	18.00		1.81E-01			
10/27/08	67	Dredge					18	18.00		1.84E-01			
10/28/08	68	Dredge					18	18.00		1.86E-01			
10/29/08	69	Dredge					18	18.00		1.89E-01			
10/30/08	70	Dredge					18	18.00		1.92E-01			
10/31/08	71	Dredge					18	18.00		1.95E-01			
11/01/08	72	Dredge					18	18.00		1.97E-01			
11/02/08	73	Dredge					18	18.00		2.00E-01			
11/03/08	74	Dredge					18	18.00		2.03E-01			
11/04/08	75	Dredge					18	18.00		2.05E-01			
11/05/08	76	Dredge					18	18.00		2.08E-01			
11/06/08	77	Dredge					18	18.00		2.11E-01			
11/07/08	78	Dredge					18	18.00		2.14E-01			
11/08/08	79	Dredge					18	18.00		2.16E-01			
11/09/08	80	Dredge					18	18.00		2.19E-01			
11/10/08	81	Post-dredge	15	15			15.00	15.00		2.22E-01			
11/11/08	82	Post-dredge		15			15.00	15.00		2.25E-01			
11/12/08	83	Post-dredge		15			15.00	15.00		2.27E-01			
11/13/08	84	Post-dredge		15			15.00	15.00		2.30E-01			
11/14/08	85	Post-dredge		15			15.00	15.00		2.33E-01			
11/15/08	86	Post-dredge		15			15.00	15.00		2.36E-01			
11/16/08	87	Post-dredge		15			15.00	15.00		2.38E-01			
11/17/08	88	Post-dredge		15			15.00	15.00		2.41E-01			
11/18/08	89	Post-dredge		15			15.00	15.00		2.44E-01			
11/19/08	90	Post-dredge		15			15.00	15.00		2.47E-01			
11/20/08	91	Post-dredge		15			15.00	15.00		2.49E-01			
11/21/08	92	Post-dredge		15			15.00	15.00		2.52E-01			
11/22/08	93	Post-dredge		15			15.00	15.00		2.55E-01			
11/23/08	94	Post-dredge		15			15.00	15.00		2.58E-01			
11/24/08	95	Post-dredge		15			15.00	15.00		2.60E-01			
11/25/08	96	Post-dredge		15			15.00	15.00		2.63E-01			
11/26/08	97	Post-dredge		15			15.00	15.00		2.66E-01			
11/27/08	98	Post-dredge		15			15.00	15.00		2.68E-01			
11/28/08	99	Post-dredge		15			15.00	15.00		2.71E-01			
11/29/08	100	Post-dredge		15			15.00	15.00		2.74E-01			
11/30/08	101	Post-dredge		15			15.00	15.00		2.77E-01			
12/01/08	102	Post-dredge		15			15.00	15.00		2.79E-01			
12/02/08	103	Post-dredge		15			15.00	15.00		2.82E-01			
12/03/08	104	Post-dredge		15			15.00	15.00		2.85E-01			
12/04/08	105	Post-dredge		15			15.00	15.00		2.88E-01			
12/05/08	106	Post-dredge		15			15.00	15.00		2.90E-01			
12/06/08	107	Post-dredge		15			15.00	15.00		2.93E-01			
12/07/08	108	Post-dredge		15			15.00	15.00		2.96E-01			
12/08/08	109	Post-dredge		15			15.00	15.00		2.99E-01			
12/09/08	110	Post-dredge		15			15.00	15.00		3.01E-01			
12/10/08	111	Post-dredge		15			15.00	15.00		3.04E-01			
12/11/08	112	Post-dredge		15			15.00	15.00		3.07E-01			
12/12/08	113	Post-dredge		15			15.00	15.00		3.10E-01			
12/13/08	114	Post-dredge		15			15.00	15.00		3.12E-01			
12/14/08	115	Post-dredge		15			15.00	15.00		3.15E-01			
12/15/08	116	Post-dredge		15			15.00	15.00		3.18E-01			
12/16/08	117	Post-dredge		15			15.00	15.00		3.21E-01			
12/17/08	118	Post-dredge		15			15.00	15.00		3.23E-01			
12/18/08	119	Post-dredge		15			15.00	15.00		3.26E-01			
12/19/08	120	Post-dredge		15			15.00	15.00		3.29E-01		</	

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
12/26/08	127	Post-dredge		15			15.00		3.48E-01				
12/27/08	128	Post-dredge		15			15.00		3.51E-01				
12/28/08	129	Post-dredge		15			15.00		3.53E-01				
12/29/08	130	Post-dredge		15			15.00		3.56E-01				
12/30/08	131	Post-dredge		15			15.00		3.59E-01				
12/31/08	132	Post-dredge		15			15.00		3.62E-01				
01/01/09	133	Post-dredge		15			15.00		3.64E-01				
01/02/09	134	Post-dredge		15			15.00		3.67E-01				
01/03/09	135	Post-dredge		15			15.00		3.70E-01				
01/04/09	136	Post-dredge		15			15.00		3.73E-01				
01/05/09	137	Post-dredge		15			15.00		3.75E-01				
01/06/09	138	Post-dredge		15			15.00		3.78E-01				
01/07/09	139	Post-dredge		15			15.00		3.81E-01				
01/08/09	140	Post-dredge		15			15.00		3.84E-01				
01/09/09	141	Post-dredge		15			15.00		3.86E-01				
01/10/09	142	Post-dredge		15			15.00		3.89E-01				
01/11/09	143	Post-dredge		15			15.00		3.92E-01				
01/12/09	144	Post-dredge		15			15.00		3.95E-01				
01/13/09	145	Post-dredge		15			15.00		3.97E-01				
01/14/09	146	Post-dredge		15			15.00		4.00E-01				
01/15/09	147	Post-dredge		15			15.00		4.03E-01				
01/16/09	148	Post-dredge		15			15.00		4.05E-01				
01/17/09	149	Post-dredge		15			15.00		4.08E-01				
01/18/09	150	Post-dredge		15			15.00		4.11E-01				
01/19/09	151	Post-dredge		15			15.00		4.14E-01				
01/20/09	152	Post-dredge		15			15.00		4.16E-01				
01/21/09	153	Post-dredge		15			15.00		4.19E-01				
01/22/09	154	Post-dredge		15			15.00		4.22E-01				
01/23/09	155	Post-dredge		15			15.00		4.25E-01				
01/24/09	156	Post-dredge		15			15.00		4.27E-01				
01/25/09	157	Post-dredge		15			15.00		4.30E-01				
01/26/09	158	Post-dredge		15			15.00		4.33E-01				
01/27/09	159	Post-dredge		15			15.00		4.36E-01				
01/28/09	160	Post-dredge		15			15.00		4.38E-01				
01/29/09	161	Post-dredge		15			15.00		4.41E-01				
01/30/09	162	Post-dredge		15			15.00		4.44E-01				
01/31/09	163	Post-dredge		15			15.00		4.47E-01				
02/01/09	164	Post-dredge		15			15.00		4.49E-01				
02/02/09	165	Post-dredge		15			15.00		4.52E-01				
02/03/09	166	Post-dredge		15			15.00		4.55E-01				
02/04/09	167	Post-dredge		15			15.00		4.58E-01				
02/05/09	168	Post-dredge		15			15.00		4.60E-01				
02/06/09	169	Post-dredge		15			15.00		4.63E-01				
02/07/09	170	Post-dredge		15			15.00		4.66E-01				
02/08/09	171	Post-dredge		15			15.00		4.68E-01				
02/09/09	172	Post-dredge		15			15.00		4.71E-01				
02/10/09	173	Post-dredge		15			15.00		4.74E-01				
02/11/09	174	Post-dredge		15			15.00		4.77E-01				
02/12/09	175	Post-dredge		15			15.00		4.79E-01				
02/13/09	176	Post-dredge		15			15.00		4.82E-01				
02/14/09	177	Post-dredge		15			15.00		4.85E-01				
02/15/09	178	Post-dredge		15			15.00		4.88E-01				
02/16/09	179	Post-dredge		15			15.00		4.90E-01				
02/17/09	180	Post-dredge		15			15.00		4.93E-01				
02/18/09	181	Post-dredge		15			15.00		4.96E-01				
02/19/09	182	Post-dredge		15			15.00		4.99E-01				
02/20/09	183	Post-dredge		15			15.00		5.01E-01				
02/21/09	184	Post-dredge		15			15.00		5.04E-01				
02/22/09	185	Post-dredge		15			15.00		5.07E-01				
02/23/09	186	Post-dredge		15			15.00		5.10E-01				
02/24/09	187	Post-dredge		15			15.00		5.12E-01				
02/25/09	188	Post-dredge		15			15.00		5.15E-01				
02/26/09	189	Post-dredge		15			15.00		5.18E-01				
02/27/09	190	Post-dredge		15			15.00		5.21E-01				
02/28/09	191	Post-dredge		15			15.00		5.23E-01				
03/01/09	192	Post-dredge		15			15.00		5.26E-01				
03/02/09	193	Post-dredge		15			15.00		5.29E-01				
03/03/09	194	Post-dredge		15			15.00		5.32E-01				
03/04/09	195	Post-dredge		15			15.00		5.34E-01				
03/05/09	196	Post-dredge		15			15.00		5.37E-01				
03/06/09	197	Post-dredge		15			15.00		5.40E-01				
03/07/09	198	Post-dredge		15			15.00		5.42E-01				
03/08/09	199	Post-dredge		15			15.00		5.45E-01				
03/09/09	200	Post-dredge		15			15.00		5.48E-01				
03/10/09	201	Post-dredge		15			15.00		5.51E-01				
03/11/09	202	Post-dredge		15			15.00		5.53E-01				
03/12/09	203	Post-dredge		15			15.00		5.56E-01				
03/13/09	204	Post-dredge		15			15.00		5.59E-01				
03/14/09	205	Post-dredge		15			15.00		5.62E-01				
03/15/09	206	Post-dredge		15			15.00		5.64E-01				
03/16/09	207	Post-dredge		15			15.00		5.67E-01				
03/17/09	208	Post-dredge		15			15.00		5.70E-01				
03/18/09	209	Post-dredge		15			15.00		5.73E-01				
03/19/09	210	Post-dredge		15			15.00		5.75E-01				
03/20/09	211	Post-dredge		15			15.00		5.78E-01				
03/21/09	212	Post-dredge		15			15.00		5.81E-01				
03/22/09	213	Post-dredge		15			15.00		5.84E-01				
03/23/09	214	Post-dredge		15			15.00		5.86E-01				
03/24/09	215	Post-dredge		15			15.00		5.89E-01				
03/25/09	216	Post-dredge		15			15.00		5.92E-01				
03/26/09	217	Post-dredge		15			15.00		5.95E-01				
03/27/09	218	Post-dredge		15			15.00		5.97E-01				
03/28/09	219	Post-dredge		15			15.00		6.00E-01				
03/29/09	220	Post-dredge		15			15.00		6.03E-01				
03/30/09	221	Post-dredge		15			15.00		6.05E-01				
03/31/09	222	Post-dredge		15			15.00		6.08E-01				
04/01/09	223	Post-dredge		15			15.00		6.11E-01				
04/02/09	224	Post-dredge		15			15.00		6.14E-01				
04/03/09	225	Post-dredge		15			15.00		6.16E-01				
04/04/09	226	Post-dredge		15			15.00		6.19E-01				
04/05/09	227	Post-dredge		15			15.00		6.22E-01				
04/06/09	228	Post-dredge		15			15.00		6.25E-01				
04/07/09	229	Post-dredge		15			15.00		6.27E-01				
04/08/09	230	Post-dredge		15			15.00		6.30E-01				
04/09/09	231	Post-dredge		15			15.00		6.33E-01				
04/10/09	232	Post-dredge		15			15.00		6.36E-01				
04/11/09	233	Post-dredge		15			15.00		6.38E-01				
04/12/09	234	Post-dredge		15			15.00		6.41E-01				
04/13/09	235	Post-dredge		15			15.00		6.44E-01				
04/14/09	236	Post-dredge		15			15.00		6.47E-01				
04/15/09	237	Post-dredge		15			15.00		6.49E-01				
04/16/09	238	Post-dredge		15			15.00		6.52E-01				
04/17/09	239	Post-dredge		15			15.00		6.55E-01				
04/18/09	240	Post-dredge		15			15.00		6.58E-01				
04/19/09	241	Post-dredge		15			15.00		6.60E-01				
04/20/09	242	Post-dredge		15			15.00		6.63E-01				
04/21/09	243	Post-dredge		15			15.00		6.66E-01				
04/22/09	244	Post-dredge		15			15.00		6.68E-01				
04/23/09	245	Post-dredge		15			15.00		6.71E-01				
04/24/09	246	Post-dredge		15			15.00		6.74E-01				
04/25/09	247	Post-dredge		15			15.00		6.77E-01				
04/26/09	248	Post-dredge		15			15.00		6.79E-01				
04/27/09	249	Post-dredge		15			15.00		6.82E-01				
04/28/09	250	Post-dredge		15			15.00		6.85E-01				
04/29/09	251	Post-dredge		15			15.00		6.88E-01				
04/30/09	252	Post-dredge		15			15.00		6.90E-01				
05/01/09	253	Post-dredge		15			15.00		6.93E-01				
05/02/09	254	Post-dredge		15			15.00		6.96E-01				
05/03/09	255	Post-dredge		15			15.00		6.99E-01				
05/04/09	256	Post-dredge		15			15.00		7.01E-01				

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
05/07/09	259	Post-dredge		15				15.00	7.10E-01				
05/08/09	260	Post-dredge		15				15.00	7.12E-01				
05/09/09	261	Post-dredge		15				15.00	7.15E-01				
05/10/09	262	Post-dredge		15				15.00	7.18E-01				
05/11/09	263	Post-dredge		15				15.00	7.21E-01				
05/12/09	264	Post-dredge		15				15.00	7.23E-01				
05/13/09	265	Post-dredge		15				15.00	7.26E-01				
05/14/09	266	Post-dredge		15				15.00	7.29E-01				
05/15/09	267	Post-dredge		15				15.00	7.32E-01				
05/16/09	268	Post-dredge		15				15.00	7.34E-01				
05/17/09	269	Post-dredge		15				15.00	7.37E-01				
05/18/09	270	Post-dredge		15				15.00	7.40E-01				
05/19/09	271	Post-dredge		15				15.00	7.42E-01				
05/20/09	272	Post-dredge		15				15.00	7.45E-01				
05/21/09	273	Post-dredge		15				15.00	7.48E-01				
05/22/09	274	Post-dredge		15				15.00	7.51E-01				
05/23/09	275	Post-dredge		15				15.00	7.53E-01				
05/24/09	276	Post-dredge		15				15.00	7.56E-01				
05/25/09	277	Post-dredge		15				15.00	7.59E-01				
05/26/09	278	Post-dredge		15				15.00	7.62E-01				
05/27/09	279	Post-dredge		15				15.00	7.64E-01				
05/28/09	280	Post-dredge		15				15.00	7.67E-01				
05/29/09	281	Post-dredge		15				15.00	7.70E-01				
05/30/09	282	Post-dredge		15				15.00	7.73E-01				
05/31/09	283	Post-dredge		15				15.00	7.75E-01				
06/01/09	284	Post-dredge		15				15.00	7.78E-01				
06/02/09	285	Post-dredge		15				15.00	7.81E-01				
06/03/09	286	Post-dredge		15				15.00	7.84E-01				
06/04/09	287	Post-dredge		15				15.00	7.86E-01				
06/05/09	288	Post-dredge		15				15.00	7.89E-01				
06/06/09	289	Post-dredge		15				15.00	7.92E-01				
06/07/09	290	Post-dredge		15				15.00	7.95E-01				
06/08/09	291	Post-dredge		15				15.00	7.97E-01				
06/09/09	292	Post-dredge		15				15.00	8.00E-01				
06/10/09	293	Post-dredge		15				15.00	8.03E-01				
06/11/09	294	Post-dredge		15				15.00	8.05E-01				
06/12/09	295	Post-dredge		15				15.00	8.08E-01				
06/13/09	296	Post-dredge		15				15.00	8.11E-01				
06/14/09	297	Post-dredge		15				15.00	8.14E-01				
06/15/09	298	Post-dredge		15				15.00	8.16E-01				
06/16/09	299	Dredge				33	33	33.00	8.19E-01				
06/17/09	300	Dredge					33	33.00	8.22E-01				
06/18/09	301	Dredge					33	33.00	8.25E-01				
06/19/09	302	Dredge					33	33.00	8.27E-01				
06/20/09	303	Dredge					33	33.00	8.30E-01				
06/21/09	304	Dredge					33	33.00	8.33E-01				
06/22/09	305	Dredge					33	33.00	8.36E-01				
06/23/09	306	Dredge					33	33.00	8.38E-01				
06/24/09	307	Dredge					33	33.00	8.41E-01				
06/25/09	308	Dredge					33	33.00	8.44E-01				
06/26/09	309	Dredge					33	33.00	8.47E-01				
06/27/09	310	Dredge					33	33.00	8.49E-01				
06/28/09	311	Dredge					33	33.00	8.52E-01				
06/29/09	312	Dredge					33	33.00	8.55E-01				
06/30/09	313	Dredge					33	33.00	8.58E-01				
07/01/09	314	Dredge					33	33.00	8.60E-01				
07/02/09	315	Dredge					33	33.00	8.63E-01				
07/03/09	316	Dredge					33	33.00	8.66E-01				
07/04/09	317	Dredge					33	33.00	8.68E-01				
07/05/09	318	Dredge					33	33.00	8.71E-01				
07/06/09	319	Dredge					33	33.00	8.74E-01				
07/07/09	320	Dredge					33	33.00	8.77E-01				
07/08/09	321	Dredge					33	33.00	8.79E-01				
07/09/09	322	Dredge					33	33.00	8.82E-01				
07/10/09	323	Dredge					33	33.00	8.85E-01				
07/11/09	324	Dredge					33	33.00	8.88E-01				
07/12/09	325	Dredge					33	33.00	8.90E-01				
07/13/09	326	Dredge				110	110	110.00	8.93E-01				
07/14/09	327	Dredge					110	110.00	8.96E-01				
07/15/09	328	Dredge					110	110.00	8.99E-01				
07/16/09	329	Dredge					110	110.00	9.01E-01				
07/17/09	330	Dredge					110	110.00	9.04E-01				
07/18/09	331	Dredge					110	110.00	9.07E-01				
07/19/09	332	Dredge					110	110.00	9.10E-01				
07/20/09	333	Dredge					110	110.00	9.12E-01				
07/21/09	334	Dredge					110	110.00	9.15E-01				
07/22/09	335	Dredge					110	110.00	9.18E-01				
07/23/09	336	Dredge					110	110.00	9.21E-01				
07/24/09	337	Dredge					110	110.00	9.23E-01				
07/25/09	338	Dredge					110	110.00	9.26E-01				
07/26/09	339	Dredge					110	110.00	9.29E-01				
07/27/09	340	Dredge					110	110.00	9.32E-01				
07/28/09	341	Dredge					110	110.00	9.34E-01				
07/29/09	342	Dredge					110	110.00	9.37E-01				
07/30/09	343	Dredge					110	110.00	9.40E-01				
07/31/09	344	Dredge					110	110.00	9.42E-01				
08/01/09	345	Dredge					110	110.00	9.45E-01				
08/02/09	346	Dredge					110	110.00	9.48E-01				
08/03/09	347	Dredge					110	110.00	9.51E-01				
08/04/09	348	Dredge					110	110.00	9.53E-01				
08/05/09	349	Dredge					110	110.00	9.56E-01				
08/06/09	350	Dredge					110	110.00	9.59E-01				
08/07/09	351	Dredge					110	110.00	9.62E-01				
08/08/09	352	Dredge					110	110.00	9.64E-01				
08/09/09	353	Dredge					110	110.00	9.67E-01				
08/10/09	354	Dredge					110	110.00	9.70E-01				
08/11/09	355	Dredge					110	110.00	9.73E-01				
08/12/09	356	Dredge					110	110.00	9.75E-01				
08/13/09	357	Dredge				49	49	49.00	9.78E-01				
08/14/09	358	Dredge					49	49.00	9.81E-01				
08/15/09	359	Dredge					49	49.00	9.84E-01				
08/16/09	360	Dredge					49	49.00	9.86E-01				
08/17/09	361	Dredge					49	49.00	9.89E-01				
08/18/09	362	Dredge					49	49.00	9.92E-01				
08/19/09	363	Dredge					49	49.00	9.95E-01				
08/20/09	364	Dredge					49	49.00	9.97E-01				
08/21/09	365	Dredge					49	49.00	1.00E+00				
08/22/09	366	Dredge					49	49.00	1.00E+00				
08/23/09	367	Dredge					49	49.00	1.01E+00				
08/24/09	368	Dredge					49	49.00	1.01E+00				
08/25/09	369	Dredge					49	49.00	1.01E+00				
08/26/09	370	Dredge					49	49.00	1.01E+00				
08/27/09	371	Dredge					49	49.00	1.02E+00				
08/28/09	372	Dredge					49	49.00	1.02E+00				
08/29/09	373	Dredge					49	49.00	1.02E+00				
08/30/09	374	Dredge					49	49.00	1.02E+00				
08/31/09	375	Dredge					49	49.00	1.03E+00				
09/01/09	376	Dredge					49	49.00	1.03E+00				
09/02/09	377	Dredge					49	49.00	1.03E+00				
09/03/09	378	Dredge					49	49.00	1.04E+00				
09/04/09	379	Dredge					49	49.00	1.04E+00				
09/05/09	380	Dredge					49	49.00	1.04E+00				
09/06/09	381	Dredge					49	49.00	1.04E+00				
09/07/09	382	Dredge					49	49.00	1.05E+00				
09/08/09	383	Dredge					49	49.00	1.05E+00				
09/09/09	384	Dredge					49	49.00	1.05E+00				
09/10/09	385	Dredge					49	49.00	1.05E+00				
09/11/09	386	Dredge					49	49.00	1.06E+00				
09/12/09	387	Dredge					49	49.00	1.06E+00				
09/13/09	388	Dredge					49	49.00	1.06E+00				
09/14/09	389	Dredge					49	49.00	1.07E+00				

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
09/16/09	391	Dredge					49	49.00		1.07E+00			
09/17/09	392	Dredge				51	51	51.00		1.07E+00			
09/18/09	393	Dredge					51	51.00		1.08E+00			
09/19/09	394	Dredge					51	51.00		1.08E+00			
09/20/09	395	Dredge					51	51.00		1.08E+00			
09/21/09	396	Dredge					51	51.00		1.08E+00			
09/22/09	397	Dredge					51	51.00		1.09E+00			
09/23/09	398	Dredge					51	51.00		1.09E+00			
09/24/09	399	Dredge					51	51.00		1.09E+00			
09/25/09	400	Dredge					51	51.00		1.10E+00			
09/26/09	401	Dredge					51	51.00		1.10E+00			
09/27/09	402	Dredge					51	51.00		1.10E+00			
09/28/09	403	Dredge					51	51.00		1.10E+00			
09/29/09	404	Dredge					51	51.00		1.11E+00			
09/30/09	405	Dredge					51	51.00		1.11E+00			
10/01/09	406	Dredge					51	51.00		1.11E+00			
10/02/09	407	Dredge					51	51.00		1.12E+00			
10/03/09	408	Dredge					51	51.00		1.12E+00			
10/04/09	409	Dredge					51	51.00		1.12E+00			
10/05/09	410	Dredge					51	51.00		1.12E+00			
10/06/09	411	Dredge					51	51.00		1.13E+00			
10/07/09	412	Dredge					51	51.00		1.13E+00			
10/08/09	413	Dredge					51	51.00		1.13E+00			
10/09/09	414	Dredge					51	51.00		1.13E+00			
10/10/09	415	Dredge					51	51.00		1.14E+00			
10/11/09	416	Dredge					51	51.00		1.14E+00			
10/12/09	417	Dredge					51	51.00		1.14E+00			
10/13/09	418	Dredge					51	51.00		1.15E+00			
10/14/09	419	Dredge				10.01	10.01	10.01		1.15E+00			
10/15/09	420	Dredge					10.01	10.01		1.15E+00			
10/16/09	421	Dredge					10.01	10.01		1.15E+00			
10/17/09	422	Dredge					10.01	10.01		1.16E+00			
10/18/09	423	Dredge					10.01	10.01		1.16E+00			
10/19/09	424	Dredge					10.01	10.01		1.16E+00			
10/20/09	425	Dredge					10.01	10.01		1.16E+00			
10/21/09	426	Dredge					10.01	10.01		1.17E+00			
10/22/09	427	Dredge					10.01	10.01		1.17E+00			
10/23/09	428	Dredge					10.01	10.01		1.17E+00			
10/24/09	429	Dredge					10.01	10.01		1.18E+00			
10/25/09	430	Dredge					10.01	10.01		1.18E+00			
10/26/09	431	Dredge					10.01	10.01		1.18E+00			
10/27/09	432	Dredge					10.01	10.01		1.18E+00			
10/28/09	433	Dredge					10.01	10.01		1.19E+00			
10/29/09	434	Dredge					10.01	10.01		1.19E+00			
10/30/09	435	Dredge					10.01	10.01		1.19E+00			
10/31/09	436	Dredge					10.01	10.01		1.19E+00			
11/01/09	437	Dredge					10.01	10.01		1.20E+00			
11/02/09	438	Dredge					10.01	10.01		1.20E+00			
11/03/09	439	Dredge					10.01	10.01		1.20E+00			
11/04/09	440	Dredge					10.01	10.01		1.21E+00			
11/05/09	441	Dredge					10.01	10.01		1.21E+00			
11/06/09	442	Dredge					10.01	10.01		1.21E+00			
11/07/09	443	Dredge					10.01	10.01		1.21E+00			
11/08/09	444	Dredge					10.01	10.01		1.22E+00			
11/09/09	445	Dredge				55.2	55.2	55.20		1.22E+00			
11/10/09	446	Dredge					55.2	55.20		1.22E+00			
11/11/09	447	Dredge					55.2	55.20		1.22E+00			
11/12/09	448	Dredge					55.2	55.20		1.23E+00			
11/13/09	449	Dredge					55.2	55.20		1.23E+00			
11/14/09	450	Dredge					55.2	55.20		1.23E+00			
11/15/09	451	Dredge					55.2	55.20		1.24E+00			
11/16/09	452	Dredge					55.2	55.20		1.24E+00			
11/17/09	453	Dredge					55.2	55.20		1.24E+00			
11/18/09	454	Dredge					55.2	55.20		1.24E+00			
11/19/09	455	Dredge					55.2	55.20		1.25E+00			
11/20/09	456	Dredge					55.2	55.20		1.25E+00			
11/21/09	457	Dredge					55.2	55.20		1.25E+00			
11/22/09	458	Dredge					55.2	55.20		1.25E+00			
11/23/09	459	Dredge					55.2	55.20		1.26E+00			
11/24/09	460	Dredge					55.2	55.20		1.26E+00			
11/25/09	461	Dredge					55.2	55.20		1.26E+00			
11/26/09	462	Dredge					55.2	55.20		1.27E+00			
11/27/09	463	Dredge					55.2	55.20		1.27E+00			
11/28/09	464	Dredge					55.2	55.20		1.27E+00			
11/29/09	465	Dredge					55.2	55.20		1.27E+00			
11/30/09	466	Dredge					55.2	55.20		1.28E+00			
12/01/09	467	Dredge					55.2	55.20		1.28E+00			
12/02/09	468	Dredge					55.2	55.20		1.28E+00			
12/03/09	469	Dredge					55.2	55.20		1.28E+00			
12/04/09	470	Dredge					55.2	55.20		1.29E+00			
12/05/09	471	Dredge					55.2	55.20		1.29E+00			
12/06/09	472	Dredge					55.2	55.20		1.29E+00			
12/07/09	473	Dredge					55.2	55.20		1.30E+00			
12/08/09	474	Dredge					55.2	55.20		1.30E+00			
12/09/09	475	Dredge					55.2	55.20		1.30E+00			
12/10/09	476	Dredge					55.2	55.20		1.30E+00			
12/11/09	477	Dredge					55.2	55.20		1.31E+00			
12/12/09	478	Dredge					55.2	55.20		1.31E+00			
12/13/09	479	Dredge					55.2	55.20		1.31E+00			
12/14/09	480	Dredge					55.2	55.20		1.32E+00			
12/15/09	481	Dredge					55.2	55.20		1.32E+00			
12/16/09	482	Post-dredge	9.12	9.12				9.12		1.32E+00			
12/17/09	483	Post-dredge		9.12				9.12		1.32E+00			
12/18/09	484	Post-dredge		9.12				9.12		1.33E+00			
12/19/09	485	Post-dredge		9.12				9.12		1.33E+00			
12/20/09	486	Post-dredge		9.12				9.12		1.33E+00			
12/21/09	487	Post-dredge		9.12				9.12		1.33E+00			
12/22/09	488	Post-dredge		9.12				9.12		1.34E+00			
12/23/09	489	Post-dredge		9.12				9.12		1.34E+00			
12/24/09	490	Post-dredge		9.12				9.12		1.34E+00			
12/25/09	491	Post-dredge		9.12				9.12		1.35E+00			
12/26/09	492	Post-dredge		9.12				9.12		1.35E+00			
12/27/09	493	Post-dredge		9.12				9.12		1.35E+00			
12/28/09	494	Post-dredge		9.12				9.12		1.35E+00			
12/29/09	495	Post-dredge		9.12				9.12		1.36E+00			
12/30/09	496	Post-dredge		9.12				9.12		1.36E+00			
12/31/09	497	Post-dredge		9.12				9.12		1.36E+00			
01/01/10	498	Post-dredge		9.12				9.12		1.36E+00			
01/02/10	499	Post-dredge		9.12				9.12		1.37E+00			
01/03/10	500	Post-dredge		9.12				9.12		1.37E+00			
01/04/10	501	Post-dredge		9.12				9.12		1.37E+00			
01/05/10	502	Post-dredge		9.12				9.12		1.38E+00			
01/06/10	503	Post-dredge		9.12				9.12		1.38E+00			
01/07/10	504	Post-dredge		9.12				9.12		1.38E+00			
01/08/10	505	Post-dredge		9.12				9.12		1.38E+00			
01/09/10	506	Post-dredge		9.12				9.12		1.39E+00			
01/10/10	507	Post-dredge		9.12				9.12		1.39E+00			
01/11/10	508	Post-dredge		9.12				9.12		1.39E+00			
01/12/10	509	Post-dredge		9.12				9.12		1.39E+00			
01/13/10	510	Post-dredge		9.12				9.12		1.40E+00			
01/14/10	511	Post-dredge		9.12				9.12		1.40E+00			
01/15/10	512	Post-dredge		9.12				9.12		1.40E+00			
01/16/10	513	Post-dredge		9.12				9.12		1.41E+00			
01/17/10	514	Post-dredge		9.12				9.12		1.41E+00			
01/18/10	515												

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
01/26/10	523	Post-dredge		9.12			9.12		1.43E+00				
01/27/10	524	Post-dredge		9.12			9.12		1.44E+00				
01/28/10	525	Post-dredge		9.12			9.12		1.44E+00				
01/29/10	526	Post-dredge		9.12			9.12		1.44E+00				
01/30/10	527	Post-dredge		9.12			9.12		1.44E+00				
01/31/10	528	Post-dredge		9.12			9.12		1.45E+00				
02/01/10	529	Post-dredge		9.12			9.12		1.45E+00				
02/02/10	530	Post-dredge		9.12			9.12		1.45E+00				
02/03/10	531	Post-dredge		9.12			9.12		1.45E+00				
02/04/10	532	Post-dredge		9.12			9.12		1.46E+00				
02/05/10	533	Post-dredge		9.12			9.12		1.46E+00				
02/06/10	534	Post-dredge		9.12			9.12		1.46E+00				
02/07/10	535	Post-dredge		9.12			9.12		1.47E+00				
02/08/10	536	Post-dredge		9.12			9.12		1.47E+00				
02/09/10	537	Post-dredge		9.12			9.12		1.47E+00				
02/10/10	538	Post-dredge		9.12			9.12		1.47E+00				
02/11/10	539	Post-dredge		9.12			9.12		1.48E+00				
02/12/10	540	Post-dredge		9.12			9.12		1.48E+00				
02/13/10	541	Post-dredge		9.12			9.12		1.48E+00				
02/14/10	542	Post-dredge		9.12			9.12		1.48E+00				
02/15/10	543	Post-dredge		9.12			9.12		1.49E+00				
02/16/10	544	Post-dredge		9.12			9.12		1.49E+00				
02/17/10	545	Post-dredge		9.12			9.12		1.49E+00				
02/18/10	546	Post-dredge		9.12			9.12		1.50E+00				
02/19/10	547	Post-dredge		9.12			9.12		1.50E+00				
02/20/10	548	Post-dredge		9.12			9.12		1.50E+00				
02/21/10	549	Post-dredge		9.12			9.12		1.50E+00				
02/22/10	550	Post-dredge		9.12			9.12		1.51E+00				
02/23/10	551	Post-dredge		9.12			9.12		1.51E+00				
02/24/10	552	Post-dredge		9.12			9.12		1.51E+00				
02/25/10	553	Post-dredge		9.12			9.12		1.52E+00				
02/26/10	554	Post-dredge		9.12			9.12		1.52E+00				
02/27/10	555	Post-dredge		9.12			9.12		1.52E+00				
02/28/10	556	Post-dredge		9.12			9.12		1.52E+00				
03/01/10	557	Post-dredge		9.12			9.12		1.53E+00				
03/02/10	558	Post-dredge		9.12			9.12		1.53E+00				
03/03/10	559	Post-dredge		9.12			9.12		1.53E+00				
03/04/10	560	Post-dredge		9.12			9.12		1.53E+00				
03/05/10	561	Post-dredge		9.12			9.12		1.54E+00				
03/06/10	562	Post-dredge		9.12			9.12		1.54E+00				
03/07/10	563	Post-dredge		9.12			9.12		1.54E+00				
03/08/10	564	Post-dredge		9.12			9.12		1.55E+00				
03/09/10	565	Post-dredge		9.12			9.12		1.55E+00				
03/10/10	566	Post-dredge		9.12			9.12		1.55E+00				
03/11/10	567	Post-dredge		9.12			9.12		1.55E+00				
03/12/10	568	Post-dredge		9.12			9.12		1.56E+00				
03/13/10	569	Post-dredge		9.12			9.12		1.56E+00				
03/14/10	570	Post-dredge		9.12			9.12		1.56E+00				
03/15/10	571	Post-dredge		9.12			9.12		1.56E+00				
03/16/10	572	Post-dredge		9.12			9.12		1.57E+00				
03/17/10	573	Post-dredge		9.12			9.12		1.57E+00				
03/18/10	574	Post-dredge		9.12			9.12		1.57E+00				
03/19/10	575	Post-dredge		9.12			9.12		1.58E+00				
03/20/10	576	Post-dredge		9.12			9.12		1.58E+00				
03/21/10	577	Post-dredge		9.12			9.12		1.58E+00				
03/22/10	578	Post-dredge		9.12			9.12		1.58E+00				
03/23/10	579	Post-dredge		9.12			9.12		1.59E+00				
03/24/10	580	Post-dredge		9.12			9.12		1.59E+00				
03/25/10	581	Post-dredge		9.12			9.12		1.59E+00				
03/26/10	582	Post-dredge		9.12			9.12		1.59E+00				
03/27/10	583	Post-dredge		9.12			9.12		1.60E+00				
03/28/10	584	Post-dredge		9.12			9.12		1.60E+00				
03/29/10	585	Post-dredge		9.12			9.12		1.60E+00				
03/30/10	586	Post-dredge		9.12			9.12		1.61E+00				
03/31/10	587	Post-dredge		9.12			9.12		1.61E+00				
04/01/10	588	Post-dredge		9.12			9.12		1.61E+00				
04/02/10	589	Post-dredge		9.12			9.12		1.61E+00				
04/03/10	590	Post-dredge		9.12			9.12		1.62E+00				
04/04/10	591	Post-dredge		9.12			9.12		1.62E+00				
04/05/10	592	Post-dredge		9.12			9.12		1.62E+00				
04/06/10	593	Post-dredge		9.12			9.12		1.62E+00				
04/07/10	594	Post-dredge		9.12			9.12		1.63E+00				
04/08/10	595	Post-dredge		9.12			9.12		1.63E+00				
04/09/10	596	Post-dredge		9.12			9.12		1.63E+00				
04/10/10	597	Post-dredge		9.12			9.12		1.64E+00				
04/11/10	598	Post-dredge		9.12			9.12		1.64E+00				
04/12/10	599	Post-dredge		9.12			9.12		1.64E+00				
04/13/10	600	Post-dredge		9.12			9.12		1.64E+00				
04/14/10	601	Post-dredge		9.12			9.12		1.65E+00				
04/15/10	602	Post-dredge		9.12			9.12		1.65E+00				
04/16/10	603	Post-dredge		9.12			9.12		1.65E+00				
04/17/10	604	Post-dredge		9.12			9.12		1.65E+00				
04/18/10	605	Post-dredge		9.12			9.12		1.66E+00				
04/19/10	606	Post-dredge		9.12			9.12		1.66E+00				
04/20/10	607	Post-dredge		9.12			9.12		1.66E+00				
04/21/10	608	Post-dredge		9.12			9.12		1.67E+00				
04/22/10	609	Post-dredge		9.12			9.12		1.67E+00				
04/23/10	610	Post-dredge		9.12			9.12		1.67E+00				
04/24/10	611	Post-dredge		9.12			9.12		1.67E+00				
04/25/10	612	Post-dredge		9.12			9.12		1.68E+00				
04/26/10	613	Post-dredge		9.12			9.12		1.68E+00				
04/27/10	614	Post-dredge		9.12			9.12		1.68E+00				
04/28/10	615	Post-dredge		9.12			9.12		1.68E+00				
04/29/10	616	Post-dredge		9.12			9.12		1.69E+00				
04/30/10	617	Post-dredge		9.12			9.12		1.69E+00				
05/01/10	618	Post-dredge		9.12			9.12		1.69E+00				
05/02/10	619	Post-dredge		9.12			9.12		1.70E+00				
05/03/10	620	Post-dredge		9.12			9.12		1.70E+00				
05/04/10	621	Post-dredge		9.12			9.12		1.70E+00				
05/05/10	622	Post-dredge		9.12			9.12		1.70E+00				
05/06/10	623	Post-dredge		9.12			9.12		1.71E+00				
05/07/10	624	Post-dredge		9.12			9.12		1.71E+00				
05/08/10	625	Post-dredge		9.12			9.12		1.71E+00				
05/09/10	626	Post-dredge		9.12			9.12		1.72E+00				
05/10/10	627	Post-dredge		9.12			9.12		1.72E+00				
05/11/10	628	Post-dredge		9.12			9.12		1.72E+00				
05/12/10	629	Post-dredge		9.12			9.12		1.72E+00				
05/13/10	630	Pre-dredge		9.12			9.12		1.73E+00				
05/14/10	631	Pre-dredge		9.12			9.12		1.73E+00				
05/15/10	632	Pre-dredge		9.12			9.12		1.73E+00				
05/16/10	633	Pre-dredge		9.12			9.12		1.73E+00				
05/17/10	634	Pre-dredge		9.12			9.12		1.74E+00				
05/18/10	635	Pre-dredge		9.12			9.12		1.74E+00				
05/19/10	636	Pre-dredge		9.12			9.12		1.74E+00				
05/20/10	637	Pre-dredge		9.12			9.12		1.75E+00				
05/21/10	638	Pre-dredge		9.12			9.12		1.75E+00				
05/22/10	639	Pre-dredge		9.12			9.12		1.75E+00				
05/23/10	640	Pre-dredge		9.12			9.12		1.75E+00				
05/24/10	641	Pre-dredge		9.12			9.12		1.76E+00				
05/25/10	642	Pre-dredge		9.12			9.12		1.76E+00				
05/26/10	643	Pre-dredge		9.12			9.12		1.76E+00				
05/27/10	644	Pre-dredge		9.12			9.12		1.76E+00				
05/28/10	645	Pre-dredge		9.12			9.12		1.77E+00				
05/29/10	646	Pre-dredge		9.12			9.12		1.77E+00				
05/30/10	647	Pre-dredge		9.12			9.12		1.77E+00				
05/31/10	648	Pre-dredge		9.12			9.12		1.78E+00				
06/01/10	649	Pre-dredge		9.12			9.12		1.78E+00				
06/02/10	650	Pre-dredge		9.12			9.12		1.78E+00				
06/03/10	651	Pre-dredge		9.12</									

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
06/07/10	655	Pre-dredge		9.12				9.12		1.79E+00			
06/08/10	656	Pre-dredge		9.12				9.12		1.80E+00			
06/09/10	657	Pre-dredge		9.12				9.12		1.80E+00			
06/10/10	658	Pre-dredge		9.12				9.12		1.80E+00			
06/11/10	659	Pre-dredge		9.12				9.12		1.81E+00			
06/12/10	660	Pre-dredge		9.12				9.12		1.81E+00			
06/13/10	661	Pre-dredge		9.12				9.12		1.81E+00			
06/14/10	662	Pre-dredge		9.12				9.12		1.81E+00			
06/15/10	663	Pre-dredge		9.12				9.12		1.82E+00			
06/16/10	664	Pre-dredge		9.12				9.12		1.82E+00			
06/17/10	665	Pre-dredge		9.12				9.12		1.82E+00			
06/18/10	666	Pre-dredge		9.12				9.12		1.82E+00			
06/19/10	667	Pre-dredge		9.12				9.12		1.83E+00			
06/20/10	668	Pre-dredge		9.12				9.12		1.83E+00			
06/21/10	669	Pre-dredge		9.12				9.12		1.83E+00			
06/22/10	670	Pre-dredge		9.12				9.12		1.84E+00			
06/23/10	671	Pre-dredge		9.12				9.12		1.84E+00			
06/24/10	672	Pre-dredge		9.12				9.12		1.84E+00			
06/25/10	673	Pre-dredge		9.12				9.12		1.84E+00			
06/26/10	674	Pre-dredge		9.12				9.12		1.85E+00			
06/27/10	675	Pre-dredge		9.12				9.12		1.85E+00			
06/28/10	676	Pre-dredge		9.12				9.12		1.85E+00			
06/29/10	677	Pre-dredge		9.12				9.12		1.85E+00			
06/30/10	678	Dredge				82	82	82.00		1.86E+00			
07/01/10	679	Dredge					82	82.00		1.86E+00			
07/02/10	680	Dredge					82	82.00		1.86E+00			
07/03/10	681	Dredge					82	82.00		1.87E+00			
07/04/10	682	Dredge					82	82.00		1.87E+00			
07/05/10	683	Dredge					82	82.00		1.87E+00			
07/06/10	684	Dredge					82	82.00		1.87E+00			
07/07/10	685	Dredge					82	82.00		1.88E+00			
07/08/10	686	Dredge					82	82.00		1.88E+00			
07/09/10	687	Dredge					82	82.00		1.88E+00			
07/10/10	688	Dredge					82	82.00		1.88E+00			
07/11/10	689	Dredge					82	82.00		1.89E+00			
07/12/10	690	Dredge					82	82.00		1.89E+00			
07/13/10	691	Dredge					82	82.00		1.89E+00			
07/14/10	692	Dredge					82	82.00		1.90E+00			
07/15/10	693	Dredge					82	82.00		1.90E+00			
07/16/10	694	Dredge					82	82.00		1.90E+00			
07/17/10	695	Dredge					82	82.00		1.90E+00			
07/18/10	696	Dredge					82	82.00		1.91E+00			
07/19/10	697	Dredge					82	82.00		1.91E+00			
07/20/10	698	Dredge				43	43	43.00		1.91E+00			
07/21/10	699	Dredge					43	43.00		1.92E+00			
07/22/10	700	Dredge					43	43.00		1.92E+00			
07/23/10	701	Dredge					43	43.00		1.92E+00			
07/24/10	702	Dredge					43	43.00		1.92E+00			
07/25/10	703	Dredge					43	43.00		1.93E+00			
07/26/10	704	Dredge					43	43.00		1.93E+00			
07/27/10	705	Dredge					43	43.00		1.93E+00			
07/28/10	706	Dredge					43	43.00		1.93E+00			
07/29/10	707	Dredge					43	43.00		1.94E+00			
07/30/10	708	Dredge					43	43.00		1.94E+00			
07/31/10	709	Dredge					43	43.00		1.94E+00			
08/01/10	710	Dredge					43	43.00		1.95E+00			
08/02/10	711	Dredge					43	43.00		1.95E+00			
08/03/10	712	Dredge					43	43.00		1.95E+00			
08/04/10	713	Dredge					43	43.00		1.95E+00			
08/05/10	714	Dredge					43	43.00		1.96E+00			
08/06/10	715	Dredge					43	43.00		1.96E+00			
08/07/10	716	Dredge					43	43.00		1.96E+00			
08/08/10	717	Dredge					43	43.00		1.96E+00			
08/09/10	718	Dredge					43	43.00		1.97E+00			
08/10/10	719	Dredge					43	43.00		1.97E+00			
08/11/10	720	Dredge					43	43.00		1.97E+00			
08/12/10	721	Dredge					43	43.00		1.98E+00			
08/13/10	722	Dredge					43	43.00		1.98E+00			
08/14/10	723	Dredge					43	43.00		1.98E+00			
08/15/10	724	Dredge					43	43.00		1.98E+00			
08/16/10	725	Dredge					43	43.00		1.99E+00			
08/17/10	726	Dredge					43	43.00		1.99E+00			
08/18/10	727	Dredge				36	36	36.00		1.99E+00			
08/19/10	728	Dredge					36	36.00		1.99E+00			
08/20/10	729	Dredge					36	36.00		2.00E+00			
08/21/10	730	Dredge					36	36.00		2.00E+00			
08/22/10	731	Dredge					36	36.00		2.00E+00			
08/23/10	732	Dredge					36	36.00		2.01E+00			
08/24/10	733	Dredge					36	36.00		2.01E+00			
08/25/10	734	Dredge					36	36.00		2.01E+00			
08/26/10	735	Dredge					36	36.00		2.01E+00			
08/27/10	736	Dredge					36	36.00		2.02E+00			
08/28/10	737	Dredge					36	36.00		2.02E+00			
08/29/10	738	Dredge					36	36.00		2.02E+00			
08/30/10	739	Dredge					36	36.00		2.02E+00			
08/31/10	740	Dredge					36	36.00		2.03E+00			
09/01/10	741	Dredge					36	36.00		2.03E+00			
09/02/10	742	Dredge					36	36.00		2.03E+00			
09/03/10	743	Dredge					36	36.00		2.04E+00			
09/04/10	744	Dredge					36	36.00		2.04E+00			
09/05/10	745	Dredge					36	36.00		2.04E+00			
09/06/10	746	Dredge					36	36.00		2.04E+00			
09/07/10	747	Dredge					36	36.00		2.05E+00			
09/08/10	748	Dredge					36	36.00		2.05E+00			
09/09/10	749	Dredge					36	36.00		2.05E+00			
09/10/10	750	Dredge					36	36.00		2.05E+00			
09/11/10	751	Dredge					36	36.00		2.06E+00			
09/12/10	752	Dredge					36	36.00		2.06E+00			
09/13/10	753	Dredge					36	36.00		2.06E+00			
09/14/10	754	Dredge					36	36.00		2.07E+00			
09/15/10	755	Dredge					36	36.00		2.07E+00			
09/16/10	756	Dredge					36	36.00		2.07E+00			
09/17/10	757	Dredge					36	36.00		2.07E+00			
09/18/10	758	Dredge					36	36.00		2.08E+00			
09/19/10	759	Dredge					36	36.00		2.08E+00			
09/20/10	760	Dredge					36	36.00		2.08E+00			
09/21/10	761	Dredge					36	36.00		2.08E+00			
09/22/10	762	Dredge					36	36.00		2.09E+00			
09/23/10	763	Dredge					36	36.00		2.09E+00			
09/24/10	764	Dredge					36	36.00		2.09E+00			
09/25/10	765	Dredge					36	36.00		2.10E+00			
09/26/10	766	Dredge					36	36.00		2.10E+00			
09/27/10	767	Dredge					36	36.00		2.10E+00			
09/28/10	768	Dredge					36	36.00		2.10E+00			
09/29/10	769	Dredge					36	36.00		2.11E+00			
09/30/10	770	Dredge					36	36.00		2.11E+00			
10/01/10	771	Dredge					36	36.00		2.11E+00			
10/02/10	772	Dredge					36	36.00		2.12E+00			
10/03/10	773	Dredge					36	36.00		2.12E+00			
10/04/10	774	Dredge					36	36.00		2.12E+00			
10/05/10	775	Dredge					36	36.00		2.12E+00			
10/06/10	776	Dredge					36	36.00		2.13E+00			
10/07/10	777	Dredge					36	36.00		2.13E+00			
10/08/10	778	Dredge					36	36.00		2.13E+00			
10/09/10	779	Dredge					36	36.00		2.13E+00			
10/10/10	780	Dredge					36	36.00		2.14E+00			
10/11/10	781	Dredge											

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
10/17/10	787	Post-dredge		7.4			7.40		2.16E+00				
10/18/10	788	Post-dredge		7.4			7.40		2.16E+00				
10/19/10	789	Post-dredge		7.4			7.40		2.16E+00				
10/20/10	790	Post-dredge		7.4			7.40		2.16E+00				
10/21/10	791	Post-dredge		7.4			7.40		2.17E+00				
10/22/10	792	Post-dredge		7.4			7.40		2.17E+00				
10/23/10	793	Post-dredge		7.4			7.40		2.17E+00				
10/24/10	794	Post-dredge		7.4			7.40		2.18E+00				
10/25/10	795	Post-dredge		7.4			7.40		2.18E+00				
10/26/10	796	Post-dredge		7.4			7.40		2.18E+00				
10/27/10	797	Post-dredge		7.4			7.40		2.18E+00				
10/28/10	798	Post-dredge		7.4			7.40		2.19E+00				
10/29/10	799	Post-dredge		7.4			7.40		2.19E+00				
10/30/10	800	Post-dredge		7.4			7.40		2.19E+00				
10/31/10	801	Post-dredge		7.4			7.40		2.19E+00				
11/01/10	802	Post-dredge		7.4			7.40		2.20E+00				
11/02/10	803	Post-dredge		7.4			7.40		2.20E+00				
11/03/10	804	Post-dredge		7.4			7.40		2.20E+00				
11/04/10	805	Post-dredge		7.4			7.40		2.21E+00				
11/05/10	806	Post-dredge		7.4			7.40		2.21E+00				
11/06/10	807	Post-dredge		7.4			7.40		2.21E+00				
11/07/10	808	Post-dredge		7.4			7.40		2.21E+00				
11/08/10	809	Post-dredge		7.4			7.40		2.22E+00				
11/09/10	810	Post-dredge		7.4			7.40		2.22E+00				
11/10/10	811	Post-dredge		7.4			7.40		2.22E+00				
11/11/10	812	Post-dredge		7.4			7.40		2.22E+00				
11/12/10	813	Post-dredge		7.4			7.40		2.23E+00				
11/13/10	814	Post-dredge		7.4			7.40		2.23E+00				
11/14/10	815	Post-dredge		7.4			7.40		2.23E+00				
11/15/10	816	Post-dredge		7.4			7.40		2.24E+00				
11/16/10	817	Post-dredge		7.4			7.40		2.24E+00				
11/17/10	818	Post-dredge		7.4			7.40		2.24E+00				
11/18/10	819	Post-dredge		7.4			7.40		2.24E+00				
11/19/10	820	Post-dredge		7.4			7.40		2.25E+00				
11/20/10	821	Post-dredge		7.4			7.40		2.25E+00				
11/21/10	822	Post-dredge		7.4			7.40		2.25E+00				
11/22/10	823	Post-dredge		7.4			7.40		2.25E+00				
11/23/10	824	Post-dredge		7.4			7.40		2.26E+00				
11/24/10	825	Post-dredge		7.4			7.40		2.26E+00				
11/25/10	826	Post-dredge		7.4			7.40		2.26E+00				
11/26/10	827	Post-dredge		7.4			7.40		2.27E+00				
11/27/10	828	Post-dredge		7.4			7.40		2.27E+00				
11/28/10	829	Post-dredge		7.4			7.40		2.27E+00				
11/29/10	830	Post-dredge		7.4			7.40		2.27E+00				
11/30/10	831	Post-dredge		7.4			7.40		2.28E+00				
12/01/10	832	Post-dredge		7.4			7.40		2.28E+00				
12/02/10	833	Post-dredge		7.4			7.40		2.28E+00				
12/03/10	834	Post-dredge		7.4			7.40		2.28E+00				
12/04/10	835	Post-dredge		7.4			7.40		2.29E+00				
12/05/10	836	Post-dredge		7.4			7.40		2.29E+00				
12/06/10	837	Post-dredge		7.4			7.40		2.29E+00				
12/07/10	838	Post-dredge		7.4			7.40		2.30E+00				
12/08/10	839	Post-dredge		7.4			7.40		2.30E+00				
12/09/10	840	Post-dredge		7.4			7.40		2.30E+00				
12/10/10	841	Post-dredge		7.4			7.40		2.30E+00				
12/11/10	842	Post-dredge		7.4			7.40		2.31E+00				
12/12/10	843	Post-dredge		7.4			7.40		2.31E+00				
12/13/10	844	Post-dredge		7.4			7.40		2.31E+00				
12/14/10	845	Post-dredge		7.4			7.40		2.32E+00				
12/15/10	846	Post-dredge		7.4			7.40		2.32E+00				
12/16/10	847	Post-dredge		7.4			7.40		2.32E+00				
12/17/10	848	Post-dredge		7.4			7.40		2.32E+00				
12/18/10	849	Post-dredge		7.4			7.40		2.33E+00				
12/19/10	850	Post-dredge		7.4			7.40		2.33E+00				
12/20/10	851	Post-dredge		7.4			7.40		2.33E+00				
12/21/10	852	Post-dredge		7.4			7.40		2.33E+00				
12/22/10	853	Post-dredge		7.4			7.40		2.34E+00				
12/23/10	854	Post-dredge		7.4			7.40		2.34E+00				
12/24/10	855	Post-dredge		7.4			7.40		2.34E+00				
12/25/10	856	Post-dredge		7.4			7.40		2.35E+00				
12/26/10	857	Post-dredge		7.4			7.40		2.35E+00				
12/27/10	858	Post-dredge		7.4			7.40		2.35E+00				
12/28/10	859	Post-dredge		7.4			7.40		2.35E+00				
12/29/10	860	Post-dredge		7.4			7.40		2.36E+00				
12/30/10	861	Post-dredge		7.4			7.40		2.36E+00				
12/31/10	862	Post-dredge		7.4			7.40		2.36E+00				
01/01/11	863	Post-dredge		7.4			7.40		2.36E+00				
01/02/11	864	Post-dredge		7.4			7.40		2.37E+00				
01/03/11	865	Post-dredge		7.4			7.40		2.37E+00				
01/04/11	866	Post-dredge		7.4			7.40		2.37E+00				
01/05/11	867	Post-dredge		7.4			7.40		2.38E+00				
01/06/11	868	Post-dredge		7.4			7.40		2.38E+00				
01/07/11	869	Post-dredge		7.4			7.40		2.38E+00				
01/08/11	870	Post-dredge		7.4			7.40		2.38E+00				
01/09/11	871	Post-dredge		7.4			7.40		2.39E+00				
01/10/11	872	Post-dredge		7.4			7.40		2.39E+00				
01/11/11	873	Post-dredge		7.4			7.40		2.39E+00				
01/12/11	874	Post-dredge		7.4			7.40		2.39E+00				
01/13/11	875	Post-dredge		7.4			7.40		2.40E+00				
01/14/11	876	Post-dredge		7.4			7.40		2.40E+00				
01/15/11	877	Post-dredge		7.4			7.40		2.40E+00				
01/16/11	878	Post-dredge		7.4			7.40		2.41E+00				
01/17/11	879	Post-dredge		7.4			7.40		2.41E+00				
01/18/11	880	Post-dredge		7.4			7.40		2.41E+00				
01/19/11	881	Post-dredge		7.4			7.40		2.41E+00				
01/20/11	882	Post-dredge		7.4			7.40		2.42E+00				
01/21/11	883	Post-dredge		7.4			7.40		2.42E+00				
01/22/11	884	Post-dredge		7.4			7.40		2.42E+00				
01/23/11	885	Post-dredge		7.4			7.40		2.42E+00				
01/24/11	886	Post-dredge		7.4			7.40		2.43E+00				
01/25/11	887	Post-dredge		7.4			7.40		2.43E+00				
01/26/11	888	Post-dredge		7.4			7.40		2.43E+00				
01/27/11	889	Post-dredge		7.4			7.40		2.44E+00				
01/28/11	890	Post-dredge		7.4			7.40		2.44E+00				
01/29/11	891	Post-dredge		7.4			7.40		2.44E+00				
01/30/11	892	Post-dredge		7.4			7.40		2.44E+00				
01/31/11	893	Post-dredge		7.4			7.40		2.45E+00				
02/01/11	894	Post-dredge		7.4			7.40		2.45E+00				
02/02/11	895	Post-dredge		7.4			7.40		2.45E+00				
02/03/11	896	Post-dredge		7.4			7.40		2.45E+00				
02/04/11	897	Post-dredge		7.4			7.40		2.46E+00				
02/05/11	898	Post-dredge		7.4			7.40		2.46E+00				
02/06/11	899	Post-dredge		7.4			7.40		2.46E+00				
02/07/11	900	Post-dredge		7.4			7.40		2.47E+00				
02/08/11	901	Post-dredge		7.4			7.40		2.47E+00				
02/09/11	902	Post-dredge		7.4			7.40		2.47E+00				
02/10/11	903	Post-dredge		7.4			7.40		2.47E+00				
02/11/11	904	Post-dredge		7.4			7.40		2.48E+00				
02/12/11	905	Post-dredge		7.4			7.40		2.48E+00				
02/13/11	906	Post-dredge		7.4			7.40		2.48E+00				
02/14/11	907	Post-dredge		7.4			7.40		2.48E+00				
02/15/11	908	Post-dredge		7.4			7.40		2.49E+00				
02/16/11	909	Post-dredge		7.4			7.40		2.49E+00				
02/17/11	910	Post-dredge		7.4			7.40		2.49E+00				
02/18/11	911	Post-dredge		7.4			7.40		2.50E+00				
02/19/11	912	Post-dredge		7.4			7.40		2.50E+00				
02/20/11	913	Post-dredge		7.4			7.40		2.50E+00				
02/21/11	914	Post-dredge		7.4			7.40		2.50E+00				
02/22/11	915	Post-dredge		7.4			7.40		2.51E+00				
02/23/11	916	Post-dredge		7.4			7.40		2.51E+00				

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
02/26/11	919	Post-dredge		7.4			7.40		2.52E+00				
02/27/11	920	Post-dredge		7.4			7.40		2.52E+00				
02/28/11	921	Post-dredge		7.4			7.40		2.52E+00				
03/01/11	922	Post-dredge		7.4			7.40		2.53E+00				
03/02/11	923	Post-dredge		7.4			7.40		2.53E+00				
03/03/11	924	Post-dredge		7.4			7.40		2.53E+00				
03/04/11	925	Post-dredge		7.4			7.40		2.53E+00				
03/05/11	926	Post-dredge		7.4			7.40		2.54E+00				
03/06/11	927	Post-dredge		7.4			7.40		2.54E+00				
03/07/11	928	Post-dredge		7.4			7.40		2.54E+00				
03/08/11	929	Post-dredge		7.4			7.40		2.55E+00				
03/09/11	930	Post-dredge		7.4			7.40		2.55E+00				
03/10/11	931	Post-dredge		7.4			7.40		2.55E+00				
03/11/11	932	Post-dredge		7.4			7.40		2.55E+00				
03/12/11	933	Post-dredge		7.4			7.40		2.56E+00				
03/13/11	934	Post-dredge		7.4			7.40		2.56E+00				
03/14/11	935	Post-dredge		7.4			7.40		2.56E+00				
03/15/11	936	Post-dredge		7.4			7.40		2.56E+00				
03/16/11	937	Post-dredge		7.4			7.40		2.57E+00				
03/17/11	938	Post-dredge		7.4			7.40		2.57E+00				
03/18/11	939	Post-dredge		7.4			7.40		2.57E+00				
03/19/11	940	Post-dredge		7.4			7.40		2.58E+00				
03/20/11	941	Post-dredge		7.4			7.40		2.58E+00				
03/21/11	942	Post-dredge		7.4			7.40		2.58E+00				
03/22/11	943	Post-dredge		7.4			7.40		2.58E+00				
03/23/11	944	Post-dredge		7.4			7.40		2.59E+00				
03/24/11	945	Post-dredge		7.4			7.40		2.59E+00				
03/25/11	946	Post-dredge		7.4			7.40		2.59E+00				
03/26/11	947	Post-dredge		7.4			7.40		2.59E+00				
03/27/11	948	Post-dredge		7.4			7.40		2.60E+00				
03/28/11	949	Post-dredge		7.4			7.40		2.60E+00				
03/29/11	950	Post-dredge		7.4			7.40		2.60E+00				
03/30/11	951	Post-dredge		7.4			7.40		2.61E+00				
03/31/11	952	Post-dredge		7.4			7.40		2.61E+00				
04/01/11	953	Post-dredge		7.4			7.40		2.61E+00				
04/02/11	954	Post-dredge		7.4			7.40		2.61E+00				
04/03/11	955	Post-dredge		7.4			7.40		2.62E+00				
04/04/11	956	Post-dredge		7.4			7.40		2.62E+00				
04/05/11	957	Post-dredge		7.4			7.40		2.62E+00				
04/06/11	958	Post-dredge		7.4			7.40		2.62E+00				
04/07/11	959	Post-dredge		7.4			7.40		2.63E+00				
04/08/11	960	Post-dredge		7.4			7.40		2.63E+00				
04/09/11	961	Post-dredge		7.4			7.40		2.63E+00				
04/10/11	962	Post-dredge		7.4			7.40		2.64E+00				
04/11/11	963	Post-dredge		7.4			7.40		2.64E+00				
04/12/11	964	Post-dredge		7.4			7.40		2.64E+00				
04/13/11	965	Post-dredge		7.4			7.40		2.64E+00				
04/14/11	966	Post-dredge		7.4			7.40		2.65E+00				
04/15/11	967	Post-dredge		7.4			7.40		2.65E+00				
04/16/11	968	Post-dredge		7.4			7.40		2.65E+00				
04/17/11	969	Post-dredge		7.4			7.40		2.65E+00				
04/18/11	970	Post-dredge		7.4			7.40		2.66E+00				
04/19/11	971	Post-dredge		7.4			7.40		2.66E+00				
04/20/11	972	Post-dredge		7.4			7.40		2.66E+00				
04/21/11	973	Post-dredge		7.4			7.40		2.67E+00				
04/22/11	974	Post-dredge		7.4			7.40		2.67E+00				
04/23/11	975	Post-dredge		7.4			7.40		2.67E+00				
04/24/11	976	Post-dredge		7.4			7.40		2.67E+00				
04/25/11	977	Post-dredge		7.4			7.40		2.68E+00				
04/26/11	978	Post-dredge		7.4			7.40		2.68E+00				
04/27/11	979	Post-dredge		7.4			7.40		2.68E+00				
04/28/11	980	Post-dredge		7.4			7.40		2.68E+00				
04/29/11	981	Post-dredge		7.4			7.40		2.69E+00				
04/30/11	982	Post-dredge		7.4			7.40		2.69E+00				
05/01/11	983	Post-dredge		7.4			7.40		2.69E+00				
05/02/11	984	Post-dredge		7.4			7.40		2.70E+00				
05/03/11	985	Post-dredge		7.4			7.40		2.70E+00				
05/04/11	986	Post-dredge		7.4			7.40		2.70E+00				
05/05/11	987	Post-dredge		7.4			7.40		2.70E+00				
05/06/11	988	Post-dredge		7.4			7.40		2.71E+00				
05/07/11	989	Post-dredge		7.4			7.40		2.71E+00				
05/08/11	990	Post-dredge		7.4			7.40		2.71E+00				
05/09/11	991	Post-dredge		7.4			7.40		2.72E+00				
05/10/11	992	Post-dredge		7.4			7.40		2.72E+00				
05/11/11	993	Post-dredge		7.4			7.40		2.72E+00				
05/12/11	994	Post-dredge		7.4			7.40		2.72E+00				
05/13/11	995	Post-dredge		7.4			7.40		2.73E+00				
05/14/11	996	Post-dredge		7.4			7.40		2.73E+00				
05/15/11	997	Post-dredge		7.4			7.40		2.73E+00				
05/16/11	998	Post-dredge		7.4			7.40		2.73E+00				
05/17/11	999	Post-dredge		7.4			7.40		2.74E+00				
05/18/11	1000	Post-dredge		7.4			7.40		2.74E+00				
05/19/11	1001	Post-dredge		7.4			7.40		2.74E+00				
05/20/11	1002	Post-dredge		7.4			7.40		2.75E+00				
05/21/11	1003	Post-dredge		7.4			7.40		2.75E+00				
05/22/11	1004	Post-dredge		7.4			7.40		2.75E+00				
05/23/11	1005	Post-dredge		7.4			7.40		2.75E+00				
05/24/11	1006	Post-dredge		7.4			7.40		2.76E+00				
05/25/11	1007	Pre-dredge		7.4			7.40		2.76E+00				
05/26/11	1008	Pre-dredge		7.4			7.40		2.76E+00				
05/27/11	1009	Pre-dredge		7.4			7.40		2.76E+00				
05/28/11	1010	Pre-dredge		7.4			7.40		2.77E+00				
05/29/11	1011	Pre-dredge		7.4			7.40		2.77E+00				
05/30/11	1012	Pre-dredge		7.4			7.40		2.77E+00				
05/31/11	1013	Pre-dredge		7.4			7.40		2.78E+00				
06/01/11	1014	Pre-dredge		7.4			7.40		2.78E+00				
06/02/11	1015	Pre-dredge		7.4			7.40		2.78E+00				
06/03/11	1016	Pre-dredge		7.4			7.40		2.78E+00				
06/04/11	1017	Pre-dredge		7.4			7.40		2.79E+00				
06/05/11	1018	Pre-dredge		7.4			7.40		2.79E+00				
06/06/11	1019	Pre-dredge		7.4			7.40		2.79E+00				
06/07/11	1020	Pre-dredge		7.4			7.40		2.79E+00				
06/08/11	1021	Pre-dredge		7.4			7.40		2.80E+00				
06/09/11	1022	Pre-dredge		7.4			7.40		2.80E+00				
06/10/11	1023	Pre-dredge		7.4			7.40		2.80E+00				
06/11/11	1024	Pre-dredge		7.4			7.40		2.81E+00				
06/12/11	1025	Pre-dredge		7.4			7.40		2.81E+00				
06/13/11	1026	Pre-dredge		7.4			7.40		2.81E+00				
06/14/11	1027	Pre-dredge		7.4			7.40		2.81E+00				
06/15/11	1028	Pre-dredge		7.4			7.40		2.82E+00				
06/16/11	1029	Pre-dredge		7.4			7.40		2.82E+00				
06/17/11	1030	Pre-dredge		7.4			7.40		2.82E+00				
06/18/11	1031	Pre-dredge		7.4			7.40		2.82E+00				
06/19/11	1032	Pre-dredge		7.4			7.40		2.83E+00				
06/20/11	1033	Pre-dredge		7.4			7.40		2.83E+00				
06/21/11	1034	Pre-dredge		7.4			7.40		2.83E+00				
06/22/11	1035	Pre-dredge		7.4			7.40		2.84E+00				
06/23/11	1036	Pre-dredge		7.4			7.40		2.84E+00				
06/24/11	1037	Pre-dredge		7.4			7.40		2.84E+00				
06/25/11	1038	Pre-dredge		7.4			7.40		2.84E+00				
06/26/11	1039	Pre-dredge		7.4			7.40		2.85E+00				
06/27/11	1040	Pre-dredge		7.4			7.40		2.85E+00				
06/28/11	1041	Pre-dredge		7.4			7.40		2.85E+00				
06/29/11	1042	Pre-dredge		7.4			7.40		2.85E+00				
06/30/11	1043	Pre-dredge		7.4			7.40		2.86E+00				
07/01/11	1044	Pre-dredge		7.4			7.40		2.86E+00				
07/02/11	1045	Pre-dredge		7.4			7.40		2.86E+00				
07/03/11	1046	Pre-dredge		7.4			7.40		2.87E+00				
07/04/11	1047	Pre-dredge		7.4			7.40		2.87E+00				
07/05/11	1048	Pre-dredge											

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
07/08/11	1051	Pre-dredge		7.4				7.40		2.88E+00			
07/09/11	1052	Pre-dredge		7.4				7.40		2.88E+00			
07/10/11	1053	Pre-dredge		7.4				7.40		2.88E+00			
07/11/11	1054	Pre-dredge		7.4				7.40		2.89E+00			
07/12/11	1055	Pre-dredge		7.4				7.40		2.89E+00			
07/13/11	1056	Dredge				43	43	43.00		2.89E+00			
07/14/11	1057	Dredge					43	43.00		2.90E+00			
07/15/11	1058	Dredge					43	43.00		2.90E+00			
07/16/11	1059	Dredge					43	43.00		2.90E+00			
07/17/11	1060	Dredge					43	43.00		2.90E+00			
07/18/11	1061	Dredge					43	43.00		2.91E+00			
07/19/11	1062	Dredge					43	43.00		2.91E+00			
07/20/11	1063	Dredge					43	43.00		2.91E+00			
07/21/11	1064	Dredge					43	43.00		2.92E+00			
07/22/11	1065	Dredge					43	43.00		2.92E+00			
07/23/11	1066	Dredge					43	43.00		2.92E+00			
07/24/11	1067	Dredge					43	43.00		2.92E+00			
07/25/11	1068	Dredge					43	43.00		2.93E+00			
07/26/11	1069	Excavation Area Q					43	43.00		2.93E+00			
07/27/11	1070	Excavation Area Q					43	43.00		2.93E+00			
07/28/11	1071	Excavation Area Q					43	43.00		2.93E+00			
07/29/11	1072	Excavation Area Q					43	43.00		2.94E+00			
07/30/11	1073	Excavation Area Q					43	43.00		2.94E+00			
07/31/11	1074	Excavation Area Q					43	43.00		2.94E+00			
08/01/11	1075	Excavation Area Q					43	43.00		2.95E+00			
08/02/11	1076	Excavation Area Q					43	43.00		2.95E+00			
08/03/11	1077	Excavation Area Q					43	43.00		2.95E+00			
08/04/11	1078	Excavation Area Q					43	43.00		2.95E+00			
08/05/11	1079	Excavation Area Q					43	43.00		2.96E+00			
08/06/11	1080	Excavation Area Q					43	43.00		2.96E+00			
08/07/11	1081	Excavation Area Q					43	43.00		2.96E+00			
08/08/11	1082	Excavation Area Q					43	43.00		2.96E+00			
08/09/11	1083	Excavation Area Q					43	43.00		2.97E+00			
08/10/11	1084	Excavation Area Q					43	43.00		2.97E+00			
08/11/11	1085	Excavation Area Q					43	43.00		2.97E+00			
08/12/11	1086	Excavation Area Q					43	43.00		2.98E+00			
08/13/11	1087	Excavation Area Q					43	43.00		2.98E+00			
08/14/11	1088	Excavation Area Q					43	43.00		2.98E+00			
08/15/11	1089	Excavation Area Q					43	43.00		2.98E+00			
08/16/11	1090	Excavation Area Q					43	43.00		2.99E+00			
08/17/11	1091	Excavation Area Q					43	43.00		2.99E+00			
08/18/11	1092	Excavation Area Q					43	43.00		2.99E+00			
08/19/11	1093	Excavation Area Q					43	43.00		2.99E+00			
08/20/11	1094	Excavation Area Q					43	43.00		3.00E+00			
08/21/11	1095	Excavation Area Q					43	43.00		3.00E+00			
08/22/11	1096	Excavation Area Q					43	43.00		3.00E+00			
08/23/11	1097	Dredge				94	94	94.00		3.01E+00			
08/24/11	1098	Dredge					94	94.00		3.01E+00			
08/25/11	1099	Dredge					94	94.00		3.01E+00			
08/26/11	1100	Dredge					94	94.00		3.01E+00			
08/27/11	1101	Dredge					94	94.00		3.02E+00			
08/28/11	1102	Dredge					94	94.00		3.02E+00			
08/29/11	1103	Dredge					94	94.00		3.02E+00			
08/30/11	1104	Dredge					94	94.00		3.02E+00			
08/31/11	1105	Dredge					94	94.00		3.03E+00			
09/01/11	1106	Dredge					94	94.00		3.03E+00			
09/02/11	1107	Dredge					94	94.00		3.03E+00			
09/03/11	1108	Dredge					94	94.00		3.04E+00			
09/04/11	1109	Dredge					94	94.00		3.04E+00			
09/05/11	1110	Dredge					94	94.00		3.04E+00			
09/06/11	1111	Dredge					94	94.00		3.04E+00			
09/07/11	1112	Dredge					94	94.00		3.05E+00			
09/08/11	1113	Dredge					94	94.00		3.05E+00			
09/09/11	1114	Dredge					94	94.00		3.05E+00			
09/10/11	1115	Dredge					94	94.00		3.05E+00			
09/11/11	1116	Dredge					94	94.00		3.06E+00			
09/12/11	1117	Dredge					94	94.00		3.06E+00			
09/13/11	1118	Dredge					94	94.00		3.06E+00			
09/14/11	1119	Dredge				61	61	61.00		3.07E+00			
09/15/11	1120	Dredge					61	61.00		3.07E+00			
09/16/11	1121	Dredge					61	61.00		3.07E+00			
09/17/11	1122	Dredge					61	61.00		3.07E+00			
09/18/11	1123	Dredge					61	61.00		3.08E+00			
09/19/11	1124	Dredge					61	61.00		3.08E+00			
09/20/11	1125	Dredge					61	61.00		3.08E+00			
09/21/11	1126	Dredge					61	61.00		3.08E+00			
09/22/11	1127	Dredge					61	61.00		3.09E+00			
09/23/11	1128	Dredge					61	61.00		3.09E+00			
09/24/11	1129	Dredge					61	61.00		3.09E+00			
09/25/11	1130	Dredge					61	61.00		3.10E+00			
09/26/11	1131	Dredge					61	61.00		3.10E+00			
09/27/11	1132	Dredge					61	61.00		3.10E+00			
09/28/11	1133	Dredge					61	61.00		3.10E+00			
09/29/11	1134	Dredge					61	61.00		3.11E+00			
09/30/11	1135	Dredge					61	61.00		3.11E+00			
10/01/11	1136	Dredge					61	61.00		3.11E+00			
10/02/11	1137	Dredge					61	61.00		3.12E+00			
10/03/11	1138	Dredge					61	61.00		3.12E+00			
10/04/11	1139	Dredge					61	61.00		3.12E+00			
10/05/11	1140	Dredge					61	61.00		3.12E+00			
10/06/11	1141	Dredge					61	61.00		3.13E+00			
10/07/11	1142	Dredge					61	61.00		3.13E+00			
10/08/11	1143	Dredge					61	61.00		3.13E+00			
10/09/11	1144	Dredge					61	61.00		3.13E+00			
10/10/11	1145	Dredge					61	61.00		3.14E+00			
10/11/11	1146	Post-dredge	18	18				18.00		3.14E+00			
10/12/11	1147	Post-dredge		18				18.00		3.14E+00			
10/13/11	1148	Post-dredge		18				18.00		3.15E+00			
10/14/11	1149	Post-dredge		18				18.00		3.15E+00			
10/15/11	1150	Post-dredge		18				18.00		3.15E+00			
10/16/11	1151	Post-dredge		18				18.00		3.15E+00			
10/17/11	1152	Post-dredge		18				18.00		3.16E+00			
10/18/11	1153	Post-dredge		18				18.00		3.16E+00			
10/19/11	1154	Post-dredge		18				18.00		3.16E+00			
10/20/11	1155	Post-dredge		18				18.00		3.16E+00			
10/21/11	1156	Post-dredge		18				18.00		3.17E+00			
10/22/11	1157	Post-dredge		18				18.00		3.17E+00			
10/23/11	1158	Post-dredge		18				18.00		3.17E+00			
10/24/11	1159	Post-dredge		18				18.00		3.18E+00			
10/25/11	1160	Post-dredge		18				18.00		3.18E+00			
10/26/11	1161	Post-dredge		18				18.00		3.18E+00			
10/27/11	1162	Post-dredge		18				18.00		3.18E+00			
10/28/11	1163	Post-dredge		18				18.00		3.19E+00			
10/29/11	1164	Post-dredge		18				18.00		3.19E+00			
10/30/11	1165	Post-dredge		18				18.00		3.19E+00			
10/31/11	1166	Post-dredge		18				18.00		3.19E+00			
11/01/11	1167	Post-dredge		18				18.00		3.20E+00			
11/02/11	1168	Post-dredge		18				18.00		3.20E+00			
11/03/11	1169	Post-dredge		18				18.00		3.20E+00			
11/04/11	1170	Post-dredge		18				18.00		3.21E+00			
11/05/11	1171	Post-dredge		18				18.00		3.21E+00			
11/06/11	1172	Post-dredge		18				18.00		3.21E+00			
11/07/11	1173	Post-dredge		18				18.00		3.21E+00			
11/08/11	1174	Post-dredge		18				18.00		3.22E+00			
11/													

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
11/17/11	1183	Post-dredge		18			18.00		3.24E+00				
11/18/11	1184	Post-dredge		18			18.00		3.24E+00				
11/19/11	1185	Post-dredge		18			18.00		3.25E+00				
11/20/11	1186	Post-dredge		18			18.00		3.25E+00				
11/21/11	1187	Post-dredge		18			18.00		3.25E+00				
11/22/11	1188	Post-dredge		18			18.00		3.25E+00				
11/23/11	1189	Post-dredge		18			18.00		3.26E+00				
11/24/11	1190	Post-dredge		18			18.00		3.26E+00				
11/25/11	1191	Post-dredge		18			18.00		3.26E+00				
11/26/11	1192	Post-dredge		18			18.00		3.27E+00				
11/27/11	1193	Post-dredge		18			18.00		3.27E+00				
11/28/11	1194	Post-dredge		18			18.00		3.27E+00				
11/29/11	1195	Post-dredge		18			18.00		3.27E+00				
11/30/11	1196	Post-dredge		18			18.00		3.28E+00				
12/01/11	1197	Post-dredge		18			18.00		3.28E+00				
12/02/11	1198	Post-dredge		18			18.00		3.28E+00				
12/03/11	1199	Post-dredge		18			18.00		3.28E+00				
12/04/11	1200	Post-dredge		18			18.00		3.29E+00				
12/05/11	1201	Post-dredge		18			18.00		3.29E+00				
12/06/11	1202	Post-dredge		18			18.00		3.29E+00				
12/07/11	1203	Post-dredge		18			18.00		3.30E+00				
12/08/11	1204	Post-dredge		18			18.00		3.30E+00				
12/09/11	1205	Post-dredge		18			18.00		3.30E+00				
12/10/11	1206	Post-dredge		18			18.00		3.30E+00				
12/11/11	1207	Post-dredge		18			18.00		3.31E+00				
12/12/11	1208	Post-dredge		18			18.00		3.31E+00				
12/13/11	1209	Post-dredge		18			18.00		3.31E+00				
12/14/11	1210	Post-dredge		18			18.00		3.32E+00				
12/15/11	1211	Post-dredge		18			18.00		3.32E+00				
12/16/11	1212	Post-dredge		18			18.00		3.32E+00				
12/17/11	1213	Post-dredge		18			18.00		3.32E+00				
12/18/11	1214	Post-dredge		18			18.00		3.33E+00				
12/19/11	1215	Post-dredge		18			18.00		3.33E+00				
12/20/11	1216	Post-dredge		18			18.00		3.33E+00				
12/21/11	1217	Post-dredge		18			18.00		3.33E+00				
12/22/11	1218	Post-dredge		18			18.00		3.34E+00				
12/23/11	1219	Post-dredge		18			18.00		3.34E+00				
12/24/11	1220	Post-dredge		18			18.00		3.34E+00				
12/25/11	1221	Post-dredge		18			18.00		3.35E+00				
12/26/11	1222	Post-dredge		18			18.00		3.35E+00				
12/27/11	1223	Post-dredge		18			18.00		3.35E+00				
12/28/11	1224	Post-dredge		18			18.00		3.35E+00				
12/29/11	1225	Post-dredge		18			18.00		3.36E+00				
12/30/11	1226	Post-dredge		18			18.00		3.36E+00				
12/31/11	1227	Post-dredge		18			18.00		3.36E+00				
01/01/12	1228	Post-dredge		18			18.00		3.36E+00				
01/02/12	1229	Post-dredge		18			18.00		3.37E+00				
01/03/12	1230	Post-dredge		18			18.00		3.37E+00				
01/04/12	1231	Post-dredge		18			18.00		3.37E+00				
01/05/12	1232	Post-dredge		18			18.00		3.38E+00				
01/06/12	1233	Post-dredge		18			18.00		3.38E+00				
01/07/12	1234	Post-dredge		18			18.00		3.38E+00				
01/08/12	1235	Post-dredge		18			18.00		3.38E+00				
01/09/12	1236	Post-dredge		18			18.00		3.39E+00				
01/10/12	1237	Post-dredge		18			18.00		3.39E+00				
01/11/12	1238	Post-dredge		18			18.00		3.39E+00				
01/12/12	1239	Post-dredge		18			18.00		3.39E+00				
01/13/12	1240	Post-dredge		18			18.00		3.40E+00				
01/14/12	1241	Post-dredge		18			18.00		3.40E+00				
01/15/12	1242	Post-dredge		18			18.00		3.40E+00				
01/16/12	1243	Post-dredge		18			18.00		3.41E+00				
01/17/12	1244	Post-dredge		18			18.00		3.41E+00				
01/18/12	1245	Post-dredge		18			18.00		3.41E+00				
01/19/12	1246	Post-dredge		18			18.00		3.41E+00				
01/20/12	1247	Post-dredge		18			18.00		3.42E+00				
01/21/12	1248	Post-dredge		18			18.00		3.42E+00				
01/22/12	1249	Post-dredge		18			18.00		3.42E+00				
01/23/12	1250	Post-dredge		18			18.00		3.42E+00				
01/24/12	1251	Post-dredge		18			18.00		3.43E+00				
01/25/12	1252	Post-dredge		18			18.00		3.43E+00				
01/26/12	1253	Post-dredge		18			18.00		3.43E+00				
01/27/12	1254	Post-dredge		18			18.00		3.44E+00				
01/28/12	1255	Post-dredge		18			18.00		3.44E+00				
01/29/12	1256	Post-dredge		18			18.00		3.44E+00				
01/30/12	1257	Post-dredge		18			18.00		3.44E+00				
01/31/12	1258	Post-dredge		18			18.00		3.45E+00				
02/01/12	1259	Post-dredge		18			18.00		3.45E+00				
02/02/12	1260	Post-dredge		18			18.00		3.45E+00				
02/03/12	1261	Post-dredge		18			18.00		3.45E+00				
02/04/12	1262	Post-dredge		18			18.00		3.46E+00				
02/05/12	1263	Post-dredge		18			18.00		3.46E+00				
02/06/12	1264	Post-dredge		18			18.00		3.46E+00				
02/07/12	1265	Post-dredge		18			18.00		3.47E+00				
02/08/12	1266	Post-dredge		18			18.00		3.47E+00				
02/09/12	1267	Post-dredge		18			18.00		3.47E+00				
02/10/12	1268	Post-dredge		18			18.00		3.47E+00				
02/11/12	1269	Post-dredge		18			18.00		3.48E+00				
02/12/12	1270	Post-dredge		18			18.00		3.48E+00				
02/13/12	1271	Post-dredge		18			18.00		3.48E+00				
02/14/12	1272	Post-dredge		18			18.00		3.48E+00				
02/15/12	1273	Post-dredge		18			18.00		3.49E+00				
02/16/12	1274	Post-dredge		18			18.00		3.49E+00				
02/17/12	1275	Post-dredge		18			18.00		3.49E+00				
02/18/12	1276	Post-dredge		18			18.00		3.50E+00				
02/19/12	1277	Post-dredge		18			18.00		3.50E+00				
02/20/12	1278	Post-dredge		18			18.00		3.50E+00				
02/21/12	1279	Post-dredge		18			18.00		3.50E+00				
02/22/12	1280	Post-dredge		18			18.00		3.51E+00				
02/23/12	1281	Post-dredge		18			18.00		3.51E+00				
02/24/12	1282	Post-dredge		18			18.00		3.51E+00				
02/25/12	1283	Post-dredge		18			18.00		3.52E+00				
02/26/12	1284	Post-dredge		18			18.00		3.52E+00				
02/27/12	1285	Post-dredge		18			18.00		3.52E+00				
02/28/12	1286	Post-dredge		18			18.00		3.52E+00				
02/29/12	1287	Post-dredge		18			18.00		3.53E+00				
03/01/12	1288	Post-dredge		18			18.00		3.53E+00				
03/02/12	1289	Post-dredge		18			18.00		3.53E+00				
03/03/12	1290	Post-dredge		18			18.00		3.53E+00				
03/04/12	1291	Post-dredge		18			18.00		3.54E+00				
03/05/12	1292	Post-dredge		18			18.00		3.54E+00				
03/06/12	1293	Post-dredge		18			18.00		3.54E+00				
03/07/12	1294	Post-dredge		18			18.00		3.55E+00				
03/08/12	1295	Post-dredge		18			18.00		3.55E+00				
03/09/12	1296	Post-dredge		18			18.00		3.55E+00				
03/10/12	1297	Post-dredge		18			18.00		3.55E+00				
03/11/12	1298	Post-dredge		18			18.00		3.56E+00				
03/12/12	1299	Post-dredge		18			18.00		3.56E+00				
03/13/12	1300	Post-dredge		18			18.00		3.56E+00				
03/14/12	1301	Post-dredge		18			18.00		3.56E+00				
03/15/12	1302	Post-dredge		18			18.00		3.57E+00				
03/16/12	1303	Post-dredge		18			18.00		3.57E+00				
03/17/12	1304	Post-dredge		18			18.00		3.57E+00				
03/18/12	1305	Post-dredge		18			18.00		3.58E+00				
03/19/12	1306	Post-dredge		18			18.00		3.58E+00				
03/20/12	1307	Post-dredge		18			18.00		3.58E+00				
03/21/12	1308	Post-dredge		18			18.00		3.58E+00				
03/22/12	1309	Post-dredge		18			18.00		3.59E+00				
03/23/12	1310	Post-dredge		18			18.00		3.59E+00				
03/24/12	1311	Post-dredge		18									

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
03/28/12	1315	Post-dredge		18			18.00		3.60E+00				
03/29/12	1316	Post-dredge		18			18.00		3.61E+00				
03/30/12	1317	Post-dredge		18			18.00		3.61E+00				
03/31/12	1318	Post-dredge		18			18.00		3.61E+00				
04/01/12	1319	Post-dredge		18			18.00		3.61E+00				
04/02/12	1320	Post-dredge		18			18.00		3.62E+00				
04/03/12	1321	Post-dredge		18			18.00		3.62E+00				
04/04/12	1322	Post-dredge		18			18.00		3.62E+00				
04/05/12	1323	Post-dredge		18			18.00		3.62E+00				
04/06/12	1324	Post-dredge		18			18.00		3.63E+00				
04/07/12	1325	Post-dredge		18			18.00		3.63E+00				
04/08/12	1326	Post-dredge		18			18.00		3.63E+00				
04/09/12	1327	Post-dredge		18			18.00		3.64E+00				
04/10/12	1328	Post-dredge		18			18.00		3.64E+00				
04/11/12	1329	Post-dredge		18			18.00		3.64E+00				
04/12/12	1330	Post-dredge		18			18.00		3.64E+00				
04/13/12	1331	Post-dredge		18			18.00		3.65E+00				
04/14/12	1332	Post-dredge		18			18.00		3.65E+00				
04/15/12	1333	Post-dredge		18			18.00		3.65E+00				
04/16/12	1334	Post-dredge		18			18.00		3.65E+00				
04/17/12	1335	Post-dredge		18			18.00		3.66E+00				
04/18/12	1336	Post-dredge		18			18.00		3.66E+00				
04/19/12	1337	Post-dredge		18			18.00		3.66E+00				
04/20/12	1338	Post-dredge		18			18.00		3.67E+00				
04/21/12	1339	Post-dredge		18			18.00		3.67E+00				
04/22/12	1340	Post-dredge		18			18.00		3.67E+00				
04/23/12	1341	Post-dredge		18			18.00		3.67E+00				
04/24/12	1342	Post-dredge		18			18.00		3.68E+00				
04/25/12	1343	Post-dredge		18			18.00		3.68E+00				
04/26/12	1344	Post-dredge		18			18.00		3.68E+00				
04/27/12	1345	Post-dredge		18			18.00		3.68E+00				
04/28/12	1346	Post-dredge		18			18.00		3.69E+00				
04/29/12	1347	Post-dredge		18			18.00		3.69E+00				
04/30/12	1348	Post-dredge		18			18.00		3.69E+00				
05/01/12	1349	Post-dredge		18			18.00		3.70E+00				
05/02/12	1350	Post-dredge		18			18.00		3.70E+00				
05/03/12	1351	Post-dredge		18			18.00		3.70E+00				
05/04/12	1352	Post-dredge		18			18.00		3.70E+00				
05/05/12	1353	Post-dredge		18			18.00		3.71E+00				
05/06/12	1354	Post-dredge		18			18.00		3.71E+00				
05/07/12	1355	Post-dredge		18			18.00		3.71E+00				
05/08/12	1356	Post-dredge		18			18.00		3.72E+00				
05/09/12	1357	Post-dredge		18			18.00		3.72E+00				
05/10/12	1358	Post-dredge		18			18.00		3.72E+00				
05/11/12	1359	Post-dredge		18			18.00		3.72E+00				
05/12/12	1360	Post-dredge		18			18.00		3.73E+00				
05/13/12	1361	Post-dredge		18			18.00		3.73E+00				
05/14/12	1362	Post-dredge		18			18.00		3.73E+00				
05/15/12	1363	Post-dredge		18			18.00		3.73E+00				
05/16/12	1364	Post-dredge		18			18.00		3.74E+00				
05/17/12	1365	Post-dredge		18			18.00		3.74E+00				
05/18/12	1366	Post-dredge		18			18.00		3.74E+00				
05/19/12	1367	Post-dredge		18			18.00		3.75E+00				
05/20/12	1368	Post-dredge		18			18.00		3.75E+00				
05/21/12	1369	Pre-dredge		18			18.00		3.75E+00				
05/22/12	1370	Pre-dredge		18			18.00		3.75E+00				
05/23/12	1371	Pre-dredge		18			18.00		3.76E+00				
05/24/12	1372	Pre-dredge		18			18.00		3.76E+00				
05/25/12	1373	Pre-dredge		18			18.00		3.76E+00				
05/26/12	1374	Pre-dredge		18			18.00		3.76E+00				
05/27/12	1375	Pre-dredge		18			18.00		3.77E+00				
05/28/12	1376	Pre-dredge		18			18.00		3.77E+00				
05/29/12	1377	Pre-dredge		18			18.00		3.77E+00				
05/30/12	1378	Pre-dredge		18			18.00		3.78E+00				
05/31/12	1379	Pre-dredge		18			18.00		3.78E+00				
06/01/12	1380	Pre-dredge		18			18.00		3.78E+00				
06/02/12	1381	Pre-dredge		18			18.00		3.78E+00				
06/03/12	1382	Pre-dredge		18			18.00		3.79E+00				
06/04/12	1383	Pre-dredge		18			18.00		3.79E+00				
06/05/12	1384	Pre-dredge		18			18.00		3.79E+00				
06/06/12	1385	Pre-dredge		18			18.00		3.79E+00				
06/07/12	1386	Pre-dredge		18			18.00		3.80E+00				
06/08/12	1387	Pre-dredge		18			18.00		3.80E+00				
06/09/12	1388	Pre-dredge		18			18.00		3.80E+00				
06/10/12	1389	Pre-dredge		18			18.00		3.81E+00				
06/11/12	1390	Pre-dredge		18			18.00		3.81E+00				
06/12/12	1391	Pre-dredge		18			18.00		3.81E+00				
06/13/12	1392	Pre-dredge		18			18.00		3.81E+00				
06/14/12	1393	Pre-dredge		18			18.00		3.82E+00				
06/15/12	1394	Pre-dredge		18			18.00		3.82E+00				
06/16/12	1395	Pre-dredge		18			18.00		3.82E+00				
06/17/12	1396	Pre-dredge		18			18.00		3.82E+00				
06/18/12	1397	Pre-dredge		18			18.00		3.83E+00				
06/19/12	1398	Pre-dredge		18			18.00		3.83E+00				
06/20/12	1399	Pre-dredge		18			18.00		3.83E+00				
06/21/12	1400	Pre-dredge		18			18.00		3.84E+00				
06/22/12	1401	Pre-dredge		18			18.00		3.84E+00				
06/23/12	1402	Pre-dredge		18			18.00		3.84E+00				
06/24/12	1403	Pre-dredge		18			18.00		3.84E+00				
06/25/12	1404	Pre-dredge		18			18.00		3.85E+00				
06/26/12	1405	Pre-dredge		18			18.00		3.85E+00				
06/27/12	1406	Pre-dredge		18			18.00		3.85E+00				
06/28/12	1407	Pre-dredge		18			18.00		3.85E+00				
06/29/12	1408	Pre-dredge		18			18.00		3.86E+00				
06/30/12	1409	Pre-dredge		18			18.00		3.86E+00				
07/01/12	1410	Pre-dredge		18			18.00		3.86E+00				
07/02/12	1411	Pre-dredge	0	18			18.00		3.87E+00			explain why measured result of 0 ng/m3 was not carried to subsequent days until 7/5/12	
07/03/12	1412	Pre-dredge		18			18.00		3.87E+00				
07/04/12	1413	Pre-dredge		18			18.00		3.87E+00				
07/05/12	1414	Pre-dredge		18			18.00		3.87E+00				
07/06/12	1415	Pre-dredge		18			18.00		3.88E+00				
07/07/12	1416	Pre-dredge		18			18.00		3.88E+00				
07/08/12	1417	Pre-dredge		18			18.00		3.88E+00				
07/09/12	1418	Pre-dredge		18			18.00		3.88E+00				
07/10/12	1419	Pre-dredge		18			18.00		3.89E+00				
07/11/12	1420	Pre-dredge		18			18.00		3.89E+00				
07/12/12	1421	Pre-dredge		18			18.00		3.89E+00				
07/13/12	1422	Pre-dredge		18			18.00		3.90E+00				
07/14/12	1423	Pre-dredge		18			18.00		3.90E+00				
07/15/12	1424	Pre-dredge		18			18.00		3.90E+00				
07/16/12	1425	Dredge				140	140	140.00	3.90E+00				
07/17/12	1426	Dredge					140	140.00	3.91E+00				
07/18/12	1427	Dredge					140	140.00	3.91E+00				
07/19/12	1428	Dredge					140	140.00	3.91E+00				
07/20/12	1429	Dredge					140	140.00	3.92E+00				
07/21/12	1430	Dredge					140	140.00	3.92E+00				
07/22/12	1431	Dredge					140	140.00	3.92E+00				
07/23/12	1432	Dredge					140	140.00	3.92E+00				
07/24/12	1433	Dredge					140	140.00	3.93E+00				
07/25/12	1434	Dredge					140	140.00	3.93E+00				
07/26/12	1435	Dredge					140	140.00	3.93E+00				
07/27/12	1436	Dredge					140	140.00	3.93E+00				
07/28/12	1437	Dredge					140	140.00	3.94E+00				
07/29/12	1438	Dredge					140	140.00	3.94E+00				
07/30/12	1439	Dredge					140	140.00	3.94E+00				
07/31/12	1440	Dredge					140	140.00	3.95E+00				
08/01/12	1441	Dredge					140	140.00	3.95E+00				
08/02/12	1442	Dredge					140	140.00	3.95E+00				
08/03/12													

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
08/07/12	1447	Dredge					140	140.00		3.96E+00			
08/08/12	1448	Dredge					140	140.00		3.97E+00			
08/09/12	1449	Dredge					140	140.00		3.97E+00			
08/10/12	1450	Dredge					140	140.00		3.97E+00			
08/11/12	1451	Dredge					140	140.00		3.98E+00			
08/12/12	1452	Dredge					140	140.00		3.98E+00			
08/13/12	1453	Dredge					140	140.00		3.98E+00			
08/14/12	1454	Dredge					140	140.00		3.98E+00			
08/15/12	1455	Dredge					140	140.00		3.99E+00			
08/16/12	1456	Dredge					140	140.00		3.99E+00			
08/17/12	1457	Dredge					140	140.00		3.99E+00			
08/18/12	1458	Dredge					140	140.00		3.99E+00			
08/19/12	1459	Dredge					140	140.00		4.00E+00			
08/20/12	1460	Dredge					140	140.00		4.00E+00			
08/21/12	1461	Dredge				67	67	67.00		4.00E+00			
08/22/12	1462	Dredge					67	67.00		4.01E+00			
08/23/12	1463	Dredge					67	67.00		4.01E+00			
08/24/12	1464	Dredge					67	67.00		4.01E+00			
08/25/12	1465	Dredge					67	67.00		4.01E+00			
08/26/12	1466	Dredge					67	67.00		4.02E+00			
08/27/12	1467	Dredge					67	67.00		4.02E+00			
08/28/12	1468	Dredge					67	67.00		4.02E+00			
08/29/12	1469	Dredge					67	67.00		4.02E+00			
08/30/12	1470	Dredge					67	67.00		4.03E+00			
08/31/12	1471	Dredge					67	67.00		4.03E+00			
09/01/12	1472	Dredge					67	67.00		4.03E+00			
09/02/12	1473	Dredge					67	67.00		4.04E+00			
09/03/12	1474	Dredge					67	67.00		4.04E+00			
09/04/12	1475	Dredge					67	67.00		4.04E+00			
09/05/12	1476	Dredge					67	67.00		4.04E+00			
09/06/12	1477	Dredge					67	67.00		4.05E+00			
09/07/12	1478	Dredge					67	67.00		4.05E+00			
09/08/12	1479	Dredge					67	67.00		4.05E+00			
09/09/12	1480	Dredge					67	67.00		4.05E+00			
09/10/12	1481	Dredge					67	67.00		4.06E+00			
09/11/12	1482	Dredge					67	67.00		4.06E+00			
09/12/12	1483	Dredge					67	67.00		4.06E+00			
09/13/12	1484	Dredge					67	67.00		4.07E+00			
09/14/12	1485	Dredge					67	67.00		4.07E+00			
09/15/12	1486	Dredge					67	67.00		4.07E+00			
09/16/12	1487	Dredge					67	67.00		4.07E+00			
09/17/12	1488	Dredge					67	67.00		4.08E+00			
09/18/12	1489	Dredge					67	67.00		4.08E+00			
09/19/12	1490	Dredge					67	67.00		4.08E+00			
09/20/12	1491	Dredge					67	67.00		4.08E+00			
09/21/12	1492	Dredge					67	67.00		4.09E+00			
09/22/12	1493	Dredge					67	67.00		4.09E+00			
09/23/12	1494	Dredge					67	67.00		4.09E+00			
09/24/12	1495	Dredge					67	67.00		4.10E+00			
09/25/12	1496	Dredge					67	67.00		4.10E+00			
09/26/12	1497	Dredge					67	67.00		4.10E+00			
09/27/12	1498	Dredge					67	67.00		4.10E+00			
09/28/12	1499	Dredge					67	67.00		4.11E+00			
09/29/12	1500	Dredge					67	67.00		4.11E+00			
09/30/12	1501	Dredge					67	67.00		4.11E+00			
10/01/12	1502	Post-dredge	87	87			87	87.00		4.12E+00			
10/02/12	1503	Post-dredge		87			87	87.00		4.12E+00			
10/03/12	1504	Post-dredge		87			87	87.00		4.12E+00			
10/04/12	1505	Post-dredge		87			87	87.00		4.12E+00			
10/05/12	1506	Post-dredge		87			87	87.00		4.13E+00			
10/06/12	1507	Post-dredge		87			87	87.00		4.13E+00			
10/07/12	1508	Post-dredge		87			87	87.00		4.13E+00			
10/08/12	1509	Post-dredge		87			87	87.00		4.13E+00			
10/09/12	1510	Post-dredge		87			87	87.00		4.14E+00			
10/10/12	1511	Post-dredge		87			87	87.00		4.14E+00			
10/11/12	1512	Post-dredge		87			87	87.00		4.14E+00			
10/12/12	1513	Post-dredge		87			87	87.00		4.15E+00			
10/13/12	1514	Post-dredge		87			87	87.00		4.15E+00			
10/14/12	1515	Post-dredge		87			87	87.00		4.15E+00			
10/15/12	1516	Post-dredge		87			87	87.00		4.15E+00			
10/16/12	1517	Post-dredge		87			87	87.00		4.16E+00			
10/17/12	1518	Post-dredge		87			87	87.00		4.16E+00			
10/18/12	1519	Post-dredge		87			87	87.00		4.16E+00			
10/19/12	1520	Post-dredge		87			87	87.00		4.16E+00			
10/20/12	1521	Post-dredge		87			87	87.00		4.17E+00			
10/21/12	1522	Post-dredge		87			87	87.00		4.17E+00			
10/22/12	1523	Post-dredge		87			87	87.00		4.17E+00			
10/23/12	1524	Post-dredge		87			87	87.00		4.18E+00			
10/24/12	1525	Post-dredge		87			87	87.00		4.18E+00			
10/25/12	1526	Post-dredge		87			87	87.00		4.18E+00			
10/26/12	1527	Post-dredge		87			87	87.00		4.18E+00			
10/27/12	1528	Post-dredge		87			87	87.00		4.19E+00			
10/28/12	1529	Post-dredge		87			87	87.00		4.19E+00			
10/29/12	1530	Post-dredge		87			87	87.00		4.19E+00			
10/30/12	1531	Post-dredge		87			87	87.00		4.19E+00			
10/31/12	1532	Post-dredge		87			87	87.00		4.20E+00			
11/01/12	1533	Post-dredge		87			87	87.00		4.20E+00			
11/02/12	1534	Post-dredge		87			87	87.00		4.20E+00			
11/03/12	1535	Post-dredge		87			87	87.00		4.21E+00			
11/04/12	1536	Post-dredge		87			87	87.00		4.21E+00			
11/05/12	1537	Post-dredge		87			87	87.00		4.21E+00			
11/06/12	1538	Post-dredge		87			87	87.00		4.21E+00			
11/07/12	1539	Post-dredge		87			87	87.00		4.22E+00			
11/08/12	1540	Post-dredge		87			87	87.00		4.22E+00			
11/09/12	1541	Post-dredge		87			87	87.00		4.22E+00			
11/10/12	1542	Post-dredge		87			87	87.00		4.22E+00			
11/11/12	1543	Post-dredge		87			87	87.00		4.23E+00			
11/12/12	1544	Post-dredge		87			87	87.00		4.23E+00			
11/13/12	1545	Post-dredge		87			87	87.00		4.23E+00			
11/14/12	1546	Post-dredge		87			87	87.00		4.24E+00			
11/15/12	1547	Post-dredge		87			87	87.00		4.24E+00			
11/16/12	1548	Post-dredge		87			87	87.00		4.24E+00			
11/17/12	1549	Post-dredge		87			87	87.00		4.24E+00			
11/18/12	1550	Post-dredge		87			87	87.00		4.25E+00			
11/19/12	1551	Post-dredge		87			87	87.00		4.25E+00			
11/20/12	1552	CAD Cell Constr.		87			87	87.00		4.25E+00			
11/21/12	1553	CAD Cell Constr.		87			87	87.00		4.25E+00			
11/22/12	1554	CAD Cell Constr.		87			87	87.00		4.26E+00			
11/23/12	1555	CAD Cell Constr.		87			87	87.00		4.26E+00			
11/24/12	1556	CAD Cell Constr.		87			87	87.00		4.26E+00			
11/25/12	1557	CAD Cell Constr.		87			87	87.00		4.27E+00			
11/26/12	1558	CAD Cell Constr.		87			87	87.00		4.27E+00			
11/27/12	1559	CAD Cell Constr.		87			87	87.00		4.27E+00			
11/28/12	1560	CAD Cell Constr.		87			87	87.00		4.27E+00			
11/29/12	1561	CAD Cell Constr.		87			87	87.00		4.28E+00			
11/30/12	1562	CAD Cell Constr.		87			87	87.00		4.28E+00			
12/01/12	1563	CAD Cell Constr.		87			87	87.00		4.28E+00			
12/02/12	1564	CAD Cell Constr.		87			87	87.00		4.28E+00			
12/03/12	1565	CAD Cell Constr.		87			87	87.00		4.29E+00			
12/04/12	1566	CAD Cell Constr.		87			87	87.00		4.29E+00			
12/05/12	1567	CAD Cell Constr.		87			87	87.00		4.29E+00			
12/06/12	1568	CAD Cell Constr.		87			87	87.00		4.30E+00			
12/07/1													

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
12/17/12	1579	CAD Cell Constr.		87			87.00		4.33E+00				
12/18/12	1580	CAD Cell Constr.		87			87.00		4.33E+00				
12/19/12	1581	CAD Cell Constr.		87			87.00		4.33E+00				
12/20/12	1582	Post-dredge		87			87.00		4.33E+00				
12/21/12	1583	Post-dredge		87			87.00		4.34E+00				
12/22/12	1584	Post-dredge		87			87.00		4.34E+00				
12/23/12	1585	Post-dredge		87			87.00		4.34E+00				
12/24/12	1586	Post-dredge		87			87.00		4.35E+00				
12/25/12	1587	Post-dredge		87			87.00		4.35E+00				
12/26/12	1588	Post-dredge		87			87.00		4.35E+00				
12/27/12	1589	Post-dredge		87			87.00		4.35E+00				
12/28/12	1590	Post-dredge		87			87.00		4.36E+00				
12/29/12	1591	Post-dredge		87			87.00		4.36E+00				
12/30/12	1592	Post-dredge		87			87.00		4.36E+00				
12/31/12	1593	Post-dredge		87			87.00		4.36E+00				
01/01/13	1594	Post-dredge		87			87.00		4.37E+00				
01/02/13	1595	Post-dredge		87			87.00		4.37E+00				
01/03/13	1596	Post-dredge		87			87.00		4.37E+00				
01/04/13	1597	Post-dredge		87			87.00		4.38E+00				
01/05/13	1598	Post-dredge		87			87.00		4.38E+00				
01/06/13	1599	Post-dredge		87			87.00		4.38E+00				
01/07/13	1600	Post-dredge		87			87.00		4.38E+00				
01/08/13	1601	Post-dredge		87			87.00		4.39E+00				
01/09/13	1602	Post-dredge		87			87.00		4.39E+00				
01/10/13	1603	Post-dredge		87			87.00		4.39E+00				
01/11/13	1604	Post-dredge		87			87.00		4.39E+00				
01/12/13	1605	Post-dredge		87			87.00		4.40E+00				
01/13/13	1606	Post-dredge		87			87.00		4.40E+00				
01/14/13	1607	Post-dredge		87			87.00		4.40E+00				
01/15/13	1608	Post-dredge		87			87.00		4.41E+00				
01/16/13	1609	Post-dredge		87			87.00		4.41E+00				
01/17/13	1610	Post-dredge		87			87.00		4.41E+00				
01/18/13	1611	Post-dredge		87			87.00		4.41E+00				
01/19/13	1612	Post-dredge		87			87.00		4.42E+00				
01/20/13	1613	Post-dredge		87			87.00		4.42E+00				
01/21/13	1614	Post-dredge		87			87.00		4.42E+00				
01/22/13	1615	Post-dredge		87			87.00		4.42E+00				
01/23/13	1616	Post-dredge		87			87.00		4.43E+00				
01/24/13	1617	Post-dredge		87			87.00		4.43E+00				
01/25/13	1618	Post-dredge		87			87.00		4.43E+00				
01/26/13	1619	Post-dredge		87			87.00		4.44E+00				
01/27/13	1620	Post-dredge		87			87.00		4.44E+00				
01/28/13	1621	Post-dredge		87			87.00		4.44E+00				
01/29/13	1622	Post-dredge		87			87.00		4.44E+00				
01/30/13	1623	Post-dredge		87			87.00		4.45E+00				
01/31/13	1624	Post-dredge		87			87.00		4.45E+00				
02/01/13	1625	Post-dredge		87			87.00		4.45E+00				
02/02/13	1626	Post-dredge		87			87.00		4.45E+00				
02/03/13	1627	Post-dredge		87			87.00		4.46E+00				
02/04/13	1628	Post-dredge		87			87.00		4.46E+00				
02/05/13	1629	Post-dredge		87			87.00		4.46E+00				
02/06/13	1630	Post-dredge		87			87.00		4.47E+00				
02/07/13	1631	Post-dredge		87			87.00		4.47E+00				
02/08/13	1632	Post-dredge		87			87.00		4.47E+00				
02/09/13	1633	Post-dredge		87			87.00		4.47E+00				
02/10/13	1634	Post-dredge		87			87.00		4.48E+00				
02/11/13	1635	Post-dredge		87			87.00		4.48E+00				
02/12/13	1636	Post-dredge		87			87.00		4.48E+00				
02/13/13	1637	Post-dredge		87			87.00		4.48E+00				
02/14/13	1638	Post-dredge		87			87.00		4.49E+00				
02/15/13	1639	Post-dredge		87			87.00		4.49E+00				
02/16/13	1640	Post-dredge		87			87.00		4.49E+00				
02/17/13	1641	Post-dredge		87			87.00		4.50E+00				
02/18/13	1642	Post-dredge		87			87.00		4.50E+00				
02/19/13	1643	Post-dredge		87			87.00		4.50E+00				
02/20/13	1644	Post-dredge		87			87.00		4.50E+00				
02/21/13	1645	Post-dredge		87			87.00		4.51E+00				
02/22/13	1646	Post-dredge		87			87.00		4.51E+00				
02/23/13	1647	Post-dredge		87			87.00		4.51E+00				
02/24/13	1648	Post-dredge		87			87.00		4.52E+00				
02/25/13	1649	Post-dredge		87			87.00		4.52E+00				
02/26/13	1650	Post-dredge		87			87.00		4.52E+00				
02/27/13	1651	Post-dredge		87			87.00		4.52E+00				
02/28/13	1652	Post-dredge		87			87.00		4.53E+00				
03/01/13	1653	Post-dredge		87			87.00		4.53E+00				
03/02/13	1654	Post-dredge		87			87.00		4.53E+00				
03/03/13	1655	Post-dredge		87			87.00		4.53E+00				
03/04/13	1656	Post-dredge		87			87.00		4.54E+00				
03/05/13	1657	Post-dredge		87			87.00		4.54E+00				
03/06/13	1658	Post-dredge		87			87.00		4.54E+00				
03/07/13	1659	Post-dredge		87			87.00		4.55E+00				
03/08/13	1660	Post-dredge		87			87.00		4.55E+00				
03/09/13	1661	Post-dredge		87			87.00		4.55E+00				
03/10/13	1662	Post-dredge		87			87.00		4.55E+00				
03/11/13	1663	Post-dredge		87			87.00		4.56E+00				
03/12/13	1664	Post-dredge		87			87.00		4.56E+00				
03/13/13	1665	Post-dredge		87			87.00		4.56E+00				
03/14/13	1666	Post-dredge		87			87.00		4.56E+00				
03/15/13	1667	Post-dredge		87			87.00		4.57E+00				
03/16/13	1668	Post-dredge		87			87.00		4.57E+00				
03/17/13	1669	Post-dredge		87			87.00		4.57E+00				
03/18/13	1670	Post-dredge		87			87.00		4.58E+00				
03/19/13	1671	Post-dredge		87			87.00		4.58E+00				
03/20/13	1672	Post-dredge		87			87.00		4.58E+00				
03/21/13	1673	Post-dredge		87			87.00		4.58E+00				
03/22/13	1674	Post-dredge		87			87.00		4.59E+00				
03/23/13	1675	Post-dredge		87			87.00		4.59E+00				
03/24/13	1676	Post-dredge		87			87.00		4.59E+00				
03/25/13	1677	Post-dredge		87			87.00		4.59E+00				
03/26/13	1678	Pre-dredge	8.3	8.3			8.30		4.60E+00				
03/27/13	1679	Pre-dredge		8.3			8.30		4.60E+00				
03/28/13	1680	Pre-dredge		8.3			8.30		4.60E+00				
03/29/13	1681	Pre-dredge		8.3			8.30		4.61E+00				
03/30/13	1682	Pre-dredge		8.3			8.30		4.61E+00				
03/31/13	1683	Pre-dredge		8.3			8.30		4.61E+00				
04/01/13	1684	Pre-dredge		8.3			8.30		4.61E+00				
04/02/13	1685	Pre-dredge		8.3			8.30		4.62E+00				
04/03/13	1686	Pre-dredge		8.3			8.30		4.62E+00				
04/04/13	1687	Pre-dredge		8.3			8.30		4.62E+00				
04/05/13	1688	Pre-dredge		8.3			8.30		4.62E+00				
04/06/13	1689	Pre-dredge		8.3			8.30		4.63E+00				
04/07/13	1690	Pre-dredge		8.3			8.30		4.63E+00				
04/08/13	1691	Pre-dredge		8.3			8.30		4.63E+00				
04/09/13	1692	Pre-dredge		8.3			8.30		4.64E+00				
04/10/13	1693	Pre-dredge		8.3			8.30		4.64E+00				
04/11/13	1694	Pre-dredge		8.3			8.30		4.64E+00				
04/12/13	1695	Pre-dredge		8.3			8.30		4.64E+00				
04/13/13	1696	Pre-dredge		8.3			8.30		4.65E+00				
04/14/13	1697	Pre-dredge		8.3			8.30		4.65E+00				
04/15/13	1698	Pre-dredge		8.3			8.30		4.65E+00				
04/16/13	1699	Pre-dredge		8.3			8.30		4.65E+00				
04/17/13	1700	Pre-dredge		8.3			8.30		4.66E+00				
04/18/13	1701	Pre-dredge		8.3			8.30		4.66E+00				
04/19/13	1702	Pre-dredge		8.3			8.30		4.66E+00				
04/20/13	1703	Pre-dredge		8.3			8.30		4.67E+00				
04/21/13	1704	Pre-dredge		8.3			8.30		4.67E+00				
04/22/13	1705	Pre-dredge		8.3			8.30		4.67E+00				
04/23/13	1706	Pre-dredge		8.3			8.30		4.67E+00				
04/24/13	1707	Pre-dredge		8.3									

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
04/28/13	1711	Pre-dredge		8.3				8.30		4.69E+00			
04/29/13	1712	Pre-dredge		8.3				8.30		4.69E+00			
04/30/13	1713	Pre-dredge		8.3				8.30		4.69E+00			
05/01/13	1714	Pre-dredge		8.3				8.30		4.70E+00			
05/02/13	1715	Pre-dredge		8.3				8.30		4.70E+00			
05/03/13	1716	Pre-dredge		8.3				8.30		4.70E+00			
05/04/13	1717	Pre-dredge		8.3				8.30		4.70E+00			
05/05/13	1718	Pre-dredge		8.3				8.30		4.71E+00			
05/06/13	1719	Pre-dredge		8.3				8.30		4.71E+00			
05/07/13	1720	Pre-dredge		8.3				8.30		4.71E+00			
05/08/13	1721	Pre-dredge		8.3				8.30		4.72E+00			
05/09/13	1722	Pre-dredge		8.3				8.30		4.72E+00			
05/10/13	1723	Pre-dredge		8.3				8.30		4.72E+00			
05/11/13	1724	Pre-dredge		8.3				8.30		4.72E+00			
05/12/13	1725	Pre-dredge		8.3				8.30		4.73E+00			
05/13/13	1726	Pre-dredge		8.3				8.30		4.73E+00			
05/14/13	1727	Pre-dredge		8.3				8.30		4.73E+00			
05/15/13	1728	Pre-dredge		8.3				8.30		4.73E+00			
05/16/13	1729	Pre-dredge		8.3				8.30		4.74E+00			
05/17/13	1730	Pre-dredge		8.3				8.30		4.74E+00			
05/18/13	1731	Pre-dredge		8.3				8.30		4.74E+00			
05/19/13	1732	Pre-dredge		8.3				8.30		4.75E+00			
05/20/13	1733	Pre-dredge		8.3				8.30		4.75E+00			
05/21/13	1734	Pre-dredge		8.3				8.30		4.75E+00			
05/22/13	1735	Pre-dredge		8.3				8.30		4.75E+00			
05/23/13	1736	Pre-dredge		8.3				8.30		4.76E+00			
05/24/13	1737	Pre-dredge		8.3				8.30		4.76E+00			
05/25/13	1738	Pre-dredge		8.3				8.30		4.76E+00			
05/26/13	1739	Pre-dredge		8.3				8.30		4.76E+00			
05/27/13	1740	Pre-dredge		8.3				8.30		4.77E+00			
05/28/13	1741	Pre-dredge		8.3				8.30		4.77E+00			
05/29/13	1742	Pre-dredge		8.3				8.30		4.77E+00			
05/30/13	1743	Pre-dredge		8.3				8.30		4.78E+00			
05/31/13	1744	Pre-dredge		8.3				8.30		4.78E+00			
06/01/13	1745	Pre-dredge		8.3				8.30		4.78E+00			
06/02/13	1746	Pre-dredge		8.3				8.30		4.78E+00			
06/03/13	1747	Pre-dredge		8.3				8.30		4.79E+00			
06/04/13	1748	Pre-dredge		8.3				8.30		4.79E+00			
06/05/13	1749	Pre-dredge		8.3				8.30		4.79E+00			
06/06/13	1750	Pre-dredge		8.3				8.30		4.79E+00			
06/07/13	1751	Pre-dredge		8.3				8.30		4.80E+00			
06/08/13	1752	Pre-dredge		8.3				8.30		4.80E+00			
06/09/13	1753	Pre-dredge		8.3				8.30		4.80E+00			
06/10/13	1754	Pre-dredge		8.3				8.30		4.81E+00			
06/11/13	1755	Pre-dredge		8.3				8.30		4.81E+00			
06/12/13	1756	Pre-dredge		8.3				8.30		4.81E+00			
06/13/13	1757	Pre-dredge		8.3				8.30		4.81E+00			
06/14/13	1758	Pre-dredge		8.3				8.30		4.82E+00			
06/15/13	1759	Pre-dredge		8.3				8.30		4.82E+00			
06/16/13	1760	Pre-dredge		8.3				8.30		4.82E+00			
06/17/13	1761	Pre-dredge		8.3				8.30		4.82E+00			
06/18/13	1762	Pre-dredge		8.3				8.30		4.83E+00			
06/19/13	1763	Pre-dredge		8.3				8.30		4.83E+00			
06/20/13	1764	Pre-dredge		8.3				8.30		4.83E+00			
06/21/13	1765	Pre-dredge		8.3				8.30		4.84E+00			
06/22/13	1766	Pre-dredge		8.3				8.30		4.84E+00			
06/23/13	1767	Pre-dredge		8.3				8.30		4.84E+00			
06/24/13	1768	Pre-dredge		8.3				8.30		4.84E+00			
06/25/13	1769	Pre-dredge		8.3				8.30		4.85E+00			
06/26/13	1770	Pre-dredge		8.3				8.30		4.85E+00			
06/27/13	1771	Pre-dredge		8.3				8.30		4.85E+00			
06/28/13	1772	Pre-dredge		8.3				8.30		4.85E+00			
06/29/13	1773	Pre-dredge		8.3				8.30		4.86E+00			
06/30/13	1774	Pre-dredge		8.3				8.30		4.86E+00			
07/01/13	1775	Pre-dredge		8.3				8.30		4.86E+00			
07/02/13	1776	Pre-dredge		8.3				8.30		4.87E+00			
07/03/13	1777	Pre-dredge		8.3				8.30		4.87E+00			
07/04/13	1778	Pre-dredge		8.3				8.30		4.87E+00			
07/05/13	1779	Pre-dredge		8.3				8.30		4.87E+00			
07/06/13	1780	Pre-dredge		8.3				8.30		4.88E+00			
07/07/13	1781	Pre-dredge		8.3				8.30		4.88E+00			
07/08/13	1782	Pre-dredge		8.3				8.30		4.88E+00			
07/09/13	1783	Pre-dredge		8.3				8.30		4.88E+00			
07/10/13	1784	Pre-dredge		8.3				8.30		4.89E+00			
07/11/13	1785	Pre-dredge		8.3				8.30		4.89E+00			
07/12/13	1786	Pre-dredge		8.3				8.30		4.89E+00			
07/13/13	1787	Pre-dredge		8.3				8.30		4.90E+00			
07/14/13	1788	Pre-dredge		8.3				8.30		4.90E+00			
07/15/13	1789	Pre-dredge		8.3				8.30		4.90E+00			
07/16/13	1790	Dredge	36	36				36.00		4.90E+00			
07/17/13	1791	Dredge		36				36.00		4.91E+00			
07/18/13	1792	Dredge		36				36.00		4.91E+00			
07/19/13	1793	Dredge		36				36.00		4.91E+00			
07/20/13	1794	Dredge		36				36.00		4.92E+00			
07/21/13	1795	Dredge		36				36.00		4.92E+00			
07/22/13	1796	Dredge		36				36.00		4.92E+00			
07/23/13	1797	Dredge		36				36.00		4.92E+00			
07/24/13	1798	Dredge		36				36.00		4.93E+00			
07/25/13	1799	Dredge		36				36.00		4.93E+00			
07/26/13	1800	Dredge		36				36.00		4.93E+00			
07/27/13	1801	Dredge		36				36.00		4.93E+00			
07/28/13	1802	Dredge		36				36.00		4.94E+00			
07/29/13	1803	Dredge		36				36.00		4.94E+00			
07/30/13	1804	Dredge		36				36.00		4.94E+00			
07/31/13	1805	Dredge		36				36.00		4.95E+00			
08/01/13	1806	Dredge		36				36.00		4.95E+00			
08/02/13	1807	Dredge		36				36.00		4.95E+00			
08/03/13	1808	Dredge		36				36.00		4.95E+00			
08/04/13	1809	Dredge		36				36.00		4.96E+00			
08/05/13	1810	Dredge		36				36.00		4.96E+00			
08/06/13	1811	Dredge		36				36.00		4.96E+00			
08/07/13	1812	Dredge		36				36.00		4.96E+00			
08/08/13	1813	Dredge		36				36.00		4.97E+00			
08/09/13	1814	Dredge		36				36.00		4.97E+00			
08/10/13	1815	Dredge		36				36.00		4.97E+00			
08/11/13	1816	Dredge		36				36.00		4.98E+00			
08/12/13	1817	Dredge		36				36.00		4.98E+00			
08/13/13	1818	Dredge		36				36.00		4.98E+00			
08/14/13	1819	Dredge		36				36.00		4.98E+00			
08/15/13	1820	Dredge		36				36.00		4.99E+00			
08/16/13	1821	Dredge		36				36.00		4.99E+00			
08/17/13	1822	Dredge		36				36.00		4.99E+00			
08/18/13	1823	Dredge		36				36.00		4.99E+00			
08/19/13	1824	Dredge		36				36.00		5.00E+00			
08/20/13	1825	Dredge				61	61	61.00		5.00E+00			
08/21/13	1826	Dredge					61	61.00		5.00E+00			
08/22/13	1827	Dredge					61	61.00		5.01E+00			
08/23/13	1828	Dredge					61	61.00		5.01E+00			
08/24/13	1829	Dredge					61	61.00		5.01E+00			
08/25/13	1830	Dredge					61	61.00		5.01E+00			
08/26/13	1831	Dredge					61	61.00		5.02E+00			
08/27/13	1832	Dredge					61	61.00		5.02E+00			
08/28/13	1833	Dredge					61	61.00		5.02E+00			
08/29/13	1834	Dredge					61	61.00		5.02E+00			
08/													

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
09/07/13	1843	Dredge					61	61.00	5.05E+00				
09/08/13	1844	Dredge					61	61.00	5.05E+00				
09/09/13	1845	Dredge					61	61.00	5.05E+00				
09/10/13	1846	Dredge					61	61.00	5.06E+00				
09/11/13	1847	Dredge					61	61.00	5.06E+00				
09/12/13	1848	Dredge					61	61.00	5.06E+00				
09/13/13	1849	Dredge					61	61.00	5.07E+00				
09/14/13	1850	Dredge					61	61.00	5.07E+00				
09/15/13	1851	Dredge					61	61.00	5.07E+00				
09/16/13	1852	Dredge					61	61.00	5.07E+00				
09/17/13	1853	Dredge					61	61.00	5.08E+00				
09/18/13	1854	Dredge					61	61.00	5.08E+00				
09/19/13	1855	Dredge					61	61.00	5.08E+00				
09/20/13	1856	Dredge					61	61.00	5.08E+00				
09/21/13	1857	Dredge					61	61.00	5.09E+00				
09/22/13	1858	Dredge					61	61.00	5.09E+00				
09/23/13	1859	Dredge					61	61.00	5.09E+00				
09/24/13	1860	Dredge					61	61.00	5.10E+00				
09/25/13	1861	post-dredge	11.2	11.2				11.20	5.10E+00				
09/26/13	1862	post-dredge		11.2				11.20	5.10E+00				
09/27/13	1863	post-dredge		11.2				11.20	5.10E+00				
09/28/13	1864	post-dredge		11.2				11.20	5.11E+00				
09/29/13	1865	post-dredge		11.2				11.20	5.11E+00				
09/30/13	1866	post-dredge		11.2				11.20	5.11E+00				
10/01/13	1867	post-dredge		11.2				11.20	5.12E+00				
10/02/13	1868	post-dredge		11.2				11.20	5.12E+00				
10/03/13	1869	post-dredge		11.2				11.20	5.12E+00				
10/04/13	1870	post-dredge		11.2				11.20	5.12E+00				
10/05/13	1871	post-dredge		11.2				11.20	5.13E+00				
10/06/13	1872	post-dredge		11.2				11.20	5.13E+00				
10/07/13	1873	post-dredge		11.2				11.20	5.13E+00				
10/08/13	1874	post-dredge		11.2				11.20	5.13E+00				
10/09/13	1875	post-dredge		11.2				11.20	5.14E+00				
10/10/13	1876	post-dredge		11.2				11.20	5.14E+00				
10/11/13	1877	post-dredge		11.2				11.20	5.14E+00				
10/12/13	1878	post-dredge		11.2				11.20	5.15E+00				
10/13/13	1879	post-dredge		11.2				11.20	5.15E+00				
10/14/13	1880	post-dredge		11.2				11.20	5.15E+00				
10/15/13	1881	post-dredge		11.2				11.20	5.15E+00				
10/16/13	1882	post-dredge		11.2				11.20	5.16E+00				
10/17/13	1883	post-dredge		11.2				11.20	5.16E+00				
10/18/13	1884	post-dredge		11.2				11.20	5.16E+00				
10/19/13	1885	post-dredge		11.2				11.20	5.16E+00				
10/20/13	1886	post-dredge		11.2				11.20	5.17E+00				
10/21/13	1887	post-dredge		11.2				11.20	5.17E+00				
10/22/13	1888	post-dredge		11.2				11.20	5.17E+00				
10/23/13	1889	post-dredge		11.2				11.20	5.18E+00				
10/24/13	1890	post-dredge		11.2				11.20	5.18E+00				
10/25/13	1891	post-dredge		11.2				11.20	5.18E+00				
10/26/13	1892	post-dredge		11.2				11.20	5.18E+00				
10/27/13	1893	post-dredge		11.2				11.20	5.19E+00				
10/28/13	1894	post-dredge		11.2				11.20	5.19E+00				
10/29/13	1895	post-dredge		11.2				11.20	5.19E+00				
10/30/13	1896	post-dredge		11.2				11.20	5.19E+00				
10/31/13	1897	post-dredge		11.2				11.20	5.20E+00				
11/01/13	1898	post-dredge		11.2				11.20	5.20E+00				
11/02/13	1899	post-dredge		11.2				11.20	5.20E+00				
11/03/13	1900	post-dredge		11.2				11.20	5.21E+00				
11/04/13	1901	post-dredge		11.2				11.20	5.21E+00				
11/05/13	1902	post-dredge		11.2				11.20	5.21E+00				
11/06/13	1903	post-dredge		11.2				11.20	5.21E+00				
11/07/13	1904	post-dredge		11.2				11.20	5.22E+00				
11/08/13	1905	post-dredge		11.2				11.20	5.22E+00				
11/09/13	1906	post-dredge		11.2				11.20	5.22E+00				
11/10/13	1907	post-dredge		11.2				11.20	5.22E+00				
11/11/13	1908	post-dredge		11.2				11.20	5.23E+00				
11/12/13	1909	post-dredge		11.2				11.20	5.23E+00				
11/13/13	1910	post-dredge		11.2				11.20	5.23E+00				
11/14/13	1911	post-dredge		11.2				11.20	5.24E+00				
11/15/13	1912	post-dredge		11.2				11.20	5.24E+00				
11/16/13	1913	post-dredge		11.2				11.20	5.24E+00				
11/17/13	1914	post-dredge		11.2				11.20	5.24E+00				
11/18/13	1915	post-dredge		11.2				11.20	5.25E+00				
11/19/13	1916	post-dredge		11.2				11.20	5.25E+00				
11/20/13	1917	post-dredge		11.2				11.20	5.25E+00				
11/21/13	1918	post-dredge		11.2				11.20	5.25E+00				
11/22/13	1919	post-dredge		11.2				11.20	5.26E+00				
11/23/13	1920	post-dredge		11.2				11.20	5.26E+00				
11/24/13	1921	post-dredge		11.2				11.20	5.26E+00				
11/25/13	1922	post-dredge		11.2				11.20	5.27E+00				
11/26/13	1923	post-dredge		11.2				11.20	5.27E+00				
11/27/13	1924	post-dredge		11.2				11.20	5.27E+00				
11/28/13	1925	post-dredge		11.2				11.20	5.27E+00				
11/29/13	1926	post-dredge		11.2				11.20	5.28E+00				
11/30/13	1927	post-dredge		11.2				11.20	5.28E+00				
12/01/13	1928	post-dredge		11.2				11.20	5.28E+00				
12/02/13	1929	post-dredge		11.2				11.20	5.28E+00				
12/03/13	1930	post-dredge		11.2				11.20	5.29E+00				
12/04/13	1931	post-dredge		11.2				11.20	5.29E+00				
12/05/13	1932	post-dredge		11.2				11.20	5.29E+00				
12/06/13	1933	post-dredge		11.2				11.20	5.30E+00				
12/07/13	1934	post-dredge		11.2				11.20	5.30E+00				
12/08/13	1935	post-dredge		11.2				11.20	5.30E+00				
12/09/13	1936	post-dredge		11.2				11.20	5.30E+00				
12/10/13	1937	post-dredge		11.2				11.20	5.31E+00				
12/11/13	1938	post-dredge		11.2				11.20	5.31E+00				
12/12/13	1939	post-dredge		11.2				11.20	5.31E+00				
12/13/13	1940	post-dredge		11.2				11.20	5.32E+00				
12/14/13	1941	post-dredge		11.2				11.20	5.32E+00				
12/15/13	1942	post-dredge		11.2				11.20	5.32E+00				
12/16/13	1943	post-dredge		11.2				11.20	5.32E+00				
12/17/13	1944	post-dredge		11.2				11.20	5.33E+00				
12/18/13	1945	post-dredge		11.2				11.20	5.33E+00				
12/19/13	1946	post-dredge		11.2				11.20	5.33E+00				
12/20/13	1947	post-dredge		11.2				11.20	5.33E+00				
12/21/13	1948	post-dredge		11.2				11.20	5.34E+00				
12/22/13	1949	post-dredge		11.2				11.20	5.34E+00				
12/23/13	1950	post-dredge		11.2				11.20	5.34E+00				
12/24/13	1951	post-dredge		11.2				11.20	5.35E+00				
12/25/13	1952	post-dredge		11.2				11.20	5.35E+00				
12/26/13	1953	post-dredge		11.2				11.20	5.35E+00				
12/27/13	1954	post-dredge		11.2				11.20	5.35E+00				
12/28/13	1955	post-dredge		11.2				11.20	5.36E+00				
12/29/13	1956	post-dredge		11.2				11.20	5.36E+00				
12/30/13	1957	post-dredge		11.2				11.20	5.36E+00				
12/31/13	1958	post-dredge		11.2				11.20	5.36E+00				
01/01/14	1959	post-dredge		11.2				11.20	5.37E+00				
01/02/14	1960	post-dredge		11.2				11.20	5.37E+00				
01/03/14	1961	post-dredge		11.2				11.20	5.37E+00				
01/04/14	1962	post-dredge		11.2				11.20	5.38E+00				
01/05/14	1963	post-dredge		11.2				11.20	5.38E+00				
01/06/14	1964	post-dredge		11.2				11.20	5.38E+00				
01/07/14	1965	post-dredge		11.2				11.20	5.38E+00				
01/08/14	1966	post-dredge		11.2				11.20	5.39E+00				
01/09/14	1967	post-dredge		11.2				11.20	5.39E+00				
01/10/14	1968	post-dredge		11.2				11.20	5.39E+00				
01/11/14	1969	post-dredge		11.2									

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
01/17/14	1975	post-dredge		11.2				11.20		5.41E+00			
01/18/14	1976	post-dredge		11.2				11.20		5.41E+00			
01/19/14	1977	post-dredge		11.2				11.20		5.42E+00			
01/20/14	1978	post-dredge		11.2				11.20		5.42E+00			
01/21/14	1979	post-dredge		11.2				11.20		5.42E+00			
01/22/14	1980	post-dredge		11.2				11.20		5.42E+00			
01/23/14	1981	post-dredge		11.2				11.20		5.43E+00			
01/24/14	1982	post-dredge		11.2				11.20		5.43E+00			
01/25/14	1983	post-dredge		11.2				11.20		5.43E+00			
01/26/14	1984	post-dredge		11.2				11.20		5.44E+00			
01/27/14	1985	post-dredge		11.2				11.20		5.44E+00			
01/28/14	1986	post-dredge		11.2				11.20		5.44E+00			
01/29/14	1987	post-dredge		11.2				11.20		5.44E+00			
01/30/14	1988	post-dredge		11.2				11.20		5.45E+00			
01/31/14	1989	post-dredge		11.2				11.20		5.45E+00			
02/01/14	1990	post-dredge		11.2				11.20		5.45E+00			
02/02/14	1991	post-dredge		11.2				11.20		5.45E+00			
02/03/14	1992	post-dredge		11.2				11.20		5.46E+00			
02/04/14	1993	post-dredge		11.2				11.20		5.46E+00			
02/05/14	1994	post-dredge		11.2				11.20		5.46E+00			
02/06/14	1995	post-dredge		11.2				11.20		5.47E+00			
02/07/14	1996	post-dredge		11.2				11.20		5.47E+00			
02/08/14	1997	post-dredge		11.2				11.20		5.47E+00			
02/09/14	1998	post-dredge		11.2				11.20		5.47E+00			
02/10/14	1999	post-dredge		11.2				11.20		5.48E+00			
02/11/14	2000	post-dredge		11.2				11.20		5.48E+00			
02/12/14	2001	post-dredge		11.2				11.20		5.48E+00			
02/13/14	2002	post-dredge		11.2				11.20		5.48E+00			
02/14/14	2003	post-dredge		11.2				11.20		5.49E+00			
02/15/14	2004	post-dredge		11.2				11.20		5.49E+00			
02/16/14	2005	post-dredge		11.2				11.20		5.49E+00			
02/17/14	2006	post-dredge		11.2				11.20		5.50E+00			
02/18/14	2007	post-dredge		11.2				11.20		5.50E+00			
02/19/14	2008	post-dredge		11.2				11.20		5.50E+00			
02/20/14	2009	post-dredge		11.2				11.20		5.50E+00			
02/21/14	2010	post-dredge		11.2				11.20		5.51E+00			
02/22/14	2011	post-dredge		11.2				11.20		5.51E+00			
02/23/14	2012	post-dredge		11.2				11.20		5.51E+00			
02/24/14	2013	post-dredge		11.2				11.20		5.52E+00			
02/25/14	2014	post-dredge		11.2				11.20		5.52E+00			
02/26/14	2015	post-dredge		11.2				11.20		5.52E+00			
02/27/14	2016	post-dredge		11.2				11.20		5.52E+00			
02/28/14	2017	post-dredge		11.2				11.20		5.53E+00			
03/01/14	2018	post-dredge		11.2				11.20		5.53E+00			
03/02/14	2019	post-dredge		11.2				11.20		5.53E+00			
03/03/14	2020	post-dredge		11.2				11.20		5.53E+00			
03/04/14	2021	post-dredge		11.2				11.20		5.54E+00			
03/05/14	2022	post-dredge		11.2				11.20		5.54E+00			
03/06/14	2023	post-dredge		11.2				11.20		5.54E+00			
03/07/14	2024	post-dredge		11.2				11.20		5.55E+00			
03/08/14	2025	post-dredge		11.2				11.20		5.55E+00			
03/09/14	2026	post-dredge		11.2				11.20		5.55E+00			
03/10/14	2027	post-dredge		11.2				11.20		5.55E+00			
03/11/14	2028	post-dredge		11.2				11.20		5.56E+00			
03/12/14	2029	post-dredge		11.2				11.20		5.56E+00			
03/13/14	2030	post-dredge		11.2				11.20		5.56E+00			
03/14/14	2031	post-dredge		11.2				11.20		5.56E+00			
03/15/14	2032	post-dredge		11.2				11.20		5.57E+00			
03/16/14	2033	post-dredge		11.2				11.20		5.57E+00			
03/17/14	2034	post-dredge		11.2				11.20		5.57E+00			
03/18/14	2035	Pre-dredge	1.7	1.7				1.70		5.58E+00			
03/19/14	2036	Pre-dredge		1.7				1.70		5.58E+00			
03/20/14	2037	Pre-dredge		1.7				1.70		5.58E+00			
03/21/14	2038	Pre-dredge		1.7				1.70		5.58E+00			
03/22/14	2039	Pre-dredge		1.7				1.70		5.59E+00			
03/23/14	2040	Pre-dredge		1.7				1.70		5.59E+00			
03/24/14	2041	Pre-dredge		1.7				1.70		5.59E+00			
03/25/14	2042	Pre-dredge		1.7				1.70		5.59E+00			
03/26/14	2043	Pre-dredge		1.7				1.70		5.60E+00			
03/27/14	2044	Pre-dredge		1.7				1.70		5.60E+00			
03/28/14	2045	Pre-dredge		1.7				1.70		5.60E+00			
03/29/14	2046	Pre-dredge		1.7				1.70		5.61E+00			
03/30/14	2047	Pre-dredge		1.7				1.70		5.61E+00			
03/31/14	2048	Pre-dredge		1.7				1.70		5.61E+00			
04/01/14	2049	Pre-dredge		1.7				1.70		5.61E+00			
04/02/14	2050	Pre-dredge		1.7				1.70		5.62E+00			
04/03/14	2051	Pre-dredge		1.7				1.70		5.62E+00			
04/04/14	2052	Pre-dredge		1.7				1.70		5.62E+00			
04/05/14	2053	Pre-dredge		1.7				1.70		5.62E+00			
04/06/14	2054	Pre-dredge		1.7				1.70		5.63E+00			
04/07/14	2055	Pre-dredge		1.7				1.70		5.63E+00			
04/08/14	2056	Pre-dredge		1.7				1.70		5.63E+00			
04/09/14	2057	Pre-dredge		1.7				1.70		5.64E+00			
04/10/14	2058	Pre-dredge		1.7				1.70		5.64E+00			
04/11/14	2059	Pre-dredge		1.7				1.70		5.64E+00			
04/12/14	2060	Pre-dredge		1.7				1.70		5.64E+00			
04/13/14	2061	Pre-dredge		1.7				1.70		5.65E+00			
04/14/14	2062	Pre-dredge		1.7				1.70		5.65E+00			
04/15/14	2063	Pre-dredge		1.7				1.70		5.65E+00			
04/16/14	2064	Pre-dredge		1.7				1.70		5.65E+00			
04/17/14	2065	Pre-dredge		1.7	21			1.70		5.66E+00		nondredge mean from E11:E2075	
04/18/14	2066	Pre-dredge		1.7				1.70		5.66E+00			
04/19/14	2067	Pre-dredge		1.7				1.70		5.66E+00			
04/20/14	2068	Pre-dredge		1.7				1.70		5.67E+00			
04/21/14	2069	Pre-dredge		1.7				1.70		5.67E+00			
04/22/14	2070	Pre-dredge		1.7				1.70		5.67E+00			
04/23/14	2071	Pre-dredge		1.7				1.70		5.67E+00			
04/24/14	2072	Pre-dredge		1.7				1.70		5.68E+00			
04/25/14	2073	Pre-dredge		1.7				1.70		5.68E+00			
04/26/14	2074	Pre-dredge		1.7				1.70		5.68E+00			
04/27/14	2075	Pre-dredge		1.7				1.70		5.68E+00			
04/28/14	2076	Pre-dredge		1.7				1.70		5.69E+00			
04/29/14	2077	Pre-dredge		1.7				1.70		5.69E+00			
04/30/14	2078	Pre-dredge		1.7				1.70		5.69E+00			
05/01/14	2079	Pre-dredge		1.7				1.70		5.70E+00			
05/02/14	2080	Pre-dredge		1.7				1.70		5.70E+00			
05/03/14	2081	Pre-dredge		1.7				1.70		5.70E+00			
05/04/14	2082	Pre-dredge		1.7				1.70		5.70E+00			
05/05/14	2083	Pre-dredge		1.7				1.70		5.71E+00			
05/06/14	2084	Pre-dredge		1.7	21			1.70		5.71E+00		nondredge mean from E30:E2094	
05/07/14	2085	Dredge					29.7	29.7	29.70	5.71E+00			
05/08/14	2086	Dredge						29.7	29.70	5.72E+00			
05/09/14	2087	Dredge						29.7	29.70	5.72E+00			
05/10/14	2088	Dredge						29.7	29.70	5.72E+00			
05/11/14	2089	Dredge						29.7	29.70	5.72E+00			
05/12/14	2090	Dredge						29.7	29.70	5.73E+00			
05/13/14	2091	Dredge						29.7	29.70	5.73E+00			
05/14/14	2092	Dredge						29.7	29.70	5.73E+00			
05/15/14	2093	Dredge						29.7	29.70	5.73E+00			
05/16/14	2094	Dredge						29.7	29.70	5.74E+00			
05/17/14	2095	Dredge						29.7	29.70	5.74E+00			
05/18/14	2096	Dredge						2					

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
05/29/14	2107	Dredge					29.7	29.70		5.77E+00			
05/30/14	2108	Dredge					29.7	29.70		5.78E+00			
05/31/14	2109	Dredge					29.7	29.70		5.78E+00			
06/01/14	2110	Dredge					29.7	29.70		5.78E+00			
06/02/14	2111	Dredge					29.7	29.70		5.78E+00			
06/03/14	2112	Dredge					29.7	29.70		5.79E+00			
06/04/14	2113	Dredge					29.7	29.70		5.79E+00			
06/05/14	2114	Dredge					29.7	29.70		5.79E+00			
06/06/14	2115	Dredge					29.7	29.70		5.79E+00			
06/07/14	2116	Dredge					29.7	29.70		5.80E+00			
06/08/14	2117	Dredge					29.7	29.70		5.80E+00			
06/09/14	2118	Dredge					29.7	29.70		5.80E+00			
06/10/14	2119	Dredge					29.7	29.70		5.81E+00			
06/11/14	2120	Dredge					29.7	29.70		5.81E+00			
06/12/14	2121	Dredge					29.7	29.70		5.81E+00			
06/13/14	2122	Dredge					29.7	29.70		5.81E+00			
06/14/14	2123	Dredge					29.7	29.70		5.82E+00			
06/15/14	2124	Dredge					29.7	29.70		5.82E+00			
06/16/14	2125	Dredge				35	35	35.00		5.82E+00			
06/17/14	2126	Dredge					35	35.00		5.82E+00			
06/18/14	2127	Dredge					35	35.00		5.83E+00			
06/19/14	2128	Dredge					35	35.00		5.83E+00			
06/20/14	2129	Dredge					35	35.00		5.83E+00			
06/21/14	2130	Dredge					35	35.00		5.84E+00			
06/22/14	2131	Dredge					35	35.00		5.84E+00			
06/23/14	2132	Dredge					35	35.00		5.84E+00			
06/24/14	2133	Dredge					35	35.00		5.84E+00			
06/25/14	2134	Dredge					35	35.00		5.85E+00			
06/26/14	2135	Dredge					35	35.00		5.85E+00			
06/27/14	2136	Dredge					35	35.00		5.85E+00			
06/28/14	2137	Dredge					35	35.00		5.85E+00			
06/29/14	2138	Dredge					35	35.00		5.86E+00			
06/30/14	2139	Dredge					35	35.00		5.86E+00			
07/01/14	2140	Dredge					35	35.00		5.86E+00			
07/02/14	2141	Dredge					35	35.00		5.87E+00			
07/03/14	2142	Dredge					35	35.00		5.87E+00			
07/04/14	2143	Dredge					35	35.00		5.87E+00			
07/05/14	2144	Dredge					35	35.00		5.87E+00			
07/06/14	2145	Dredge					35	35.00		5.88E+00			
07/07/14	2146	Dredge					35	35.00		5.88E+00			
07/08/14	2147	Dredge				43.1	43.1	43.10		5.88E+00			
07/09/14	2148	Dredge					43.1	43.10		5.88E+00			
07/10/14	2149	Dredge					43.1	43.10		5.89E+00			
07/11/14	2150	Dredge					43.1	43.10		5.89E+00			
07/12/14	2151	Dredge					43.1	43.10		5.89E+00			
07/13/14	2152	Dredge					43.1	43.10		5.90E+00			
07/14/14	2153	Dredge					43.1	43.10		5.90E+00			
07/15/14	2154	Dredge					43.1	43.10		5.90E+00			
07/16/14	2155	Dredge					43.1	43.10		5.90E+00			
07/17/14	2156	Dredge					43.1	43.10		5.91E+00			
07/18/14	2157	Dredge					43.1	43.10		5.91E+00			
07/19/14	2158	Dredge					43.1	43.10		5.91E+00			
07/20/14	2159	Dredge					43.1	43.10		5.92E+00			
07/21/14	2160	Dredge					43.1	43.10		5.92E+00			
07/22/14	2161	Dredge					43.1	43.10		5.92E+00			
07/23/14	2162	Dredge					43.1	43.10		5.92E+00			
07/24/14	2163	Dredge					43.1	43.10		5.93E+00			
07/25/14	2164	Dredge					43.1	43.10		5.93E+00			
07/26/14	2165	Dredge					43.1	43.10		5.93E+00			
07/27/14	2166	Dredge					43.1	43.10		5.93E+00			
07/28/14	2167	Dredge					43.1	43.10		5.94E+00			
07/29/14	2168	Dredge					43.1	43.10		5.94E+00			
07/30/14	2169	Dredge					43.1	43.10		5.94E+00			
07/31/14	2170	Dredge					43.1	43.10		5.95E+00			
08/01/14	2171	Dredge					43.1	43.10		5.95E+00			
08/02/14	2172	Dredge					43.1	43.10		5.95E+00			
08/03/14	2173	Dredge					43.1	43.10		5.95E+00			
08/04/14	2174	Dredge					43.1	43.10		5.96E+00			
08/05/14	2175	Dredge				37	37	37.00		5.96E+00			
08/06/14	2176	Dredge					37	37.00		5.96E+00			
08/07/14	2177	Dredge					37	37.00		5.96E+00			
08/08/14	2178	Dredge					37	37.00		5.97E+00			
08/09/14	2179	Dredge					37	37.00		5.97E+00			
08/10/14	2180	Dredge					37	37.00		5.97E+00			
08/11/14	2181	Dredge					37	37.00		5.98E+00			
08/12/14	2182	Dredge					37	37.00		5.98E+00			
08/13/14	2183	Dredge					37	37.00		5.98E+00			
08/14/14	2184	Dredge					37	37.00		5.98E+00			
08/15/14	2185	Dredge					37	37.00		5.99E+00			
08/16/14	2186	Dredge					37	37.00		5.99E+00			
08/17/14	2187	Dredge					37	37.00		5.99E+00			
08/18/14	2188	Dredge					37	37.00		5.99E+00			
08/19/14	2189	Dredge					37	37.00		6.00E+00			
08/20/14	2190	Dredge					37	37.00	30.7	6.00E+00	0.3	5.1E-08	Start 6-yr rolling average exposure and risk (HQ, ILCR)
08/21/14	2191	Dredge					37	37.00	30.8	6.00E+00	0.3	5.1E-08	
08/22/14	2192	Dredge					37	37.00	30.8	6.01E+00	0.3	5.1E-08	
08/23/14	2193	Dredge					37	37.00	30.8	6.01E+00	0.3	5.1E-08	
08/24/14	2194	Dredge					37	37.00	30.8	6.01E+00	0.3	5.1E-08	
08/25/14	2195	Dredge					37	37.00	30.8	6.01E+00	0.3	5.1E-08	
08/26/14	2196	Dredge					37	37.00	30.8	6.02E+00	0.3	5.1E-08	
08/27/14	2197	Dredge					37	37.00	30.8	6.02E+00	0.3	5.1E-08	
08/28/14	2198	Dredge					37	37.00	30.8	6.02E+00	0.3	5.1E-08	
08/29/14	2199	Dredge					37	37.00	30.8	6.02E+00	0.3	5.1E-08	
08/30/14	2200	Dredge					37	37.00	30.8	6.03E+00	0.3	5.1E-08	
08/31/14	2201	Dredge					37	37.00	30.8	6.03E+00	0.3	5.1E-08	
09/01/14	2202	Dredge					37	37.00	30.8	6.03E+00	0.3	5.1E-08	
09/02/14	2203	Dredge					37	37.00	30.8	6.04E+00	0.3	5.1E-08	
09/03/14	2204	Dredge				52.8	52.8	52.80	30.8	6.04E+00	0.3	5.1E-08	
09/04/14	2205	Dredge					52.8	52.80	30.8	6.04E+00	0.3	5.1E-08	
09/05/14	2206	Dredge					52.8	52.80	30.8	6.04E+00	0.3	5.1E-08	
09/06/14	2207	Dredge					52.8	52.80	30.8	6.05E+00	0.3	5.1E-08	
09/07/14	2208	Dredge					52.8	52.80	30.8	6.05E+00	0.3	5.1E-08	
09/08/14	2209	Dredge					52.8	52.80	30.8	6.05E+00	0.3	5.1E-08	
09/09/14	2210	Dredge					52.8	52.80	30.8	6.05E+00	0.3	5.1E-08	
09/10/14	2211	Dredge					52.8	52.80	30.9	6.06E+00	0.3	5.1E-08	
09/11/14	2212	Dredge					52.8	52.80	30.9	6.06E+00	0.3	5.1E-08	
09/12/14	2213	Dredge					52.8	52.80	30.9	6.06E+00	0.3	5.1E-08	
09/13/14	2214	Dredge					52.8	52.80	30.9	6.07E+00	0.3	5.1E-08	
09/14/14	2215	Dredge					52.8	52.80	30.9	6.07E+00	0.3	5.1E-08	
09/15/14	2216	Dredge					52.8	52.80	30.9	6.07E+00	0.3	5.1E-08	
09/16/14	2217	Dredge					52.8	52.80	30.9	6.07E+00	0.3	5.1E-08	
09/17/14	2218	Dredge					52.8	52.80	30.9	6.08E+00	0.3	5.1E-08	
09/18/14	2219	Dredge					52.8	52.80	30.9	6.08E+00	0.3	5.2E-08	
09/19/14	2220	Dredge					52.8	52.80	30.9	6.08E+00	0.3	5.2E-08	
09/20/14	2221	Dredge					52.8	52.80	31.0	6.08E+00	0.3	5.2E-08	
09/21/14	2222	Dredge					52.8	52.80	31.0	6.09E+00	0.3	5.2E-08	
09/22/14	2223	Dredge					52.8	52.80	31.0	6.09E+00	0.3	5.2E-08	
09/23/14	2224	Dredge					52.8	52.80	31.0	6.09E+00	0.3	5.	





**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
06/29/15	2503	pre-dredge		8.6				8.60	30.3	6.86E+00	0.3	5.7E-08	
06/30/15	2504	pre-dredge		8.6				8.60	30.2	6.86E+00	0.3	5.7E-08	
07/01/15	2505	pre-dredge		8.6				8.60	30.2	6.86E+00	0.3	5.7E-08	
07/02/15	2506	pre-dredge		8.6				8.60	30.2	6.87E+00	0.3	5.7E-08	
07/03/15	2507	pre-dredge		8.6				8.60	30.2	6.87E+00	0.3	5.7E-08	
07/04/15	2508	pre-dredge		8.6				8.60	30.2	6.87E+00	0.3	5.7E-08	
07/05/15	2509	pre-dredge		8.6				8.60	30.2	6.87E+00	0.3	5.7E-08	
07/06/15	2510	pre-dredge		8.6				8.60	30.2	6.88E+00	0.3	5.7E-08	
07/07/15	2511	pre-dredge		8.6				8.60	30.2	6.88E+00	0.3	5.7E-08	
07/08/15	2512	pre-dredge		8.6				8.60	30.2	6.88E+00	0.3	5.7E-08	
07/09/15	2513	pre-dredge		8.6				8.60	30.1	6.88E+00	0.3	5.7E-08	
07/10/15	2514	pre-dredge		8.6				8.60	30.1	6.89E+00	0.3	5.7E-08	
07/11/15	2515	pre-dredge		8.6				8.60	30.1	6.89E+00	0.3	5.7E-08	
07/12/15	2516	pre-dredge		8.6				8.60	30.1	6.89E+00	0.3	5.7E-08	
07/13/15	2517	pre-dredge		8.6				8.60	30.0	6.90E+00	0.3	5.7E-08	
07/14/15	2518	pre-dredge		8.6				8.60	30.0	6.90E+00	0.3	5.7E-08	
07/15/15	2519	pre-dredge		8.6				8.60	29.9	6.90E+00	0.3	5.7E-08	
07/16/15	2520	pre-dredge		8.6				8.60	29.9	6.90E+00	0.3	5.7E-08	
07/17/15	2521	pre-dredge		8.6				8.60	29.8	6.91E+00	0.3	5.6E-08	
07/18/15	2522	pre-dredge		8.6				8.60	29.8	6.91E+00	0.3	5.6E-08	
07/19/15	2523	pre-dredge		8.6				8.60	29.8	6.91E+00	0.3	5.6E-08	
07/20/15	2524	pre-dredge		8.6				8.60	29.7	6.92E+00	0.3	5.6E-08	
07/21/15	2525	pre-dredge	37	37				37.00	29.7	6.92E+00	0.3	5.6E-08	
07/22/15	2526	pre-dredge		37				37.00	29.6	6.92E+00	0.3	5.6E-08	
07/23/15	2527	pre-dredge		37				37.00	29.6	6.92E+00	0.3	5.6E-08	
07/24/15	2528	pre-dredge		37				37.00	29.6	6.93E+00	0.3	5.6E-08	
07/25/15	2529	pre-dredge		37				37.00	29.5	6.93E+00	0.3	5.6E-08	
07/26/15	2530	pre-dredge		37				37.00	29.5	6.93E+00	0.3	5.6E-08	
07/27/15	2531	pre-dredge		37				37.00	29.5	6.93E+00	0.3	5.6E-08	
07/28/15	2532	pre-dredge		37				37.00	29.4	6.94E+00	0.3	5.6E-08	
07/29/15	2533	pre-dredge		37				37.00	29.4	6.94E+00	0.3	5.6E-08	
07/30/15	2534	pre-dredge		37				37.00	29.4	6.94E+00	0.3	5.6E-08	
07/31/15	2535	pre-dredge		37				37.00	29.3	6.95E+00	0.3	5.6E-08	
08/01/15	2536	pre-dredge		37				37.00	29.3	6.95E+00	0.3	5.6E-08	
08/02/15	2537	pre-dredge		37				37.00	29.3	6.95E+00	0.3	5.6E-08	
08/03/15	2538	pre-dredge		37				37.00	29.2	6.95E+00	0.3	5.6E-08	
08/04/15	2539	pre-dredge		37				37.00	29.2	6.96E+00	0.3	5.6E-08	
08/05/15	2540	pre-dredge		37				37.00	29.2	6.96E+00	0.3	5.6E-08	
08/06/15	2541	pre-dredge		37				37.00	29.1	6.96E+00	0.3	5.6E-08	
08/07/15	2542	pre-dredge		37				37.00	29.1	6.96E+00	0.3	5.6E-08	
08/08/15	2543	pre-dredge		37				37.00	29.1	6.97E+00	0.3	5.5E-08	
08/09/15	2544	pre-dredge		37				37.00	29.0	6.97E+00	0.3	5.5E-08	
08/10/15	2545	pre-dredge		37				37.00	29.0	6.97E+00	0.3	5.5E-08	
08/11/15	2546	pre-dredge		37				37.00	29.0	6.98E+00	0.3	5.5E-08	
08/12/15	2547	pre-dredge		37				37.00	29.0	6.98E+00	0.3	5.5E-08	
08/13/15	2548	pre-dredge		37				37.00	29.0	6.98E+00	0.3	5.5E-08	
08/14/15	2549	pre-dredge		37				37.00	29.0	6.98E+00	0.3	5.5E-08	
08/15/15	2550	pre-dredge		37				37.00	29.0	6.99E+00	0.3	5.5E-08	
08/16/15	2551	pre-dredge		37				37.00	28.9	6.99E+00	0.3	5.5E-08	
08/17/15	2552	pre-dredge		37				37.00	28.9	6.99E+00	0.3	5.5E-08	
08/18/15	2553	pre-dredge		37				37.00	28.9	6.99E+00	0.3	5.5E-08	
08/19/15	2554	pre-dredge		37				37.00	28.9	7.00E+00	0.3	5.5E-08	
08/20/15	2555	pre-dredge		37				37.00	28.9	7.00E+00	0.3	5.5E-08	
08/21/15	2556	pre-dredge		37				37.00	28.9	7.00E+00	0.3	5.5E-08	
08/22/15	2557	pre-dredge		37				37.00	28.9	7.01E+00	0.3	5.5E-08	
08/23/15	2558	pre-dredge		37				37.00	28.9	7.01E+00	0.3	5.6E-08	
08/24/15	2559	pre-dredge		37				37.00	28.9	7.01E+00	0.3	5.6E-08	
08/25/15	2560	pre-dredge		37	11			37.00	28.9	7.01E+00	0.3	5.6E-08	nondredge mean E2276:E2570
08/26/15	2561	dredge				84	84	84.00	28.9	7.02E+00	0.3	5.6E-08	
08/27/15	2562	dredge					84	84.00	28.9	7.02E+00	0.3	5.6E-08	
08/28/15	2563	dredge					84	84.00	28.9	7.02E+00	0.3	5.6E-08	
08/29/15	2564	dredge					84	84.00	29.0	7.02E+00	0.3	5.6E-08	
08/30/15	2565	dredge					84	84.00	29.0	7.03E+00	0.3	5.6E-08	
08/31/15	2566	dredge					84	84.00	29.0	7.03E+00	0.3	5.6E-08	
09/01/15	2567	dredge					84	84.00	29.0	7.03E+00	0.3	5.6E-08	
09/02/15	2568	dredge					84	84.00	29.0	7.04E+00	0.3	5.6E-08	
09/03/15	2569	dredge					84	84.00	29.0	7.04E+00	0.3	5.6E-08	
09/04/15	2570	dredge					84	84.00	29.1	7.04E+00	0.3	5.6E-08	
09/05/15	2571	dredge					84	84.00	29.1	7.04E+00	0.3	5.6E-08	
09/06/15	2572	dredge					84	84.00	29.1	7.05E+00	0.3	5.6E-08	
09/07/15	2573	dredge					84	84.00	29.1	7.05E+00	0.3	5.6E-08	
09/08/15	2574	dredge					84	84.00	29.1	7.05E+00	0.3	5.6E-08	
09/09/15	2575	dredge					84	84.00	29.1	7.05E+00	0.3	5.6E-08	
09/10/15	2576	dredge					84	84.00	29.2	7.06E+00	0.3	5.6E-08	
09/11/15	2577	dredge					84	84.00	29.2	7.06E+00	0.3	5.6E-08	
09/12/15	2578	dredge					84	84.00	29.2	7.06E+00	0.3	5.6E-08	
09/13/15	2579	dredge					84	84.00	29.2	7.07E+00	0.3	5.7E-08	
09/14/15	2580	dredge					84	84.00	29.2	7.07E+00	0.3	5.7E-08	
09/15/15	2581	dredge					84	84.00	29.2	7.07E+00	0.3	5.7E-08	
09/16/15	2582	dredge					84	84.00	29.2	7.07E+00	0.3	5.7E-08	
09/17/15	2583	dredge					84	84.00	29.3	7.08E+00	0.3	5.7E-08	
09/18/15	2584	dredge					84	84.00	29.3	7.08E+00	0.3	5.7E-08	
09/19/15	2585	dredge					84	84.00	29.3	7.08E+00	0.3	5.7E-08	
09/20/15	2586	dredge					84	84.00	29.3	7.08E+00	0.3	5.7E-08	
09/21/15	2587	dredge					84	84.00	29.3	7.09E+00	0.3	5.7E-08	
09/22/15	2588	dredge					84	84.00	29.3	7.09E+00	0.3	5.7E-08	
09/23/15	2589	dredge				19	19	19.00	29.3	7.09E+00	0.3	5.7E-08	
09/24/15	2590	dredge					19	19.00	29.3	7.10E+00	0.3	5.7E-08	
09/25/15	2591	dredge					19	19.00	29.3	7.10E+00	0.3	5.7E-08	
09/26/15	2592	dredge					19	19.00	29.3	7.10E+00	0.3	5.7E-08	
09/27/15	2593	dredge					19	19.00	29.3	7.10E+00	0.3	5.7E-08	
09/28/15	2594	dredge					19	19.00	29.3	7.11E+00	0.3	5.7E-08	
09/29/15	2595	dredge					19	19.00	29.2	7.11E+00	0.3	5.7E-08	
09/30/15	2596	dredge					19	19.00	29.2	7.11E+00	0.3	5.7E-08	
10/01/15	2597	dredge					19	19.00	29.2	7.12E+00	0.3	5.7E-08	
10/02/15	2598	dredge					19	19.00	29.2	7.12E+00	0.3	5.7E-08	
10/03/15	2599	dredge					19	19.00	29.2	7.12E+00	0.3	5.7E-08	
10/04/15	2600	dredge					19	19.00	29.2	7.12E+00	0.3	5.7E-08	
10/05/15	2601	dredge					19	19.00	29.1	7.13E+00	0.3	5.7E-08	
10/06/15	2602	dredge					19	19.00	29.1	7.13E+00	0.3	5.7E-08	
10/07/15	2603	dredge					19	19.00	29.1	7.13E+00	0.3	5.7E-08	
10/08/15	2604	dredge					19	19.00	29.1	7.13E+00	0.3	5.7E-08	
10/09/15	2605	dredge					19	19.00	29.1	7.14E+00	0.3	5.7E-08	
10/10/15	2606	dredge					19	19.00	29.1	7.14E+00	0.3	5.7E-08	
10/11/15	2607	dredge					19	19.00	29.1	7.14E+00	0.3	5.7E-08	
10/12/15	2608	dredge					19	19.00	2				

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
11/08/15	2635	dredge					42.8	42.80	29.4	7.22E+00	0.3	5.8E-08	
11/09/15	2636	dredge					42.8	42.80	29.4	7.22E+00	0.3	5.8E-08	
11/10/15	2637	dredge					42.8	42.80	29.4	7.22E+00	0.3	5.8E-08	
11/11/15	2638	dredge					42.8	42.80	29.4	7.23E+00	0.3	5.8E-08	
11/12/15	2639	dredge					42.8	42.80	29.4	7.23E+00	0.3	5.8E-08	
11/13/15	2640	dredge					42.8	42.80	29.4	7.23E+00	0.3	5.8E-08	
11/14/15	2641	dredge					42.8	42.80	29.4	7.24E+00	0.3	5.8E-08	
11/15/15	2642	dredge					42.8	42.80	29.4	7.24E+00	0.3	5.8E-08	
11/16/15	2643	dredge					42.8	42.80	29.4	7.24E+00	0.3	5.8E-08	
11/17/15	2644	dredge					42.8	42.80	29.4	7.24E+00	0.3	5.8E-08	
11/18/15	2645	dredge					42.8	42.80	29.4	7.25E+00	0.3	5.8E-08	
11/19/15	2646	dredge					42.8	42.80	29.4	7.25E+00	0.3	5.8E-08	
11/20/15	2647	dredge					42.8	42.80	29.4	7.25E+00	0.3	5.8E-08	
11/21/15	2648	dredge					42.8	42.80	29.3	7.25E+00	0.3	5.8E-08	
11/22/15	2649	dredge					42.8	42.80	29.3	7.26E+00	0.3	5.8E-08	
11/23/15	2650	dredge					42.8	42.80	29.3	7.26E+00	0.3	5.8E-08	
11/24/15	2651	dredge					42.8	42.80	29.3	7.26E+00	0.3	5.8E-08	
11/25/15	2652	dredge					42.8	42.80	29.3	7.27E+00	0.3	5.8E-08	
11/26/15	2653	dredge					42.8	42.80	29.3	7.27E+00	0.3	5.8E-08	
11/27/15	2654	dredge					42.8	42.80	29.3	7.27E+00	0.3	5.8E-08	
11/28/15	2655	dredge					42.8	42.80	29.3	7.27E+00	0.3	5.8E-08	
11/29/15	2656	dredge					42.8	42.80	29.3	7.28E+00	0.3	5.8E-08	
11/30/15	2657	dredge					42.8	42.80	29.3	7.28E+00	0.3	5.8E-08	
12/01/15	2658	dredge					42.8	42.80	29.3	7.28E+00	0.3	5.8E-08	
12/02/15	2659	dredge					42.8	42.80	29.3	7.28E+00	0.3	5.8E-08	
12/03/15	2660	dredge					42.8	42.80	29.3	7.29E+00	0.3	5.8E-08	
12/04/15	2661	dredge					42.8	42.80	29.3	7.29E+00	0.3	5.8E-08	
12/05/15	2662	dredge					42.8	42.80	29.3	7.29E+00	0.3	5.8E-08	
12/06/15	2663	dredge					42.8	42.80	29.3	7.30E+00	0.3	5.8E-08	
12/07/15	2664	dredge					42.8	42.80	29.3	7.30E+00	0.3	5.8E-08	
12/08/15	2665	dredge					42.8	42.80	29.2	7.30E+00	0.3	5.9E-08	
12/09/15	2666	dredge					42.8	42.80	29.2	7.30E+00	0.3	5.9E-08	
12/10/15	2667	dredge					42.8	42.80	29.2	7.31E+00	0.3	5.9E-08	
12/11/15	2668	dredge					42.8	42.80	29.2	7.31E+00	0.3	5.9E-08	
12/12/15	2669	dredge					42.8	42.80	29.2	7.31E+00	0.3	5.9E-08	
12/13/15	2670	dredge					42.8	42.80	29.2	7.32E+00	0.3	5.9E-08	
12/14/15	2671	dredge					42.8	42.80	29.2	7.32E+00	0.3	5.9E-08	
12/15/15	2672	Debris removal		18				17.52	29.2	7.32E+00	0.3	5.9E-08	explain basis for assumed 18 nondredge
12/16/15	2673	Debris removal		18				17.52	29.2	7.32E+00	0.3	5.9E-08	
12/17/15	2674	Debris removal		18				17.52	29.2	7.33E+00	0.3	5.9E-08	
12/18/15	2675	Debris removal		18				17.52	29.2	7.33E+00	0.3	5.9E-08	
12/19/15	2676	Debris removal		18				17.52	29.2	7.33E+00	0.3	5.9E-08	
12/20/15	2677	Debris removal		18				17.52	29.2	7.33E+00	0.3	5.9E-08	
12/21/15	2678	Debris removal		18				17.52	29.2	7.34E+00	0.3	5.9E-08	
12/22/15	2679	Debris removal		18				17.52	29.2	7.34E+00	0.3	5.9E-08	
12/23/15	2680	Debris removal		18				17.52	29.2	7.34E+00	0.3	5.9E-08	
12/24/15	2681	Debris removal		18				17.52	29.3	7.35E+00	0.3	5.9E-08	
12/25/15	2682	Debris removal		18				17.52	29.3	7.35E+00	0.3	5.9E-08	
12/26/15	2683	Debris removal		18				17.52	29.3	7.35E+00	0.3	5.9E-08	
12/27/15	2684	Debris removal		18				17.52	29.3	7.35E+00	0.3	5.9E-08	
12/28/15	2685	Debris removal		18				17.52	29.3	7.36E+00	0.3	5.9E-08	
12/29/15	2686	Debris removal		18				17.52	29.3	7.36E+00	0.3	5.9E-08	
12/30/15	2687	Debris removal		18				17.52	29.3	7.36E+00	0.3	5.9E-08	
12/31/15	2688	Debris removal		18				17.52	29.3	7.36E+00	0.3	5.9E-08	
01/01/16	2689	Debris removal		18				17.52	29.3	7.37E+00	0.3	5.9E-08	
01/02/16	2690	Debris removal		18				17.52	29.3	7.37E+00	0.3	5.9E-08	
01/03/16	2691	Debris removal		18				17.52	29.3	7.37E+00	0.3	5.9E-08	
01/04/16	2692	Debris removal		18				17.52	29.3	7.38E+00	0.3	5.9E-08	
01/05/16	2693	Debris removal		18				17.52	29.3	7.38E+00	0.3	5.9E-08	
01/06/16	2694	Debris removal		18				17.52	29.3	7.38E+00	0.3	5.9E-08	
01/07/16	2695	Debris removal		18				17.52	29.3	7.38E+00	0.3	5.9E-08	
01/08/16	2696	Debris removal		18				17.52	29.3	7.39E+00	0.3	5.9E-08	
01/09/16	2697	Debris removal		18				17.52	29.3	7.39E+00	0.3	5.9E-08	
01/10/16	2698	Debris removal		18				17.52	29.3	7.39E+00	0.3	5.9E-08	
01/11/16	2699	Debris removal		18				17.52	29.3	7.39E+00	0.3	5.9E-08	
01/12/16	2700	Debris removal		18				17.52	29.3	7.40E+00	0.3	5.9E-08	
01/13/16	2701	Debris removal		18				17.52	29.3	7.40E+00	0.3	5.9E-08	
01/14/16	2702	Debris removal		18				17.52	29.3	7.40E+00	0.3	5.9E-08	
01/15/16	2703	Debris removal		18				17.52	29.3	7.41E+00	0.3	6.0E-08	
01/16/16	2704	Debris removal		18				17.52	29.3	7.41E+00	0.3	6.0E-08	
01/17/16	2705	Debris removal		18				17.52	29.3	7.41E+00	0.3	6.0E-08	
01/18/16	2706	post-dredge	1.6809	1.6809				1.68	29.3	7.41E+00	0.3	6.0E-08	
01/19/16	2707	post-dredge		1.6809				1.68	29.3	7.42E+00	0.3	6.0E-08	
01/20/16	2708	post-dredge		1.6809				1.68	29.3	7.42E+00	0.3	6.0E-08	
01/21/16	2709	Parcel 265 Excav	2.82	2.82				2.82	29.3	7.42E+00	0.3	6.0E-08	
01/22/16	2710	Parcel 265 Excav		2.82				2.82	29.3	7.42E+00	0.3	6.0E-08	
01/23/16	2711	Parcel 265 Excav		2.82				2.82	29.3	7.43E+00	0.3	6.0E-08	
01/24/16	2712	Parcel 265 Excav		2.82				2.82	29.3	7.43E+00	0.3	6.0E-08	
01/25/16	2713	Parcel 265 Excav		2.82				2.82	29.3	7.43E+00	0.3	6.0E-08	
01/26/16	2714	Parcel 265 Excav	14.1	14.1				14.10	29.3	7.44E+00	0.3	6.0E-08	
01/27/16	2715	Parcel 265 Excav		14.1				14.10	29.3	7.44E+00	0.3	6.0E-08	
01/28/16	2716	Parcel 265 Excav		14.1				14.10	29.3	7.44E+00	0.3	6.0E-08	
01/29/16	2717	Parcel 265 Excav		14.1				14.10	29.3	7.44E+00	0.3	6.0E-08	
01/30/16	2718	Parcel 265 Excav		14.1				14.10	29.3	7.45E+00	0.3	6.0E-08	
01/31/16	2719	Parcel 265 Excav		14.1				14.10	29.3	7.45E+00	0.3	6.0E-08	
02/01/16	2720	Parcel 265 Excav		14.1				14.10	29.3	7.45E+00	0.3	6.0E-08	
02/02/16	2721	Parcel 265 Excav		14.1				14.10	29.3	7.45E+00	0.3	6.0E-08	
02/03/16	2722	Parcel 265 Excav		14.1				14.10	29.3	7.46E+00	0.3	6.0E-08	
02/04/16	2723	Parcel 265 Excav		14.1				14.10	29.3	7.46E+00	0.3	6.0E-08	
02/05/16	2724	Parcel 265 Excav		14.1				14.10	29.3	7.46E+00	0.3	6.0E-08	
02/06/16	2725	Parcel 265 Excav		14.1				14.10	29.3	7.47E+00	0.3	6.0E-08	
02/07/16	2726	Parcel 265 Excav		14.1				14.10	29.4	7.47E+00	0.3	6.0E-08	
02/08/16	2727	Parcel 265 Excav		14.1				14.10	29.4	7.47E+00	0.3	6.0E-08	
02/09/16	2728	Parcel 265 Excav		14.1				14.10	29.4	7.47E+00	0.3	6.0E-08	
02/10/16	2729	Parcel 265 Excav		14.1				14.10	29.4	7.48E+00	0.3	6.0E-08	
02/11/16	2730	Parcel 265 Excav		14.1				14.10	29.4	7.48E+00	0.3	6.0E-08	
02/12/16	2731	Parcel 265 Excav		14.1				14.10	29.4	7.48E+00	0.3	6.0E-08	
02/13/16	2732	Parcel 265 Excav		14.1				14.10	29.4	7.48E+00	0.3	6.0E-08	
02/14/16	2733	Parcel 265 Excav		14.1				14.10	29.4	7.49E+00	0.3	6.0E-08	
02/15/16	2734	Parcel 265 Excav		14.1				14.10	29.4	7.49E+00	0.3	6.0E-08	
02/16/16	2735	Parcel 265 Excav		14.1				14.10	29.4	7.49E+00	0.3	6.0E-08	
02/17/16	2736	Parcel 265 Excav		14.1	14			14.10	29.4	7.50E+00	0.3	6.0E-08	nondredge mean E2862:E2746
02/18/16	2737	dredge					4.88	4.88	29.4	7.50E+00	0.3	6.0E-08	
02/19/16	2738	dredge					4.88	4.88	29.4				

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
03/19/16	2767	dredge					4.88	4.88	29.3	7.58E+00	0.3	6.1E-08	
03/20/16	2768	dredge					4.88	4.88	29.3	7.58E+00	0.3	6.1E-08	
03/21/16	2769	dredge					4.88	4.88	29.3	7.59E+00	0.3	6.1E-08	
03/22/16	2770	dredge				12.6	12.6	12.60	29.3	7.59E+00	0.3	6.1E-08	
03/23/16	2771	dredge					12.6	12.60	29.3	7.59E+00	0.3	6.1E-08	
03/24/16	2772	dredge					12.6	12.60	29.3	7.59E+00	0.3	6.1E-08	
03/25/16	2773	dredge					12.6	12.60	29.3	7.60E+00	0.3	6.1E-08	
03/26/16	2774	dredge					12.6	12.60	29.3	7.60E+00	0.3	6.1E-08	
03/27/16	2775	dredge					12.6	12.60	29.3	7.60E+00	0.3	6.1E-08	
03/28/16	2776	dredge					12.6	12.60	29.3	7.61E+00	0.3	6.1E-08	
03/29/16	2777	dredge					12.6	12.60	29.3	7.61E+00	0.3	6.1E-08	
03/30/16	2778	dredge					12.6	12.60	29.3	7.61E+00	0.3	6.1E-08	
03/31/16	2779	dredge					12.6	12.60	29.3	7.61E+00	0.3	6.1E-08	
04/01/16	2780	dredge					12.6	12.60	29.3	7.62E+00	0.3	6.1E-08	
04/02/16	2781	dredge					12.6	12.60	29.3	7.62E+00	0.3	6.1E-08	
04/03/16	2782	dredge					12.6	12.60	29.3	7.62E+00	0.3	6.1E-08	
04/04/16	2783	dredge					12.6	12.60	29.3	7.62E+00	0.3	6.1E-08	
04/05/16	2784	dredge					12.6	12.60	29.3	7.63E+00	0.3	6.1E-08	
04/06/16	2785	dredge					12.6	12.60	29.3	7.63E+00	0.3	6.1E-08	
04/07/16	2786	dredge					12.6	12.60	29.3	7.63E+00	0.3	6.1E-08	
04/08/16	2787	dredge					12.6	12.60	29.3	7.64E+00	0.3	6.1E-08	
04/09/16	2788	dredge					12.6	12.60	29.3	7.64E+00	0.3	6.1E-08	
04/10/16	2789	dredge					12.6	12.60	29.3	7.64E+00	0.3	6.1E-08	
04/11/16	2790	dredge					12.6	12.60	29.3	7.64E+00	0.3	6.1E-08	
04/12/16	2791	dredge					12.6	12.60	29.3	7.65E+00	0.3	6.1E-08	
04/13/16	2792	dredge					12.6	12.60	29.3	7.65E+00	0.3	6.1E-08	
04/14/16	2793	dredge					12.6	12.60	29.3	7.65E+00	0.3	6.2E-08	
04/15/16	2794	dredge					12.6	12.60	29.3	7.65E+00	0.3	6.2E-08	
04/16/16	2795	dredge					12.6	12.60	29.4	7.66E+00	0.3	6.2E-08	
04/17/16	2796	dredge					12.6	12.60	29.4	7.66E+00	0.3	6.2E-08	
04/18/16	2797	dredge					12.6	12.60	29.4	7.66E+00	0.3	6.2E-08	
04/19/16	2798	dredge					12.6	12.60	29.4	7.67E+00	0.3	6.2E-08	
04/20/16	2799	dredge					12.6	12.60	29.4	7.67E+00	0.3	6.2E-08	
04/21/16	2800	dredge					12.6	12.60	29.4	7.67E+00	0.3	6.2E-08	
04/22/16	2801	dredge					12.6	12.60	29.4	7.67E+00	0.3	6.2E-08	
04/23/16	2802	dredge					12.6	12.60	29.4	7.68E+00	0.3	6.2E-08	
04/24/16	2803	dredge					12.6	12.60	29.4	7.68E+00	0.3	6.2E-08	
04/25/16	2804	Debris removal				10.9	10.9	10.90	29.4	7.68E+00	0.3	6.2E-08	
04/26/16	2805	Debris removal					10.9	10.90	29.4	7.68E+00	0.3	6.2E-08	
04/27/16	2806	Debris removal					10.9	10.90	29.4	7.69E+00	0.3	6.2E-08	
04/28/16	2807	Debris removal					10.9	10.90	29.4	7.69E+00	0.3	6.2E-08	
04/29/16	2808	Debris removal					10.9	10.90	29.4	7.69E+00	0.3	6.2E-08	
04/30/16	2809	Debris removal					10.9	10.90	29.4	7.70E+00	0.3	6.2E-08	
05/01/16	2810	Debris removal					10.9	10.90	29.4	7.70E+00	0.3	6.2E-08	
05/02/16	2811	Debris removal					10.9	10.90	29.4	7.70E+00	0.3	6.2E-08	
05/03/16	2812	Debris removal					10.9	10.90	29.4	7.70E+00	0.3	6.2E-08	
05/04/16	2813	Debris removal					10.9	10.90	29.4	7.71E+00	0.3	6.2E-08	
05/05/16	2814	Debris removal					10.9	10.90	29.4	7.71E+00	0.3	6.2E-08	
05/06/16	2815	Debris removal					10.9	10.90	29.4	7.71E+00	0.3	6.2E-08	
05/07/16	2816	Debris removal					10.9	10.90	29.4	7.72E+00	0.3	6.2E-08	
05/08/16	2817	Debris removal					10.9	10.90	29.4	7.72E+00	0.3	6.2E-08	
05/09/16	2818	Debris removal					10.9	10.90	29.4	7.72E+00	0.3	6.2E-08	
05/10/16	2819	Debris removal					10.9	10.90	29.4	7.72E+00	0.3	6.2E-08	
05/11/16	2820	Debris removal					10.9	10.90	29.4	7.73E+00	0.3	6.2E-08	
05/12/16	2821	Debris removal					10.9	10.90	29.4	7.73E+00	0.3	6.2E-08	
05/13/16	2822	Debris removal					10.9	10.90	29.4	7.73E+00	0.3	6.2E-08	
05/14/16	2823	Debris removal					10.9	10.90	29.4	7.73E+00	0.3	6.2E-08	
05/15/16	2824	Debris removal					10.9	10.90	29.4	7.74E+00	0.3	6.2E-08	
05/16/16	2825	Debris removal				41.7	41.7	41.70	29.4	7.74E+00	0.3	6.2E-08	
05/17/16	2826	Debris removal					41.7	41.70	29.4	7.74E+00	0.3	6.2E-08	
05/18/16	2827	Debris removal					41.7	41.70	29.4	7.75E+00	0.3	6.2E-08	
05/19/16	2828	Debris removal					41.7	41.70	29.4	7.75E+00	0.3	6.2E-08	
05/20/16	2829	Debris removal					41.7	41.70	29.5	7.75E+00	0.3	6.3E-08	
05/21/16	2830	Debris removal					41.7	41.70	29.5	7.75E+00	0.3	6.3E-08	
05/22/16	2831	Debris removal					41.7	41.70	29.5	7.76E+00	0.3	6.3E-08	
05/23/16	2832	Debris removal				11.9	11.9	11.90	29.5	7.76E+00	0.3	6.3E-08	
05/24/16	2833	Debris removal					11.9	11.90	29.5	7.76E+00	0.3	6.3E-08	
05/25/16	2834	Debris removal					11.9	11.90	29.5	7.76E+00	0.3	6.3E-08	
05/26/16	2835	Debris removal					11.9	11.90	29.5	7.77E+00	0.3	6.3E-08	
05/27/16	2836	Debris removal					11.9	11.90	29.5	7.77E+00	0.3	6.3E-08	
05/28/16	2837	Debris removal					11.9	11.90	29.5	7.77E+00	0.3	6.3E-08	
05/29/16	2838	Debris removal					11.9	11.90	29.5	7.78E+00	0.3	6.3E-08	
05/30/16	2839	Debris removal					11.9	11.90	29.5	7.78E+00	0.3	6.3E-08	
05/31/16	2840	Debris removal					11.9	11.90	29.5	7.78E+00	0.3	6.3E-08	
06/01/16	2841	Debris removal					11.9	11.90	29.5	7.78E+00	0.3	6.3E-08	
06/02/16	2842	Debris removal					11.9	11.90	29.5	7.79E+00	0.3	6.3E-08	
06/03/16	2843	Debris removal					11.9	11.90	29.5	7.79E+00	0.3	6.3E-08	
06/04/16	2844	Debris removal					11.9	11.90	29.5	7.79E+00	0.3	6.3E-08	
06/05/16	2845	Debris removal					11.9	11.90	29.5	7.79E+00	0.3	6.3E-08	
06/06/16	2846	Debris removal					11.9	11.90	29.5	7.80E+00	0.3	6.3E-08	
06/07/16	2847	Debris removal					11.9	11.90	29.5	7.80E+00	0.3	6.3E-08	
06/08/16	2848	Debris removal					11.9	11.90	29.5	7.80E+00	0.3	6.3E-08	
06/09/16	2849	Debris removal					11.9	11.90	29.5	7.81E+00	0.3	6.3E-08	
06/10/16	2850	Debris removal					11.9	11.90	29.5	7.81E+00	0.3	6.3E-08	
06/11/16	2851	Debris removal					11.9	11.90	29.5	7.81E+00	0.3	6.3E-08	
06/12/16	2852	Debris removal					11.9	11.90	29.5	7.81E+00	0.3	6.3E-08	
06/13/16	2853	Debris removal				36.5	36.5	36.50	29.5	7.82E+00	0.3	6.3E-08	
06/14/16	2854	Debris removal					36.5	36.50	29.5	7.82E+00	0.3	6.3E-08	
06/15/16	2855	Debris removal					36.5	36.50	29.5	7.82E+00	0.3	6.3E-08	
06/16/16	2856	Debris removal					36.5	36.50	29.6	7.82E+00	0.3	6.3E-08	
06/17/16	2857	Debris removal					36.5	36.50	29.6	7.83E+00	0.3	6.3E-08	
06/18/16	2858	Debris removal					36.5	36.50	29.6	7.83E+00	0.3	6.3E-08	
06/19/16	2859	Debris removal					36.5	36.50	29.6	7.83E+00	0.3	6.4E-08	
06/20/16	2860	Debris removal					36.5	36.50	29.6	7.84E+00	0.3	6.4E-08	
06/21/16	2861	Debris removal					36.5	36.50	29.6	7.84E+00	0.3	6.4E-08	
06/22/16	2862	Debris removal					36.5	36.50	29.6	7.84E+00	0.3	6.4E-08	
06/23/16	2863	Debris removal					36.5	36.50	29.6	7.84E+00	0.3	6.4E-08	
06/24/16	2864	Debris removal					36.5	36.50	29.7	7.85E+00	0.3	6.4E-08	
06/25/16	2865	Debris removal					36.5	36.50	29.7	7.85E+00	0.3	6.4E-08	
06/26/16	2866	Debris removal					36.5	36.50	29.7	7.85E+00	0.3	6.4E-08	
06/27/16	2867	Debris removal					36.5	36.50	29.7	7.85E+00	0.3	6.4E-08	
06/28/16	2868	Debris removal					36.5	36.50	29.7	7.86E+00	0.3	6.4E-08	
06/29/16	2869	Debris removal					36.5	36.50	29.7	7.86E+00	0.3	6.4E-08	
06/30/16	2870	Debris removal					36.5	36.50	29.6	7.86E+00	0.3	6.4E-08	
07/01/16	2871												

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
07/29/16	2899	Debris removal					42.9	42.90	29.3	7.94E+00	0.3	6.4E-08	
07/30/16	2900	Debris removal					42.9	42.90	29.3	7.95E+00	0.3	6.4E-08	
07/31/16	2901	Debris removal					42.9	42.90	29.3	7.95E+00	0.3	6.4E-08	
08/01/16	2902	Debris removal					42.9	42.90	29.3	7.95E+00	0.3	6.4E-08	
08/02/16	2903	Debris removal					42.9	42.90	29.3	7.95E+00	0.3	6.4E-08	
08/03/16	2904	Debris removal					42.9	42.90	29.3	7.96E+00	0.3	6.4E-08	
08/04/16	2905	Debris removal					42.9	42.90	29.3	7.96E+00	0.3	6.4E-08	
08/05/16	2906	Debris removal					42.9	42.90	29.3	7.96E+00	0.3	6.4E-08	
08/06/16	2907	Debris removal					42.9	42.90	29.3	7.96E+00	0.3	6.4E-08	
08/07/16	2908	Debris removal					42.9	42.90	29.3	7.97E+00	0.3	6.4E-08	
08/08/16	2909	Debris removal					42.9	42.90	29.3	7.97E+00	0.3	6.4E-08	
08/09/16	2910	Debris removal					42.9	42.90	29.3	7.97E+00	0.3	6.4E-08	
08/10/16	2911	Debris removal					42.9	42.90	29.3	7.98E+00	0.3	6.4E-08	
08/11/16	2912	Debris removal					42.9	42.90	29.3	7.98E+00	0.3	6.4E-08	
08/12/16	2913	Debris removal					42.9	42.90	29.3	7.98E+00	0.3	6.4E-08	
08/13/16	2914	Debris removal					42.9	42.90	29.3	7.98E+00	0.3	6.4E-08	
08/14/16	2915	Debris removal					42.9	42.90	29.3	7.99E+00	0.3	6.4E-08	
08/15/16	2916	Debris removal					42.9	42.90	29.3	7.99E+00	0.3	6.4E-08	
08/16/16	2917	Debris removal					42.9	42.90	29.3	7.99E+00	0.3	6.4E-08	
08/17/16	2918	Debris removal					42.9	42.90	29.3	7.99E+00	0.3	6.4E-08	
08/18/16	2919	Debris removal				97.6	97.6	97.60	29.3	8.00E+00	0.3	6.4E-08	
08/19/16	2920	dredge					97.6	97.60	29.3	8.00E+00	0.3	6.4E-08	
08/20/16	2921	dredge					97.6	97.60	29.3	8.00E+00	0.3	6.4E-08	
08/21/16	2922	dredge					97.6	97.60	29.4	8.01E+00	0.3	6.4E-08	
08/22/16	2923	dredge					97.6	97.60	29.4	8.01E+00	0.3	6.5E-08	
08/23/16	2924	dredge					97.6	97.60	29.4	8.01E+00	0.3	6.5E-08	
08/24/16	2925	dredge					97.6	97.60	29.5	8.01E+00	0.3	6.5E-08	
08/25/16	2926	dredge					97.6	97.60	29.5	8.02E+00	0.3	6.5E-08	
08/26/16	2927	dredge					97.6	97.60	29.5	8.02E+00	0.3	6.5E-08	
08/27/16	2928	dredge					97.6	97.60	29.5	8.02E+00	0.3	6.5E-08	
08/28/16	2929	dredge					97.6	97.60	29.6	8.02E+00	0.3	6.5E-08	
08/29/16	2930	dredge					97.6	97.60	29.6	8.03E+00	0.3	6.5E-08	
08/30/16	2931	dredge					97.6	97.60	29.6	8.03E+00	0.3	6.5E-08	
08/31/16	2932	dredge					97.6	97.60	29.7	8.03E+00	0.3	6.5E-08	
09/01/16	2933	dredge					97.6	97.60	29.7	8.04E+00	0.3	6.5E-08	
09/02/16	2934	dredge					97.6	97.60	29.7	8.04E+00	0.3	6.5E-08	
09/03/16	2935	dredge					97.6	97.60	29.7	8.04E+00	0.3	6.6E-08	
09/04/16	2936	dredge					97.6	97.60	29.8	8.04E+00	0.3	6.6E-08	
09/05/16	2937	dredge					97.6	97.60	29.8	8.05E+00	0.3	6.6E-08	
09/06/16	2938	dredge					97.6	97.60	29.8	8.05E+00	0.3	6.6E-08	
09/07/16	2939	dredge					97.6	97.60	29.9	8.05E+00	0.3	6.6E-08	
09/08/16	2940	dredge					97.6	97.60	29.9	8.05E+00	0.3	6.6E-08	
09/09/16	2941	dredge					97.6	97.60	29.9	8.06E+00	0.3	6.6E-08	
09/10/16	2942	dredge					97.6	97.60	29.9	8.06E+00	0.3	6.6E-08	
09/11/16	2943	dredge					97.6	97.60	30.0	8.06E+00	0.3	6.6E-08	
09/12/16	2944	dredge					97.6	97.60	30.0	8.07E+00	0.3	6.6E-08	
09/13/16	2945	dredge					97.6	97.60	30.0	8.07E+00	0.3	6.6E-08	
09/14/16	2946	dredge					97.6	97.60	30.0	8.07E+00	0.3	6.6E-08	
09/15/16	2947	dredge					97.6	97.60	30.1	8.07E+00	0.3	6.7E-08	
09/16/16	2948	dredge					97.6	97.60	30.1	8.08E+00	0.3	6.7E-08	
09/17/16	2949	dredge					97.6	97.60	30.1	8.08E+00	0.3	6.7E-08	
09/18/16	2950	dredge					97.6	97.60	30.2	8.08E+00	0.3	6.7E-08	
09/19/16	2951	dredge					97.6	97.60	30.2	8.08E+00	0.3	6.7E-08	
09/20/16	2952	dredge				35.3	35.3	35.30	30.2	8.09E+00	0.3	6.7E-08	
09/21/16	2953	dredge					35.3	35.30	30.2	8.09E+00	0.3	6.7E-08	
09/22/16	2954	dredge					35.3	35.30	30.2	8.09E+00	0.3	6.7E-08	
09/23/16	2955	dredge					35.3	35.30	30.2	8.10E+00	0.3	6.7E-08	
09/24/16	2956	dredge					35.3	35.30	30.2	8.10E+00	0.3	6.7E-08	
09/25/16	2957	dredge					35.3	35.30	30.2	8.10E+00	0.3	6.7E-08	
09/26/16	2958	dredge					35.3	35.30	30.2	8.10E+00	0.3	6.7E-08	
09/27/16	2959	dredge					35.3	35.30	30.2	8.11E+00	0.3	6.7E-08	
09/28/16	2960	dredge					35.3	35.30	30.2	8.11E+00	0.3	6.7E-08	
09/29/16	2961	dredge					35.3	35.30	30.2	8.11E+00	0.3	6.7E-08	
09/30/16	2962	dredge					35.3	35.30	30.2	8.12E+00	0.3	6.7E-08	
10/01/16	2963	dredge					35.3	35.30	30.2	8.12E+00	0.3	6.7E-08	
10/02/16	2964	dredge					35.3	35.30	30.2	8.12E+00	0.3	6.7E-08	
10/03/16	2965	dredge					35.3	35.30	30.2	8.12E+00	0.3	6.7E-08	
10/04/16	2966	dredge					35.3	35.30	30.2	8.13E+00	0.3	6.7E-08	
10/05/16	2967	dredge					35.3	35.30	30.2	8.13E+00	0.3	6.7E-08	
10/06/16	2968	dredge					35.3	35.30	30.2	8.13E+00	0.3	6.7E-08	
10/07/16	2969	dredge					35.3	35.30	30.2	8.13E+00	0.3	6.7E-08	
10/08/16	2970	dredge					35.3	35.30	30.2	8.14E+00	0.3	6.7E-08	
10/09/16	2971	dredge					35.3	35.30	30.2	8.14E+00	0.3	6.7E-08	
10/10/16	2972	dredge					35.3	35.30	30.2	8.14E+00	0.3	6.7E-08	
10/11/16	2973	dredge					35.3	35.30	30.2	8.15E+00	0.3	6.7E-08	
10/12/16	2974	dredge					35.3	35.30	30.2	8.15E+00	0.3	6.7E-08	
10/13/16	2975	dredge					35.3	35.30	30.2	8.15E+00	0.3	6.7E-08	
10/14/16	2976	dredge					35.3	35.30	30.2	8.15E+00	0.3	6.8E-08	
10/15/16	2977	dredge					35.3	35.30	30.2	8.16E+00	0.3	6.8E-08	
10/16/16	2978	dredge					35.3	35.30	30.3	8.16E+00	0.3	6.8E-08	
10/17/16	2979	dredge					35.3	35.30	30.3	8.16E+00	0.3	6.8E-08	
10/18/16	2980	dredge					35.3	35.30	30.3	8.16E+00	0.3	6.8E-08	
10/19/16	2981	dredge				85.2	85.2	85.20	30.3	8.17E+00	0.3	6.8E-08	
10/20/16	2982	dredge					85.2	85.20	30.4	8.17E+00	0.3	6.8E-08	
10/21/16	2983	dredge					85.2	85.20	30.4	8.17E+00	0.3	6.8E-08	
10/22/16	2984	dredge					85.2	85.20	30.4	8.18E+00	0.3	6.8E-08	
10/23/16	2985	dredge					85.2	85.20	30.5	8.18E+00	0.3	6.8E-08	
10/24/16	2986	dredge					85.2	85.20	30.5	8.18E+00	0.3	6.8E-08	
10/25/16	2987	dredge					85.2	85.20	30.5	8.18E+00	0.3	6.8E-08	
10/26/16	2988	dredge					85.2	85.20	30.6	8.19E+00	0.3	6.9E-08	
10/27/16	2989	dredge					85.2	85.20	30.6	8.19E+00	0.3	6.9E-08	
10/28/16	2990	dredge					85.2	85.20	30.6	8.19E+00	0.3	6.9E-08	
10/29/16	2991	dredge					85.2	85.20	30.7	8.19E+00	0.3	6.9E-08	
10/30/16	2992	dredge					85.2	85.20	30.7	8.20E+00	0.3	6.9E-08	
10/31/16	2993	dredge					85.2	85.20	30.7	8.20E+00	0.3	6.9E-08	
11/01/16	2994	dredge					85.2	85.20	30.8	8.20E+00	0.3	6.9E-08	
11/02/16	2995	dredge					85.2	85.20	30.8	8.21E+00	0.3	6.9E-08	
11/03/16	2996	dredge					85.2	85.20	30.9	8.21E+00	0.3	6.9E-08	
11/04/16	2997	dredge					85.2	85.20	30.9	8.21E+00	0.3	6.9E-08	
11/05/16	2998	dredge					85.2	85.20	30.9	8.21E+00	0.3	7.0E-08	
11/06/16	2999	dredge					85.2	85.20	31.0	8.22E+00	0.3	7.0E-08	
11/07/16	3000	dredge				6.26	6.26	6.26	31.0	8.22E+00	0.3	7.0E-08	
11/08/16	3001	dredge					6.26	6.26	31.0	8.22E+00	0.3	7.0E-08	
11/09/16	3002	dredge					6.26	6.26	31.0	8.22E+00	0.3	7.0E-08	
11/10/16	3003	dredge				13.7	13.7	13.70	31.0				

**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
12/08/16	3031	dredge					3.56	3.56	31.0	8.30E+00	0.3	7.1E-08	
12/09/16	3032	dredge					3.56	3.56	31.0	8.31E+00	0.3	7.1E-08	
12/10/16	3033	dredge					3.56	3.56	31.0	8.31E+00	0.3	7.1E-08	
12/11/16	3034	dredge					3.56	3.56	31.0	8.31E+00	0.3	7.1E-08	
12/12/16	3035	dredge					3.56	3.56	31.0	8.32E+00	0.3	7.1E-08	
12/13/16	3036	dredge					3.56	3.56	31.0	8.32E+00	0.3	7.1E-08	
12/14/16	3037	dredge					3.56	3.56	31.0	8.32E+00	0.3	7.1E-08	
12/15/16	3038	dredge					3.56	3.56	31.0	8.32E+00	0.3	7.1E-08	
12/16/16	3039	dredge					3.56	3.56	31.0	8.33E+00	0.3	7.1E-08	
12/17/16	3040	dredge					3.56	3.56	31.0	8.33E+00	0.3	7.1E-08	
12/18/16	3041	dredge					3.56	3.56	31.0	8.33E+00	0.3	7.1E-08	
12/19/16	3042	dredge					3.56	3.56	31.0	8.33E+00	0.3	7.1E-08	
12/20/16	3043	dredge					3.56	3.56	31.0	8.34E+00	0.3	7.1E-08	
12/21/16	3044	dredge					3.56	3.56	31.0	8.34E+00	0.3	7.1E-08	
12/22/16	3045	dredge					3.56	3.56	31.0	8.34E+00	0.3	7.1E-08	
12/23/16	3046	dredge					3.56	3.56	31.0	8.35E+00	0.3	7.1E-08	
12/24/16	3047	dredge					3.56	3.56	31.0	8.35E+00	0.3	7.1E-08	
12/25/16	3048	dredge					3.56	3.56	31.0	8.35E+00	0.3	7.1E-08	
12/26/16	3049	dredge					3.56	3.56	31.0	8.35E+00	0.3	7.1E-08	
12/27/16	3050	dredge					3.56	3.56	31.0	8.36E+00	0.3	7.1E-08	
12/28/16	3051	dredge					3.56	3.56	31.0	8.36E+00	0.3	7.1E-08	
12/29/16	3052	dredge					3.56	3.56	31.0	8.36E+00	0.3	7.1E-08	
12/30/16	3053	dredge					3.56	3.56	31.0	8.36E+00	0.3	7.1E-08	
12/31/16	3054	dredge					3.56	3.56	31.0	8.37E+00	0.3	7.1E-08	
01/01/17	3055	dredge					3.56	3.56	31.0	8.37E+00	0.3	7.1E-08	
01/02/17	3056	dredge					3.56	3.56	31.0	8.37E+00	0.3	7.1E-08	
01/03/17	3057	dredge					3.56	3.56	31.0	8.38E+00	0.3	7.1E-08	
01/04/17	3058	dredge					3.56	3.56	31.0	8.38E+00	0.3	7.1E-08	
01/05/17	3059	dredge					3.56	3.56	31.0	8.38E+00	0.3	7.1E-08	
01/06/17	3060	dredge					3.56	3.56	31.0	8.38E+00	0.3	7.1E-08	
01/07/17	3061	dredge					3.56	3.56	31.0	8.39E+00	0.3	7.1E-08	
01/08/17	3062	dredge					3.56	3.56	31.0	8.39E+00	0.3	7.1E-08	
01/09/17	3063	dredge					3.56	3.56	30.9	8.39E+00	0.3	7.1E-08	
01/10/17	3064	dredge					3.56	3.56	30.9	8.39E+00	0.3	7.1E-08	
01/11/17	3065	Excavation					3.56	3.56	30.9	8.40E+00	0.3	7.1E-08	
01/12/17	3066	Excavation				18.2	18.2	18.20	31.0	8.40E+00	0.3	7.1E-08	
01/13/17	3067	Excavation					18.2	18.20	31.0	8.40E+00	0.3	7.1E-08	
01/14/17	3068	Excavation					18.2	18.20	31.0	8.41E+00	0.3	7.1E-08	
01/15/17	3069	Excavation					18.2	18.20	31.0	8.41E+00	0.3	7.1E-08	
01/16/17	3070	Excavation					18.2	18.20	31.0	8.41E+00	0.3	7.1E-08	
01/17/17	3071	Excavation					18.2	18.20	31.0	8.41E+00	0.3	7.1E-08	
01/18/17	3072	Excavation					18.2	18.20	31.0	8.42E+00	0.3	7.1E-08	
01/19/17	3073	Excavation					18.2	18.20	31.0	8.42E+00	0.3	7.1E-08	
01/20/17	3074	Excavation					18.2	18.20	31.0	8.42E+00	0.3	7.2E-08	
01/21/17	3075	Excavation					18.2	18.20	31.0	8.42E+00	0.3	7.2E-08	
01/22/17	3076	Excavation					18.2	18.20	31.0	8.43E+00	0.3	7.2E-08	
01/23/17	3077	Excavation					18.2	18.20	31.0	8.43E+00	0.3	7.2E-08	
01/24/17	3078	Excavation					18.2	18.20	31.0	8.43E+00	0.3	7.2E-08	
01/25/17	3079	dredge				11.4	11.4	11.40	31.0	8.44E+00	0.3	7.2E-08	
01/26/17	3080	dredge					11.4	11.40	31.0	8.44E+00	0.3	7.2E-08	
01/27/17	3081	dredge					11.4	11.40	31.0	8.44E+00	0.3	7.2E-08	
01/28/17	3082	dredge					11.4	11.40	31.0	8.44E+00	0.3	7.2E-08	
01/29/17	3083	dredge					11.4	11.40	31.0	8.45E+00	0.3	7.2E-08	
01/30/17	3084	dredge					11.4	11.40	31.0	8.45E+00	0.3	7.2E-08	
01/31/17	3085	dredge					11.4	11.40	31.0	8.45E+00	0.3	7.2E-08	
02/01/17	3086	dredge					11.4	11.40	31.0	8.45E+00	0.3	7.2E-08	
02/02/17	3087	dredge					11.4	11.40	31.0	8.46E+00	0.3	7.2E-08	
02/03/17	3088	dredge					11.4	11.40	31.0	8.46E+00	0.3	7.2E-08	
02/04/17	3089	dredge					11.4	11.40	31.0	8.46E+00	0.3	7.2E-08	
02/05/17	3090	dredge					11.4	11.40	31.0	8.47E+00	0.3	7.2E-08	
02/06/17	3091	dredge					11.4	11.40	31.0	8.47E+00	0.3	7.2E-08	
02/07/17	3092	dredge					11.4	11.40	31.0	8.47E+00	0.3	7.2E-08	
02/08/17	3093	dredge					11.4	11.40	31.0	8.47E+00	0.3	7.2E-08	
02/09/17	3094	dredge					11.4	11.40	31.0	8.48E+00	0.3	7.2E-08	
02/10/17	3095	dredge					11.4	11.40	31.0	8.48E+00	0.3	7.2E-08	
02/11/17	3096	dredge					11.4	11.40	31.0	8.48E+00	0.3	7.2E-08	
02/12/17	3097	dredge					11.4	11.40	31.0	8.48E+00	0.3	7.2E-08	
02/13/17	3098	dredge					11.4	11.40	31.0	8.49E+00	0.3	7.2E-08	
02/14/17	3099	dredge					11.4	11.40	31.0	8.49E+00	0.3	7.2E-08	
02/15/17	3100	dredge					11.4	11.40	31.0	8.49E+00	0.3	7.2E-08	
02/16/17	3101	dredge					11.4	11.40	31.1	8.50E+00	0.3	7.2E-08	
02/17/17	3102	dredge					11.4	11.40	31.1	8.50E+00	0.3	7.2E-08	
02/18/17	3103	dredge					11.4	11.40	31.1	8.50E+00	0.3	7.2E-08	
02/19/17	3104	dredge					11.4	11.40	31.1	8.50E+00	0.3	7.2E-08	
02/20/17	3105	dredge					11.4	11.40	31.1	8.51E+00	0.3	7.2E-08	
02/21/17	3106	dredge					11.4	11.40	31.1	8.51E+00	0.3	7.2E-08	
02/22/17	3107	dredge					11.4	11.40	31.1	8.51E+00	0.3	7.2E-08	
02/23/17	3108	Excavation				4.03	4.03	4.03	31.1	8.52E+00	0.3	7.2E-08	
02/24/17	3109	Excavation					4.03	4.03	31.1	8.52E+00	0.3	7.2E-08	
02/25/17	3110	Excavation					4.03	4.03	31.1	8.52E+00	0.3	7.3E-08	
02/26/17	3111	Excavation					4.03	4.03	31.1	8.52E+00	0.3	7.3E-08	
02/27/17	3112	Excavation					4.03	4.03	31.1	8.53E+00	0.3	7.3E-08	
02/28/17	3113	Excavation					4.03	4.03	31.1	8.53E+00	0.3	7.3E-08	
03/01/17	3114	Excavation					4.03	4.03	31.1	8.53E+00	0.3	7.3E-08	
03/02/17	3115	Excavation					4.03	4.03	31.0	8.53E+00	0.3	7.3E-08	
03/03/17	3116	Excavation					4.03	4.03	31.0	8.54E+00	0.3	7.3E-08	
03/04/17	3117	Excavation					4.03	4.03	31.0	8.54E+00	0.3	7.3E-08	
03/05/17	3118	Excavation					4.03	4.03	31.0	8.54E+00	0.3	7.3E-08	
03/06/17	3119	Excavation					4.03	4.03	31.0	8.55E+00	0.3	7.3E-08	
03/07/17	3120	Excavation					4.03	4.03	31.0	8.55E+00	0.3	7.3E-08	
03/08/17	3121	dredge				29.9	29.9	29.90	31.1	8.55E+00	0.3	7.3E-08	
03/09/17	3122	dredge					29.9	29.90	31.1	8.55E+00	0.3	7.3E-08	
03/10/17	3123	dredge					29.9	29.90	31.1	8.56E+00	0.3	7.3E-08	
03/11/17	3124	dredge					29.9	29.90	31.1	8.56E+00	0.3	7.3E-08	
03/12/17	3125	dredge					29.9	29.90	31.1	8.56E+00	0.3	7.3E-08	
03/13/17	3126	dredge					29.9	29.90	31.1	8.56E+00	0.3	7.3E-08	
03/14/17	3127	dredge					29.9	29.90	31.1	8.57E+00	0.3	7.3E-08	
03/15/17	3128	dredge					29.9	29.90	31.1	8.57E+00	0.3	7.3E-08	
03/16/17	3129	dredge					29.9	29.90	31.1	8.57E+00	0.3	7.3E-08	
03/17/17	3130	dredge					29.9	29.90	31.1	8.58E+00	0.3	7.3E-08	
03/18/17	3131	dredge					29.9	29.90	31.2	8.58E+00	0.3	7.3E-08	
03/19/17	3132	dredge					29.9	29.90	31.2	8.58E+00	0.3	7.3E-08	
03/20/17	3133	dredge					29.9	29.90	31.2	8.58E+00	0.3	7.3E-08	
03/21/17	3134	dredge					29.9	29.90	31.2	8.59E+00	0.3	7.3E-08	
03/22/17	3135	dredge					29.9	29.90	31.2	8.59E+00	0.3	7.3E-08	



**Attachment C**  
**Non-cancer and Cancer Risk for PCB in Air, New Bedford Harbor, 43 Veranda**

Date	Days since 1st sample	Dredge Activity	Non-Dredging Period			Dredging Period		Assumed Exposure Concentration	6-year average conc.	ED (yr)	HQ	ILCR	Comment
			Measured Result	Assumed data	Mean	Measured Result	Assumed data						
08/29/17	3295	Excavation		70.8				70.80	31.3	9.03E+00	0.3	7.7E-08	
08/30/17	3296	Excavation		70.8				70.80	31.3	9.03E+00	0.3	7.7E-08	
08/31/17	3297	Excavation		70.8				70.80	31.2	9.03E+00	0.3	7.7E-08	
09/01/17	3298	Excavation		70.8				70.80	31.2	9.04E+00	0.3	7.7E-08	
09/02/17	3299	Excavation		70.8				70.80	31.2	9.04E+00	0.3	7.7E-08	
09/03/17	3300	Excavation		70.8				70.80	31.2	9.04E+00	0.3	7.7E-08	
09/04/17	3301	Excavation		70.8				70.80	31.2	9.04E+00	0.3	7.7E-08	
09/05/17	3302	Excavation		70.8				70.80	31.2	9.05E+00	0.3	7.7E-08	
09/06/17	3303	Excavation		70.8				70.80	31.2	9.05E+00	0.3	7.7E-08	
09/07/17	3304	Excavation		70.8				70.80	31.2	9.05E+00	0.3	7.7E-08	
09/08/17	3305	Excavation		70.8				70.80	31.2	9.05E+00	0.3	7.7E-08	
09/09/17	3306	Excavation		70.8				70.80	31.1	9.06E+00	0.3	7.7E-08	
09/10/17	3307	Excavation		70.8				70.80	31.1	9.06E+00	0.3	7.7E-08	
09/11/17	3308	Excavation		70.8				70.80	31.1	9.06E+00	0.3	7.7E-08	
09/12/17	3309	Cable Crossing BCKG		70.8				70.80	31.1	9.07E+00	0.3	7.7E-08	
09/13/17	3310	Cable Crossing BCKG		70.8				70.80	31.1	9.07E+00	0.3	7.7E-08	
09/14/17	3311	Cable Crossing BCKG		70.8				70.80	31.1	9.07E+00	0.3	7.7E-08	
09/15/17	3312	Cable Crossing BCKG		70.8				70.80	31.1	9.07E+00	0.3	7.7E-08	
09/16/17	3313	Cable Crossing BCKG		70.8				70.80	31.1	9.08E+00	0.3	7.7E-08	
09/17/17	3314	Cable Crossing BCKG		70.8				70.80	31.2	9.08E+00	0.3	7.7E-08	
09/18/17	3315	Cable Crossing BCKG		70.8				70.80	31.2	9.08E+00	0.3	7.8E-08	
09/19/17	3316	Cable Crossing BCKG		70.8				70.80	31.2	9.08E+00	0.3	7.8E-08	
09/20/17	3317	Cable Crossing BCKG		70.8				70.80	31.2	9.09E+00	0.3	7.8E-08	
09/21/17	3318	Cable Crossing BCKG		70.8				70.80	31.2	9.09E+00	0.3	7.8E-08	
09/22/17	3319	Cable Crossing BCKG		70.8				70.80	31.2	9.09E+00	0.3	7.8E-08	
09/23/17	3320	Cable Crossing BCKG		70.8				70.80	31.2	9.10E+00	0.3	7.8E-08	
09/24/17	3321	Cable Crossing BCKG		70.8				70.80	31.2	9.10E+00	0.3	7.8E-08	
09/25/17	3322	Cable Crossing BCKG		70.8	70.8			70.80	31.2	9.10E+00	0.3	7.8E-08	nondredge mean E3264:E3332
09/26/17	3323	Cable Crossing BCKG				34	34	34.00	31.2	9.10E+00	0.3	7.8E-08	
09/27/17	3324	Cable Crossing BCKG					34	34.00	31.2	9.11E+00	0.3	7.8E-08	
09/28/17	3325	Cable Crossing BCKG					34	34.00	31.2	9.11E+00	0.3	7.8E-08	
09/29/17	3326	Cable Crossing BCKG					34	34.00	31.1	9.11E+00	0.3	7.8E-08	
09/30/17	3327	Cable Crossing BCKG					34	34.00	31.1	9.12E+00	0.3	7.8E-08	
10/01/17	3328	Cable Crossing BCKG					34	34.00	31.1	9.12E+00	0.3	7.8E-08	
10/02/17	3329	Cable Crossing BCKG					34	34.00	31.1	9.12E+00	0.3	7.8E-08	
10/03/17	3330	Cable Crossing BCKG					34	34.00	31.1	9.12E+00	0.3	7.8E-08	
10/04/17	3331	Cable Crossing BCKG					34	34.00	31.1	9.13E+00	0.3	7.8E-08	
10/05/17	3332	Cable Crossing BCKG					34	34.00	31.1	9.13E+00	0.3	7.8E-08	
10/06/17	3333	Cable Crossing BCKG					34	34.00	31.1	9.13E+00	0.3	7.8E-08	
10/07/17	3334	Cable Crossing BCKG					34	34.00	31.0	9.13E+00	0.3	7.8E-08	
10/08/17	3335	Cable Crossing BCKG					34	34.00	31.0	9.14E+00	0.3	7.8E-08	
10/09/17	3336	Cable Crossing BCKG					34	34.00	31.0	9.14E+00	0.3	7.8E-08	
10/10/17	3337	Cable Crossing BCKG					34	34.00	31.0	9.14E+00	0.3	7.8E-08	
10/11/17	3338	Cable Crossing BCKG					34	34.00	31.0	9.15E+00	0.3	7.8E-08	
10/12/17	3339	Cable Crossing BCKG					34	34.00	31.1	9.15E+00	0.3	7.8E-08	
10/13/17	3340	Cable Crossing BCKG					34	34.00	31.1	9.15E+00	0.3	7.8E-08	
10/14/17	3341	Cable Crossing BCKG					34	34.00	31.1	9.15E+00	0.3	7.8E-08	
10/15/17	3342	Cable Crossing BCKG					34	34.00	31.1	9.16E+00	0.3	7.8E-08	
10/16/17	3343	Cable Crossing BCKG					34	34.00	31.1	9.16E+00	0.3	7.8E-08	
10/17/17	3344	Cable Crossing BCKG					34	34.00	31.1	9.16E+00	0.3	7.8E-08	
10/18/17	3345	Cable Crossing BCKG					34	34.00	31.1	9.16E+00	0.3	7.8E-08	
10/19/17	3346	Cable Crossing Excav					34	34.00	31.1	9.17E+00	0.3	7.8E-08	
10/20/17	3347	Cable Crossing Excav					34	34.00	31.1	9.17E+00	0.3	7.8E-08	
10/21/17	3348	Cable Crossing Excav					34	34.00	31.1	9.17E+00	0.3	7.8E-08	
10/22/17	3349	Cable Crossing Excav					34	34.00	31.1	9.18E+00	0.3	7.8E-08	
10/23/17	3350	Best Value remediation	5	5				5.00	31.1	9.18E+00	0.3	7.8E-08	
10/24/17	3351	Best Value remediation		5				5.00	31.1	9.18E+00	0.3	7.8E-08	
10/25/17	3352	Best Value remediation		5				5.00	31.1	9.18E+00	0.3	7.8E-08	
10/26/17	3353	Best Value remediation		5				5.00	31.1	9.19E+00	0.3	7.8E-08	
10/27/17	3354	Best Value remediation		5				5.00	31.1	9.19E+00	0.3	7.8E-08	
10/28/17	3355	Best Value remediation		5				5.00	31.1	9.19E+00	0.3	7.8E-08	
10/29/17	3356	Best Value remediation		5				5.00	31.1	9.19E+00	0.3	7.8E-08	
10/30/17	3357	Best Value remediation		5				5.00	31.1	9.20E+00	0.3	7.8E-08	
10/31/17	3358	Best Value remediation		5				5.00	31.1	9.20E+00	0.3	7.8E-08	
11/01/17	3359	Best Value remediation		5				5.00	31.1	9.20E+00	0.3	7.8E-08	
11/02/17	3360	Best Value remediation		5				5.00	31.1	9.21E+00	0.3	7.8E-08	
11/03/17	3361	Best Value remediation		5				5.00	31.1	9.21E+00	0.3	7.8E-08	
11/04/17	3362	Best Value remediation		5				5.00	31.1	9.21E+00	0.3	7.8E-08	
11/05/17	3363	Best Value remediation		5				5.00	31.0	9.21E+00	0.3	7.8E-08	
11/06/17	3364	Best Value remediation		5				5.00	31.0	9.22E+00	0.3	7.8E-08	
11/07/17	3365	Best Value remediation		5				5.00	31.0	9.22E+00	0.3	7.8E-08	
11/08/17	3366	Best Value remediation		5				5.00	31.0	9.22E+00	0.3	7.8E-08	
11/09/17	3367	Best Value remediation		5				5.00	31.0	9.22E+00	0.3	7.8E-08	
11/10/17	3368	Best Value remediation		5				5.00	31.0	9.23E+00	0.3	7.8E-08	
11/11/17	3369	Best Value remediation		5				5.00	31.0	9.23E+00	0.3	7.8E-08	
11/12/17	3370	Best Value remediation		5				5.00	31.0	9.23E+00	0.3	7.8E-08	
11/13/17	3371	Best Value remediation		5				5.00	31.0	9.24E+00	0.3	7.8E-08	
11/14/17	3372	Best Value remediation		5				5.00	31.0	9.24E+00	0.3	7.8E-08	
11/15/17	3373	Best Value remediation		5	5			5.00	31.0	9.24E+00	0.3	7.8E-08	
11/16/17	3374	Best Value remediation							31.0	9.24E+00	0.3	7.8E-08	
11/17/17	3375	Best Value remediation							31.0	9.25E+00	0.3	7.9E-08	
11/18/17	3376	Best Value remediation							31.0	9.25E+00	0.3	7.9E-08	
11/19/17	3377	Best Value remediation							31.0	9.25E+00	0.3	7.9E-08	
11/20/17	3378	Best Value remediation							31.0	9.25E+00	0.3	7.9E-08	
11/21/17	3379	Best Value remediation							31.0	9.26E+00	0.3	7.9E-08	
11/22/17	3380	Best Value remediation							31.0	9.26E+00	0.3	7.9E-08	
11/23/17	3381	Best Value remediation							31.0	9.26E+00	0.3	7.9E-08	
11/24/17	3382	Best Value remediation							31.0	9.27E+00	0.3	7.9E-08	
11/25/17	3383	Best Value remediation							31.0	9.27E+00	0.3	7.9E-08	
11/26/17	3384	Best Value remediation							31.1	9.27E+00	0.3	7.9E-08	
11/27/17	3385	Best Value remediation							31.1	9.27E+00	0.3	7.9E-08	
11/28/17	3386	Best Value remediation							31.1	9.28E+00	0.3	7.9E-08	
11/29/17	3387	Best Value remediation							31.1	9.28E+00	0.3	7.9E-08	
11/30/17	3388	Best Value remediation							31.1	9.28E+00	0.3	7.9E-08	
			Mean:	20.8			Mean:	28.93			0.3	7.4E-08	for entire period

**Non-cancer Rsk for Residential Child (age 6 years) for Aroclor 1016**

<b>Forward Risk Calculation</b>								
<b>CA (ng/m<sup>3</sup>)</b>	<b>EF (day/yr)</b>	<b>ED (yr)</b>	<b>IR (m<sup>3</sup>/d)</b>	<b>CF-1 (mg/ng)</b>	<b>BW (kg)</b>	<b>AT-nc (day)</b>	<b>RfD (mg/kg-day)</b>	<b>HQ (unitless)</b>
110	350	6	10	1.0E-06	15	2190	7.0E-05	1.0E+00
$HQ = (CA * EF * ED * IR * CF * 1 / AT * 1 / BW) / RfD$								

CA = Concentration in air  
 EF = Exposure Frequency  
 ED = Exposure Duration  
 IR = Inhalation Rate  
 CF-1 = Conversion Factor, mg/ng  
 BW = Body Weight  
 AT-nc = Averaging Time- non-cancer  
 RfD = Reference Dose (Aroclor 1016)  
 HQ = Hazard Quotient

**Cancer Risk for Resident for Aroclor 1016**

Forward Risk Calculation							
CA (ng/m <sup>3</sup> )	EF (day/yr)	ED (yr)	CF-2 (ug/ng)	AT-c (days)	LADC (ug/m <sup>3</sup> )	IUR (ug/m <sup>3</sup> ) <sup>-1</sup>	ILCR
6084	350	6	1.0E-03	25550	5.00E-01	2.00E-05	1.00E-05
ILCR = (CA*EF*ED*CF-2*1/AT-c)*IUR							

For Aroclor 1016

CA = Concentration in air

EF = Exposure Frequency

ED = Exposure Duration

LADC = Lifetime Average Daily Concentration

CF-2 = Conversion Factor, ug/ng

BW = Body Weight

AT-c = Averaging Time-cancer

IUR = Inhalation Unit Risk

ILCR = Incremental Lifetime Cancer Risk