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Superfund Program Fact Sheet

New Bedford Harbor Site
New Bedford, Massachusetts

Region I

April 1994

US Army Corps of Engineers
New England Division

Common Questions About Dredging and Air Monitoring

This fact sheet was developed from questions the Dredging Safety Committee submitted to the U.S. EPA and the Army Corps of Engineers. The fact sheet briefly describes background conditions, dredging activities to be conducted, the time frame for dredging activities, on-going monitoring and sampling activities, and shutdown procedures.

AIR SAMPLING RESULTS

What were the air sampling results?

Background air samples were collected March 11 through 19 to determine existing conditions. All samples exceeded the proposed Massachusetts Ambient Air Limit of 0.5 nanograms per cubic meter (ng/m^3).

The Hot Spot data indicated that PCB levels in the air are greater during low-tides, when the contaminated sediment is exposed to the air. The overall average PCB air level near the Hot Spot was 40 ng/m^3. This average exposure level represents an increased lifetime carcinogenic risk of 8 in 100,000. Other results were as follows:

a.) Samples collected over 24 hour durations from three locations near 103 Sawyer Street on March 11, 13, and 17 indicated PCB levels of 2 to 41 ng/m^3 with an average of 9 ng/m^3.

b.) Samples collected over 24 hour durations from one location across the River from Sawyer Street on March 11 through March 19 indicated PCB levels of 16 to 24 ng/m^3 with an average of 20 ng/m^3.

c.) Samples collected from six locations around the Hot Spot on daytime low tides from March 11 through 14 indicated PCB levels of 3 to 335 ng/m^3 with an average of 54 ng/m^3.

d.) Samples collected from the six locations around the Hot Spot on daytime high tides from March 16 through 19 indicated PCB levels of 3 to 85 ng/m^3 with an average of 25 ng/m^3.

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TIME FRAME

What are the projected dates for the Hot Spot dredging to begin and end?

Dredging is scheduled to begin April 26. We expect about 80 days of dredging spread over four months. Dredging is restricted to favorable weather conditions and approximately 4 hours of daytime high tide.

DREDGE

What will be done to ensure that dredging won't spread the contamination?

The dredge will be operated in a manner that minimizes the resuspension of sediment and the release of contamination. Data collected during the Pilot Study demonstrated that the cutterhead dredge, when operated at low rotation speed and high suction, produces minimal resuspension of sediment. We have an extensive water sampling program in place to ensure that the dredging does not spread contamination into the Harbor. Also, silt curtains will be placed upstream and downstream of the dredging areas as a barrier to sediment transport.

Will the dredge cut through debris? Could this puncture the dredging pipeline?

The cutterhead dredge is designed to "vacuum-up" small particles of sediment. It is not sharp and rotates too slowly to cut through large debris. During the Pilot Study, debris would sometimes lodge in the cutterhead and stall the motor. When this happens, dredging is stopped until the debris is removed.

Puncturing of the dredge pipeline is unlikely because the pipeline is made of a very strong plastic, called high density polyethylene or HDPE. The walls of the pipeline are 2/3 to 3/4 inch thick. The dredge has a rock box and grate which will not allow any object bigger than 2 inches in diameter to enter the pipeline. In addition, the dredge operator will continuously monitor the pipeline discharge pressure. A blockage in the pipeline would cause a sudden decrease in discharge pressure, and dredging would immediately stop until a thorough check of the entire pipeline had been made.

Repair supplies, sediment curtains, and oil booms are maintained on-site for immediate response to a spill or pipeline leak. The pipeline will be inspected at the beginning of each workday, and will be flushed with clean water at the end of each dredging shift. Any leaks will be repaired prior to resuming dredging operations.

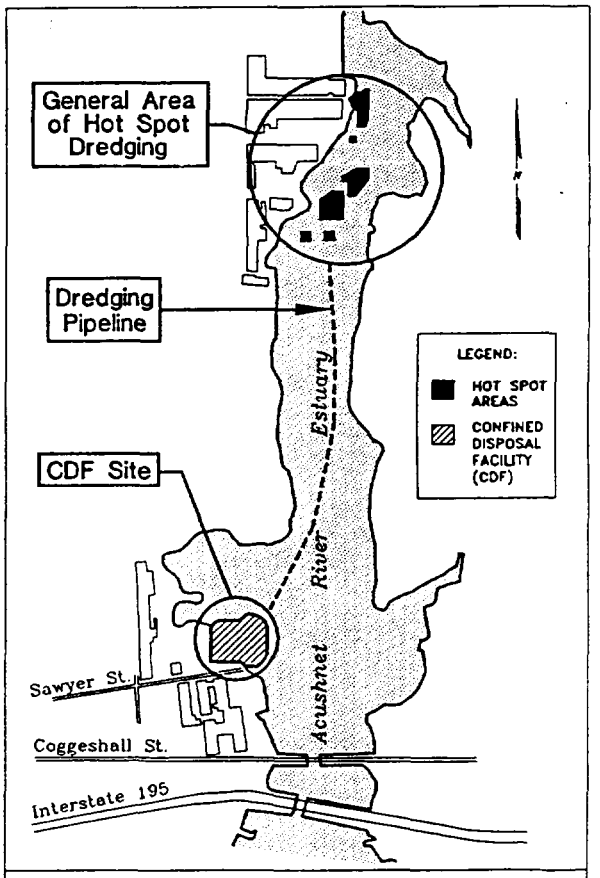

Figure 1. Hot Spot Dredging Site

How could debris affect the cutterhead?

The cutterhead is very rugged and is not likely to be damaged. Debris may jam the revolving cutterhead or plug the intake line to the dredge. If this happens, the crew will remove the debris.

PIPELINE

What is the dredging pipeline made of?

The mile long dredge pipeline is made from 50 ft lengths of high density polyethylene (HDPE) which are heat fused together, creating a water-tight seal. The pipeline's inside diameter gradually decreases from 12 inches at the dredge, to 8 inches at the Confined Disposal Facility (CDF). The reduction in pipeline diameter will cause the pressure and speed of the dredged material transport to increase, pushing the dredged material through the pipeline to the Confined Disposal Facility.

If the dredging pipeline is damaged, how do you repair it?

If damage should occur, we would probably replace the damaged section after flushing the pipeline contents into the CDF. Damage is not expected due to the thickness of the pipeline walls.

What is the expected flow rate of dredged material through the dredging pipeline?

During dredging of the Hot Spot sediments, we expect to pump approximately 2100 gallons per minute (GPM) consisting of 95% water and 5% sediments through the dredging pipeline.

What is the diffuser and where does it go?

The diffuser is a special design which reduces the turbulence in the CDF. It is attached to the CDF-end of the dredge pipeline. The reduction in turbulence promotes settlement of the sediment and reduces the volatilization of PCB's. The diffuser will be fused onto the end of the dredge pipeline.

CDF's

What material is the CDF liner made of and what is its life expectancy?

The CDF liner system consists of one 80 millimeter (mil) (1/3 inch thick) and one 60 mil (1/4 inch thick) HDPE liner separated by a 12" layer of sand. The HDPE will continue to be protective in this environment for a period of 30 years, or more.

How would you repair the liners?

The liners and liner seams were thoroughly inspected prior to filling the CDF with water and all damage was repaired. After the cell has been filled, repairs are not possible without draining the cell.

Will you cover the CDFs and for how long?

A floating cover will be placed over the largest CDF Cell. The cover is a 10 mil "Hypalon" cover which will completely cover CDF Cell No. 1. This material has an expected lifespan of 5 - 7 years. The floating cover will remain in place until the sediments are removed for treatment.

ON-GOING MONITORING - AIR and WATER

What will be monitored in the air and how often?

We are conducting air monitoring for PCB's. Air samples were collected from March 11 through 19 to establish background levels in the vicinity of the Hot Spot and the CDF. Air samples will be collected during dredging to ensure that there is no increased risk of harm to human health from increased volatization of PCBs during dredging.

During initial dredging operations the sampling frequency will be:

(1) At the Hot Spot area; daily on high tide for the first 15 dredging days. (2) At the CDF location; daily for the first twenty days after the first discharge of sediment to the CDF. As dredging operations continue, if air levels of PCB's remain within the limits set by EPA, MADEP & COE, air sampling will be less frequent, but will continue until the completion of dredging. After dredging is complete, samples will be collected in the Hot Spot area to measure any change in background PCB air levels.

How many air monitoring stations are there?

There are ten off-site air sampling locations that will be used during dredging operations. Four of these locations are near the CDF, and six are near the Hot Spot.

What is the turn around time for results of air sampling?

High volume air samplers collect and filter air over a period of 8 to 24 hours. Filters are then shipped by overnight express to the analytical laboratory. The filters require extraction, which is similar to washing, for at least 14 hours in order to capture all the PCB's for later analysis. Because of these requirements for the chemical analysis of PCBs, the preliminary results are not due from the laboratory until 72 hours after receipt.

The concentrations of PCBs that are in the air at the site are a health threat only if someone is exposed for a long period of time.

How many water monitoring stations are there?

There are four water monitoring stations. Water samples for analysis of PCB's are collected at the Coggeshall Street Bridge on both the incoming tide and the outgoing tide each dredging day.

Water samples will be collected only on the outgoing tide from the other three stations. These samples will be used for biological testing to ensure that there aren't any long term biological impacts from the dredging. Ongoing measurements of PCB bioaccummulation in mussels will continue throughout the project.

Water sampling will initially occur every dredging day, and if the results indicate little or no dredging impact, will be reduced to every third dredging day.

Will dredging harm aquatic life?

Contamination levels in the Hot Spot area have already harmed aquatic life. Proper operation of the dredge will limit additional biological impacts, and monitoring of the water will ensure that no lasting harm will occur to aquatic life in other areas of the site.

STANDARD LIMITS AND SHUTDOWN

What steps are taken if air results are above the set standards?

There are three standards set by contract to control the levels of PCBs in air at the CDF and at the Hot Spot: a Shut-down Level, an Action Level and a Notice Level. After the Hot Spot sediments are removed from the Acushnet River, the PCB levels in the air will decline and the risk from breathing PCBs will be permanently reduced.

1.) ***The Shut-down Level*** is based on the National Institute of Occupational Safety and Health (NIOSH) standard for toxic substances in the workplace, which is 1000 ng/m^3. NIOSH considers this level safe for an exposure duration of 40 hours per week over 50 years. If any air sample exceeds the Shut-down Level, dredging will be stopped until the source of the PCBs can be identified and corrective action taken.

2.) ***The Action Level*** is one-half the NIOSH standard, or 500 ng/m^3. If any air sample exceeds the Action Level, the dredging contractor must implement corrective actions such as reducing the period of dredging each day or operating the dredge at lower speeds.

3.) ***The Notice Level*** is based upon measured background PCB levels in the vicinity of the Hot Spot. The background levels are the PCB levels that are found now, without any dredging activity. The Notice Level is based on the average of the four previous background sampling events plus 30 ng/m^3, which represents an increased risk of less than 3 in 10,000,000 for the dredging period. Once the dredging is complete, PCB levels in the air near the Hot Spot will be permanently reduced.

If the results of any one sampling event exceed the Hot Spot Notice Level, the contractor must notify the government and identify a corrective action. If the Notice Level is exceeded in two consecutive sampling events, the government can direct the contractor to implement the corrective action. If the Notice Level is exceeded in 5 of 10 consecutive sampling events, the contractor is required to either implement corrective actions or shut-down the dredge.

How and when is the decision made to shutdown any part of the process?

There are three critical points where dredging may be shutdown:

1.) If any of the monitoring data indicates PCB levels in air or water exceed action levels, or if biological testing of water samples indicate a potential for long term adverse impacts, the process will be shutdown until appropriate corrective actions can be taken.

2.) If the Corps of Engineers oversight personnel observe any situation that is a potential safety risk or a risk of harm to the community or the environment, they will shutdown the dredge and take action to correct the situation.

3.) If the dredge operator observes a mechanical failure or any other problem that endangers his equipment or personnel, he will shutdown the dredge.

How will you notify the public of a shutdown or malfunction?

All monitoring data is available for review. Weekly Progress Reports are being provided to each of the affected communities and the local news media. Weekly reports will indicate which days the dredge operated and if it was shutdown, and the reason for the shutdown. During the Pilot Study, dredge downtime for all reasons averaged 20%.

Any immediate hazard to human health will be immediately reported to the appropriate fire and police officials.