



**PARTIAL CLASS A-2  
RESPONSE ACTION OUTCOME STATEMENT**

**BARGE B120 SPILL  
BUZZARDS BAY, MASSACHUSETTS  
RTN 4-17786**

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FIGURE 1       RAO Segments – July 2006

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**1.0 INTRODUCTION**

GeoInsight, Inc. (GeoInsight) prepared this Partial Class A-2 Response Action Outcome (Partial RAO) Statement on behalf of Bouchard Transportation Company, Inc. (“Bouchard” or “RP”). This Partial RAO was prepared under the direction of Richard J. Wozmak, P.E., P.H. of EnviroSense, Inc., the Licensed Site Professional (LSP)-of-record for this release. This Partial RAO was prepared as part of response actions conducted under the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000 associated with the release of Number 6 (No. 6) fuel oil from Bouchard Barge B120 that occurred on April 27, 2003 in Buzzards Bay (the “Site”). As described in this report, response actions have been completed at most of the remaining shoreline segments that comprise the Site. Additional response actions will be conducted at the two remaining portions of the Site that are not included in this Partial RAO.

This Partial RAO is based upon data presented in previous reports submitted to MADEP, including:

- August 24, 2005 Phase II Comprehensive Site Assessment Scope of Work (Phase II CSA and SOW) and Updated Conceptual Site Model (CSM);
- August 3, 2006 Phase II Comprehensive Site Assessment (Phase II CSA) Report; and
- August 3, 2006 Method 3 Risk Characterization (included in the Phase II CSA Report).

The Method 3 Risk Characterization included in the Phase II CSA report concluded that a condition of No Significant Risk to human health, public welfare, safety, and the environment has been achieved at 61 of the 63 remaining shoreline segments, as well as the subtidal zone of



Buzzards Bay. This Partial RAO therefore applies to the intertidal zone of the 61 identified shoreline segments, as well as the entire subtidal zone of Buzzards Bay.

This Partial Class A-2 was prepared in accordance with the MCP. A copy of Bureau of Waste Site Cleanup (BWSC) transmittal form BWSC104 is included in Appendix A.



## 2.0 BACKGROUND

On or about April 27, 2003, an unknown volume of No. 6 fuel oil, estimated to range between 22,000 gallons and 98,000 gallons, was released from Bouchard Barge B120 after entering the western approach of Buzzards Bay, Massachusetts. Information regarding the release, response actions, and regulatory history was included in previous reports, including the May 2004 Phase I Initial Site Investigation (ISI) and CSM, the May 2004 Partial Class A-2 RAO Statement, the August 2005 Phase II Scope of Work (SOW) and Updated CSM, the July 2006 Phase II CSA report, and IRA Status Reports dated February 10, 2004, September 16, 2004, March 23, 2005, September 23, 2005, and March 24, 2006.

The shoreline was initially divided into 149 shoreline segments. Of those 149 segments, 29 segments were found to be unoiled and not part of the Site. The Site was therefore considered to be the 120 shoreline segments that were oiled to varying degrees by the release. On May 21, 2004, a Partial Class A-2 Response Action Outcome (RAO) statement was filed for 57 out of 120 shoreline segments. These 57 shoreline segments were those segments where the maximum degree of initial oiling was characterized as “light” or “very light,” as well as three sandy beach segments where the maximum degree of initial oiling was characterized as “moderate.”

The Unified Command, consisting of the United States Coast Guard (USCG, as the federal on-scene coordinator), the Massachusetts Department of Environmental Protection (MADEP, the state on-scene coordinator), and the RP, was established to direct and oversee initial cleanup operations. Cleanup activities were conducted by Unified Command until September 3, 2003, when the Incident Command Post was deactivated. Cleanup activities were continued after September 3, 2003 at the direction of the LSP as part of IRA activities and in accordance with the September 15, 2003 IRA Plan, September 29, 2003 errata letter, and subsequent IRA Plan modifications approved by MADEP.



### **3.0 RELEASE CHARACTERIZATION**

Investigation and sampling activities were conducted as part of Phase II field activities to characterize residual oil at the remaining 63 shoreline segments and the subtidal zone. Please refer to the August 3, 2006 Phase II CSA report for specific information regarding these characterization activities. As part of the Phase II activities, sediment samples were collected from intertidal sampling locations (including fringing marshes) at 12 of the remaining 63 shoreline segments, and from a total of nine subtidal locations. Visual inspections of the intertidal zone and in marsh areas were also conducted to evaluate for the presence or absence of residual oil.

#### **3.1 DATA SUMMARY**

Overall, very little residual oil is present along the shoreline, and the relatively minor residual oil that is present is primarily located in the middle and upper intertidal zones. The oil is typically present as weathered, hardened splatter (ranging from 0.5 inch up to four inches in diameter), and typically does not come off to the touch unless vigorously disturbed. The Phase II field inspection teams removed the small amounts of residual oil encountered during the field inspections, except where the oil was hardened and could not be easily removed, or at locations where additional IRA cleanup activities were considered (e.g., Pope's Beach and Hoppy's Landing). Refer to IRA Status Reports for information regarding IRA cleanup activities.

The analytical data indicated that concentrations of extractable petroleum hydrocarbon (EPH) fractions and polynuclear aromatic hydrocarbons (PAH) associated with the B120 release in sediment were below applicable screening benchmarks (i.e., effects range-low [ER-Ls]) for ecological receptors, and did not constitute a significant risk to human health. Some PAH were detected above ER-Ls in individual sediment samples collected from Round Hill Beach West (W3A-05), Harbor View (W2A-02), and Pope's Beach (W2A-03), but forensic analysis indicated that these PAH were associated with a non-B120 local condition and not attributable to the release.



### **3.2 DATA USABILITY ASSESSMENT**

Data collected during the field investigation was analyzed by the laboratory using MADEP-approved methods. The analytical results were consistent with the required reporting procedures outlined in the MADEP Compendium of Analytical Methods (CAM). The field samples were also collected in accordance with the sample requirements outlined in the CAM. The usability of the data was evaluated as described in the Phase II CSA report. The data collected during the Phase II field investigation is considered to be both useable and conservatively representative to characterize the extent and magnitude of residual oil impacts, and for use in human health and ecological risk characterization.



#### **4.0 RESPONSE ACTION OUTCOME**

This Class A-2 Partial RAO complies with 310 CMR 40.1056 and applies to the subtidal zone of Buzzards Bay and 61 of the remaining 63 intertidal shoreline segments where a condition of No Significant Risk has been achieved for human health, public welfare, safety, and the environment. The shoreline segments addressed by this RAO are listed in Table 1 and shown on Figure 1.

Specific information regarding each segment was included in the shoreline segment summary packages included in the Phase II CSA report. The shoreline segment summary forms include information regarding sensitive receptors, segment boundaries, and reconnaissance and sampling summaries. The Phase II CSA report also includes the Method 3 Risk Characterization that was used to characterize risks to human health, public welfare, safety, and the environment.

As described in the Method 3 Risk Characterization, a condition of No Significant Risk to human health, public welfare, safety, and the environment has been achieved for the areas addressed by this RAO. Hot spots are not present, and residual oil impacts do not exceed applicable upper concentrations limits (UCLs). No substantial hazards are present at the Site. Uncontrolled sources associated with this release have been eliminated or controlled. This RAO does not require the implementation of an Activity and Use Limitation (AUL) to maintain a condition of No Significant Risk. Maintenance or monitoring at these segments and the subtidal zone of Buzzard Bay will not be required to be conducted after the submittal of the RAO Statement.





## 5.0 FEASIBILITY OF ACHIEVING BACKGROUND

The following discussion regarding the feasibility of achieving or approaching background was prepared in accordance with the MADEP Policy #WSC-04-160 *Conducting Feasibility Evaluations Under the MCP*, dated July 16, 2004 (the “Policy”).

The constituents of concern (COC) at the Site are derived from No. 6 fuel oil, which is considered to be a persistent contaminant under the Policy. However, it is important to note that the Policy typically addresses releases to soil and ground water at inland locations, where the degree of natural weathering is considerably less than the marine environment that characterizes the Buzzards Bay shoreline. Natural processes are expected to substantially degrade residual oil particularly mixed sand and gravel and bedrock shorelines with high wave energy and the residual oil impacts may be considered to be non-persistent (i.e., degradable) at these intertidal and subtidal locations. However, in other quiescent areas (e.g., some marsh habitat), No. 6 fuel oil is expected to be comparatively persistent (although less persistent than at releases at inland locations) because natural weathering is comparatively limited in these locations.

As described in the Phase II CSA report, for the purposes of this investigation, background concentrations of EPH fractions and PAH in intertidal and subtidal sediment were considered to be at or below the laboratory detection limits, and visible petroleum was assumed to be not present. However, there may be local conditions<sup>1</sup> where EPH fractions and PAH are present in Buzzards Bay sediments from non-B120 sources, or visible petroleum may be present from non-B120 sources. Therefore, at locations where local conditions are not present, this evaluation focuses upon evaluating the feasibility of achieving or approaching background. Where local conditions exist, this evaluation focused upon achieving or approaching the concentrations consistent with that local condition.

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<sup>1</sup> Local conditions are present in a relatively small area when compared to the overall area of a site.



The feasibility evaluation focused upon whether remedial technologies are available that are capable of achieving or approaching background and the potential benefits versus the costs of implementing these remedial alternatives.

## **5.1 TECHNOLOGICAL EVALUATION**

The objective of the technological evaluation is to identify whether remedial technologies are available that can reduce release-related conditions to achieve or approach background. Based upon the remedial actions performed under the direction of Unified Command, the following two alternatives were initially identified as potentially capable of remediating residual oil in the intertidal zone: 1) high pressure, hot water washing of rocks, using sorbents to catch separate-phase oil produced by the washing, and 2) excavation and disposal of oiled rocks with rock replacement. However, residual oil currently remaining on the shoreline is extremely limited in area, and is weathered and hardened. Therefore, high pressure, hot water washing is no longer considered to be effective to remove residual weathered oil at the segments addressed in this RAO Statement. Excavation and disposal of oiled rocks with rock replacement (where necessary) is the only technology that is considered potentially feasible to achieve or approach background.

Technologies to remediate residual oil impacts in the subtidal zone were not identified, although it is possible that some limited sediment removal could be conducted (e.g., using dredging equipment). The subtidal zone is essentially inaccessible to conventional equipment, and it would be difficult to monitor the progress of the sediment removal to evaluate remedial effectiveness. While dredging has been conducted for other releases (e.g., New Bedford Harbor), these areas are primarily located within harbors and are more quiescent than the dynamic Buzzards Bay subtidal environment. Dredging in Buzzards Bay to remove residual oil is therefore expected to be more difficult than removing impacted material within the shallow waters of a harbor.



## 5.2 BENEFIT-COST EVALUATION

Excavation of subtidal and/or intertidal rocks and sediment would have a substantial adverse impact to the local ecosystem. While the removal of highly weathered oil splatter from the intertidal zone may be beneficial from an aesthetic standpoint, the benefit is offset by the damage that would be caused by the excavation of the existing ecosystems. Dredging of subtidal sediments would generate substantial amounts of suspended material into the water column, and the suspended material may contain other oil or hazardous materials (possibly from non-B120 sources). This suspended material could adversely affect nearby marine organisms (such as shellfish) during remedial operations. The ecological damage from these cleanup operations would be substantial, and the benefits would be negligible because a condition of No Significant Risk already exists at these segments and in the subtidal zone. Therefore, the disadvantages and environmental costs for the potential remedial action are substantial and disproportionate to the negligible incremental benefit and it is not considered feasible to achieve background conditions for this release.



## **6.0 RELATIONSHIP TO OTHER RAOS FILED FOR THE DISPOSAL SITE**

In May 2004, a partial Class A-2 RAO was filed for 57 of the 120 oiled segments. This partial Class A-2 RAO applies to 61 of the remaining 63 segments and the entire subtidal zone of Buzzards Bay. Additional assessment and/or cleanup activities will be conducted at the remaining two segments not addressed by this RAO (Brandt Island West [W1F-02] and Long Island and Causeway South [W2A-10]), as described in the August 3 2006 Phase III Remedial Action Plan (RAP). A separate partial RAO will be submitted for these two remaining shoreline segments after assessment and/or cleanup activities are completed and a condition of No Significant Risk is achieved.



## **7.0 PUBLIC NOTIFICATION**

Notification of this partial Class A-2 RAO was provided to owners of property within the boundaries of the shoreline segments that comprise the Site and were included in this RAO, as required by the MCP regulations. Please note that although properties in Massachusetts may extend to mean low water, not all properties necessarily extend to mean low water (e.g., the property lines at some properties may only extend to mean high water and the property does not include the intertidal zone). Evaluating whether a particular property extended to mean low water would require conducting an extensive review of the deed for each property within the segments included in this RAO. Deed research for each property was not conducted and notification was therefore provided to the owners of properties along the shoreline, recognizing that some of these properties may not actually extend to mean low water (and, therefore, may not actually be part of the Site).

Notification was also provided to the chief municipal officers and local boards of health in each town where shoreline segments included in this RAO were present, as required by the MCP regulations. Examples of the notification letters to property owners and municipal officials, as well as the list of notification recipients, are included in Appendix B.



## 8.0 CONCLUSIONS

Portions of the Buzzards Bay shoreline were oiled as a result of an April 27, 2003 release of No. 6 fuel oil from Bouchard Barge B120. The shoreline was divided into a total of 149 shoreline segments, 29 of which were found to be unoiled and 120 shoreline segments were found to be oiled to varying degrees. In May 2004, a Partial Class A-2 RAO was submitted for 57 of the 120 segments that comprise the Site.

Characterization activities were conducted to evaluate the extent and magnitude of residual oil impacts, as described in reports including the August 24, 2005 Updated CSM report and the August 3, 2006 Phase II CSA report. As described in the Method 3 Risk Characterization included with the Phase II CSA report, a condition of No Significant Risk has been achieved for human health, public welfare, safety, and the environment at 61 of the remaining 63 shoreline segments, as well as the entire subtidal zone of Buzzards Bay. This Partial Class A-2 RAO applies to the 61 of the 63 shoreline segment and the subtidal zone where a condition of No Significant Risk has been achieved. Assessment and/or cleanup activities will be conducted at the two remaining shoreline segments (W1F-02 and W2A-10) that are not included in this RAO, and a separate partial RAO will be submitted for those shoreline segments at the completion of assessment and/or cleanup.