PHASE IV FINAL INSPECTION REPORT, PHASE IV COMPLETION STATEMENT, AND PARTIAL CLASS A-2 RESPONSE ACTION OUTCOME STATEMENT

BRANDT ISLAND WEST
SHORELINE SEGMENT W1F-02
MATTAPOISETT, MASSACHUSETTS
BARGE B120 SPILL, BUZZARDS BAY, MASSACHUSETTS
RTN 4-17786

Prepared For:

Bouchard Transportation Company, Inc.
58 South Service Road, Suite 150
Melville, NY 11747

Prepared By:

GeoInsight, Inc.
5 Lan Drive, Suite 200
Westford, Massachusetts 01886
Phone: (978) 692-1114
Fax: (978) 692-1115
www.geoinsightinc.com

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1.0 INTRODUCTION

This Phase IV Final Inspection Report, Phase IV Completion Statement and Partial Class A-2 Response Action Outcome (RAO) Statement was prepared by GeoInsight, Inc (GeoInsight) under the direction of Richard J. Wozmak, P.E., P.H. of EnviroLogic, LLC, the Licensed Site Professional (LSP)-of-record for the release of Number 6 (No. 6) fuel oil from Bouchard Barge B120 that occurred on April 27, 2003 in Buzzards Bay (the "Site"). ENTRIX, Inc. also provided ecological and human health risk assessment support in connection with this report. Bouchard Transportation Company, Inc. ("Bouchard" or "RP") is the responsible party for this release. This report, which applies to the Brandt Island West shoreline segment, located in Mattapoisett, Massachusetts ("segment W1F-02"), was prepared as part of response actions under the Massachusetts Contingency Plan (MCP). Refer to Figures 1 and 2 for the location of the Brandt Island West segment. This report includes the following:

- A description of Phase IV activities and findings at segment W1F-02, including a status report of activities conducted between July 31, 2008 (the last monitoring date of the previous Phase IV status report) and December 1, 2008 (the last date of response action activities conducted at this segment W1F-02);
- A list of federal, state and local permits and approvals related to the implementation of Phase IV activities;
- An updated risk characterization to account for more recent data and information collected during Phase IV activities; and

- A partial Class A-2 RAO for this segment, including a Representativeness Evaluation and Data Usability Assessment (REDUA), and Background Feasibility Analysis to support the RAO.

This report is based upon data and information collected during the most recent Phase IV monitoring period as well as in previous reports submitted to the Massachusetts Department of Environmental Protection (MADEP), including:

- May 3, 2004 Phase I Initial Site Investigation (Phase I ISI) and Conceptual Site Model (CSM) Report, Tier Classification, and Conceptual Phase II Scope of Work (SOW);
- August 24, 2005 Phase II Comprehensive Site Assessment Scope of Work (Phase II CSA SOW) and Updated CSM;
- August 3, 2006 Phase II Comprehensive Site Assessment (Phase II CSA) Report;
- Method 3 Risk Characterization (included in the Phase II CSA Report);
- August 3, 2006 Phase III Remedial Action Plan (RAP);
- August 2, 2007 Phase IV Remedy Implementation Plan (RIP); and
- February 8, 2008 Phase IV Status and Modification Report.

The August 2006 Method 3 Risk Characterization included as part of the Phase II Report previously concluded that a condition of No Significant Risk (NSR) is present for human health, safety, and the environment at segment W1F-02. A condition of NSR to public welfare was achieved for the entire segment, with the exception of the Leisure Shores portion, where a condition of NSR to public welfare could not be concluded at that time. Therefore, the Risk Characterization addendum that is presented in Section 5.0 of this report focuses on characterizing risk to public welfare, and demonstrates that a condition of NSR to public welfare has been achieved at the entire segment. In addition, the Risk Characterization addendum re-evaluated potential risks to human health at Leisure Shores and the eastern side of Howard's Beach using additional data that were obtained after the August 2006 Method 3 Risk Characterization was completed. These data demonstrate that

the conclusion of NSR to human health that was previously concluded remains valid. This report also demonstrates that it is infeasible to further remediate the limited and sporadic residual oil (consisting of weathered splatter on rock and marsh surfaces) remaining at this segment to achieve background conditions. Because NSR conditions currently exist, further remediation activities would have little benefit and the potential minor benefits would be offset by additional environmental and natural resource disturbance caused by the remediation activities. Furthermore, mechanisms of natural attenuation and weathering have reduced, and will continue to further reduce, the limited remaining oil to background over time. As a result of the conclusions presented herein, a Partial Class A-2 RAO Statement for segment W1F-02 is being submitted as part of this report. Since partial Class A-2 RAO statements have been previously submitted for the remaining segments and the subtidal zone of the Site, the transmittal of this partial RAO completes all response actions, resulting in a permanent solution for the entire Site in connection with RTN 4-17786.

2.0 BACKGROUND

On or about April 27, 2003, an unknown volume (estimated to range between 22,000 gallons and 98,000 gallons) of No. 6 fuel oil was released from Bouchard Barge B120 after entering the western approach of Buzzards Bay, Massachusetts. Oil from the release primarily floated on the water surface and was driven by waves, wind, and tides, ultimately stranding in the intertidal zone along the Buzzards Bay shoreline. The heaviest oiling occurred on exposed southwest facing shorelines, such as Barney's Joy in Dartmouth and West Island in Fairhaven.

Initial cleanup operations were conducted under the direction of Unified Command, which consisted of the United States Coast Guard (as the Federal On-Scene Coordinator), MADEP (as the State On-Scene Coordinator), and the RP. During initial cleanup overseen by Unified Command, the shoreline was divided into 149 segments for assessment and organizational purposes. Of those 149 segments, 29 segments were found to be unoiled and not part of the Site. The Site was, therefore, considered to consist of the 120 segments that were oiled to varying degrees by the release and the subtidal zone of Buzzards Bay.

Each segment was then conservatively categorized according to the maximum degree of oiling observed on the segment. For example, if a segment was mostly lightly oiled, but there was a small portion that was heavily oiled, then this segment was considered to be heavily oiled for this grouping. The designation of oiling categories was based upon the observed distribution of oil during Shoreline Clean-up Assessment Team (SCAT) surveys as well as the width of the area of oiling on the shoreline, in accordance with the matrix presented below.

Oil Distribution (% Cover)	Width of Oiled Band			
	≤ 3 feet	3 feet to ≤ 6 feet	6 feet to ≤ 9 feet	> 9 feet
≤ 1	Very Light	Very Light	Very Light	Light
1 to ≤ 10	Light	Light	Moderate	Moderate
10 to ≤ 50	Moderate	Moderate	Moderate	Heavy
50 to ≤ 90	Moderate	Heavy	Heavy	Heavy
90 to 100	Heavy	Heavy	Heavy	Heavy

As part of the transition of response actions from the Unified Command to the LSP, an Immediate Response Action (IRA) Plan, dated September 15, 2003, was submitted to MADEP that proposed to conduct the following activities:

- Evaluate the unoiled segments that were identified by Unified Command to verify that the segments were unoiled;
- Conduct assessments for the potential presence of buried oil at shoreline segments identified by Unified Command;
- Evaluate shoreline segments that did not pass the Unified Command screening, as well as shoreline segments that were not surveyed by the Unified Command field teams;
- Evaluate salt marshes that were not surveyed by the Unified Command field teams; and
- Respond to reports of oil on the shoreline.

A Phase 1 ISI and CSM Report, Tier Classification, and Conceptual Phase II SOW were filed for the Site on May 3, 2004. On May 21, 2004, a Partial Class A-2 RAO statement was filed for 57 out of the 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."

A Tier IA Permit was issued by the MADEP as part of a July 27, 2004 Decision to Grant Permit letter. A Phase II CSA SOW and Updated CSM were submitted to MADEP on August 24, 2005. MADEP approved portions of the proposed Phase II CSA SOW and requested additional information (primarily regarding the proposed ecological risk characterization) in a letter dated January 18, 2006. Additional information was provided to MADEP in a letter dated March 31, 2006, and MADEP issued final approval of the Phase II CSA SOW in a letter dated June 27, 2006.

IRA field activities were conducted between September 2003 and July 2006 as part of the September 15, 2003 IRA Plan. Residual oil was identified during IRA field inspections at several locations at the segment W1F-02, primarily at Leisure Shores, but also at Howard's Beach. IRA cleanup activities were conducted at segment W1F-02 in November 2003, April 2004, May 2004, September 2004, and July 2005. The IRA cleanup activities consisted of removing residual tarballs, oiled sand, rocks with splatter, and pieces of pavement. Turning over sediment in the sandy (western) portion of Leisure Shores was conducted by hand and using a rototiller to liberate oil from sediment so the oil could be removed using absorbent material. IRA field activities at this segment were described in IRA Status Reports that were previously submitted to MADEP.

A Phase II CSA was completed in August 2006 to characterize the remaining 63 shoreline segments and the subtidal zone in Buzzards Bay. The Phase II CSA included a Method 3 Risk Characterization that concluded that a condition of NSR to human health, public welfare, safety, and the environment was present at 61 of the remaining 63 shoreline segments and the subtidal zone in Buzzards Bay. A Partial Class A-2 RAO was submitted for these 61 segments and the subtidal zone in August 2006. At the remaining two shoreline segments, identified as segment W2A-10 – Long Island and Causeway South in Fairhaven and segment W1F-02, the Method 3 Risk Characterization concluded that a condition of NSR existed for human health and safety (at segment W2A-10) and for human health, safety, and the environment (at segment W1F-02). However, localized residual oil was present at portions of these two segments and a condition of NSR to public welfare and the environment could not be concluded at that time for the Hoppy's Landing portion of segment

W2A-10, and for public welfare at the Leisure Shores portion of segment W1F-02. A Phase III RAP identified the preferred remedial alternatives at these locations, and a Phase IV RIP was completed for the Leisure Shores portion of segment W1F-02. Additional Phase IV investigation activities were conducted at the Howard's Beach portion of segment W1F-02 as part of a subsequent Phase IV Modification. The objective of the Phase IV response actions was to assess the magnitude and extent of residual oil at portions of segment W1F-02 and, as necessary, remove residual oil to conclude a condition of NSR as to public welfare.

Phase IV remedial actions and assessment activities were initiated at segment W1F-02 in September 2007 and consisted of visual observations and test pit/trench excavation to evaluate where residual oil was present, and focused removal of oiled sediment and cobbles. Refer to the February 2008 Phase IV Status and Modification report and the January 2009 Phase IV Status report for information regarding Phase IV activities conducted prior to July 31, 2008 (the start of the monitoring period included in this report).

On September 30, 2008, representatives of MADEP accompanied GeoInsight and the LSP in visual inspection of post-cleanup conditions at Leisure Shores and Howard's Beach. The purpose of the MADEP inspection was to evaluate current residual oil conditions and to determine if these conditions constituted a condition of NSR to public welfare. In a memorandum dated November 28, 2008, MADEP indicated that Site conditions at the time of the inspection were consistent with a condition of NSR to public welfare for this segment. Further description of segment W1F-02, and the subsequent response actions at the Leisure Shores and Howard's Beach portions of that segment, is provided below.

3.0 SEGMENT SUMMARY

Segment W1F-02 consists of approximately 3,800 feet of shoreline in Mattapoisett, Massachusetts. The segment extends from near the western side of Howard's Beach to the east and south to the southern tip of Brandt Island as shown on Figure 2. An approximate 1,400-foot long causeway connects Brandt Island to mainland Mattapoisett. Three rock groins extend into the ocean at the Leisure Shores location. Segment W1F-02 includes Leisure Shores and a portion of Howard's Beach. The beaches are separated by one of the groins and a stream that drains a pond and salt marsh located behind Leisure Shores and Howards Beach. A smaller beach area owned by the Town of Mattapoisett is located between Leisure Shores and the causeway. The shoreline borders Nasketucket Bay to the south.

The shoreline substrate at this segment is varied, with boulder rip-rap comprising the causeway and the groins. Fringing marshes are present at some locations at Howard's Beach and on the northwest side of Brandt Island. The shoreline along Brandt Island is composed primarily of rocks and cobbles. Howard's Beach consists of gently sloping sandy areas generally in the upper portion of the intertidal zone and cobble areas in the lower portions of the intertidal zone. Leisure Shores consists of two general shoreline types, separated by a small rock groin in the middle of the beach; the western side is gently sloping and generally a sandy beach with some rocks and pebbles, and the eastern side is gently sloping and generally a cobble beach, with lesser amounts of sand. The shoreline between Leisure Shores and the Brandt Island Causeway is a mixture of cobbles (primarily to the west) and sand (primarily to the east). Private residences are located on Brandt Island and along Brandt Island Road near the entrance to Leisure Shores. The Leisure Shores community (comprised of approximately 80 homes) has access rights to Leisure Shores. In general, the Leisure Shores community uses this shoreline primarily for recreational activities, including fishing, walking, boating, bathing, and shellfishing. Additional information regarding this segment was included in the Phase II CSA submitted to the MADEP in August 2006.

Potential sensitive receptors identified at segment W1F-02 include water resources, critical habitats, threatened and endangered species, and humans. Based upon information obtained

and reviewed to evaluate potential sensitive receptors in the Buzzards Bay area from the Natural Heritage & Endangered Species Program (NHESP) and Massachusetts Geographic Information Systems (MassGIS), habitat for endangered species and fringing salt marshes are present at Howard's Beach and the salt marshes behind Howard's Beach, but not at Leisure Shores, Brandt Island, or the Brandt Island Causeway. Segment W1F-02 is not located within a Zone II, an interim wellhead protection area, a potentially productive aquifer, or a sole-source aquifer. Schools are not located in the vicinity of segment W1F-02. Residences near the shoreline, including the four residences at Brandt Island, maintain private water wells for potable water supply and have private septic systems with leachfields.

Previous investigations, including the field activities described in the August 2006 Phase II CSA, found that a condition of NSR to human health, public welfare, safety, and the environment had been achieved for residual oil impacts at this shoreline segment, with the exception of the Leisure Shores area. At Leisure Shores, a condition of NSR had been achieved for human health, safety, and the environment, but a condition of NSR to public welfare could not be concluded at the time of the August 2006 Phase II CSA due to the presence of localized residual oiled rocks/cobble and oil particles entrained in shallow sediment that, when contacted, could potentially create a nuisance condition (such as rubbing off on skin when touched). Therefore, the investigations and cleanup activities described in the Phase III RAP and Phase IV RIP focused primarily on the areas of Leisure Shores and Howard's Beach where this residual oil was present. In addition, as a result of public notification of the potential presence of buried oil on Howards Beach and the shoreline owned by the Town of Mattapoisett, subsurface investigation activities were conducted in these two areas as part of Phase IV activities.

4.0 PHASE IV REMEDY IMPLEMENTATION

4.1 INTRODUCTION AND OBJECTIVE

The overall objective of the Phase IV remedial actions at segment W1F-02 was to remove limited residual oil to reach a condition of NSR to public welfare. Public welfare concerns were associated with shoreline conditions that could be present to the degree that it would discourage public use of these areas along the Brandt Island West segment including: 1) direct contact with residual oil splatter on rock surfaces or oil particles in sediment such that the oil could potentially adhere to persons engaged in recreational activities at beaches, marsh, and related intertidal and subtidal areas that are accessible and available for public use, and 2) visual and/or olfactory evidence of oil residuals. To achieve the overall objective, the Phase IV RIP and Phase IV Modification proposed assessment activities (consisting of visual inspection of the shoreline surface and test pit excavation) and removal of residual oil and sheen using hand tools, absorbent materials, or small equipment. A brief summary of the Phase IV activities is presented below. Additional information regarding Phase IV cleanup activities was included in the Phase IV Status Reports submitted to the MADEP in February 2008 and January 2009.

4.2 PHASE IV ACTIVITIES

Phase IV remedial actions and assessment activities were initiated at segment W1F-02 in September 2007 and consisted of visual observations, test pit excavation, sediment and water sampling, and focused removal of oiled sediment and cobbles. Locations of test pits and samples were recorded in the field using hand-held global positioning system (GPS) devices.

4.2.1 Historical Phase IV Activities

The monitoring period for this report extends between July 31, 2008 (the last monitoring date covered by the previous Phase IV status report) and December 1, 2008. Phase IV activities conducted prior to July 31, 2008 were described in the February 2008 Phase IV Status and

Modification report and the January 2009 Phase IV Status report. A brief summary description of Phase IV activities conducted prior to July 31, 2008 is provided below.

Phase IV activities were initially proposed in the August 2007 Phase IV Remedy Implementation Plan and subsequently modified in the February 2008 Phase IV Status and Modification report. In general, the objective of Phase IV activities was to assess the magnitude and extent of residual oil and, as necessary, remove residual oil to conclude a condition of NSR. Phase IV activities were conducted at both Leisure Shores and Howard's Beach.

Pre-Phase IV reconnaissance activities, consisting of visual inspections and excavating test pits using hand tools, were conducted at Leisure Shores in May, June, and July 2007. Cobbles with hardened, weathered residual oil splatter were removed during the May and June 2007 reconnaissances and weathered residual oil was scraped off some cobbles that were not removed by the field team. A total of 153 test pits were excavated by hand in the lower intertidal zone (i.e., the relatively "flat" portion) in the western portion of Leisure Shores in June and July 2007. No evidence of oil (e.g., sheens or floating particles) was observed in most (greater than 80 percent) of the excavated test pits. These observations indicated that residual oil conditions in this area had substantially decreased from the initial observations in 2004. During the July 2007 site visit, residents reported the presence of residual oil in the eastern portion of Leisure Shores (i.e., the cobble beach) and at the eastern side of Howard's Beach near the stream channel. For additional information regarding test pit locations and field observations, please refer to the August 2, 2007 Phase IV RIP.

In September 2007, a total of 53 test pits were excavated using a mini-excavator in two general areas at Leisure Shores and Howards Beach. Most of the test pits showed either no evidence of oil or small sheens that were typically less than one inch in diameter or present as thin "ribbons." Small oil particles that were typically less than 0.25-inch in diameter were observed in 13 of the 53 test pits. Generally, fewer than 10 flecks were present in the individual test pits where flecks were observed, and some of the flecks dissipated over time after the test pits remained open. Oiled sediment and/or small tarballs were observed in nine

of 53 trenches; these tarballs were generally less than 1-inch in diameter. Some of the residual oil or sediment was removed for disposal during the investigation activities, and other areas were identified for future cleanup activities. For additional information regarding test pit locations and field observations, please refer to the February 8, 2008 Phase IV Status and Modification Report.

In October 2007, cleanup activities, consisting of excavation of sediment with residual oil, were conducted at five locations in the cobble beach area at Leisure Shores and at three areas on Howard's Beach near the stream channel. A total of 14.05 tons of remediation waste (consisting of residual oil pavement, cobbles with oil splatter, oiled sediment, oil absorbent material, and personal protective equipment worn by the cleanup crews) were transported off-site for proper disposal (note that the majority of this material weight consisted of rocks and sediment that had correspondingly small amounts of weathered oil present). A total of 18 tons of medium sand and 6.89 tons of rounded cobble were delivered to Leisure Shores and Howard's Beach in November 2007 to replace the excavated material. For additional information regarding the October 2007 cleanup activities, please refer to the February 8, 2008 Phase IV Status and Modification Report.

Samples of oiled media, including a cobble with residual oil and oiled sediment adjacent to a piece of snare, were collected for "fingerprint" analysis (laboratory analysis to identify the specific petroleum hydrocarbons in the sample relative to the B120 reference sample) in March and July 2007. The fingerprint analysis indicated that the residual oil detected on the sampling media was consistent with B120 oil. Sediment samples were collected for laboratory analysis of extractable petroleum hydrocarbon (EPH) fractions and target analytes from selected locations in July, October, and December 2007. Constituent concentrations detected in post-remediation sediment samples were below the applicable risk-based threshold concentrations (RBTCs) that were developed in the August 2006 Method 3 Risk Characterization. For additional information regarding the sample locations and analytical results, please refer to the August 2, 2007 Phase IV RIP and the February 8, 2008 Phase IV Status and Modification Report.

The Phase IV was modified in February 2008 to evaluate for the presence of cobbles with residual oil in the western portion of Leisure Shores and Howard's Beach. In March 2008, a total of 19 test pits were excavated in the western portion of Leisure Shores to evaluate for the potential presence of cobbles with residual oil splatter. Very little residual oil was found during these test pit activities. Approximately half of the test pits showed no evidence of oil. Residual oil, consisting of hard, weathered splatter on rock surfaces and in crevasses, was found on cobbles in 5 of the 19 test pit/trenches, and only two of those trenches/test pits contained more than 10 cobbles with residual oil splatter. Very little sheen was observed. The observed sheen was dull gray in color and may have been inorganic (i.e., non-B120 oil) sheen, and the sheens also dissipated within minutes of being exposed. Flecks were not observed on the standing water in the trenches/test pits. Non-B120 material, consisting of roadway pavement, an approximate six-foot length of steel cable, and wood fragments that appeared to be part of a pallet, was removed along with the cobbles with weathered, hardened oil splatter. For additional information regarding the test pit locations and field observations, please refer to the January 14, 2009 Phase IV Status Report.

4.2.2 Phase IV Activities Conducted During This Monitoring Period

4.2.2.1 August 2008 Assessment at Howard's Beach

Between August 25 and August 29, 2008, Phase IV assessment activities were conducted at Howard's Beach to evaluate for the potential presence of buried and surficial oiled cobbles, oiled sediment, and oil particles in sediment. The assessment activities consisted of visual inspection of the shoreline surface and excavation of a total of 28 test pits/trenches at Howard's Beach advanced perpendicular to the shoreline. The length of the test pits varied from approximately 12 to 45 feet, but most were approximately 30 feet long. The test pits were excavated using a mini excavator to typical depths of generally 1 to 2 feet below grade surface (with increasing depth to the north away from the edge of the water), with some test pits excavated to approximately 3 feet below grade surface. Excavated sediment from the test pits was screened using a non-mechanical screener to separate rocks and cobbles from sand to allow for visual inspection of oiled rocks and cobbles. The separated rocks and

cobbles were washed with water and visually inspected for residual oil. The test pits were backfilled with the excavated materials on the day of excavation after observations of the standing water and excavated material were recorded. Refer to Figure 3 for the location of test pits excavated at Howard's Beach in August 2008. Photographs of the August 2008 excavation activities are attached in Appendix A.

Overall, oil was generally not encountered in the test pits, with only an occasional rock or pebble with small amounts of hardened, weathered splatter or small piece of hardened pavement found. Some of the material appeared to be non-B120 oil (e.g., roadway pavement), but was nevertheless removed and disposed of by the field team. Field observations of the August 2008 test pits are summarized in Table 1. Small amounts of sheen and/or floating oil particles on the water surface ("flecks") were only observed in the two test pits (T0082508.02 and T082508.01) that were excavated on the eastern side of Howard's Beach adjacent to the stream channel shown on Figure 3. Sheens were not observed in the remaining 26 test pits. A total of 12 small cobbles or pebbles with hardened, weathered oil splatter and 5 pieces of pavement were removed during these Phase IV activities conducted along Howard's Beach.

4.2.2.2 September 4, 2008 Sample Collection

On September 4, 2008, sediment and water samples were collected from 11 test pits excavated at Leisure Shores and at Howard's Beach. The samples were collected to characterize remaining residual oil in soil or water after the Phase IV cleanup activities had been completed, and to update the August 2006 Risk Characterization that was included with the Phase II Comprehensive Site Assessment report. Water samples were collected to evaluate residual oil concentrations associated with sheens that were observed on the water surface in test pits.

The test pits were excavated using a mini excavator and backfilled with the excavated material after sample collection. Test pits were approximately 3 feet in diameter and 1 to 2 feet deep. The test pit locations were selected to evaluate areas where residual oil was

detected during previous investigations, and to characterize residual oil concentrations in sediment and water at potential worst-case locations. Refer to Figure 4 for the September 4, 2008 test pit locations. One sediment and one water sample were collected from each test pit for laboratory analysis of extractable petroleum hydrocarbons (EPH) and target analytes. The samples were collected in laboratory-supplied glassware and hand-delivered that evening to Groundwater Analytical of Buzzards Bay, Massachusetts for analysis. Sediment and water analytical results are summarized in Tables 2 and 3, and a copy of the analytical report is included in Appendix C. EPH fractions were not detected in the sediment or water samples. EPH target analytes were not detected in 10 of the 11 sediment samples and in 10 of the 11 water samples. Low concentrations (slightly above the detection limit) of some EPH target analytes were detected in 1 of the 11 sediment samples (sample TP090408.06) and in 1 of the 11 water samples (sample TP090408.09).

During test pit excavation, petroleum sheens were observed on the standing water surface in 5 of the 11 test pits. The sheens ranged from non-persistent sheens (i.e., sheens that dissipated within five minutes) to elongated "stringers" and "streamers" ranging up to 6 inches long and 0.5 inch wide. In test pits where sheens were encountered, generally 10 or fewer sheens were present. At one test pit location (TP090408.11), small oil particles ("flecks") approximately 1 millimeter (mm) in diameter were present in some of the approximately 10 sheens that were observed. There was no evidence of oil (no petroleum sheens or flecks) in 6 of the 11 test pits. Test pit observations from the September 4, 2008 sampling activities are summarized in Table 4. Photographs of the September 4, 2008 field activities are included as Appendix B.

4.2.2.3 September 30, 2008 Assessment

On September 30, 2008, test pits were excavated at Leisure Shores and Howard's Beach to evaluate residual oil conditions. The purpose of the inspection was to allow MADEP to assess residual oil conditions and to provide the LSP-of-record with guidance to address the public welfare component of the MCP. A total of 22 test pits were excavated at Leisure Shores and Howard's Beach. Test pit locations were primarily selected to investigate areas

where residual oil was observed in previous investigations. Some of the test pit locations were selected to investigate areas identified by the community and their representatives where residual oil might be present. The test pits were excavated with a mini excavator and backfilled with the excavated material shortly after field observations were made of each test pit. The test pits were excavated to depths of approximately 1 to 2 feet below ground surface (bgs), and were typically approximately 3 feet in diameter. Refer to Figure 5 for the locations of the September 30, 2008 test pits.

Petroleum sheens were observed on the standing water in 9 of the 22 test pits. The sheens ranged from non-persistent sheens (i.e., sheens that dissipated within five minutes) to elongated "stringers" and "streamers." Some inorganic (i.e., non petroleum) sheens were observed in two of the test pits. A small oil particle ("fleck") approximately 1 mm in diameter was observed in the center of one sheen in test pit T093008.17. Evidence of oil, such as sheens or flecks, was not observed in 13 of the 22 test pits. Several cobbles with hardened residual oil splatter were observed on the shoreline, particularly in the area of the middle groin at Leisure Shores. Observations of the test pits are presented in Table 5. Overall, the observations from the September 30, 2008 test pit excavations were consistent with the degree and magnitude of residual oil and sheens observed during previous assessment activities conducted in 2008 at this segment. Photographs taken during the September 30, 2008 field activities are included as Appendix D.

On September 30, 2008, a sample of black material discovered by the attorney and the LSP representatives of the Leisure Shores community who attended the field visit was, at their suggestion, collected for fingerprint analysis. The material was hard, black in color, approximately 0.5-inch in diameter, and resembled a charcoal briquette or a piece of coal. The sample was analyzed for Total Petroleum Hydrocarbons (TPH) by gas chromatograph/flame ionization detector (GC/FID), Polycyclic Aromatic Hydrocarbons (PAHs) by gas chromatograph/mass spectrometer-selected ion monitoring (GC/MS-SIM), and saturate biological markers by GC/MS-SIM by B&B Laboratories, Inc. (B&B) of College Station, Texas. The analytical results were reviewed by an ENTRIX forensic chemist and evaluated relative to B120 oil. The forensic chemist report provided in

Appendix E indicates that the sample is not B120 oil and appears to be composed of primarily pyrogenic (i.e., combustion-derived) hydrocarbons.

4.3 SHORELINE PROFILING

During this monitoring period, a shoreline profiling event was conducted on October 15, 2008 to evaluate whether there were changes in the shoreline profile, and, if so, whether these changes were partly the result of Phase IV activities. Shoreline profiling events were previously conducted on April 2, May 21, and July 11, 2008 and these activities were described in the previous Phase IV status report. The shoreline profiling was conducted using a high-precision GPS survey unit. The locations and elevations of the benchmarks used during the previous profile events were recorded using the GPS survey unit during each profile event. The October 15, 2008 profile data were compared to the July 11, 2008 profile data (collected during the previous monitoring period) to evaluate for potential changes associated with the test pit excavations conducted in August and September 2008. Shoreline surface elevation measurements were collected at selected locations and the elevation data were used to construct the maps included as Figures 7 and 8. Elevation data were referenced relative to mean sea level using the North American Vertical Datum of 1988 (NAVD 88).

The profile data suggested that some deposition of material on the western side of the middle groin occurred sometime between July 11 and October 15, 2008. The profile data for these two dates did not indicate a significant change in shoreline elevation in the eastern side of Leisure Shores (i.e., the cobble beach) or at Howard's Beach. Overall, the profile data indicated that the intertidal shoreline elevation remained relatively consistent before and after the Phase IV activities conducted during this monitoring period.

The October 15, 2008 shoreline profile was compared to the April 2, 2008 shoreline profile, which was included in the January 14, 2009 Phase IV Status Report. The October 15, 2008 profile shows slightly higher shoreline elevations in the upper part of the shoreline when compared to the April 2, 2008 profile, which is likely due to the approximately 350 tons of sand that were placed on the shoreline by the Leisure Shores Association during the summer

of 2008. It is our understanding that this sand was placed by the Leisure Shores Association as part of activities permitted by the Mattapoisett Conservation Commission, and this sand placement was not associated with the MCP cleanup activities. The elevation of the intertidal zone of the eastern side of Leisure Shores remains consistent between the April 2 and October 15, 2008 shoreline profiles. The April 2 and October 15, 2008 shoreline profiles indicate small amounts of erosion and deposition in the western and eastern sides, respectively, of the lower intertidal zone of the western portion of Leisure Shores. These changes are attributed to normal shoreline dynamics in the sandy portion of Leisure Shores; for example, during MCP field investigations we have observed seasonal changes in shoreline profiles, such as erosion during winter storm events and deposition during summer months.

4.4 RESPONSE TO REPORT OF OIL

4.4.1 October 9, 2008 Response to Report of Oil

On October 9, 2008, representatives from GeoInsight and EnviroLogic responded to a report of oil from Richard Carl in the shoreline area located to the east of Leisure Shores (i.e., between Leisure Shores and the causeway to Brandt Island). The shoreline in this area is primarily composed of rocks and cobbles on the western side, grading to more sandy material to the east toward the causeway. The field team met on-site with Mr. Carl who reported the oil, and Mr. Carl indicated that in the days shortly after the April 2003 B120 oil spill, oil washed ashore onto the rocky part of the shoreline in the area to the east of the eastern groin at Leisure Shores. Mr. Carl said that he suspected that the residual oil was buried below the shoreline surface. The field team excavated a total of 13 trenches in the area where the resident indicated that buried oil might be present. The trenches were approximately 3 to 5 feet long and excavated to depths of up to one foot below grade surface. No evidence of oil was observed in any of the trenches. Although the material on the shoreline surface consisted of rocks and cobbles, the field team found that approximately two inches below the surface the underlying soil was dense orange-brown silty sand with cobbles, interpreted to be glacial till that appeared to be undisturbed. Trench locations are shown on Figure 6 and the

field observations are summarized in Table 6. Photographs of the October 9, 2008 field visit are attached in Appendix F.

4.4.2 December 1, 2008 Response to Report of Oil

On December 1, 2008, representatives from GeoInsight and EnviroLogic responded to a report of oiled cobbles from Frank Haggerty in the middle groin at Leisure Shores. Mr. Haggerty who reported the oiled cobbles indicated that they were tacky to the touch. The field team searched the middle groin for oiled cobbles and found a total of seven cobbles with small amounts of hardened oil splatter, consistent with the conditions observed during the September 30, 2008 assessment. The field team did not find any cobbles with tacky residual oil. Photographs of the cobbles with the residual oil splatter are included in Appendix G.

4.5 REMEDIATION WASTE

Remediation waste generated by Phase IV activities during this Phase IV monitoring period (July 31 to December 1, 2008) consisted of oiled rocks, sediment containing some residual oil, non-B120 material (e.g., roadway pavement), and personal protective equipment used by the cleanup crews. Remediation waste generated during Phase IV activities were transported by Trident Environmental Group, LLC to the SEMASS facility in West Wareham, Massachusetts for disposal. A total of 0.50 tons of remediation waste generated during this monitoring period was disposed at the SEMASS facility. Most of the material that was removed was rocks and sediment that contained limited amounts of residual oil. Therefore, the mass of oil in the removed material was very low. Documentation of remediation waste disposal is included in Appendix H.

During previous Phase IV activities, a total of 14.05 tons of remediation waste (oiled rocks, sediment containing some residual oil, non-B120 material, and personal protective equipment used by the cleanup crews) were generated by cleanup operations. Therefore, a total of 14.55 tons of remediation waste were disposed of during Phase IV activities at segment W1F-02.

4.6 PERMITS AND APPROVALS

Prior to conducting the August and September 2008 Phase IV field activities, a Request for Determination of Applicability (RDA) was submitted to the Mattapoisett Conservation Commission and a Category 2 Permit Application was submitted to the United States Army Corps of Engineers (USACOE) for the proposed test pit activities. Information regarding the proposed Phase IV activities was also submitted to the Wampanoag Tribe, the Massachusetts Division of Fisheries and Wildlife, and the Massachusetts Division of Marine Fisheries. Copies of the Negative Determination of Applicability from the Mattapoisett Conservation Commission, the USACOE Category 2 Approval, and letters from the Massachusetts Division of Fisheries and Wildlife, and the Massachusetts Division of Marine Fisheries are attached in Appendix I.

4.7 PHASE IV RIP COMPLETION STATEMENT

Phase IV activities at segment W1F-02 were started on September 2007 and were completed on December 1, 2008. Focused cleanup activities, consisting of removing limited oiled sediments and cobbles with oil splatter, were conducted on various dates. Post-cleanup inspections indicated that the cleanup operations reduced the residual oil present at shoreline segment W1F-02, but small amounts of residual oil remain at portions of the shoreline segment. In general, the residual oil observed during the post-cleanup inspections consisted primarily of cobbles with small amounts of hardened, weathered splatter, sheens on water in some test pits excavated in portions of the shoreline, and rare small oil particles ("flecks") floating on the water surface in test pits. Seasonal field observations conducted in 2007 and 2008 indicated that the oil splatter on rock surfaces is typically hard to the touch, even during summertime warm weather. Although occasionally rocks with splatter that was tacky to the touch were encountered during the field investigation, it was rare to find these rocks (only 3 were found and removed during 7 days of trenching and test pit excavation in August and September 2008). Therefore, it is unlikely that rocks with tacky splatter would be encountered during normal shoreline activities.

On September 30, 2008, representatives from MADEP accompanied the LSP and a representative from GeoInsight to observe potential residual oil conditions at the Leisure Shores and Howard's Beach areas. In a memorandum dated November 28, 2008, MADEP indicated that site conditions at the time of the inspection justified a conclusion of NSR to public welfare. Field observations of residual oil conditions at segment W1F-02 at various times of the year indicate that residual oil impacts are not more pronounced during weather that is warmer than the September 30, 2008 field visit (where the temperature was approximately 70° F). Therefore, the conclusion that the limited residual oil at this segment was consistent with a condition of NSR to public welfare is applicable to the shoreline segment at other times of the year.

Additional information regarding risk characterization is included in Section 5.0. Based upon field inspections, the cleanup objectives identified in the Phase IV RIP have been met and additional response actions are not necessary to achieve a Permanent Solution.

5.0 RISK CHARACTERIZATION ADDENDUM

5.1 INTRODUCTION

A Method 3 Risk Characterization was conducted as part of the August 2006 Phase II CSA report to evaluate the potential risk of harm to health, safety, public welfare, and the environment associated with potential exposures to spilled oil constituents detected in environmental media along the Buzzards Bay shoreline. The characterization was conducted in accordance with the requirements of the MCP (Subpart I) and the MADEP *Guidance for Disposal Site Risk Characterization* (July 1995 and updates). A Method 3 Risk Characterization is a cumulative, site-specific risk-based approach that addresses potential cumulative impacts to identified human and ecological receptors. It also characterizes the risk of harm to safety and public welfare. This method is used when environmental media other than (or in addition to) soil and ground water (e.g., air, sediment, surface water) have been affected by a release of oil and/or hazardous material (OHM). In this case, a Method 3 Risk Characterization was conducted because sediment, weathered oil, and shellfish tissue were initially identified as potential environmental media of concern. The purpose of the risk characterization was to evaluate whether a condition of NSR, as defined in the MCP, has been achieved at the Site under current and reasonably foreseeable future uses and activities.

The human health risk characterization used the following two methodologies to evaluate potential risks: 1) a traditional Method 3 Risk Characterization that assumes unrestricted exposure to environmental media of concern using data collected from worst-case samples used in forward-progressing risk calculations; and 2) development of screening benchmarks to residential exposure to impacted environmental media of concern using conservative exposure scenarios. The forward-progressing Risk Characterization used conservative exposure assumptions for potential human exposure to weathered oil, sediment, and shellfish to evaluate non-cancer and carcinogenic risks. The screening benchmarks were developed to allow the comparison of future sediment concentrations for samples that collected during comprehensive response actions after the August 2006 Method 3 Risk Characterization was completed.

The August 2006 Method 3 Risk Characterization concluded that a condition of NSR was achieved at this segment for human health, safety, and the environment but that a condition of NSR to public welfare along Leisure Shores could not be concluded at that time due to the uncertainty and limited guidance from MADEP on defining NSR to public welfare. Therefore, a component of this Risk Characterization addendum focuses upon evaluating risks to public welfare. In addition, potential risk to human health associated with exposure to sheen during recreational digging was raised by the Leisure Shores Community and MADEP after the August 2006 Method 3 Risk Characterization was completed. This potential exposure scenario was not directly evaluated in the 2006 Method 3 Risk Characterization, but was indirectly evaluated through the sediment exposure pathway that was included in the 2006 Method 3 Risk Characterization (the observed sheens are derived from petroleum hydrocarbon residue in sediment). Therefore, a second component of the Risk Characterization addendum includes a re-evaluation of cumulative health risks that includes direct exposure to sheen during recreational digging. Finally, a third component of the Risk Characterization addendum includes an evaluation of sediment samples that were collected from segment W1F-02 in 2007 and 2008 (after the 2006 Method 3 Risk Characterization was completed), using the screening benchmarks established in the 2006 Method 3 Risk Characterization

Water sampling conducted in 2008 indicated that the water exposure pathway is incomplete, as hydrocarbon constituents were not detected in 10 of the 11 water samples, and only five analytes were detected (slightly above the detection limit) in one water sample. This is consistent with the 2006 Method 3 Risk Characterization in which surface water was not considered to be a complete exposure pathway.

The current and reasonably foreseeable uses and activities that were evaluated as part of the Method 3 Risk Characterization of this segment included walking, recreational shellfishing and fishing, wading, swimming, sightseeing, and bird watching. Visual observations were used to characterize the extent and magnitude of residual oil on this shoreline segment as well as the degree that oil could contact and adhere to persons engaged in recreational activities. The observations consisted of:

- Visual inspections of the shoreline conducted on multiple dates; and
- Excavating test pits and trenches at multiple locations to evaluate for potential residual oil below the surface.

These observations were used to evaluate the level of risk associated with public welfare. These observations and guidance from MADEP were also used to aid in the evaluation of risks to public welfare.

5.2 RESIDUAL OIL CHARACTERIZATION

The residual oil currently present at Leisure Shores and Howard's Beach consists of splatter on rock and cobble surfaces and small particles (colloquially referred to as "flecks") in sediment or floating on the water surface in pits excavated at the shoreline. The small amount of splatter present on occasional rock surfaces is typically less than one inch in diameter, and is generally weathered and hard to the touch. Small sheens, generally less than six inches in diameter, were also present on the surface of standing water in some of the test pits excavated in August and September 2008. Residual oil from the B120 release is generally not present along the remainder of the Brandt Island West shoreline, with the exception of very small, isolated spots of hardened, weathered splatter on rock surfaces. Non-B120 material, including roadway pavement, coal, and slag, has been observed along the Brandt Island West shoreline, and non-B120 material is expected to be currently present along the shoreline.

Prior to cleanup activities, residual oil was present primarily in the lower portion of the intertidal zone of the western side of Leisure Shores (i.e., the "flat" part of the beach), in the eastern side of Howard's Beach near the stream channel, and in the vicinity of the middle groin at Leisure Shores. Residual oil in the western side of Leisure Shores and the eastern side of Howard's Beach consisted primarily of residual oil adhered to sediment in localized areas below the shoreline surface. The amount of residual oil in a particular location was typically small (less than 10 milliliters). When disturbed during test pit activities, the

residual oil would float on the water surface as particles or "flecks" and/or would produce a small sheen on the water surface. Some of the sheens dissipate over time (typically within three minutes). Cobbles with residual oil splatter that was typically weathered and hard to the touch were also present primarily in both the western and eastern portions of Leisure Shores, and near the middle groin at Leisure Shores.

Post-Phase IV cleanup inspections indicated that the cleanup operations and natural attenuation had significantly reduced the residual oil at this shoreline segment. In particular, the residual oil at the eastern side of Howard's Beach appeared to have been completely removed (except for limited minor sheening) and the residual oil in the flat part of the western side of Leisure Shores was substantially reduced. Although occasional cobbles with residual oil, sheen, and small floating particles (generally less than 1 mm in diameter) may be encountered, the frequency of encountering this residual oil, as well as the magnitude of residual oil, has been substantially reduced. Post-cleanup analytical results did not indicate the presence of constituent concentrations above detection limits in 10 of 11 sediment samples and 10 of 11 water samples. The detected concentrations of constituents in the samples were also very low, slightly above the laboratory detection limits.

5.3 PUBLIC WELFARE RISK CHARACTERIZATION UPDATE

The risk of harm to public welfare was evaluated using two criteria: 1) comparing concentrations of detected constituents to appropriate Upper Concentration Limits (UCLs); and 2) evaluating the potential for the existence of a nuisance condition to the degree that would limit the use of the shoreline under current and reasonably foreseeable future uses that is directly attributable to the release of OHM.

Residual oil conditions do not exceed applicable UCLs and, therefore, the primary component to characterizing potential risks to public welfare at this segment is to evaluate the potential for residual oil to create a nuisance condition (such as rubbing off on skin when touched). In a memorandum attached to the MADEP June 27, 2006 Phase II SOW Addendum approval letter,

MADEP provided additional Site-specific guidance on evaluating potential risks to public welfare, which included the following:

- presence of visual and/or olfactory evidence of oil residuals; and
- oil residuals that are likely to contact and adhere to persons.

During the September 30, 2008 field visit, MADEP representatives observed the current residual oil conditions, which consisted primarily of isolated cobbles with residual oil splatter and sheen in excavated test pits. Based upon these observations, MADEP concluded in its memorandum dated November 28, 2008 (Appendix J) that site conditions at the time of the inspection did not constitute a significant risk to public welfare. It is important to note that while it is possible that the public may come into contact with residual oil and possibly sheen, this does not necessarily constitute a significant risk to public welfare. Although isolated splatter may be present, the splatter is weathered and hard to the touch, and contact with this splatter would not create a nuisance condition that would limit public or community use of the shoreline. Similarly, the occasional presence of faint, non-persistent sheens that may appear when sediment or cobbles are disturbed does not exceed the threshold of a significant risk to public welfare. Therefore, in accordance with the MADEP guidance, it is concluded that a condition of No Significant Risk to public welfare exists at segment W1F-02.

5.4 HUMAN HEALTH RISK CHARACTERIZATION UPDATE

The human health risk characterization that was completed in August 2006 was updated to include the potential sheen exposure scenario. In addition, sediment samples collected since the August 2006 Risk Characterization was completed were compared to the risk-based threshold concentrations (RBTC) that were derived in the August 2006 Risk Characterization. The August 2006 human health risk characterization included evaluating risks associated with exposure to residual oil (such as oil on cobbles and exposure to sediment with residual oil.

5.4.1 Sheen Exposure Scenario

The exposure scenario was updated to include excavating "recreational" test pits along the shoreline and exposure to the sheen on the water surface. The Risk Characterization Update concluded that the condition of NSR to human health that was previously concluded in the August 2006 Risk Characterization remained valid. A copy of the Human Health Risk Characterization Update is attached as Appendix K.

5.4.2 Phase IV Sediment Data Evaluation

Sediment samples were collected from Leisure Shores and Howard's Beach during Phase VI activities after the August 2006 Method 3 Risk Characterization was completed. Samples were collected both before the Phase IV cleanup activities, and after the Phase IV cleanup activities were completed. The samples collected prior to Phase IV cleanup activities were used to identify areas for cleanup, and to fingerprint the hydrocarbon material relative to B120 oil. Samples collected after the Phase IV cleanup activities were obtained to evaluate the effectiveness of the Phase IV cleanup operations.

A total of 16 sediment samples were collected after Phase IV cleanup activities were completed for specific areas. The following samples were collected after Phase IV cleanup operations:

Sample Collection Date	Sample Identification
October 25, 2007	W1F02-102507-S2
December 21, 2007	HA-01 2', HA-02 2.5', HA-03, 3', and HA-04 2.5'
September 4, 2008	TP090408.01, TP090408.02, TP090408.03, TP090408.04, TP090408.05, TP090408.06, TP090408.07, TP090408.08, TP090408.09, TP090408.10, and TP090408.11

Sediment sampling activities and locations are described in Phase IV Status Reports (including this report). EPH fractions were not detected in the post-Phase IV cleanup sediment samples. PAH were detected in only two of the post-Phase IV cleanup sediment samples (samples HA-04 2.5' and TP090408.06). The analytical results of the post-Phase IV sediment samples are compared to the risk-based threshold concentrations (RBTCs) that were developed in the August 2006 Method 3 Risk Characterization. The detected concentrations are well below the RBTC values, and these results are consistent with the conclusion of NSR in the August 2006 Method 3 Risk Characterization.

5.5 RISK CHARACTERIZATION UPDATE CONCLUSIONS

Based upon the field observations and data described above, the Phase IV cleanup activities conducted at Leisure Shores and Howard's Beach and natural attenuation processes have achieved a condition of NSR to public welfare as defined in the MCP at segment W1F-02. The previous risk characterization was updated with additional sample results and the previously-demonstrated condition of NSR to human health remained valid. Therefore, a condition of NSR to human health, public welfare, safety, and the environment has been achieved at this segment.

6.0 DATA REPRESENTATIVENESS EVALUATION AND USABILITY ASSESSMENT

The types of data that were used to characterize risks at the Site consisted of sediment and water sample concentrations and visual observations of residual oil (e.g., floating particles or "flecks" on water in test pits, splatter on rocks, and sheens). The sediment analytical data was initially used in the August 2006 Method 3 Risk Characterization to characterize potential risks to human health and environmental receptors (e.g., benthic organisms) via ingestion of, and/or dermal contact with, residual oil in sediment. The visual data was used primarily to characterize public welfare risks (e.g., oil smearing on skin) and ecological risks related to wildlife direct contact with oil.

Sediment and water samples were collected from the Leisure Shores and Howard's Beach portions of segment W1F-02 on various dates, including samples collected after the Phase IV cleanup activities were completed in October 2007. The sediment and water samples were submitted for laboratory analysis for EPH fractions using MADEP methods and the 17 PAH target analytes by GC/MS. Some samples of sediment or other media were collected for laboratory analysis to identify the petroleum hydrocarbons present in the sample relative to B120 oil (i.e., a "fingerprint" analysis). A data usability assessment and "Tier II" data validation were performed as part of the Phase II CSA for samples collected prior to August 2006. A data quality/data usability assessment was also conducted for the samples collected after August 2006 from the W1F-02 shoreline segment. A summary of the data quality/data usability assessment for the post-August 2006 samples is presented in the sections that follow.

The potential exposure to sheen material in the updated Risk Characterization (discussed in Section 5.4.1 above) used Teflon® net samples of sheen that were collected on September 20, 2006. The Teflon® net sampling procedures and locations are described in the April 3, 2007 Immediate Response Action Status and Completion Report, and a copy of the analytical report is included in Appendix K, along with the Human Health Risk Characterization Update Memorandum. The data quality and usability of the Teflon® net samples was

evaluated independently in the Human Health Risk Characterization Update Memorandum, and the samples were determined to be usable for the purpose of the Risk Characterization.

When applicable, data usability was evaluated according to guidelines presented in the MCP Representativeness Evaluations and Data Usability Assessments final document dated September 19, 2007, that includes precision, accuracy, representativeness, comparability, sensitivity, and completeness. The "Tier II" data validation was performed using quality control criteria established by the analytical methods and USEPA National Functional Guidelines for the Contract Laboratory Program.

Samples collected during the field investigation were 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).

Visual inspections of the distribution and magnitude of residual oil were performed on various dates through different seasons during preliminary response actions (e.g., during IRA activities) and comprehensive response actions (e.g., during Phase IV activities). Visual inspections consisted of walking through the area of concern and documenting the residual oil impacts present, as well as excavating test pits using hand tools or mini-excavators to evaluate conditions below the shoreline surface.

6.1 DATA USABILITY ASSESSMENT

Samples were collected from the segment W1F-02 between 2003 and 2008 by ENTRIX and GeoInsight. Sample matrices included sediment, pore water, and oil-impacted solids. ENTRIX prepared data usability assessments for samples they collected in May 2003 and December 2004. The results of ENTRIX's data usability assessment are summarized below. The data usability assessment for soil and pore water samples collected by GeoInsight between 2005 and 2008, and analyzed for EPH constituents was prepared by EnviroLogic and is included below.

6.1.1 May 2003 and December 2004 Data Quality Assessment Summary

As documented in the *Phase I Initial Site Investigation and Conceptual Site Model* report for the Buzzards Bay Site, ENTRIX collected three sediment samples from segment W1F-02. Upper Intertidal and Lower Intertidal sediment samples B1-SED-UI-01 and B1-SED-LI-01 were collected on May 7, 2003, and subtidal sediment sample EMN-SED was collected on May 13, 2003. The samples were analyzed by B&B by proprietary methods including TPH by B&B SOP 1013; aliphatic hydrocarbons by B&B SOP 1016; low-level PAH by B&B SOP 1006; and Total Organic Carbon (TOC) by B&B SOP 1005. The TPH and aliphatic hydrocarbons were analyzed by GC/FID while the PAH were analyzed by a GC/MS. The samples collected in December 2004 were analyzed for EPH and PAH using the MADEP Method. ENTRIX evaluated these non-EPA and non-CAM proprietary methods in accordance with QC criteria obtained in the laboratory method, ENTRIX protocols, and the *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (EPA-540/R-94/012, February 1994).*

ENTRIX evaluated sample preservation, holding times, initial calibration criteria and continuing calibration checks, method blanks, surrogate recoveries, laboratory control sample (LCS) recoveries, matrix spike recoveries, duplicate precision for matrix or laboratory duplicates, standard reference material (SRM) analyses, target compound identification and quantitation criteria. The only quality control (QC) deficiencies identified by ENTRIX involved data qualification of the alkane results for a single sediment sample (WMN-SED) as estimated (J) and were likely biased high due to high outliers associated with the continuing calibration check standard. Actual alkane results for WMN-SED are likely to be less than reported by the laboratory. ENTRIX stated that concentrations noted by B&B as positive results less than the target Method Detection Limit (MDL) were also qualified as estimated (J). No other data qualifiers were applied to sample results by ENTRIX, and the data were concluded to exhibit acceptable levels of accuracy and precision.

6.1.2 Non-CAM Compliant and CAM Compliant Data Usability

EnviroLogic's data usability assessment focused on the EPH and PAH sediment and pore water sample data; these samples were deemed to be representative of current Site conditions and are being used to support the RAO for this Site. EnviroLogic evaluated data usability for 36 sediment and 11 pore water samples submitted to Groundwater Analytical, Inc. (GAI) between 2005 and 2008. All sediment and pore water samples were prepared and analyzed for EPH petroleum hydrocarbon fractions by GC/FID following the MADEP EPH Method (*EPH Revision 1.1, 2004*). In order to meet the low-level PAH detection limits required for the Site, the PAH fraction of the EPH extract was analyzed by GC/MS in Selected Ion Monitoring (SIM) detection mode for 34 of the 36 sediment and all 11 pore water samples. The remaining two sediment samples, W1F02-071807-S1 and W1F02-071807-S2, were analyzed for EPH and PAHs by the MADEP EPH method and then the two samples were extracted for PAHs one day past the expiration of the extraction holding time and re-analyzed for low-level PAHs. Note that an additional sample (W1F02-081307-S1) was subsequently collected from this location and analyzed within the holding time.

EnviroLogic's data usability assessment included a review of sample results and laboratory QC data included in GAI data packages. The laboratory analytical report for GAI samples collected on September 14, 2005 was submitted as Appendix C of the *Phase II Comprehensive Site Assessment Report*. The laboratory analytical reports for GAI samples collected between July and December 2007 were submitted as Appendix D of the *Phase IV Status and Modification Report*. The laboratory analytical report for GAI samples collected in September 2008 is included in Appendix B of this report. Laboratory analytical reports are included in their entirety in this and the above-referenced reports.

Laboratory analysis and analytical reporting of results were generally consistent with required reporting procedures outlined in the MADEP Compendium of Analytical Methods (CAM) and were either CAM compliant or Non-CAM compliant. Field samples were collected in accordance with the sampling requirements outlined in the CAM. Aqueous samples for EPH analysis were preserved with hydrochloric acid (HCl). Soil and pore water

samples were placed in sample coolers with ice and delivered under Chain-of-Custody to GAI.

Appendix L includes a tabulated Data Usability Summary for each of the 36 sediment and 11 pore water samples collected for EPH (including PAHs). The following criteria were evaluated as part of the usability assessment:

- Sample holding times;
- Surrogate recoveries;
- Method blank contamination;
- Laboratory Control Sample (LCS) and, where provided, Laboratory Control Sample Duplicate (LCSD) spike recoveries and duplicate precision;
- Matrix Spike and Matrix Spike Duplicate recoveries and duplicate precision (when requested);
- Laboratory Duplicate analysis; and
- Other QC outliers included in the laboratory narrative discussion.

Any analytical issues which have potential impacts upon data usability are discussed in detail for each sample in the tabulated Sediment and Water Data Usability Summaries in Appendix L, along with the rationale for qualification of the data.

No sediment or pore water data were rejected and the majority of sample results were deemed usable without any qualifications. Qualified data are presented in the table below. Non-detected PAH results (i.e., PAH reporting limits) were elevated for one sediment sample, W1F-02-102507-S1, due to sample dilution. Detected and non-detected EPH results were estimated with a low bias for sediment samples W1F02-P2-SUB-03, W1F02-P2-SUB-04, W1F02-P2-SUB-05; sediment samples TP090408.01 through TP090408.11; and pore water samples TP090408.01 through TP090408.11. The actual EPH results and reporting limits for these samples may be higher than reported. Other data qualifications are summarized in the table below:

EPH and PAH Data Qualifications:

Sample (Date Sampled)	Analysis	Issue	Use Rationale
SEDIMENT SAMPLES			
W1F-02-071807-S1 W1F-02-071807-S2 (07/18/2007)	PAHs	PAHs were originally reported from the EPH analysis and all samples were non-detected for PAHs in the original EPH analysis. Samples were subsequently extracted for low-level PAHs four days after the extraction holding time expired. Several PAHs were detected at lower reporting levels using the GC/MS SIM method.	Detected PAHs are estimated with a low bias (JL) and non-detected results are estimated with a low bias (UJL). However, as a result of the hold time exceedence, an additional sample (W1F02-081307-S1) was collected from the same area as a replacement.
W1F-02-102507-S1 (10/25/2007)	PAHs	The sample extract required dilution during instrument analysis which resulted in elevated reporting limits for non-detected PAH compounds.	Sample dilution resulted in elevated reporting limits for 6 PAH compounds: naphthalene; 2-methylnaphthalene; acenaphthylene; benzo(k)fluoranthene; indeno(1,2,3-cd)pyrene; and benzo(g,h,i)perylene.
TP090408.01through TP090408.11	EPH and PAH	The cooler temperature upon receipt at the laboratory (14.7°C) exceeded the upper QC limit (6°C). However, samples were placed on ice immediately after collection, and the samples were driven to the laboratory by the field team immediately after sampling.	All non-detected hydrocarbon fraction results could be estimated with a low bias (UJL); however, due to the immediate delivery of the samples to the laboratory, temperature conditions should not affect the laboratory results.
PORE WATER			
TP090408.01through TP090408.11	EPH and PAH	The cooler temperature upon receipt at the laboratory (14.7°C) exceeded the upper QC limit (6°C). However, samples were placed on ice immediately after collection, and the samples were driven to the laboratory by the field team immediately after sampling.	All non-detected hydrocarbon fraction results could be estimated with a low bias (UJL); however, due to the immediate delivery of the samples to the laboratory, temperature conditions should not affect the laboratory results.

The remaining sample data, which was evaluated by EnviroLogic, are considered to be usable without qualification for Site and risk characterization.

6.2 DATA REPRESENTATIVENESS EVALUATION

6.2.1 Conceptual Site Model Summary

No. 6 oil that stranded on this segment W1F-02 was cleaned up as part of emergency response actions under the direction of the Unified Command (with the U.S. Coast Guard as federal on-scene coordinator and MADEP as state on-scene coordinator) and during IRA and Phase IV activities under the direction of the LSP. Residual oil that remained after cleanup activities consisted of small amounts of residual oil on portions of the segment shoreline. The residual oil consists primarily of rocks/cobbles with small amounts of hardened, weathered splatter, and limited small and discontinuous sheens associated with pore water when pits are excavated in the intertidal zone. In addition, although not recently observed, small "flecks" have been detected in pits excavated in the intertidal zone along Leisure Shores.

No. 6 oil is considered a persistent and immobile contaminant in the environment, and does not readily volatilize into air or sediment gas, or dissolve in surface or ground water. However, it should be noted that tidal energy scouring has and will continue to attenuate any remaining exposed residual oil over time.

Pathways and points of exposure consist of the following:

- A person digging a hole in beach sediment and encountering sheens or flecks (if still present) and either ingesting material and/or rubbing material on their skin; and
- A person contacting or handling a rock containing residual oil and either ingesting material and/or rubbing material on skin.

6.2.2 Use of Field Data

Due to the low volatile nature of No. 6 oil, headspace screening was not conducted as part of site investigation activities. However, visual observations were conducted through surficial

field inspections and by advancement of shallow test pits along shoreline areas that were not substantially covered with rocks, cobbles and rock groins. These visual inspections were used to: 1) determine the consistency of oil tarballs (i.e., degree of hardening) for the purpose of evaluating public welfare conditions; 2) to aid in field investigation decision-making (i.e., the selection of sample locations in representative worst-case locations); 3) to locate areas for remedial excavations and confirm the adequacy of cleanup; and 4) to evaluate the presence or absence of B120 residual oil along the shoreline.

The visual observation data was an important data set for this release due to the following:

- Direct contact with oil or the presence of oil that would significantly impede or limit the public's ability or inclination to access, use, and enjoy the shoreline; and
- A component of the ecological risk characterization that focused upon direct contact of wildlife with oil.

Due to the physical and chemical characteristics of the residual No. 6 fuel oil (e.g., low solubility), it is expected that environmental media sampling conducted in areas where residual oil was not visibly present would result in constituent concentrations in sediment or surface water below risk characterization thresholds. This condition is supported by the Phase I and Phase II sediment sample analytical results that did not indicate the presence of No. 6 fuel oil constituents at levels that constituted a significant risk. In many samples, the constituent concentrations were below analytical detection limits.

6.2.3 Sampling Rationale and Spatial Distribution

Phase II CSA activities included assessment of 63 shoreline segments in Buzzards Bay, including segment W1F-02. Sediment samples were collected from intertidal shoreline locations and fringing marshes to evaluate potential risks to human and environmental receptors (e.g., benthic organisms). The oil that stranded on the shoreline in April and May 2003 from the release was discontinuous and varied substantially, both among the various shoreline segments and within individual shoreline segments. The degrees of human use of

the shoreline and potential environmental receptors also varied considerably along the shoreline. Due to the expansive area of potential impacts, as well as the variability of shoreline oiling, public use, and environmental receptors, intertidal and marsh sediment samples were not collected uniformly along the shoreline. Instead, intertidal and marsh sediment samples were collected during the Phase II CSA from a subset of the 63 remaining shoreline segments (including segment W1F-02), representing the worst-case conditions at that time. This subset of worst-case segments included representatives from each shoreline classification (i.e., sandy beaches, mixed sand and gravel beaches, rip rap seawalls, piers, rocky shores, and marshes). Characterization of intertidal sediment was conducted at 12 of the remaining 63 segments (approximately 20%), and these segments were considered to be worst-case examples. MADEP was consulted regarding the sampling approach and concurred with the proposed sampling program. To provide representative coverage in the intertidal zone, intertidal sediment samples were collected from both the upper and lower intertidal zones.

To identify which segments were most representative of worst-case conditions, the results of qualitative and quantitative surveys conducted between April 2003 and June 2005 were carefully reviewed using the following criteria:

- the extent and magnitude of residual oil along shoreline segments during the most recent field surveys;
- the results of existing field surveys and laboratory analyses of environmental media collected within the Site;
- the initial maximum shoreline oiling levels in the spring of 2003;
- the initial oiling index[1] for each shoreline segment; and
- the IRAC status[2] of each shoreline segment.

In addition, information on environmental resources at the remaining 63 segments was reviewed using these additional criteria:

- shoreline classification based on NOAA's Ecological Sensitivity Index and IRAC designations;

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[1] *The initial oiling index is a numerical value ranging from 0 to 4 that is a function of the degree of oiling and the proportion of the segment that was oiled.*

[2] *The IRAC status of a particular shoreline segment was established at the completion of the IRAC inspections conducted by field teams under the direction of Unified Command.*

- salt marsh habitat;
- known occurrence of threatened or endangered species;
- presence of NHESP priority habitat; and
- public access/expected human use.

The results of this information review were assimilated to develop segment selection criteria for existing residual oil, initial oiling, ecological ranking, and public access. The primary emphasis was on the degree and extent of residual oil since those areas could be the most likely to pose a risk to ecological receptors and humans. The segments that had residual splatter on rocks with sporadic "pavement" and/or tar patties or flecks (including segment W1F-02) were selected for further characterization. To be conservative, additional segments were selected for further characterization based on the current status of residual oil (albeit most of the residual oil was present as minimal weathered splatter) coupled with relatively high rankings for initial oiling, ecological ranking, and/or public access/use. Post-cleanup sediment and water samples were collected from the Leisure Shores and Howard's Beach portions of segment W1F-02. Samples were collected from areas where residual oil was present or in the vicinity based upon visual inspections.

The Phase II analytical data set conservatively focused upon evaluating locations that are considered to be "worst-case" where potential residual oil could most likely be present. The Phase II characterization activities were described in the August 2005 Phase II SOW and the Phase II CSA.

Whole sediment samples (i.e., sediment particulates and associated pore water) were collected as part of the Phase II CSA at each sampling location and the analytical results are presented on a dry-weight basis. Sediment sample analytical results were considered to be representative of residual oil impacts adsorbed to sediment, as well as dissolved in pore water. This is consistent with methodology followed during the sediment toxicity studies conducted as part of NOAA's National Status and Trends Program (NOAA NST Program) (Long and Morgan, 1991). ER-Ls were developed in this program using the results of dozens of whole sediment toxicity studies that incorporated sediment samples collected from major water bodies around the United States where it was known that a range of chemical

contaminants co-occurred in the samples (Long and Morgan, 1991). A variety of benthic infaunal and epibenthic test organisms were used, including various amphipods and bivalve larvae, which are all sensitive to dissolved chemicals in pore water. Because ER-Ls were developed for organisms exposed to whole sediment, including pore water, ER-Ls directly address constituents dissolved in sediment pore water.

Since the Phase II CSA, additional samples, including samples of sediment, water, and tarballs were collected as part of IRA or Phase IV activities. The purpose of these samples was to:

1. support remedial excavation efforts (i.e., pre- and post excavation sampling from shallow sediment);
2. support risk characterization (samples were collected based on visual observations of areas where residual oil was observed as well as from other areas to obtain a better spatial distribution across the area of concern); and
3. evaluate the nature of oil (i.e., tarball or other matrix sample for comparison to B120 oil).

Since No. 6 oil is considered to be immobile in the environment, exposure to residual oil is greatest in the shallow sediment. Therefore, sediment and pore water samples were collected primarily from shallow depths (within one foot of the ground surface). Note that the pore water samples were collected to evaluate the potential effects of sheens on dissolved-phase impacts and human exposure to pore water when digging in sediment. Therefore, these samples were collected from the surface of the water column such that the sheen was part of the sample. In addition, tarball samples collected from this segment were also analyzed for petroleum constituents for use in updating the human health risk characterization specific to this segment.

The potential exposure to sheen material in the updated Risk Characterization used Teflon® net samples of sheen that were collected on September 20, 2006. The Teflon® net samples were collected using a methodology specific to collecting as much sheen as possible and

limiting potential dilution of the sample by water. Therefore these samples are considered to accurately represent hydrocarbon concentrations in the sampled sheen. The samples were collected from Leisure Shores in 2006 from test pits that exhibited much greater degrees of sheening (floating "flecks" were observed in each of the 2006 test pits selected for Teflon® net sampling) than observed in 2008. Therefore, the Teflon® net data are considered to be conservatively representative of sheens for someone exposed to sheens during recreational digging at Leisure Shores.

6.2.4 Temporal Distribution

Multiple visual inspections were conducted during low tide and in different seasons to account for different shoreline and oil conditions. For example, shoreline visibility is increased during cold weather inspections when plants are dormant, while during hot weather conditions, residual oil is potentially more tacky (less viscous) and could more easily produce a sheen or rub off on skin. In addition, as a result of seasonal changes in sediment deposition and erosion, residual oil that may be observable during one season, may be buried during another. Therefore, multiple visits during different seasons reduced the chance of not observing oil that could be hidden under wrack or deposited sediment during an individual inspection.

Regarding sediment sampling, since No. 6 oil is considered to be generally persistent in the environment, sampling over time (although conducted) to assess degradation or temporal concentration changes was not considered important in site characterization. Use of initial sediment sampling data also provided a level of conservatism in risk characterization.

6.2.5 Data Not Used

Data not included in the data usability assessment and RAO include samples collected from sediment or pavement where the sediment or pavement was subsequently removed as part of remedial actions. These data consisted of samples collected from the "tire track" area and the cobble beach area of Leisure Shores, and include W1F02-071007-A through D, W1F-02-

071807-S1 and S2, and W1F02-102507-S1. These samples were used to locate areas for sediment removal that occurred in October 2007. Sediment samples were collected after sediment removal to evaluate the adequacy of remediation. These samples consisted of W1F02-102507-S2, HA-01 through 04 collected from the "tire track" area as well as the sediment and pore water samples collected from Leisure Shores on September 4, 2008. These samples are considered to be representative of current segment conditions, and were included in the data usability assessment and RAO.

An oiled rock sample (W1F02-32707) and tar ball sample (W1F02-093008) were collected from Leisure Shores for petroleum fingerprint analysis on March 27, 2007, and September 30, 2008, respectively. These materials were removed from the Site as part of cleanup activities. However, these sample results were used to compare tar ball characteristics to those used in the Phase II Risk Characterization and, therefore, these two samples were included in the data usability assessment and RAO.

The water samples collected on September 8, 2008 were not used in the Risk Characterization because the data indicated that the exposure pathway to water was incomplete, which is consistent with the August 2006 Method 3 Risk Characterization.

6.3 DATA REPRESENTATIVENESS AND USABILITY CONCLUSIONS

The RAO is based upon visual observations of residual oil conditions and laboratory analysis of sediment, water and other media samples. The data were collected with sufficient temporal and spatial distribution to characterize residual oil impacts at this shoreline segment. Therefore, the data that is used to support the RAO is considered to be acceptable for its intended use.

7.0 FEASIBILITY OF ACHIEVING OR APPROACHING 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 in some locations along the shoreline. Natural processes are expected to substantially degrade residual oil with high wave energy and, therefore, the residual oil impacts may be considered to be non-persistent (i.e., degradable) at segment W1F-02. However, in other quiescent areas (e.g., some marsh habitat), No. 6 fuel oil is expected to be persistent 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 not be present. Note that there may be local conditions[3] 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. For example, non-B120 oil is present at Holly Woods in Mattapoisett and on Naushon Island, and pyrogenic PAH associated with the Atlas Tack Superfund Site were detected in sediment samples collected from Harbor View and Pope's Beach in Fairhaven. Non-B120 material, including roadway pavement, coal, and slag were also observed at segment W1F-02. In addition, the definition of "approaching background" for soil that contain persistent contaminants, such as No. 6 fuel oil, is presented in the Policy as a number of criteria, one of which includes soil that has concentrations at or below

[3] *Local conditions are present in a relatively small area when compared to the overall area of a segment.*

Method 1 S-1 Standards. Residual oil concentrations in sediment samples collected from this shoreline segment could be considered to be "approaching background," resulting in categorical infeasibility to achieve background and presumptive certainty of MADEP acceptance of this conclusion in accordance with the Policy. However, the Policy does not consider the presence of visible petroleum such as the weathered splatter observed on cobbles. Therefore, to evaluate the feasibility of achieving or approaching background for this segment, a technological and cost-benefit evaluation was performed as well as an evaluation of conditions that MADEP considers to be almost always categorically feasible to achieve or approach background.

7.1 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 by Unified Command, two alternatives were initially identified as potentially capable of remediating residual oil in the intertidal zone; these two alternatives were: 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. Residual oil currently remaining on the shoreline is weathered and hardened and, therefore, hot washing is no longer considered to be effective at removing residual weathered oil to background conditions. Complete excavation and disposal of oiled rocks with rock replacement (where necessary) is the only approach that is considered feasible to achieve or approach background conditions. However, based upon the initial screening results, complete excavation and disposal of impacted media would substantially impact the existing ecosystem and, therefore, the risks are very high to use this remedial action alternative at this shoreline segment.

7.2 BENEFIT-COST EVALUATION

Excavation of intertidal rocks and sediment will have a substantial adverse impact on the local ecosystem. While the removal of highly weathered, hardened, oil splatter from the intertidal zone may be beneficial from an aesthetic standpoint, the benefit is offset by the ecological damage that would be caused by the excavation of the existing ecosystems. Note that the aesthetic impacts are likely to be minimal due to the comparatively infrequent use of this part of the shoreline compared to other areas along Buzzards Bay. Removing the small amounts of residual oil would likely damage or destroy more than 5,000 square feet of wetlands or wildlife habitat. The limited remaining residual oil is primarily highly weathered splatter or sheen that is created when digging in the intertidal sediment that is not expected to migrate and is not expected to bioaccumulate in its present form. The damages to the shoreline resources from large-scale excavation activities would remain for a long time and would not be repairable to current state in a reasonable time frame (10 years).

The ecological damage from large-scale cleanup operations would be substantial, and the benefits would be negligible because a condition of NSR already exists at this segment. Therefore, the disadvantages and costs for the potential remedial action are considered to be substantial and disproportionate to the negligible incremental benefits and, consistent with Section 3.0 of the Policy, it is not considered feasible to remove the remaining residual oil (which consists primarily of highly weathered oil splatter) at this segment.

7.3 EVALUATION OF CATEGORICAL FEASIBILITY CONDITIONS

It is MADEP's position that it is categorically feasible to remove small quantities (less than or equal to 20 cubic yards) of petroleum-impacted soil to achieve or approach background under certain conditions where the soil is accessible, is not located in a sensitive environment (e.g., wetlands, including the intertidal zone), and the removal would not substantially interrupt public service or threaten public safety. For this segment, it is likely that removal of residual petroleum-impacted sediment may require excavating greater than 20 cubic yards of material to reach background conditions. Therefore, additional soil removal is not required

to achieve or approach background based upon the conditions of categorical feasibility presented in the Policy.

8.0 RESPONSE ACTION OUTCOME

As described in the Method 3 Risk Characterization included in the August 2006 Phase II CSA report, a condition of NSR to human health, safety, and the environment was achieved for segment W1F-02. Phase IV activities were conducted at Leisure Shores and Howard's Beach in 2007 and 2008 to characterize residual oil conditions, to remove minor amounts of residual oil, and to address potential issues concerning public welfare risk. Phase IV inspections indicated that the cleanup activities and natural attenuation processes reduced residual oil so that a condition of NSR to public welfare is currently present. New analytical data collected since the August 2006 Risk Characterization were incorporated into an updated Risk Characterization, which indicated that the condition of NSR to human health and the environment that was previously demonstrated was still applicable to this shoreline segment. Therefore, a condition of NSR to human health, public welfare, safety, and the environment has been achieved at this shoreline segment. Hot spots, as defined in the MCP, are not present, and residual oil impacts do not exceed UCLs. No substantial hazards are present at the Site. Uncontrolled sources associated with this release have been eliminated. A site-specific evaluation of the feasibility for achieving or approaching background conditions was conducted and it was concluded that it was not feasible to achieve or approach background. In addition, a REDUA was completed and demonstrated that the data used to support the RAO is acceptable. Therefore, a Partial Class A-2 RAO is appropriate for segment W1F-02. Segment W1F-02 is shown on Figure 2.

This RAO is not based upon the implementation of an Activity and Use Limitation (AUL) to maintain a condition of NSR. Post-RAO monitoring is not necessary to ensure that the conditions upon which the Class A-2 RAO is based are maintained.

9.0 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 shoreline segments. In August 2006 a Partial Class A-2 RAO was submitted for 61 of the remaining 63 segments and the entire subtidal zone beneath Buzzards Bay. A Partial Class A-2 RAO for the Long Island and Causeway South (W2A-10) was submitted to MADEP on October 3, 2008. This RAO applies to the last remaining shoreline segment (W1F-02) that was affected by the B120 release, and no other RAOs will be filed for this Site. As a result of the filing of this partial RAO, response actions are complete, resulting in a permanent solution for the entire Site associated with RTN 4-17786.

10.0 PUBLIC INVOLVEMENT

Notification of this Partial Class A-2 RAO was provided to owners of property within the boundaries of segment W1F-02. 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). However, evaluating whether a particular property extended to mean low water would require conducting a review of the deed for each property within segment W1F-02. To be conservative, although deed research for each property was not conducted, notification was provided to the owners of properties along the shoreline segment, recognizing that some of these properties may not actually extend to mean low water (and thus are not part of the Site).

Notification was also provided to the Mattapoisett chief municipal officer and Board of Health. Copies of the notification letters to property owners and municipal officials are included in Appendix M.

TABLES

TABLE 1
SUMMARY OF TEST PIT OBSERVATIONS - AUGUST 2008
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

Trench/Test Pit ID	Date	Field Observations
T082508.01	8/25/2008	Two small cobbles with small amounts of hardened splatter (removed), sheen on water surface in an approximate 2-foot by 3-foot area in the northern part of trench, and approximately 20 small (1 mm - 7 mm diameter) flecks on water surface in area of sheen. Removed one piece of peat (approximately 1 inch in diameter) with residual oil from sheen area.
T082508.02	8/25/2008	Two small cobbles with hardened splatter (removed). Fewer than 20 small (less than 1-inch diameter) sheens on water surface, mostly in southern end.
T082608.01	8/26/2008	No evidence of oil.
T082608.02	8/26/2008	No evidence of oil.
T082608.03	8/26/2008	Found one cobble with splatter (removed). No other evidence of oil.
T082608.04	8/26/2008	No evidence of oil.
T082608.05	8/26/2008	No evidence of oil.
T082608.06	8/26/2008	Two small cobbles with some tacky splatter (removed). No other evidence of oil.
T082608.07	8/26/2008	No evidence of oil.
T082708.01	8/27/2008	No evidence of oil.
T082708.02	8/27/2008	No evidence of oil.
T082708.03	8/27/2008	No evidence of oil.
T082708.04	8/27/2008	No evidence of oil.
T082708.05	8/27/2008	No evidence of oil.
T082708.06	8/27/2008	No evidence of oil.
T082708.07	8/27/2008	No evidence of oil.
T082808.01	8/28/2008	No evidence of oil.
T082808.02	8/28/2008	No evidence of oil.
T082808.03	8/28/2008	No evidence of oil.
T082808.04	8/28/2008	No evidence of oil.
T082808.05	8/28/2008	Found and removed two pieces of roadway pavement (not B120 oil). No evidence of B120 oil.
T082808.06	8/28/2008	One small pebble (less than 0.5-inch diameter) with tacky oil removed. No other evidence of oil.
T082808.07	8/28/2008	Found and removed one piece of pavement approximately 3 inches by 5 inches by 0.25 inches. Hard on outside, but pliable and soft on inside. No other evidence of oil.
T082908.01	8/29/2008	No evidence of oil in trench. Removed one cobble with splatter from shoreline surface near T082909.01.
T082908.02	8/29/2008	Found and removed one piece of hardened pavement approximately 2 inches by 4 inches by 0.25 inches. No other evidence of oil.
T082908.03	8/29/2008	No evidence of oil.
T082908.04	8/29/2008	Found and removed one pebble (approximately 0.5 inch diameter) with hardened splatter and one piece of pavement (approximately 2 inches in diameter and 0.25 inch thick). No other evidence of oil.
T082908.05	8/29/2008	No evidence of oil in trench. Removed one pebble with hardened splatter (non-B120?) from beach surface near T0829089.05.

Notes:
1. A total of less than one 5-gallon bucket of material (primarily pavement and cobbles with hard, weathered splatter) were removed during these activities.

TABLE 2
SUMMARY OF SEDIMENT ANALYTICAL RESULTS
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

SAMPLE ID:	**TP090408.01**	**TP090408.02**	**TP090408.03**	**TP090408.04**	**TP090408.05**	**TP090408.06**	**TP090408.07**	**TP090408.08**	**TP090408.09**	**TP090408.10**	**TP090408.11**
DATE:	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008
MA DEP EPH											
C9 to C18 Aliphatic Hydrocarbons	ND(32)	ND(33)	ND(35)	ND(34)	ND(34)	ND(33)	ND(36)	ND(35)	ND(35)	ND(31)	ND(34)
C19 to C36 Aliphatic Hydrocarbons	ND(32)	ND(33)	ND(35)	ND(34)	ND(34)	ND(33)	ND(36)	ND(35)	ND(35)	ND(31)	ND(34)
C11 to C22 Aromatic Hydrocarbons	ND(32)	ND(33)	ND(35)	ND(34)	ND(34)	ND(33)	ND(36)	ND(35)	ND(35)	ND(31)	ND(34)
EPA 8270C Mod											
Naphthalene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
2-Methylnaphthalene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Acenaphthylene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Acenaphthene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Fluorene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Phenanthrene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	**0.022**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Anthracene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Fluoranthene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	**0.025**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Pyrene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	**0.019**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Benzo[a]anthracene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Chrysene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Benzo[b]fluoranthene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	**0.011**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Benzo[k]fluoranthene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Benzo[a]pyrene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Indeno[1,2,3-c,d]pyrene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Dibenzo[a,h]anthracene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)
Benzo[g,h,i]perylene	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)

Notes:
1. Results in milligrams per kilogram (mg/kg).
2. ND(x) = Constituent not detected at laboratory reporting limits noted in parentheses.
3. Bold values exceed laboratory reporting limits.
4. Potentially applicable Massachusetts Contingency Plan (MCP) Method 1 Risk Characterization standards are included for comparison.
5. EPH = Extractable Petroleum Hydrocarbons.

TABLE 3
SUMMARY OF AQUEOUS SAMPLE ANALYTICAL RESULTS
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

SAMPLE ID: / **DATE:**	**TP090408.01** 9/4/2008	**TP090408.02** 9/4/2008	**TP090408.03** 9/4/2008	**TP090408.04** 9/4/2008	**TP090408.05** 9/4/2008	**TP090408.06** 9/4/2008	**TP090408.07** 9/4/2008	**TP090408.08** 9/4/2008	**TP090408.09** 9/4/2008	**TP090408.10** 9/4/2008	**TP090408.11** 9/4/2008
MA DEP EPH											
C9 to C18 Aliphatic Hydrocarbons	ND(620)	ND(540)	ND(570)	ND(540)	ND(530)	ND(520)	ND(540)	ND(550)	ND(530)	ND(520)	ND(560)
C19 to C36 Aliphatic Hydrocarbons	ND(620)	ND(540)	ND(570)	ND(540)	ND(530)	ND(520)	ND(540)	ND(550)	ND(530)	ND(520)	ND(560)
C11 to C22 Aromatic Hydrocarbons	ND(190)	ND(160)	ND(170)	ND(160)	ND(160)	ND(160)	ND(160)	ND(160)	ND(160)	ND(160)	ND(170)
EPA 8270C Mod											
Naphthalene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
2-Methylnaphthalene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Acenaphthylene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Acenaphthene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Fluorene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Phenanthrene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Anthracene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Fluoranthene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Pyrene	ND(0.6)	ND(0.6)	ND(0.6)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.6)
Benzo[a]anthracene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	**0.3**	ND(0.1)	ND(0.1)
Chrysene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	**0.5**	ND(0.1)	ND(0.1)
Benzo[b]fluoranthene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	**0.2**	ND(0.1)	ND(0.1)
Benzo[k]fluoranthene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Benzo[a]pyrene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	**0.3**	ND(0.1)	ND(0.1)
Indeno[1,2,3-c,d]pyrene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Dibenzo[a,h]anthracene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Benzo[g,h,i]perylene	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	**0.1**	ND(0.1)	ND(0.1)

Notes:
1. Results in micrograms per liter (ug/L).
2. ND(x) = constituent not detected at practical quanitation limits noted in parentheses.
3. EPH = Extractable Petroleum Hydrocarbons.
4. Bold values exceed laboratory reporting limits.
5. Potentially applicable Massachusetts Contingency Plan (MCP) Method 1 Risk Characterization standards are included for comparison.
6. NS = No standard.

TABLE 4
SUMMARY OF TEST PIT OBSERVATIONS - SEPTEMBER 4, 2008
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

Trench/Test Pit ID	Date	Field Observations
T090408.01	9/4/2008	No evidence of oil.
T090408.02	9/4/2008	No evidence of oil.
T090408.03	9/4/2008	Approximately 10 sheens (1 inch diameter) on water surface.
T090408.04	9/4/2008	Some small sheens initially, then the sheens dissipated within 5 minutes.
T090408.05	9/4/2008	No evidence of oil.
T090408.06	9/4/2008	Fewer than 10 sheen "stringers" approximately 2 inches long and 0.5 inch wide.
T090408.07	9/4/2008	No evidence of oil.
T090408.08	9/4/2008	Natural organic "scum" (not B120 oil) floating on water surface.
T090408.09	9/4/2008	Approximately 30 sheen "stringers approximately 1 inch long and 0.5 inch wide. Some of sheens dissipated over time.
T090408.10	9/4/2008	No evidence of oil.
T090408.11	9/4/2008	Approximately 10 sheen "streamers" approximately 6 inches long and 0.5 inch wide. Small (approximatley 1 mm) flecks in some of sheens.

Notes:

TABLE 5
SUMMARY OF TEST PIT OBSERVATIONS - SEPTEMBER 30, 2008
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

Trench/Test Pit ID	Date	Field Observations
T093008.01	9/30/2008	No evidence of oil.
T093008.02	9/30/2008	Sheen "streamers" on apprximately 10% of water surface.
T093008.03	9/30/2008	Faint, dull organic (non B120) sheen.
T093008.04	9/30/2008	Two sheens less than 0.5 inch diameters. Some faint, broken sheens.
T093008.05	9/30/2008	Fewer than 10 very faint sheen "streamers" approximately 2 inches by 0.5 inch.
T093008.06	9/30/2008	One sheen "streamer" approximately 1.5 inch by 0.125 inch. Fewer than 5 faint sheens less than 1 inch diameter.
T093008.07	9/30/2008	Fewer than 5 faint sheens less than 0.5 inch diameter. Upon re-visiting, observed approximately 50 small inorganic (i.e., not B120) sheens.
T093008.08	9/30/2008	Three faint sheens less than 0.25 inch diameter.
T093008.09	9/30/2008	No evidence of oil.
T093008.10	9/30/2008	No evidence of oil.
T093008.11	9/30/2008	No evidence of oil.
T093008.12	9/30/2008	No evidence of oil.
T093008.13	9/30/2008	No evidence of oil.
T093008.14	9/30/2008	No evidence of oil.
T093008.15	9/30/2008	Initially observed 3 "streamer" sheens, but they dissipated within 3 minutes.
T093008.16	9/30/2008	Six small sheens and one fleck approximately 1 mm diameter.
T093008.17	9/30/2008	No evidence of oil. Upon re-visiting, observed approximately 5 sheens less than 1 inch diameter, with one fleck (1 mm) in center of one sheen.
T093008.18	9/30/2008	No evidence of oil.
T093008.19	9/30/2008	No evidence of oil (lots of floating organic material, but not B120 oil).
T093008.20	9/30/2008	No evidence of oil.
T093008.21	9/30/2008	No evidence of oil.
T093008.22	9/30/2008	No evidence of oil.

Notes:

TABLE 6
SUMMARY OF TEST PIT OBSERVATIONS - OCTOBER 9, 2008
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

Trench/Test Pit ID	Date	Field Observations
T0100908.01	10/9/2008	No evidence of oil.
T0100908.02	10/9/2008	No evidence of oil.
T0100908.03	10/9/2008	No evidence of oil.
T0100908.04	10/9/2008	No evidence of oil.
T0100908.05	10/9/2008	No evidence of oil.
T0100908.06	10/9/2008	No evidence of oil.
T0100908.07	10/9/2008	No evidence of oil.
T0100908.08	10/9/2008	No evidence of oil.
T0100908.09	10/9/2008	No evidence of oil.
T0100908.10	10/9/2008	No evidence of oil.
T0100908.11	10/9/2008	No evidence of oil.
T0100908.12	10/9/2008	No evidence of oil.
T0100908.13	10/9/2008	No evidence of oil.

Notes:

TABLE 7
POST-CLEANUP SEDIMENT SAMPLE RISK EVALUATION
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

Sample ID:	**W1F02-102507-S2**	**HA-01 2'**	**HA-02 2.5'**	**HA-03 3'**	**HA-04 2.5'**	**TP090408.01**	**TP090408.02**	**TP090408.03**	**TP090408.04**	**TP090408.05**	**Risk-Based Threshold Concentrations**
Sample Date:	10/25/2007	12/21/2007	12/21/2007	12/21/2007	12/21/2007	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	
MA DEP EPH											
EPH Fractions											
n-C9 to n-C18 Aliphatic Hydrocarbons	ND(33)	ND (37)	ND (41)	ND (33)	ND (36)	ND(32)	ND(33)	ND(35)	ND(34)	ND(34)	---
n-C19 to n-C36 Aliphatic Hydrocarbons	ND(33)	ND (37)	ND (41)	ND (33)	ND (36)	ND(32)	ND(33)	ND(35)	ND(34)	ND(34)	---
n-C11 to n-C22 Aromatic Hydrocarbons	ND(33)	ND (37)	ND (41)	ND (33)	ND (36)	ND(32)	ND(33)	ND(35)	ND(34)	ND(34)	---
Target PAH Analytes (Low-Level Detection Limits)											
Naphthalene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Acenaphthylene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Acenaphthene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Fluorene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Anthracene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Phenanthrene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	**0.021**	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Fluoranthene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	**0.025**	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Pyrene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	**0.025**	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Benz(a)anthracene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	**0.013**	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Chrysene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Benzo(b)fluoranthene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	**0.013**	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Benzo(k)fluoranthene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Benzo(a)pyrene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Indeno(1,2,3-c,d)pyrene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Dibenzo(a,h)anthracene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Benzo(g,h,i)perylene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
2-Methylnaphthalene	ND(0.011)	ND (0.012)	ND (0.014)	ND (0.011)	ND (0.012)	ND(0.011)	ND(0.011)	ND(0.012)	ND(0.011)	ND(0.011)	---
Comparison to RBTCs											
Total PAH + EPH Fractions	**ND**	**ND**	**ND**	**ND**	**0.10**	**ND**	**ND**	**ND**	**ND**	**ND**	**222**
Total BaP Equivalents	**ND**	**ND**	**ND**	**ND**	**0.00**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.35**

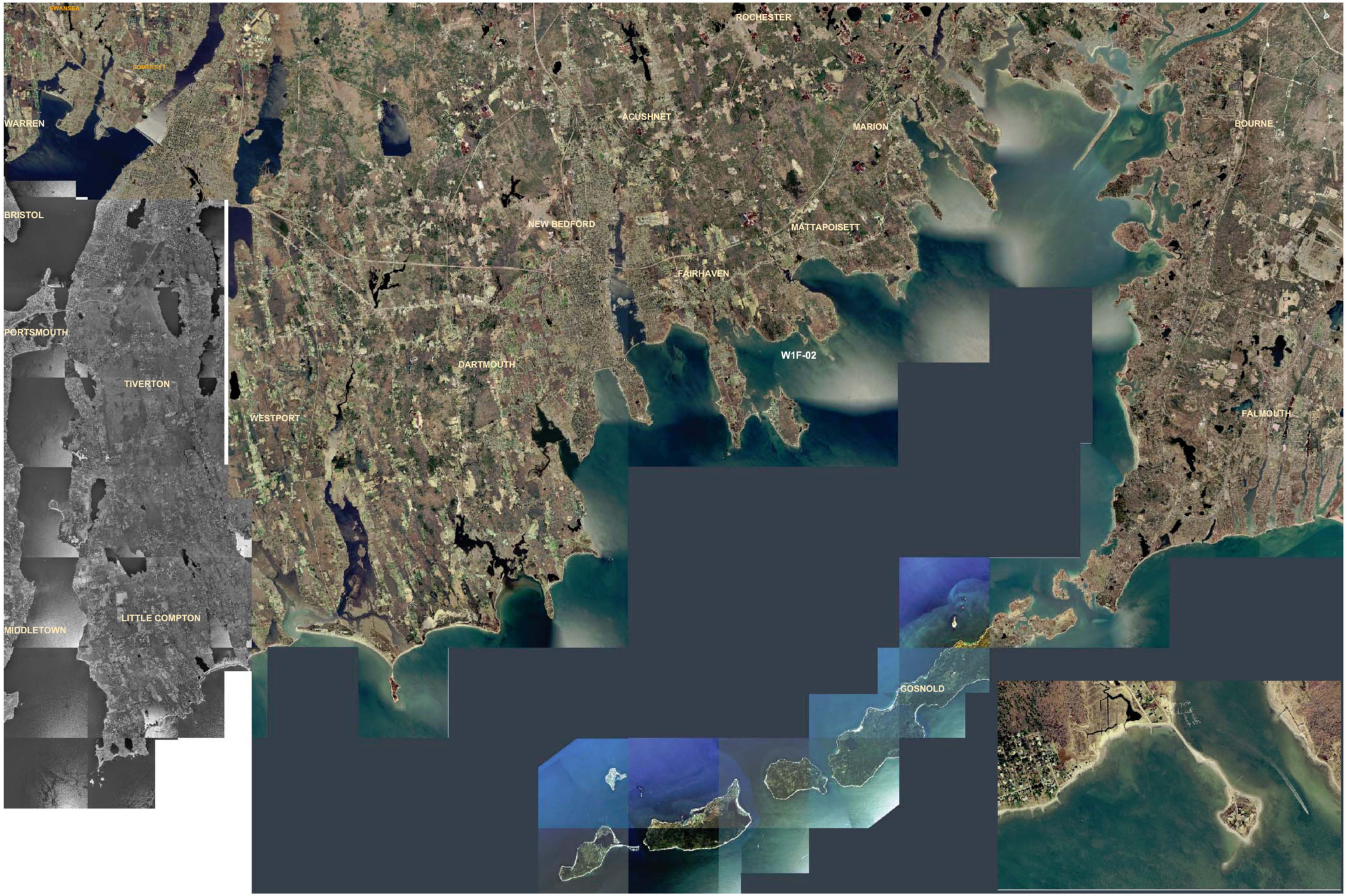
Notes:
1. Results in milligrams per kilogram (mg/kg).
2. ND (X) = constituent not detected above detection limit noted in parentheses.
3. BOLD exceeds laboratory detection limits.
4. EPH = Extractable Petroleum Hydrocarbons.
5. PAH = Polynuclear Aromatic Hydrocarbons.
6. BaP = Benzo(a)pyrene. Note that concentrations of carcinogenic PAH were converted into units equivalent to BaP to compare to RBTCs
7. RBTCs = Risk-Based Threshold Concentrations.

TABLE 7
POST-CLEANUP SEDIMENT SAMPLE RISK EVALUATION
SHORELINE SEGMENT W1F-02
BARGE B120 SPILL
BUZZARDS BAY, MASSACHUSETTS

Sample ID:	**TP090408.06**	**TP090408.07**	**TP090408.08**	**TP090408.09**	**TP090408.10**	**TP090408.11**	**Risk-Based Threshold Concentrations**
Sample Date:	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	9/4/2008	
MA DEP EPH							
EPH Fractions							
n-C9 to n-C18 Aliphatic Hydrocarbons	ND(33)	ND(36)	ND(35)	ND(35)	ND(31)	ND(34)	---
n-C19 to n-C36 Aliphatic Hydrocarbons	ND(33)	ND(36)	ND(35)	ND(35)	ND(31)	ND(34)	---
n-C11 to n-C22 Aromatic Hydrocarbons	ND(33)	ND(36)	ND(35)	ND(35)	ND(31)	ND(34)	---
Target PAH Analytes (Low-Level Detection Limits)							
Naphthalene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Acenaphthylene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Acenaphthene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Fluorene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Anthracene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Phenanthrene	**0.022**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Fluoranthene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Pyrene	**0.025**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Benz(a)anthracene	**0.019**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Chrysene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Benzo(b)fluoranthene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Benzo(k)fluoranthene	**0.011**	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Benzo(a)pyrene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Indeno(1,2,3-c,d)pyrene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Dibenzo(a,h)anthracene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Benzo(g,h,i)perylene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
2-Methylnaphthalene	ND(0.011)	ND(0.012)	ND(0.012)	ND(0.012)	ND(0.01)	ND(0.011)	---
Comparison to RBTCs							
Total PAH + EPH Fractions	**0.08**	**ND**	**ND**	**ND**	**ND**	**ND**	**222**
Total BaP Equivalents	**0.00**	**ND**	**ND**	**ND**	**ND**	**ND**	**0.35**

Notes:
1. Results in milligrams per kilogram (mg/kg).
2. ND (X) = constituent not detected above detection limit noted in parentheses.
3. BOLD exceeds laboratory detection limits.
4. EPH = Extractable Petroleum Hydrocarbons.
5. PAH = Polynuclear Aromatic Hydrocarbons.
6. BaP = Benzo(a)pyrene. Note that concentrations of carcinogenic PAH were converted into units equivalent to BaP to compare to RBTCs
7. RBTCs = Risk-Based Threshold Concentrations.

FIGURES



Legend

W1F-02 Segment

Segment Break

0 5 10 Miles

N

GeoInsight®
Environmental Strategy & Engineering
Practical in Nature

ENTRIX

Figure 1
Segment Location W1F-02
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Map Document: (J:\Arcview\7079607 - BuzzardsBaySpill\GeoinsightReport 1-05\Figure 1 W1F-02 7-30-07.mxd)

S:\GIS\Buzzard's Bay\RAO Leisure Shores - For Geoinsight\W1F-02.mxd

0 330 660 1,320 Feet

N

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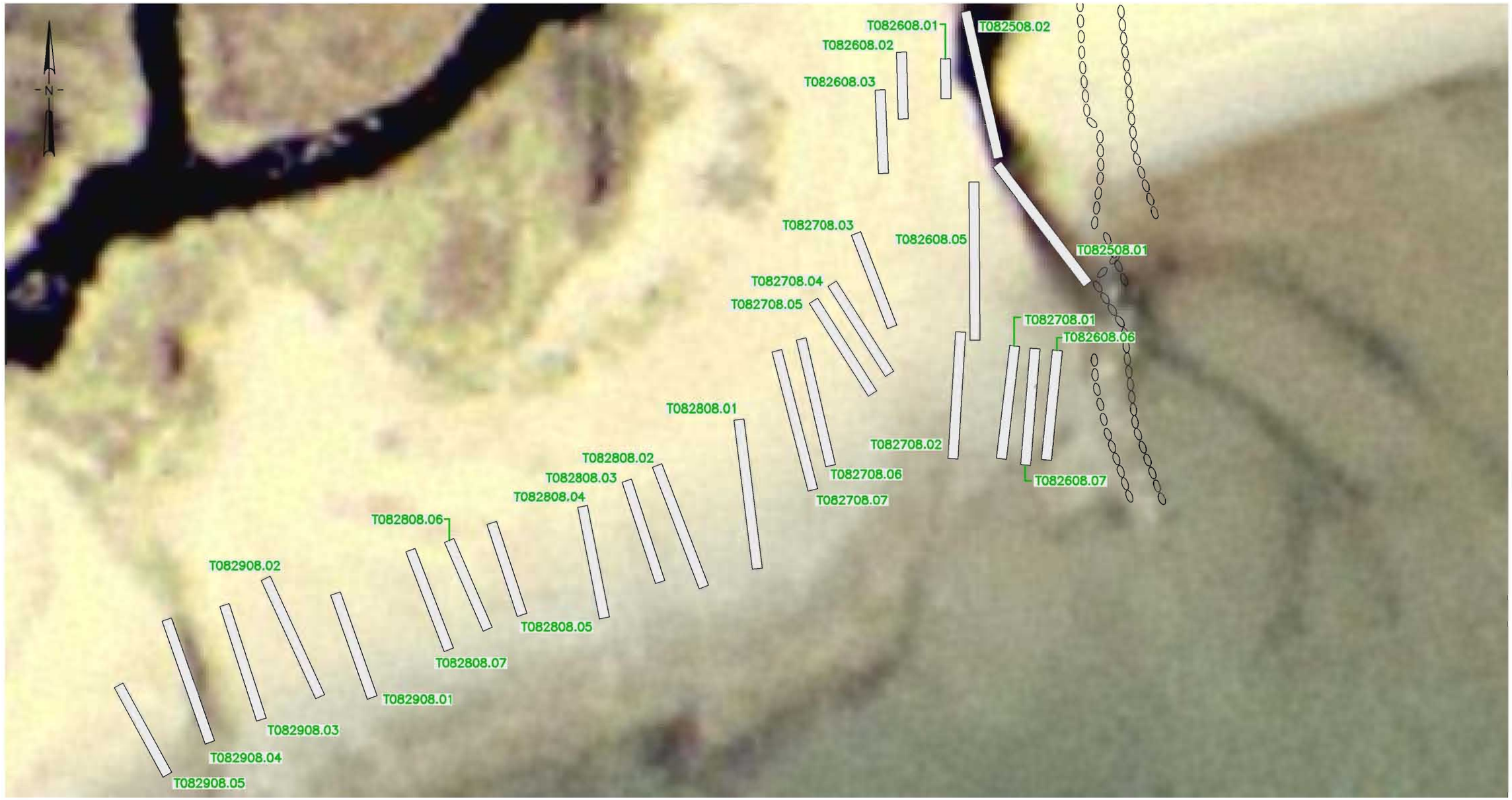
ENVIRONMENTAL CONSULTANTS

Figure 2
Segment Boundary W1F-02
Brandt Island West
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA



0 30 60

APPROX. SCALE IN FEET

CLIENT: B120 OIL SPILL			
PROJECT: WIF-02 MATTAPOISETT, MASSACHUSETTS			
TITLE: TEST PIT LOCATIONS – AUGUST 2008			
DESIGNED: RSE	DRAWN: NMT	CHECKED: KDT	APPROVED: KDT
SCALE: 1 = 30	DATE: 02/05/09	FILE NO.: 3871D037	PROJECT NO.: 3871-002

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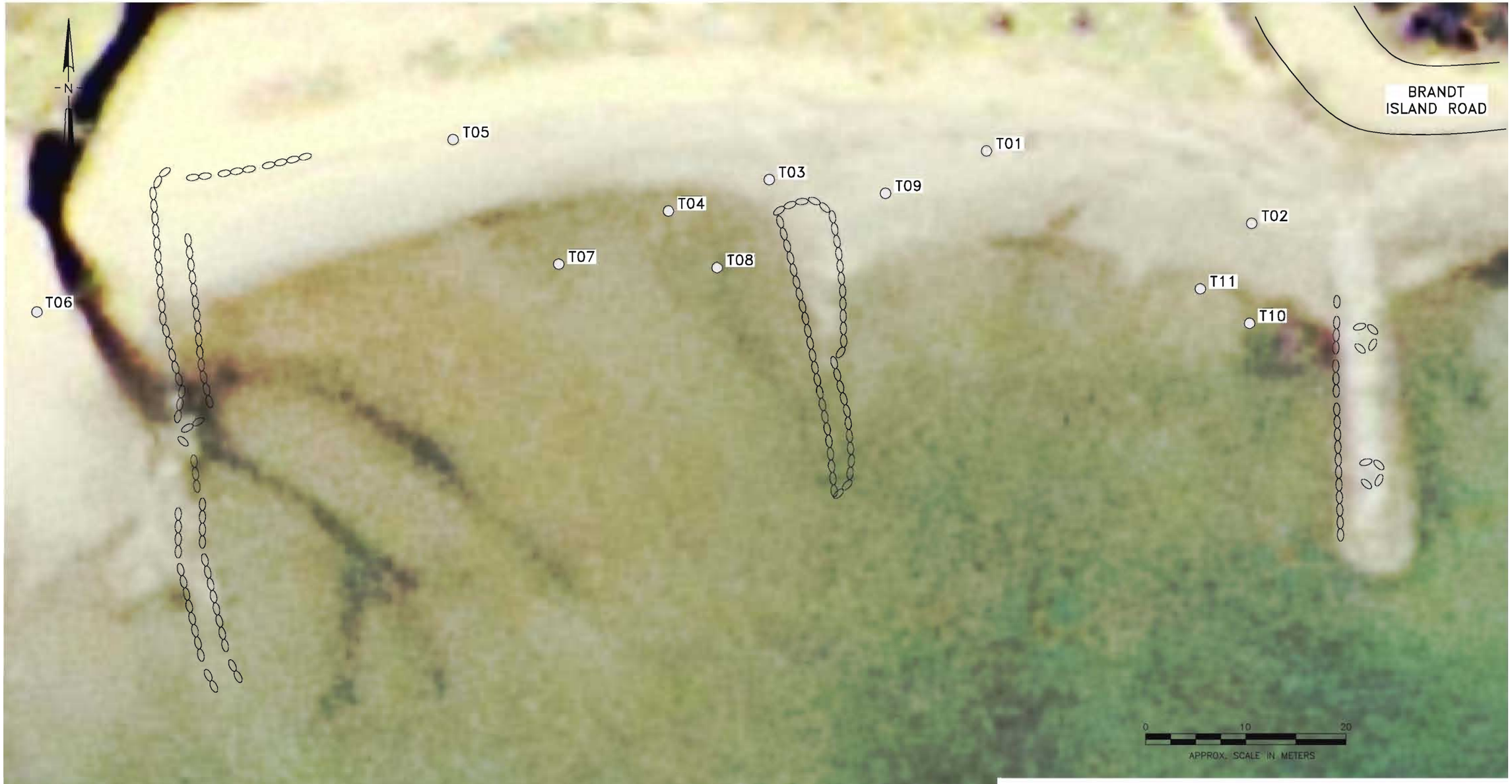
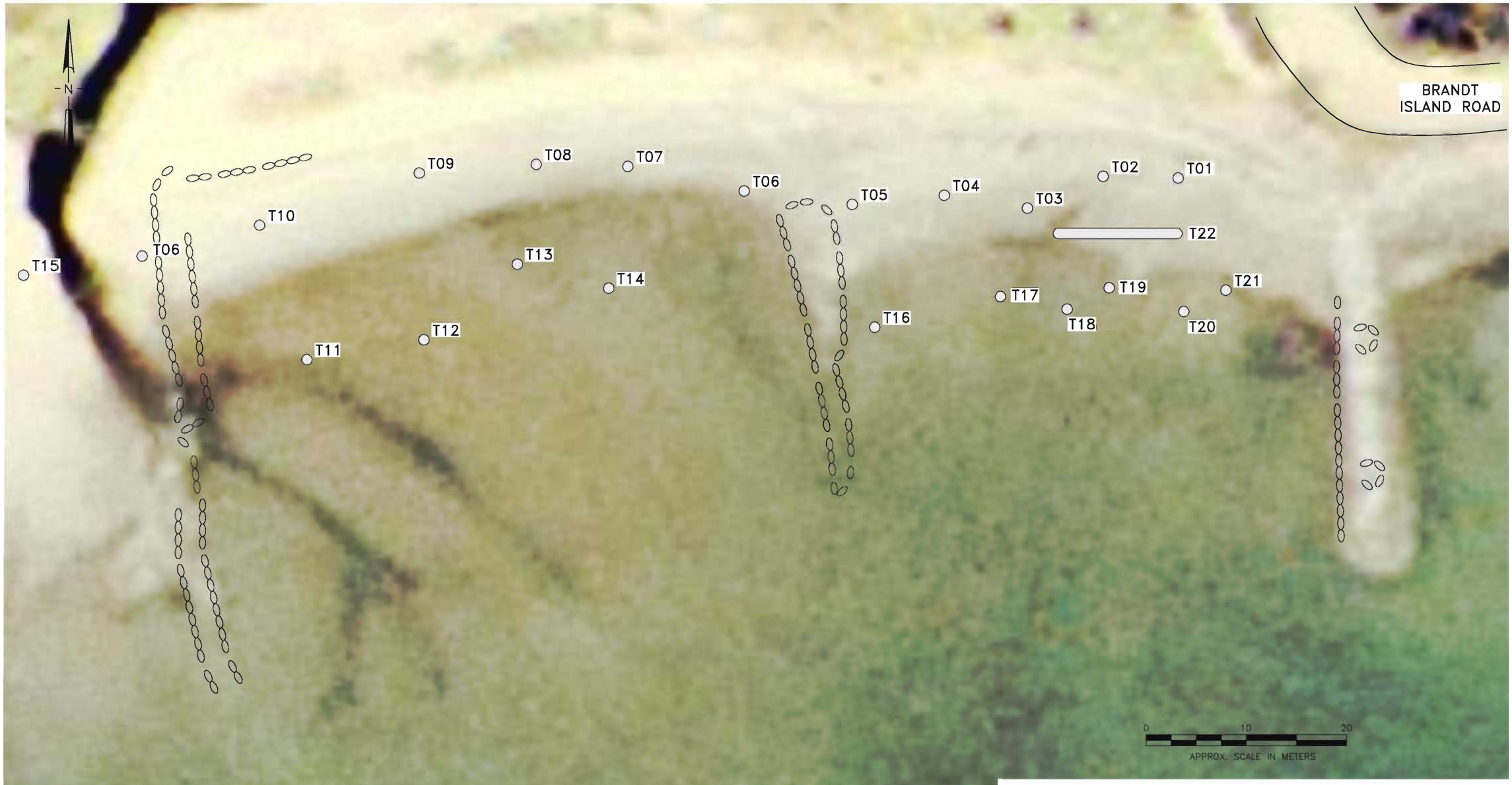
FIGURE NO.: 3

PLOT DATE: 3-30-09
FILE: C:\GEO\3871\3871d037.dwg



CLIENT: B120 OIL SPILL				
PROJECT: WIF-02 MATTAPOISETT, MASSACHUSETTS				
TITLE: TEST PIT LOCATIONS – SEPTEMBER 4, 2008				
DESIGNED: RSE	DRAWN: NMT	CHECKED: KDT	APPROVED: KDT	GeoInsight Practical in Nature
SCALE: 1 = 10	DATE: 01/26/09	FILE NO.: 3871D033	PROJECT NO.: 3871-002	FIGURE NO.: 4

PLOT DATE: 3-30-09
FILE: C:\GEO\3871\3871d033.dwg



CLIENT: B120 OIL SPILL				GeoInsight *Practical in Nature*
PROJECT: WIF-02 MATTAPOISETT, MASSACHUSETTS				
TITLE: TEST PIT LOCATIONS SEPTEMBER 30, 2008				
DESIGNED: RSE	DRAWN: NMT	CHECKED: KDT	APPROVED: KDT	
SCALE: 1 = 10	DATE: 02/17/09	FILE NO.: 3871D040	PROJECT NO.: 3871-002	FIGURE NO.: 5

PLOT DATE: 3-30-09
FILE: C:\GEO\3871\3871d040.dwg

0 20 40

APPROX. SCALE IN FEET

CLIENT: B120 OIL SPILL			
PROJECT: WIF-02 MATTAPOISETT, MASSACHUSETTS			
TITLE: TEST PIT LOCATIONS – OCTOBER 9, 2008			
DESIGNED: RSE	DRAWN: NMT	CHECKED: KDT	APPROVED: KDT
SCALE: 1" = 20'	DATE: 02/05/09	FILE NO.: 3871D038	PROJECT NO.: 3871-002

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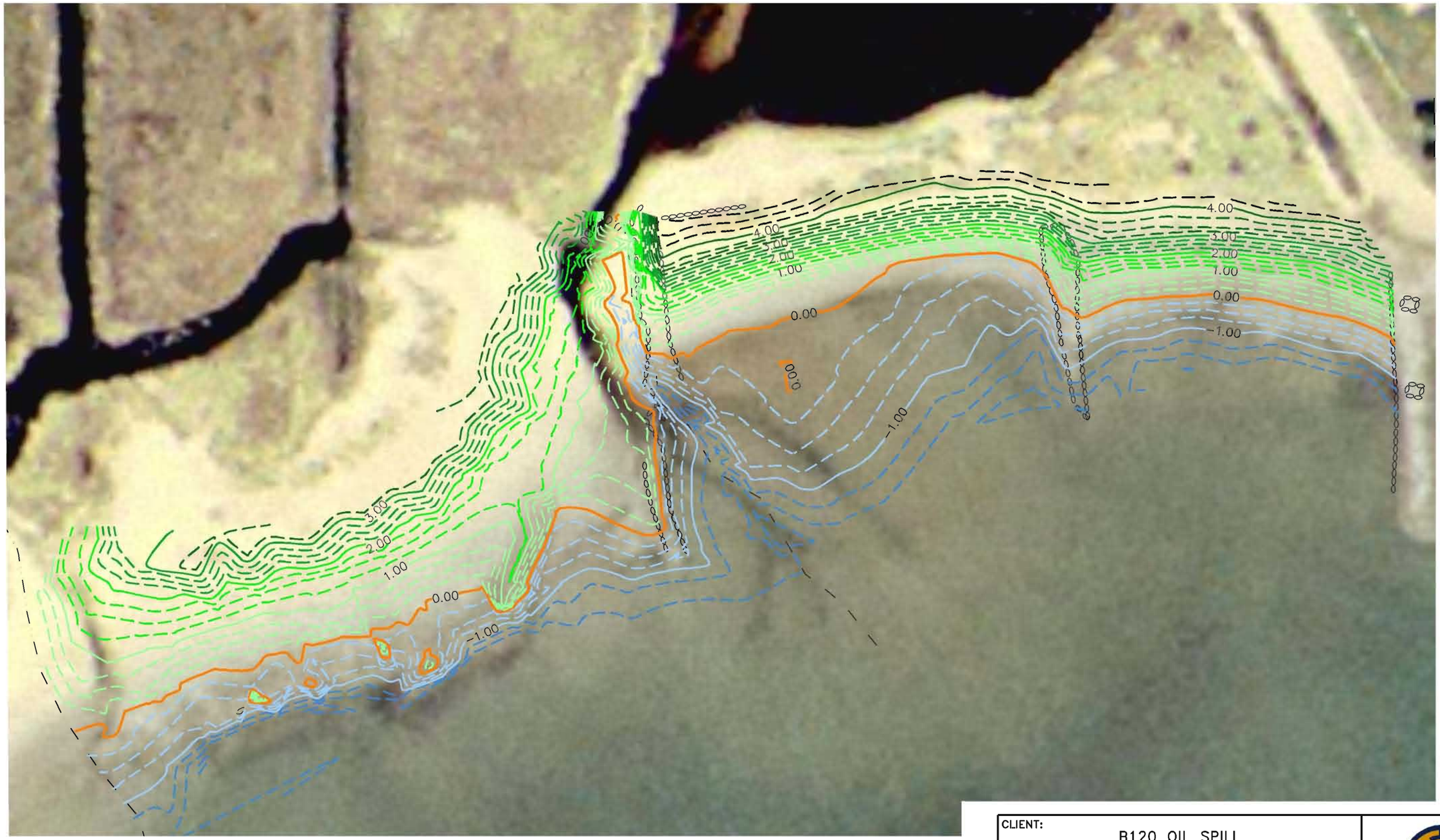
FIGURE NO.: 6

PLOT DATE: 3-30-09
FILE: C:\GEO\3871\3871d038.dwg



NOTES:

1. IMAGE FROM MASSGIS, 2001 AERIAL PHOTOGRAPH.

2. THE ELEVATIONS ARE IN FEET REFERENCED TO MEAN SEA LEVEL USING THE NGVD88 DATUM.

3. THE ORANGE CONTOUR LINE REPRESENTS MEAN SEA LEVEL. GREEN CONTOUR LINES REPRESENT ELEVATIONS ABOVE MEAN SEA LEVEL AND BLUE CONTOUR LINES REPRESENT ELEVATIONS BELOW MEAN SEA LEVEL.

0 50 100

APPROX. SCALE IN FEET

CLIENT: B120 OIL SPILL				
PROJECT: WIF-02 MATTAPOISETT, MASSACHUSETTS				
TITLE: SHORELINE PROFILE – JULY 11, 2008				
DESIGNED: RSE	DRAWN: NMT	CHECKED: KDT	APPROVED: KDT	GeoInsight Practical in Nature
SCALE: 1" = 50'	DATE: 01/26/09	FILE NO.: 3871D035	PROJECT NO.: 3871-002	FIGURE NO.: 7

PLOT DATE: 4-24-09
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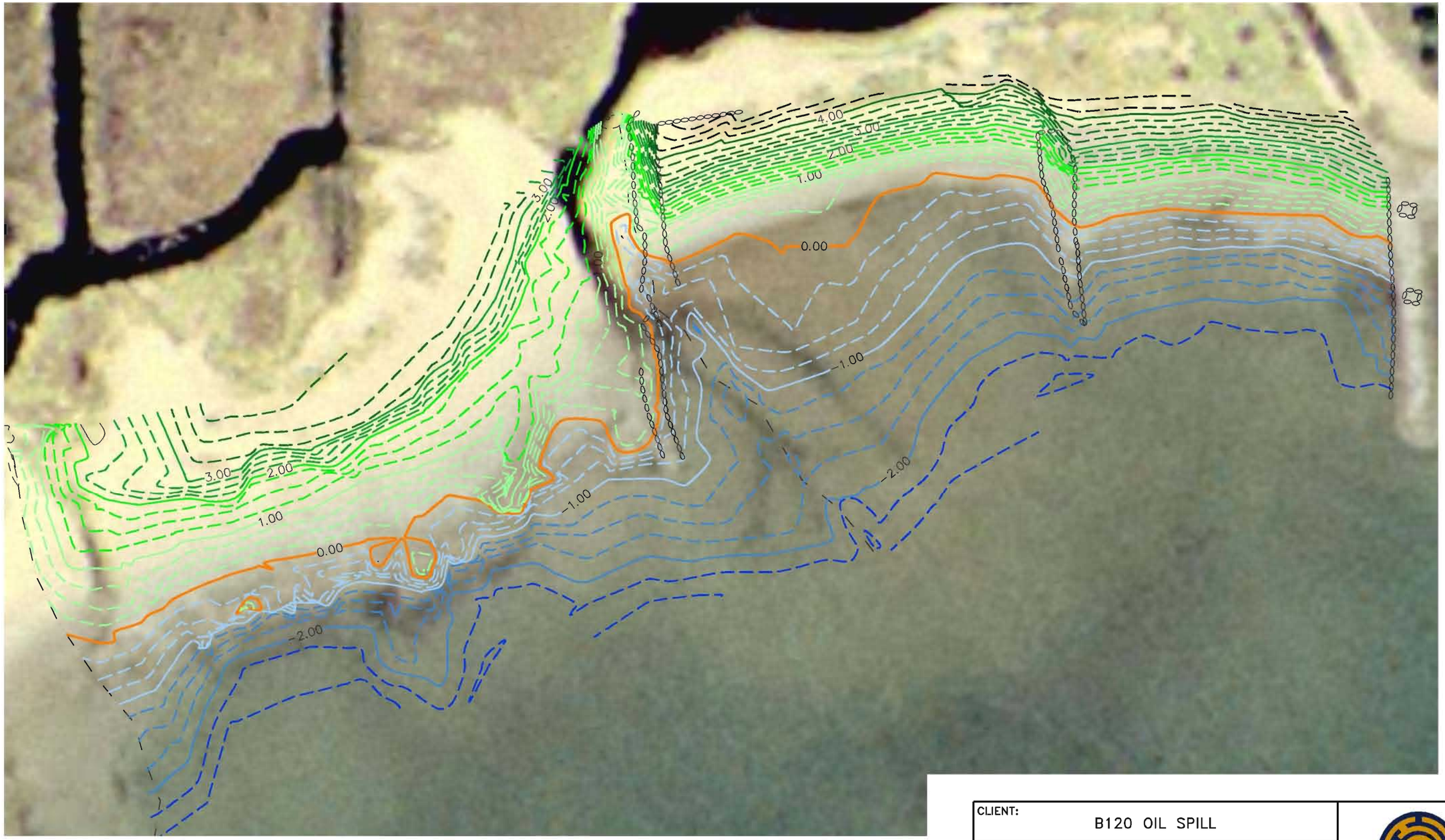


NOTES:

1. IMAGE FROM MASSGIS, 2001 AERIAL PHOTOGRAPH.

2. THE ELEVATIONS ARE IN FEET REFERENCED TO MEAN SEA LEVEL USING THE NGVD88 DATUM.

3. THE ORANGE CONTOUR LINE REPRESENTS MEAN SEA LEVEL. GREEN CONTOUR LINES REPRESENT ELEVATIONS ABOVE MEAN SEA LEVEL AND BLUE CONTOUR LINES REPRESENT ELEVATIONS BELOW MEAN SEA LEVEL.

0 50 100

APPROX. SCALE IN FEET

CLIENT: B120 OIL SPILL			
PROJECT: WIF-02 MATTAPOISETT, MASSACHUSETTS			
TITLE: SHORELINE PROFILE – OCTOBER 15, 2008			
DESIGNED: RSE	DRAWN: NMT	CHECKED: KDT	APPROVED: KDT
SCALE: 1" = 50'	DATE: 01/26/09	FILE NO.: 3871D036	PROJECT NO.: 3871-002

GeoInsight
Practical in Nature

FIGURE NO.: 8

PLOT DATE: 4-24-09
FILE: C:\GEO\3871\3871d036.dwg

APPENDICES

APPENDIX A
AUGUST 2008 PHOTOGRAPHS

INVESTIGATION AND CLEANUP ACTIVITIES – HOWARD'S BEACH
AUGUST 2008
B120 RELEASE
BUZZARDS BAY, MASSACHUSETTS

1. Test pit/trench excavation at Howard's Beach.

2. Rock/sediment screener.

3. Trench/test pit excavation.

4. Trench/test pit excavation.

5. Sheen with flecks on water surface in trench/test pit T082508.01.

6. Screening excavated material.

7. Material removed on August 25, 2008.

8. Material removed on August 26, 2008.

APPENDIX B

SEDIMENT/AQUEOUS ANALYTICAL RESULTS

Groundwater Analytical, Inc.
P.O. Box 1200
228 Main Street
Buzzards Bay, MA 02532

Telephone (508) 759-4441
FAX (508) 759-4475
www.groundwateranalytical.com

September 17, 2008

Mr. Kevin Trainer
GeoInsight, Inc.
5 Lan Drive
Second Floor
Westford, MA 01886

LABORATORY REPORT

Project: **Buzzards Bay/3871-002-18**
Lab ID: **119879**
Received: **09-04-08**

Dear Kevin:

Enclosed are the analytical results for the above referenced project. The project was processed for Standard turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC or NVLAP standards, except as may be specifically noted, or described in the project narrative. The analytical results relate only to the samples received. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Eric H. Jensen
Operations Manager

EHJ/ajh
Enclosures

GROUNDWATER ANALYTICAL

Sample Receipt Report

Project: **Buzzards Bay/3871-002-18**
Client: **GeoInsight, Inc.**
Lab ID: **119879**

Delivery: **Hand**
Airbill: **n/a**
Lab Receipt: **09-04-08**

Temperature: **14.7ºC**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-1	TP090408.01		Aqueous	9/4/08 14:50	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1106226	1 L Amber Glass	Proline	BX31466	H2SO4	R-5615F	08-25-08	09-02-08	
C1046936	1 L Amber Glass	Proline	BX30603	H2SO4	R-5615E	05-14-08	05-15-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-2	TP090408.02		Aqueous	9/4/08 15:05	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1046937	1 L Amber Glass	Proline	BX30603	H2SO4	R-5615E	05-14-08	05-15-08	
C1046933	1 L Amber Glass	Proline	BX30603	H2SO4	R-5615E	05-14-08	05-15-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-3	TP090408.03		Aqueous	9/4/08 15:35	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1046935	1 L Amber Glass	Proline	BX30603	H2SO4	R-5615E	05-14-08	05-15-08	
C1046934	1 L Amber Glass	Proline	BX30603	H2SO4	R-5615E	05-14-08	05-15-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-4	TP090408.04		Aqueous	9/4/08 15:50	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1106229	1 L Amber Glass	Proline	BX31466	H2SO4	R-5615F	08-25-08	09-02-08	
C1046938	1 L Amber Glass	Proline	BX30603	H2SO4	R-5615E	05-14-08	05-15-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-5	TP090408.05		Aqueous	9/4/08 16:00	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1106228	1 L Amber Glass	Proline	BX31466	H2SO4	R-5615F	08-25-08	09-02-08	
C1106225	1 L Amber Glass	Proline	BX31466	H2SO4	R-5615F	08-25-08	09-02-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-6	TP090408.06		Aqueous	9/4/08 16:30	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1111235	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	
C1111234	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-7	TP090408.07		Aqueous	9/4/08 17:00	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1111233	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	
C1111230	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-8	TP090408.08		Aqueous	9/4/08 17:10	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1111232	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	
C1111231	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-9	TP090408.09		Aqueous	9/4/08 17:40	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1111228	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	
C1111224	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	

GROUNDWATER ANALYTICAL

Sample Receipt Report (Continued)

Project:	**Buzzards Bay/3871-002-18**	Delivery:	**Hand**	Temperature:	**14.7ºC**
Client:	**GeoInsight, Inc.**	Airbill:	**n/a**	Chain of Custody:	**Present**
Lab ID:	**119879**	Lab Receipt:	**09-04-08**	Custody Seal(s):	**n/a**

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-10	TP090408.10		Aqueous	9/4/08 18:00	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1111226	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	
C1111225	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-11	TP090408.11		Aqueous	9/4/08 17:48	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1111229	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	
C1111227	1 L Amber Glass	Proline	BX31467	H2SO4	R-5615F	08-28-08	09-03-08	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-23	TP090408.01		Soil	9/4/08 14:50	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119448	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-24	TP090408.02		Soil	9/4/08 15:05	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119450	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-25	TP090408.03		Soil	9/4/08 15:35	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119449	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-26	TP090408.04		Soil	9/4/08 15:50	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119451	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-27	TP090408.05		Soil	9/4/08 16:00	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119452	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-28	TP090408.06		Soil	9/4/08 16:30	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119453	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-29	TP090408.07		Soil	9/4/08 17:00	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119454	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-30	TP090408.08		Soil	9/4/08 17:10	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119455	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

GROUNDWATER ANALYTICAL

Sample Receipt Report (Continued)

Project:	**Buzzards Bay/3871-002-18**	Delivery:	**Hand**	Temperature:	**14.7ºC**
Client:	**GeoInsight, Inc.**	Airbill:	**n/a**	Chain of Custody:	**Present**
Lab ID:	**119879**	Lab Receipt:	**09-04-08**	Custody Seal(s):	**n/a**

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-31	TP090408.09		Soil	9/4/08 17:40	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119456	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-32	TP090408.10		Soil	9/4/08 18:00	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119457	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

Lab ID	Field ID		Matrix	Sampled	Method			Notes
119879-33	TP090408.11		Soil	9/4/08 17:48	MA DEP EPH with PAHs by 8270C-Mod SIM			
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**	
C1119458	250 mL Amber Glass	n/a	n/a	None	n/a	n/a	n/a	

GROUNDWATER ANALYTICAL

Data Certification

Project:	**Buzzards Bay/3871-002-18**	Lab ID:	**119879**
Client:	**GeoInsight, Inc.**	Received:	**09-04-08 19:55**

MA DEP Compendium of Analytical Methods

Project Location: **n/a** MA DEP RTN: **n/a**

This Form provides certifications for the following data set:

MA DEP EPH: 119879-1,-2,-3,-4,-5,-6,-7,-8,-9,-10,-11,-23,-24,-25,-26,-27,-28,-29,-30,-31,-32,-33

Sample Matrices:	Groundwater (X)	Soil/Sediment (X)	Drinking Water ( )	Other ( )	
MCP SW-846	8260B ( )	8151A ( )	8330 ( )	6010B ( )	7470A/1A ( )
Methods Used	8270C ( )	8081A ( )	VPH ( )	6020A ( )	9012A[2] ( )
As specified in MA DEP Compendium of Analytical Methods.	8082 ( )	8021B ( )	EPH (X)	7000 S[3] ( )	Other ( )

1. List Release Tracking Number (RTN), if known.
2. SW-846 Method 9012A (Equivalent to 9014) or MA DEP Physiologically Available Cyanide (PAC) Method
3. S - SW-846 Methods 7000 Series. List individual method and analyte.

(check all that apply)

An affirmative response to questions A, B, C and D is required for "Presumptive Certainty" status.

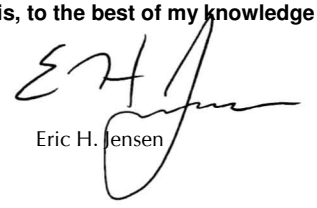
A.	Were all samples received by the laboratory in a condition consistent with that described on the Chain-of-Custody documentation for the data set?	Yes
B.	Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?	Yes
C.	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty," as described in Section 2.0 of the MA DEP document CAM VII A, *Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data* ?	No
D.	VPH and EPH methods only: Was the VPH or EPH method run without significant modifications, as specified in Section 11.3?	Yes

A response to questions E and F below is required for "Presumptive Certainty" status.

E.	Were all QC performance standards and recommendations for the specified methods achieved?	Yes
F.	Were results for all analyte-list compounds/elements for the specified method(s) reported?	Yes

All No answers are addressed in the attached Project Narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature:  Position: Operations Manager

Printed Name: Eric H. Jensen Date: 09-17-08

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.01**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-1**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 14:50**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**800 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 03:45**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 04:30**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	620
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	620
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	190
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	190

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	50	41	**83** %	40 - 140 %
	2-Bromonaphthalene	50	34	**67** %	40 - 140 %
Extraction:	Chloro-octadecane	50	46	**93** %	40 - 140 %
	ortho-Terphenyl	50	49	**98** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.01**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-01**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 14:50**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**800 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 09:33**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.6
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.6
208-96-8	Acenaphthylene	BRL		ug/L	0.6
83-32-9	Acenaphthene	BRL		ug/L	0.6
86-73-7	Fluorene	BRL		ug/L	0.6
85-01-8	Phenanthrene	BRL		ug/L	0.6
120-12-7	Anthracene	BRL		ug/L	0.6
206-44-0	Fluoranthene	BRL		ug/L	0.6
129-00-0	Pyrene	BRL		ug/L	0.6
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	50	47	**95** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.02**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-2**	QC Batch ID:	**EP-2115-F**
Sampled:	**09-04-08 15:05**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**930 mL**
Extracted:	**09-10-08 18:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-11-08 18:53**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-11-08 19:37**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	540
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	540
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	43	35	**81** %	40 - 140 %
	2-Bromonaphthalene	43	27	**63** %	40 - 140 %
Extraction:	Chloro-octadecane	43	36	**84** %	40 - 140 %
	ortho-Terphenyl	43	40	**94** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.02**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-02**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 15:05**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**860 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 10:13**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.6
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.6
208-96-8	Acenaphthylene	BRL		ug/L	0.6
83-32-9	Acenaphthene	BRL		ug/L	0.6
86-73-7	Fluorene	BRL		ug/L	0.6
85-01-8	Phenanthrene	BRL		ug/L	0.6
120-12-7	Anthracene	BRL		ug/L	0.6
206-44-0	Fluoranthene	BRL		ug/L	0.6
129-00-0	Pyrene	BRL		ug/L	0.6
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	47	45	**97** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.03**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-3**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 15:35**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**880 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 14:03**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 14:47**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	570
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	570
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	170
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	170

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	45	39	**87** %	40 - 140 %
	2-Bromonaphthalene	45	34	**74** %	40 - 140 %
Extraction:	Chloro-octadecane	45	40	**89** %	40 - 140 %
	ortho-Terphenyl	45	46	**101** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.03**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-03**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 15:35**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**880 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 10:54**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.6
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.6
208-96-8	Acenaphthylene	BRL		ug/L	0.6
83-32-9	Acenaphthene	BRL		ug/L	0.6
86-73-7	Fluorene	BRL		ug/L	0.6
85-01-8	Phenanthrene	BRL		ug/L	0.6
120-12-7	Anthracene	BRL		ug/L	0.6
206-44-0	Fluoranthene	BRL		ug/L	0.6
129-00-0	Pyrene	BRL		ug/L	0.6
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	45	45	**99** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.04**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-4**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 15:50**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**930 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 15:32**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 16:16**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	540
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	540
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	43	36	**83** %	40 - 140 %
	2-Bromonaphthalene	43	31	**71** %	40 - 140 %
Extraction:	Chloro-octadecane	43	34	**78** %	40 - 140 %
	ortho-Terphenyl	43	39	**92** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.04**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-04**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 15:50**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**930 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 11:34**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	43	40	**93** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.05**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-5**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 16:00**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**940 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 17:01**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 17:45**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	530
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	530
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	43	36	**85** %	40 - 140 %
	2-Bromonaphthalene	43	27	**62** %	40 - 140 %
Extraction:	Chloro-octadecane	43	35	**82** %	40 - 140 %
	ortho-Terphenyl	43	42	**99** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.05**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-05**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 16:00**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**940 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 12:15**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	43	42	**99** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.06**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-6**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 16:30**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**960 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 18:30**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 19:14**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	520
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	520
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	42	35	**83** %	40 - 140 %
	2-Bromonaphthalene	42	26	**63** %	40 - 140 %
Extraction:	Chloro-octadecane	42	36	**86** %	40 - 140 %
	ortho-Terphenyl	42	41	**97** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:
- BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
- † Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
- ◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.06**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-06**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 16:30**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**960 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 12:55**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	42	41	**98** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.07**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-7**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 17:00**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**920 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 19:59**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 20:43**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	540
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	540
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	43	37	**86** %	40 - 140 %
	2-Bromonaphthalene	43	30	**69** %	40 - 140 %
Extraction:	Chloro-octadecane	43	39	**90** %	40 - 140 %
	ortho-Terphenyl	43	43	**99** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed? Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes
3. Were any significant modifications made to the method, as specified in Section 11.3? No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.07**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-07**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 17:00**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**920 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 16:57**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	43	46	**106** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.08**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-8**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 17:10**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**910 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 21:28**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 22:12**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	550
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	550
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	44	37	**84** %	40 - 140 %
	2-Bromonaphthalene	44	30	**68** %	40 - 140 %
Extraction:	Chloro-octadecane	44	38	**87** %	40 - 140 %
	ortho-Terphenyl	44	43	**98** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.08**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-08**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 17:10**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**910 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 17:37**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	44	43	**98** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.09**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-9**	QC Batch ID:	**EP-2116-F**
Sampled:	**09-04-08 17:40**	Instrument ID:	**GC-7 HP 5890**
Received:	**09-04-08 19:55**	Sample Volume:	**940 mL**
Extracted:	**09-12-08 03:30**	Final Volume:	**1 mL**
Analyzed (AL):	**09-15-08 15:13**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-15-08 15:57**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	530
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	530
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	43	43	**101** %	40 - 140 %
	2-Bromonaphthalene	43	38	**89** %	40 - 140 %
Extraction:	Chloro-octadecane	43	37	**87** %	40 - 140 %
	ortho-Terphenyl	43	42	**99** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.09**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-09**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 17:40**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**930 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 18:17**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene		BRL	ug/L	0.5
91-57-6	2-Methylnaphthalene		BRL	ug/L	0.5
208-96-8	Acenaphthylene		BRL	ug/L	0.5
83-32-9	Acenaphthene		BRL	ug/L	0.5
86-73-7	Fluorene		BRL	ug/L	0.5
85-01-8	Phenanthrene		BRL	ug/L	0.5
120-12-7	Anthracene		BRL	ug/L	0.5
206-44-0	Fluoranthene		BRL	ug/L	0.5
129-00-0	Pyrene		BRL	ug/L	0.5
56-55-3	Benzo[a]anthracene	**0.3**		ug/L	0.1
218-01-9	Chrysene	**0.5**		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	**0.2**		ug/L	0.1
207-08-9	Benzo[k]fluoranthene		BRL	ug/L	0.1
50-32-8	Benzo[a]pyrene	**0.3**		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene		BRL	ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene		BRL	ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	**0.1**		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	43	39	**91** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.10**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-10**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 18:00**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**960 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-11-08 00:26**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-11-08 01:11**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	520
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	520
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	160
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	160

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	42	35	**85** %	40 - 140 %
	2-Bromonaphthalene	42	30	**73** %	40 - 140 %
Extraction:	Chloro-octadecane	42	37	**89** %	40 - 140 %
	ortho-Terphenyl	42	41	**99** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.10**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-10**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 18:00**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**960 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 18:57**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	42	41	**97** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.11**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-11**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 17:48**	Instrument ID:	**GC-9 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**890 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 12:34**	Aliphatic Dilution Factor:	**1**
Analyzed (AR):	**09-10-08 13:18**	Aromatic Dilution Factor:	**1**
Analyst:	**KMC**		

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	560
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	560
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	170
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	170

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	45	36	**80** %	40 - 140 %
	2-Bromonaphthalene	45	31	**68** %	40 - 140 %
Extraction:	Chloro-octadecane	45	41	**92** %	40 - 140 %
	ortho-Terphenyl	45	44	**97** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.11**	Matrix:	**Aqueous**
Project:	**Buzzards Bay/3871-002-18**	Container:	**1 L Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**H2SO4/ Cool**
Laboratory ID:	**119879-11**	QC Batch ID:	**EP-2114-F**
Sampled:	**09-04-08 17:48**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**890 mL**
Extracted:	**09-05-08 19:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 19:38**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.6
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.6
208-96-8	Acenaphthylene	BRL		ug/L	0.6
83-32-9	Acenaphthene	BRL		ug/L	0.6
86-73-7	Fluorene	BRL		ug/L	0.6
85-01-8	Phenanthrene	BRL		ug/L	0.6
120-12-7	Anthracene	BRL		ug/L	0.6
206-44-0	Fluoranthene	BRL		ug/L	0.6
129-00-0	Pyrene	BRL		ug/L	0.6
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	45	45	**100** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.01**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-23**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 14:50**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 17:39**	% Solids:	**92**
Analyzed (AR):	**09-09-08 18:25**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	32
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	32
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	32
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	32

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.8	2.5	**89** %	40 - 140 %
	2-Bromonaphthalene	2.8	2.2	**78** %	40 - 140 %
Extraction:	Chloro-octadecane	2.8	2.5	**89** %	40 - 140 %
	ortho-Terphenyl	2.8	3.0	**106** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.01**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-23**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 14:50**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 21:38**	Percent Solids:	**91.974**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	11
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	11
208-96-8	Acenaphthylene	BRL		ug/Kg	11
83-32-9	Acenaphthene	BRL		ug/Kg	11
86-73-7	Fluorene	BRL		ug/Kg	11
85-01-8	Phenanthrene	BRL		ug/Kg	11
120-12-7	Anthracene	BRL		ug/Kg	11
206-44-0	Fluoranthene	BRL		ug/Kg	11
129-00-0	Pyrene	BRL		ug/Kg	11
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	11
218-01-9	Chrysene	BRL		ug/Kg	11
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	11
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	11
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	11
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	11
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	11
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	11

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,800	2,900	**102** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.02**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-24**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 15:05**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 19:11**	% Solids:	**88**
Analyzed (AR):	**09-09-08 19:57**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	33
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	33
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	33
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	33

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.0	2.4	**80** %	40 - 140 %
	2-Bromonaphthalene	3.0	2.0	**67** %	40 - 140 %
Extraction:	Chloro-octadecane	3.0	2.5	**86** %	40 - 140 %
	ortho-Terphenyl	3.0	2.8	**95** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.02**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-24**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 15:05**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 22:19**	Percent Solids:	**88.466**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	11
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	11
208-96-8	Acenaphthylene	BRL		ug/Kg	11
83-32-9	Acenaphthene	BRL		ug/Kg	11
86-73-7	Fluorene	BRL		ug/Kg	11
85-01-8	Phenanthrene	BRL		ug/Kg	11
120-12-7	Anthracene	BRL		ug/Kg	11
206-44-0	Fluoranthene	BRL		ug/Kg	11
129-00-0	Pyrene	BRL		ug/Kg	11
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	11
218-01-9	Chrysene	BRL		ug/Kg	11
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	11
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	11
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	11
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	11
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	11
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	11

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,000	2,700	**91** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.03**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-25**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 15:35**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 19:03**	% Solids:	**82**
Analyzed (AR):	**09-09-08 19:49**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	35
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	35
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	35
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	35

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.1	2.7	**86** %	40 - 140 %
	2-Bromonaphthalene	3.1	2.1	**68** %	40 - 140 %
Extraction:	Chloro-octadecane	3.1	2.7	**85** %	40 - 140 %
	ortho-Terphenyl	3.1	3.1	**97** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.03**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-25**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 15:35**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 22:59**	Percent Solids:	**82.193**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	BRL		ug/Kg	12
129-00-0	Pyrene	BRL		ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,100	3,000	**94** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.04**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-26**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 15:50**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 20:35**	% Solids:	**84**
Analyzed (AR):	**09-09-08 21:21**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	34
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	34
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	34
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	34

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.0	2.2	**72** %	40 - 140 %
	2-Bromonaphthalene	3.0	2.1	**68** %	40 - 140 %
Extraction:	Chloro-octadecane	3.0	2.3	**77** %	40 - 140 %
	ortho-Terphenyl	3.0	2.5	**82** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.04**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-26**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 15:50**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-09-08 23:39**	Percent Solids:	**84.414**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	11
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	11
208-96-8	Acenaphthylene	BRL		ug/Kg	11
83-32-9	Acenaphthene	BRL		ug/Kg	11
86-73-7	Fluorene	BRL		ug/Kg	11
85-01-8	Phenanthrene	BRL		ug/Kg	11
120-12-7	Anthracene	BRL		ug/Kg	11
206-44-0	Fluoranthene	BRL		ug/Kg	11
129-00-0	Pyrene	BRL		ug/Kg	11
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	11
218-01-9	Chrysene	BRL		ug/Kg	11
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	11
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	11
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	11
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	11
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	11
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	11

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,000	2,400	**78** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.05**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-27**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 16:00**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 22:07**	% Solids:	**85**
Analyzed (AR):	**09-09-08 22:53**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	34
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	34
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	34
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	34

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.0	2.7	**91** %	40 - 140 %
	2-Bromonaphthalene	3.0	2.4	**80** %	40 - 140 %
Extraction:	Chloro-octadecane	3.0	2.4	**82** %	40 - 140 %
	ortho-Terphenyl	3.0	3.1	**103** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.05**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-27**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 16:00**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-10-08 00:20**	Percent Solids:	**85.119**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	11
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	11
208-96-8	Acenaphthylene	BRL		ug/Kg	11
83-32-9	Acenaphthene	BRL		ug/Kg	11
86-73-7	Fluorene	BRL		ug/Kg	11
85-01-8	Phenanthrene	BRL		ug/Kg	11
120-12-7	Anthracene	BRL		ug/Kg	11
206-44-0	Fluoranthene	BRL		ug/Kg	11
129-00-0	Pyrene	BRL		ug/Kg	11
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	11
218-01-9	Chrysene	BRL		ug/Kg	11
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	11
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	11
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	11
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	11
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	11
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	11

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,000	2,700	**90** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.06**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-28**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 16:30**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 23:39**	% Solids:	**88**
Analyzed (AR):	**09-10-08 00:26**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	33
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	33
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	33
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	33

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.0	2.5	**84** %	40 - 140 %
	2-Bromonaphthalene	3.0	2.0	**66** %	40 - 140 %
Extraction:	Chloro-octadecane	3.0	2.5	**83** %	40 - 140 %
	ortho-Terphenyl	3.0	2.9	**99** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.06**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-28**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 16:30**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-10-08 01:00**	Percent Solids:	**88.169**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	11
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	11
208-96-8	Acenaphthylene	BRL		ug/Kg	11
83-32-9	Acenaphthene	BRL		ug/Kg	11
86-73-7	Fluorene	BRL		ug/Kg	11
85-01-8	Phenanthrene	**22**		ug/Kg	11
120-12-7	Anthracene	BRL		ug/Kg	11
206-44-0	Fluoranthene	**25**		ug/Kg	11
129-00-0	Pyrene	**19**		ug/Kg	11
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	11
218-01-9	Chrysene	BRL		ug/Kg	11
205-99-2	Benzo[b]fluoranthene	**11**		ug/Kg	11
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	11
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	11
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	11
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	11
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	11

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,000	2,700	**93** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.07**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-29**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:00**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 01:12**	% Solids:	**81**
Analyzed (AR):	**09-10-08 01:58**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	36
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	36
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	36
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	36

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.2	2.8	**87** %	40 - 140 %
	2-Bromonaphthalene	3.2	1.9	**59** %	40 - 140 %
Extraction:	Chloro-octadecane	3.2	2.7	**84** %	40 - 140 %
	ortho-Terphenyl	3.2	3.2	**100** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed? Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved? Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1? No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.
† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.
◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.07**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-29**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:00**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-10-08 01:41**	Percent Solids:	**81.312**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	BRL		ug/Kg	12
129-00-0	Pyrene	BRL		ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,200	3,000	**92** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.08**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-30**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:10**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-10-08 02:44**	% Solids:	**85**
Analyzed (AR):	**09-10-08 03:30**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	35
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	35
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	35
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	35

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.1	2.8	**92** %	40 - 140 %
	2-Bromonaphthalene	3.1	2.1	**70** %	40 - 140 %
Extraction:	Chloro-octadecane	3.1	2.7	**87** %	40 - 140 %
	ortho-Terphenyl	3.1	3.3	**107** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.08**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-30**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:10**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**15 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-10-08 02:21**	Percent Solids:	**84.728**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	BRL		ug/Kg	12
129-00-0	Pyrene	BRL		ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,100	2,800	**91** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.09**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-31**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:40**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 20:43**	% Solids:	**82**
Analyzed (AR):	**09-09-08 21:29**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	35
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	35
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	35
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	35

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.1	2.5	**79** %	40 - 140 %
	2-Bromonaphthalene	3.1	2.0	**62** %	40 - 140 %
Extraction:	Chloro-octadecane	3.1	2.5	**79** %	40 - 140 %
	ortho-Terphenyl	3.1	3.0	**95** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.09**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-31**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:40**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-10-08 03:02**	Percent Solids:	**81.542**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	12
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	12
208-96-8	Acenaphthylene	BRL		ug/Kg	12
83-32-9	Acenaphthene	BRL		ug/Kg	12
86-73-7	Fluorene	BRL		ug/Kg	12
85-01-8	Phenanthrene	BRL		ug/Kg	12
120-12-7	Anthracene	BRL		ug/Kg	12
206-44-0	Fluoranthene	BRL		ug/Kg	12
129-00-0	Pyrene	BRL		ug/Kg	12
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	12
218-01-9	Chrysene	BRL		ug/Kg	12
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	12
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	12
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	12
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	12
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	12
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	12

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,100	2,800	**91** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.10**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-32**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 18:00**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 22:15**	% Solids:	**93**
Analyzed (AR):	**09-09-08 23:01**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	31
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	31
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	31
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	31

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.8	2.2	**80** %	40 - 140 %
	2-Bromonaphthalene	2.8	2.0	**72** %	40 - 140 %
Extraction:	Chloro-octadecane	2.8	2.4	**87** %	40 - 140 %
	ortho-Terphenyl	2.8	2.7	**97** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.10**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-32**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 18:00**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-10-08 03:42**	Percent Solids:	**93.029**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	10
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	10
208-96-8	Acenaphthylene	BRL		ug/Kg	10
83-32-9	Acenaphthene	BRL		ug/Kg	10
86-73-7	Fluorene	BRL		ug/Kg	10
85-01-8	Phenanthrene	BRL		ug/Kg	10
120-12-7	Anthracene	BRL		ug/Kg	10
206-44-0	Fluoranthene	BRL		ug/Kg	10
129-00-0	Pyrene	BRL		ug/Kg	10
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	10
218-01-9	Chrysene	BRL		ug/Kg	10
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	10
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	10
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	10
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	10
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	10

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	2,800	2,600	**94** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Massachusetts DEP EPH Method
Extractable Petroleum Hydrocarbons by GC/FID

Field ID:	**TP090408.11**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-33**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:48**	Instrument ID:	**GC-12 Agilent 6890**
Received:	**09-04-08 19:55**	Sample Weight:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed (AL):	**09-09-08 23:47**	% Solids:	**84**
Analyzed (AR):	**09-10-08 00:34**	Aliphatic Dilution Factor:	**1**
Analyst:	**KMC**	Aromatic Dilution Factor:	**1**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	34
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	34
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	34
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	34

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	3.0	2.4	**80** %	40 - 140 %
	2-Bromonaphthalene	3.0	1.7	**57** %	40 - 140 %
Extraction:	Chloro-octadecane	3.0	2.3	**76** %	40 - 140 %
	ortho-Terphenyl	3.0	2.8	**93** %	40 - 140 %

QA/QC Certification

1. Were all QA/QC procedures required by the method followed?	Yes
2. Were all performance/acceptance standards for the required QA/QC procedures achieved?	Yes
3. Were any significant modifications made to the method, as specified in Section 11.3.1.1?	No

Method non-conformances indicated above are detailed below on this data report, or in the accompanying project narrative and project quality control report. Release of this data is authorized by the accompanying signed project cover letter. The accompanying cover letter, project narrative and quality control report are considered part of this data report.

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique. Results are reported on a dry weight basis.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

EPA Method 8270C (Modified)
MA DEP EPH Polynuclear Aromatic Hydrocarbons by GC/MS-SIM

Field ID:	**TP090408.11**	Matrix:	**Soil**
Project:	**Buzzards Bay/3871-002-18**	Container:	**250 mL Amber Glass**
Client:	**GeoInsight, Inc.**	Preservation:	**Cool**
Laboratory ID:	**119879-33**	QC Batch ID:	**EP-2854-M**
Sampled:	**09-04-08 17:48**	Instrument ID:	**MS-6 HP 6890**
Received:	**09-04-08 19:55**	Sample Volume:	**16 g**
Extracted:	**09-08-08 21:00**	Final Volume:	**1 mL**
Analyzed:	**09-10-08 04:22**	Percent Solids:	**83.875**
Analyst:	**MJB**	Dilution Factor:	**1**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	11
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	11
208-96-8	Acenaphthylene	BRL		ug/Kg	11
83-32-9	Acenaphthene	BRL		ug/Kg	11
86-73-7	Fluorene	BRL		ug/Kg	11
85-01-8	Phenanthrene	BRL		ug/Kg	11
120-12-7	Anthracene	BRL		ug/Kg	11
206-44-0	Fluoranthene	BRL		ug/Kg	11
129-00-0	Pyrene	BRL		ug/Kg	11
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	11
218-01-9	Chrysene	BRL		ug/Kg	11
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	11
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	11
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	11
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	11
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	11
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	11

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho- Terphenyl	3,000	2,800	**91** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546. Results are reported on a dry weight basis.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Project Narrative

Project:	**Buzzards Bay/3871-002-18**	Lab ID:	**119879**
Client:	**GeoInsight, Inc.**	Received:	**09-04-08 19:55**

A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1 . No documentation discrepancies, changes, or amendments were noted.

B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1 . Project Non-conformance. Project 119879 was received at a temperature of 14.7ºC. This measurement is outside the recommended range of 2-6'C.

2 . MA DEP EPH Note: Samples 119879-1,-2,-3,-4,-5,-6,-7,-8,-9,-10,-11,-23,-24,-25,-26,-27,-28,-29,-30,-31,-32,-33. Polynuclear aromatic hydrocarbon (PAH) target analytes were identified and quantified by GC/MS-SIM, in accordance with the method provision for alternate determinative methodologies. GC/MS-SIM was used to achieve low quantification limits necessary for regulatory compliance. Target analytes were determined utilizing the same sample extract used for carbon range determination by GC/FID.

GROUNDWATER ANALYTICAL

228 Main Street, P.O. Box 1200
Buzzards Bay, MA 02532
Telephone (508) 759-4441 • FAX (508) 759-4475
www.groundwateranalytical.com

CHAIN-OF-CUSTODY RECORD AND WORK ORDER

Page 1 of 2

Project Name: Buzzards Bay	Firm: GeoInsight
Project Number: 3871-002-18	Address: 5 Lan Drive, Suite 2000
Sampler Name: Kevin Trainer	City / State / Zip: Westford, MA 01886
Project Manager: Kevin Trainer	Telephone: 978-692-1114

INSTRUCTIONS: Use separate line for each container (except replicates).

TURNAROUND

- [X] STANDARD (10 Business Days)
- [ ] PRIORITY (5 Business Days)
- [ ] RUSH (RAN- _____)
  (Rush requires Rush Authorization Number)
- [X] Please Email to: kdtrainer@geoinc.com
- [ ] Please FAX to: _____

BILLING

- [ ] Purchase Order No.: _____
- [ ] Third Party Billing: _____
- [ ] GWA Quote: _____

ANALYSIS REQUEST

OPTIONS: Volatiles: ☐ TIC Scan; Semivolatiles: ☐ Acid Only ☐ B/N Only ☐ TIC Search; Pest/Herb/PCBs Extractable: ☐ Acid Only ☐ B/N Only ☐ TIC Search; Vol.: ☐ Acid Only ☐ B/N Only ☐ TIC Search; Metals: Specify For Water Samples ☐ Total ☐ Dissolved

SDWA: ☐ 524.2+MTBE; ☐ 525.2; ☐ 505 ☐ 508; ☐ 531.1; ☐ 515.1; ☐ 504.1 EDB/DBCP; ☐ Lead and Copper

NPDES: ☐ 624; ☐ 624+MTBE; ☐ 601; ☐ 601/602+MTBE; ☐ 625; ☐ 625 PAHs only; ☐ 608 Pesticides; ☐ 608 PCBs; ☐ 615; ☐ 13 Priority Pollutant

RCRA/21E: ☐ 8260B TCL+MTBE; ☐ 8260B NH PETROLEUM; ☐ 8260B; ☐ 8021B Aromatics; ☐ 8021B Halocarbons; ☐ 8021B; ☐ 8270C; ☐ 8270C PAHs only; ☐ 8081A Pesticides; ☐ 8082 PCBs; ☐ 8151A Herbicides; ☐ 8011 EDB/DBCP; ☐ 8 RCRA; ☐ 8 RCRA; ☐ MA List Metals; ☐ 23 TAL; ☐ Specify:

Petroleum Hydrocarbon Ext. TPH: ☐ TPH-IR; ☐ Diesel Range Organics (DRO) ☐ ME DRO; ☐ CT ETPH; ☐ MA DEP EPH w/all targets ☐ EPH Carbon Ranges only ☐ EPH w/4 PAHs; ☐ Hydrocarbon Fingerprint (GC/FID by ASTM D3328-00 Mod.); Vol. TPH: ☐ TPH by GC/FID (8015B Mod) Quantitative Only; ☐ Gasoline Range Organics (GRO) ☐ ME GRO; ☐ MA DEP VPH w/all targets ☐ VPH Carbon ranges only

Haz. Waste: ☐ TCLP ☐ SPLP ☐ 8 Metals ☐ Pb only ☐ VOA ☐ Semi VOA ☐ Pesticides ☐ Herbicides; ☐ Corrosivity (as pH) ☐ Reactivity ☐ Ignitability (as Flashpoint) ☐ Paint Filter; ☐ MA Basic Disposal Criteria: 8260B, TPH by GC, PCBs, 5 Metals, Corrosivity, Ignitability, Reactivity

General Chemistry: ☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Fluoride ☐ Sulfate; ☐ Dissolved Phosphorus; ☐ Ammonia ☐ TKN ☐ Total Phosphorus ☐ Total N (as N02/N03/TKN); ☐ Oil & Grease; ☐ COD ☐ TOC; ☐ BOD ☐ TDS ☐ TSS ☐ TS ☐ Alkalinity; ☐ Cyanide, Total ☐ Cyanide, Physiologically Available; ☐ pH ☐ Dissolved Oxygen ☐ Turbidity; ☐ Total Coliform ☐ Fecal Coliform ☐ HPC

Sampling DATE	Sampling TIME	SAMPLE IDENTIFICATION	Matrix: GROUNDWATER	DRINKING WATER	WASTEWATER	SOIL	OTHER SOLID	OIL/ORGANIC LIQUID	Type: COMPOSITE	GRAB	Container(s): NUMBER	40mL VOA Vial	60ml./2 oz Glass	120ml./4 oz Amber Glass	250mL/8 oz Glass	500mL/16 oz Glass	1L/32 oz Amber Glass	250mL/8 oz Plastic	500mL/16 oz Plastic	1L/32 oz Plastic	120mL Sterile	Preservation: HCl	HNO3	H2SO4	NaOH	Methanol	Sodium Bisulfate	ICE	Filtered: YES	NO	LABORATORY NUMBER (Lab Use Only)
9/4/08	2:50	TP090408.01	X							X	2						X							X				X		
9/4/08	2:50	TP090408.01				X				X	1				X													X			
9/4/08	3:05	TP090408.02	X							X	2						X							X				X			
9/4/08	3:05	TP090408.02				X				X	1				X													X			
9/4/08	3:35	TP090408.03	X							X	2						X							X				X			
9/4/08	3:35	TP090408.03				X				X	1				X													X			
9/4/08	3:50	TP090408.04	X							X	2						X							X				X			
9/4/08	3:50	TP090408.04				X				X	1				X													X			
9/4/08	4:00	TP090408.05	X							X	2						X							X				X			
9/4/08	4:00	TP090408.05				X				X	1				X													X			
9/4/08	4:30	TP090408.06	X							X	2						X							X				X			
9/4/08	4:30	TP090408.06				X				X	1				X													X			

REMARKS / SPECIAL INSTRUCTIONS

MA DEP MCP Data Enhancement Affirmation

- ☐ YES ☐ NO MCP Data Certification required.
- ☐ YES ☐ NO MCP Drinking Water Sample included.

(Require collection of contingent duplicate sample. Trip blanks are also required, if VOA sample collected).

Signature: _____

Note: Must use SIM + achieve low-ppb level detection limits for soil and water samples

DATA QUALITY OBJECTIVES

Regulatory Program

State	Standard	Deliverables
☐ CT	[X] MCP GW-1/S-1	☐ PWS Form
☐ ME	☐ MCP GW-2/S-2	☐ MWRA
☐ MA	☐ NY STARS	☐ _____
☐ NH	☐ Drinking Water	
☐ NY	☐ Wastewater	
☐ RI	☐ Waste Disposal	
☐ VT	☐ Dredge Material	
☐ ___	☐ _____	

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. **Each MS, MSD and Sample Duplicate requires an additional sample aliquot.**

Project Specific QC Required	Selection of QC Sample
☐ Sample Duplicate	☐ Please use sample:
☐ Matrix Spike	_____
☐ Matrix Spike Duplicate	

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

	Date	Time		
Relinquished by Sampler:	9/4/08	1955	Received by: Kimberly Crowley	Receipt Temperature: 14.7 [X] Ice ☐ Refrigerated 2-6°C Recommended
Relinquished by:	Date	Time	Received by:	Container Count:
Relinquished by:	Date	Time	Received by Laboratory:	Shipping/Airbill Number:

Method of Shipment: ☐ GWA Courier ☐ Express Mail ☐ Federal Express ☐ UPS [X] Hand ☐ _____

Custody Seal Number:

GROUNDWATER ANALYTICAL
228 Main Street, P.O. Box 1200
Buzzards Bay, MA 02532
Telephone (508) 759-4441 • FAX (508) 759-4475
www.groundwateranalytical.com

CHAIN-OF-CUSTODY RECORD AND WORK ORDER

Project Name: Buzzards Bay	Firm: GeoInsight
Project Number: 3871-002-18	Address: 5 Lan Drive, Suite 200
Sampler Name: Kevin Trainer	City / State / Zip: Westford, MA 01886
Project Manager: Kevin Trainer	Telephone: 978-692-1114

INSTRUCTIONS: Use separate line for each container (except replicates).

TURNAROUND

- ☒ STANDARD (10 Business Days)
- ☐ PRIORITY (5 Business Days)
- ☐ RUSH (RAN- _____)
  (Rush requires Rush Authorization Number)
- ☒ Please Email to: ktrainer@geoinsight.com
- ☐ Please FAX to: _____

BILLING

- ☐ Purchase Order No.: _____
- ☐ Third Party Billing: _____
- ☐ GWA Quote: _____

ANALYSIS REQUEST

OPTIONS
- Volatiles: ☐ TIC Search
- Semivolatiles: ☐ Acid Only ☐ BAN Only ☐ TIC Search
- Pest/Herb/PCBs Extractable: ☐ Vol.
- Metals: Specify For Water Samples ☐ Total ☐ Dissolved
- Petroleum Hydrocarbon Ext. TPH: ☐ Vol. TPH
- Haz. Waste
- General Chemistry
- Other

SDWA
- Volatiles: ☐ 524.2+MTBE
- Semivolatiles: ☐ 525.2
- Pest/Herb/PCBs Extractable: ☐ 505 ☐ 508
- Pest/Herb/PCBs Vol.: ☐ 531.1 ☐ 515.1 ☐ 504.1 EDB/DBCP
- Metals: ☐ Lead and Copper

NPDES
- Volatiles: ☐ 624 ☐ 602+MTBE ☐ 601 ☐ 601/602+MTBE
- Semivolatiles: ☐ 625 ☐ 625 PAHs only
- Pest/Herb/PCBs Extractable: ☐ 608 Pesticides ☐ 608 PCBs
- Pest/Herb/PCBs Vol.: ☐ 615
- Metals: ☐ 13 Priority Pollutant

RCRA/21E
- Volatiles: ☐ 8260B TCL+MTBE ☐ 8260B NH PETROLEUM ☐ 8260B ☐ 8021B Aromatics ☐ 8021B Halocarbons ☐ 8021B
- Semivolatiles: ☐ 8270C ☐ 8270C PAHs only
- Pest/Herb/PCBs Extractable: ☐ 8081A Pesticides ☐ 8082 PCBs
- Pest/Herb/PCBs Vol.: ☐ 8151A Herbicides ☐ 8011 EDB/DBCP
- Metals: ☐ 8 RCRA ☐ 5 RCRA ☐ MA List Metals ☐ 23 TAL ☐ Specify:
- Petroleum Hydrocarbon Ext. TPH: ☐ TPH-IR ☐ Diesel Range Organics (DRO) ☐ ME DRO ☐ CT ETPH ☐ MA DEP EPH w/all targets ☐ EPH Carbon Ranges only ☐ EPH w/4 PAHs ☐ Hydrocarbon Fingerprint (GC/FID by ASTM D3328-(DO-Mod.) ☐ TPH by GC/FID (8015B Mod) Quantitative Only
- Petroleum Hydrocarbon Vol. TPH: ☐ Gasoline Range Organics (GRO) ☐ ME GRO ☐ MA DEP VPH w/all targets ☐ VPH Carbon ranges only
- Haz. Waste: ☐ TCLP ☐ SPLP ☐ 8 Metals ☐ Pb only ☐ VOA ☐ Semi VOA ☐ Pesticides ☐ Herbicides ☐ Corrosivity (as pH) ☐ Reactivity ☐ Ignitability (as Flashpoint) ☐ Paint Filter ☐ MA Basic Disposal Criteria: 82608, TPH by GC, PCBs, 5 Metals, Corrosivity, Ignitability, Reactivity
- General Chemistry: ☐ Nitrate ☐ Nitrite ☐ Chloride ☐ Fluoride ☐ Sulfate ☐ Dissolved Phosphorus ☐ Ammonia ☐ TKN ☐ Total Phosphorus ☐ Total N (as NO2/NO3/TKN) ☐ Oil & Grease ☐ COD ☐ TOC ☐ BOD ☐ TDS ☐ TSS ☐ TS ☐ Alkalinity ☐ Cyanide, Total ☐ Cyanide, Physiologically Available ☐ pH ☐ Dissolved Oxygen ☐ Turbidity
- Other: ☐ Total Coliform ☐ Fecal Coliform ☐ HPC

Sampling DATE	Sampling TIME	SAMPLE IDENTIFICATION	Matrix: GROUNDWATER	DRINKING WATER	WASTEWATER	SOIL	OTHER SOLID	OIL/ORGANIC LIQUID	Type: COMPOSITE	GRAB	Container(s): NUMBER	40mL VOA Vial	60mL/2 oz Glass	120mL/4 oz Amber Glass	250mL/8 oz Glass	500mL/16 oz Glass	1L/32 oz Amber Glass	250mL/8 oz Plastic	500mL/16 oz Plastic	1L/32 oz Plastic	120mL Sterile	Preservation: HCl	HNO3	H2SO4	NaOH	Methanol	Sodium Bisulfate	ICE	Filtered: YES	NO	LABORATORY NUMBER (Lab Use Only)
9/4/08		TP090408.07	X							X	2						X						X				X	X		
9/4/08		TP090408.07				X				X	1				X												X	X		
9/4/08		TP090408.08	X							X	2						X						X				X	X		
9/4/08		TP090408.08				X				X	1				X												X	X		
9/4/08		TP090408.09	X							X	2						X						X				X	X		
9/4/08		TP090408.09				X				X	1				X												X	X		
9/4/08		TP090408.11	X							X	2						X						X				X	X		
9/4/08		TP090408.11				X				X	1				X												X	X		
9/4/08		TP090408.10	X							X	2						X						X				X	X		
9/4/08		TP090408.10				X				X	1				X												X	X		

REMARKS / SPECIAL INSTRUCTIONS

MA DEP MCP Data Enhancement Affirmation

☐ YES ☐ NO MCP Data Certification required.

☐ YES ☐ NO MCP Drinking Water Sample included.
(Require collection of contingent duplicate sample. Trip blanks are also required, if VOA sample collected).

Signature: _____

Must use SIM and achieve low-level detection limits for soil and water samples

DATA QUALITY OBJECTIVES

Regulatory Program

State	Standard	Deliverables
☐ CT	☒ MCP GW-1/S-1	☐ PWS Form
☐ ME	☐ MCP GW-2/S-2	☐ MWRA
☐ MA	☐ NY STARS	☐ _____
☐ NH	☐ Drinking Water	
☐ NY	☐ Wastewater	
☐ RI	☐ Waste Disposal	
☐ VT	☐ Dredge Material	
☐ ___	☐ _____	

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. **Each MS, MSD and Sample Duplicate requires an additional sample aliquot.**

Project Specific QC Required	Selection of QC Sample
☐ Sample Duplicate	☐ Please use sample:
☐ Matrix Spike	_____
☐ Matrix Spike Duplicate	

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

	Date	Time		
Relinquished by Sampler:	9/4/08	1955	Received by: Kimberly Crowley	Receipt Temperature: ☑ Ice ☐ Refrigerated 2-6°C Recommended 14.7
Relinquished by:	Date	Time	Received by	Container Count:
Relinquished by:	Date	Time	Received by Laboratory:	Shipping/Airbill Number:

Method of Shipment: ☐ GWA Courier ☐ Express Mail ☐ Federal Express ☐ UPS ☒ Hand ☐ _____

Custody Seal Number:

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans,* US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste,* US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**MA DEP EPH Method**	Instrument ID:	**GC-9 Agilent 6890**	Instrument ID:	**GC-9 Agilent 6890**
QC Batch ID:	**EP-2114-F**	Extracted:	**09-05-08 19:00**	Extracted:	**09-05-08 19:00**
Matrix:	**Aqueous**	Analyzed (AL):	**09-09-08 11:23**	Analyzed (AL):	**09-09-08 12:52**
Units:	**ug/L**	Analyzed (AR):	**09-09-08 12:08**	Analyzed (AR):	**09-09-08 13:37**
		Analyst:	**KMC**	Analyst:	**KMC**

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
111-84-2	*n*-Nonane (C_9)	50	18	**35** %	50	21	**42** %	**18** %	30 - 140 %	25%
124-18-5	*n*-Decane (C_{10})	50	20	**41** %	50	25	**51** %	**21** %	40 - 140 %	25%
112-40-3	*n*-Dodecane (C_{12})	50	23	**46** %	50	27	**55** %	**16** %	40 - 140 %	25%
629-59-4	*n*-Tetradecane (C_{14})	50	30	**60** %	50	32	**63** %	**6** %	40 - 140 %	25%
544-76-3	*n*-Hexadecane (C_{16})	50	37	**74** %	50	37	**75** %	**1** %	40 - 140 %	25%
593-45-3	*n*-Octadecane (C_{18})	50	41	**82** %	50	40	**81** %	**1** %	40 - 140 %	25%
n/a	*n*-C9 to *n*-C18 Group	300	170	**56** %	300	180	**61** %	**8** %	40 - 140 %	25%
629-92-5	*n*-Nonadecane (C_{19})	50	41	**82** %	50	40	**80** %	**2** %	40 - 140 %	25%
112-95-8	*n*-Eicosane (C_{20})	50	42	**84** %	50	41	**82** %	**2** %	40 - 140 %	25%
629-97-0	*n*-Docosane (C_{22})	50	41	**82** %	50	40	**81** %	**1** %	40 - 140 %	25%
646-31-1	*n*-Tetracosane (C_{24})	50	42	**84** %	50	41	**83** %	**1** %	40 - 140 %	25%
630-01-3	*n*-Hexacosane (C_{26})	50	41	**81** %	50	40	**80** %	**2** %	40 - 140 %	25%
630-02-4	*n*-Octacosane (C_{28})	50	41	**83** %	50	41	**82** %	**1** %	40 - 140 %	25%
638-68-6	*n*-Triacontane (C_{30})	50	42	**84** %	50	41	**83** %	**2** %	40 - 140 %	25%
630-06-8	*n*-Hexatriacontane (C_{36})	50	36	**72** %	50	36	**72** %	**0** %	40 - 140 %	25%
n/a	*n*-C19 to *n*-C36 Group	400	330	**81** %	400	320	**80** %	**1** %	40 - 140 %	25%
91-20-3	Naphthalene	50	26	**52** %	50	31	**62** %	**17** %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	50	29	**58** %	50	35	**70** %	**19** %	40 - 140 %	25%
208-96-8	Acenaphthylene	50	34	**67** %	50	37	**74** %	**9** %	40 - 140 %	25%
83-32-9	Acenaphthene	50	36	**72** %	50	40	**80** %	**10** %	40 - 140 %	25%
86-73-7	Fluorene	50	38	**76** %	50	41	**83** %	**8** %	40 - 140 %	25%
85-01-8	Phenanthrene	50	41	**82** %	50	44	**89** %	**8** %	40 - 140 %	25%
120-12-7	Anthracene	50	42	**83** %	50	45	**90** %	**8** %	40 - 140 %	25%
206-44-0	Fluoranthene	50	46	**91** %	50	49	**99** %	**8** %	40 - 140 %	25%
129-00-0	Pyrene	50	45	**89** %	50	49	**97** %	**8** %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	50	45	**90** %	50	49	**98** %	**8** %	40 - 140 %	25%
218-01-9	Chrysene	50	47	**93** %	50	50	**100** %	**6** %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	50	43	**86** %	50	46	**92** %	**7** %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	50	47	**94** %	50	51	**102** %	**8** %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	50	47	**94** %	50	51	**101** %	**8** %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	50	42	**85** %	50	46	**92** %	**8** %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	50	45	**90** %	50	48	**96** %	**7** %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	50	42	**85** %	50	46	**92** %	**8** %	40 - 140 %	25%
n/a	PAH Group	850	690	**82** %	850	760	**89** %	**9** %	40 - 140 %	25%

QC Surrogate Compound		Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	40	35	**87** %	40	35	**87** %	40 - 140 %
	2-Bromonaphthalene	40	23	**59** %	40	30	**75** %	40 - 140 %
Extraction:	Chloro-octadecane	40	34	**85** %	40	33	**81** %	40 - 140 %
	ortho-Terphenyl	40	36	**91** %	40	39	**98** %	40 - 140 %

		Fractionation Breakthrough Evaluation			QC Limits
91-20-3	Naphthalene	LCS	**4** %	LCSD **1** %	5%
91-57-6	2-Methylnaphthalene	LCS	**2** %	LCSD **0** %	5%

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Sample extraction performed by separatory funnel technique.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

The LCS and LCSD are prepared from separate source standards than those used for calibration.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**MA DEP EPH**	Instrument ID:	**GC-9 Agilent 6890**
QC Batch ID:	**EP-2114-F**	Extracted:	**09-05-08 19:00**
Matrix:	**Aqueous**	Analyzed (AL):	**09-09-08 14:22**
		Analyzed (AR):	**09-09-08 15:06**
		Analyst:	**KMC**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		ug/L	500
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		ug/L	500
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		ug/L	150
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		ug/L	150

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	40	30	**76** %	40 - 140 %
	2-Bromonaphthalene	40	28	**69** %	40 - 140 %
Extraction:	Chloro-octadecane	40	36	**90** %	40 - 140 %
	ortho-Terphenyl	40	38	**94** %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by separatory funnel technique.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8270C Modified**	Instrument ID:	**MS-6 HP 6890**	Instrument ID:	**MS-6 HP 6890**
QC Batch ID:	**EP-2114-F**	Extracted:	**09-05-08 19:00**	Extracted:	**09-05-08 19:00**
Matrix:	**Aqueous**	Analyzed:	**09-09-08 07:32**	Analyzed:	**09-09-08 08:12**
Units:	**ug/L**	Analyst:	**MJB**	Analyst:	**MJB**

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
91-20-3	Naphthalene	5.0	3.0	**60** %	5.0	3.2	**64** %	**6** %	40 - 140 %	20%
91-57-6	2-Methylnaphthalene	5.0	2.9	**58** %	5.0	3.2	**64** %	**10** %	40 - 140 %	20%
85-01-8	Phenanthrene	5.0	3.3	**66** %	5.0	3.6	**72** %	**9** %	40 - 140 %	20%
83-32-9	Acenaphthene	5.0	3.3	**66** %	5.0	3.6	**72** %	**9** %	40 - 140 %	20%
208-96-8	Acenaphthylene	5.0	3.3	**66** %	5.0	3.6	**72** %	**9** %	40 - 140 %	20%
86-73-7	Fluorene	5.0	3.5	**70** %	5.0	3.9	**78** %	**11** %	40 - 140 %	20%
120-12-7	Anthracene	5.0	3.4	**68** %	5.0	3.8	**76** %	**11** %	40 - 140 %	20%
206-44-0	Fluoranthene	5.0	3.7	**74** %	5.0	4.0	**80** %	**8** %	40 - 140 %	20%
129-00-0	Pyrene	5.0	3.6	**72** %	5.0	4.0	**80** %	**11** %	40 - 140 %	20%
56-55-3	Benzo[a]anthracene	5.0	3.8	**76** %	5.0	4.1	**82** %	**8** %	40 - 140 %	20%
218-01-9	Chrysene	5.0	3.6	**72** %	5.0	3.9	**78** %	**8** %	40 - 140 %	20%
205-99-2	Benzo[b]fluoranthene	5.0	3.8	**76** %	5.0	4.1	**82** %	**8** %	40 - 140 %	20%
207-08-9	Benzo[k]fluoranthene	5.0	4.0	**80** %	5.0	4.3	**86** %	**7** %	40 - 140 %	20%
50-32-8	Benzo[a]pyrene	5.0	4.0	**80** %	5.0	4.4	**88** %	**10** %	40 - 140 %	20%
193-39-5	Indeno[1,2,3-c,d]pyrene	5.0	3.8	**76** %	5.0	4.2	**84** %	**10** %	40 - 140 %	20%
53-70-3	Dibenzo[a,h]anthracene	5.0	3.8	**76** %	5.0	4.2	**84** %	**10** %	40 - 140 %	20%
191-24-2	Benzo[g,h,i]perylene	5.0	3.7	**74** %	5.0	4.0	**80** %	**8** %	40 - 140 %	20%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
ortho -Terphenyl	40	35	**88** %	40	38	**95** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

The LCS and LCSD are prepared from separate source standards than those used for calibration.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8270C (Mod.) - EPH PAHs by GC/MS-SIM**	Instrument ID:	**MS-6 HP 6890**
QC Batch ID:	**EP-2114-F**	Extracted:	**09-05-08 19:00**
Matrix:	**Aqueous**	Analyzed:	**09-09-08 08:52**
		Analyst:	**MJB**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho-Terphenyl	40	38	**94** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**MA DEP EPH Method**	Instrument ID:	**GC-12 Agilent 6890**	Instrument ID:	**GC-12 Agilent 6890**
QC Batch ID:	**EP-2854-M**	Extracted:	**09-08-08 21:00**	Extracted:	**09-08-08 21:00**
Matrix:	**Soil**	Analyzed (AL):	**09-09-08 14:36**	Analyzed (AL):	**09-09-08 16:01**
Units:	**mg/Kg**	Analyzed (AR):	**09-09-08 15:16**	Analyzed (AR):	**09-09-08 16:47**
		Analyst:	**KMC**	Analyst:	**KMC**

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
111-84-2	*n*-Nonane (C_9)	3.3	1.7	**53** %	3.3	1.7	**51** %	**4** %	30 - 140 %	25%
124-18-5	*n*-Decane (C_{10})	3.3	2.0	**61** %	3.3	1.9	**58** %	**5** %	40 - 140 %	25%
112-40-3	*n*-Dodecane (C_{12})	3.3	2.1	**64** %	3.3	2.0	**61** %	**4** %	40 - 140 %	25%
629-59-4	*n*-Tetradecane (C_{14})	3.3	2.2	**67** %	3.3	2.1	**64** %	**5** %	40 - 140 %	25%
544-76-3	*n*-Hexadecane (C_{16})	3.3	2.4	**72** %	3.3	2.3	**69** %	**4** %	40 - 140 %	25%
593-45-3	*n*-Octadecane (C_{18})	3.3	2.7	**83** %	3.3	2.7	**81** %	**2** %	40 - 140 %	25%
n/a	*n*-C9 to *n*-C18 Group	20	13	**67** %	20	13	**64** %	**4** %	40 - 140 %	25%
629-92-5	*n*-Nonadecane (C_{19})	3.3	2.8	**84** %	3.3	2.7	**82** %	**2** %	40 - 140 %	25%
112-95-8	*n*-Eicosane (C_{20})	3.3	2.8	**85** %	3.3	2.8	**85** %	**0** %	40 - 140 %	25%
629-97-0	*n*-Docosane (C_{22})	3.3	2.8	**85** %	3.3	2.9	**88** %	**3** %	40 - 140 %	25%
646-31-1	*n*-Tetracosane (C_{24})	3.3	2.9	**87** %	3.3	2.9	**89** %	**2** %	40 - 140 %	25%
630-01-3	*n*-Hexacosane (C_{26})	3.3	2.7	**83** %	3.3	2.8	**83** %	**1** %	40 - 140 %	25%
630-02-4	*n*-Octacosane (C_{28})	3.3	2.8	**86** %	3.3	2.8	**86** %	**0** %	40 - 140 %	25%
638-68-6	*n*-Triacontane (C_{30})	3.3	2.8	**85** %	3.3	2.8	**85** %	**0** %	40 - 140 %	25%
630-06-8	*n*-Hexatriacontane (C_{36})	3.3	2.4	**73** %	3.3	2.4	**73** %	**0** %	40 - 140 %	25%
n/a	*n*-C19 to *n*-C36 Group	26	22	**84** %	26	22	**84** %	**1** %	40 - 140 %	25%
91-20-3	Naphthalene	3.3	2.1	**62** %	3.3	1.9	**56** %	**10** %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	3.3	2.2	**66** %	3.3	2.0	**61** %	**9** %	40 - 140 %	25%
208-96-8	Acenaphthylene	3.3	2.2	**67** %	3.3	2.0	**61** %	**10** %	40 - 140 %	25%
83-32-9	Acenaphthene	3.3	2.3	**71** %	3.3	2.1	**65** %	**9** %	40 - 140 %	25%
86-73-7	Fluorene	3.3	2.5	**76** %	3.3	2.3	**69** %	**9** %	40 - 140 %	25%
85-01-8	Phenanthrene	3.3	2.6	**80** %	3.3	2.4	**73** %	**8** %	40 - 140 %	25%
120-12-7	Anthracene	3.3	3.0	**90** %	3.3	2.8	**85** %	**5** %	40 - 140 %	25%
206-44-0	Fluoranthene	3.3	3.3	**99** %	3.3	3.1	**92** %	**6** %	40 - 140 %	25%
129-00-0	Pyrene	3.3	3.2	**96** %	3.3	3.0	**91** %	**5** %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	3.3	3.3	**100** %	3.3	3.2	**95** %	**4** %	40 - 140 %	25%
218-01-9	Chrysene	3.3	3.1	**95** %	3.3	3.0	**92** %	**4** %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	3.3	2.9	**88** %	3.3	2.8	**84** %	**5** %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	3.3	3.3	**100** %	3.3	3.1	**95** %	**5** %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	3.3	3.2	**98** %	3.3	3.2	**96** %	**2** %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	3.3	3.0	**90** %	3.3	2.8	**85** %	**5** %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	3.3	3.4	**102** %	3.3	3.2	**97** %	**5** %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	3.3	3.1	**94** %	3.3	3.0	**89** %	**5** %	40 - 140 %	25%
n/a	PAH Group	56	49	**87** %	56	46	**82** %	**6** %	40 - 140 %	25%

QC Surrogate Compound		Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.0	**74** %	2.7	1.9	**70** %	40 - 140 %
	2-Bromonaphthalene	2.7	1.9	**70** %	2.7	1.8	**67** %	40 - 140 %
Extraction:	Chloro-octadecane	2.7	2.3	**85** %	2.7	2.2	**81** %	40 - 140 %
	ortho-Terphenyl	2.7	2.4	**89** %	2.7	2.3	**85** %	40 - 140 %

		Fractionation Breakthrough Evaluation				QC Limits
91-20-3	Naphthalene	LCS	**0** %	LCSD	**0** %	5%
91-57-6	2-Methylnaphthalene	LCS	**0** %	LCSD	**0** %	5%

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004). Method modified by use of microwave accelerated solvent extraction technique.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

The LCS and LCSD are prepared from separate source standards than those used for calibration.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**MA DEP EPH**	Instrument ID:	**GC-12 Agilent 6890**
QC Batch ID:	**EP-2854-M**	Extracted:	**09-08-08 21:00**
Matrix:	**Soil**	Analyzed (AL):	**09-09-08 17:32**
		Analyzed (AR):	**09-09-08 18:17**
		Analyst:	**KMC**

EPH Ranges	Concentration	Notes	Units	Reporting Limit
n-C9 to n-C18 Aliphatic Hydrocarbons †	BRL		mg/Kg	30
n-C19 to n-C36 Aliphatic Hydrocarbons †	BRL		mg/Kg	30
n-C11 to n-C22 Aromatic Hydrocarbons †◊	BRL		mg/Kg	30
Unadjusted n-C11 to n-C22 Aromatic Hydrocarbons †	BRL		mg/Kg	30

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
Fractionation:	2-Fluorobiphenyl	2.7	2.2	**82** %	40 - 140 %
	2-Bromonaphthalene	2.7	2.1	**78** %	40 - 140 %
Extraction:	Chloro-octadecane	2.7	2.4	**89** %	40 - 140 %
	ortho -Terphenyl	2.7	2.6	**96** %	40 - 140 %

Method Reference: Method for the Determination of Extractable Petroleum Hydrocarbons, MA DEP (Revision 1.1, 2004).
Sample extraction performed by microwave accelerated solvent extraction technique.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Hydrocarbon range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range.

◊ n-C11 to n-C22 Aromatic Hydrocarbons range data excludes the method target analyte concentrations.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8270C Modified**	Instrument ID:	**MS-6 HP 6890**	Instrument ID:	**MS-6 HP 6890**
QC Batch ID:	**EP-2854-M**	Extracted:	**09-08-08 21:00**	Extracted:	**09-08-08 21:00**
Matrix:	**Soil**	Analyzed:	**09-09-08 14:56**	Analyzed:	**09-09-08 15:36**
Units:	**ug/Kg**	Analyst:	**MJB**	Analyst:	**MJB**

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
91-20-3	Naphthalene	330	210	**64** %	330	220	**67** %	**5** %	40 - 140 %	20%
91-57-6	2-Methylnaphthalene	330	200	**61** %	330	220	**67** %	**10** %	40 - 140 %	20%
85-01-8	Phenanthrene	330	210	**64** %	330	240	**73** %	**13** %	40 - 140 %	20%
83-32-9	Acenaphthene	330	220	**67** %	330	240	**73** %	**9** %	40 - 140 %	20%
208-96-8	Acenaphthylene	330	220	**67** %	330	230	**70** %	**4** %	40 - 140 %	20%
86-73-7	Fluorene	330	220	**67** %	330	240	**73** %	**9** %	40 - 140 %	20%
120-12-7	Anthracene	330	220	**67** %	330	240	**73** %	**9** %	40 - 140 %	20%
206-44-0	Fluoranthene	330	240	**73** %	330	260	**79** %	**8** %	40 - 140 %	20%
129-00-0	Pyrene	330	240	**73** %	330	260	**79** %	**8** %	40 - 140 %	20%
56-55-3	Benzo[a]anthracene	330	250	**76** %	330	270	**82** %	**8** %	40 - 140 %	20%
218-01-9	Chrysene	330	240	**73** %	330	270	**82** %	**12** %	40 - 140 %	20%
205-99-2	Benzo[b]fluoranthene	330	260	**79** %	330	280	**85** %	**7** %	40 - 140 %	20%
207-08-9	Benzo[k]fluoranthene	330	260	**79** %	330	290	**88** %	**11** %	40 - 140 %	20%
50-32-8	Benzo[a]pyrene	330	270	**82** %	330	300	**91** %	**11** %	40 - 140 %	20%
193-39-5	Indeno[1,2,3-c,d]pyrene	330	260	**79** %	330	290	**88** %	**11** %	40 - 140 %	20%
53-70-3	Dibenzo[a,h]anthracene	330	260	**79** %	330	290	**88** %	**11** %	40 - 140 %	20%
191-24-2	Benzo[g,h,i]perylene	330	250	**76** %	330	270	**82** %	**8** %	40 - 140 %	20%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery	QC Limits
ortho -Terphenyl	2,700	2,200	**81** %	2,700	2,500	**93** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

The LCS and LCSD are prepared from separate source standards than those used for calibration.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8270C (Mod.) - EPH PAHs by GC/MS-SIM**	Instrument ID:	**MS-6 HP 6890**
QC Batch ID:	**EP-2854-M**	Extracted:	**09-08-08 21:00**
Matrix:	**Soil**	Analyzed:	**09-09-08 16:16**
		Analyst:	**MJB**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/Kg	10
91-57-6	2-Methylnaphthalene	BRL		ug/Kg	10
208-96-8	Acenaphthylene	BRL		ug/Kg	10
83-32-9	Acenaphthene	BRL		ug/Kg	10
86-73-7	Fluorene	BRL		ug/Kg	10
85-01-8	Phenanthrene	BRL		ug/Kg	10
120-12-7	Anthracene	BRL		ug/Kg	10
206-44-0	Fluoranthene	BRL		ug/Kg	10
129-00-0	Pyrene	BRL		ug/Kg	10
56-55-3	Benzo[a]anthracene	BRL		ug/Kg	10
218-01-9	Chrysene	BRL		ug/Kg	10
205-99-2	Benzo[b]fluoranthene	BRL		ug/Kg	10
207-08-9	Benzo[k]fluoranthene	BRL		ug/Kg	10
50-32-8	Benzo[a]pyrene	BRL		ug/Kg	10
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/Kg	10
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/Kg	10
191-24-2	Benzo[g,h,i]perylene	BRL		ug/Kg	10

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho-Terphenyl	2,700	2,400	**91** %	40 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Method protocol modified to include acidification and the surrogate compound in accordance with the MA DEP Method for the Determination of Extractable Petroleum Hydrocarbons.
Sample extraction performed by EPA Method 3546.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states.
Copies of our current certificates may be obtained from our website:

http://www.groundwateranalytical.com/qualifications.htm

CONNECTICUT

Department of Health Services, PH-0586 — Potable Water, Wastewater, Solid Waste and Soil
http://www.ct.gov/dph/lib/dph/environmental health/environmental laboratories/pdf/Out State.pdf

MASSACHUSETTS

Department of Environmental Protection, M-MA-103 — Potable Water and Non-Potable Water
http://public.dep.state.ma.us/labcert/labcert.aspx

Department of Labor,
Division of Occupational Safety, AA000195 — Asbestos Analytical Services, Class A
http://www.mass.gov/dos/forms/la-rpt list aa.pdf

NEW YORK

Department of Health, 11754 — Potable Water, Non-Potable Water, Solid and Hazardous Waste
http://www.wadsworth.org/labcert/elap/comm.html

NIST NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP)

NVLAP Lab Code 200751-1 — Bulk Asbestos Fiber Analysis (PLM)
http://ts.nist.gov/Standards/scopes/plmtm.htm

RHODE ISLAND

Department of Health,
Division of Laboratories, LAO00054 — Potable and Non-Potable Water Microbiology, Organic and Inorganic Chemistry
http://www.health.ri.gov/labs/outofstatelabs.pdf

U.S. DEPARTMENT OF AGRICULTURE

USDA, Soil Permit, S-53921 — Foreign soil import permit

GROUNDWATER ANALYTICAL

Certifications and Approvals

MASSACHUSETTS **Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

Potable Water (Drinking Water)

Analyte	Method
1,2-Dibromo-3-Chloropropane	EPA 504.1
1,2-Dibromoethane	EPA 504.1
Alkalinity, Total	SM 2320-B
Antimony	EPA 200.8
Antimony	EPA 200.9
Arsenic	EPA 200.8
Arsenic	EPA 200.9
Barium	EPA 200.7
Barium	EPA 200.8
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chlorine, Residual Free	SM 4500-CL-G
Chromium	EPA 200.7
Copper	EPA 200.7
Copper	EPA 200.8
Cyanide, Total	Lachat 10-204-00-1-A
E. Coli (Treatment and Distribution)	EC-MUG SM 9221-F
E. Coli (Treatment and Distribution)	Enz. Sub. SM 9223
E. Coli (Treatment and Distribution)	NA-MUG SM 9222-G
Fecal Coliform (Source Water)	MF SM 9222-D
Fluoride	EPA 300.0
Fluoride	SM 4500-F-C
Heterotrophic Plate Count	SM 9215-B
Lead	EPA 200.8
Lead	EPA 200.9
Mercury	EPA 245.1
Nickel	EPA 200.7
Nickel	EPA 200.8
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Nitrite-N	EPA 300.0
Nitrite-N	Lachat 10-107-04-1-C
pH	SM 4500-H-B
Selenium	EPA 200.8
Selenium	EPA 200.9
Silver	EPA 200.7
Silver	EPA 200.8
Sodium	EPA 200.7
Sulfate	EPA 300.0
Thallium	EPA 200.8
Thallium	EPA 200.9
Total Coliform (Treatment and Distribution)	Enz. Sub. SM 9223
Total Coliform (Treatment and Distribution)	MF SM 9222-B
Total Dissolved Solids	SM 2540-C
Trihalomethanes	EPA 524.2
Turbidity	SM 2130-B
Volatile Organic Compounds	EPA 524.2

Non-Potable Water (Wastewater)

Analyte	Method
Aldrin	EPA 608
Alkalinity, Total	Lachat 10-303-31-1-A
Alpha-BHC	EPA 608
Aluminum	EPA 200.7
Aluminum	EPA 200.8

Non-Potable Water (Wastewater)

Analyte	Method
Ammonia-N	Lachat 10-107-06-1-B
Antimony	EPA 200.7
Antimony	EPA 200.8
Antimony	EPA 200.9
Arsenic	EPA 200.7
Arsenic	EPA 200.8
Arsenic	EPA 200.9
Beryllium	EPA 200.7
Beryllium	EPA 200.8
Beta-BHC	EPA 608
Biochemical Oxygen Demand	SM 5210-B
Cadmium	EPA 200.7
Cadmium	EPA 200.8
Calcium	EPA 200.7
Chemical Oxygen Demand	SM 5220-D
Chlordane	EPA 608
Chloride	EPA 300.0
Chlorine, Total Residual	SM 4500-CL-G
Chromium	EPA 200.7
Chromium	EPA 200.8
Cobalt	EPA 200.7
Cobalt	EPA 200.8
Copper	EPA 200.7
Copper	EPA 200.8
Copper	EPA 200.9
Cyanide, Total	Lachat 10-204-00-1-A
DDD	EPA 608
DDE	EPA 608
DDT	EPA 608
Delta-BHC	EPA 608
Dieldrin	EPA 608
Endosulfan I	EPA 608
Endosulfan II	EPA 608
Endosulfan Sulfate	EPA 608
Endrin	EPA 608
Endrin Aldehyde	EPA 608
Fluoride	EPA 300.0
Gamma-BHC	EPA 608
Hardness (CaCO3), Total	EPA 200.7
Hardness (CaCO3), Total	SM 2340-B
Heptachlor	EPA 608
Heptachlor Epoxide	EPA 608
Iron	EPA 200.7
Kjeldahl-N	Lachat 10-107-06-02-D
Lead	EPA 200.7
Lead	EPA 200.9
Magnesium	EPA 200.7
Manganese	EPA 200.7
Manganese	EPA 200.8
Mercury	EPA 245.1
Molybdenum	EPA 200.7
Molybdenum	EPA 200.8
Nickel	EPA 200.7
Nickel	EPA 200.8
Nickel	EPA 200.9
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Non-Filterable Residue	SM 2540-D
Oil and Grease	EPA 1664

GROUNDWATER ANALYTICAL

Certifications and Approvals

MASSACHUSETTS **Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

Non-Potable Water (Wastewater)

Analyte	Method
Orthophosphate	Lachat 10-115-01-1-A
pH	SM 4500-H-B
Phenolics, Total	EPA 420.4
Phenolics, Total	Lachat 10-210-00-1-B
Phosphorus, Total	Lachat 10-115-01-1-C
Phosphorus, Total	SM 4500-P-B,E
Polychlorinated Biphenyls (Oil)	EPA 600/4-81-045
Polychlorinated Biphenyls (Water)	EPA 608
Potassium	EPA 200.7
Selenium	EPA 200.7
Selenium	EPA 200.8
Selenium	EPA 200.9
Silver	EPA 200.7
Sodium	EPA 200.7
Specific Conductivity	SM 2510-B
Strontium	EPA 200.7
Sulfate	EPA 300.0
SVOC-Acid Extractables	EPA 625
SVOC-Base/Neutral Extractables	EPA 625
Thallium	EPA 200.7
Thallium	EPA 200.8
Thallium	EPA 200.9
Titanium	EPA 200.7
Total Dissolved Solids	SM 2540-C
Total Organic Carbon	SM 5310-B
Toxaphene	EPA 608
Vanadium	EPA 200.7
Vanadium	EPA 200.8
Volatile Aromatics	EPA 602
Volatile Aromatics	EPA 624
Volatile Halocarbons	EPA 624
Zinc	EPA 200.7
Zinc	EPA 200.8

APPENDIX C

SEPTEMBER 4, 2008 PHOTOGRAPHS

INVESTIGATION ACTIVITIES – LEISURE SHORES AND HOWARD'S BEACH
SEPTEMBER 4, 2008
B120 RELEASE
BUZZARDS BAY, MASSACHUSETTS

1. Test pit excavation at Leisure Shores.

2. Test pit excavation.

3. Sheen in test pit.

4. Sheen with small fleck on water surface in trench/test pit T090408.11.

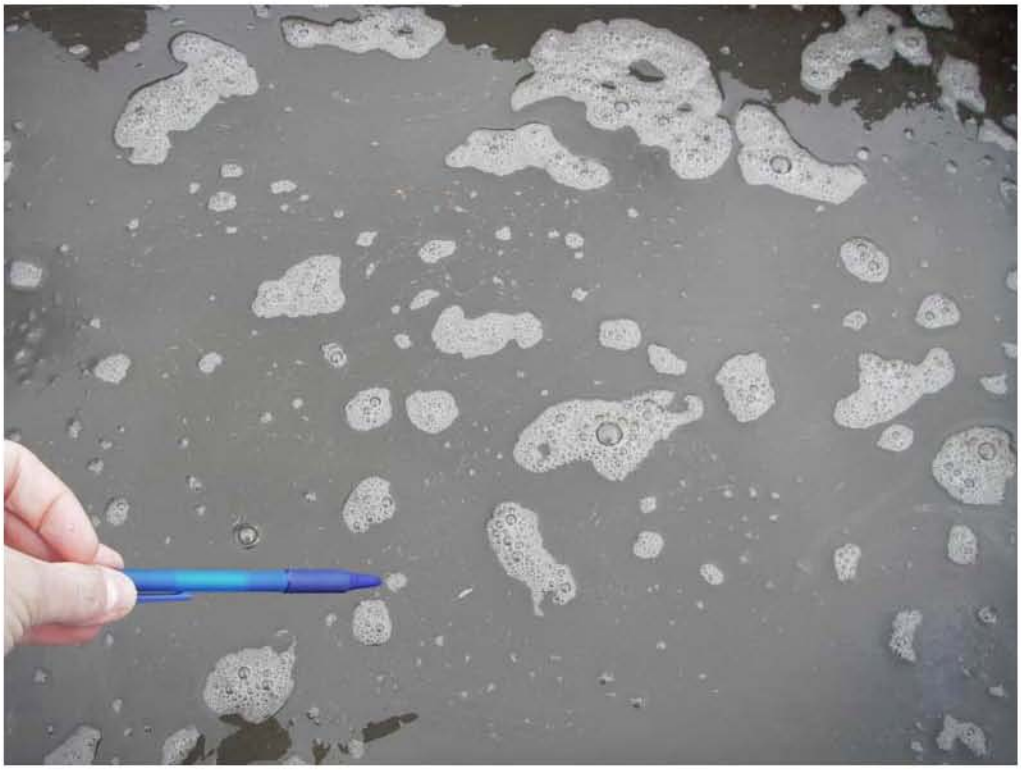
APPENDIX D

SEPTEMBER 30, 2008 PHOTOGRAPHS

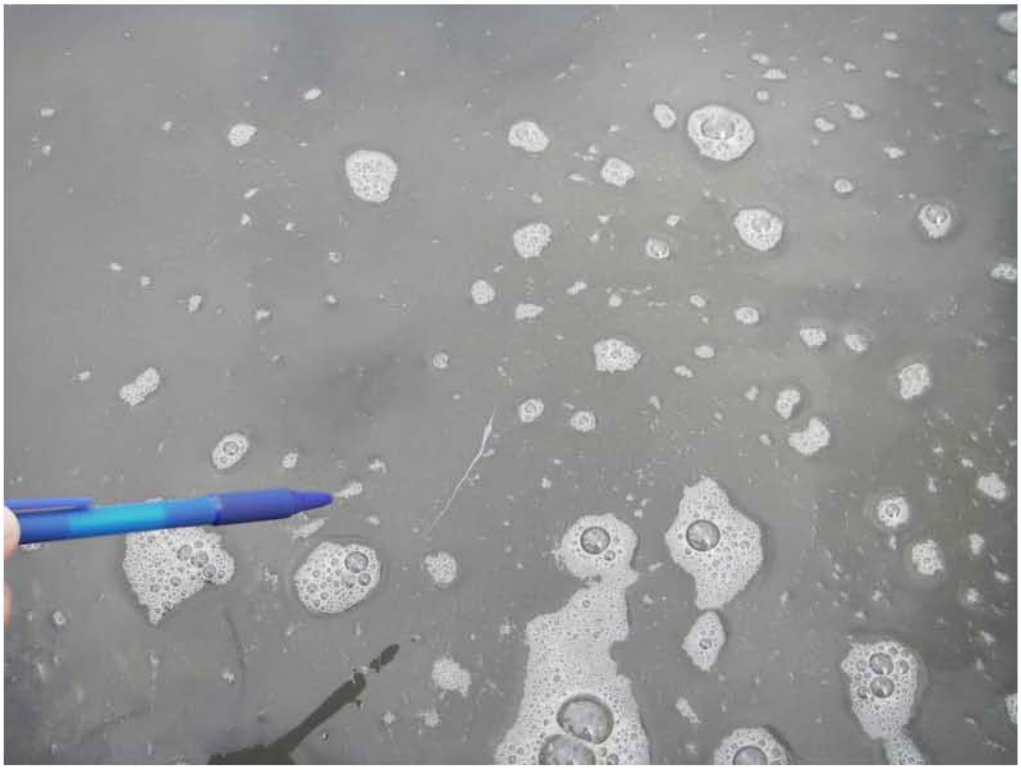
INVESTIGATION ACTIVITIES – LEISURE SHORES AND HOWARD'S BEACH
SEPTEMBER 30, 2008
B120 RELEASE
BUZZARDS BAY, MASSACHUSETTS

1. Test pit excavation in cobble shoreline at Leisure Shores.

2. Test pit (note natural organic-rich sediment).



3. Small sheens in test pit.



4. Sheen "streamer" on water surface in test pit.

5. Test pit with faint sheen on water surface.

6. Test pit excavation (T093008.22)

APPENDIX E
FINGERPRINT ANALYTICAL RESULTS

September 2008 Leisure Shores Tar Ball Sample
January 20, 2009

Comparison of Leisure Shore Tar Ball Sample with B120 Oil

This report summarizes the evaluation of a tar ball sample collected by GeoInsight on September 30, 2008 from the Leisure Shore Beach portion of shoreline segment WIF-02. The sample was sent to B&B Laboratories under chain-of-custody for laboratory analysis to evaluate if the chemical signature was consistent with Number 6 fuel oil released from Bouchard Barge B120 on April 27, 2003. Detailed discussions of the chemical composition of the original (fresh) B120 product and environmental samples of the B120 oil are provided in the August 3, 2006 Phase II Comprehensive Site Assessment Report.

Chemical Composition of B120 Oil

The composition of polycyclic aromatic hydrocarbon (PAH) compounds is regularly used to identify the presence/absence and source of oils as well as assess the degree of environmental weathering. The original B120 product was dominated by the following PAH compounds, which together comprised over 80% of the total PAH content:

- Naphthalenes (2-ringed PAH compounds) with carbon side-chains comprise almost one-third of the total PAH content. Naphthalenes with two carbon side-chains (C2-naphthalenes) are the most abundant, present at concentrations over 0.7%.
- Phenanthrenes (3-ringed PAH compounds) with carbon side-chains comprise 25% of the total PAH content. C2-Phenanthrenes are the most abundant of these PAHs, with concentrations exceeding 0.5%.
- Fluoranthenes/Pyrenes (4-ringed PAH compounds) with carbon side-chains comprise 13% of the total PAH content. Again, compounds with two carbon side-chains are the most abundant.
- Chrysenes (also 4-ringed PAH compounds) with carbon side-chains are the fourth dominant PAH. Chrysenes with either one or two carbon side-chains are similar in concentration.

Absent or relatively insignificant concentrations of the following PAHs also characterize the fresh B120 product:

- Acenaphthylene (not detected);
- PAHs without side-chains (often referred to as ‘parent’ PAHs);
- PAHs with five or six rings (e.g., benzo[a]pyrene or benzo[g,h,i]perylene); and
- Dibenzothiophenes (sulfur-containing PAH).

Sample Analysis

The sample was analyzed by B&B Laboratories for Total Petroleum Hydrocarbons by GC/FID, PAH by GC/MS-SIM, and saturate biological markers by GC/MS-SIM. A copy of the laboratory report is attached. B&B Laboratories identified the sample as “W1F-02-093008-51” in the laboratory report but the sample was identified in the field as “W1F-02-093008-S1.” The sample is identified in this memo as W1F02-093008-51 to be consistent with the laboratory report. Although the sample is identified as a “tar ball” by the

laboratory, GeoInsight reports that the physical characteristics of the sample were similar to a charcoal briquette.

Forensics Evaluation

Sample WIF-02-093008-51 was compared to a representative source oil sample to determine if B120 oil was present. Figure 1 illustrates the PAH distribution in this sample relative to that in B120 oil. The lightest PAH compounds appear on the far left side of the graph and the heaviest PAH compounds are on the far right side. The bar height is proportional to concentration, which in Figure 1 is displayed as a percentage of the total PAH concentration. The total PAH concentrations was 4,363 nanograms total PAH/milligram dry sediment (parts per million) in sample WIF-02-093008-51.

Figure 1 shows that the dominant pattern of PAH compounds in sample WIF-02-093008-51 is similar to creosote or similar pyrogenic substance (e.g., tars), which are distinct from oil (including B120 oil). Some additional combustion-derived material is likely present. Detailed biomarker analyses were not conducted on this sample because the PAH distribution was sufficiently characteristic to distinguish it from B120 oil.[1] In particular, oils contain a characteristic "bell-shaped" distribution of parent and alkylated homologues for each 2-, 3-, and 4-ring compound as illustrated in Figure 1.

The following findings compare and contrast the hydrocarbon distribution in the tar ball sample with that of the B120 source oil:

1. Sample WIF-02-093008-51 does not contain a PAH distribution consistent with an oil of any kind, much less B120 oil.
2. Sample WIF-02-093008-51 does not contain detectable amounts of the two major C_{29} and C_{30} hopane biomarkers found in oils, including B120 oil.
3. The hydrocarbon distribution in sample WIF-02-093008-51 is consistent with that of an admixture of creosote or tar and combustion particles (e.g., soot) from a regional source.

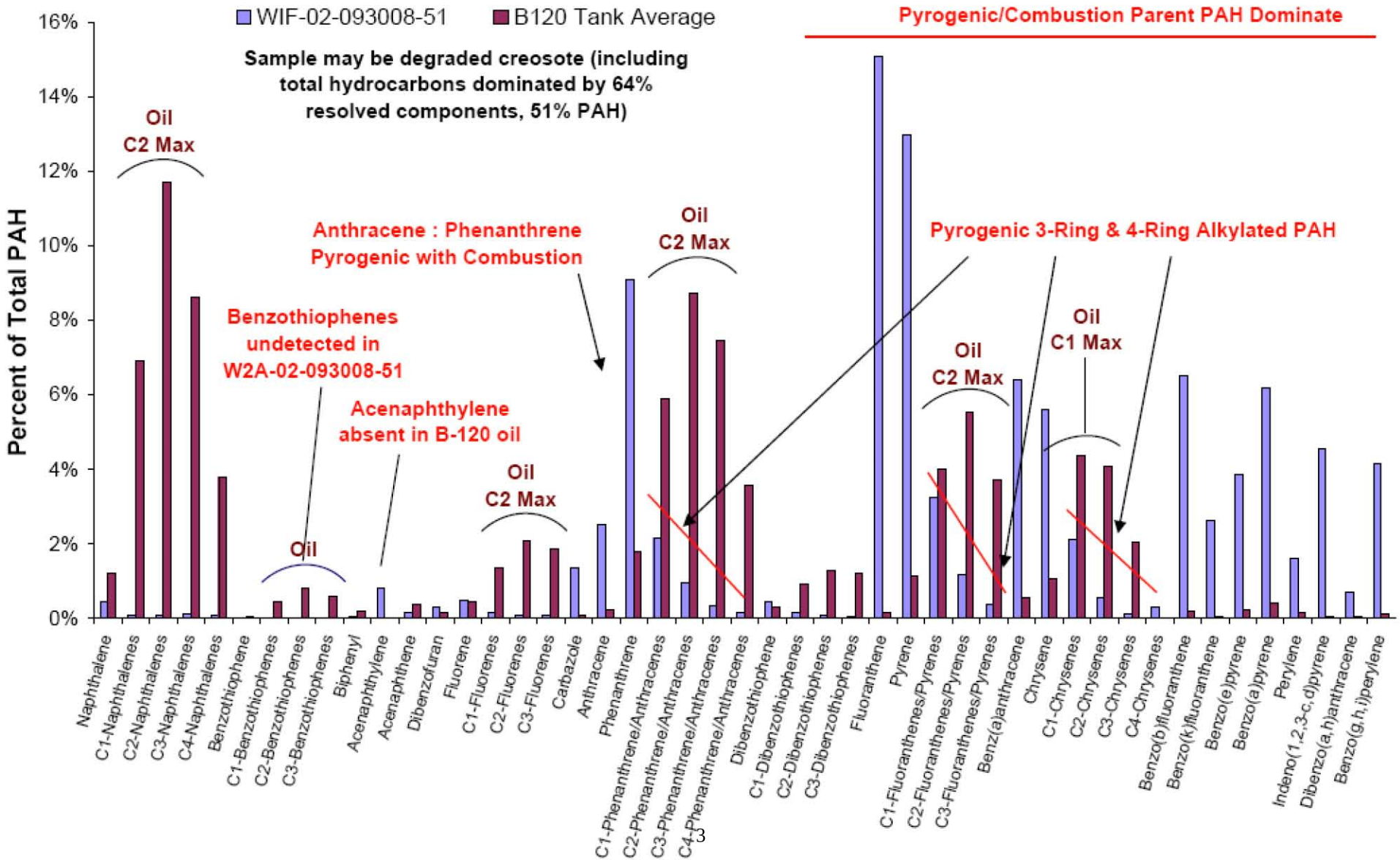
Summary

Sample WIF-02-093008-51 is not oil but is a pyrogenic substance such as creosote or tar, likely mixed with particles from a combustion source.

Attachment: B&B Laboratories Analytical Report

[1] The potential presence of three specific hopane biomarkers found in oils was assessed but all three were undetected (C_{29} and C_{30} hopane, and 18α-oleanane).

Figure 1. Comparison of PAH Distribution in Sample WIF-02-093008-51 and B120 Oil



APPENDIX F

OCTOBER 9, 2008 PHOTOGRAPHS

INVESTIGATION ACTIVITIES – LEISURE SHORES
OCTOBER 9, 2008
B120 RELEASE
BUZZARDS BAY, MASSACHUSETTS

1. Test pit/trench excavation.

2. Excavated test pit/trench.

APPENDIX G

DECEMBER 1, 2008 PHOTOGRAPHS

INVESTIGATION ACTIVITIES – LEISURE SHORES
DECEMBER 1, 2008
B120 RELEASE
BUZZARDS BAY, MASSACHUSETTS

1. Cobble with hardened splatter and stain.

2. Cobble with hardened splatter.

3. Cobble with hardened splatter.

4. Cobble with hardened splatter.

5. Cobble with hardened splatter.

6. Cobble with hardened splatter.

7. Cobble with hardened splatter.

APPENDIX H

REMEDIATION WASTE DOCUMENTATION

SEMASS Facility
141 Cranberry Highway
West Wareham, MA 02576
Phone (508) 291-4452 Fax (508) 291-1522

Ticket: 544809
Date: 11/4/2008
Time: 11:07:21 - 11:48:57

Gross: 15080 lb In Scale 1
Tare: 14080 lb Out Scale 2
Net: 1000 lb

Truck: 999
Customer: 73901i/TRIDENT ENV GROUP License: NO ID
Carrier: 39088/TRIDENT ENVIRONMETruck Type: Packer

Comment: APPROVAL #7393

Origin	Materials & Services	Quantity	Unit
1725/Mass	100% of IND-TON/Industrial-T	0.50	ton

Driver: [signature] Deputy Weighmaster: [signature]
JB

[signature]

APPENDIX I

PERMITS

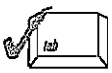
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 2 – Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. General Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



From:

Mattapoisett
Conservation Commission

To: Applicant

Bouchard Transportation Company
Name

58 South Service Road
Mailing Address

Melville | NY | 11747
City/Town | State | Zip

Property Owner (if different from applicant):

Costa, Edward F., Alexis A., Alyssa M., and Raymond Bertrand
Name

COSTA: 6 Costa Street, North Dartmouth, MA 02749
BERTRAND: 679 Plymouth St. Middleborough MA 02346
Mailing Address

City/Town | State | Zip Code

1. Title and Date (or Revised Date if applicable) of Final Plans and Other Documents:

Title	Date
Phase IV Beach Investigation	5/6/08

2. Date Request Filed:

6/12/08

B. Determination

Pursuant to the authority of M.G.L. c. 131, § 40, the Conservation Commission considered your Request for Determination of Applicability, with its supporting documentation, and made the following Determination.

Project Description (if applicable):

Evacuate shallow test pits/trenches to evaluate for the presence of potential residual oil. Test pits and trenches will be backfilled on the day of excavation with the excavated material.

Project Location:

Street Address	City/Town
Near 173 Brandt Island Road	Mattapoisett
14	25
Assessors Map/Plat Number	Parcel/Lot Number

B. Determination (cont.)

The following Determination(s) is/are applicable to the proposed site and/or project relative to the Wetlands Protection Act and regulations:

Positive Determination
Note: No work within the jurisdiction of the Wetlands Protection Act may proceed until a final Order of Conditions (issued following submittal of a Notice of Intent or Abbreviated Notice of Intent) or Order of Resource Area Delineation (issued following submittal of Simplified Review ANRAD) has been received from the issuing authority (i.e., Conservation Commission or the Department of Environmental Protection).

☐ 1. The area described on the referenced plan(s) is an area subject to protection under the Act. Removing, filling, dredging, or altering of the area requires the filing of a Notice of Intent.

☐ 2a. The boundary delineations of the following resource areas described on the referenced plan(s) are confirmed as accurate. Therefore, the resource area boundaries confirmed in this Determination are binding as to all decisions rendered pursuant to the Wetlands Protection Act and its regulations regarding such boundaries for as long as this Determination is valid.

_____

_____

_____

☐ 2b. The boundaries of resource areas listed below are not confirmed by this Determination, regardless of whether such boundaries are contained on the plans attached to this Determination or to the Request for Determination.

_____

_____

_____

☐ 3. The work described on referenced plan(s) and document(s) is within an area subject to protection under the Act and will remove, fill, dredge, or alter that area. Therefore, said work requires the filing of a Notice of Intent.

☐ 4. The work described on referenced plan(s) and document(s) is within the Buffer Zone and will alter an Area subject to protection under the Act. Therefore, said work requires the filing of a Notice of Intent or ANRAD Simplified Review (if work is limited to the Buffer Zone).

☐ 5. The area and/or work described on referenced plan(s) and document(s) is subject to review and approval by:

_____
Name of Municipality

Pursuant to the following municipal wetland ordinance or bylaw:

_____ _____
Name Ordinance or Bylaw Citation

B. Determination (cont.)

☐ 6. The following area and/or work, if any, is subject to a municipal ordinance or bylaw but not subject to the Massachusetts Wetlands Protection Act:

☐ 7. If a Notice of Intent is filed for the work in the Riverfront Area described on referenced plan(s) and document(s), which includes all or part of the work described in the Request, the applicant must consider the following alternatives. (Refer to the wetland regulations at 10.58(4)c. for more information about the scope of alternatives requirements):

- ☐ Alternatives limited to the lot on which the project is located.
- ☐ Alternatives limited to the lot on which the project is located, the subdivided lots, and any adjacent lots formerly or presently owned by the same owner.
- ☐ Alternatives limited to the original parcel on which the project is located, the subdivided parcels, any adjacent parcels, and any other land which can reasonably be obtained within the municipality.
- ☐ Alternatives extend to any sites which can reasonably be obtained within the appropriate region of the state.

Negative Determination

Note: No further action under the Wetlands Protection Act is required by the applicant. However, if the Department is requested to issue a Superseding Determination of Applicability, work may not proceed on this project unless the Department fails to act on such request within 35 days of the date the request is post-marked for certified mail or hand delivered to the Department. Work may then proceed at the owner's risk only upon notice to the Department and to the Conservation Commission. Requirements for requests for Superseding Determinations are listed at the end of this document.

☐ 1. The area described in the Request is not an area subject to protection under the Act or the Buffer Zone.

☒ 2. The work described in the Request is within an area subject to protection under the Act, but will not remove, fill, dredge, or alter that area. Therefore, said work does not require the filing of a Notice of Intent.

☐ 3. The work described in the Request is within the Buffer Zone, as defined in the regulations, but will not alter an Area subject to protection under the Act. Therefore, said work does not require the filing of a Notice of Intent, subject to the following conditions (if any).

This determination is subject to review and approval by the Army Corps of Engineers, Massachusetts Office of Coastal Zone Management, the Division of Marine Fisheries, and the Natural Heritage and Endangered Species Program, with the following conditions: 1) Adhere to the time frame given by the aforementioned agencies, 2) Notify the Conservation Commission and the Building Department 48 hours before starting work, and 3) No washing down or refueling of equipment is allowed onsite.

☐ 4. The work described in the Request is not within an Area subject to protection under the Act (including the Buffer Zone). Therefore, said work does not require the filing of a Notice of Intent, unless and until said work alters an Area subject to protection under the Act.

B. Determination (cont.)

☐ 5. The area described in the Request is subject to protection under the Act. Since the work described therein meets the requirements for the following exemption, as specified in the Act and the regulations, no Notice of Intent is required:

Exempt Activity (site applicable statuatory/regulatory provisions)

☐ 6. The area and/or work described in the Request is not subject to review and approval by:

Name of Municipality

Pursuant to a municipal wetlands ordinance or bylaw.

Name | Ordinance or Bylaw Citation

C. Authorization

This Determination is issued to the applicant and delivered as follows:

☐ by hand delivery on — Date

☒ by certified mail, return receipt requested on 7-31-08 — Date

This Determination is valid for **three years** from the date of issuance (except Determinations for Vegetation Management Plans which are valid for the duration of the Plan). This Determination does not relieve the applicant from complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.

This Determination must be signed by a majority of the Conservation Commission. A copy must be sent to the appropriate DEP Regional Office (see Attachment) and the property owner (if different from the applicant).

Signatures:

7-14-08
Date

D. Appeals

The applicant, owner, any person aggrieved by this Determination, any owner of land abutting the land upon which the proposed work is to be done, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate Department of Environmental Protection Regional Office (see Attachment) to issue a Superseding Determination of Applicability. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and Fee Transmittal Form (see Request for Departmental Action Fee Transmittal Form) as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Determination. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant if he/she is not the appellant. The request shall state clearly and concisely the objections to the Determination which is being appealed. To the extent that the Determination is based on a municipal ordinance or bylaw and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

DEP Regional Addresses
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Mail transmittal forms and DEP payments, payable to:

Commonwealth of Massachusetts
Department of Environmental Protection
Box 4062
Boston, MA 02211

DEP Western Region
436 Dwight Street
Suite 402
Springfield, MA 01103
Phone: 413-784-1100
Fax: 413-784-1149

Adams	Colrain	Hampden	Monroe	Pittsfield	Tyringham
Agawam	Conway	Hancock	Montague	Plainfield	Wales
Alford	Cummington	Hatfield	Monterey	Richmond	Ware
Amherst	Dalton	Hawley	Montgomery	Rowe	Warwick
Ashfield	Deerfield	Heath	Monson	Russell	Washington
Becket	Easthampton	Hinsdale	Mount Washington	Sandisfield	Wendell
Belchertown	East Longmeadow	Holland	New Ashford	Savoy	Westfield
Bernardston	Egremont	Holyoke	New Marlborough	Sheffield	Westhampton
Blandford	Erving	Huntington	New Salem	Shelburne	West Springfield
Brimfield	Florida	Lanesborough	North Adams	Shutesbury	West Stockbridge
Buckland	Gill	Lee	Northampton	Southampton	Whately
Charlemont	Goshen	Lenox	Northfield	South Hadley	Wilbraham
Cheshire	Granby	Leverett	Orange	Southwick	Williamsburg
Chester	Granville	Leyden	Otis	Springfield	Williamstown
Chesterfield	Great Barrington	Longmeadow	Palmer	Stockbridge	Windsor
Chicopee	Greenfield	Ludlow	Pelham	Sunderland	Worthington
Clarksburg	Hadley	Middlefield	Peru	Tolland	

DEP Central Region
627 Main Street
Worcester, MA 01608
Phone: 508-792-7650
Fax: 508-792-7621
TDD: 508-767-2788

Acton	Charlton	Hopkinton	Millbury	Rutland	Uxbridge
Ashburnham	Clinton	Hubbardston	Millville	Shirley	Warren
Ashby	Douglas	Hudson	New Braintree	Shrewsbury	Webster
Athol	Dudley	Holliston	Northborough	Southborough	Westborough
Auburn	Dunstable	Lancaster	Northbridge	Southbridge	West Boylston
Ayer	East Brookfield	Leicester	North Brookfield	Spencer	West Brookfield
Barre	Fitchburg	Leominster	Oakham	Sterling	Westford
Bellingham	Gardner	Littleton	Oxford	Stow	Westminster
Berlin	Grafton	Lunenburg	Paxton	Sturbridge	Winchendon
Blackstone	Groton	Marlborough	Pepperell	Sutton	Worcester
Bolton	Harvard	Maynard	Petersham	Templeton	
Boxborough	Hardwick	Medway	Phillipston	Townsend	
Boylston	Holden	Mendon	Princeton	Tyngsborough	
Brookfield	Hopedale	Milford	Royalston	Upton	

DEP Southeast Region
20 Riverside Drive
Lakeville, MA 02347
Phone: 508-946-2700
Fax: 508-947-6557
TDD: 508-946-2795

Abington	Dartmouth	Freetown	Mattapoisett	Provincetown	Tisbury
Acushnet	Dennis	Gay Head	Middleborough	Raynham	Truro
Attleboro	Dighton	Gosnold	Nantucket	Rehoboth	Wareham
Avon	Duxbury	Halifax	New Bedford	Rochester	Wellfleet
Barnstable	Eastham	Hanover	North Attleborough	Rockland	West Bridgewater
Berkley	East Bridgewater	Hanson	Norton	Sandwich	Westport
Bourne	Easton	Harwich	Norwell	Scituate	West Tisbury
Brewster	Edgartown	Kingston	Oak Bluffs	Seekonk	Whitman
Bridgewater	Fairhaven	Lakeville	Orleans	Sharon	Wrentham
Brockton	Fall River	Mansfield	Pembroke	Somerset	Yarmouth
Carver	Falmouth	Marion	Plainville	Stoughton	
Chatham	Foxborough	Marshfield	Plymouth	Swansea	
Chilmark	Franklin	Mashpee	Plympton	Taunton	

DEP Northeast Region
1 Winter Street
Boston, MA 02108
Phone: 617-654-6500
Fax: 617-556-1049
TDD: 617-574-6868

Amesbury	Chelmsford	Hingham	Merrimac	Quincy	Wakefield
Andover	Chelsea	Holbrook	Methuen	Randolph	Walpole
Arlington	Cohasset	Hull	Middleton	Reading	Waltham
Ashland	Concord	Ipswich	Millis	Revere	Watertown
Bedford	Danvers	Lawrence	Milton	Rockport	Wayland
Belmont	Dedham	Lexington	Nahant	Rowley	Wellesley
Beverly	Dover	Lincoln	Natick	Salem	Wenham
Billerica	Dracut	Lowell	Needham	Salisbury	West Newbury
Boston	Essex	Lynn	Newbury	Saugus	Weston
Boxford	Everett	Lynnfield	Newburyport	Sherborn	Westwood
Braintree	Framingham	Malden	Newton	Somerville	Weymouth
Brookline	Georgetown	Manchester-By-The-Sea	Norfolk	Stoneham	Wilmington
Burlington	Gloucester	Marblehead	North Andover	Sudbury	Winchester
Cambridge	Groveland	Medfield	North Reading	Swampscott	Winthrop
Canton	Hamilton	Medford	Norwood	Tewksbury	Woburn
Carlisle	Haverhill	Melrose	Peabody	Topsfield	

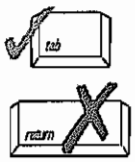
Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

Request for Departmental Action Fee Transmittal Form

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A. Request Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. Person or party making request (if appropriate, name the citizen group's representative):

Name

Mailing Address

City/Town | State | Zip Code

Phone Number | Fax Number (if applicable)

Project Location

Mailing Address

City/Town | State | Zip Code

2. Applicant (as shown on Notice of Intent (Form 3), Abbreviated Notice of Resource Area Delineation (Form 4A); or Request for Determination of Applicability (Form 1)):

Name

Mailing Address

City/Town | State | Zip Code

Phone Number | Fax Number (if applicable)

3. DEP File Number:

B. Instructions

1. When the Departmental action request is for (check one):

☐ Superseding Order of Conditions ($100 for individual single family homes with associated structures; $200 for all other projects)

☐ Superseding Determination of Applicability ($100)

☐ Superseding Order of Resource Area Delineation ($100)

Send this form and check or money order for the appropriate amount, payable to the *Commonwealth of Massachusetts* to:

Department of Environmental Protection
Box 4062
Boston, MA 02211

B. Instructions (cont.)

2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP Regional Office (see Attachment A).

4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO:
ATTENTION OF:

August 8, 2008

Regulatory Division
CENAE-R-PEA
Permit Number: NAE-2008-02236

Bouchard Transportation Company, Inc.
58 South Service Road
Melville, New York 11747

Dear Sir/Madam:

We have reviewed your application to excavate trenches at Howard's Beach and Leisure Shores to evaluate for the presence of potential residual oil cobbles, oil sediment, and oil particles. The work is proposed to take place during August and September of 2008. The excavated trenches will also be used for water and sediment sample collections along with field inspections to evaluate for residual oil conditions. The trenches are to be dug by a mini-excavator and will be 2 feet below grade and six feet apart. All trenches will be backfilled once sampling and inspections are complete. All activities will be carried out three hours before low tide through three hours after low tide during the daylight weather permitting. This project is located in Buzzards Bay adjacent to Brandt Island Road, Mattapoisett, Massachusetts. The work is shown on the attached plans entitled "Phase IV Beach Investigation", on 3 sheets, and dated "5/6/2008".

Based on the information you have provided, we have determined that the proposed activity, which includes a discharge of dredged or fill material into waters or wetlands, will have only minimal individual or cumulative environmental impacts on waters of the United States, including wetlands. Therefore, this work is authorized as a Category 2 activity under the attached Federal permit known as the Massachusetts Programmatic General Permit (PGP). This work must be performed in accordance with the terms and conditions of the PGP and also in compliance with the following special conditions:

1. Dredging and filling shall not occur beyond the timeframe between three hours before and three hours after low tide.
2. Trenches shall be backfilled once work is complete.

You are responsible for complying with all of the PGP's requirements. Please review the attached PGP carefully, in particular the PGP conditions beginning on Page 9, to familiarize yourself with its contents. You should ensure that whoever does the work fully understands the requirements and that a copy of the permit document and this authorization letter are at the project site throughout the time the work is underway.

This determination becomes valid only after the Massachusetts Department of Environmental Protection (DEP) issues or waives Water Quality Certification (WQC) as required under Section 401 of the Clean Water Act. In the event the DEP denies the 401 WQC, this

determination becomes null and void. The address of the DEP Regional office for your area is provided in the attached PGP.

Your project is located within, or may affect resources within the coastal zone. The Massachusetts Office of Coastal Zone Management (CZM) has already determined that no further Federal Consistency Review is required.

This authorization expires on January 20, 2010, unless the PGP is modified, suspended or revoked. You must complete the work authorized herein by January 20, 2010. If you do not, you must contact this office to determine the need for further authorization before continuing the activity. We recommend you contact us *before* this permit expires to discuss a time extension or permit reissuance.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

This authorization requires you to complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated starting date. You must also complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work and any required mitigation.

This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law, as listed on Page 1 of the PGP. Performing work not specifically authorized by this determination or failing to comply with any special conditions provided above or all the terms and conditions of the PGP may subject you to the enforcement provisions of our regulations.

We continually strive to improve our customer service. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://per2.nwp.usace.army.mil/survey.html

Please contact Richard C. Kristoff Jr., of my staff at 978-318-8171 if you have any questions.

Sincerely,

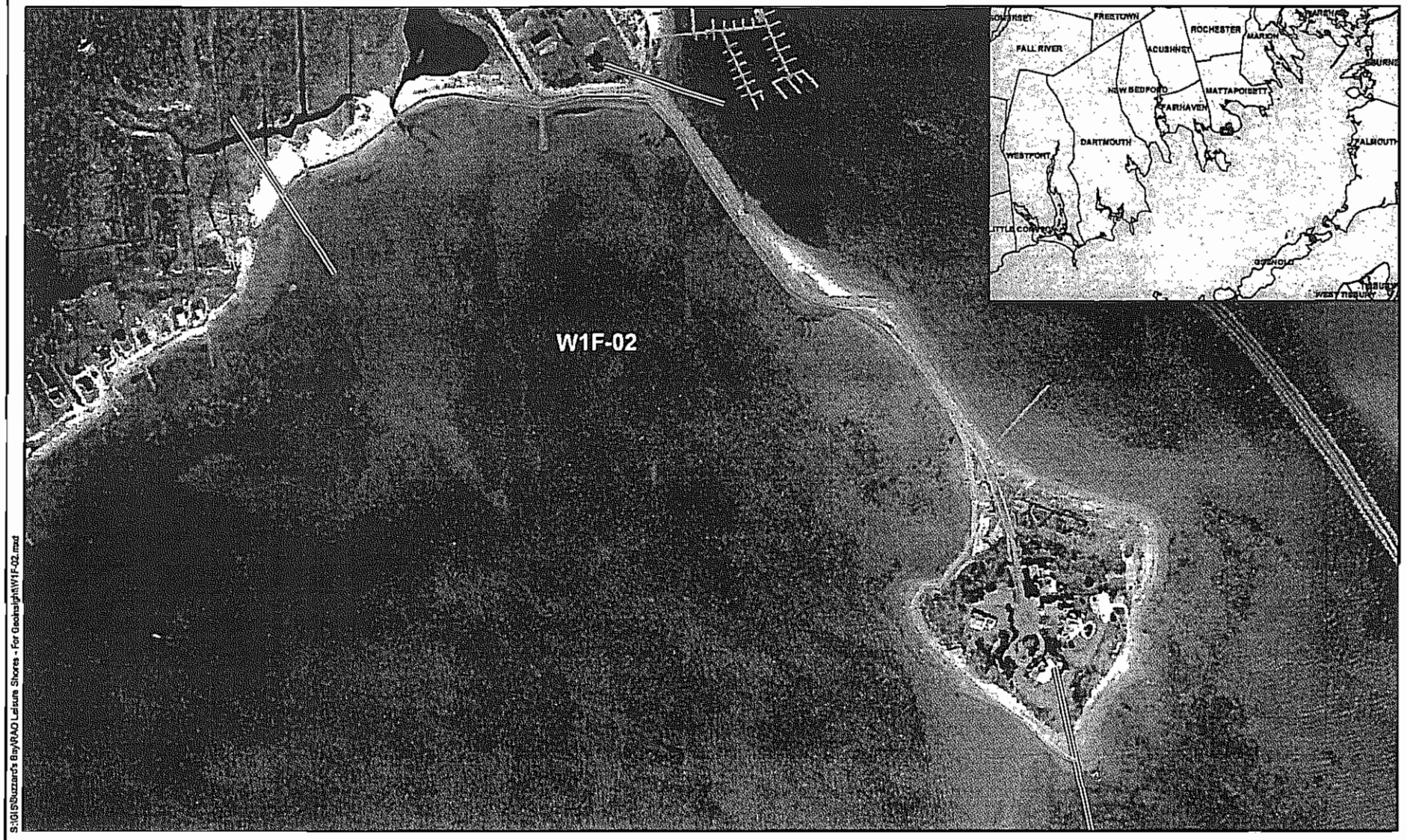
for Paul Sweeney

Philip T. Feir
Colonel, Corps of Engineers
District Engineer

Attachments

Copies Furnished:

Ed Reiner, U.S. EPA, Region 1, 1 Congress Street, Suite 1100-Mail Code CWP, Boston, Massachusetts 02114-2023
Christopher Boelke, National Marine Fisheries Service, One Blackburn Drive, Gloucester, Massachusetts 01930-2298
Elizabeth F. Kouloheras, DEP SERO, Wetlands and Waterways, 20 Riverside Drive, Lakeville, Massachusetts 02347
Robert Boeri, Coastal Zone Management, 251 Causeway Street, Suite 900, Boston, Massachusetts 02114
Kevin Trainer, GeoInsight, 5 Lan Drive, Suite 200, Westford, Massachusetts 01886
Richard J. Wozmak, EnviroLogic, LLC, 50 Nashua Road, Suite 205, Londonderry, New Hampshire 03053



S:\GIS\Buzzard's Bay\RAO Leisure Shores - For Geoinsight\W1F-02.mxd

0 330 660 1,320 Feet

N

GeoInsight

ENTRIX
ENVIRONMENTAL CONSULTANTS

Figure 2
Segment Boundary W1F-02
Brandt Island West
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

8/12/2008

Bouchard Transportation Co., Inc.
58 South Service Road
Melville NY 11747

RE: Project Location: Howard's Beach & Leisure Shores Beach
Project Description: Excavate test pits/trenches to evaluate for the presence of residual oil
NHESP File No.: 08-25132

To Whom It May Concern:

Thank you for submitting the MESA Project Review Checklist, site plans (dated 5/6/2008) and other required materials to the Natural Heritage and Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

Based on a review of the information that was provided and the information that is currently contained in our database, the NHESP has determined that this project, as currently proposed, **will not result in a prohibited "take"** of state-listed rare species. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the NHESP pursuant to the MESA. This project may be subject to further review if no physical work is commenced within three-years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Amy Coman, Endangered Species Review Assistant, at (508) 389-6364.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director

cc: Kevin Trainer, GeoInsight, Inc

Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street, Suite 400
Boston, Massachusetts 02114
(617)626-1520
Fax (617)626-1509

Paul J. Diodati
Director

Deval Patrick
Governor
Ian A. Bowles
Secretary
Mary B. Griffin
Commissioner

July 30, 2008

Mr. Richard Kristoff
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742

Re: NAE-2008-02236

Dear Mr. Kristoff:

The Division of Marine Fisheries (*MarineFisheries*) has reviewed the PGP Cat 2 Permit Application by GeoInsight to excavate trenches at Howard's Beach and Leisure Shores to evaluate for the presence of potential residual oil cobbles, oiled sediment and oil particles as part of the 2003 oil spill cleanup on Buzzards Bay in the Town of Mattapoisett, with respect to potential impacts to marine fishery resources.

The proposed site lies within land containing shellfish which is afforded protection under the Wetlands Protection Act (310 CMR 10.34).

After careful review, *MarineFisheries* has no recommendations for this project at this time.

Questions regarding this review may be directed to Frank Germano in our New Bedford office at (508) 910-6344.

Sincerely,

Paul J Diodati

Paul J. Diodati
Director

cc: Mattapoisett Conservation Commission
Kathy Massey, Shellfish Constable
Greg Sawyer, DMF
Eileen Feeney, DMF
Heather Marshall, DMF
Robert Boeri, CZM
Christopher Boelke, NMFS
Ed Reiner, US EPA
Maria Tur, US FWS
Ken Chin, DEP

APPENDIX J

MADEP MEMORANDUM

MEMORANDUM

TO: Richard Packard, BWSC/SERO
BY: John Fitzgerald, BWSC
DATE: November 28, 2008

SUBJECT: **MATTAPOISETT** – Leisure Shores – Site Inspection

On September 30th, between noon and 2:30 PM, the writer conducted an inspection of the Leisure Shores beach area in Mattapoisett. Present at the site at that time were Richard Packard of SERO, the site LSPs (Rick Wozmak and Kevin Trainor of GeoInsight), several area residents and their attorney, Nora Chorover, and representatives from Bouchard. It was a partly sunny day with temperatures around 70°F.

The purpose of this inspection was to evaluate site conditions, with respect to residual oil contamination from the (2003) Bouchard B-120 oil spill. Previous work by GeoInsight had documented that a condition of No Significant Risk had been achieved at this location for human health, safety, and the environment. At issue is whether residual oil could continue to constitute a significant risk to public welfare. This memorandum contains my observations, conclusions, and recommendations in this regard.

Activities and Observations

A series of trenches were excavated in the upper and lower intertidal zones, as shown in the figure below:

Each trench was dug with a small excavator, and extended several feet below grade into the water table. Some sheening was observed in a number of trenches, especially in the upper intertidal zone in the trenches easterly of the small groin. One trench had a relatively high concentration of a sheen-like material, however, this material appeared to be an inorganic oxide (e.g., manganese or iron), as opposed to petroleum (given that it broke up into small pieces when disturbed).

The observed petroleum sheens were small and discontinuous; from less than a centimeter to thin "strips" a few centimeters long. The concentrations of these "blobs" ranged from none to perhaps a dozen in the 5 ft^2 +/- test pits. Many sheens were elongated, as opposed to more circular in nature, and many were light and translucent, and difficult to detect. In past inspections, "rainbow" propagations were observed as small globules dislodged and floated to the surface of the standing water in the trenches. This was not the case during the September 30, 2008 inspection. Moreover, no petroleum "flecks" were observed.

A trench was also excavated westerly of the stream discharge, as shown on the figure. Although the writer did not observe this activity, according to reports by Richard Packard, there were a few small sheens that dispersed to non-detectable conditions.

In addition to viewing trenching operations, the writer also looked for oiled rocks. While not visually obvious or pervasive, it was possible to turn over the mostly cobble-sized rocks and on occasion encounter one with dried, residual oil present on some part of its surface. This was especially true in the small groin. In a few cases, if the rock was vigorously rubbed against the skin, some discoloration of the skin was observed. It was however often difficult to discern whether a black appearance on a rock was the result of algae or petroleum.

Discussion

At issue is whether the residual petroleum at this site constitutes a significant risk to public welfare, as defined in MGL c. 21E.

Previously, the agency had developed some criteria to guide considerations in this regard:

> A Significant Risk to Public Welfare exists if the presence of oil or hazardous materials at a disposal site significantly impedes or limits the public's ability or inclination to access, use, enjoy and/or benefit from the natural resources of the Commonwealth. Examples in this regard with respect to oil residuals in a coastal environment would include, without limitation:
>
> - visual and/or olfactory evidence of oil residuals that are likely to discourage the use of beaches, marshes, and related intertidal and subtidal areas that are otherwise accessible and available for public use;
> - oil residuals that are likely to contact and adhere to persons engaged in recreational activities at beaches, marshes, and related intertidal and subtidal areas that are accessible and available for public use;
> - oil residuals that are likely to adversely impact the economic interests of a region, by decreasing tourism, investment, development, and/or marine and fishery commerce.

Of the 3 examples listed above, the first and third would appear to be non issues at this location:

> *Visual/olfactory*: There is no observable petroleum odor at this location. The sheens observed in the test pits were relatively minor and without odor. The oil residuals observed on some rocks were dry and highly weathered, and without a detectable odor. Conversely, while petroleum odors were not detected, it was noted that some of the natural sediments in the lower intertidal zone were black in color with a pungent sulfide odor.
>
> *Economic Interests:* The residual oil at this location appears to be localized and not impacting fishery interests, tourism, nor investment or development of the region.

That leaves the second example*: oil residuals that are likely to contact and adhere to persons engaged in recreational activities at beaches, marshes, and related intertidal and subtidal areas that are accessible and available for public use*.

There are two discrete exposure pathways in this regard: (i) a person (e.g., child) digging a hole in the beach area and encountering blobs of oil on the soil or in the groundwater, and (ii) a person contacting or handling a rock containing residual oil.

> **Digging Holes**: Much of the beach area is gravelly (as opposed to sandy), with some portions (e.g., lower intertidal zone easterly of the small groin) containing relatively large cobbles. Digging is these areas is difficult, even for an adult with a shovel. Moreover, in some areas of the beach, as previously noted, a black anaerobic sand layer and/or peat layer is present. Digging in these areas produces a pungent hydrogen sulfide odor (as was noted on September 30th).
>
> These factors would tend to limit the number and sizes of "recreational" holes that might expose persons to residual oil globs in soil or groundwater. Even assuming that a 1 ft^2 hole is excavated, it is unlikely that more than one or two small streaks or globs of a faint petroleum sheen would be encountered. Based upon observations on September 30th, it appears unlikely that these streaks/blobs would stain skin or clothing, or even be noticed by persons who were not specifically looking for such streaks/globs.
>
> It appears likely that the residual oil remaining at this location will be less of an impediment to the public use and enjoyment of this area than the difficulty in digging and the discoloration and hydrogen sulfide odor caused by contact with native sediments.
>
> **Oiled Rocks**: While not visually apparent or pervasive, rocks with some degree of dried, residual oil are not difficult to locate, if one is aware of the oil spill and finding such rocks is one's objective. However, it seems unlikely that a member of the general public unaware of the site's history of oil impact would notice such a condition, given the large number of other rocks that are discolored (black) for other reasons (e.g., organic sediment, algae).
>
> If vigorously rubbed, some of these oil-contaminated rocks may leave a stain on skin or clothing. However, the same could likely be said of rocks discolored by algae or other natural conditions. It may be that staining of this nature could be worse during very hot weather (e.g., 90 degree days with bright sunshine), but I have no first hand observations in this regard, and the experience of others should be considered in this regard.

Conclusions

Unless impacts from oily rocks are substantially more pronounced during hot weather conditions, in my view, it would appear that after 5 years of remediation and weathering, conditions at the Leisure Shore beach site have reached a point of "No Significant Risk" to public welfare. In arriving at this conclusion, It is important to stress that per MGL c. 21E, *No Significant Risk does not mean zero risk or zero contamination*. There is unquestionably some residual, small globules of oil remaining in soils at the site, and dried, residual oils adhered to some rocks at the site. However, it would appear that the "general public" would by in large be unaware of these conditions, if they were engaged in common recreational activities at this beach. This conclusion is further supported by the lack of public complaints of this nature at a number of other beaches along Buzzards Bay that contained and/or still contain similar (if not more) levels of residual oil from the 2003 spill.

APPENDIX K

RISK CHARACTERIZATION OF SHEEN AT LEISURE SHORES AND HOWARD'S BEACH MEMORANDUM

ENTRIX, Inc.
100 Hart Road, Suite 130
Barrington, Illinois 60010
(847) 277-2850 | Fax (847) 381-6679
www.entrix.com

Date: April 27, 2008

To: Kevin Trainer (GeoInsight, Inc.) and Richard Wozmak (EnviroLogic, LLC.)

cc: Ralph Markarian, Ph.D. and Wayne Kicklighter (ENTRIX, Inc.)

From: Jody Kubitz, Ph.D. and Amy Bass (ENTRIX, Inc.)

Re: **Risk Characterization of Sheen at Leisure Shores and Howard's Beach — Addendum to the 2006 Method 3 Risk Characterization Report**

As requested, we have evaluated the September 2008 field observations and laboratory results with regard to potential risks to human health at Leisure Shores and Howard's Beach due to the B120 oil spill of April 27, 2003. The September 2008 field and laboratory results do not change the conclusions presented in the Method 3 Risk Characterization (GeoInsight 2006) that documented a condition of No Significant Risk had been achieved at this location for human health, safety, and the environment.

In regard to the consideration of human health risks associated with the September 2008 results, we assessed the human health risk associated with potential exposure to sheen on porewater in recreational pits dug at Leisure Shores based on conditions documented through September 2008. This potential exposure scenario was not evaluated in the 2006 Method 3 Risk Characterization; however, the sheen presumably arises from the petroleum hydrocarbon residue in the sediment, released from the sediment as the groundwater / porewater seeps into the trenches during the digging process. Thus, exposure to the sheen material is an indirect exposure pathway to the residual material in the sediment. The direct exposure to petroleum hydrocarbon residue in the sediment was included in the 2006 Method 3 Risk Characterization; therefore, evaluation of exposure to the sheen as a separate exposure pathway and treating the results as additive to those derived for the direct sediment exposure is conservative in nature.

Previous field observations documented that sheening occurred in pits dug in localized areas of the Leisure Shores beach area (GeoInsight 2006, MADEP 2008). Field survey results have indicated that the occurrence of sheening in excavated pits has decreased in extent and magnitude over the last few years, and the most recent surveys have indicated that it is largely limited to a relatively small portion of the beach. On September 30, 2008, representatives of the Massachusetts Department of Environmental Protection (MADEP) conducted a site visit and confirmed that there was No Significant Risk to public welfare associated with the residual petroleum hydrocarbons potentially remaining at the site (MADEP 2008). Some of the observed sheening was due to inorganic oxides and was not from petroleum

hydrocarbons. The majority of petroleum sheening observed in the post-cleanup inspections at Leisure Shores and Howard's Beach was reported to be up to perhaps a dozen thin, translucent strips ranging from less than a centimeter (cm) to a few cm long. These sheens were reported in a relatively large pit dug by an excavator (approximately 5 square feet and several feet deep, extending into the water table) primarily in the gravelly intertidal zone near the eastern end of Leisure Shores. MADEP reported that digging "recreational" holes in this portion of the beach would be generally difficult and unattractive due to gravel/cobble substrate that would make digging difficult, even for an adult with a shovel, and the presence of anaerobic subsurface sediments that smelled of hydrogen sulfide ("rotten eggs") in some instances (MADEP 2008). They reported that it is unlikely that more than one or two small streaks or globs of a faint petroleum sheen would be encountered when digging in the beach recreationally.

Sheen was observed in 5 of the 11 test pits that were dug on the September 30, 2008, visit but, in most cases, was difficult to discern and dissipated quickly. Water samples were collected from the 11 test pits, carefully collecting as much as possible of the visible sheen, if present. These water/sheen samples were analyzed for extractable petroleum hydrocarbons (EPH) by MADEP EPH Method and polycyclic aromatic hydrocarbons (PAHs) by USEPA Method SW846-8270C. EPH constituents were reported as non-detect in all of the samples, and PAHs were reported as non-detect in ten of the eleven samples; one sample reported relatively low concentrations (slightly above the detection limit) of five PAHs. These water/sheen samples were not analyzed in a manner allowing separate characterization of the water and sheen portions of the sample; therefore, the analytical results were not used for this sheen-contact Risk Characterization. However, observations made on that site visit were used in the characterization and quantification of potential exposure to the sheen material. Our assessment considered both the results of the field observations and laboratory results from the September 2006 and September 2008 surveys to assess the ongoing extent, magnitude, and chemical composition of the sheen at Leisure Shores.

The chemical composition of the sheen material was estimated based on analytical results for Teflon® net samples of the sheen, collected from test pits at Leisure Shores on September 20, 2006 (described in the April 3, 2007 Immediate Response Action Status and Completion Report). Use of the analytical results from the 2006 net samples is expected to overestimate potential current risk associated with sheens at Leisure Shores since the environment has undergone over two additional years of natural attenuation since these samples were collected in September 2006. The laboratory data report was reviewed for data quality and was determined to be useable for the purpose of this Risk Characterization. The laboratory reported one aliphatic analysis and two PAH analyses with one to two surrogate recovery percentages outside of the acceptable range (low); however, in each case, the reported percent recovery

was higher than 10 percent, and there were more surrogate recoveries reported within the range than outside of the range (each sample was analyzed with 3 surrogates for the aliphatic analysis and 5 surrogates for the PAH analysis). No other anomalies were found in the laboratory report. Based on this information, the data were determined to be useable for the purposes of this Risk Characterization.

These samples were collected using multiple passes of the net along the surface in order to skim the majority of the sheen and particles into the net. Three net samples were collected, and these samples were analyzed for total petroleum hydrocarbons and aliphatic hydrocarbons using B&B Laboratories, Inc., (B&B) (College Station, TX) Method 1013/1016 and for PAHs using B&B Method 1006. The analytical results for the net samples were reported in units of mass of analyte (in micrograms [µg] or nanograms [ng]) per net sample (e.g., ng/Net). The analytical results are summarized in Attachment A. The B&B laboratory report also provided the total mass of organic matter extracted from each net, and that information was used to derive the concentration in milligrams per kilogram (mg/kg) for each analyte detected in the sheen material (Attachment A). As shown in Attachment A, the identified aliphatic components (e.g., n-C12, n-C13, etc.) (Table A-1) and the PAH components that do not have constituent-specific toxicity values (e.g., C1-naphthalenes, naphthobenzothiophene, etc.) (Table A-2) were summed into the aliphatic/aromatic fractions identified in MADEP guidance (Table 1). The B&B analysis reported some heavier aromatic compounds (C29-C30) which were included in the sum for "C11-C22 Aromatic Hydrocarbons" as a conservative measure (the list of MADEP fractions does not include the heavier aromatic components). The laboratory report also included a quantity labeled as "Unresolved Complex Mixture." As a conservative measure, this quantity was arbitrarily included in the sum for "C9-C10 Aromatic Hydrocarbons" since that is one of groups with the lowest toxicity value (implying highest toxicity) among the aliphatic/aromatic fractions. The average of the derived concentrations for the three samples was used as the representative exposure point concentration (EPC) for each chemical constituent in the Risk Characterization of potential sheen contact (Table 1).

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Table 1. Exposure Point Concentrations Used for Risk Characterization of Potential Sheen Contact

Constituent	EPC (mg/kg) [a]
Petroleum Hydrocarbons	
C9-C18 Aliphatic Hydrocarbons	1,400
C19-C36 Aliphatic Hydrocarbons	17,000
C9-C10 Aromatic Hydrocarbons [b]	140,000
C11-C22 Aromatic Hydrocarbons [c]	23,000
Polycyclic Aromatic Hydrocarbons	
2-Methylnaphthalene	60
Acenaphthene	27
Acenaphthylene	4.6
Anthracene	22
Benzo(a)anthracene	300
Benzo(a)pyrene	180
Benzo(b)fluoranthene	110
Benzo(k)fluoranthene	18
Benzo(g,h,i)perylene	52
Biphenyl	20
Chrysene	560
Dibenzo(a,h)anthracene	33
Fluoranthene	58
Fluorene	41
Indeno(1,2,3-c,d)pyrene	33
Naphthalene	53
Phenanthrene	190
Pyrene	270

[a] Average of the Teflon® net sample concentrations calculated in Table A-3 of Attachment A, rounded to two significant figures.
[b] The concentration indicated for this fraction is almost entirely attributable to the "Unresolved Complex Mixture" contribution.
[c] This sum includes the "C29-C30 Aromatic Hydrocarbons."
EPC – Exposure point concentration.
mg/kg – Milligrams per kilogram.

The risks posed by potential exposure to the sheen were evaluated using the same procedures used in Attachment IV ("Forward Calculation of Risk Estimates") to the 2006 Method 3 Risk Characterization (GeoInsight 2006). The sediment exposure scenario and sediment exposure factors from the Method 3 Risk Characterization, modified to more appropriately represent potential exposure to the sheen material, were used to assess sheen risk.

Field observations and laboratory results from September 2008 documented that petroleum concentrations were either non-detect or limited to one specific location at the eastern extent of Leisure Shores. Digging in that location would be difficult due to the gravel and cobble beach material in this area. MADEP (2008) also noted the presence of an unpleasant odor from the subsurface, and the fact that the sheens were not encountered in all of the trenches. Based on these observations, the likelihood of exposure to the sheen material would occur in only a fraction of the sediment contact events (87 days per year) that were assumed in the 2006 Method 3 Risk Characterization calculations (GeoInsight 2006). If it is assumed that a receptor visits this beach 87 days each year and digs a "recreational hole" on every visit (considered to be a conservative assumption, particularly with the difficulty and undesirability of digging in this portion of the beach), it is expected that they might encounter measurable sheen concentrations less than 10 percent of the time based on the general proportion of the beach with observed sheen through September 2008 and the subsequent laboratory results (1 out of 11 samples had measurable petroleum in September 2008). This results in approximately 8 days/year as a realistic exposure frequency for contact with the sheen.

It was assumed that the receptor digs, on each of these visits to the beach area, a 1 square foot "recreational hole" and that two sheen streaks (as estimated by MADEP 2008) are captured on their skin. The approximate area for each of these two sheen streaks was assumed to be approximately 0.5 cm by 5 cm based on the field observations from September 2008. The total amount of this sheen material was assumed to adhere to the receptor's skin; therefore, the total skin surface area exposed to the sheen material was calculated to be 5 square centimeters (cm^2) (2 × 0.5 cm × 5 cm). For this Risk Characterization, the mass of sheen was estimated based on the "light and translucent" description of the sheen by MADEP (2008), which is consistent with a "silver" sheen that has an approximate thickness of 0.00001 cm according to *Technical Information Paper No. 1*, published by The International Tanker Owners Pollution Federation Limited (ITOPF 2009). Thus, 2 sheens streaks of approximately 5 cm^2 total area would have an estimated total volume of 0.00005 cm^3. The density of Bunker C Fuel Oil is 0.97871 gram (g)/cm^3 according to Bobra and Callaghan (1990). Therefore, the mass of sheen in 2 sheen streaks of total volume 0.00005 cm^3 was estimated as 0.0000489 g.

Table 2 summarizes the receptor-specific exposure parameters used to evaluate potential exposure to the sheen material in this Method 3 Risk Characterization. As noted, most of the parameter values are the same as those used in the 2006 Method 3 Risk Characterization for sediment exposure, but the exposure frequency and exposed skin surface area were adjusted to more appropriately represent potential sheen contact. The evaluation of sheen exposure is based only on potential dermal contact with

the sheen. The incidental ingestion of sheen material was not included in the evaluation since it is not considered to be a relevant or significant exposure pathway due to the extremely low likelihood of ingesting any of the sheen material. The current evaluation does, however, assume that all of the sheen material in a recreational-sized pit (presumably two sheen streaks) is contacted and adheres to the receptor's skin.

Table 2. Exposure Factors Used for the Method 3 Risk Characterization of Risk from Sheen Contact.

Exposure Parameter	Receptor / Risk Endpoint		
	Child (1<2 years) Non-Cancer, Subchronic Exposure	**Child (1<8 years) Non-Cancer, Chronic Exposure**	**Adult (1<31 years) Cancer**
Averaging Period (days)	365	2,555	27,375
Body Weight (kg)	11.15	17.2	47.7
Event Frequency (events/day)	1	1	1
Exposure Frequency (days/year) *	8	8	8
Exposure Period (years)	1	7	30
Skin Surface Area (cm^2) *	5	5	5

* These exposure parameter values were adjusted to more appropriately represent potential exposure to the sheen material; other parameter values are the same as those used for sediment exposure in the 2006 Method 3 Risk Characterization.

cm^2 - Square centimeters. kg - Kilograms.

Consistent with the 2006 Method 3 Risk Characterization, the younger child receptor was used to evaluate non-cancer risk from subchronic exposure, the older child receptor was used to evaluate non-cancer risk from chronic exposure, and the adult receptor was used to evaluate cancer risk from lifetime exposure. Estimates of non-cancer and cancer risk were derived using agency-recommended toxicity values, the EPCs listed in Table 1, and the exposure parameter values listed in Table 2. The approach used for this risk evaluation is consistent with the approach used in the "Forward-Calculation of Risk Estimates" in Attachment IV to the Method 3 Risk Characterization (GeoInsight 2006). The average daily dose (ADD) (used in calculating non-cancer risk) and lifetime average daily dose (LADD) (used in calculating cancer risk) are derived using the following equation:

$$\text{ADD or LADD} = \frac{EPC \times SSA \times AF \times EV \times EF \times EP \times RAFd \times CF}{BW \times AP}$$

where:

ADD = Average daily dose (mg/kg/day)
AF = Adherence factor (0.00979 mg/cm^2/event)
AP = Averaging period (days) (Table 2)
BW = Body weight (kg) (Table 2)

CF = Unit conversion factor (10^{-6} kg/mg)
EF = Exposure frequency (days/year) (Table 2)
EP = Exposure period (years) (Table 2)
EPC = Exposure point concentration (mg/kg) (Table 1)
EV = Event frequency (1 event/day of exposure)
LADD = Lifetime average daily dose (mg/kg/day)
RAFd = Relative absorption factor, dermal (unitless); constituent-specific (GeoInsight 2006)
SSA = Exposed skin surface area (cm^2) (Table 2)

The adherence factor value of 0.00979 mg/cm^2/event was derived from the assumption that the entire mass of two sheen streaks in a 1 square foot recreational hole (0.0489 milligrams [mg]) adheres to a skin surface area of 5 cm^2. The non-cancer risk (hazard index [HI]) and cancer risk (excess lifetime cancer risk [ELCR]) are then calculated as shown below:

Non-cancer risk: $HI = ADD / RfD$

Cancer risk: $ELCR = LADD \times CSF$

where:

CSF = Cancer slope factor $(mg/kg/day)^{-1}$; constituent-specific (GeoInsight 2006)
ELCR = Excess lifetime cancer risk (unitless)
HI = Non-cancer hazard index (unitless)
RfD = Reference dose (mg/kg/day); constituent-specific (GeoInsight 2006)

Tables A-4, A-5, and A-6 in Attachment A present the calculations for estimated non-cancer and cancer risks based on the sheen contact exposure scenario. The calculated values for non-cancer risk from sheen exposure (2E-05 for subchronic exposure [Table A-4]; 2E-04 for chronic exposure [Table A-5]) are well below the agency benchmark value of 1 for non-cancer risk. The calculated value for cancer risk from sheen exposure (3E-09) (Table A-6) is below the agency benchmark value of 1E-05 for cancer risk. Even if the sheen were encountered on every site visit (87 days per year) (a worst-case scenario), the calculated values for non-cancer and cancer risk exposure (non-cancer risk of 3E-04 for subchronic exposure and 2E-03 for chronic exposure; cancer risk of 3E-08) would be less than the agency benchmark values.

These estimated risks from potential sheen exposure were also viewed in combination with the results of the 2006 Method 3 Risk Characterization to ensure that the additional risks estimated for this hypothetical sheen exposure scenario do not cause the cumulative risks to exceed the Massachusetts Contingency Plan (MCP) target maximum risk levels of 1 for non-cancer risk and 1E-05 for cancer risk. The 2006 Method 3 Risk Characterization calculations likely overestimate the upper bound risks associated with the

site, particularly since the constituent concentrations have continued to decrease over the period of time since the 2006 Method 3 Risk Characterization concentration data were collected. The conservative human health risk estimates derived in Attachment IV of the 2006 Method 3 Risk Characterization are presented in Table 3.

Table 3. Summary of 2006 Method 3 Risk Characterization Results.

Exposure Scenario		**Non-Cancer Risk**		**Cancer Risk**
Medium	**Pathway**	**Subchronic HI** (unitless)	**Chronic HI** (unitless)	**ELCR** (unitless)
Sediment	Dermal	1E-03	9E-03	3E-06
	Oral	2E-04	5E-03	2E-07
Shellfish	Oral	5E-04	3E-03	6E-08
Product	Dermal	1E-02	1E-01	5E-07
	Oral	4E-03	2E-02	4E-06
	Risk Totals:	**0.02**	**0.1**	**8E-06**

ELCR – Excess lifetime cancer risk. HI – Non-cancer hazard index.

The sums of the 2006 Method 3 Risk Characterization results and the risk estimates for the hypothetical sheen contact are below the threshold for significant risk to human health, as shown in Table 4.

Table 4. Cumulative Risks Based on the 2006 Method 3 Risk Characterization Results and the Estimated Risks for the Hypothetical Sheen Exposure.

	Non-Cancer Risks		**Cancer Risk**
Basis of Risk Estimates	**Subchronic HI** (unitless)	**Chronic HI** (unitless)	**ELCR** (unitless)
2006 Method 3 Risk Characterization Cumulative Risks (Table 3):	0.02	0.1	8E-06
Estimated Risks for Sheen Contact – Exposure Frequency = 8 days/year	2E-05	2E-04	3E-09
Cumulative Risk (Sum)*	**0.02**	**0.1**	**8E-06**
Worst-Case Risk Estimates (Sheen Contact 87 days/year)	3E-04	2E-03	3E-08
Cumulative Risk (Sum)*	**0.02**	**0.1**	**8E-06**

* Sum of the indicated estimate of the sheen-related risk and the 2006 Method 3 Risk Characterization cumulative risk.
ELCR – Excess lifetime cancer risk. EPC – Exposure point concentration. HI – Non-cancer hazard index.

The cumulative risks in Table 4 are the sums of the indicated estimate of the sheen-related risks and the cumulative risks from the 2006 Method 3 Risk Characterization. Even in the worst-case scenario of sheen contact occurring 87 days per year, the estimated sheen-related risks do not make a significant

contribution to the sum, and the cumulative risks are (to one significant figure) equal to the 2006 Method 3 Risk Characterization results. The cumulative risks are less than the MCP target maximum risk levels of 1 for non-cancer risk and 1E-05 for cancer risk. The additional contributory risks for potential exposure to sheen in pits excavated at the shoreline do not increase the total potential risks to human health to above the thresholds for significant risk to human health. Therefore, the conclusion in the August 2006 Risk Characterization that a Condition of No Significant Risk to human health has been achieved remains valid.

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ATTACHMENT A

ANALYTICAL RESULTS FOR THE SEPTEMBER 2006 TEFLON® NET SAMPLES,

DERIVATION OF EXPOSURE POINT CONCENTRATIONS,

AND

PRESENTATION OF NON-CANCER AND CANCER RISK ESTIMATES

FOR THE SHEEN RISK CHARACTERIZATION

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Table A-1
ANALYTICAL RESULTS FOR PETROLEUM HYDROCARBONS, TEFLON® NET SHEEN SAMPLES
B-120 Oil Spill - Buzzards Bay, MA

Analyte	Sample ID: / Sample Date:	A-70 9/20/06	B-30 9/20/06	B-70 9/20/06
Alkanes		(µg/Net)	(µg/Net)	(µg/Net)
n-C10	[a]	0.41	0.50	0.23
n-C11	[a]	0.23	0.26	0.11 J
n-C12	[a]	0.20	0.13	0.08 J
n-C13	[a]	0.14 J	0.11 J	0.06 J
n-C14	[a]	0.19 J	0.17 J	0.11 J
n-C15	[a]	0.57	0.24 J	0.18 J
n-C16	[a]	0.19 J	0.17 J	0.15 J
n-C17	[a]	0.26	0.06 J	0.04 J
Pristane (C19)	[b]	0.36	0.12 J	0.05 J
n-C18	[a]	0.46	0.16 J	0.15 J
Phytane (C20)	[b]	ND (<0.18)	0.09 J	ND (<0.18)
n-C19	[b]	ND (<0.17)	0.29	ND (<0.17)
n-C20	[b]	0.23	0.13 J	ND (<0.21)
n-C21	[b]	1.64	0.34	0.10 J
n-C22	[b]	2.43	0.33	0.22
n-C23	[b]	1.06	0.27	0.32
n-C24	[b]	0.42	0.30	0.77
n-C25	[b]	2.03	0.57	1.63
n-C26	[b]	2.94	0.89	2.44
n-C27	[b]	5.25	1.32	2.92
n-C28	[b]	3.12	1.06	2.84
n-C29	[b]	3.94	1.24	2.66
n-C30	[b]	2.78	0.83	2.15
n-C31	[b]	1.96	0.70	1.70
n-C32	[b]	1.36	0.50	1.20
n-C33	[b]	1.01	0.30	0.80
n-C34	[b]	0.58	ND (<0.18)	0.49
Unresolved Complex Mixture	[c]	917	168	2.7

J - Estimated concentration below the relevant detection limit.
µg/Net - Micrograms per net.
ND - Not detected. The relevant detection limit is shown in parentheses. One-half the detection limit was used as a proxy concentration in deriving exposure point concentrations for the Risk Characterization.

[a] Analyte was included in the sum for C9-C18 Aliphatic Hydrocarbons.
[b] Analyte was included in the sum for C19-C36 Aliphatic Hydrocarbons.
[c] Analyte was arbirarily included in the sum for C9-C10 Aromatic Hydrocarbons as a conservative measure.

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Table A-2
ANALYTICAL RESULTS FOR POLYCYCLIC AROMATIC HYDROCARBONS, TEFLON® NET SHEEN SAMPLES
B-120 Oil Spill - Buzzards Bay, MA

Analyte	Sample ID: / Sample Date:		A-70 9/28/06	B-30 9/28/06	B-70 9/28/06
Polycyclic Aromatic Hydrocarbons			(ng/Net)	(ng/Net)	(ng/Net)
Naphthalene			72.8	77.6	45.0
C1-Naphthalenes		[b]	97.4	79.5	55.4
C2-Naphthalenes		[b]	116	91.1	38.1
C3-Naphthalenes		[b]	869	233	40.6
C4-Naphthalenes		[b]	1,560	378	44.4
Benzothiophene			2.5 J	ND (<10)	ND (<10)
C1-Benzothiophenes		[a]	7.1 J	ND (<10)	ND (<10)
C2-Benzothiophenes		[a]	21.6	ND (<10)	ND (<10)
C3-Benzothiophenes		[b]	46.5	ND (<10)	ND (<10)
Biphenyl			33.2	24.1	19.2
Acenaphthylene			ND (<10)	ND (<10)	ND (<10)
Acenaphthene			48.4	36.4	22.8
Dibenzofuran		[b]	192	145	99.0
Fluorene			73.10	53.7	35.2
C1-Fluorenes		[b]	264	73.7	10.0
C2-Fluorenes		[b]	1,770	439	56.4
C3-Fluorenes		[b]	842	279	ND (<10)
Carbazole			ND (<10)	ND (<10)	ND (<10)
Anthracene			106	25.1	8.1 J
Phenanthrene			242	290	163
C1-Phenanthrene/Anthracenes		[b]	2,650	1,380	93.9
C2-Phenanthrene/Anthracenes		[b]	11,500	4,100	563
C3-Phenanthrene/Anthracenes		[b]	15,000	4,660	825
C4-Phenanthrene/Anthracenes		[b]	7,420	2,590	584
Dibenzothiophene		[b]	73.6	24.2	12.1
C1-Dibenzothiophenes		[b]	519	177	19.8
C2-Dibenzothiophenes		[b]	2,200	641	102
C3-Dibenzothiophenes		[b]	2,970	956	177
Fluoranthene			240	79.1	20.3
Pyrene			1,320	369	63.4
C1-Fluoranthenes/Pyrenes		[b]	6,210	2,290	427
C2-Fluoranthenes/Pyrenes		[b]	8,420	3,040	619
C3-Fluoranthenes/Pyrenes		[b]	6,140	2,470	424
Naphthobenzothiophene		[b]	1,040	361	77.1
C1-Naphthobenzothiophenes		[b]	2,990	955	204
C2-Naphthobenzothiophenes		[b]	3,130	1,080	239
C3-Naphthobenzothiophenes		[b]	1,230	362	89.6
Benzo(a)anthracene			1,250	448	89.0
Chrysene			2,460	798	157
C1-Chrysenes		[b]	7,920	2,830	544
C2-Chrysenes		[b]	8,330	3,070	573
C3-Chrysenes		[b]	3,360	1,330	228
C4-Chrysenes		[b]	99.6	54.9	ND (<10)
Benzo(b)fluoranthene			433	159	39.2
Benzo(k)fluoranthene			66.6	25.0	8.1 J
Benzo(e)pyrene		[b]	440	189	43.5

Footnotes appear on the last page.

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Table A-2
ANALYTICAL RESULTS FOR POLYCYCLIC AROMATIC HYDROCARBONS, TEFLON® NET SHEEN SAMPLES
B-120 Oil Spill - Buzzards Bay, MA

Analyte	Sample ID: / Sample Date:	A-70 9/28/06	B-30 9/28/06	B-70 9/28/06
Polycyclic Aromatic Hydrocarbons		(ng/Net)	(ng/Net)	(ng/Net)
Benzo(a)pyrene		664	291	57.9
Perylene	[b]	209	86.1	18.3
Indeno(1,2,3-c,d)pyrene		118	44.1	15.5
Dibenzo(a,h)anthracene		106	53.3	12.7
Benzo(g,h,i)perylene		186	87.3	16.7
Individual Alkyl Isomers and Hopanes				
2-Methylnaphthalene		95.9	54.3	76.6
1-Methylnaphthalene	[b]	35.7	20.6	31.1
2,6-Dimethylnaphthalene	[b]	41.8	17.2	36.7
1,6,7-Trimethylnaphthalene	[b]	134	2.7 J	32.8
1-Methylphenanthrene	[b]	288	20.9	272
C29-Hopane	[c]	145	ND (<10)	85.6
18a-Oleanane	[c]	46.1	ND (<10)	23.6
C30-Hopane	[c]	258	ND (<10)	113

J - Estimated concentration below the relevant detection limit.
ng/Net - Nanograms per net.
ND - Not detected. The relevant detection limit is shown in parentheses. One-half the detection limit was used as a proxy concentration in deriving exposure point concentrations for the Risk Characterization.

[a] Analyte was included in the sum for C9-C10 Aromatic Hydrocarbons.
[b] Analyte was included in the sum for C11-C22 Aromatic Hydrocarbons.
[c] Analyte is outside of the C11-C22 range but was included in the sum for C11-C22 Aromatic Hydrocarbons as a conservative measure.

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Table A-3
DERIVATION OF CONSTITUENT CONCENTRATIONS IN MG/KG
TEFLON® NET SHEEN SAMPLES
B-120 Oil Spill - Buzzards Bay, MA

		Sample:	A-70	B-30	B-70
Calculation of EOM Total Mass					
EOM Weight (mg/100 µL)	[a]		0.11	0.039	0.021
EOM Weight (mg/µL)			0.0011	0.00039	0.00021
Final extracted volume (mL)	[a]		3	3	3
Mass of EOM (mg)	[b]		3.3	1.17	0.63
Mass of EOM (µg)			3,300	1,170	630

Constituent	**Quantity (µg/Net)**	**Conc'n (mg/kg)**	**Quantity (µg/Net)**	**Conc'n (mg/kg)**	**Quantity (µg/Net)**	**Conc'n (mg/kg)**
Petroleum Hydrocarbons		[c]		[c]		[c]
C9-C18 Aliphatic Hydrocarbons	2.65	804	1.80	1,543	1.11	1,768
C19-C36 Aliphatic Hydrocarbons	31.3	9,482	10.2	8,712	20.6	32,653
C9-C10 Aromatic Hydrocarbons [e]	917	278,010	168	143,588	2.72	4,316
C11-C22 Aromatic Hydrocarbons [f]	98.6	29,866	35.0	29,884	6.30	9,998
Polycyclic Aromatic Hydrocarbons	[d]		[d]		[d]	
2-Methylnaphthalene	0.0959	29.1	0.0766	65.5	0.0543	86.2
Acenaphthene	0.0484	14.7	0.0364	31.1	0.0228	36.2
Acenaphthylene	0.005	1.52	0.005	4.27	0.005	7.94
Anthracene	0.106	32.1	0.0251	21.5	0.0081	12.9
Benzo(a)anthracene	1.25	379	0.448	383	0.089	141
Benzo(a)pyrene	0.664	201	0.291	249	0.0579	91.9
Benzo(b)fluoranthene	0.433	131	0.159	136	0.0392	62.2
Benzo(k)fluoranthene	0.0666	20.2	0.025	21.4	0.0081	12.9
Benzo(g,h,i)perylene	0.186	56.4	0.0873	74.6	0.0167	26.5
Biphenyl	0.0332	10.1	0.0241	20.6	0.0192	30.5
Chrysene	2.46	745	0.798	682	0.157	249
Dibenzo(a,h)anthracene	0.106	32.1	0.0533	45.6	0.0127	20.2
Fluoranthene	0.24	72.7	0.0791	67.6	0.0203	32.2
Fluorene	0.0731	22.2	0.0537	45.9	0.0352	55.9
Indeno(1,2,3-c,d)pyrene	0.118	35.8	0.0441	37.7	0.0155	24.6
Naphthalene	0.0728	22.1	0.0776	66.3	0.045	71.4
Phenanthrene	0.242	73.3	0.29	248	0.163	259
Pyrene	1.32	400	0.369	315	0.0634	101

Conc'n - Concentration.
EOM - Extracted organic matter.
kg - Kilograms.
µg - Micrograms.
µL - Microliters.
mg - Milligrams.
mL - Milliliters.
ng - Nanograms.

[a] Taken from the B&B Laboratory Report, page 155 (B&B Laboratories EOM Logbook).
[b] Calculated as (EOM Weight, mg/µL) × (Final extracted volume, mL) × (1000 µL/mL)
[c] Calculated as (Quantity, µg/Net) / (Mass of EOM, µg) × (10^6 mg/kg)
[d] Quantity converted from units of ng/Net (Table A-2) to µg/Net.
[e] These quantities are almost entirely attributable to the "Unresolved Complex Mixture" contribution (included as a conservative measure).
[f] These quantities include the "C29-C30 Aromatic Hydrocarbons" (included as a conservative measure).

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Table A-4
CALCULATION OF ESTIMATED NON-CANCER RISK BASED ON HYPOTHETICAL SHEEN CONTACT, SUBCHRONIC EXPOSURE
B-120 Oil Spill - Buzzards Bay, MA

Constituent	EPC (mg/kg) [a]	RAFd (unitless) [b]	ADD (mg/kg/day) [c]	Subchronic RfD (mg/kg/day) [b]	Subchronic HI (unitless) [d]
Petroleum Hydrocarbons					
C9-C18 Aliphatic Hydrocarbons	1,400	0.5	6.7E-08	1	6.7E-08
C19-C36 Aliphatic Hydrocarbons	17,000	0.1	1.6E-07	6	2.7E-08
C9-C10 Aromatic Hydrocarbons	140,000	0.5	6.7E-06	0.3	2.2E-05
C11-C22 Aromatic Hydrocarbons	23,000	0.1	2.2E-07	0.3	7.4E-07
Polycyclic Aromatic Hydrocarbons					
2-Methylnaphthalene	60	0.1	5.8E-10	0.004	1.4E-07
Acenaphthene	27	0.2	5.2E-10	0.6	8.7E-10
Acenaphthylene	4.6	0.18	8.0E-11	0.3	2.7E-10
Anthracene	22	0.29	6.1E-10	3	2.0E-10
Benzo(a)anthracene	300	0.18	5.2E-09	0.3	1.7E-08
Benzo(a)pyrene	180	0.18	3.1E-09	0.3	1.0E-08
Benzo(b)fluoranthene	110	0.18	1.9E-09	0.3	6.4E-09
Benzo(k)fluoranthene	18	0.18	3.1E-10	0.3	1.0E-09
Benzo(g,h,i)perylene	52	0.18	9.0E-10	0.3	3.0E-09
Biphenyl	20	0.08	1.5E-10	0.05	3.1E-09
Chrysene	560	0.18	9.7E-09	0.3	3.2E-08
Dibenzo(a,h)anthracene	33	0.08	2.5E-10	0.3	8.5E-10
Fluoranthene	58	0.2	1.1E-09	0.4	2.8E-09
Fluorene	41	0.2	7.9E-10	0.4	2.0E-09
Indeno(1,2,3-c,d)pyrene	33	0.18	5.7E-10	0.3	1.9E-09
Naphthalene	53	0.1	5.1E-10	0.02	2.5E-08
Phenanthrene	190	0.18	3.3E-09	0.3	1.1E-08
Pyrene	270	0.2	5.2E-09	0.3	1.7E-08
				Total Subchronic HI:	**2E-05**

ADD - Average daily dose.
EPC - Exposure point concentration.
HI - Hazard index.
RAFd - Relative absorption factor, dermal.
RfD - Reference dose.
kg - Kilograms.
mg - Milligrams.

[a] Average of the derived concentrations for the 3 Teflon® net samples (Table A-3), rounded to two significant figures.
[b] Taken from the 2006 Method 3 Risk Characterization or from MADEP (2002) guidance.
[c] Calculated as shown below:

$$ADD = \frac{EPC \times SSA \times AF \times EV \times EF \times EP \times RAFd \times CF}{BW \times AP}$$

(see text for variable definitions)

AF =	0.00979	mg/cm²/event
AP =	365	days
BW =	11.15	kg/mg
CF =	1E-06	kg/mg
EF =	8	days/year
EP =	1	years
EV =	1	events/day
SSA =	5	cm²

[d] Non-cancer hazard index for subchronic exposure.
Calculated as HI = ADD / RfD

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Table A-5
CALCULATION OF ESTIMATED NON-CANCER RISK BASED ON HYPOTHETICAL SHEEN CONTACT, CHRONIC EXPOSURE
B-120 Oil Spill - Buzzards Bay, MA

Constituent	EPC (mg/kg) [a]	RAFd (unitless) [b]	ADD (mg/kg/day) [c]	Chronic RfD (mg/kg/day) [b]	Chronic HI (unitless) [d]
Petroleum Hydrocarbons					
C9-C18 Aliphatic Hydrocarbons	1,400	0.5	4.4E-08	0.1	4.4E-07
C19-C36 Aliphatic Hydrocarbons	17,000	0.1	1.1E-07	2	5.3E-08
C9-C10 Aromatic Hydrocarbons	140,000	0.5	4.4E-06	0.03	1.5E-04
C11-C22 Aromatic Hydrocarbons	23,000	0.1	1.4E-07	0.03	4.8E-06
Polycyclic Aromatic Hydrocarbons					
2-Methylnaphthalene	60	0.1	3.7E-10	0.004	9.4E-08
Acenaphthene	27	0.2	3.4E-10	0.06	5.6E-09
Acenaphthylene	4.6	0.18	5.2E-11	0.03	1.7E-09
Anthracene	22	0.29	4.0E-10	0.3	1.3E-09
Benzo(a)anthracene	300	0.18	3.4E-09	0.03	1.1E-07
Benzo(a)pyrene	180	0.18	2.0E-09	0.03	6.7E-08
Benzo(b)fluoranthene	110	0.18	1.2E-09	0.03	4.1E-08
Benzo(k)fluoranthene	18	0.18	2.0E-10	0.03	6.7E-09
Benzo(g,h,i)perylene	52	0.18	5.8E-10	0.03	1.9E-08
Biphenyl	20	0.08	1.0E-10	0.05	2.0E-09
Chrysene	560	0.18	6.3E-09	0.03	2.1E-07
Dibenzo(a,h)anthracene	33	0.08	1.6E-10	0.03	5.5E-09
Fluoranthene	58	0.2	7.2E-10	0.04	1.8E-08
Fluorene	41	0.2	5.1E-10	0.04	1.3E-08
Indeno(1,2,3-c,d)pyrene	33	0.18	3.7E-10	0.03	1.2E-08
Naphthalene	53	0.1	3.3E-10	0.02	1.7E-08
Phenanthrene	190	0.18	2.1E-09	0.03	7.1E-08
Pyrene	270	0.2	3.4E-09	0.03	1.1E-07
				Total Chronic HI:	**2E-04**

ADD - Average daily dose.
EPC - Exposure point concentration.
HI - Hazard index.
RAFd - Relative absorption factor, dermal.
RfD - Reference dose.
kg - Kilograms.
mg - Milligrams.

[a] Average of the derived concentrations for the 3 Teflon® net samples (Table A-3), rounded to two significant figures.
[b] Taken from the 2006 Method 3 Risk Characterization or from MADEP (2002) guidance.
[c] Calculated as shown below:

$$ADD = \frac{EPC \times SSA \times AF \times EV \times EF \times EP \times RAFd \times CF}{BW \times AP}$$

(see text for variable definitions)

AF =	0.00979	mg/cm²/event
AP =	2,555	days
BW =	17.2	kg/mg
CF =	1E-06	kg/mg
EF =	8	days/year
EP =	7	years
EV =	1	events/day
SSA =	5	cm²

[d] Non-cancer hazard index for chronic exposure.
Calculated as HI = ADD / RfD

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Table A-6
CALCULATION OF ESTIMATED CANCER RISK BASED ON HYPOTHETICAL SHEEN CONTACT
B-120 Oil Spill - Buzzards Bay, MA

Constituent	EPC (mg/kg) [a]	RAFd (unitless) [b]	LADD (mg/kg/day) [c]	CSF $(mg/kg/day)^{-1}$ [b]	ELCR (unitless) [d]
Petroleum Hydrocarbons					
C9-C18 Aliphatic Hydrocarbons	1,400	NC	NC	NC	NC
C19-C36 Aliphatic Hydrocarbons	17,000	NC	NC	NC	NC
C9-C10 Aromatic Hydrocarbons	140,000	NC	NC	NC	NC
C11-C22 Aromatic Hydrocarbons	23,000	NC	NC	NC	NC
Polycyclic Aromatic Hydrocarbons					
2-Methylnaphthalene	60	NC	NC	NC	NC
Acenaphthene	27	NC	NC	NC	NC
Acenaphthylene	4.6	NC	NC	NC	NC
Anthracene	22	NC	NC	NC	NC
Benzo(a)anthracene	300	0.2	5.4E-10	0.73	3.9E-10
Benzo(a)pyrene	180	0.2	3.2E-10	7.3	2.4E-09
Benzo(b)fluoranthene	110	0.2	2.0E-10	0.73	1.4E-10
Benzo(k)fluoranthene	18	0.2	3.2E-11	0.073	2.4E-12
Benzo(g,h,i)perylene	52	NC	NC	NC	NC
Biphenyl	20	NC	NC	NC	NC
Chrysene	560	0.2	1.0E-09	0.073	7.4E-11
Dibenzo(a,h)anthracene	33	0.09	2.7E-11	7.3	2.0E-10
Fluoranthene	58	NC	NC	NC	NC
Fluorene	41	NC	NC	NC	NC
Indeno(1,2,3-c,d)pyrene	33	0.2	5.9E-11	0.73	4.3E-11
Naphthalene	53	NC	NC	NC	NC
Phenanthrene	190	NC	NC	NC	NC
Pyrene	270	NC	NC	NC	NC
				Total ELCR:	**3E-09**

ADD - Average daily dose.
CSF - Cancer slope factor.
ELCR - Excess lifetime cancer risk.
EPC - Exposure point concentration.
RAFd - Relative absorption factor, dermal.
kg - Kilograms.
mg - Milligrams.

[a] Average of the derived concentrations for the 3 Teflon® net samples (Table A-3), rounded to two significant figures.
[b] Taken from the 2006 Method 3 Risk Characterization or from MADEP (2002) guidance.
[c] Calculated as shown below:

$$LADD = \frac{EPC \times SSA \times AF \times EV \times EF \times EP \times RAFd \times CF}{BW \times AP}$$

(see text for variable definitions)

AF =	0.00979	$mg/cm^2/event$
AP =	27,375	days
BW =	47.7	kg/mg
CF =	1E-06	kg/mg
EF =	8	days/year
EP =	30	years
EV =	1	events/day
SSA =	5	cm^2

[d] Excess lifetime cancer risk.
Calculated as ELCR = LADD × CSF

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College Station, TX

Entrix, Inc.
Buzzards Bay Spill Project

Determination of: Aliphatic Hydrocarbons, Total Petroleum Hydrocarbons, Polycyclic Aromatic Hydrocarbons, and Saturate Biological Markers in Sheen Net Samples

(QC Batch ENV 1516)

November 5, 2006

Technical Report 06-1729

Entrix, Inc.
Buzzards Bay Spill Project
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Narrative

Technical Report 06-1729
Entrix, Inc.
Buzzards Bay Spill Project
Sheen Net Samples

November 5, 2006

Introduction

B&B Laboratories received one (1) ice chest that contained three (3) glass jars that each contained one sheen net that was sent on September 22, 2006 and arrived on September 23, 2006 at B&B Laboratories in College Station, Texas sealed and in good condition. The internal temperature of the cooler was 3.5°C. The sheen net samples were collected in support of the Buzzards Bay Spill Project. The sheen net samples were stored in an access-controlled refrigerator (4.0°C) until processing. The sheen net samples were analyzed for Total Petroleum Hydrocarbons (TPH), Aliphatic Hydrocarbons (ALI), Polycyclic Aromatic Hydrocarbons (PAHs) and selected saturate biological markers (m/z = 191, 217, 218, and 259).

The results for TPH, ALI, Saturate Biological Markers, PAH and hopanes are included in this report.

Analytical Methods

The analytical methods employed for PAH are listed in Table 1.

Table 1. Standard Operating Procedures for each analytical test.

Matrix	Extraction	TPH/ALI	PAH
Sheen Net	SW-846 3580A	B&B 1013/1016	B&B 1006

Data Reporting

The reporting units for each analyte are listed in Table 2. The method detection limits (MDL) for each analyte are listed in Table 3. Analytes that are detected below the method detection limit are qualified as "J". Analytes that are detected in the procedural blanks greater than 3X MDL are qualified with a "B". Analytical interference's that are detected in the sample are qualified with an "I". Analytes not detected in the samples are qualified with a "U". RPD for analytes in duplicate samples that are <2X MDL are qualified with a "X". Spiked levels of analytes in matrix spikes that are <50% of the native levels are considered invalid spikes and are qualified with a "Y". Any QC result reported to be outside the corresponding QC criteria is discussed in the QA/QC variance section of this report.

Table 2. Analytical Reporting Units.

Matrix	TPH/ALI	PAH
Sheen Net	ug/net	ng/net

Table 3. Method Detection Limits.

Aliphatic/TPH	**Net RLs**
Sample size	1 net, 1ml final extract volume
Unit of measure	µg/net
n-C_{10}	0.28
n-C_{11}	0.31
n-C_{12}	0.25
n-C_{13}	0.29
n-C_{14}	0.24
n-C_{15}	0.13
n-C_{16}	0.18
n-C_{17}	0.13
Pristane	0.14
n-C_{18}	0.13
Phytane	0.12
n-C_{19}	0.11
n-C_{20}	0.23
n-C_{21}	0.11
n-C_{22}	0.13
n-C_{23}	0.14
n-C_{24}	0.14
n-C_{25}	0.11
n-C_{26}	0.13
n-C_{27}	0.13
n-C_{28}	0.15
n-C_{29}	0.15
n-C_{30}	0.16
n-C_{31}	0.22
n-C_{32}	0.17
n-C_{33}	0.21
n-C_{34}	0.23
Total Petroleum Hydrocarbons	13.0
Total Resolved Hydrocarbons	13.0
Unresolved Complex Mixture	13.0
Extractable Organic Matter	100

Table 3 (Continued). Method Detection Limits.

PAH Unit of measure	Net RL ng/net
Naphthalene	10
C1-Naphthalenes	10
C2-Naphthalenes	10
C3-Naphthalenes	10
C4-Naphthalenes	10
Benzothiophene	10
C1-Benzothiophenes	10
C2-Benzothiophenes	10
C3-Benzothiophenes	10
Biphenyl	10
Acenaphthylene	10
Acenaphthene	10
Dibenzofuran	10
Fluorene	10
C1-Fluorenes	10
C2-Fluorenes	10
C3-Fluorenes	10
Carbazole	10
Anthracene	10
Phenanthrene	10
C1-Phenanthrenes/Anthracenes	10
C2-Phenanthrenes/Anthracenes	10
C3-Phenanthrenes/Anthracenes	10
C4-Phenanthrenes/Anthracenes	10
Dibenzothiophene	10
C1-Dibenzothiophenes	10
C2-Dibenzothiophenes	10
C3-Dibenzothiophenes	10
Fluoranthene	10
Pyrene	10
C1-Fluoranthenes/Pyrenes	10
C2-Fluoranthenes/Pyrenes	10
C3-Fluoranthenes/Pyrenes	10
Benz(a)anthracene	10
Chrysene	10
C1-Chrysenes	10
C2-Chrysenes	10
C3-Chrysenes	10
C4-Chrysenes	10
Benzo(b)fluoranthene	10
Benzo(k)fluoranthene	10
Benzo(e)pyrene	10
Benzo(a)pyrene	10
Perylene	10
Indeno(1,2,3-c,d)pyrene	10
Dibenzo(a,h)anthracene	10
Benzo(g,h,i)perylene	10

PAH (Continued) Unit of measure	Net RL ng/net
Individual Alkyl Isomers and Hopanes	
2-Methylnaphthalene	10
1-Methylnaphthalene	10
2,6-Dimethylnaphthalene	10
1,6,7-Trimethylnaphthalene	10
1-Methylphenanthrene	10
C29-Hopane	10
18a-Oleanane	10
C30-Hopane	10

Quality Assurance/Quality Control

Net

TPH/ALI

The quality assurance/quality control procedure for this program included the analyses of a laboratory control sample (LCS) that was analyzed with each data set. The LCS is a diesel sample that is analyzed with each TPH/ALI run and for which controls are established based on performance. The QC criterion for the LCS is between 85 – 115% of the laboratory determined mean.

Surrogate solutions equivalent to 5-10X the MDL are prepared for various hydrocarbon analyses. The appropriate surrogate solution is added to every sample including quality control samples. The data are corrected based on surrogate recovery up to 100%. The QC criteria for surrogate recoveries are between 40-120%.

PAH

The quality assurance/quality control procedure for this program included a standard reference oil (NIST 1582) and a laboratory control solution that were analyzed with this data set. A SRM is a material for which a mean and confidence interval are certified for specific analytes. SRMs are selected based on matrix similarities as well as type and level of certified analytes. All SRMs are traceable to NIST. SRMs are used to verify analytical accuracy. All QC samples are subject to the identical preparation and analysis steps as samples. The QC criterion for the reference oil SRM and the laboratory control material is ± 15% the laboratory derived mean.

Surrogate solutions equivalent to 5-10X the MDL are prepared for various hydrocarbon analyses. The appropriate surrogate solution is added to every sample including quality control samples. The data are corrected based on surrogate recovery up to 100%. The QC criteria for surrogate recoveries are between 40-120%, except d12-perylene.

Quality Assurance/Quality Control Variances

Net

Total Hydrocarbons (TPH) and Aliphatic Hydrocarbons (ALI)

Surrogate Recoveries

Observation

- n-dodecane (d26) was detected outside of the QC recovery limits of 40-120% in sample ETX7073 (B-70).

Comments

- This surrogate was probably lost during the extraction and solvent reduction steps.

Laboratory Control Standard

Observation

- No variances were observed.

PAH

Surrogate Recoveries

Observation

- d8-Naphthalene was detected outside of the QC recovery limits of 40-120% in samples ETX7072 (A-70) and ETX7073 (B-70). d10-Acenaphthene was detected outside of the QC recovery limits of 40-120% in sample ETX7073 (B-70).

Comments

- These surrogates were probably lost during the extraction and solvent reduction steps.

Standard Reference Materials/Laboratory Control Materials

Observation

- No variances were observed.

We appreciate the opportunity to serve your analytical needs and please do not hesitate to contact us should you have any questions.

Thomas J. McDonald
Project Manager

Susanne J. McDonald
Quality Officer

Sample/Analyses Description

B&B Laboratories
Project J03318
Report 06-1729

Entrix, Inc.
Buzzards Bay Spill Project
Sample Inventory

Client Project #7079607-2000

Laboratory File Number	Client Identification	Collection Date	Receive Date	Analysis	Matrix	Comments	B&B SDG	Entrix Project #
ETX7072	A-70	09/20/06	09/23/06	PAH, ALI, TPH	OTHER	Teflon net	06092301	7079607-2000
ETX7073	B-70	09/20/06	09/23/06	PAH, ALI, TPH	OTHER	Teflon net	06092301	7079607-2000
ETX7074	B-30	09/20/06	09/23/06	PAH, ALI, TPH	OTHER	Teflon net	06092301	7079607-2000

200003

Sheen Net Samples

Aliphatic Hydrocarbons/ Total Petroleum Hydrocarbons/ Extractable Organic Matter Concentrations

Entrix, Inc.
Buzzards Bay Oil Spill Project
Total Petroleum Hydrocarbon Data
Client Submitted Samples

Sample Name	ETX7073.D	ETX7074.D	ETX7072.D
Client Name	B-70	B-30	A-70
Matrix	Net	Net	Net
Collection Date	09/20/06	09/20/06	09/20/06
Received Date	09/23/06	09/23/06	09/23/06
Extraction Date	09/26/06	09/26/06	09/26/06
Extraction Batch	ENV1516	ENV1516	ENV1516
Date Acquired	09/28/06	09/28/06	09/28/06
Method	ALI_COMP.M	ALI_COMP.M	ALI_COMP.M
Number of Sample Nets	1.0	1.0	1.0
Dilution	NA	NA	NA

Target Compounds	Su Corrected Conc (µg/Net)	Q	Su Corrected Conc (µg/Net)	Q	Su Corrected Conc (µg/Net)	Q
n-C_{10}	0.23		0.50		0.41	
n-C_{11}	0.11	J	0.26		0.23	
n-C_{12}	0.08	J	0.13		0.20	
n-C_{13}	0.06	J	0.11	J	0.14	J
n-C_{14}	0.11	J	0.17	J	0.19	J
n-C_{15}	0.18	J	0.24	J	0.57	
n-C_{16}	0.15	J	0.17	J	0.19	J
n-C_{17}	0.04	J	0.06	J	0.26	
Pristane	0.05	J	0.12	J	0.36	
n-C_{18}	0.15	J	0.16	J	0.46	
Phytane	<0.18	U	0.09	J	<0.18	U
n-C_{19}	<0.17	U	0.29		<0.17	U
n-C_{20}	<0.21	U	0.13	J	0.23	
n-C_{21}	0.10	J	0.34		1.64	
n-C_{22}	0.22		0.33		2.43	
n-C_{23}	0.32		0.27		1.06	
n-C_{24}	0.77		0.30		0.42	
n-C_{25}	1.63		0.57		2.03	
n-C_{26}	2.44		0.89		2.94	
n-C_{27}	2.92		1.32		5.25	
n-C_{28}	2.84		1.06		3.12	
n-C_{29}	2.66		1.24		3.94	
n-C_{30}	2.15		0.83		2.78	
n-C_{31}	1.70		0.70		1.96	
n-C_{32}	1.20		0.50		1.36	
n-C_{33}	0.80		0.30		1.01	
n-C_{34}	0.49		<0.18	U	0.58	
Total Alkanes	21.4		11.1		33.8	
Total Petroleum Hydrocarbons	27.7		202		1060	
Total Resolved Hydrocarbons	25.0		34.4		142	
Unresolved Complex Mixture	2.7	J	168		917	

Surrogate (Su)	Su Recovery (%)		Su Recovery (%)	Su Recovery (%)
n-dodecane-d26	27	*	49	46
n-eicosane-d42	79		82	69
n-triacontane-d62	92		93	94

Qualifiers (Q): J=Below the RL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not applicable, *=Outside QA limits, refer to narrative
If n-eicosane-d42 (surrogate) recovery is above 100%, TPH and aliphatic values are surrogate corrected to 100%.

Entrix, Inc.
Buzzards Bay Oil Spill Project
Total Petroleum Hydrocarbon Data
Lab Control Standard Report

Sample Name	GC10801B.D
Client Name	AL-WKDIESEL-1000-003
Matrix	Solution
Collection Date	NA
Received Date	NA
Extraction Date	NA
Extraction Batch	ENV 1516
Date Acquired	09/27/06
Method	ALI_COMP.M
Sample Volume (mL)	1.0
Dilution	NA

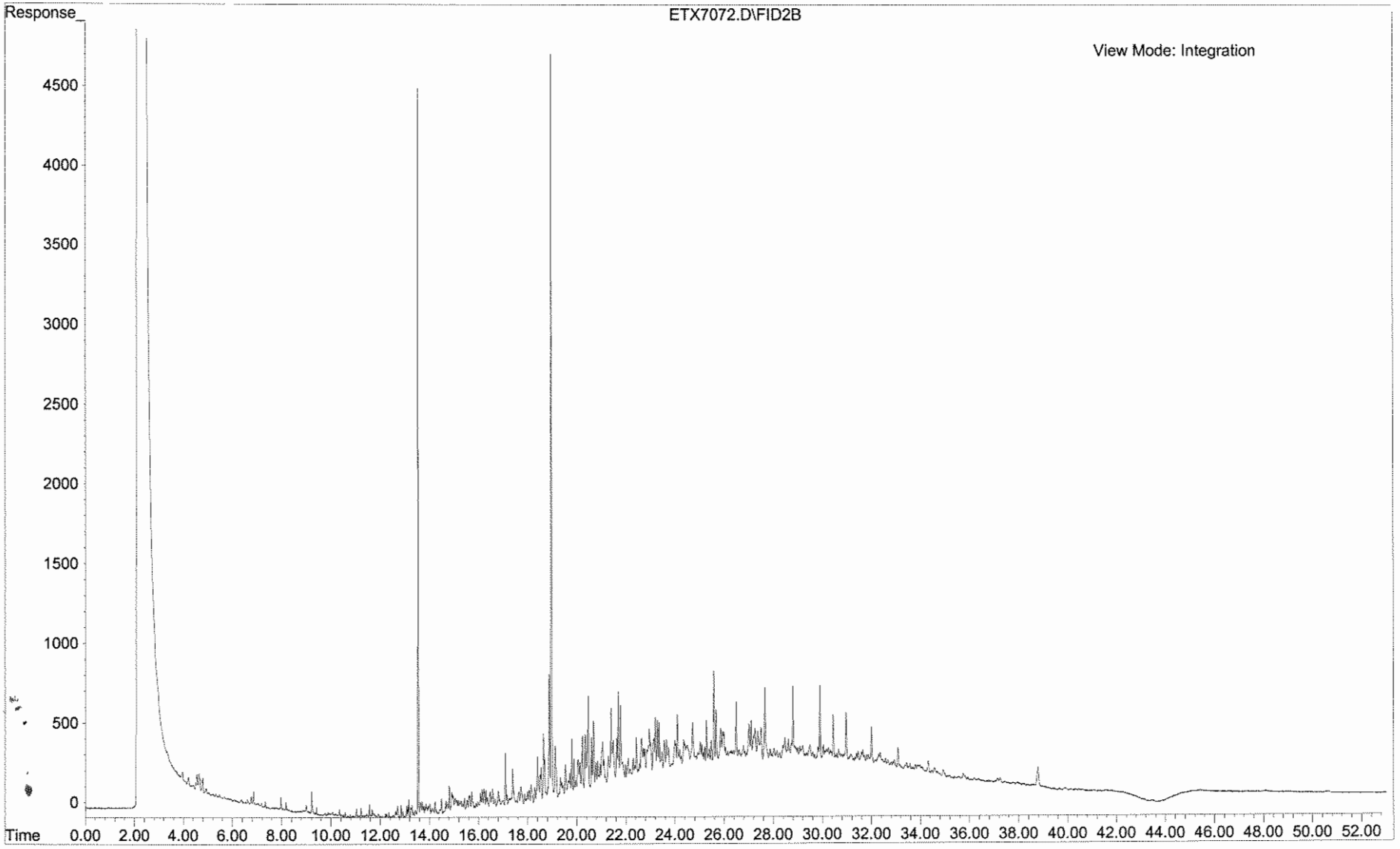
Target Compounds	Su Corrected Conc (ug/mL)	Q	RPD (%)	B&B Average Conc (ug/mL)	-15% Conc (ug/mL)	+15% Conc (ug/mL)
Total Petroleum Hydrocarbons	103		3.1	100	85	115

Surrogate (Su)	Su Recovery (%)
n-dodecane-d26	96
n-eicosane-d42	93
n-triacontane-d62	89

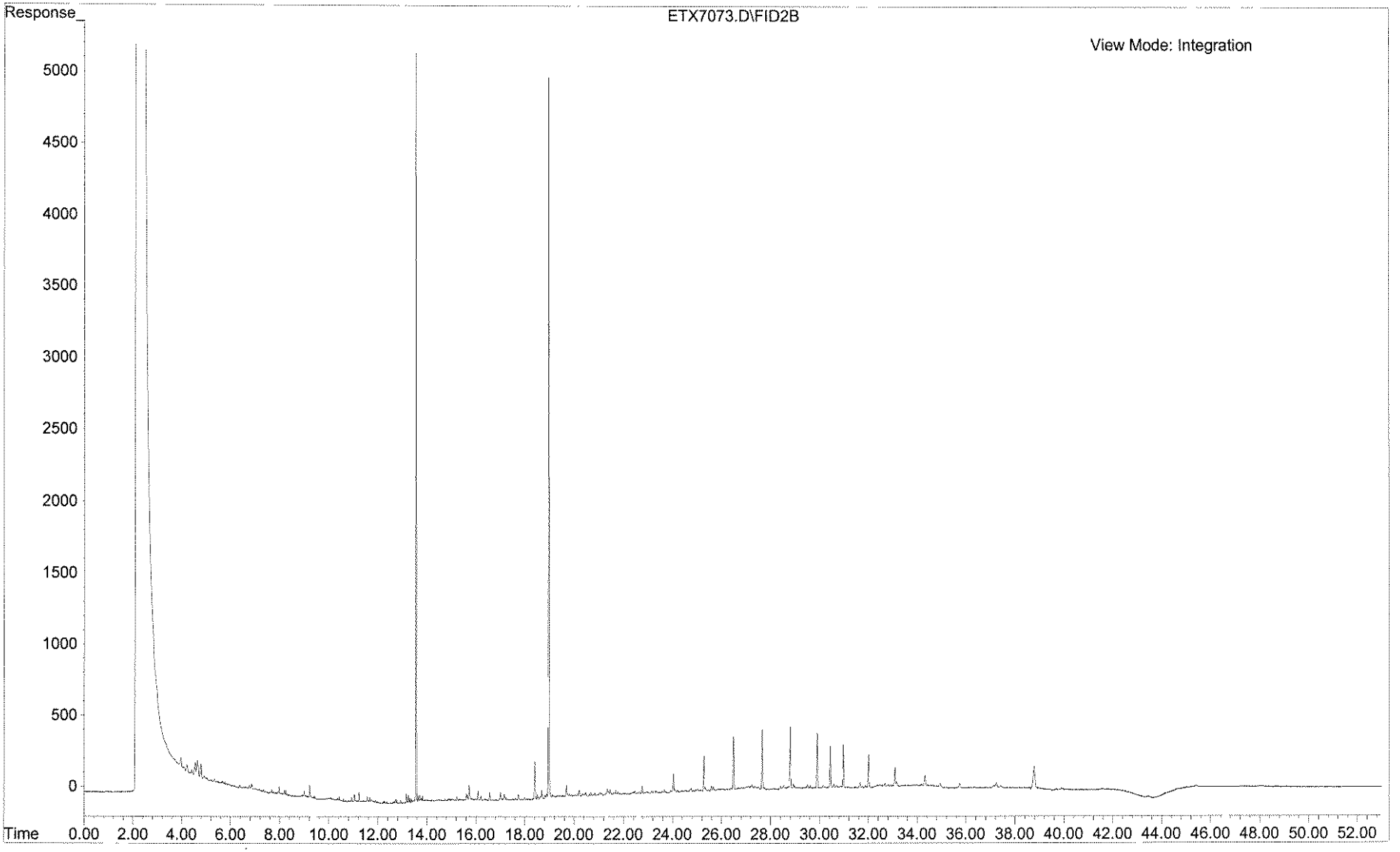
Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not applicable, *=Outside QA limits, refer to narrative
If n-eicosane-d42 (surrogate) recovery is above 100%, TPH values are surrogate corrected to 100%.

Total Petroleum Hydrocarbons Chromatograms

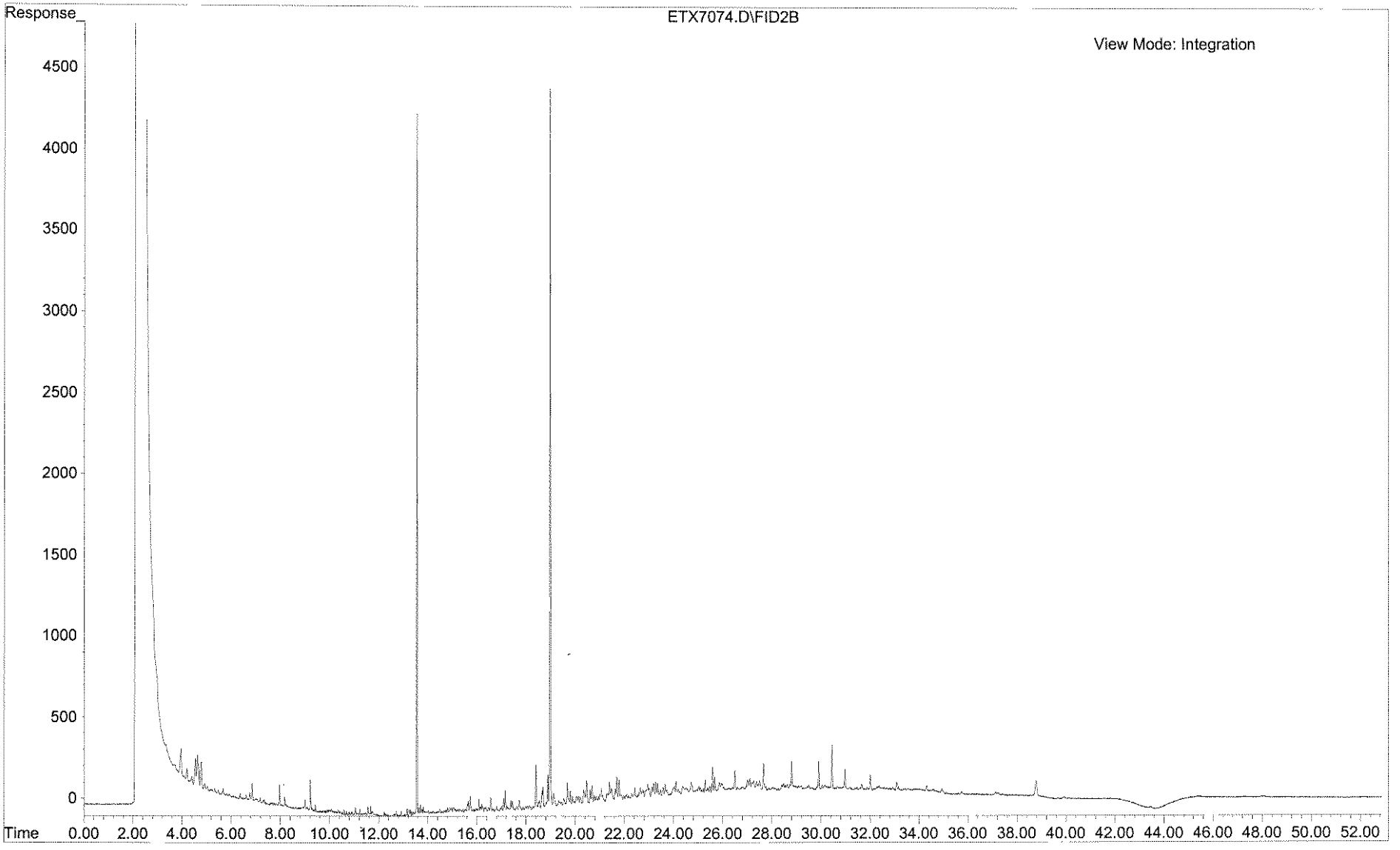
File : D:\GC-MSD~1\GC10801\ETX7072.D
Operator : TJM
Acquired : 28 Sep 2006 7:01 using AcqMethod ALI_COMP.M
Instrument : GC#1
Sample Name: A-70
Misc Info :
Vial Number: 62



File : D:\GC-MSD~1\GC10801\ETX7073.D
Operator : TJM
Acquired : 28 Sep 2006 5:01 using AcqMethod ALI_COMP.M
Instrument : GC#1
Sample Name: B-70
Misc Info :
Vial Number: 60

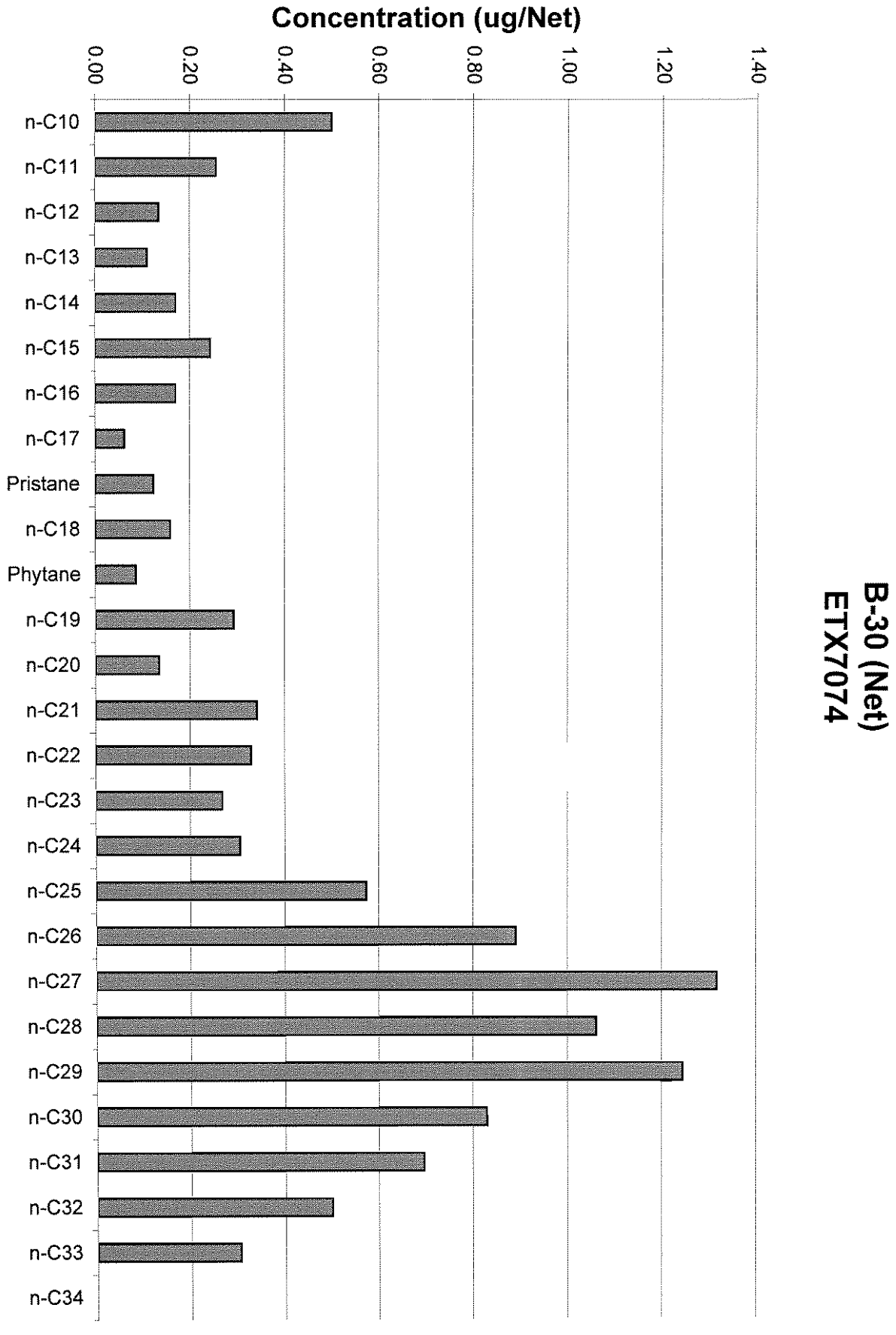


File : D:\GC-MSD~1\GC10801\ETX7074.D
Operator : TJM
Acquired : 28 Sep 2006 6:01 using AcqMethod ALI_COMP.M
Instrument : GC#1
Sample Name: B-30
Misc Info :
Vial Number: 61

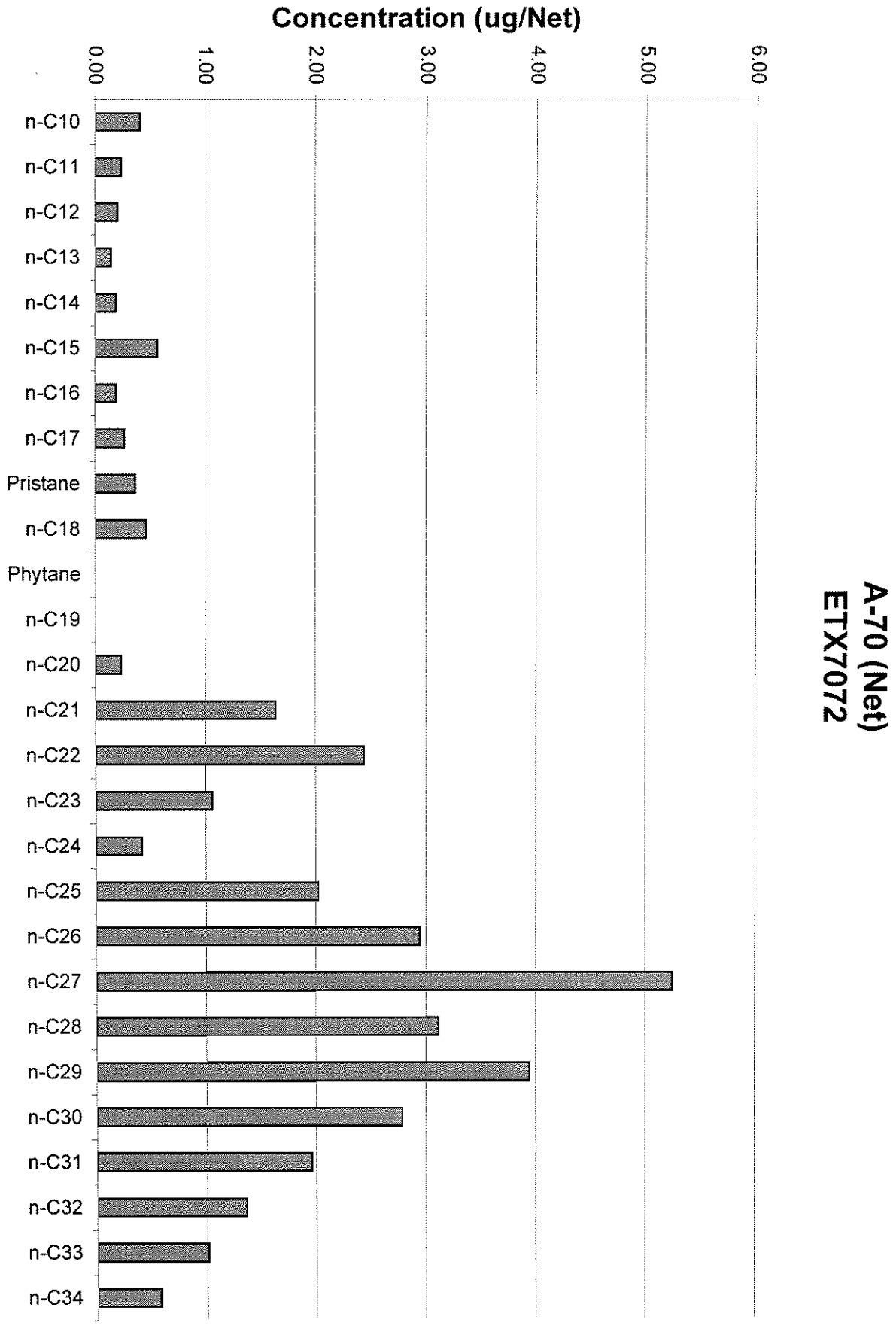


Aliphatic Hydrocarbon Histograms

B-70 (Net)
ETX7073



B-30 (Net)
ETX7074


Concentration (ug/Net)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
n-C10
n-C11
n-C12
n-C13
n-C14
n-C15
n-C16
n-C17
Pristane
n-C18
Phytane
n-C19
n-C20
n-C21
n-C22
n-C23
n-C24
n-C25
n-C26
n-C27
n-C28
n-C29
n-C30
n-C31
n-C32
n-C33
n-C34
A-70 (Net)
ETX7072

Polycyclic Aromatic Hydrocarbon Concentration

Entrix, Inc.
Buzzards Bay Oil Spill Project
Polycyclic Aromatic Hydrocarbon Data
Client Submitted Samples

Sample Name	ETX7072.D	ETX7073.D	ETX7074.D
Client Name	A-70	B-70	B-30
Matrix	Teflon Net	Teflon Net	Teflon Net
Collection Date	09/20/06	09/20/06	09/20/06
Received Date	09/23/06	09/23/06	09/23/06
Extraction Date	09/26/06	09/26/06	09/26/06
Extraction Batch	ENV 1516	ENV 1516	ENV 1516
Date Acquired	09/28/06	09/28/06	09/28/06
Method	PAH-2002	PAH-2002	PAH-2002
Number of Sample Nets	1.0	1.0	1.0
Dilution	NA	NA	NA

Target Compounds	Su Corrected Conc. (ng/net)	Q	Su Corrected Conc. (ng/net)	Q	Su Corrected Conc. (ng/net)	Q
Naphthalene	72.8		45.0		77.6	
C1-Naphthalenes	97.4		55.4		79.5	
C2-Naphthalenes	116		38.1		91.1	
C3-Naphthalenes	869		40.6		233	
C4-Naphthalenes	1560		44.4		378	
Benzothiophene	2.5	J	<10	U	<10	U
C1-Benzothiophenes	7.1	J	<10	U	<10	U
C2-Benzothiophenes	21.6		<10	U	<10	U
C3-Benzothiophenes	46.5		<10	U	<10	U
Biphenyl	33.2		19.2		24.1	
Acenaphthylene	<10	U	<10	U	<10	U
Acenaphthene	48.4		22.8		36.4	
Dibenzofuran	192		99.0		145	
Fluorene	73.1		35.2		53.7	
C1-Fluorenes	264		10.0		73.7	
C2-Fluorenes	1770		56.4		439	
C3-Fluorenes	842		<10	U	279	
Carbazole	<10	U	<10	U	<10	U
Anthracene	106		8.1	J	25.1	
Phenanthrene	242		163		290	
C1-Phenanthrene/Anthracenes	2650		93.9		1380	
C2-Phenanthrene/Anthracenes	11500		563		4100	
C3-Phenanthrene/Anthracenes	15000		825		4660	
C4-Phenanthrene/Anthracenes	7420		584		2590	
Dibenzothiophene	73.6		12.1		24.2	
C1-Dibenzothiophenes	519		19.8		177	
C2-Dibenzothiophenes	2200		102		641	
C3-Dibenzothiophenes	2970		177		956	
Fluoranthene	240		20.3		79.1	
Pyrene	1320		63.4		369	
C1-Fluoranthenes/Pyrenes	6210		427		2290	
C2-Fluoranthenes/Pyrenes	8420		619		3040	
C3-Fluoranthenes/Pyrenes	6140		424		2470	
Naphthobenzothiophene	1040		77.1		361	
C1-Naphthobenzothiophenes	2990		204		955	
C2-Naphthobenzothiophenes	3130		239		1080	
C3-Naphthobenzothiophenes	1230		89.6		362	
Benz(a)anthracene	1250		89.0		448	
Chrysene	2460		157		798	
C1-Chrysenes	7920		544		2830	
C2-Chrysenes	8330		573		3070	
C3-Chrysenes	3360		228		1330	
C4-Chrysenes	100		<10	U	54.9	
Benzo(b)fluoranthene	433		39.2		159	
Benzo(k)fluoranthene	66.6		8.1	J	25.0	
Benzo(e)pyrene	440		43.5		189	
Benzo(a)pyrene	664		57.9		291	
Perylene	209		18.3		86.1	
Indeno(1,2,3-c,d)pyrene	118		15.5		44.1	
Dibenzo(a,h)anthracene	106		12.7		53.3	
Benzo(g,h,i)perylene	186		16.7		87.3	
Total PAHs	105058		6980		37225	
Individual Alkyl Isomers and Hopanes						
2-Methylnaphthalene	95.9		54.3		76.6	
1-Methylnaphthalene	35.7		20.6		31.1	
2,6-Dimethylnaphthalene	41.8		17.2		36.7	
1,6,7-Trimethylnaphthalene	134		2.7	J	32.8	
1-Methylphenanthrene	288		20.9		272	
C29-Hopane	145		<10	U	85.6	
18a-Oleanane	46.1		<10	U	23.6	
C30-Hopane	258		<10	U	113	

Surrogate (Su)	Su Recovery (%)		Su Recovery (%)		Su Recovery (%)	
Naphthalene-d8	35	*	18	*	42	
Acenaphthene-d10	54		21	*	46	
Phenanthrene-d10	73		46		56	
Chrysene-d12	100		85		95	
Perylene-d12	73		92		90	

Qualifiers (Q): J=Below the RL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

Entrix, Inc.
Buzzards Bay Oil Spill Project
Polycyclic Aromatic Hydrocarbon Data
Standard Reference Material Report

Sample Name	MS30306B.D
Client Name	SRM 1582
Matrix	Petroleum
Collection Date	NA
Received Date	NA
Extraction Date	NA
Extraction Batch	ENV 1516
Date Acquired	09/28/06
Method	PAH-2002
Sample Weight (g)	1.7

Target Compounds	Su Corrected Conc. (ug/g)	Q	RPD (%)	SRM 1582 Certified Conc. (ug/ g)	B&B Average	-15% Conc. (ug/g)	+15% Conc. (ug/g)
Naphthalene	154		6.0		145	123	167
C1-Naphthalenes	690		10.4		622	529	715
C2-Naphthalenes	1310		9.7		1189	1011	1367
C3-Naphthalenes	1170		12.1		1037	881	1193
C4-Naphthalenes	775		2.7		754	641	867
Benzothiophene	10.2						
C1-Benzothiophenes	23.0						
C2-Benzothiophenes	83.8						
C3-Benzothiophenes	181						
Biphenyl	32.9		4.7		34.5	29.3	39.7
Acenaphthylene	<10	U					
Acenaphthene	18.3		3.2		18.9	16.1	21.7
Dibenzofuran	12.9						
Fluorene	31.8		11.8		35.8	30.4	41.2
C1-Fluorenes	122		7.9		132	112	152
C2-Fluorenes	260		1.6		256	218	294
C3-Fluorenes	239		1.2		242	206	278
Carbazole	11.3						
Anthracene	<10	U					
Phenanthrene	111		1.1	100 ± 7.0	110	93.3	126
C1-Phenanthrene/Anthracenes	361		10.2		326	277	375
C2-Phenanthrene/Anthracenes	508		6.7		543	462	624
C3-Phenanthrene/Anthracenes	487		6.9		522	444	600
C4-Phenanthrene/Anthracenes	273		0.7		275	234	316
Dibenzothiophene	33.2		6.7	32.9 ± 1.7	35.5	30.2	40.8
C1-Dibenzothiophene	142		12.7		125	106	144
C2-Dibenzothiophene	237		8.1		257	218	296
C3-Dibenzothiophene	225		10.5		250	213	288
Fluoranthene	10.3						
Pyrene	11.6						
C1-Fluoranthenes/Pyrenes	61.1		11.9		68.8	58.5	79.1
C2-Fluoranthenes/Pyrenes	92.4		12.8		105	89.3	121
C3-Fluoranthenes/Pyrenes	73.8		14.6		85.4	72.6	98.2
Naphthobenzothiophene	36.3		9.2		39.8	33.8	45.8
C1-Naphthobenzothiophenes	58.3		1.0		58.9	50.1	67.7
C2-Naphthobenzothiophenes	70.4		10.4		78.1	66.4	89.8
C3-Naphthobenzothiophenes	54.8		0.7		55.2	46.9	63.5
Benz(a)anthracene	4.3	J					
Chrysene	20.9		3.3		21.6	18.4	24.8
C1-Chrysenes	63.1		8.1		68.4	58.1	78.7
C2-Chrysenes	109		13.7		125	106	144
C3-Chrysenes	75.3		16.1		88.5	75.2	102
C4-Chrysenes	<10	U					
Benzo(b)fluoranthene	4.1	J					
Benzo(k)fluoranthene	6.5	J					
Benzo(e)pyrene	3.9	J					
Benzo(a)pyrene	6.4	J					
Perylene	32.5		2.9	30.2± 1.7	33.5	28.4	38.5
Indeno(1,2,3-c,d)pyrene	3.9	J					
Dibenzo(a,h)anthracene	0.7	J					
Benzo(g,h,i)perylene	2.7	J					
Total PAHs	8305						
Selected Ratios							
D2/P2	0.467		1.4		0.473	0.402	0.544
D3/P3	0.462		3.6		0.479	0.407	0.551
D2/C2	2.174		5.6		2.056	1.748	2.364
D3/C3	2.988		5.6		2.825	2.401	3.249
FI-Py2/C2	0.848		0.9		0.840	0.714	0.966
FI-Py3/C3	0.980		1.6		0.965	0.820	1.110
Individual Alkyl Isomers and Hopane							
2-Methylnaphthalene	535		11.8		602	512	692
1-Methylnaphthalene	425		2.4		415	353	477
2,6-Dimethylnaphthalene	537		11.4		602	512	692
1,6,7-Trimethylnaphthalene	151		0.7		152	129	175
1-Methylphenanthrene	88.5		12.2		100	85.0	115
C29-Hopane	348						
18a-Oleanane	93.3						
C30-Hopane	305		4.7		291	239	323

Surrogate (Su)	Su Recovery (%)
Naphthalene-d8	94
Acenaphthene-d10	97
Phenanthrene-d10	96
Chrysene-d12	80
Perylene-d12	98

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

Entrix, Inc.
Buzzards Bay Oil Spill Project
Polycyclic Aromatic Hydrocarbon Data
Laboratory Control Standard Report

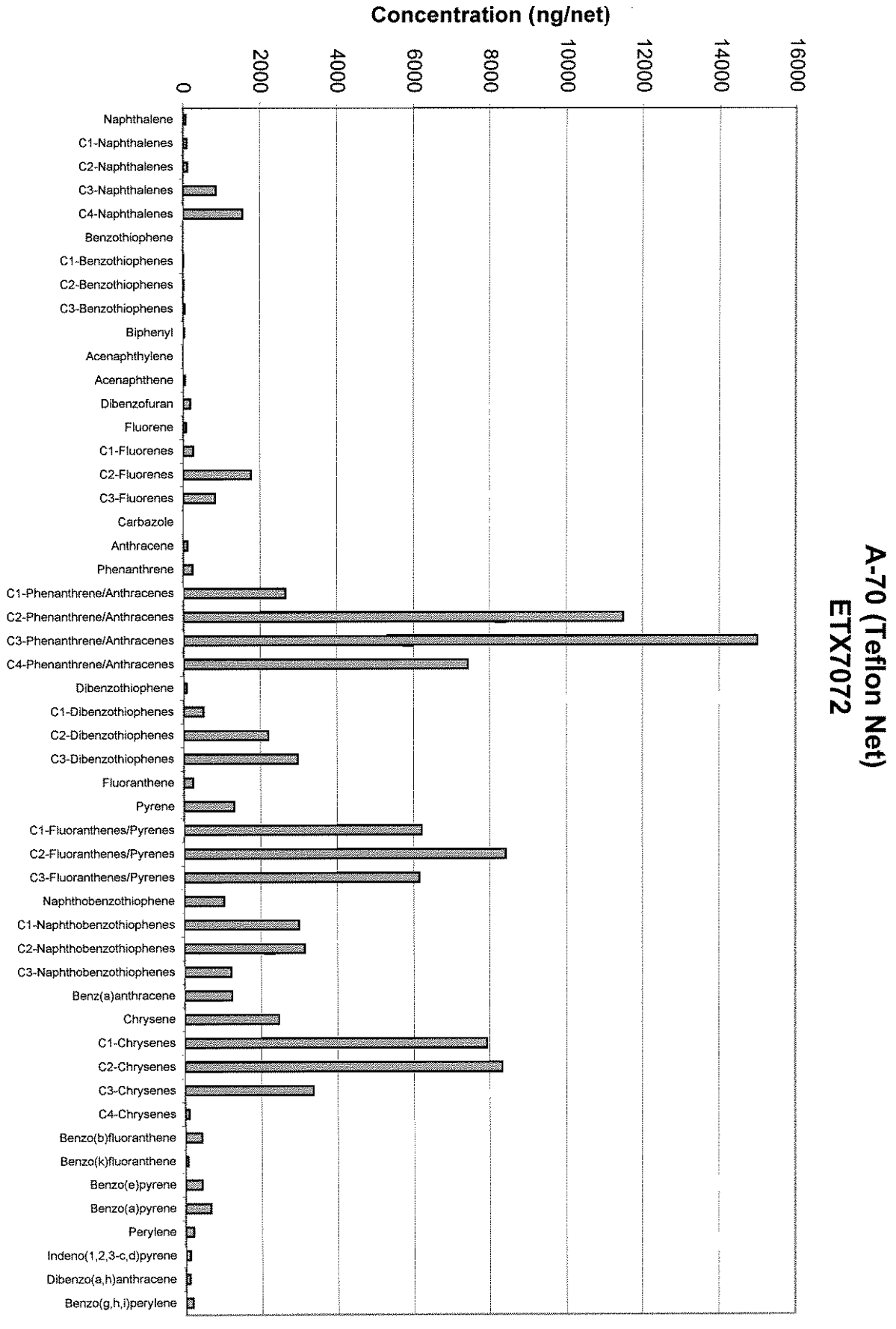
Sample Name	MS30306I.D
Client Name	AR-WKCC-250-022
Matrix	Solution
Collection Date	NA
Received Date	NA
Extraction Date	NA
Extraction Batch	ENV 1516
Date Acquired	09/28/06
Method	PAH-2002
Sample Volume (mL)	1

Target Compounds	Conc. (ng/ml)	Q	RPD (%)	LCS Certified Conc. Conc. (ng/ml)	-15% Conc. Conc. (ng/ml)	+15% Conc. Conc. (ng/ml)
Naphthalene	243		-3.8	253	215	290
C1-Naphthalenes	NA					
C2-Naphthalenes	NA					
C3-Naphthalenes	NA					
C4-Naphthalenes	NA					
Benzothiophene	249		-0.6	251	213	288
C1-Benzothiophenes	NA					
C2-Benzothiophenes	NA					
C3-Benzothiophenes	NA					
Biphenyl	249		-0.6	250	213	288
Acenaphthylene	245		-2.1	250	213	288
Acenaphthene	235		-6.4	251	213	288
Dibenzofuran	246					
Fluorene	226		-10.3	251	213	288
C1-Fluorenes	NA					
C2-Fluorenes	NA					
C3-Fluorenes	NA					
Carbazole	249		-0.5	250	213	288
Anthracene	252		0.6	250	213	288
Phenanthrene	282		11.8	251	213	288
C1-Phenanthrene/Anthracenes	NA					
C2-Phenanthrene/Anthracenes	NA					
C3-Phenanthrene/Anthracenes	NA					
C4-Phenanthrene/Anthracenes	NA					
Dibenzothiophene	257		2.6	250	213	288
C1-Dibenzothiophenes	NA					
C2-Dibenzothiophenes	NA					
C3-Dibenzothiophenes	NA					
Fluoranthene	263		4.8	251	213	288
Pyrene	251		0.2	251	213	288
C1-Fluoranthenes/Pyrenes	NA					
C2-Fluoranthenes/Pyrenes	NA					
C3-Fluoranthenes/Pyrenes	NA					
Naphthobenzothiophene	252		0.9	250	212	287
C1-Naphthobenzothiophenes	NA					
C2-Naphthobenzothiophenes	NA					
C3-Naphthobenzothiophenes	NA					
Benz(a)anthracene	229		-9.0	251	213	288
Chrysene	249		-0.7	251	213	288
C1-Chrysenes	NA					
C2-Chrysenes	NA					
C3-Chrysenes	NA					
C4-Chrysenes	NA					
Benzo(b)fluoranthene	241		-3.8	250	213	288
Benzo(k)fluoranthene	268		6.7	251	213	288
Benzo(e)pyrene	263		4.8	251	213	288
Benzo(a)pyrene	259		3.4	250	213	288
Perylene	254		1.4	250	213	288
Indeno(1,2,3-c,d)pyrene	259		3.3	251	213	288
Dibenzo(a,h)anthracene	256		2.2	250	213	288
Benzo(g,h,i)perylene	270		7.5	250	213	288
Individual Alkyl Isomers and Hopanes						
2-Methylnaphthalene	237		-5.6	251	213	288
1-Methylnaphthalene	249		-0.6	251	213	288
2,6-Dimethylnaphthalene	220		-13.0	251	213	288
1,6,7-Trimethylnaphthalene	252		0.6	250	213	288
1-Methylphenanthrene	242		-3.5	251	213	288
C29-Hopane	NA					
18a-Oleanane	NA					
C30-Hopane	259		3.5	250	213	288

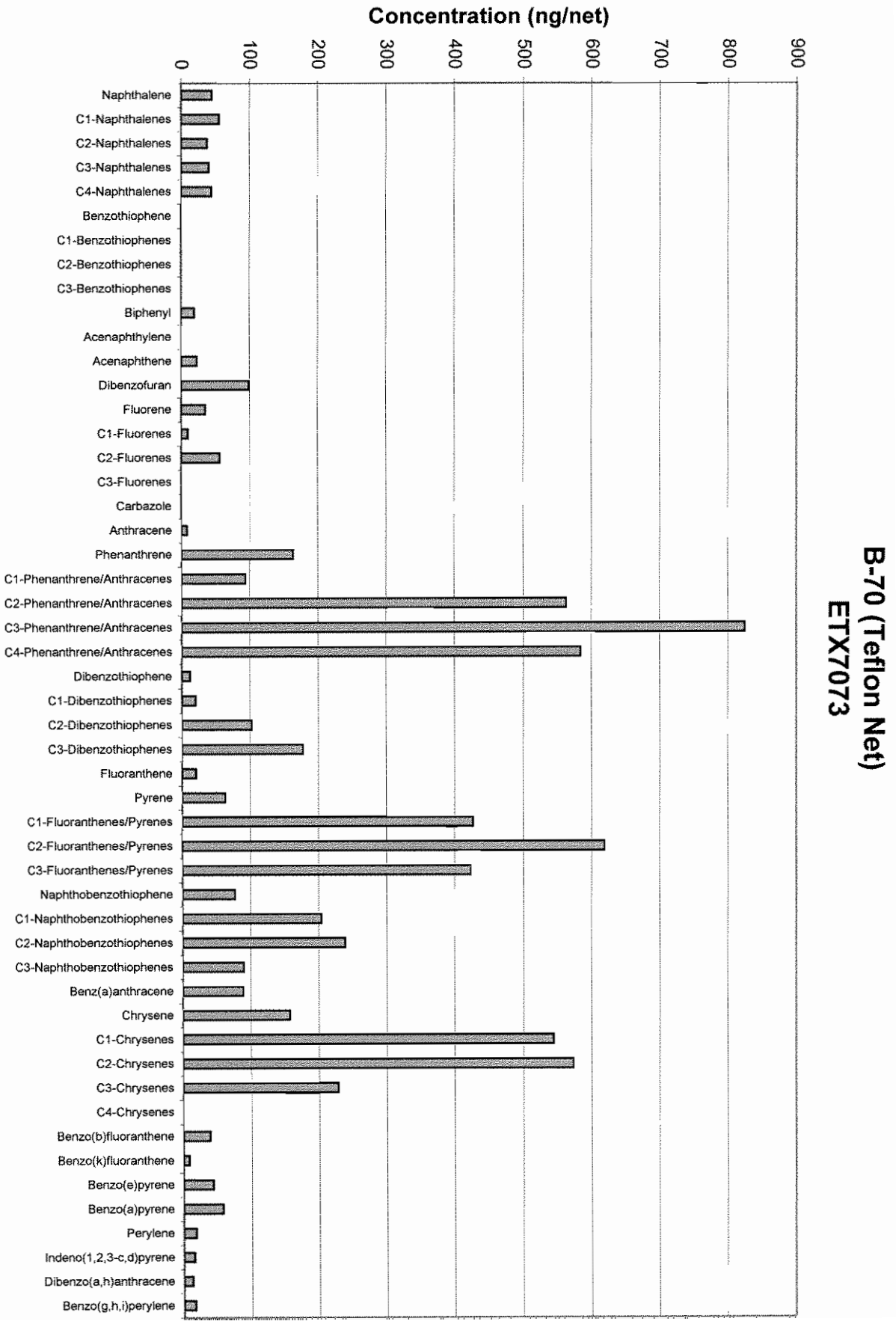
Surrogate (Su)	Su Recovery (%)
Naphthalene-d8	102
Acenaphthene-d10	94
Phenanthrene-d10	109
Chrysene-d12	88
Perylene-d12	105

Qualifiers (Q): J=Below the MDL, U=Not detected, B=In procedural blank > 3x MDL, I=Interference, D=Diluted value, NA=Not Applicable, *=Outside QA limits, refer to narrative

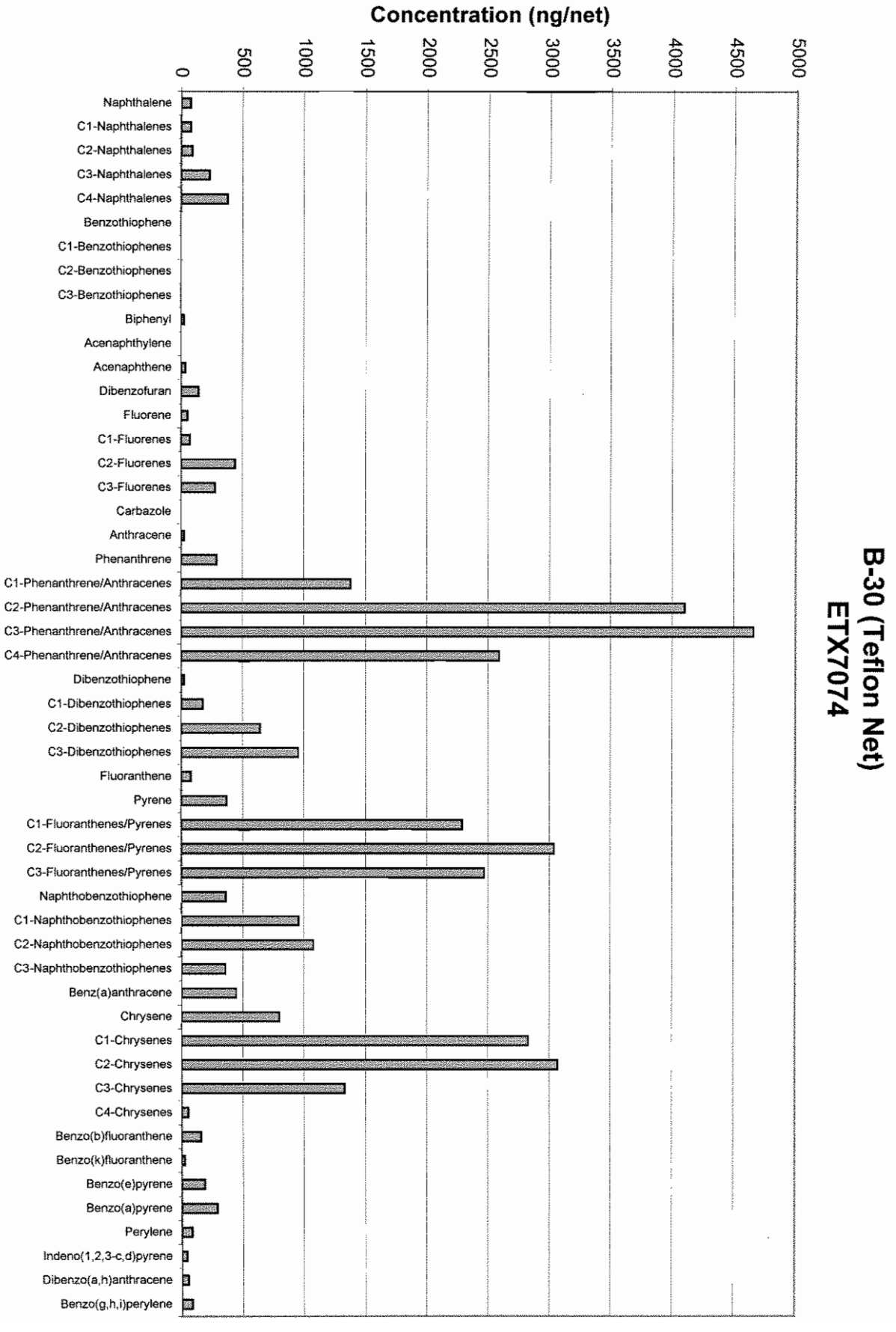
Polycyclic Aromatic Hydrocarbon Histograms



A-70 (Teflon Net)
ETX7072

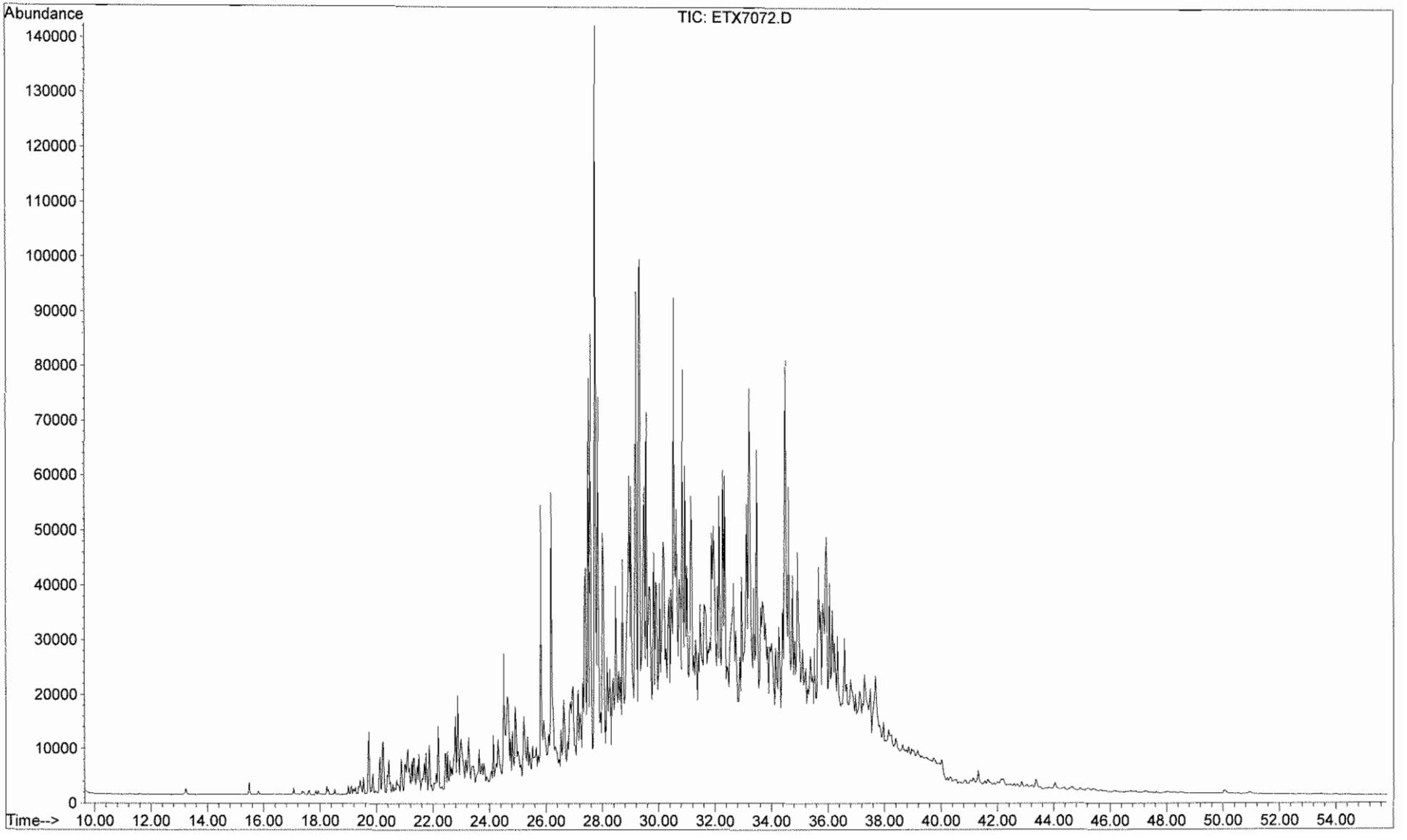


B-70 (Teflon Net)
ETX7073


B-30 (Teflon Net)
ETX7074
Concentration (ng/net)
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
Naphthalene
C1-Naphthalenes
C2-Naphthalenes
C3-Naphthalenes
C4-Naphthalenes
Benzothiophene
C1-Benzothiophenes
C2-Benzothiophenes
C3-Benzothiophenes
Biphenyl
Acenaphthylene
Acenaphthene
Dibenzofuran
Fluorene
C1-Fluorenes
C2-Fluorenes
C3-Fluorenes
Carbazole
Anthracene
Phenanthrene
C1-Phenanthrene/Anthracenes
C2-Phenanthrene/Anthracenes
C3-Phenanthrene/Anthracenes
C4-Phenanthrene/Anthracenes
Dibenzothiophene
C1-Dibenzothiophenes
C2-Dibenzothiophenes
C3-Dibenzothiophenes
Fluoranthene
Pyrene
C1-Fluoranthenes/Pyrenes
C2-Fluoranthenes/Pyrenes
C3-Fluoranthenes/Pyrenes
Naphthobenzothiophene
C1-Naphthobenzothiophenes
C2-Naphthobenzothiophenes
C3-Naphthobenzothiophenes
Benz(a)anthracene
Chrysene
C1-Chrysenes
C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-c,d)pyrene
Dibenzo(a,h)anthracene
Benzo(g,h,i)perylene

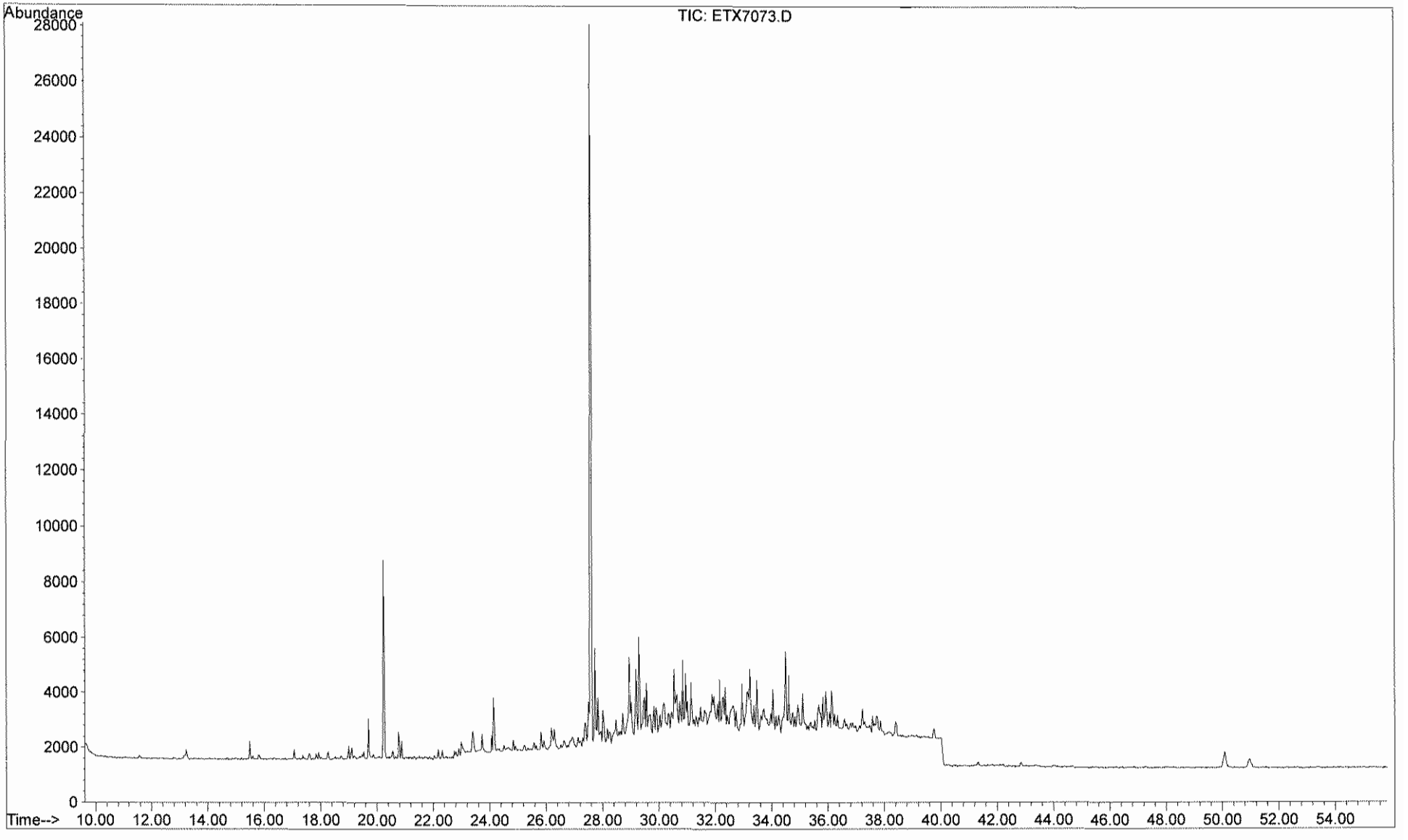
Polycyclic Aromatic Hydrocarbon Total Ion Chromatograms

File : D:\GC-MSD~1\MS30306\ETX7072.D
Operator : TJM
Acquired : 28 Sep 2006 3:52 am using AcqMethod PAH-2002
Instrument : GC/MS Ins
Sample Name: A-70
Misc Info :
Vial Number: 7



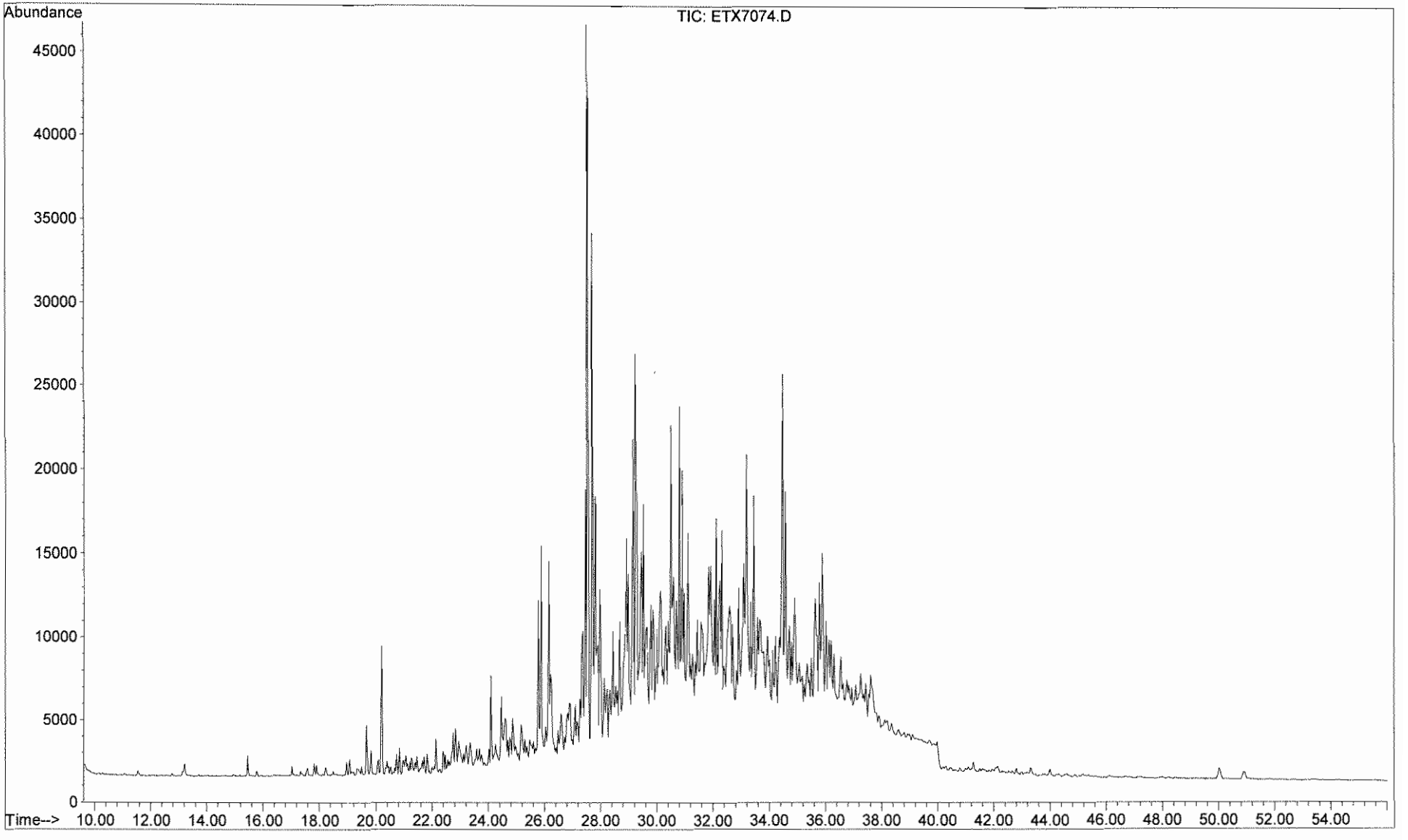
C00024

File : D:\GC-MSD~1\MS30306\ETX7073.D
Operator : TJM
Acquired : 28 Sep 2006 1:44 am using AcqMethod PAH-2002
Instrument : GC/MS Ins
Sample Name: B-70
Misc Info :
Vial Number: 5



000025

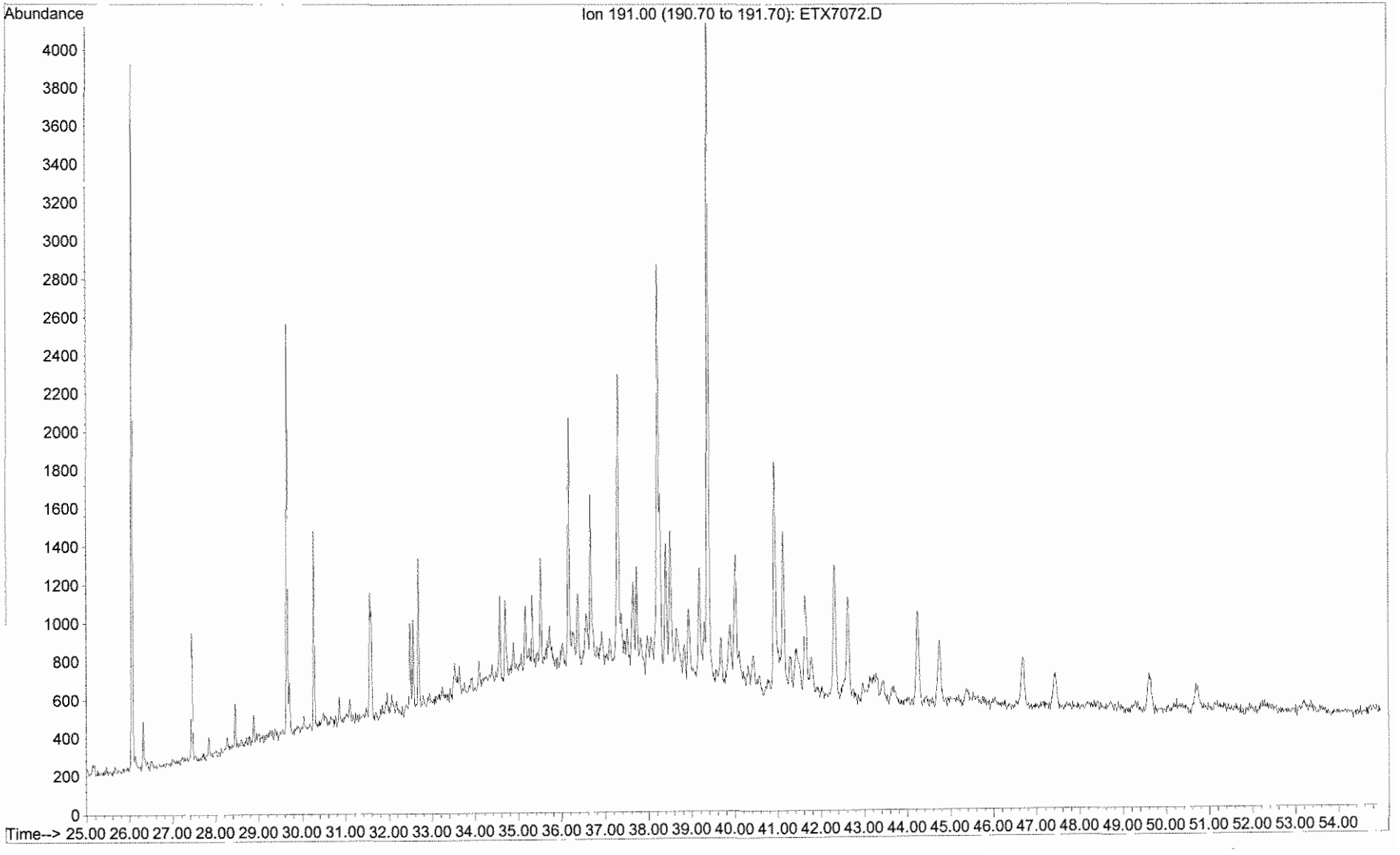
File : D:\GC-MSD-1\MS30306\ETX7074.D
Operator : TJM
Acquired : 28 Sep 2006 2:48 am using AcqMethod PAH-2002
Instrument : GC/MS Ins
Sample Name: B-30
Misc Info :
Vial Number: 6



920000

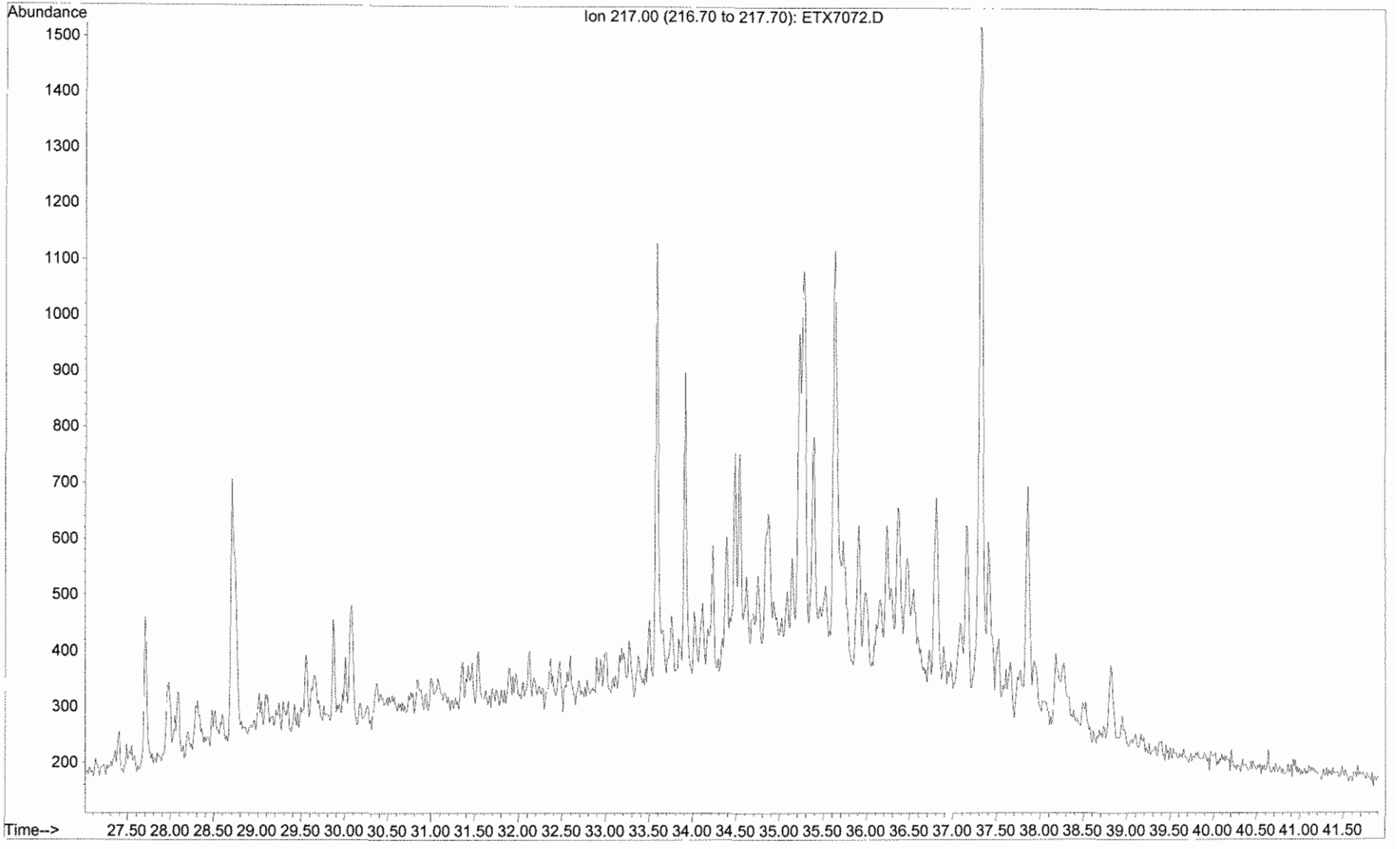
Saturate Biological Marker Chromatograms (m/z = 191, 217, 218, and 259)

File : X:\1\DATA\MS30310\ETX7072.D
Operator : TJM
Acquired : 10 Oct 2006 3:15 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: A-70
Misc Info :
Vial Number: 38



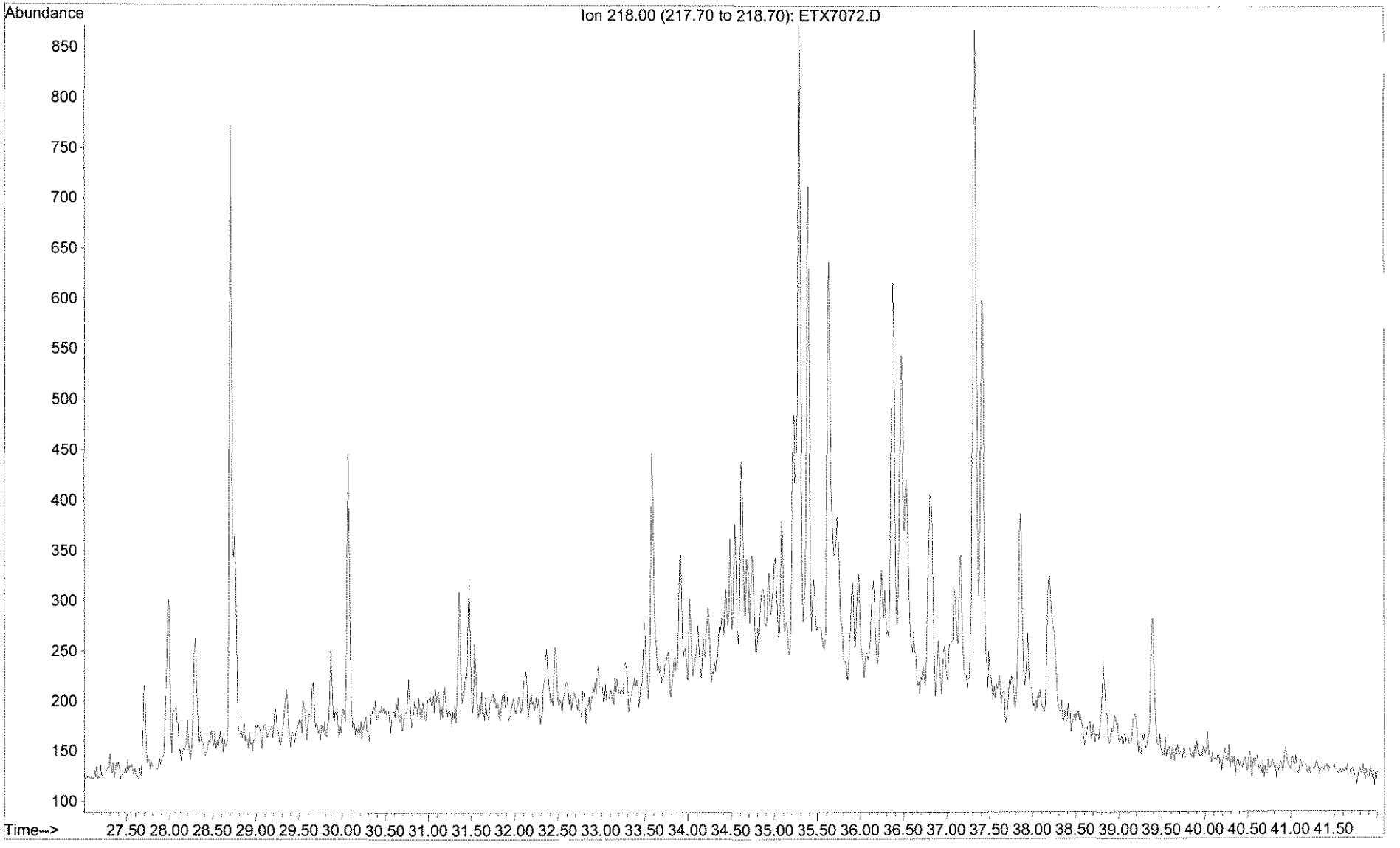
820003

File : X:\1\DATA\MS30310\ETX7072.D
Operator : TJM
Acquired : 10 Oct 2006 3:15 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: A-70
Misc Info :
Vial Number: 38



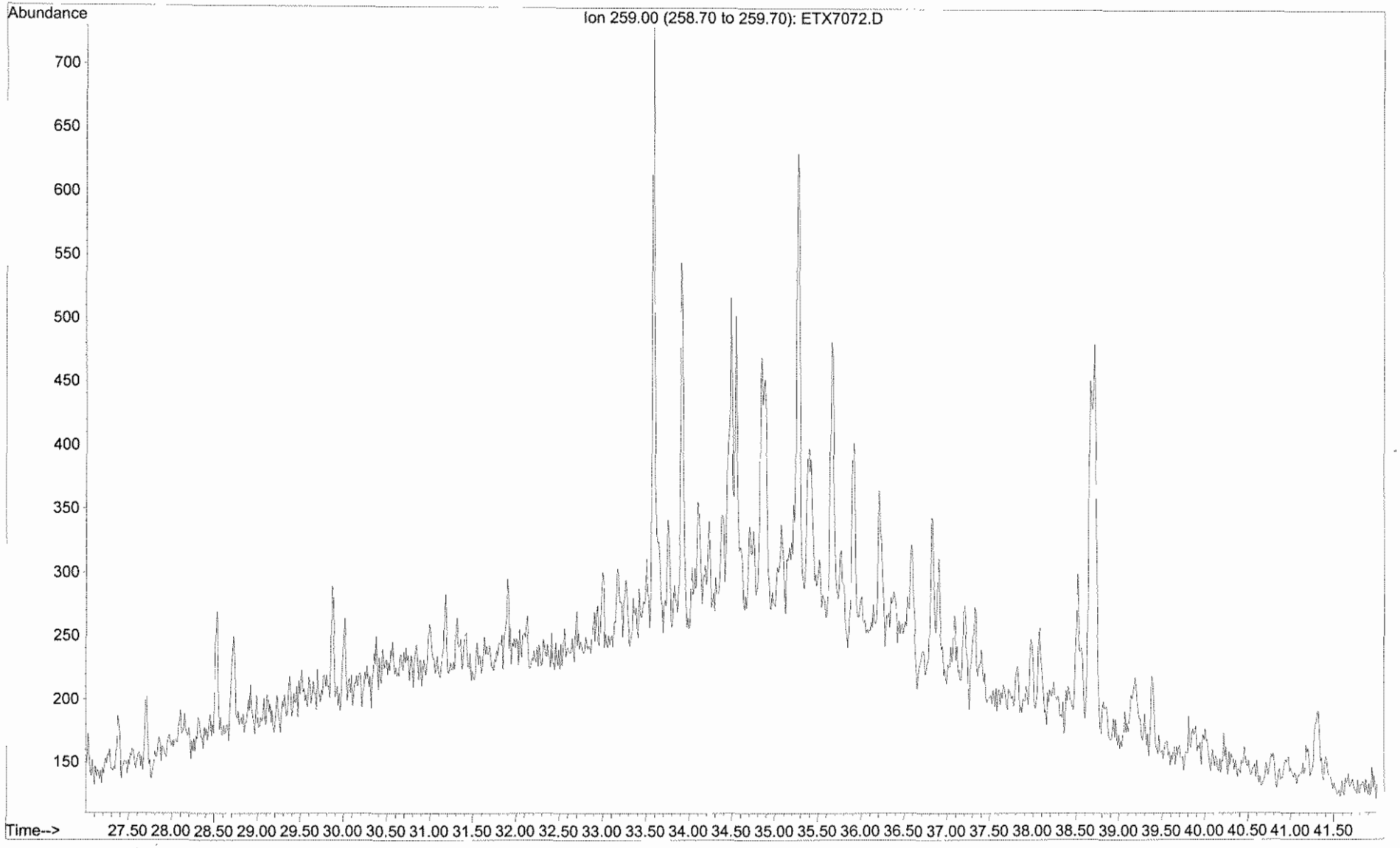
620006

File : X:\1\DATA\MS30310\ETX7072.D
Operator : TJM
Acquired : 10 Oct 2006 3:15 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: A-70
Misc Info :
Vial Number: 38



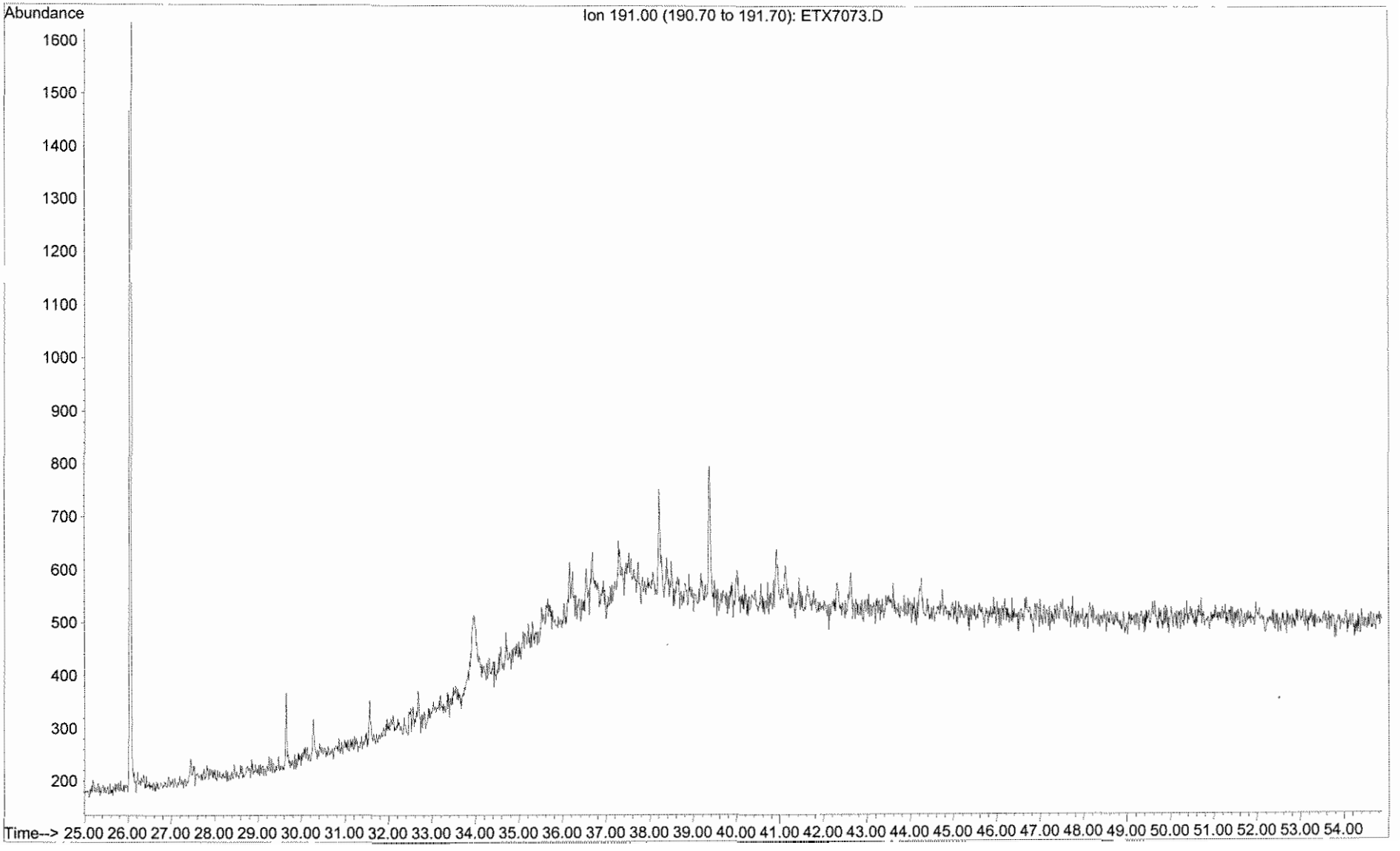
000030

File : X:\1\DATA\MS30310\ETX7072.D
Operator : TJM
Acquired : 10 Oct 2006 3:15 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: A-70
Misc Info :
Vial Number: 38

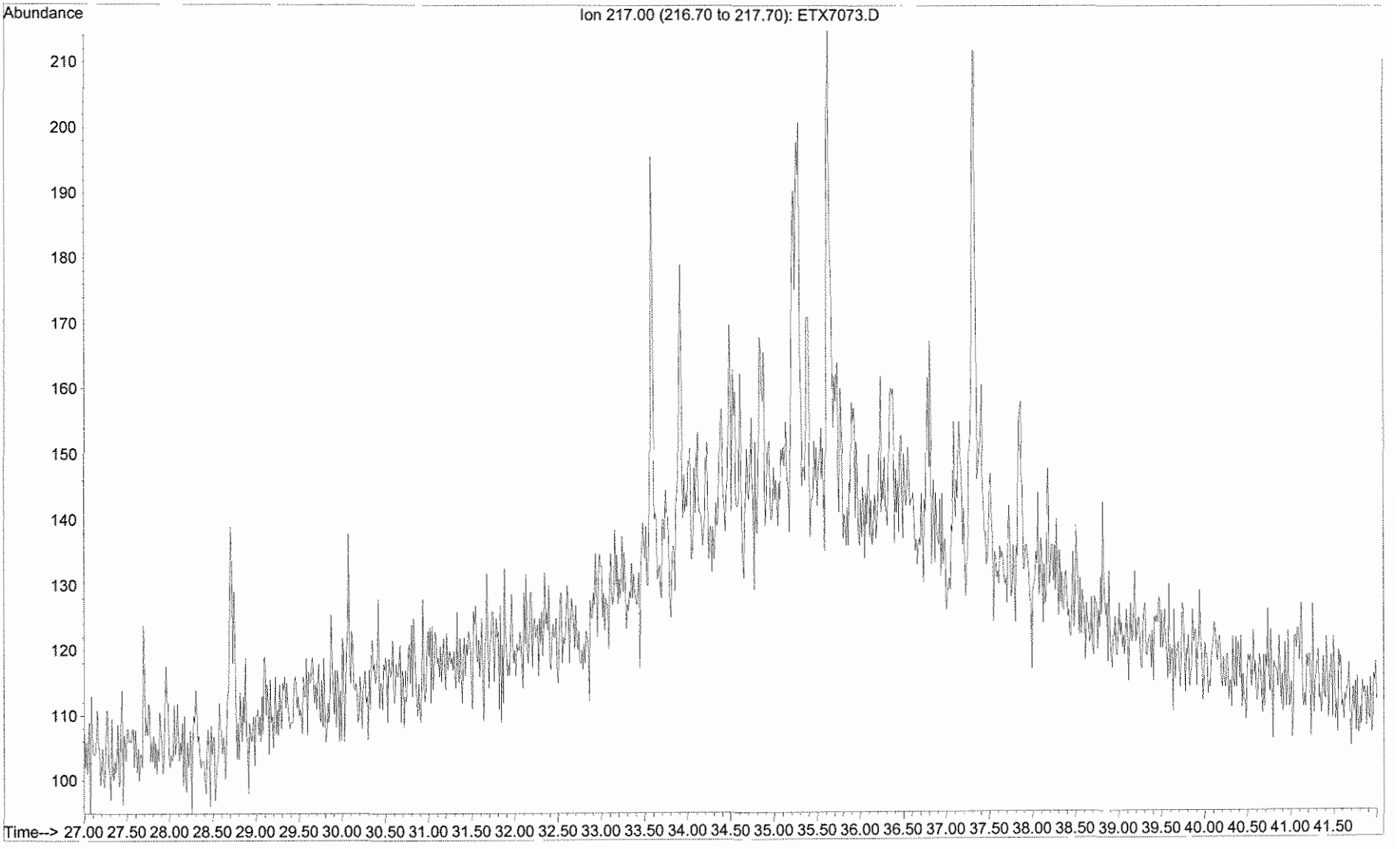


000031

File : X:\1\DATA\MS30310\ETX7073.D
Operator : TJM
Acquired : 10 Oct 2006 1:05 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: B-70
Misc Info :
Vial Number: 36

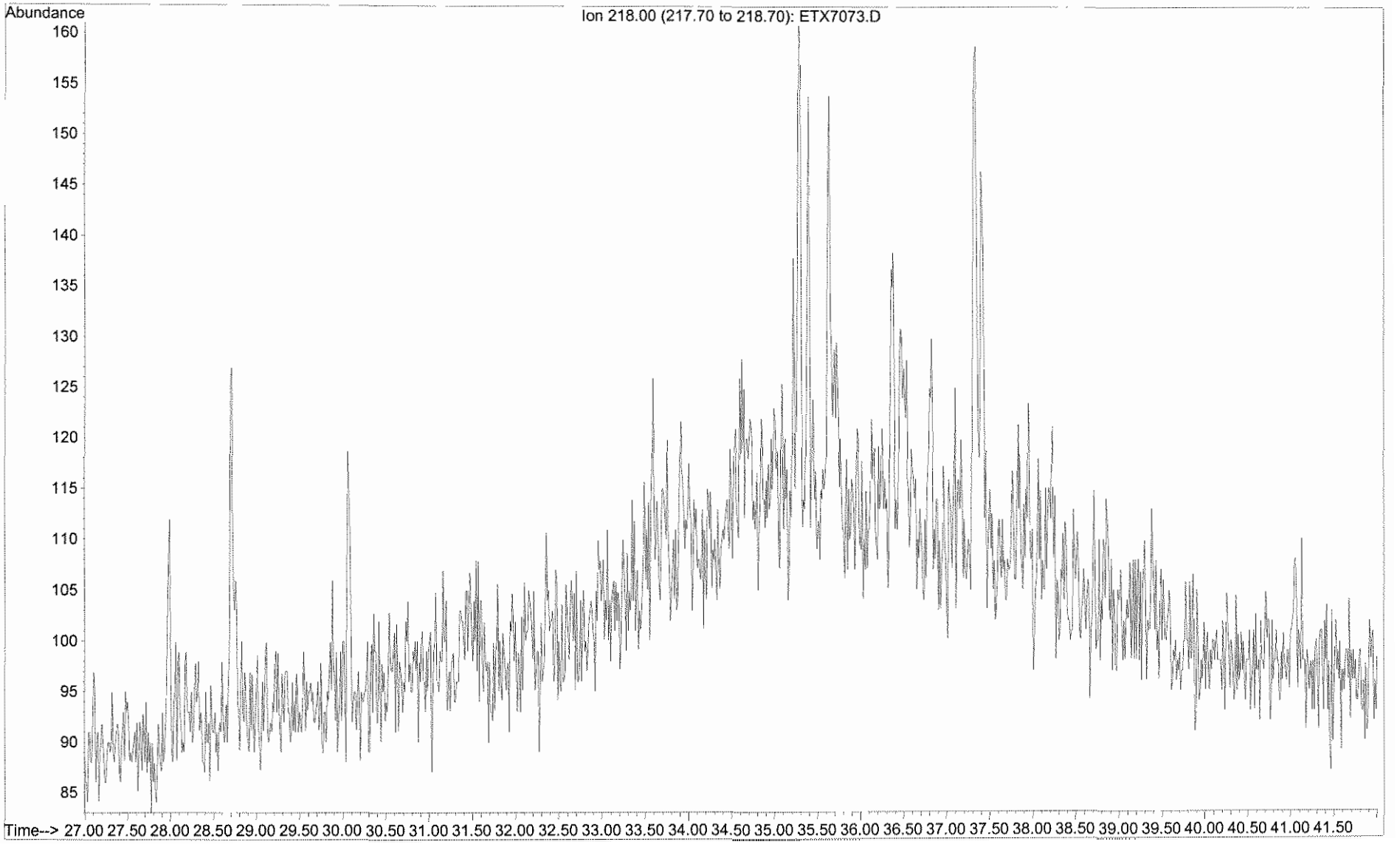


File : X:\1\DATA\MS30310\ETX7073.D
Operator : TJM
Acquired : 10 Oct 2006 1:05 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: B-70
Misc Info :
Vial Number: 36

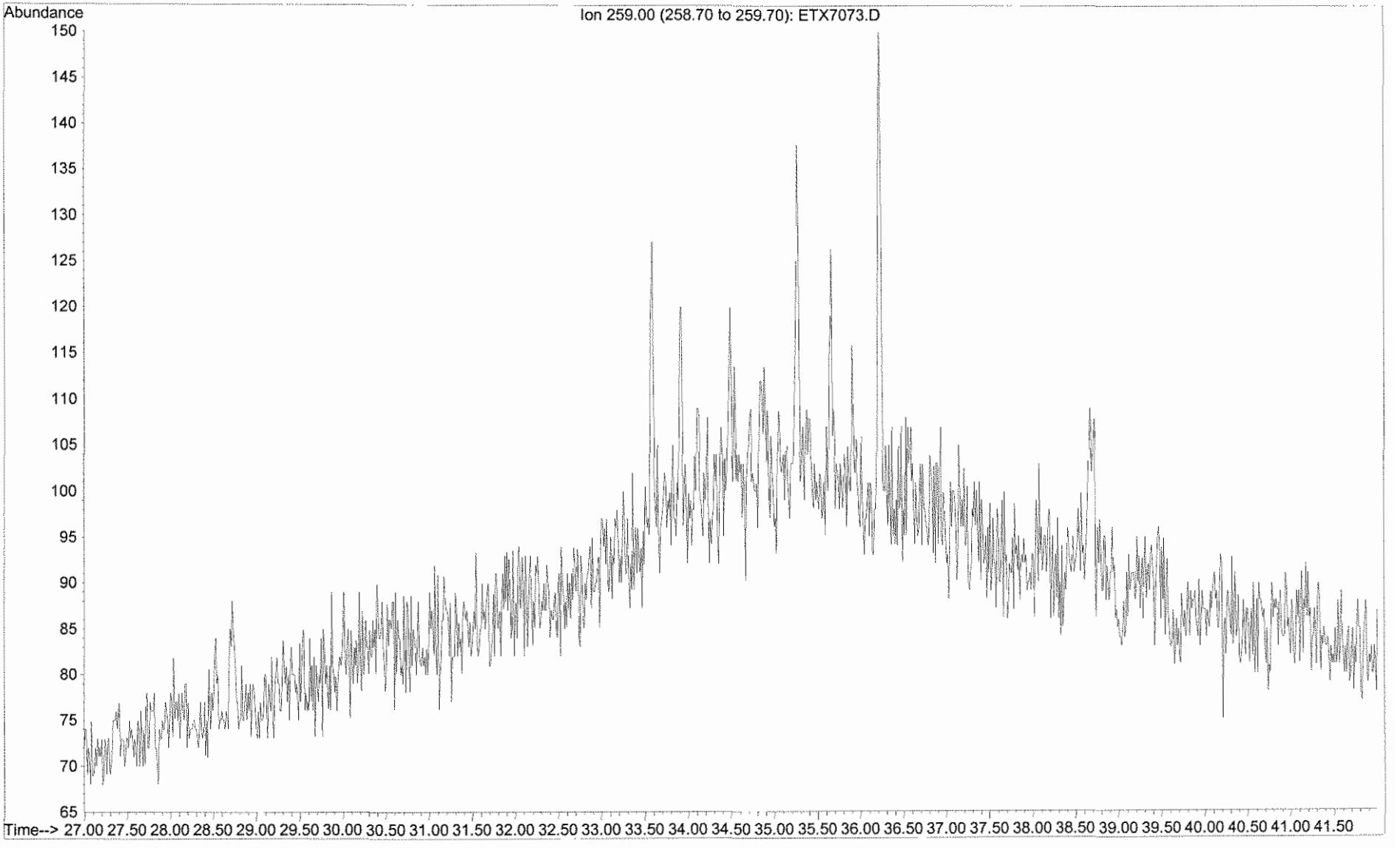


330033

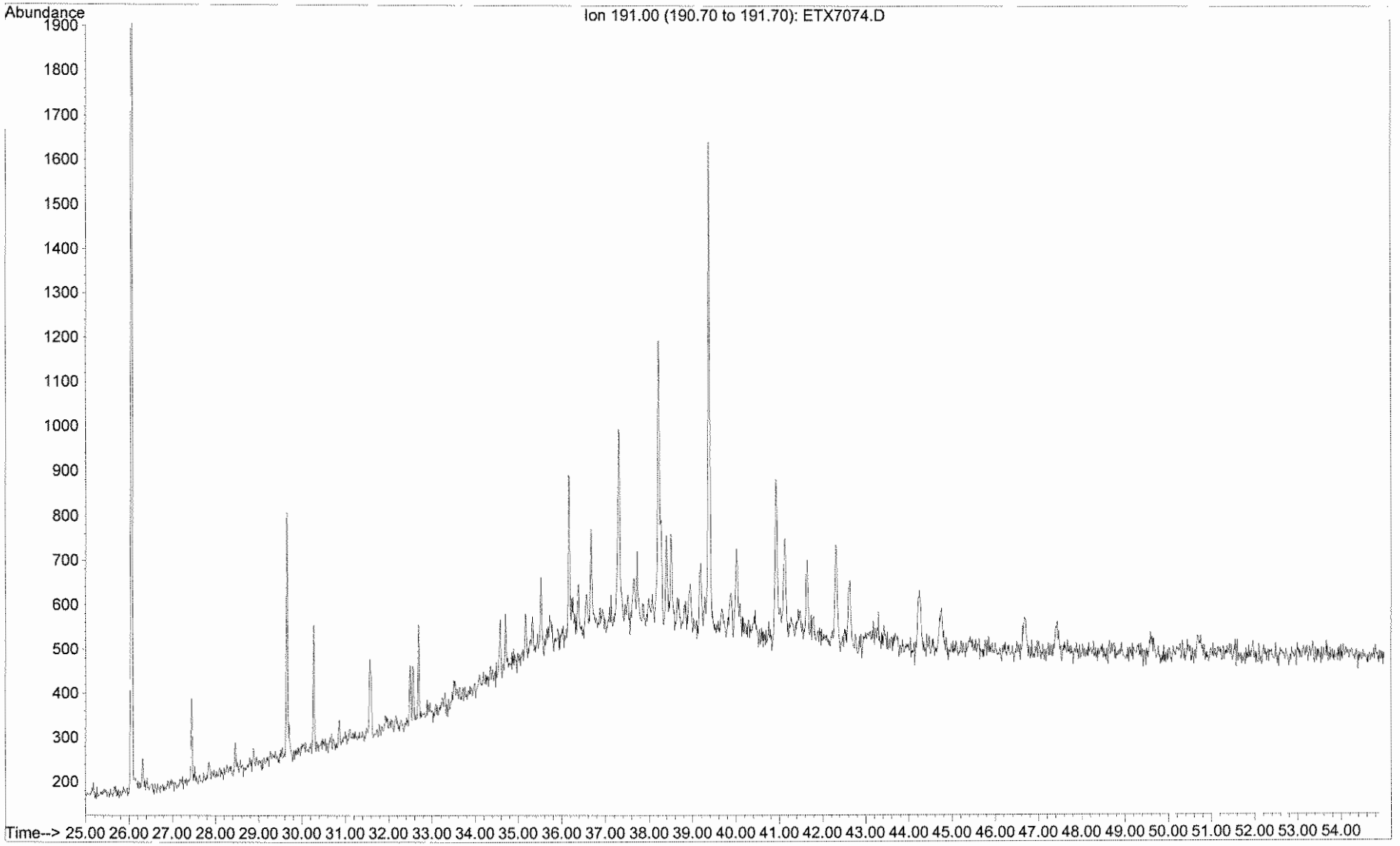
File : X:\1\DATA\MS30310\ETX7073.D
Operator : TJM
Acquired : 10 Oct 2006 1:05 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: B-70
Misc Info :
Vial Number: 36



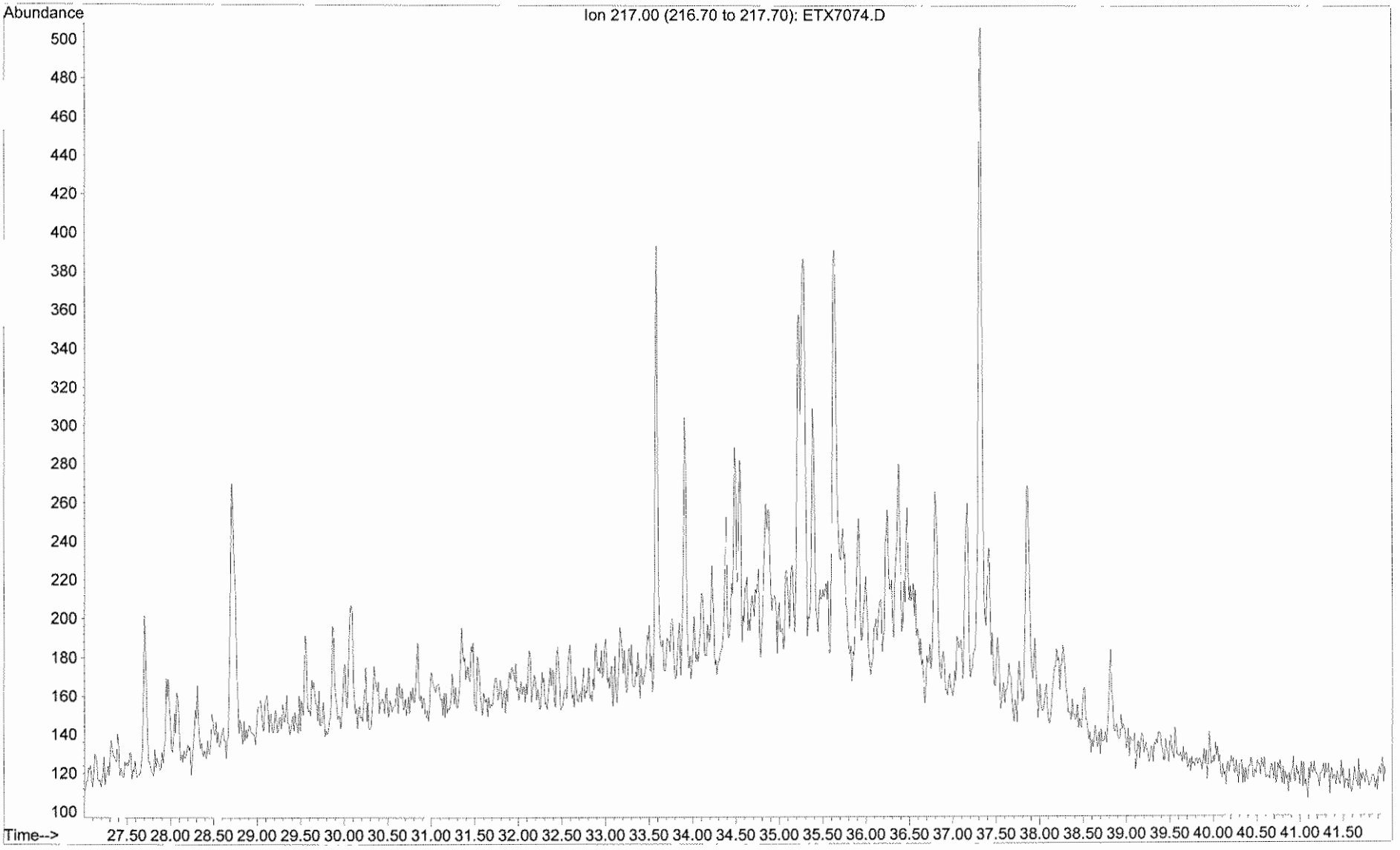
File : X:\1\DATA\MS30310\ETX7073.D
Operator : TJM
Acquired : 10 Oct 2006 1:05 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name: B-70
Misc Info :
Vial Number: 36



File : X:\1\DATA\MS30310\ETX7074.D
Operator : TJM
Acquired : 10 Oct 2006 2:10 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name:
Misc Info :
Vial Number: 37

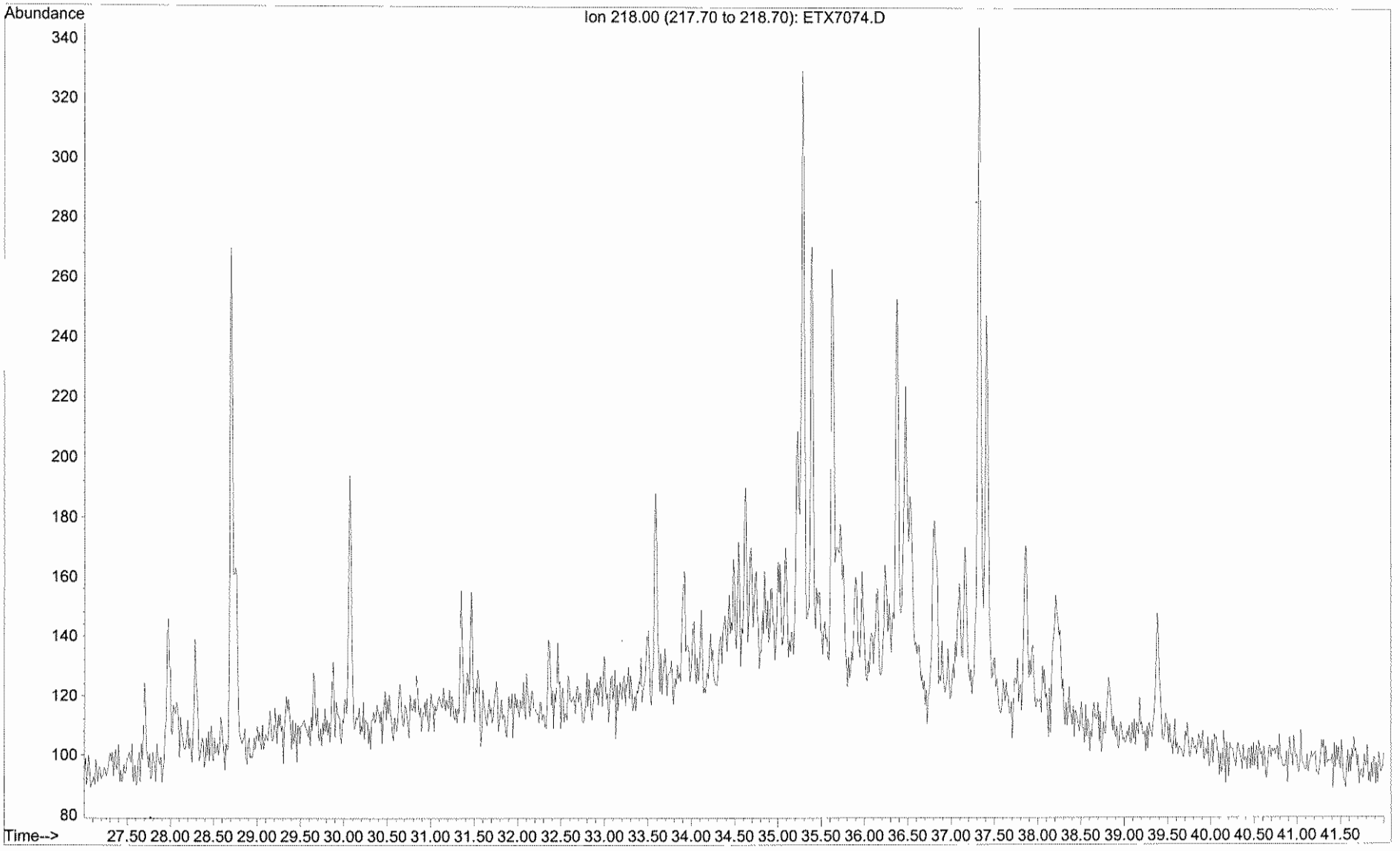


File : X:\1\DATA\MS30310\ETX7074.D
Operator : TJM
Acquired : 10 Oct 2006 2:10 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name:
Misc Info :
Vial Number: 37



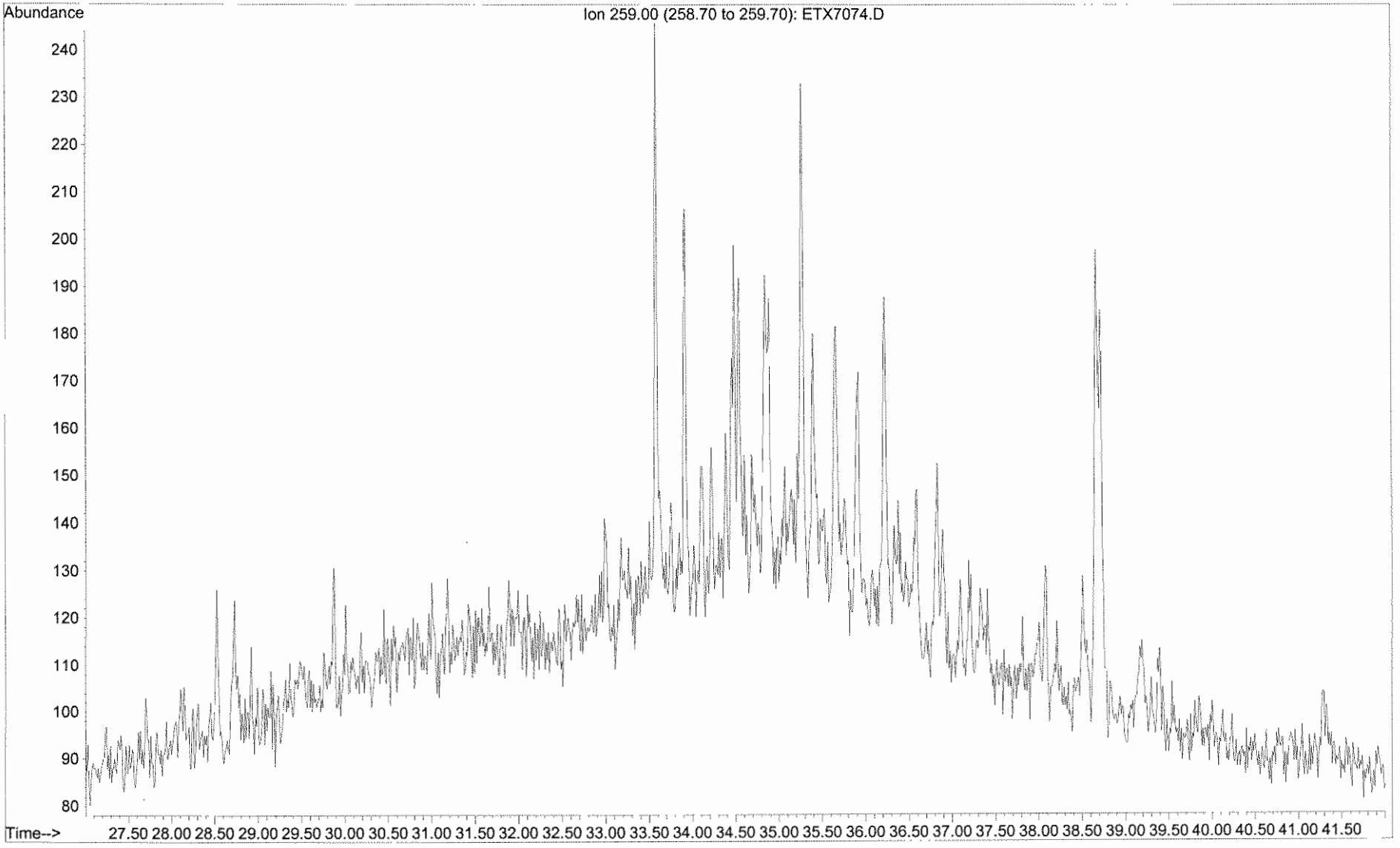
000037

File : X:\1\DATA\MS30310\ETX7074.D
Operator : TJM
Acquired : 10 Oct 2006 2:10 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name:
Misc Info :
Vial Number: 37



Q000038

File : X:\1\DATA\MS30310\ETX7074.D
Operator : TJM
Acquired : 10 Oct 2006 2:10 am using AcqMethod SATBIO
Instrument : GC/MS Ins
Sample Name:
Misc Info :
Vial Number: 37



Total Petroleum Hydrocarbons/ Aliphatic Hydrocarbons Raw Data

B&B LABORATORIES ALIPHATICS/TPH QA FORM

Extraction Page: ENV 1516 Analyst: M. Cyr / T. McDaniel

Client: Entrix Date: 11-5-06

Job: #: J03318 QA Manager: [signature]

SDG #: 06092301 Date: 11/07/04

Calibration: No failures

Surrogate Recoveries: n-dodecane (d26) was detected outside of the QC specified Recovery limits in Sample ETX7073 (B-70)

Blank: NA

Blank Spike: NA

Blank Spike Duplicate: NA

Duplicate: NA

Matrix Spike: NA

Matirx Spike Duplicate: NA

Other: LCS - No failures

Comments: None

Sequence Name: U:\2\SEQUENCE\GC10801.S
Comment: NPS--Water; Entrix-Net
Operator: TJM
Data Path: C:\HPCHEM\2\DATA\GC10801\
Pre-Seq Cmd:
Post-Seq Cmd:

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

On A Barcode Mismatch
(X) Inject Anyway
( ) Don't Inject

Line	Type	Vial	DataFile	Method	Sample Name
1	Sample	51	GC10801A	ALI_COMP	Solvent Blank
2	Sample	52	GC10801B	ALI_COMP	Diesel Std.
3	Sample	53	GC10801C	ALI_COMP	PEM (Low)
4	Sample	54	GC10801D	ALI_COMP	PEM (High)
5	Sample	96	GC10801E	ALI_COMP	CS1
6	Sample	97	GC10801F	ALI_COMP	CS2
7	Sample	98	GC10801G	ALI_COMP	CS3
8	Sample	99	GC10801H	ALI_COMP	CS4
9	Sample	100	GC10801I	ALI_COMP	CS5
10	Sample	55	GC10801J	ALI_COMP	AL-WKCC-25-004 (CCC)
11	Sample	56	ENV1511A	ALI_COMP	
12	Sample	57	ENV1511B	ALI_COMP	
13	Sample	58	ENV1511C	ALI_COMP	
14	Sample	59	NPS0077	ALI_COMP	
15	Sample	60	ETX7073	ALI_COMP	
16	Sample	61	ETX7074	ALI_COMP	
17	Sample	62	ETX7072	ALI_COMP	
18	Sample	63	GC10801K	ALI_COMP	AL-WKCC-25-004 (CCC)

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801J.D Vial: 55
Acq On : 28 Sep 2006 12:00 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e

Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:18:49 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1		n-hexadecane-d34	1.000	1.000	0.0	73	0.00
2		n-C10	1.282	1.388	-8.3	79	0.00
3		n-C11	1.250	1.358	-8.6	79	0.00
4	S	n-dodecane-d26	1.009	1.084	-7.4	78	0.00
5		n-C12	1.254	1.364	-8.8	79	0.00
6		n-C13	1.227	1.335	-8.8	79	0.00
7		n-C14	1.201	1.305	-8.7	78	0.00
8		n-C15	1.180	1.274	-8.0	78	0.00
9		n-C16	1.140	1.226	-7.5	78	0.00
10		5a-androstane	1.000	1.000	0.0	79	0.00
11		n-C17	0.983	1.003	-2.0	78	0.00
12		Pristane	0.933	0.949	-1.7	78	0.00
13		n-C18	0.953	0.969	-1.7	78	0.00
14		Phytane	0.953	0.969	-1.7	78	0.00
15		n-C19	0.915	0.932	-1.9	78	0.00
16	S	n-eicosane-d42	0.789	0.799	-1.3	78	0.00
17		n-C20	0.896	0.907	-1.2	78	0.00
18		n-C21	0.886	0.902	-1.8	78	0.00
19		n-C22	0.847	0.859	-1.4	78	0.00
20		n-C23	0.848	0.855	-0.8	78	0.00
21		n-C24	0.836	0.843	-0.8	79	0.00
22		n-C25	0.828	0.837	-1.1	79	0.00
23		n-C26	0.843	0.841	0.2	79	0.00
24		n-C27	0.832	0.825	0.8	79	0.00
25		n-C28	0.841	0.827	1.7	79	0.00
26		n-C29	0.828	0.834	-0.7	79	0.00
27	S	n-triacontane-d62	0.762	0.770	-1.0	79	0.00
28		n-C30	0.786	0.803	-2.2	79	0.00
29		n-C31	0.804	0.790	1.7	80	0.00
30		n-C32	0.728	0.739	-1.5	80	0.00
31		n-C33	0.716	0.707	1.3	81	0.00
32		n-C34	0.688	0.676	1.7	80	0.00

Evaluate Continuing Calibration Report - Not Founds

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801J.D Vial: 55
Acq On : 28 Sep 2006 12:00 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e

Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:18:49 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
33	TPH	0.044	0.000	100.0#	0#	-23.43#
34	TRH1	0.044	0.000	100.0#	0#	-5.97#
35	TRH2	0.044	0.000	100.0#	0#	-13.37#
36	TRH3	0.044	0.000	100.0#	0#	-20.70#
37	TRH4	0.044	0.000	100.0#	0#	-28.57#
38	TRH5	0.044	0.000	100.0#	0#	-35.70#
39	TRH6	0.044	0.000	100.0#	0#	-44.13#

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801J.D Vial: 55
Acq On : 28 Sep 2006 12:00 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:29 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc Units
		Internal Standards			
1)		n-hexadecane-d34	13.55	102037	20.001 ug/mlm
10)		5a-androstane	18.97	121110	20.003 ug/mlm
		System Monitoring Compounds			
4)	S	n-dodecane-d26	9.22	138399	26.881 ug/mlm
16)	S	n-eicosane-d42	18.41	121030	25.335 ug/mlm
27)	S	n-triacontane-d62	30.44	116744	25.307 ug/mlm
		Target Compounds			
2)		n-C10	6.86	176964	27.062 ug/mlm
3)		n-C11	8.18	174200	27.312 ug/mlm
5)		n-C12	9.43	173793	27.174 ug/mlm
6)		n-C13	10.59	169727	27.110 ug/mlm
7)		n-C14	11.67	166414	27.154 ug/mlm
8)		n-C15	12.72	161145	26.765 ug/mlm
9)		n-C16	13.82	155792	26.788 ug/mlm
11)		n-C17	14.98	152023	25.552 ug/mlm
12)		Pristane	15.12	142630	25.253 ug/mlm
13)		n-C18	16.21	146797	25.449 ug/mlm
14)		Phytane	16.39	144278	24.993 ug/mlm
15)		n-C19	17.50	141397	25.533 ug/mlm
17)		n-C20	18.82	137406	25.320 ug/mlm
18)		n-C21	20.14	136646	25.483 ug/mlm
19)		n-C22	21.47	127823	24.913 ug/mlm
20)		n-C23	22.77	130194	25.352 ug/mlm
21)		n-C24	24.04	127779	25.258 ug/mlm
22)		n-C25	25.29	126815	25.298 ug/mlm
23)		n-C26	26.49	126501	24.799 ug/mlm
24)		n-C27	27.67	124015	24.633 ug/mlm
25)		n-C28	28.80	125025	24.560 ug/mlm
26)		n-C29	29.91	126402	25.204 ug/mlm
28)		n-C30	30.97	121924	25.622 ug/mlm
29)		n-C31	32.01	119643	24.579 ug/mlm
30)		n-C32	33.09	110263	25.000 ug/mlm
31)		n-C33	34.32	106989	24.679 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801J.D Vial: 55
Acq On : 28 Sep 2006 12:00 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:29 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

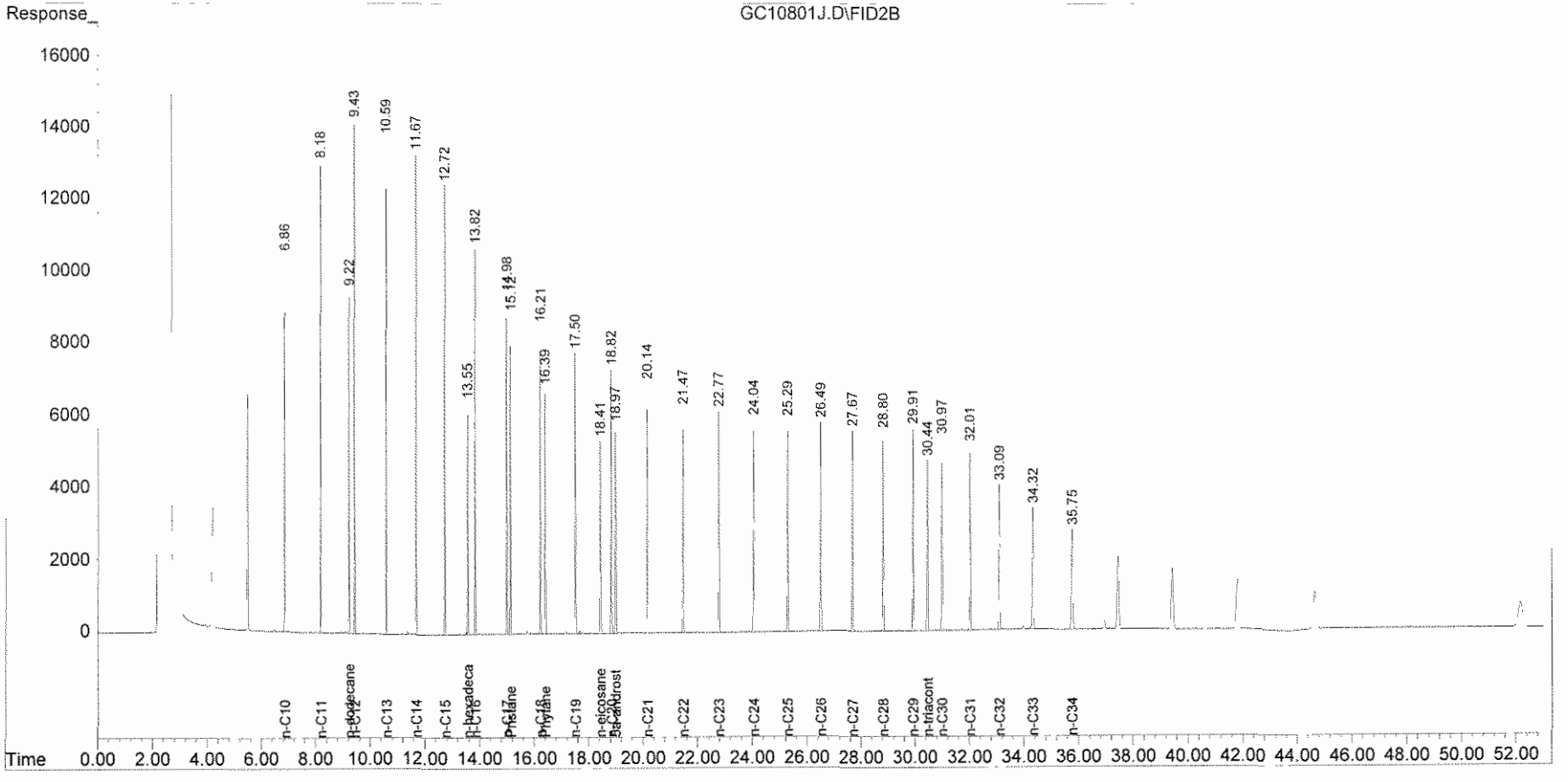
Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc Units
32)	n-C34	35.75	102330	24.576 ug/mlm

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801J.D Vial: 55
Acq On : 28 Sep 2006 12:00 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:29 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



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Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801K.D Vial: 63
Acq On : 28 Sep 2006 8:01 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e

Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:18:49 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1		n-hexadecane-d34	1.000	1.000	0.0	71	0.00
2		n-C10	1.282	1.423	-11.0	79	0.00
3		n-C11	1.250	1.381	-10.5	78	0.00
4	S	n-dodecane-d26	1.009	1.095	-8.5	77	0.00
5		n-C12	1.254	1.374	-9.6	78	0.00
6		n-C13	1.227	1.336	-8.9	77	0.00
7		n-C14	1.201	1.302	-8.4	77	0.00
8		n-C15	1.180	1.272	-7.8	77	0.00
9		n-C16	1.140	1.227	-7.6	77	0.00
10		5a-androstane	1.000	1.000	0.0	77	0.00
11		n-C17	0.983	1.005	-2.2	77	0.00
12		Pristane	0.933	0.953	-2.1	77	0.00
13		n-C18	0.953	0.979	-2.7	78	0.00
14		Phytane	0.953	0.981	-2.9	78	0.00
15		n-C19	0.915	0.949	-3.7	79	0.00
16	S	n-eicosane-d42	0.789	0.822	-4.2	79	0.00
17		n-C20	0.896	0.933	-4.1	79	0.00
18		n-C21	0.886	0.935	-5.5	80	0.00
19		n-C22	0.847	0.900	-6.3	81	0.00
20		n-C23	0.848	0.900	-6.1	81	0.00
21		n-C24	0.836	0.895	-7.1	82	0.00
22		n-C25	0.828	0.892	-7.7	83	0.00
23		n-C26	0.843	0.899	-6.6	83	0.00
24		n-C27	0.832	0.884	-6.3	83	0.00
25		n-C28	0.841	0.886	-5.4	84	0.00
26		n-C29	0.828	0.894	-8.0	84	0.00
27	S	n-triacontane-d62	0.762	0.826	-8.4	83	0.00
28		n-C30	0.786	0.862	-9.7	84	0.00
29		n-C31	0.804	0.848	-5.5	84	0.00
30		n-C32	0.728	0.793	-8.9	84	0.00
31		n-C33	0.716	0.754	-5.3	85	0.00
32		n-C34	0.688	0.724	-5.2	85	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Evaluate Continuing Calibration Report - Not Founds

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801K.D Vial: 63
Acq On : 28 Sep 2006 8:01 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e

Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:18:49 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 150%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
33	TPH	0.044	0.000	100.0#	0#	-23.43#
34	TRH1	0.044	0.000	100.0#	0#	-5.97#
35	TRH2	0.044	0.000	100.0#	0#	-13.37#
36	TRH3	0.044	0.000	100.0#	0#	-20.70#
37	TRH4	0.044	0.000	100.0#	0#	-28.57#
38	TRH5	0.044	0.000	100.0#	0#	-35.70#
39	TRH6	0.044	0.000	100.0#	0#	-44.13#

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801K.D Vial: 63
Acq On : 28 Sep 2006 8:01 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:33 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc Units
		Internal Standards			
1)		n-hexadecane-d34	13.55	100075	20.001 ug/mlm
10)		5a-androstane	18.97	119244	20.003 ug/mlm
		System Monitoring Compounds			
4)	S	n-dodecane-d26	9.22	137091	27.149 ug/mlm
16)	S	n-eicosane-d42	18.41	122514	26.047 ug/mlm
27)	S	n-triacontane-d62	30.44	123388	27.166 ug/mlm
		Target Compounds			
2)		n-C10	6.86	178048	27.762 ug/mlm
3)		n-C11	8.18	173828	27.788 ug/mlm
5)		n-C12	9.43	171745	27.380 ug/mlm
6)		n-C13	10.59	166636	27.138 ug/mlm
7)		n-C14	11.67	162754	27.077 ug/mlm
8)		n-C15	12.72	157829	26.727 ug/mlm
9)		n-C16	13.82	152911	26.808 ug/mlm
11)		n-C17	14.98	149934	25.595 ug/mlm
12)		Pristane	15.11	141076	25.368 ug/mlm
13)		n-C18	16.21	146071	25.719 ug/mlm
14)		Phytane	16.39	143867	25.312 ug/mlm
15)		n-C19	17.50	141875	26.020 ug/mlm
17)		n-C20	18.81	139170	26.046 ug/mlm
18)		n-C21	20.14	139491	26.421 ug/mlm
19)		n-C22	21.47	131805	26.091 ug/mlm
20)		n-C23	22.77	134915	26.682 ug/mlm
21)		n-C24	24.05	133544	26.810 ug/mlm
22)		n-C25	25.29	133017	26.951 ug/mlm
23)		n-C26	26.49	133048	26.491 ug/mlm
24)		n-C27	27.67	130840	26.395 ug/mlm
25)		n-C28	28.80	131927	26.322 ug/mlm
26)		n-C29	29.90	133433	27.022 ug/mlm
28)		n-C30	30.97	128766	27.483 ug/mlm
29)		n-C31	32.01	126456	26.384 ug/mlm
30)		n-C32	33.09	116365	26.797 ug/mlm
31)		n-C33	34.32	112477	26.351 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801K.D Vial: 63
Acq On : 28 Sep 2006 8:01 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:33 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

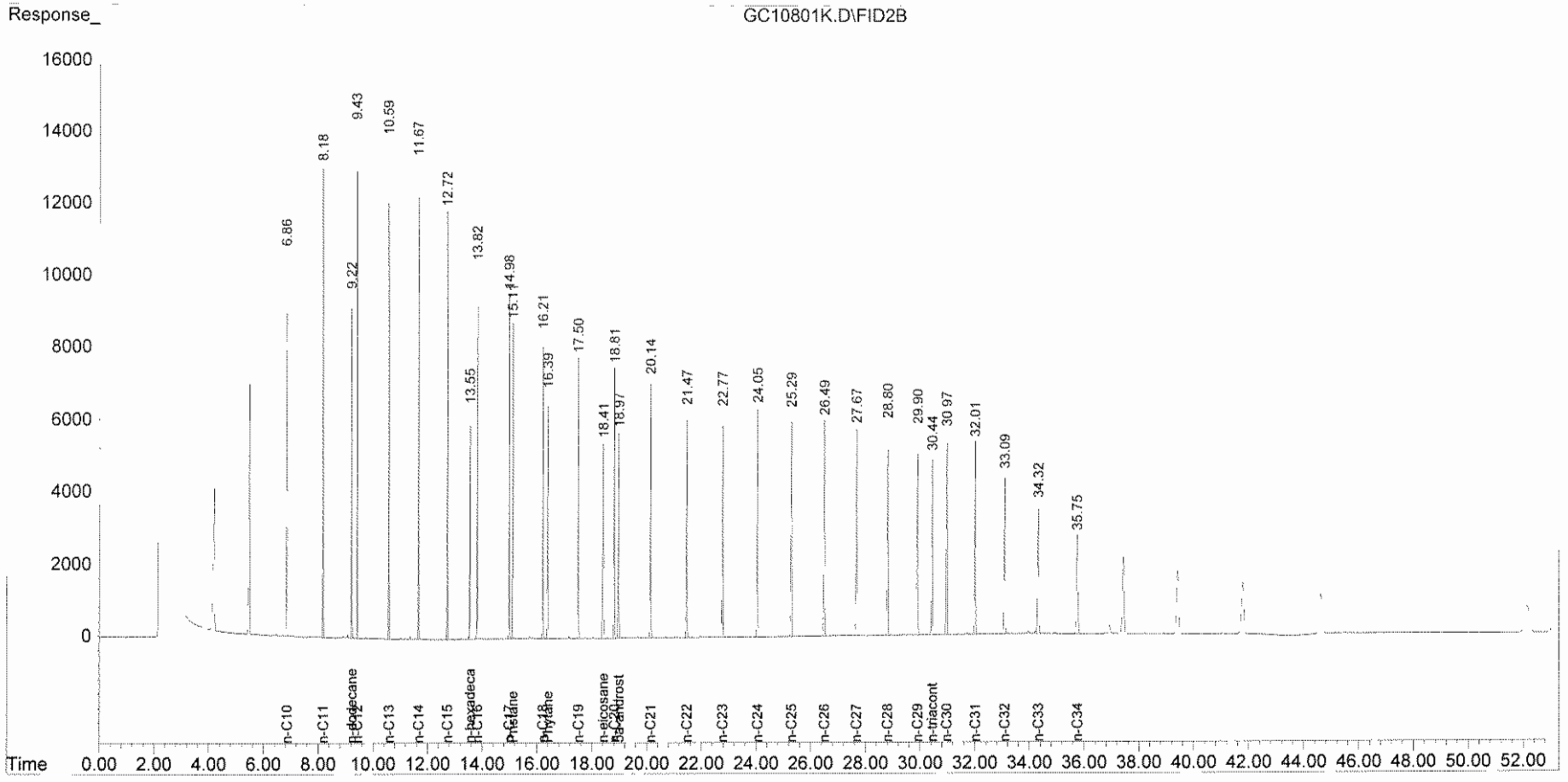
	Compound	R.T.	Response	Conc Units
32)	n-C34	35.75	107827	26.301 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801K.D Vial: 63
Acq On : 28 Sep 2006 8:01 am Operator: TJM
Sample : AL-WKCC-25-004 (CCC) Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:33 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



	Data File Name	**GC10801B.D**	GC10801B.D
	Data File Path	**D:\GC-MSD~1\GC10801**	Diesel Std.
	Date Acquired	**09/27/20 -1:5:**	09/27/20 -1:5:
	Sample Name	**Diesel Std.**	ALI_COMP.M
	Sample Multiplier	**1**	
			1
Name	**Amount**		20.001
n-hexadecane-d34	20.00		20.003
5a-androstane	20.00		1.926906508
		Surrogate recovery	1.854933928
n-dodecane-d26	1.93	96	1.784559652
n-eicosane-d42	1.85	93	197.888954
n-triacontane-d62	1.78	89	0
			0
		Surrogate Corrected	0
			0
TPH	197.89	213.36	0
TRH1	0.00	0.00	0
TRH2	0.00	0.00	96.3453254
TRH3	0.00	0.00	92.74669641
TRH4	0.00	0.00	89.22798259
TRH5	0.00	0.00	
TRH6	0.00	0.00	

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\GC10801\GC10801B.D
Acq On : 27 Sep 2006 15:58
Sample : Diesel Std.
Misc :

Vial: 52
Operator: TJM
Inst : GC#1
Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 5 16:18 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc	Units
		Internal Standards				
1)		n-hexadecane-d34	13.55	100981	20.001	ug/mlm
10)		5a-androstane	18.97	129330	20.003	ug/mlm
		System Monitoring Compounds				
4)	S	n-dodecane-d26	9.22	9818	1.927	ug/mlm
16)	S	n-eicosane-d42	18.41	9463	1.855	ug/mlm
27)	S	n-triacontane-d62	30.44	8791	1.785	ug/mlm
		Target Compounds				
33)		TPH	13.55	1135217	197.889	ug/mlm

Data File : D:\GC-MSD~1\GC10801\GC10801B.D
Acq On : 27 Sep 2006 15:58
Sample : Diesel Std.
Misc :

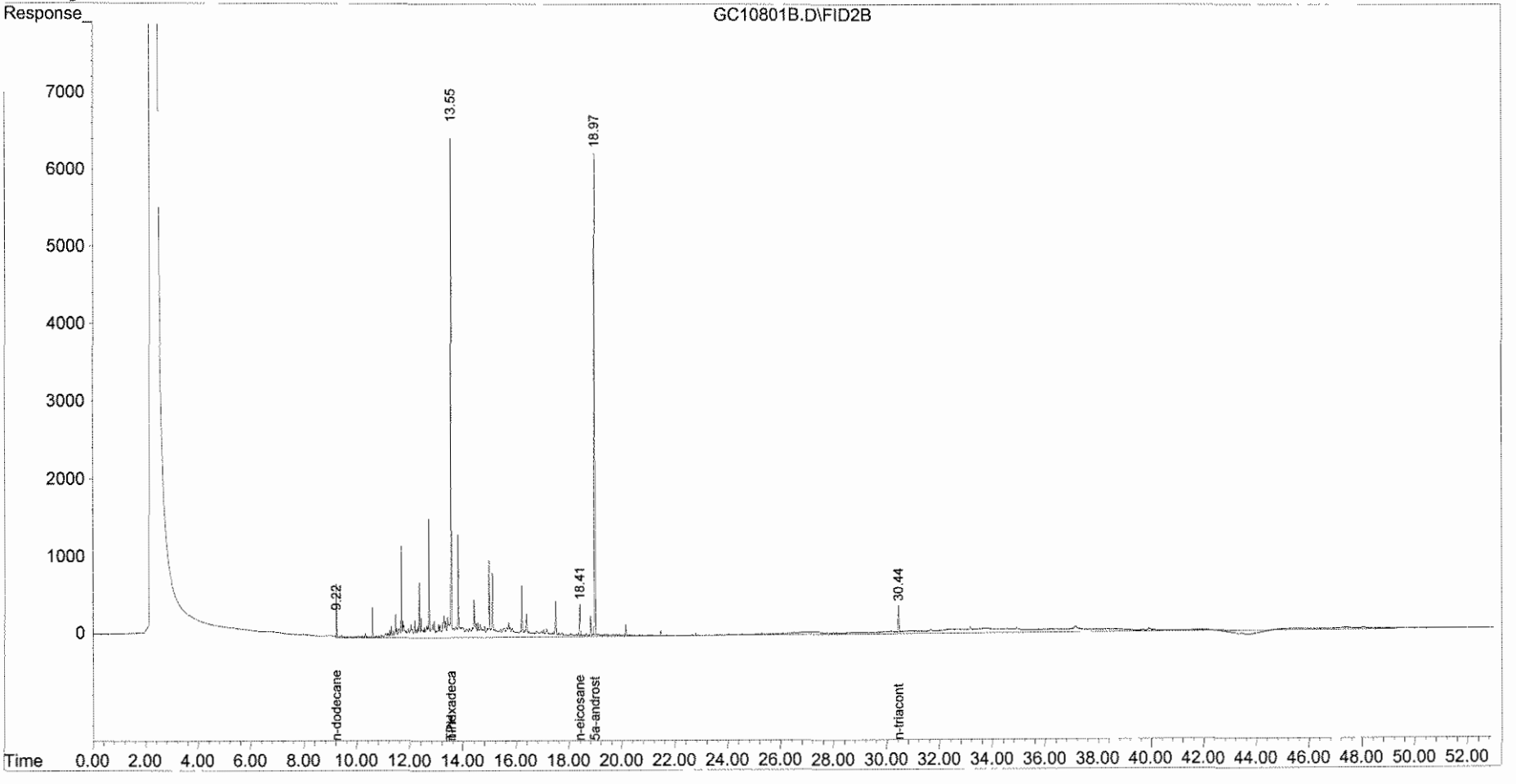
IntFile : autoint1.e

Vial: 52
Operator: TJM
Inst : GC#1
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Oct 5 16:18 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



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Data File Name **GC10801C.D**
Sample Name **PEM (Low)**
Date Acquired 09/27/20 -1:6:
Method File ALI_COMP.M
Sample Multiplier 1
Operator: TJM
Instrument Name: GC#1

Name	Ret Time (min)	Response (Area)	Concentrations (ug/L or ug/g)	Su Recovery
Internal Standards				
n-hexadecane-d34	13.55	81234	20.00	
5a-androstane	18.97	106274	20.00	
Surrogates				
n-dodecane-d26	9.22	9086	2.22	**110.8**
n-eicosane-d42	18.41	8347	1.99	**99.6**
n-triacontane-d62	30.44	7479	1.85	**92.4**
Target Compounds				***Surrogate Corrected Concentrations***
n-C10	0.00	0	0.00	0.00
n-C11	0.00	0	0.00	0.00
n-C12	0.00	0	0.00	0.00
n-C13	0.00	0	0.00	0.00
n-C14	0.00	0	0.00	0.00
n-C15	0.00	0	0.00	0.00
n-C16	0.00	0	0.00	0.00
n-C17	0.00	0	0.00	0.00
Pristane	0.00	0	0.00	0.00
n-C18	0.00	0	0.00	0.00
Phytane	0.00	0	0.00	0.00
n-C19	0.00	0	0.00	0.00
n-C20	0.00	0	0.00	0.00
n-C21	0.00	0	0.00	0.00
n-C22	0.00	0	0.00	0.00
n-C23	0.00	0	0.00	0.00
n-C24	0.00	0	0.00	0.00
n-C25	0.00	0	0.00	0.00
n-C26	0.00	0	0.00	0.00
n-C27	0.00	0	0.00	0.00
n-C28	0.00	0	0.00	0.00
n-C29	0.00	0	0.00	0.00
n-C30	0.00	0	0.00	0.00
n-C31	0.00	0	0.00	0.00
n-C32	0.00	0	0.00	0.00
n-C33	0.00	0	0.00	0.00
n-C34	0.00	0	0.00	0.00
TPH	18.97	482052	102.26	110.69
TRH1	9.22	9540	2.02	2.19
TRH2	13.55	82544	17.51	18.95
TRH3	18.41	14014	2.97	3.22
TRH4	18.97	106681	22.63	24.50
TRH5	30.44	7770	1.65	1.78
TRH6	0.00	0	0.00	0.00
n-dodecane-d26			111	
n-eicosane-d42			100	
n-triacontane-d62			92	

000056

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\GC10801\GC10801C.D
Acq On : 27 Sep 2006 16:58
Sample : PEM (Low)
Misc :

Vial: 53
Operator: TJM
Inst : GC#1
Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 4 16:34 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc	Units
		Internal Standards				
1)		n-hexadecane-d34	13.55	81234	20.001	ug/mlm
10)		5a-androstane	18.97	106275	20.003	ug/mlm
		System Monitoring Compounds				
4)	S	n-dodecane-d26	9.22	9087	2.217	ug/ml
16)	S	n-eicosane-d42	18.41	8348	1.991	ug/mlm
27)	S	n-triacontane-d62	30.44	7480	1.848	ug/mlm
		Target Compounds				
33)		TPH	18.97	482052	102.260	ug/mlm
34)		TRH1	9.22f	9540	2.024	ug/mlm
35)		TRH2	13.55	82544	17.511	ug/mlm
36)		TRH3	18.41	14015	2.973	ug/mlm
37)		TRH4	18.97f	106681	22.631	ug/mlm
38)		TRH5	30.44	7771	1.648	ug/mlm

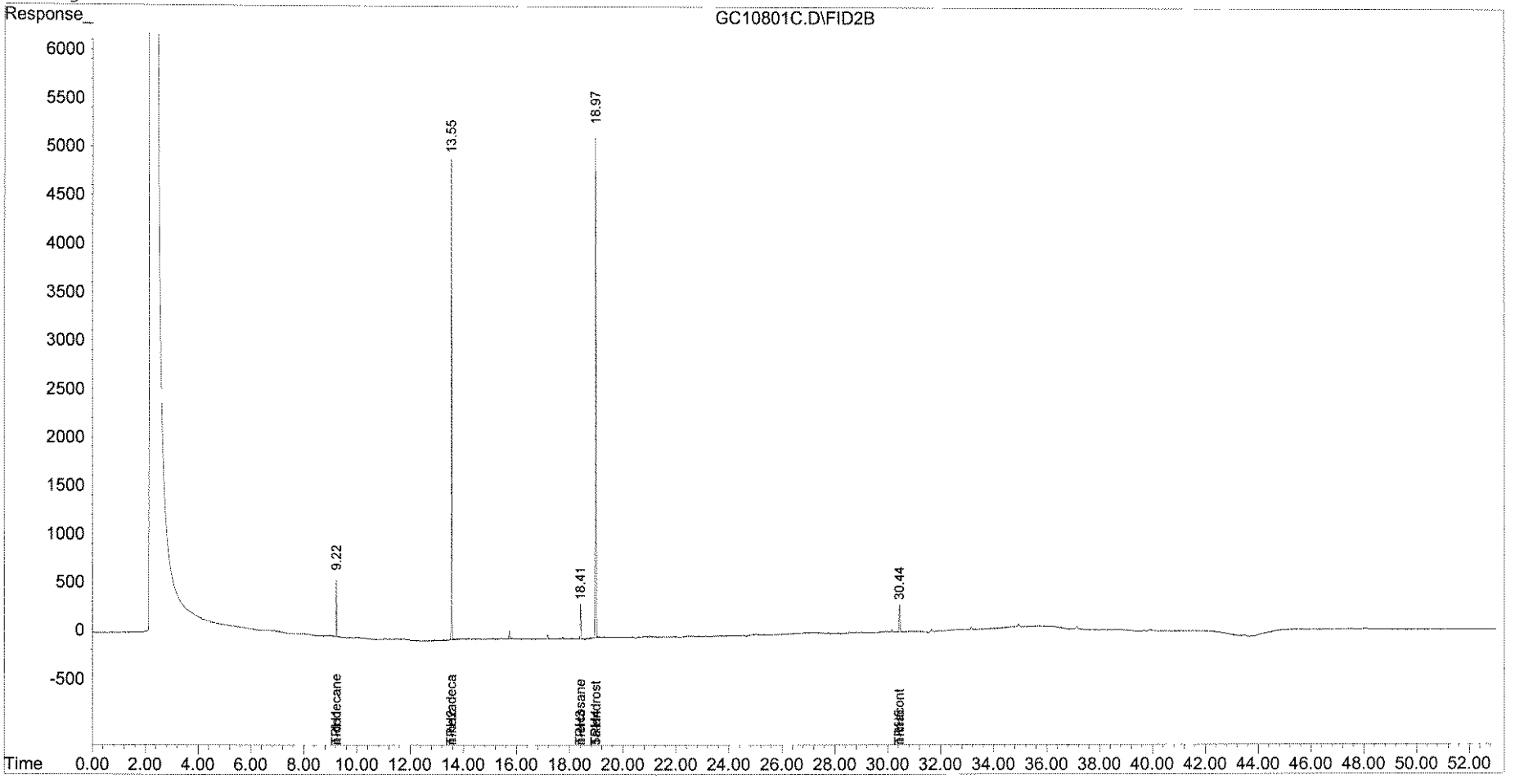
Data File : D:\GC-MSD~1\GC10801\GC10801C.D Vial: 53
Acq On : 27 Sep 2006 16:58 Operator: TJM
Sample : PEM (Low) Inst : GC#1
Misc : Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 4 16:34 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



C10B0928

Data File Name **ETX7073.D**
Sample Name **B-70**
Date Acquired 09/28/20 -1:5:
Method File ALI_COMP.M
Sample Multiplier 1
Operator: TJM
Instrument Name: GC#1

Name	Ret Time (min)	Response (Area)	Concentrations (ug/L or ug/g)	Su Recovery
Internal Standards				
n-hexadecane-d34	13.55	81440	20.00	
5a-androstane	18.97	105599	20.00	
Surrogates				
n-dodecane-d26	9.22	2192	0.53	**26.7**
n-eicosane-d42	18.41	6573	1.58	**78.9**
n-triacontane-d62	30.44	7376	1.83	**91.7**
Target Compounds				***Surrogate Corrected Concentrations***
n-C10	6.86	942	0.18	0.68
n-C11	8.18	469	0.09	0.35
n-C12	9.43	280	0.06	0.21
n-C13	10.59	263	0.05	0.20
n-C14	11.67	418	0.09	0.32
n-C15	12.72	680	0.14	0.53
n-C16	13.82	543	0.12	0.44
n-C17	14.99	138	0.03	0.10
Pristane	15.05	208	0.04	0.16
n-C18	16.21	618	0.12	0.46
Phytane	0.00	0	0.00	0.00
n-C19	0.00	0	0.00	0.00
n-C20	0.00	0	0.00	0.00
n-C21	20.13	357	0.08	0.10
n-C22	21.46	768	0.17	0.22
n-C23	22.76	1103	0.25	0.31
n-C24	24.04	2707	0.61	0.78
n-C25	25.28	5625	1.29	1.63
n-C26	26.49	8564	1.93	2.44
n-C27	27.66	10156	2.31	2.93
n-C28	28.80	9929	2.24	2.84
n-C29	29.90	9166	2.10	2.66
n-C30	30.97	7065	1.70	1.86
n-C31	32.00	5704	1.34	1.47
n-C32	33.08	3637	0.95	1.03
n-C33	34.31	2374	0.63	0.69
n-C34	35.74	1401	0.39	0.42
TPH	13.55	682131	145.63	158.82
TRH1	9.22	5009	1.07	1.17
TRH2	13.55	86726	18.52	20.19
TRH3	18.97	197372	42.14	45.95
TRH4	32.00	22610	4.83	5.26
TRH5	0.00	0	0.00	0.00
TRH6	0.00	0	0.00	0.00
n-dodecane-d26			27	
n-eicosane-d42			79	
n-triacontane-d62			92	

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\GC10801\ETX7073.D
Acq On : 28 Sep 2006 5:01
Sample : B-70
Misc :

Vial: 60
Operator: TJM
Inst : GC#1
Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 5 16:34 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc	Units
		Internal Standards				
1)		n-hexadecane-d34	13.55	81440	20.001	ug/mlm
10)		5a-androstane	18.97	105599	20.003	ug/mlm
		System Monitoring Compounds				
4)	S	n-dodecane-d26	9.22	2192	0.533	ug/ml
16)	S	n-eicosane-d42	18.41	6573	1.578	ug/mlm
27)	S	n-triacontane-d62	30.44	7376	1.834	ug/mlm
		Target Compounds				
2)		n-C10	6.86	942	0.181	ug/ml
3)		n-C11	8.18	469	0.092	ug/ml
5)		n-C12	9.43	281	0.055	ug/ml
6)		n-C13	10.59	264	0.053	ug/ml
7)		n-C14	11.67	419	0.086	ug/ml
8)		n-C15	12.72	680	0.142	ug/ml
9)		n-C16	13.82	543	0.117	ug/ml
11)		n-C17	14.99	139	0.027	ug/mlm
12)		Pristane	15.05	209	0.042	ug/mlm
13)		n-C18	16.21	618	0.123	ug/mlm
18)		n-C21	20.13	358	0.077	ug/mlm
19)		n-C22	21.46	768	0.172	ug/mlm
20)		n-C23	22.76	1104	0.246	ug/mlm
21)		n-C24	24.04	2708	0.614	ug/mlm
22)		n-C25	25.28	5626	1.287	ug/mlm
23)		n-C26	26.49	8564	1.925	ug/mlm
24)		n-C27	27.66	10157	2.314	ug/mlm
25)		n-C28	28.80	9930	2.237	ug/mlm
26)		n-C29	29.90	9166	2.096	ug/mlm
28)		n-C30	30.97	7065	1.703	ug/mlm
29)		n-C31	32.00	5705	1.344	ug/mlm
30)		n-C32	33.08	3637	0.946	ug/mlm
31)		n-C33	34.31	2375	0.628	ug/mlm
32)		n-C34	35.74	1402	0.386	ug/mlm
33)		TPH	13.55	682132	145.629	ug/mlm
34)		TRH1	9.22f	5009	1.069	ug/mlm
35)		TRH2	13.55	86726	18.515	ug/mlm
36)		TRH3	18.97	197373	42.137	ug/mlm
37)		TRH4	32.00	22610	4.827	ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File : D:\GC-MSD~1\GC10801\ETX7073.D
Acq On : 28 Sep 2006 5:01
Sample : B-70
Misc :

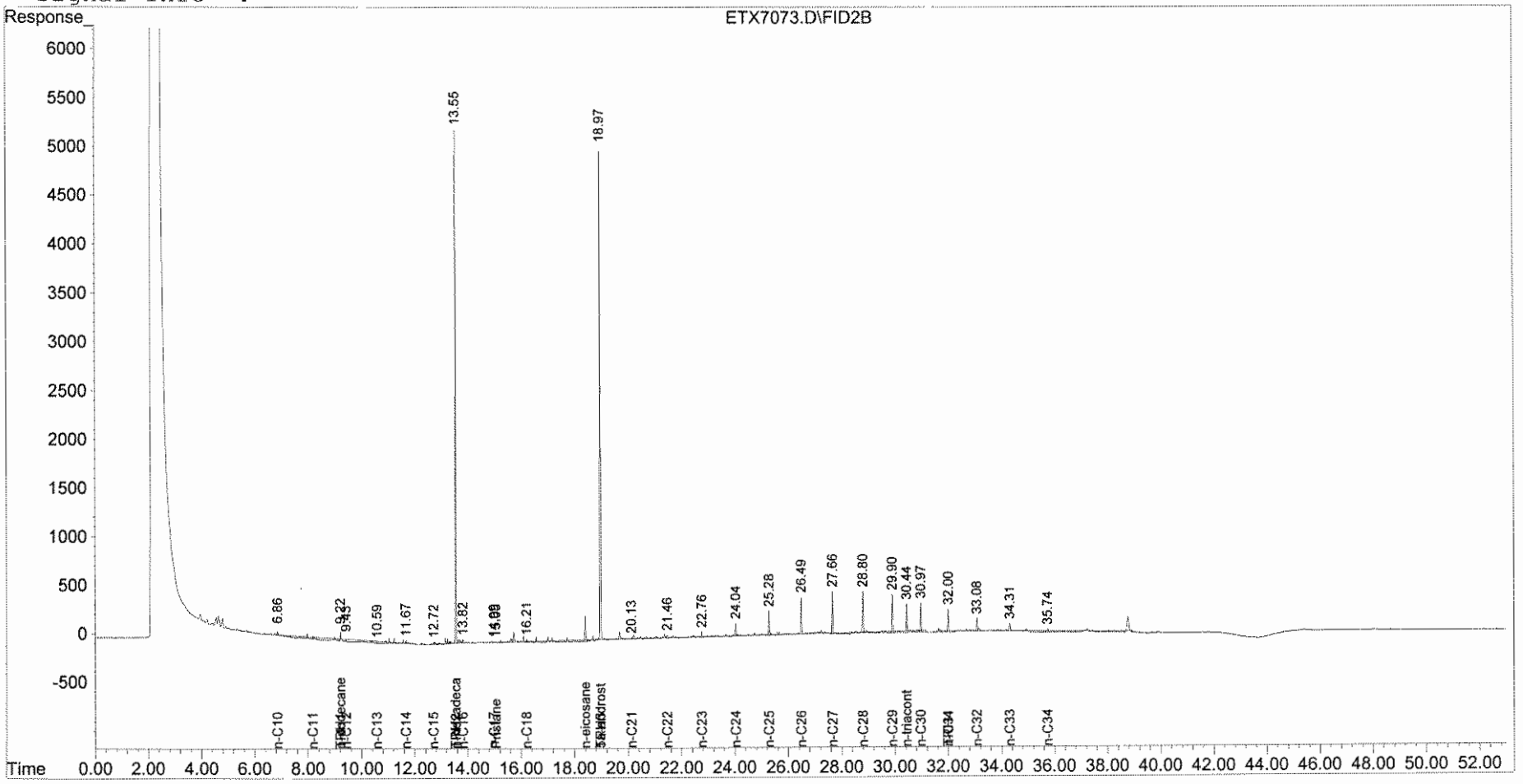
IntFile : autoint1.e

Vial: 60
Operator: TJM
Inst : GC#1
Multiplr: 1.00
Sample Amount: 0.00

Quant Time: Oct 5 16:34 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File Name **ETX7074.D**
Sample Name **B-30**
Date Acquired 09/28/20 -1:6:
Method File ALI_COMP.M
Sample Multiplier 1
Operator: TJM
Instrument Name: GC#1

Name	Ret Time (min)	Response (Area)	Concentrations (ug/L or ug/g)	Su Recovery
Internal Standards				
n-hexadecane-d34	13.55	74264	20.00	
5a-androstane	18.97	95599	20.00	
Surrogates				
n-dodecane-d26	9.22	3639	0.97	**48.6**
n-eicosane-d42	18.41	6168	1.64	**81.8**
n-triacontane-d62	30.44	6745	1.85	**92.6**
Target Compounds				***Surrogate Corrected Concentrations***
n-C10	6.86	1974	0.41	0.85
n-C11	8.18	957	0.21	0.42
n-C12	9.43	532	0.11	0.24
n-C13	10.58	390	0.09	0.18
n-C14	11.67	636	0.14	0.29
n-C15	12.71	886	0.20	0.42
n-C16	13.82	572	0.14	0.28
n-C17	14.98	224	0.05	0.10
Pristane	15.04	445	0.10	0.21
n-C18	16.21	604	0.13	0.27
Phytane	16.37	299	0.07	0.14
n-C19	17.46	1033	0.24	0.49
n-C20	18.82	491	0.11	0.14
n-C21	20.13	1180	0.28	0.34
n-C22	21.48	1088	0.27	0.33
n-C23	22.77	879	0.22	0.27
n-C24	24.03	1017	0.25	0.31
n-C25	25.28	1849	0.47	0.57
n-C26	26.49	2923	0.73	0.89
n-C27	27.66	4311	1.08	1.33
n-C28	28.79	3486	0.87	1.06
n-C29	29.90	4043	1.02	1.25
n-C30	30.97	2537	0.68	0.73
n-C31	32.00	2192	0.57	0.62
n-C32	33.08	1439	0.41	0.45
n-C33	34.32	860	0.25	0.27
n-C34	0.00	0	0.00	0.00
TPH	13.55	1228349	289.67	312.74
TRH1	9.22	11689	2.76	2.98
TRH2	13.55	261205	61.60	66.50
TRH3	0.00	0	0.00	0.00
TRH4	30.44	35465	8.36	9.03
TRH5	38.78	9625	2.27	2.45
TRH6	0.00	0	0.00	0.00
n-dodecane-d26			49	
n-eicosane-d42			82	
n-triacontane-d62			93	

000062

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\GC10801\ETX7074.D
Acq On : 28 Sep 2006 6:01
Sample : B-30
Misc :

Vial: 61
Operator: TJM
Inst : GC#1
Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 5 16:33 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc	Units
		Internal Standards				
1)		n-hexadecane-d34	13.55	74265	20.001	ug/mlm
10)		5a-androstane	18.97	95599	20.003	ug/mlm
		System Monitoring Compounds				
4)	S	n-dodecane-d26	9.22	3640	0.971	ug/mlm
16)	S	n-eicosane-d42	18.41	6169	1.636	ug/mlm
27)	S	n-triacontane-d62	30.44	6746	1.853	ug/mlm
		Target Compounds				
2)		n-C10	6.86	1975	0.415	ug/mlm
3)		n-C11	8.18	957	0.206	ug/mlm
5)		n-C12	9.43	533	0.114	ug/mlm
6)		n-C13	10.58	390	0.086	ug/mlm
7)		n-C14	11.67	636	0.143	ug/mlm
8)		n-C15	12.71	887	0.202	ug/mlm
9)		n-C16	13.82	573	0.135	ug/mlm
11)		n-C17	14.98	225	0.048	ug/mlm
12)		Pristane	15.04	445	0.100	ug/mlm
13)		n-C18	16.21	604	0.133	ug/mlm
14)		Phytane	16.37	299	0.066	ug/mlm
15)		n-C19	17.46	1033	0.236	ug/mlm
17)		n-C20	18.82	491	0.115	ug/mlm
18)		n-C21	20.13	1181	0.279	ug/mlm
19)		n-C22	21.48	1088	0.269	ug/mlm
20)		n-C23	22.77	879	0.217	ug/mlm
21)		n-C24	24.03	1018	0.255	ug/mlm
22)		n-C25	25.28	1849	0.467	ug/mlm
23)		n-C26	26.49	2923	0.726	ug/mlm
24)		n-C27	27.66	4312	1.085	ug/mlm
25)		n-C28	28.79	3486	0.868	ug/mlm
26)		n-C29	29.90	4044	1.021	ug/mlm
28)		n-C30	30.97	2537	0.676	ug/mlm
29)		n-C31	32.00	2192	0.571	ug/mlm
30)		n-C32	33.08	1440	0.413	ug/mlm
31)		n-C33	34.32	861	0.251	ug/mlm
33)		TPH	13.55	1228349	289.674	ug/mlm
34)		TRH1	9.22f	11690	2.757	ug/mlm
35)		TRH2	13.55	261205	61.598	ug/mlm
37)		TRH4	30.44	35465	8.364	ug/mlm
38)		TRH5	38.78	9626	2.270	ug/mlm

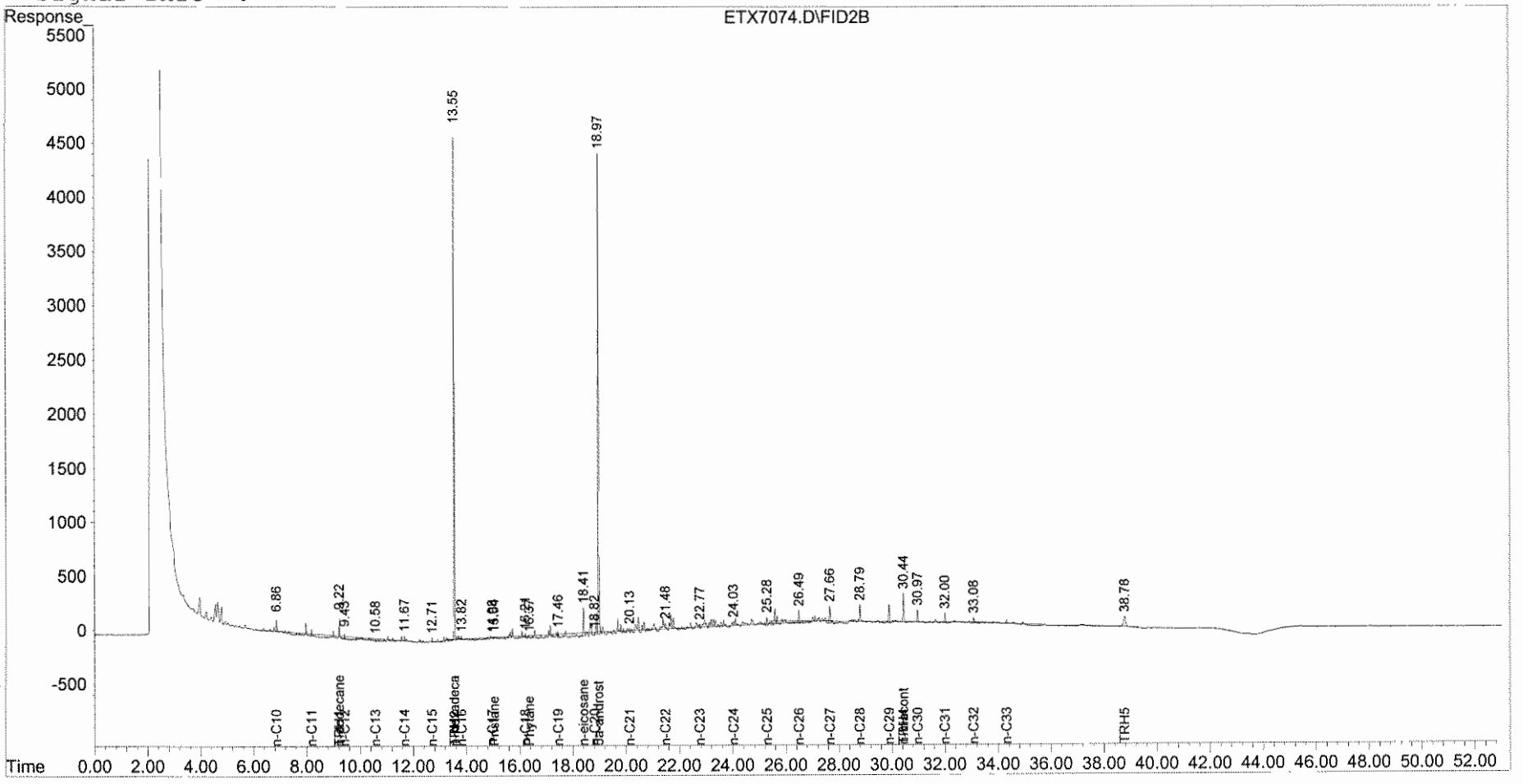
Data File : D:\GC-MSD~1\GC10801\ETX7074.D Vial: 61
Acq On : 28 Sep 2006 6:01 Operator: TJM
Sample : B-30 Inst : GC#1
Misc : Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 5 16:33 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



Data File Name **ETX7072.D**
Sample Name **A-70**
Date Acquired 09/28/20 -1:7:
Method File ALI_COMP.M
Sample Multiplier 1
Operator: TJM
Instrument Name: GC#1

Name	Ret Time (min)	Response (Area)	Concentrations (ug/L or ug/g)	Su Recovery
Internal Standards				
n-hexadecane-d34	13.55	73700	20.00	
5a-androstane	18.97	97300	20.00	
Surrogates				
n-dodecane-d26	9.22	3413	0.92	**45.9**
n-eicosane-d42	18.40	5292	1.38	**69.0**
n-triacontane-d62	30.44	6961	1.88	**93.9**
Target Compounds				***Surrogate Corrected Concentrations***
n-C10	6.86	1300	0.28	0.60
n-C11	8.18	749	0.16	0.35
n-C12	9.43	644	0.14	0.30
n-C13	10.59	436	0.10	0.21
n-C14	11.67	563	0.13	0.28
n-C15	12.72	1677	0.39	0.84
n-C16	13.81	556	0.13	0.29
n-C17	14.98	860	0.18	0.39
Pristane	15.12	1131	0.25	0.54
n-C18	16.22	1465	0.32	0.69
Phytane	0.00	0	0.00	0.00
n-C19	0.00	0	0.00	0.00
n-C20	18.82	687	0.16	0.23
n-C21	20.13	4866	1.13	1.64
n-C22	21.49	6939	1.68	2.44
n-C23	22.76	3025	0.73	1.06
n-C24	24.04	1178	0.29	0.42
n-C25	25.28	5649	1.40	2.03
n-C26	26.49	8320	2.03	2.94
n-C27	27.66	14638	3.62	5.25
n-C28	28.80	8799	2.15	3.12
n-C29	29.90	10971	2.72	3.95
n-C30	30.97	7353	1.92	2.05
n-C31	32.00	5284	1.35	1.44
n-C32	33.08	3327	0.94	1.00
n-C33	34.31	2436	0.70	0.74
n-C34	35.73	1348	0.40	0.43
TPH	18.97	3689413	854.83	910.16
TRH1	9.22	9541	2.21	2.35
TRH2	18.97	534880	123.93	131.95
TRH3	29.90	59640	13.82	14.71
TRH4	32.00	14964	3.47	3.69
TRH5	38.78	6288	1.46	1.55
TRH6	0.00	0	0.00	0.00
n-dodecane-d26			46	
n-eicosane-d42			69	
n-triacontane-d62			94	

000065

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\GC10801\ETX7072.D
Acq On : 28 Sep 2006 7:01
Sample : A-70
Misc :

Vial: 62
Operator: TJM
Inst : GC#1
Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 5 15:36 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc	Units
		Internal Standards				
1)		n-hexadecane-d34	13.55	73700	20.001	ug/mlm
10)		5a-androstane	18.97	97301	20.003	ug/mlm
		System Monitoring Compounds				
4)	S	n-dodecane-d26	9.22	3413	0.918	ug/mlm
16)	S	n-eicosane-d42	18.40	5293	1.379	ug/mlm
27)	S	n-triacontane-d62	30.44	6962	1.878	ug/mlm
		Target Compounds				
2)		n-C10	6.86	1301	0.275	ug/ml
3)		n-C11	8.18	749	0.163	ug/ml
5)		n-C12	9.43	644	0.139	ug/ml
6)		n-C13	10.59	437	0.097	ug/ml
7)		n-C14	11.67	564	0.127	ug/ml
8)		n-C15	12.72	1678	0.386	ug/ml
9)		n-C16	13.81	557	0.133	ug/ml
11)		n-C17	14.98	861	0.180	ug/mlm
12)		Pristane	15.12	1131	0.249	ug/mlm
13)		n-C18	16.22	1465	0.316	ug/mlm
17)		n-C20	18.82	687	0.158	ug/mlm
18)		n-C21	20.13	4867	1.130	ug/mlm
19)		n-C22	21.49	6939	1.683	ug/mlm
20)		n-C23	22.76	3026	0.733	ug/mlm
21)		n-C24	24.04	1178	0.290	ug/mlm
22)		n-C25	25.28	5650	1.403	ug/mlm
23)		n-C26	26.49	8320	2.030	ug/mlm
24)		n-C27	27.66	14639	3.619	ug/mlm
25)		n-C28	28.80	8799	2.152	ug/mlm
26)		n-C29	29.90	10972	2.723	ug/mlm
28)		n-C30	30.97	7353	1.923	ug/mlm
29)		n-C31	32.00	5284	1.351	ug/mlm
30)		n-C32	33.08	3328	0.939	ug/mlm
31)		n-C33	34.31	2436	0.700	ug/mlm
32)		n-C34	35.73	1348	0.403	ug/mlm
33)		TPH	18.97	3689413	854.834	ug/mlm
34)		TRH1	9.22f	9542	2.211	ug/mlm
35)		TRH2	18.97f	534880	123.931	ug/mlm
36)		TRH3	29.90f	59640	13.819	ug/mlm
37)		TRH4	32.00	14965	3.467	ug/mlm
38)		TRH5	38.78	6289	1.457	ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

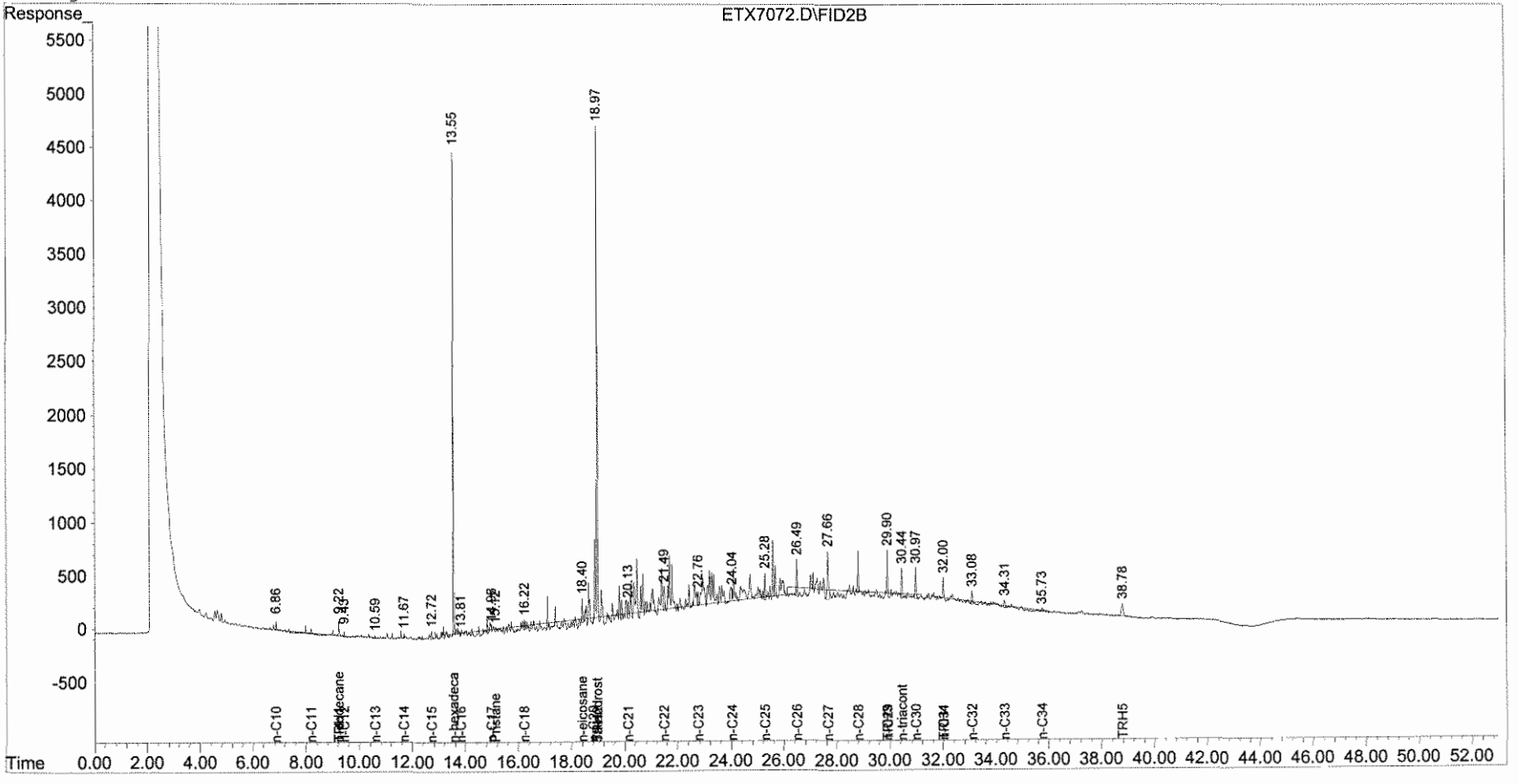
Data File : D:\GC-MSD~1\GC10801\ETX7072.D Vial: 62
Acq On : 28 Sep 2006 7:01 Operator: TJM
Sample : A-70 Inst : GC#1
Misc : Multiplr: 1.00
Sample Amount: 0.00

IntFile : autoint1.e

Quant Time: Oct 5 15:36 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:26:18 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



Polycyclic Aromatic Hydrocarbon Raw Data

B&B LABORATORIES PAHs QA FORM

Extraction Page: ETX-1516	Analyst: Y Mead / T McDonald
Client: Entrix	Date: 11-5-06
Job: #: J03318	QA Manager: Winell Quinn
SDG #: 06092301	Date: 11/07/06

Calibration:	No failures
Surrogate Recoveries:	d8-Naph was detected outside of QC limits in ETX 7072, d8-Naph & Chrysene were detected outside of QC limits in ETX 7073
Procedural Blank:	NA
Blank Spike:	NA
Blank Spike Duplicate:	NA
Laboratory Duplicate:	NA
Matrix Spike:	NA
Matirx Spike Duplicate:	NA
SRM/LCS:	No failures
CCC:	No failures
Comments:	None

Sequence Name: C:\HPCHEM\1\SEQUENCE\MS30306.S
Comment: Entrix-Net
Operator: TJM
Data Path: C:\HPCHEM\1\data\ms30306\
Pre-Seq Cmd:
Post-Seq Cmd:

Method Sections To Run
(X) Full Method
( ) Reprocessing Only

On A Barcode Mismatch
(X) Inject Anyway
( ) Don't Inject

Line	Type	Vial	DataFile	Method	Sample Name
1	Sample	1	MS30306A	PAH-2002	Solvent Rinse
2	Sample	2	MS30306B	PAH-2002	SRM 1582
3	Sample	3	MS30306C	PAH-2002	IS/SU Mixture
4	Sample	41	MS30306D	PAH-2002	Cal Level 1
5	Sample	42	MS30306E	PAH-2002	Cal Level 2
6	Sample	43	MS30306F	PAH-2002	Cal Level 3
7	Sample	44	MS30306G	PAH-2002	Cal Level 4
8	Sample	45	MS30306H	PAH-2002	Cal Level 5
9	Sample	4	MS30306I	PAH-2002	AR-WKCC-250-022
10	Sample	5	ETX7073	PAH-2002	
11	Sample	6	ETX7074	PAH-2002	
12	Sample	7	ETX7072	PAH-2002	
13	Sample	8	MS30306J	PAH-2002	AR-WKCC-250-022

Evaluate Continuing Calibration Report

Data File : Z:\1\DATA\MS30306\MS30306I.D Vial: 4
Acq On : 28 Sep 2006 12:39 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Fluorene-d10	1.000	1.000	0.0	93	0.00
2	S	Naphthalene-d8	1.690	1.715	-1.5	93	0.00
3	T	Decalin	0.339	0.299	11.8	81	0.96#
4	un	C1-Decalin	0.339	0.000	100.0#	0#	-12.78#
5	un	C2-Decalin	0.339	0.000	100.0#	0#	-14.29#
6	un	C3-Decalin	0.339	0.000	100.0#	0#	-15.89#
7	un	C4-Decalin	0.339	0.000	100.0#	0#	-19.72#
8	T	Naphthalene	1.901	1.843	3.1	89	0.00
9	T	2-Methylnaphthalene	1.471	1.393	5.3	86	0.00
10	T	1-Methylnaphthalene	1.235	1.230	0.4	90	0.00
11	T	2,6-Dimethylnaphthalene	1.293	1.138	12.0	78	0.00
12	T	1,6,7-Trimethylnaphthalene	1.206	1.211	-0.4	92	0.00
13	un	C2-Naphthalenes	1.901	0.000	100.0#	0#	-17.98#
14	un	C3-Naphthalenes	1.901	0.000	100.0#	0#	-20.16#
15	un	C4-Naphthalenes	1.901	0.000	100.0#	0#	-22.28#
16	T	Benzothiophene	1.645	1.634	0.7	89	0.00
17	un	C1-Benzothiophene	1.645	0.000	100.0#	0#	-15.61#
18	un	C2-Benzothiophene	1.645	0.000	100.0#	0#	-18.01#
19	un	C3-Benzothiophene	1.645	0.000	100.0#	0#	-19.65#
20	S	Acenaphthene-d10	1.037	0.974	6.1	83	0.00
21	T	Biphenyl	1.839	1.829	0.5	92	0.00
22	T	Acenaphthylene	1.962	1.915	2.4	90	0.00
23	T	Acenaphthene	1.234	1.158	6.2	86	-0.03
24	T	Dibenzofuran	2.089	2.051	1.8	84	0.00
25	T	Fluorene	1.656	1.492	9.9	79	0.00
26	un	C1-Fluorenes	1.656	0.000	100.0#	0#	-22.70#
27	un	C2-Fluorenes	1.656	0.000	100.0#	0#	-24.37#
28	un	C3-Fluorenes	1.656	0.000	100.0#	0#	-28.56#
29	I	Pyrene-d10	1.000	1.000	0.0	83	0.00
30	S	Phenanthrene-d10	0.997	1.088	-9.1	90	0.00
31	T	Pentachlorophenol	0.072	0.088	-22.2	100	0.00
32	T	Carbazole	0.907	0.901	0.7	84	0.00
33	T	Dibenzothiophene	0.951	0.975	-2.5	83	0.03
34	un	C1-Dibenzothiophene	0.951	0.000	100.0#	0#	-25.17#
35	un	C2-Dibenzothiophene	0.951	0.000	100.0#	0#	-26.53#
36	un	C3-Dibenzothiophene	0.951	0.000	100.0#	0#	-28.64#
37	T	Phenanthrene	1.006	1.132	-12.5	95	0.00
38	T	Anthracene	1.056	1.062	-0.6	85	0.00
39	T	1-Methylphenanthrene	0.758	0.733	3.3	83	0.00
40	un	C1-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-26.17#

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : Z:\1\DATA\MS30306\MS30306I.D Vial: 4
Acq On : 28 Sep 2006 12:39 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
41	un	C2-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-27.57#
42	un	C3-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-30.13#
43	un	C4-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-30.84#
44	T	Naphthobenzothiophene	0.781	0.788	-0.9	85	0.00
45	un	C1-Naphthobenzothiophene	0.781	0.000	100.0#	0#	-33.10#
46	un	C2-Naphthobenzothiophene	0.781	0.000	100.0#	0#	-34.77#
47	un	C3-Naphthobenzothiophene	0.781	0.000	100.0#	0#	-36.14#
48	T	Fluoranthene	1.356	1.426	-5.2	83	0.00
49	T	Pyrene	1.359	1.359	0.0	81	0.00
50	un	C1-Fluoranthenes/Pyrenes	1.356	0.000	100.0#	0#	-30.58#
51	un	C2-Fluoranthenes/Pyrenes	1.356	0.000	100.0#	0#	-31.95#
52	un	C3-Fluoranthenes/Pyrenes	1.356	0.000	100.0#	0#	-33.00#
53	S	Chrysene-d12	0.709	0.624	12.0	72	0.00
54	T	Benz(a)anthracene	0.851	0.778	8.6	78	0.00
55	T	Chrysene	1.015	1.007	0.8	81	0.00
56	un	C1-Chrysenes	1.015	0.000	100.0#	0#	-34.33#
57	un	C2-Chrysenes	1.015	0.000	100.0#	0#	-35.52#
58	un	C3-Chrysenes	1.015	0.000	100.0#	0#	-36.95#
59	un	C4-Chrysenes	1.015	0.000	100.0#	0#	-42.48#
60	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	81	0.00
61	un	C29-Hopane	0.847	0.000	100.0#	0#	-40.43#
62	un	18a-Oleanane	0.847	0.000	100.0#	0#	-42.28#
63	T	C30-Hopane	0.847	0.876	-3.4	78	0.00
64	T	Benzo(b)fluoranthene	1.834	1.764	3.8	80	0.00
65	T	Benzo(k)fluoranthene	1.746	1.865	-6.8	88	0.00
66	T	Benzo(e)pyrene	1.593	1.671	-4.9	86	0.00
67	T	Benzo(a)pyrene	1.419	1.471	-3.7	86	0.00
68	T	Indeno(1,2,3-c,d)pyrene	1.110	1.148	-3.4	85	0.00
69	T	Dibenzo(a,h)anthracene	1.091	1.113	-2.0	86	0.00
70	un	C1-Dibenzo(a,h)anthracene	1.091	0.000	100.0#	0#	-42.56#
71	un	C2-Dibenzo(a,h)anthracene	1.091	0.000	100.0#	0#	-44.47#
72	un	C3-Dibenzo(a,h)anthracene	1.091	0.000	100.0#	0#	-44.94#
73	T	Benzo(g,h,i)perylene	1.099	1.184	-7.7	89	0.00
74	S	Perylene-d12	0.803	0.847	-5.5	83	0.00
75	T	Perylene	1.415	1.436	-1.5	81	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306I.D Vial: 4
Acq On : 28 Sep 2006 12:39 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 8:23 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1205m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	2193m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	819m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.13	136	10117	253.77		0.00
20) Acenaphthene-d10	18.98	164	5744m	234.82		0.00
30) Phenanthrene-d10	24.05	188	11935m	272.90		0.00
53) Chrysene-d12	33.14	240	6850m	220.06		0.00
74) Perylene-d12	37.84	264	3802m	263.61		0.00
Target Compounds						Qvalue
3) Decalin	11.47	138	1765	220.42	ng/ml	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	10892m	242.82		
9) 2-Methylnaphthalene	15.46	142	8237m	237.30		
10) 1-Methylnaphthalene	15.77	142	7263m	249.29		
11) 2,6-Dimethylnaphthalene	17.57	156	6725m	220.43		
12) 1,6,7-Trimethylnaphthalene	20.41	170	7154m	251.53		
13) C2-Naphthalenes	0.00	156	0	N.D.	d	
14) C3-Naphthalenes	0.00	170	0	N.D.	d	
15) C4-Naphthalenes	0.00	184	0	N.D.	d	
16) Benzothiophene	13.35	134	9655m	248.80	ng/ml	
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.04	154	10806m	249.07		
22) Acenaphthylene	18.47	152	11320m	244.54		
23) Acenaphthene	19.06	154	6835m	234.82		
24) Dibenzofuran	19.68	168	12116m	245.86	ng/ml	
25) Fluorene	20.86	166	8821m	225.80		
26) C1-Fluorenes	0.00	180	0	N.D.	d	
27) C2-Fluorenes	0.00	194	0	N.D.	d	
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	23.41	266	970m	305.46	ng/ml	
32) Carbazole	24.89	167	9894m	248.59	ng/ml	
33) Dibenzothiophene	23.71	184	10715m	256.69		
34) C1-Dibenzothiophene	0.00	198	0	N.D.	d	

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306I.D Vial: 4
Acq On : 28 Sep 2006 12:39 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 8:23 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
35)	C2-Dibenzothiophene	0.00	212	0	N.D. d	
36)	C3-Dibenzothiophene	0.00	226	0	N.D. d	
37)	Phenanthrene	24.11	178	12449m	281.92	
38)	Anthracene	24.31	178	11665m	251.72	
39)	1-Methylphenanthrene	26.27	192	8053m	242.18	
40)	C1-Phenanthrene/Anthracene	0.00	192	0	N.D. d	
41)	C2-Phenanthrene/Anthracene	0.00	206	0	N.D. d	
42)	C3-Phenanthrene/Anthracene	0.00	220	0	N.D. d	
43)	C4-Phenanthrene/Anthracene	0.00	234	0	N.D. d	
44)	Naphthobenzothiophene	32.27	234	8631m	251.87	
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D. d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D. d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D. d	
48)	Fluoranthene	28.22	202	15680m	263.44	
49)	Pyrene	29.00	202	14939m	250.56	
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D. d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D. d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D. d	
54)	Benz(a)anthracene	33.10	228	8555m	229.00	
55)	Chrysene	33.21	228	11069m	248.52	
56)	C1-Chrysenes	0.00	242	0	N.D. d	
57)	C2-Chrysenes	0.00	256	0	N.D. d	
58)	C3-Chrysenes	0.00	270	0	N.D. d	
59)	C4-Chrysenes	0.00	284	0	N.D. d	
61)	C29-Hopane	0.00	191	0	N.D. d	
62)	18a-Oleanane	0.00	191	0	N.D. d	
63)	C30-Hopane	42.00	191	3933m	258.59 ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	7927m	240.66	
65)	Benzo(k)fluoranthene	36.64	252	8393m	267.76	
66)	Benzo(e)pyrene	37.45	252	7522m	262.99	
67)	Benzo(a)pyrene	37.63	252	6612m	259.41	
68)	Indeno(1,2,3-c,d)pyrene	42.07	276	5166m	259.28	
69)	Dibenzo(a,h)anthracene	42.20	278	5006m	255.58	
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D. d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D. d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D. d	
73)	Benzo(g,h,i)perylene	43.34	276	5325m	269.94	
75)	Perylene	37.91	252	6458m	254.25	

(#) = qualifier out of range (m) = manual integration

000074

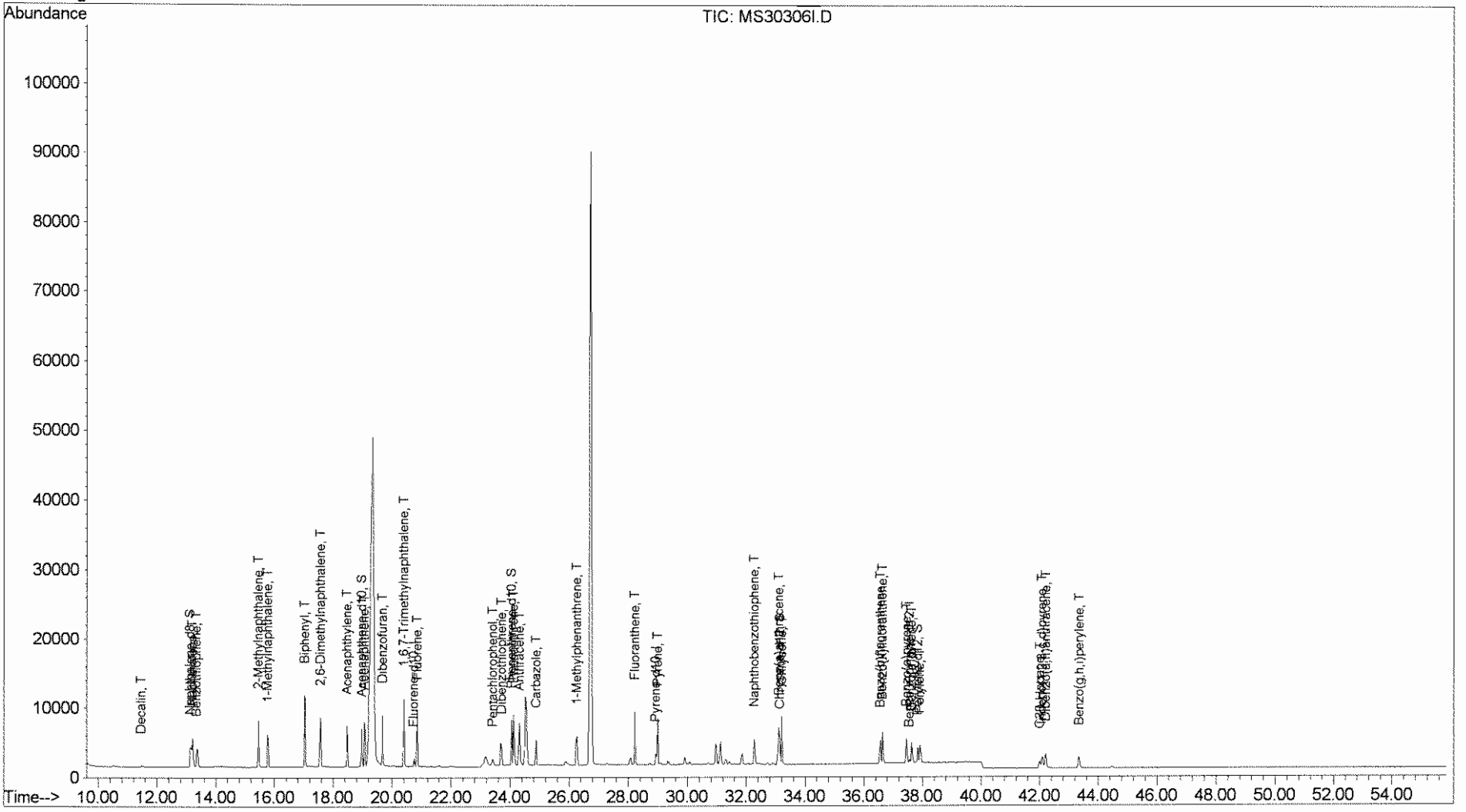
Quantitation Report

Data File : Z:\1\DATA\MS30306\MS30306I.D
Acq On : 28 Sep 2006 12:39 am
Sample : AR-WKCC-250-022
Misc :
MS Integration Params: rteint.p
Quant Time: Sep 28 8:23 2006

Vial: 4
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Evaluate Continuing Calibration Report

Data File : Z:\1\DATA\MS30306\MS30306J.D Vial: 8
Acq On : 28 Sep 2006 7:04 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Fluorene-d10	1.000	1.000	0.0	114	0.00
2	S	Naphthalene-d8	1.690	1.653	2.2	109	0.00
3	T	Decalin	0.339	0.313	7.7	103	0.96#
4	un	C1-Decalin	0.339	0.000	100.0#	0#	-12.78#
5	un	C2-Decalin	0.339	0.000	100.0#	0#	-14.29#
6	un	C3-Decalin	0.339	0.000	100.0#	0#	-15.89#
7	un	C4-Decalin	0.339	0.000	100.0#	0#	-19.72#
8	T	Naphthalene	1.901	1.757	7.6	104	0.00
9	T	2-Methylnaphthalene	1.471	1.310	10.9	98	0.00
10	T	1-Methylnaphthalene	1.235	1.218	1.4	109	0.00
11	T	2,6-Dimethylnaphthalene	1.293	1.100	14.9	92	0.00
12	T	1,6,7-Trimethylnaphthalene	1.206	1.142	5.3	105	0.00
13	un	C2-Naphthalenes	1.901	0.000	100.0#	0#	-17.98#
14	un	C3-Naphthalenes	1.901	0.000	100.0#	0#	-20.16#
15	un	C4-Naphthalenes	1.901	0.000	100.0#	0#	-22.28#
16	T	Benzothiophene	1.645	1.594	3.1	106	0.00
17	un	C1-Benzothiophene	1.645	0.000	100.0#	0#	-15.61#
18	un	C2-Benzothiophene	1.645	0.000	100.0#	0#	-18.01#
19	un	C3-Benzothiophene	1.645	0.000	100.0#	0#	-19.65#
20	S	Acenaphthene-d10	1.037	0.924	10.9	96	0.00
21	T	Biphenyl	1.839	1.706	7.2	104	0.00
22	T	Acenaphthylene	1.962	2.059	-4.9	118	0.00
23	T	Acenaphthene	1.234	1.198	2.9	109	-0.03
24	T	Dibenzofuran	2.089	1.917	8.2	96	0.00
25	T	Fluorene	1.656	1.386	16.3	89	0.00
26	un	C1-Fluorenes	1.656	0.000	100.0#	0#	-22.70#
27	un	C2-Fluorenes	1.656	0.000	100.0#	0#	-24.37#
28	un	C3-Fluorenes	1.656	0.000	100.0#	0#	-28.56#
29	I	Pyrene-d10	1.000	1.000	0.0	100	0.00
30	S	Phenanthrene-d10	0.997	1.048	-5.1	105	0.00
31	T	Pentachlorophenol	0.072	0.086	-19.4	120	0.00
32	T	Carbazole	0.907	0.869	4.2	99	-0.03
33	T	Dibenzothiophene	0.951	1.051	-10.5	109	0.00
34	un	C1-Dibenzothiophene	0.951	0.000	100.0#	0#	-25.17#
35	un	C2-Dibenzothiophene	0.951	0.000	100.0#	0#	-26.53#
36	un	C3-Dibenzothiophene	0.951	0.000	100.0#	0#	-28.64#
37	T	Phenanthrene	1.006	1.172	-16.5	120	0.00
38	T	Anthracene	1.056	0.960	9.1	93	-0.03
39	T	1-Methylphenanthrene	0.758	0.721	4.9	100	-0.03
40	un	C1-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-26.17#

(#) = Out of Range

000076

Evaluate Continuing Calibration Report

Data File : Z:\1\DATA\MS30306\MS30306J.D Vial: 8
Acq On : 28 Sep 2006 7:04 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 25% Max. R.T. Dev 0.50min
Max. RRF Dev : 25% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
41	un	C2-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-27.57#
42	un	C3-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-30.13#
43	un	C4-Phenanthrene/Anthracene	1.006	0.000	100.0#	0#	-30.84#
44	T	Naphthobenzothiophene	0.781	0.912	-16.8	120	0.00
45	un	C1-Naphthobenzothiophene	0.781	0.000	100.0#	0#	-33.10#
46	un	C2-Naphthobenzothiophene	0.781	0.000	100.0#	0#	-34.77#
47	un	C3-Naphthobenzothiophene	0.781	0.000	100.0#	0#	-36.14#
48	T	Fluoranthene	1.356	1.368	-0.9	97	0.00
49	T	Pyrene	1.359	1.184	12.9	86	0.00
50	un	C1-Fluoranthenes/Pyrenes	1.356	0.000	100.0#	0#	-30.58#
51	un	C2-Fluoranthenes/Pyrenes	1.356	0.000	100.0#	0#	-31.95#
52	un	C3-Fluoranthenes/Pyrenes	1.356	0.000	100.0#	0#	-33.00#
53	S	Chrysene-d12	0.709	0.613	13.5	86	-0.04
54	T	Benz(a)anthracene	0.851	0.741	12.9	90	-0.04
55	T	Chrysene	1.015	0.921	9.3	91	0.00
56	un	C1-Chrysenes	1.015	0.000	100.0#	0#	-34.33#
57	un	C2-Chrysenes	1.015	0.000	100.0#	0#	-35.52#
58	un	C3-Chrysenes	1.015	0.000	100.0#	0#	-36.95#
59	un	C4-Chrysenes	1.015	0.000	100.0#	0#	-42.48#
60	I	Benzo(a)pyrene-d12	1.000	1.000	0.0	103	0.00
61	un	C29-Hopane	0.847	0.000	100.0#	0#	-40.43#
62	un	18a-Oleanane	0.847	0.000	100.0#	0#	-42.28#
63	T	C30-Hopane	0.847	0.766	9.6	86	0.00
64	T	Benzo(b)fluoranthene	1.834	1.682	8.3	97	-0.04
65	T	Benzo(k)fluoranthene	1.746	1.765	-1.1	106	0.00
66	T	Benzo(e)pyrene	1.593	1.642	-3.1	107	0.00
67	T	Benzo(a)pyrene	1.419	1.482	-4.4	110	0.00
68	T	Indeno(1,2,3-c,d)pyrene	1.110	1.037	6.6	97	0.00
69	T	Dibenzo(a,h)anthracene	1.091	0.954	12.6	94	-0.03
70	un	C1-Dibenzo(a,h)anthracene	1.091	0.000	100.0#	0#	-42.56#
71	un	C2-Dibenzo(a,h)anthracene	1.091	0.000	100.0#	0#	-44.47#
72	un	C3-Dibenzo(a,h)anthracene	1.091	0.000	100.0#	0#	-44.94#
73	T	Benzo(g,h,i)perylene	1.099	0.961	12.6	92	-0.03
74	S	Perylene-d12	0.803	0.766	4.6	95	0.00
75	T	Perylene	1.415	1.419	-0.3	102	0.00

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306J.D Vial: 8
Acq On : 28 Sep 2006 7:04 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 8:53 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1470m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	2670m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	1040m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.13	136	11891m	244.50		0.00
20) Acenaphthene-d10	18.98	164	6651m	222.88		0.00
30) Phenanthrene-d10	24.05	188	13991m	262.76		0.00
53) Chrysene-d12	33.10	240	8191m	216.13		-0.04
74) Perylene-d12	37.84	264	4364m	238.28		0.00
Target Compounds						Qvalue
3) Decalin	11.47	138	2255m	230.84	ng/ml	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	12671m	231.56		
9) 2-Methylnaphthalene	15.46	142	9448m	223.12		
10) 1-Methylnaphthalene	15.77	142	8772m	246.81		
11) 2,6-Dimethylnaphthalene	17.57	156	7930m	213.07		
12) 1,6,7-Trimethylnaphthalene	20.41	170	8230m	237.20		
13) C2-Naphthalenes	0.00	156	0	N.D.	d	
14) C3-Naphthalenes	0.00	170	0	N.D.	d	
15) C4-Naphthalenes	0.00	184	0	N.D.	d	
16) Benzothiophene	13.35	134	11490m	242.71	ng/ml	
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.04	154	12299m	232.38		
22) Acenaphthylene	18.47	152	14848m	262.93		
23) Acenaphthene	19.06	154	8630m	243.04		
24) Dibenzofuran	19.68	168	13813m	229.76	ng/ml	
25) Fluorene	20.86	166	9991m	209.65		
26) C1-Fluorenes	0.00	180	0	N.D.	d	
27) C2-Fluorenes	0.00	194	0	N.D.	d	
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	23.41	266	1156m	299.00	ng/ml	
32) Carbazole	24.85	167	11622m	239.84	ng/ml	
33) Dibenzothiophene	23.67	184	14062m	276.69		
34) C1-Dibenzothiophene	0.00	198	0	N.D.	d	

(#) = qualifier out of range (m) = manual integration

000078

Data File : Z:\1\DATA\MS30306\MS30306J.D Vial: 8
Acq On : 28 Sep 2006 7:04 am Operator: TJM
Sample : AR-WKCC-250-022 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 8:53 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
35)	C2-Dibenzothiophene	0.00	212	0	N.D.	d	
36)	C3-Dibenzothiophene	0.00	226	0	N.D.	d	
37)	Phenanthrene	24.11	178	15690m	291.83		
38)	Anthracene	24.28	178	12841m	227.59		
39)	1-Methylphenanthrene	26.24	192	9649m	238.33		
40)	C1-Phenanthrene/Anthracene	0.00	192	0	N.D.	d	
41)	C2-Phenanthrene/Anthracene	0.00	206	0	N.D.	d	
42)	C3-Phenanthrene/Anthracene	0.00	220	0	N.D.	d	
43)	C4-Phenanthrene/Anthracene	0.00	234	0	N.D.	d	
44)	Naphthobenzothiophene	32.27	234	12160m	291.46		
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D.	d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D.	d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D.	d	
48)	Fluoranthene	28.22	202	18318m	252.78		
49)	Pyrene	29.00	202	15841m	218.22		
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D.	d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D.	d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D.	d	
54)	Benz(a)anthracene	33.07	228	9913m	217.95		
55)	Chrysene	33.21	228	12328m	227.33		
56)	C1-Chrysenes	0.00	242	0	N.D.	d	
57)	C2-Chrysenes	0.00	256	0	N.D.	d	
58)	C3-Chrysenes	0.00	270	0	N.D.	d	
59)	C4-Chrysenes	0.00	284	0	N.D.	d	
61)	C29-Hopane	0.00	191	0	N.D.	d	
62)	18a-Oleanane	0.00	191	0	N.D.	d	
63)	C30-Hopane	42.00	191	4364m	225.95	ng/ml	
64)	Benzo(b)fluoranthene	36.53	252	9597m	229.44		
65)	Benzo(k)fluoranthene	36.64	252	10083m	253.32		
66)	Benzo(e)pyrene	37.45	252	9383m	258.34		
67)	Benzo(a)pyrene	37.63	252	8462m	261.44		
68)	Indeno(1,2,3-c,d)pyrene	42.07	276	5924m	234.14		
69)	Dibenzo(a,h)anthracene	42.18	278	5448m	219.04		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.32	276	5488m	219.08		
75)	Perylene	37.91	252	8102m	251.19		

(#) = qualifier out of range (m) = manual integration

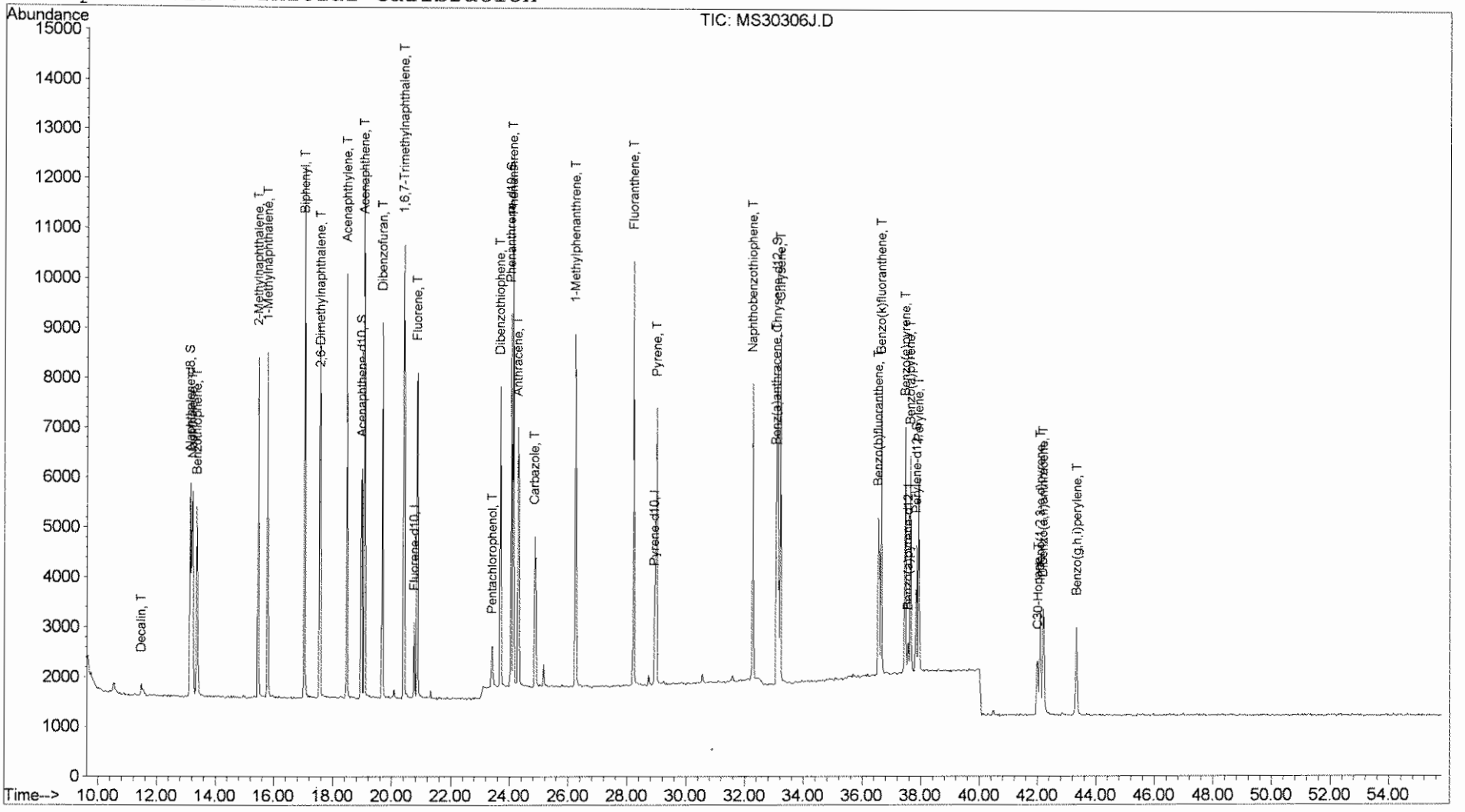
Quantitation Report

Data File : Z:\1\DATA\MS30306\MS30306J.D
Acq On : 28 Sep 2006 7:04 am
Sample : AR-WKCC-250-022
Misc :
MS Integration Params: rteint.p
Quant Time: Sep 28 8:53 2006

Vial: 8
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Tissue, Sediment, and Water Sample Report (Use d-10 Phenanthrene only for Surrogate Corrections)

Data File Name	MS30306B.D	Su Amt = 50	MS30306B.D
Data File Path	D:\GC-MSD~1\MS30306\		SRM 1582
Operator	TJM		
Date Acquired	09/28/20 -1:1:		
Method File	PAH-2002		
Sample Name	SRM 1582		
Misc Info			
Instrument Name	GC/MS Ins		09/28/20 -1:1:
Vial Number	2		PAH-2002
Sample Multiplier	0.588		1.70
Sample Amount	0		

Peak #	Compound	Ret Time (min)	Target Response (Area)	Conc. (ng/g or ng/L)	Su. Corrected Conc. (ng/g or ng/L)
3)	Decalin	0.00	0	0.00	0.00
4)	C1-Decalin	0.00	0	0.00	0.00
5)	C2-Decalin	0.00	0	0.00	0.00
6)	C3-Decalin	0.00	0	0.00	0.00
7)	C4-Decalin	0.00	0	0.00	0.00
8)	Naphthalene	13.21	17217	148.69	154.42
9+10)	C1-Naphthalenes	15.61	76965	664.69	690.32
13)	C2-Naphthalenes	17.91	146064	1261.46	1310.08
14)	C3-Naphthalenes	19.85	129998	1122.70	1165.98
15)	C4-Naphthalenes	22.97	86402	746.20	774.96
16)	Benzothiophene	13.43	987	9.85	10.23
17)	C1-Benzothiophene	15.46	2218	22.14	23.00
18)	C2-Benzothiophene	17.93	8082	80.68	83.79
19)	C3-Benzothiophene	19.65	17500	174.70	181.43
21)	Biphenyl	17.03	3542	31.63	32.85
22)	Acenaphthylene	0.00	0	0.00	0.00
23)	Acenaphthene	19.06	1326	17.65	18.33
24)	Dibenzofuran	19.68	1583	12.44	12.92
25)	Fluorene	20.86	3086	30.60	31.78
26)	C1-Fluorenes	22.86	11892	117.93	122.47
27)	C2-Fluorenes	24.48	25270	250.59	260.25
28)	C3-Fluorenes	30.34	23172	229.78	238.64
31)	Pentachlorophenol	0.00	0	0.00	0.00
32)	Carbazole	24.85	1219	10.86	11.28
38)	Anthracene	0.00	0	0.00	0.00
37)	Phenanthrene	24.11	13261	106.50	110.61
40)	C1-Phenanthrene/Anthracene	26.17	43285	347.63	361.03
41)	C2-Phenanthrene/Anthracene	27.72	60918	489.24	508.10
42)	C3-Phenanthrene/Anthracene	30.34	58376	468.82	486.90
43)	C4-Phenanthrene/Anthracene	31.12	32732	262.87	273.01
33)	Dibenzothiophene	23.67	3762	31.96	33.19
34)	C1-Dibenzothiophene	25.19	16063	136.47	141.73
35)	C2-Dibenzothiophene	26.94	26909	228.62	237.43
36)	C3-Dibenzothiophene	28.79	25466	216.36	224.70
48)	Fluoranthene	28.22	1661	9.90	10.28
49)	Pyrene	29.00	1876	11.16	11.59
50)	C1-Fluoranthenes/Pyrenes	31.22	9866	58.79	61.05
51)	C2-Fluoranthenes/Pyrenes	31.66	14937	89.00	92.43
52)	C3-Fluoranthenes/Pyrenes	33.35	11933	71.10	73.84
44)	Naphthobenzothiophene	32.26	3378	34.96	36.31
45)	C1-Naphthobenzothiophene	34.02	5420	56.09	58.25
46)	C2-Naphthobenzothiophene	35.12	6547	67.76	70.37
47)	C3-Naphthobenzothiophene	36.50	5098	52.76	54.79
54)	Benz(a)anthracene	33.10	433	4.11	4.27
55)	Chrysene	33.21	2527	20.12	20.90
56)	C1-Chrysenes	34.59	7626	60.72	63.06
57)	C2-Chrysenes	36.21	13180	104.94	108.99
58)	C3-Chrysenes	37.27	9109	72.53	75.32
59)	C4-Chrysenes	0.00	0	0.00	0.00
64)	Benzo(b)fluoranthene	36.57	305	3.98	4.13
65)	Benzo(k)fluoranthene	36.67	458	6.28	6.52
66)	Benzo(e)pyrene	37.45	252	3.79	3.93
67)	Benzo(a)pyrene	37.63	365	6.16	6.39
75)	Perylene	37.91	1848	31.28	32.49
68)	Indeno(1,2,3-c,d)pyrene	42.05	174	3.75	3.90
69)	Dibenzo(a,h)anthracene	42.26	31	0.68	0.71
70)	C1-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
71)	C2-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
72)	C3-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
73)	Benzo(g,h,i)perylene	43.32	120	2.62	2.72
	Total PAH				8302
	Individual Isomers				
9)	2-Methylnaphthalene	15.46	46160	515.16	535.01
10)	1-Methylnaphthalene	15.77	30805	409.61	425.40
11)	2,6-Dimethylnaphthalene	17.60	40722	517.09	537.02
12)	1,6,7-Trimethylnaphthalene	20.41	10683	145.51	151.12
39)	1-Methylphenanthrene	26.23	7993	85.25	88.53
61)	C29-Hopane	40.00	11860	335.28	348.21
62)	18a-Oleanane	41.06	3176	89.79	93.25
63)	C30-Hopane	41.27	10398	293.95	305.28
	Surrogates (AR-STSU-040-005)				**Su Recovery (%)**
2)	Naphthalene-d8	13.12	2859	27.78	94
20)	Acenaphthene-d10	18.97	1801	28.52	97
30)	Phenanthrene-d10	24.04	3491	28.31	96
53)	Chrysene-d12	33.10	2054	23.40	80
74)	Perylene-d12	37.84	965	28.77	98
	Internal Stds (AR-WKIS-0500-007)				
1)	Fluorene-d10	20.75	1829	51.08	
29)	Pyrene-d10	28.93	3636	49.98	
60)	Benzo(a)pyrene-d12	37.56	1120	45.61	

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\MS30306\MS30306B.D Vial: 2
Acq On : 28 Sep 2006 11:05 am Operator: TJM
Sample : SRM 1582 Inst : GC/MS Ins
Misc : Multiplr: 0.59
MS Integration Params: rteint.p
Quant Time: Oct 3 14:40 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1829m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	3636m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	1120m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.12	136	2859	27.78		0.00
20) Acenaphthene-d10	18.97	164	1801	28.52		0.00
30) Phenanthrene-d10	24.04	188	3491m	28.31		0.00
53) Chrysene-d12	33.10	240	2054	23.40		-0.04
74) Perylene-d12	37.84	264	965m	28.77		0.00
Target Compounds						Qvalue
3) Decalin	0.00	138	0	N.D.	d	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	17217	148.69		
9) 2-Methylnaphthalene	15.46	142	46160	515.16		
10) 1-Methylnaphthalene	15.77	142	30805	409.61		
11) 2,6-Dimethylnaphthalene	17.60	156	40722	517.09		
12) 1,6,7-Trimethylnaphthalene	20.41	170	10683	145.51		
13) C2-Naphthalenes	17.91	156	146064	1261.46		
14) C3-Naphthalenes	19.85	170	129998	1122.70		
15) C4-Naphthalenes	22.97	184	86402	746.20		
16) Benzothiophene	13.43	134	987	9.85	ng/ml	
17) C1-Benzothiophene	15.46	148	2218	22.14	ng/ml	
18) C2-Benzothiophene	17.93	162	8082	80.68	ng/ml	
19) C3-Benzothiophene	19.65	176	17500	174.70	ng/ml	
21) Biphenyl	17.03	154	3542	31.63		
22) Acenaphthylene	0.00	152	0	N.D.		
23) Acenaphthene	19.06	154	1326m	17.65		
24) Dibenzofuran	19.68	168	1583	12.44	ng/ml	
25) Fluorene	20.86	166	3086	30.60		
26) C1-Fluorenes	22.86	180	11892	117.93		
27) C2-Fluorenes	24.48	194	25270	250.59		
28) C3-Fluorenes	30.34	208	23172	229.78		
31) Pentachlorophenol	0.00	266	0	N.D.		
32) Carbazole	24.85	167	1219	10.86	ng/ml	
33) Dibenzothiophene	23.67	184	3762	31.96		
34) C1-Dibenzothiophene	25.19	198	16063	136.47		
35) C2-Dibenzothiophene	26.94	212	26909	228.62		
36) C3-Dibenzothiophene	28.79	226	25466	216.36		
37) Phenanthrene	24.11	178	13261	106.50		
38) Anthracene	0.00	178	0	N.D.	d	
39) 1-Methylphenanthrene	26.23	192	7993m	85.25		
40) C1-Phenanthrene/Anthracene	26.17	192	43285	347.63		
41) C2-Phenanthrene/Anthracene	27.72	206	60918	489.24		
42) C3-Phenanthrene/Anthracene	30.34	220	58376	468.82		
43) C4-Phenanthrene/Anthracene	31.12	234	32732	262.87		
44) Naphthobenzothiophene	32.26	234	3378	34.96		

(#) = qualifier out of range (m) = manual integration

Data File : D:\GC-MSD~1\MS30306\MS30306B.D Vial: 2
Acq On : 28 Sep 2006 11:05 am Operator: TJM
Sample : SRM 1582 Inst : GC/MS Ins
Misc : Multiplr: 0.59
MS Integration Params: rteint.p
Quant Time: Oct 3 14:40 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45)	C1-Naphthobenzothiophene	34.02	248	5420	56.09		
46)	C2-Naphthobenzothiophene	35.12	262	6547	67.76		
47)	C3-Naphthobenzothiophene	36.50	276	5098m	52.76		
48)	Fluoranthene	28.22	202	1661	9.90		
49)	Pyrene	29.00	202	1876	11.16		
50)	C1-Fluoranthenes/Pyrenes	31.22	216	9866	58.79	ng/mL	
51)	C2-Fluoranthenes/Pyrenes	31.66	230	14937	89.00	ng/mL	
52)	C3-Fluoranthenes/Pyrenes	33.35	244	11933	71.10	ng/mL	
54)	Benz(a)anthracene	33.10	228	433	4.11		
55)	Chrysene	33.21	228	2527m	20.12		
56)	C1-Chrysenes	34.59	242	7626	60.72	ng/mL	
57)	C2-Chrysenes	36.21	256	13180	104.94	ng/mL	
58)	C3-Chrysenes	37.27	270	9109	72.53	ng/mL	
59)	C4-Chrysenes	0.00	284	0	N.D.	d	
61)	C29-Hopane	40.00	191	11860m	335.28	ng/ml	
62)	18a-Oleanane	41.06	191	3176m	89.79	ng/ml	
63)	C30-Hopane	41.27	191	10398m	293.95	ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	305m	3.98		
65)	Benzo(k)fluoranthene	36.67	252	458m	6.28		
66)	Benzo(e)pyrene	37.45	252	252m	3.79		
67)	Benzo(a)pyrene	37.63	252	365m	6.16		
68)	Indeno(1,2,3-c,d)pyrene	42.05	276	174m	3.75		
69)	Dibenzo(a,h)anthracene	42.26	278	31m	0.68		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.32	276	120m	2.62		
75)	Perylene	37.91	252	1848m	31.28		

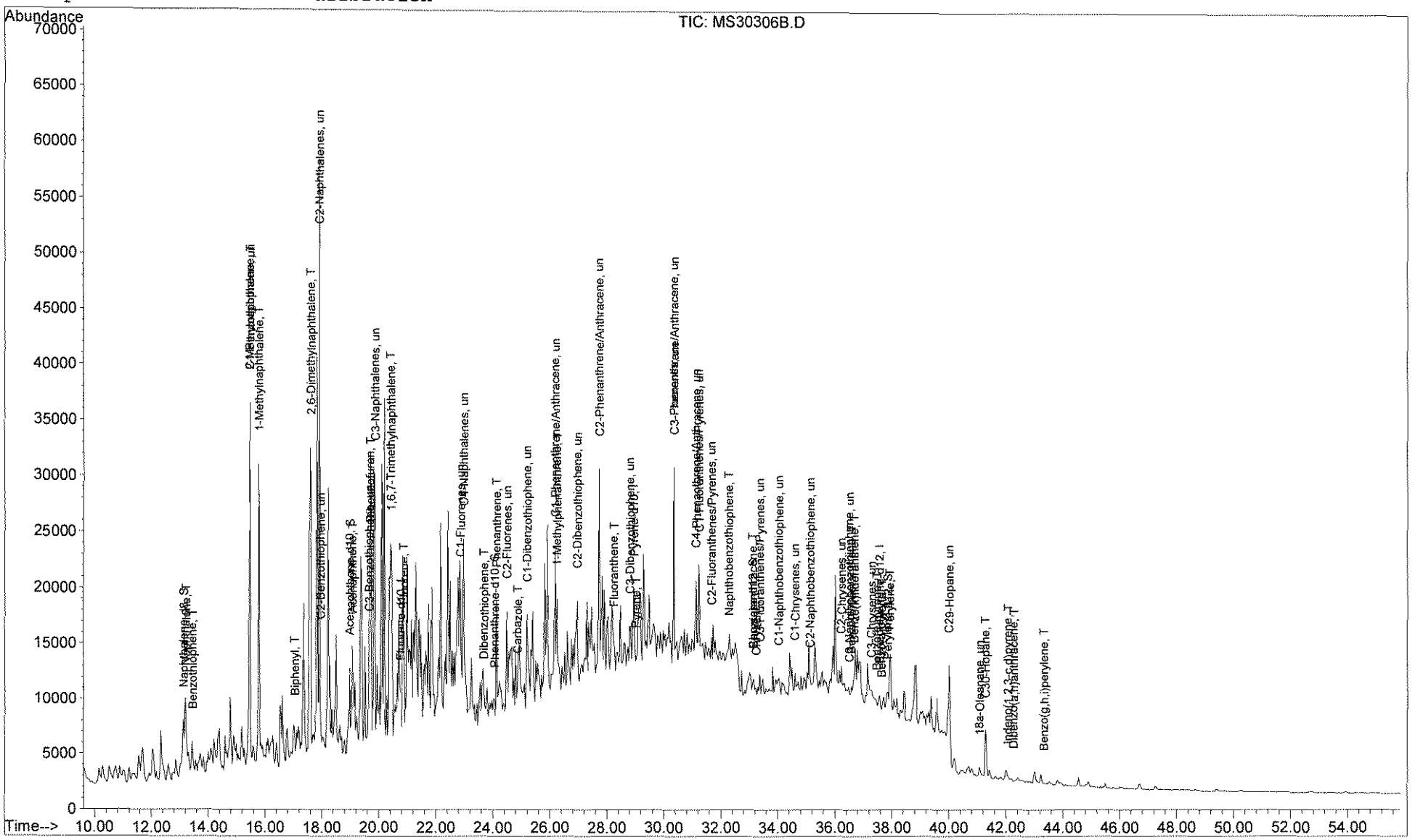
(#) = qualifier out of range (m) = manual integration

Data File : D:\GC-MSD~1\MS30306\MS30306B.D
Acq On : 28 Sep 2006 11:05 am
Sample : SRM 1582
Misc :
MS Integration Params: rteint.p
Quant Time: Oct 3 14:40 2006

Vial: 2
Operator: TJM
Inst : GC/MS Ins
Multiplr: 0.59

Quant Results File: 092806.RES

Method : D:\GC-MSD~1\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Tissue, Sediment, and Water Sample Report (Use d-10 Phenanthrene only for Surrogate Corrections)

Data File Name	**MS30306C.D**	**Su Amt = 50**	MS30306C.D
Data File Path	**Z:\1\DATA\MS30306**		IS/SU Mixture
Operator	**TJM**		
Date Acquired	**09/27/20 -1:5:**		
Method File	**PAH-2002**		
Sample Name	**IS/SU Mixture**		
Misc Info			
Instrument Name	**GC/MS Ins**		09/27/20 -1:5:
Vial Number	**3**		PAH-2002
Sample Multiplier	**1**		1 00
Sample Amount	**0**		

Peak #	Compound	Ret Time (min)	Target Response (Area)	Conc. (ng/g or ng/L)	Su. Corrected Conc. (ng/g or ng/L)
3)	Decalin	0.00	0	0.00	0.00
4)	C1-Decalin	0.00	0	0.00	0.00
5)	C2-Decalin	0.00	0	0.00	0.00
6)	C3-Decalin	0.00	0	0.00	0.00
7)	C4-Decalin	0.00	0	0.00	0.00
8)	Naphthalene	0.00	0	0.00	0.00
9+10)	C1-Naphthalenes	0.00	0	#DIV/0!	#DIV/0!
13)	C2-Naphthalenes	0.00	0	0.00	0.00
14)	C3-Naphthalenes	0 00	0	0.00	0.00
15)	C4-Naphthalenes	0.00	0	0.00	0.00
16)	Benzothiophene	0.00	0	0.00	0.00
17)	C1-Benzothiophene	0.00	0	0.00	0.00
18)	C2-Benzothiophene	0.00	0	0.00	0.00
19)	C3-Benzothiophene	0.00	0	0.00	0.00
21)	Biphenyl	0 00	0	0.00	0.00
22)	Acenaphthylene	0.00	0	0.00	0.00
23)	Acenaphthene	0.00	0	0.00	0.00
24)	Dibenzofuran	0.00	0	0.00	0.00
25)	Fluorene	0.00	0	0.00	0.00
26)	C1-Fluorenes	0.00	0	0.00	0.00
27)	C2-Fluorenes	0.00	0	0.00	0.00
28)	C3-Fluorenes	0.00	0	0.00	0.00
31)	Pentachlorophenol	0.00	0	0.00	0.00
32)	Carbazole	0.00	0	0.00	0.00
38)	Anthracene	0.00	0	0.00	0.00
37)	Phenanthrene	0.00	0	0.00	0.00
40)	C1-Phenanthrene/Anthracene	0.00	0	0.00	0.00
41)	C2-Phenanthrene/Anthracene	0.00	0	0.00	0.00
42)	C3-Phenanthrene/Anthracene	0.00	0	0.00	0.00
43)	C4-Phenanthrene/Anthracene	0.00	0	0.00	0.00
33)	Dibenzothiophene	0.00	0	0.00	0.00
34)	C1-Dibenzothiophene	0.00	0	0.00	0.00
35)	C2-Dibenzothiophene	0.00	0	0 00	0.00
36)	C3-Dibenzothiophene	0.00	0	0.00	0.00
48)	Fluoranthene	0.00	0	0.00	0.00
49)	Pyrene	0.00	0	0.00	0.00
50)	C1-Fluoranthenes/Pyrenes	0.00	0	0.00	0 00
51)	C2-Fluoranthenes/Pyrenes	0.00	0	0.00	0.00
52)	C3-Fluoranthenes/Pyrenes	0.00	0	0.00	0.00
44)	Naphthobenzothiophene	0.00	0	0.00	0 00
45)	C1-Naphthobenzothiophene	0.00	0	0.00	0.00
46)	C2-Naphthobenzothiophene	0.00	0	0.00	0.00
47)	C3-Naphthobenzothiophene	0.00	0	0.00	0.00
54)	Benz(a)anthracene	0.00	0	0.00	0.00
55)	Chrysene	0.00	0	0.00	0.00
56)	C1-Chrysenes	0.00	0	0.00	0.00
57)	C2-Chrysenes	0.00	0	0.00	0.00
58)	C3-Chrysenes	0.00	0	0.00	0.00
59)	C4-Chrysenes	0.00	0	0.00	0.00
64)	Benzo(b)fluoranthene	0.00	0	0.00	0.00
65)	Benzo(k)fluoranthene	0.00	0	0.00	0.00
66)	Benzo(e)pyrene	0.00	0	0.00	0.00
67)	Benzo(a)pyrene	0.00	0	0.00	0.00
75)	Perylene	0.00	0	0.00	0.00
68)	Indeno(1.2,3-c,d)pyrene	0.00	0	0.00	0.00
69)	Dibenzo(a,h)anthracene	0.00	0	0 00	0.00
70)	C1-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
71)	C2-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
72)	C3-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
73)	Benzo(g,h,i)perylene	0.00	0	0.00	0.00
	Total PAH				#DIV/0!
	Individual Isomers				
9)	2-Methylnaphthalene	0.00	0	0.00	0.00
10)	1-Methylnaphthalene	0.00	0	0.00	0.00
11)	2,6-Dimethylnaphthalene	0.00	0	0.00	0.00
12)	1,6,7-Trimethylnaphthalene	0.00	0	0.00	0.00
39)	1-Methylphenanthrene	0 00	0	0.00	0.00
61)	C29-Hopane	0.00	0	0.00	0.00
62)	18a-Oleanane	0.00	0	0.00	0.00
63)	C30-Hopane	0.00	0	0.00	0.00
	Surrogates *(AR-STSU-040-005)*				**Su Recovery (%)**
2)	Naphthalene-d8	13.15	2042	50.18	100
20)	Acenaphthene-d10	18.97	1323	52.99	106
30)	Phenanthrene-d10	24.05	2155	47.15	94
53)	Chrysene-d12	33.14	1576	48.44	97
74)	Perylene-d12	37.84	689	50.81	102
	Internal Stds *(AR-WKIS-0500-007)*				
1)	Fluorene-d10	20.77	1230	51.08	
29)	Pyrene-d10	28.93	2292	49.98	
60)	Benzo(a)pyrene-d12	37.56	770	45.61	

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\MS30306\MS30306C.D Vial: 3
Acq On : 27 Sep 2006 5:59 pm Operator: TJM
Sample : IS/SU Mixture Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 8:58 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.77	176	1230m	51.08	ng/ml	0.03
29) Pyrene-d10	28.93	212	2292m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	770m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.15	136	2042	50.18		0.03
20) Acenaphthene-d10	18.97	164	1323m	52.99		0.00
30) Phenanthrene-d10	24.05	188	2155m	47.15		0.00
53) Chrysene-d12	33.14	240	1576m	48.44		0.00
74) Perylene-d12	37.84	264	689m	50.81		0.00
Target Compounds						Qvalue
3) Decalin	0.00	138	0	N.D.	d	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	0.00	128	0	N.D.	d	
9) 2-Methylnaphthalene	0.00	142	0	N.D.		
10) 1-Methylnaphthalene	0.00	142	0	N.D.		
11) 2,6-Dimethylnaphthalene	0.00	156	0	N.D.		
12) 1,6,7-Trimethylnaphthalene	0.00	170	0	N.D.		
13) C2-Naphthalenes	0.00	156	0	N.D.	d	
14) C3-Naphthalenes	0.00	170	0	N.D.	d	
15) C4-Naphthalenes	0.00	184	0	N.D.	d	
16) Benzothiophene	0.00	134	0	N.D.		
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	0.00	154	0	N.D.		
22) Acenaphthylene	0.00	152	0	N.D.		
23) Acenaphthene	0.00	154	0	N.D.		
24) Dibenzofuran	0.00	168	0	N.D.		
25) Fluorene	0.00	166	0	N.D.		
26) C1-Fluorenes	0.00	180	0	N.D.	d	
27) C2-Fluorenes	0.00	194	0	N.D.	d	
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	0.00	266	0	N.D.		
32) Carbazole	0.00	167	0	N.D.		
33) Dibenzothiophene	0.00	184	0	N.D.		
34) C1-Dibenzothiophene	0.00	198	0	N.D.	d	
35) C2-Dibenzothiophene	0.00	212	0	N.D.	d	
36) C3-Dibenzothiophene	0.00	226	0	N.D.	d	
37) Phenanthrene	0.00	178	0	N.D.		
38) Anthracene	0.00	178	0	N.D.		
39) 1-Methylphenanthrene	0.00	192	0	N.D.		
40) C1-Phenanthrene/Anthracene	0.00	192	0	N.D.	d	
41) C2-Phenanthrene/Anthracene	0.00	206	0	N.D.	d	
42) C3-Phenanthrene/Anthracene	0.00	220	0	N.D.	d	
43) C4-Phenanthrene/Anthracene	0.00	234	0	N.D.	d	
44) Naphthobenzothiophene	0.00	234	0	N.D.		

(#) = qualifier out of range (m) = manual integration

Data File : D:\GC-MSD~1\MS30306\MS30306C.D Vial: 3
Acq On : 27 Sep 2006 5:59 pm Operator: TJM
Sample : IS/SU Mixture Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 8:58 2006 Quant Results File: 092806.RES

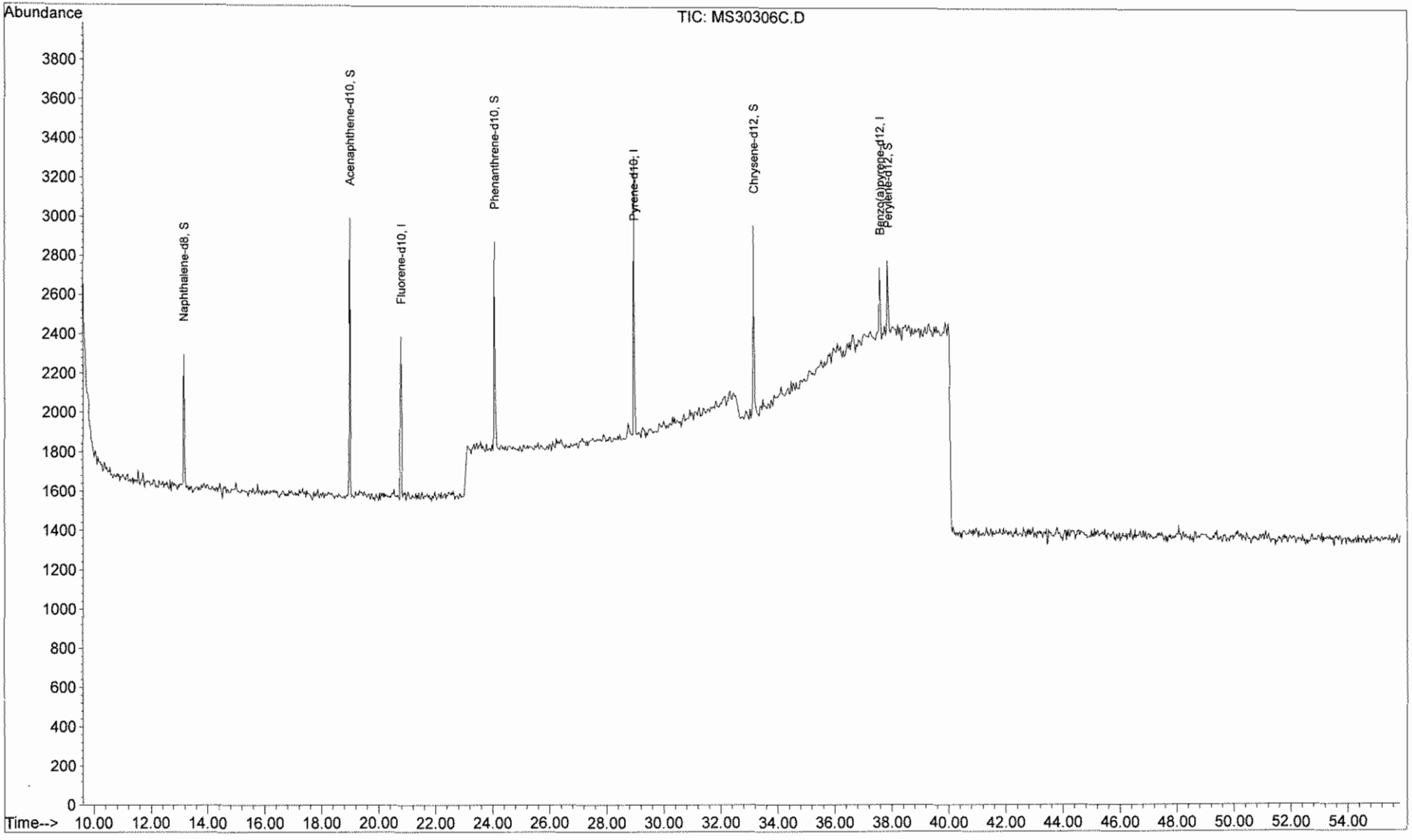
Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D. d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D. d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D. d	
48)	Fluoranthene	0.00	202	0	N.D.	
49)	Pyrene	0.00	202	0	N.D.	
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D. d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D. d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D. d	
54)	Benz(a)anthracene	0.00	228	0	N.D.	
55)	Chrysene	0.00	228	0	N.D.	
56)	C1-Chrysenes	0.00	242	0	N.D. d	
57)	C2-Chrysenes	0.00	256	0	N.D. d	
58)	C3-Chrysenes	0.00	270	0	N.D. d	
59)	C4-Chrysenes	0.00	284	0	N.D. d	
61)	C29-Hopane	0.00	191	0	N.D. d	
62)	18a-Oleanane	0.00	191	0	N.D. d	
63)	C30-Hopane	0.00	191	0	N.D. d	
64)	Benzo(b)fluoranthene	0.00	252	0	N.D.	
65)	Benzo(k)fluoranthene	0.00	252	0	N.D.	
66)	Benzo(e)pyrene	0.00	252	0	N.D.	
67)	Benzo(a)pyrene	0.00	252	0	N.D.	
68)	Indeno(1,2,3-c,d)pyrene	0.00	276	0	N.D.	
69)	Dibenzo(a,h)anthracene	0.00	278	0	N.D. d	
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D. d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D. d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D. d	
73)	Benzo(g,h,i)perylene	0.00	276	0	N.D. d	
75)	Perylene	0.00	252	0	N.D.	

(#) = qualifier out of range (m) = manual integration

Data File : D:\GC-MSD~1\MS30306\MS30306C.D Vial: 3
Acq On : 27 Sep 2006 5:59 pm Operator: TJM
Sample : IS/SU Mixture Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 8:58 2006 Quant Results File: 092806.RES

Method : D:\GC-MSD~1\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



880000

Tissue, Sediment, and Water Sample Report (Use d-10 Phenanthrene only for Surrogate Corrections)

Data File Name	ETX7072.D	Su Amt = 50	ETX7072.D
Data File Path	D:\GC-MSD~1\MS30306\		A-70
Operator	TJM		
Date Acquired	09/28/20 -1:3:		
Method File	PAH-2002		
Sample Name	A-70		
Misc Info			
Instrument Name	GC/MS Ins		09/28/20 -1:3:
Vial Number	7		PAH-2002
Sample Multiplier	1		1.00
Sample Amount	0		

Peak #	Compound	Ret Time (min)	Target Response (Area)	Conc. (ng/g or ng/L)	Su. Corrected Conc. (ng/g or ng/L)
3)	Decalin	0.00	0	0.00	0.00
4)	C1-Decalin	0.00	0	0.00	0.00
5)	C2-Decalin	0.00	0	0.00	0.00
6)	C3-Decalin	0.00	0	0.00	0.00
7)	C4-Decalin	0.00	0	0.00	0.00
8)	Naphthalene	13.21	2776	52.93	72.82
9+10)	C1-Naphthalenes	15.63	3712	70.77	97.38
13)	C2-Naphthalenes	18.21	4433	84.52	116.29
14)	C3-Naphthalenes	19.71	33126	631.57	868.99
15)	C4-Naphthalenes	22.18	59561	1135.58	1562.46
16)	Benzothiophene	13.35	83	1.83	2.52
17)	C1-Benzothiophene	15.63	235	5.18	7.13
18)	C2-Benzothiophene	17.57	712	15.69	21.59
19)	C3-Benzothiophene	19.51	1532	33.76	46.45
21)	Biphenyl	17.03	1224	24.13	33.20
22)	Acenaphthylene	0.00	0	0.00	0.00
23)	Acenaphthene	19.09	1198	35.20	48.43
24)	Dibenzofuran	19.68	8034	139.42	191.83
25)	Fluorene	20.86	2427	53.13	73.10
26)	C1-Fluorenes	22.86	8754	191.64	263.68
27)	C2-Fluorenes	24.48	58857	1288.49	1772.86
28)	C3-Fluorenes	28.73	27940	611.66	841.59
31)	Pentachlorophenol	0.00	0	0.00	0.00
32)	Carbazole	0.00	0	0.00	0.00
38)	Anthracene	24.32	4902	77.22	106.25
37)	Phenanthrene	24.11	10632	175.77	241.84
40)	C1-Phenanthrene/Anthracene	25.80	116598	1927.59	2652.21
41)	C2-Phenanthrene/Anthracene	27.72	507763	8394.28	11549.88
42)	C3-Phenanthrene/Anthracene	29.30	659253	10898.70	14995.76
43)	C4-Phenanthrene/Anthracene	31.15	326024	5389.79	7415.94
33)	Dibenzothiophene	23.68	3058	53.48	73.59
34)	C1-Dibenzothiophene	25.49	21553	376.94	518.63
35)	C2-Dibenzothiophene	26.94	91356	1597.71	2198.32
36)	C3-Dibenzothiophene	28.16	123430	2158.64	2970.12
48)	Fluoranthene	28.22	14214	174.34	239.88
49)	Pyrene	29.00	78493	961.07	1322.36
50)	C1-Fluoranthenes/Pyrenes	30.51	367930	4512.78	6209.24
51)	C2-Fluoranthenes/Pyrenes	32.33	498895	6119.11	8419.42
52)	C3-Fluoranthenes/Pyrenes	33.46	363846	4462.69	6140.32
44)	Naphthobenzothiophene	32.30	35545	757.23	1041.89
45)	C1-Naphthobenzothiophene	33.70	102085	2174.76	2992.30
46)	C2-Naphthobenzothiophene	35.37	106658	2272.18	3126.35
47)	C3-Naphthobenzothiophene	36.50	41868	891.93	1227.23
54)	Benz(a)anthracene	33.10	46465	907.99	1249.33
55)	Chrysene	33.21	108985	1786.28	2457.79
56)	C1-Chrysenes	34.48	351236	5756.82	7920.94
57)	C2-Chrysenes	35.93	369491	6056.03	8332.62
58)	C3-Chrysenes	37.28	148855	2439.76	3356.92
59)	C4-Chrysenes	40.47	4418	72.41	99.63
64)	Benzo(b)fluoranthene	36.57	18458	314.56	432.81
65)	Benzo(k)fluoranthene	36.60	2703	48.41	66.60
66)	Benzo(e)pyrene	37.49	16307	320.04	440.35
67)	Benzo(a)pyrene	37.66	21927	482.91	664.44
75)	Perylene	37.95	6860	151.61	208.60
68)	Indeno(1,2,3-c,d)pyrene	42.10	3043	85.73	117.96
69)	Dibenzo(a,h)anthracene	42.18	2695	77.24	106.27
70)	C1-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
71)	C2-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
72)	C3-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
73)	Benzo(g,h,i)perylene	43.34	4749	135.14	185.94
	Total PAH				105102
	Individual Isomers				
9)	2-Methylnaphthalene	15.46	2828	69.68	95.87
10)	1-Methylnaphthalene	15.80	884	25.95	35.70
11)	2,6-Dimethylnaphthalene	17.57	1083	30.36	41.77
12)	1,6,7-Trimethylnaphthalene	20.41	3247	97.63	134.34
39)	1-Methylphenanthrene	26.17	9524	209.09	287.69
61)	C29-Hopane	39.01	2864	105.70	145.44
62)	18a-Oleanane	41.09	907	33.48	46.06
63)	C30-Hopane	41.30	5071	187.16	257.51
	Surrogates				Su Recovery (%)
	(AR-STSU-040-005)				
2)	Naphthalene-d8	13.15	813	17.44	35
20)	Acenaphthene-d10	18.97	770	26.92	54
30)	Phenanthrene-d10	24.05	2177	36.34	73
53)	Chrysene-d12	33.14	2138	50.14	100
74)	Perylene-d12	37.84	940	36.59	73
	Internal Stds				
	(AR-WKIS-0500-007)				
1)	Fluorene-d10	20.75	1409	51.08	
29)	Pyrene-d10	28.93	3004	49.98	
60)	Benzo(a)pyrene-d12	37.56	1459	45.61	

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD-1\MS30306\ETX7072.D Vial: 7
Acq On : 28 Sep 2006 3:52 am Operator: TJM
Sample : A-70 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:45 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1409m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	3004m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	1459m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.15	136	813m	17.44		0.03
20) Acenaphthene-d10	18.97	164	770m	26.92		0.00
30) Phenanthrene-d10	24.05	188	2177	36.34		0.00
53) Chrysene-d12	33.14	240	2138m	50.14		0.00
74) Perylene-d12	37.84	264	940m	36.59		0.00
Target Compounds						Qvalue
3) Decalin	0.00	138	0	N.D.	d	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	2776	52.93		
9) 2-Methylnaphthalene	15.46	142	2828	69.68		
10) 1-Methylnaphthalene	15.80	142	884	25.95		
11) 2,6-Dimethylnaphthalene	17.57	156	1083	30.36		
12) 1,6,7-Trimethylnaphthalene	20.41	170	3247	97.63		
13) C2-Naphthalenes	18.21	156	4433	84.52		
14) C3-Naphthalenes	19.71	170	33126	631.57		
15) C4-Naphthalenes	22.18	184	59561	1135.58		
16) Benzothiophene	13.35	134	83	1.83	ng/ml	
17) C1-Benzothiophene	15.63	148	235m	5.18	ng/ml	
18) C2-Benzothiophene	17.57	162	712m	15.69	ng/ml	
19) C3-Benzothiophene	19.51	176	1532m	33.76	ng/ml	
21) Biphenyl	17.03	154	1224	24.13		
22) Acenaphthylene	0.00	152	0	N.D.		
23) Acenaphthene	19.09	154	1198	35.20		
24) Dibenzofuran	19.68	168	8034	139.42	ng/ml	
25) Fluorene	20.86	166	2427	53.13		
26) C1-Fluorenes	22.86	180	8754	191.64		
27) C2-Fluorenes	24.48	194	58857	1288.49		
28) C3-Fluorenes	28.73	208	27940	611.66		
31) Pentachlorophenol	0.00	266	0	N.D.		
32) Carbazole	0.00	167	0	N.D.	d	
33) Dibenzothiophene	23.68	184	3058	53.48		
34) C1-Dibenzothiophene	25.49	198	21553	376.94		
35) C2-Dibenzothiophene	26.94	212	91356	1597.71		
36) C3-Dibenzothiophene	28.16	226	123430	2158.64		
37) Phenanthrene	24.11	178	10632	175.77		
38) Anthracene	24.32	178	4902	77.22		
39) 1-Methylphenanthrene	26.17	192	9524	209.09		
40) C1-Phenanthrene/Anthracene	25.80	192	116598	1927.59		
41) C2-Phenanthrene/Anthracene	27.72	206	507763	8394.28		
42) C3-Phenanthrene/Anthracene	29.30	220	659253	10898.70		
43) C4-Phenanthrene/Anthracene	31.15	234	326024	5389.79		
44) Naphthobenzothiophene	32.30	234	35545	757.23		

(#) = qualifier out of range (m) = manual integration

000090

Data File : D:\GC-MSD-1\MS30306\ETX7072.D Vial: 7
Acq On : 28 Sep 2006 3:52 am Operator: TJM
Sample : A-70 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:45 2006 Quant Results File: 092806.RES

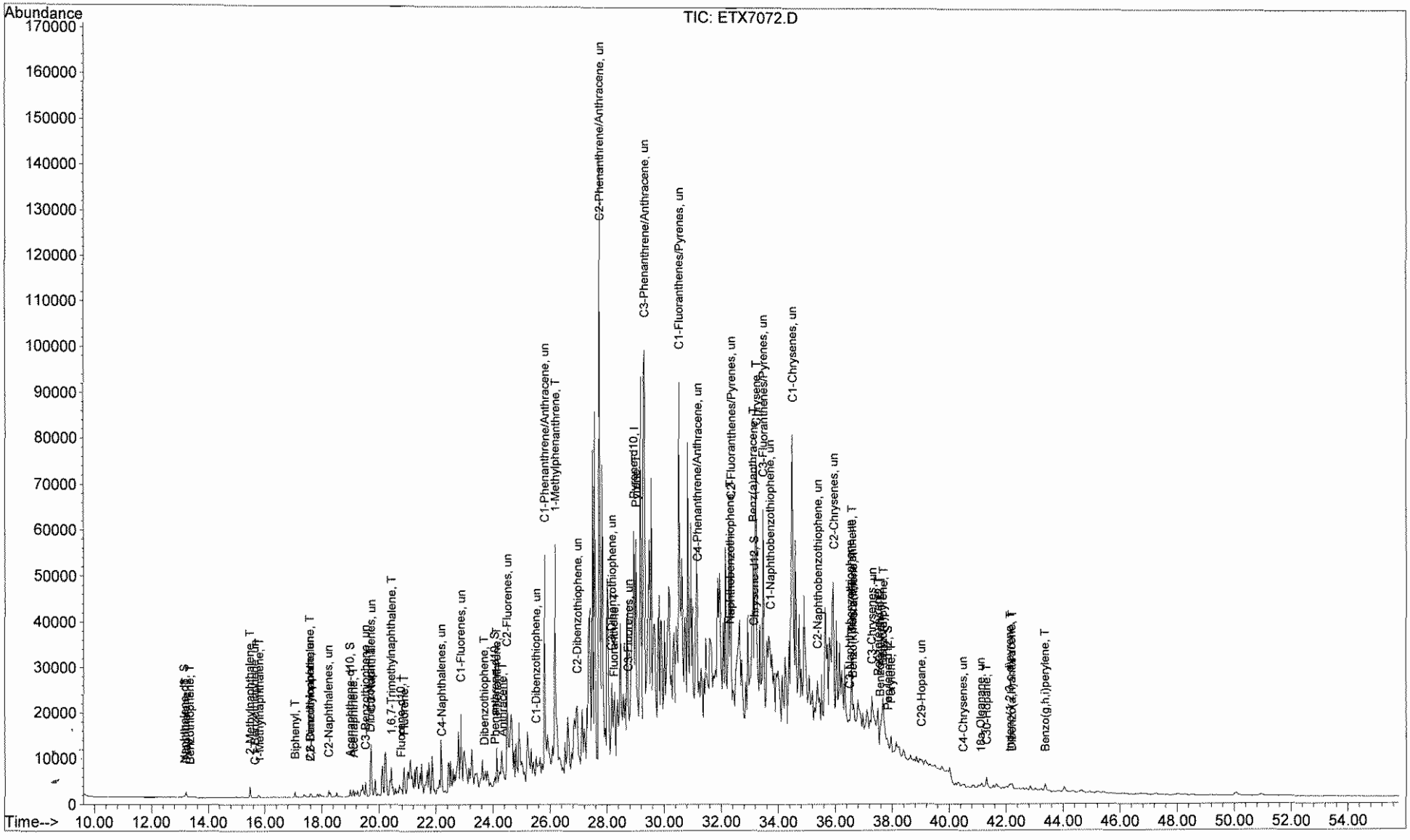
Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45)	C1-Naphthobenzothiophene	33.70	248	102085	2174.76		
46)	C2-Naphthobenzothiophene	35.37	262	106658m	2272.18		
47)	C3-Naphthobenzothiophene	36.50	276	41868m	891.93		
48)	Fluoranthene	28.22	202	14214	174.34		
49)	Pyrene	29.00	202	78493	961.07		
50)	C1-Fluoranthenes/Pyrenes	30.51	216	367930	4512.78	ng/mL	
51)	C2-Fluoranthenes/Pyrenes	32.33	230	498895	6119.11	ng/mL	
52)	C3-Fluoranthenes/Pyrenes	33.46	244	363846m	4462.69	ng/mL	
54)	Benz(a)anthracene	33.10	228	46465m	907.99		
55)	Chrysene	33.21	228	108985m	1786.28		
56)	C1-Chrysenes	34.48	242	351236m	5756.82	ng/mL	
57)	C2-Chrysenes	35.93	256	369491m	6056.03	ng/mL	
58)	C3-Chrysenes	37.28	270	148855m	2439.76	ng/mL	
59)	C4-Chrysenes	40.47	284	4418m	72.41	ng/mL	
61)	C29-Hopane	39.01	191	2864m	105.70	ng/ml	
62)	18a-Oleanane	41.09	191	907m	33.48	ng/ml	
63)	C30-Hopane	41.30	191	5071m	187.16	ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	18458m	314.56		
65)	Benzo(k)fluoranthene	36.60	252	2703m	48.41		
66)	Benzo(e)pyrene	37.49	252	16307m	320.04		
67)	Benzo(a)pyrene	37.66	252	21927m	482.91		
68)	Indeno(1,2,3-c,d)pyrene	42.10	276	3043m	85.73		
69)	Dibenzo(a,h)anthracene	42.18	278	2695m	77.24		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.34	276	4749m	135.14		
75)	Perylene	37.95	252	6860m	151.61		

(#) = qualifier out of range (m) = manual integration

Data File : D:\GC-MSD-1\MS30306\ETX7072.D Vial: 7
Acq On : 28 Sep 2006 3:52 am Operator: TJM
Sample : A-70 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:45 2006 Quant Results File: 092806.RES

Method : D:\GC-MSD-1\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Tissue, Sediment, and Water Sample Report (Use d-10 Phenanthrene only for Surrogate Corrections)

Data File Name **ETX7073.D** Su Amt = 50 ETX7073.D
Data File Path **D:\GC-MSD~1\MS30306** B-70
Operator **TJM**
Date Acquired **09/28/20 -1:1:**
Method File **PAH-2002**
Sample Name **B-70**
Misc Info
Instrument Name **GC/MS Ins** 09/28/20 -1:1:
Vial Number **5** PAH-2002
Sample Multiplier **1** 1.00
Sample Amount **0**

Peak #	Compound	Ret Time (min)	Target Response (Area)	Conc. (ng/g or ng/L)	Su. Corrected Conc. (ng/g or ng/L)
3)	Decalin	0.00	0	0.00	0.00
4)	C1-Decalin	0.00	0	0.00	0.00
5)	C2-Decalin	0.00	0	0.00	0.00
6)	C3-Decalin	0.00	0	0.00	0.00
7)	C4-Decalin	0.00	0	0.00	0.00
8)	Naphthalene	13.21	925	20.83	44.96
9+10)	C1-Naphthalenes	15.63	1139	25.65	55.36
13)	C2-Naphthalenes	17.57	783	17.63	38.06
14)	C3-Naphthalenes	20.75	835	18.80	40.58
15)	C4-Naphthalenes	22.18	913	20.56	44.38
16)	Benzothiophene	0.00	0	0.00	0.00
17)	C1-Benzothiophene	0.00	0	0.00	0.00
18)	C2-Benzothiophene	0.00	0	0.00	0.00
19)	C3-Benzothiophene	0.00	0	0.00	0.00
21)	Biphenyl	17.03	381	8.87	19.15
22)	Acenaphthylene	0.00	0	0.00	0.00
23)	Acenaphthene	19.09	305	10.58	22.84
24)	Dibenzofuran	19.68	2238	45.87	99.01
25)	Fluorene	20.86	630	16.29	35.16
26)	C1-Fluorenes	22.86	179	4.63	9.99
27)	C2-Fluorenes	24.58	1011	26.14	56.42
28)	C3-Fluorenes	0.00	0	0.00	0.00
31)	Pentachlorophenol	0.00	0	0.00	0.00
32)	Carbazole	0.00	0	0.00	0.00
38)	Anthracene	24.31	202	3.73	8.05
37)	Phenanthrene	24.11	3896	75.49	162.95
40)	C1-Phenanthrene/Anthracene	26.17	2246	43.52	93.94
41)	C2-Phenanthrene/Anthracene	27.72	13461	260.83	562.99
42)	C3-Phenanthrene/Anthracene	29.16	19727	382.24	825.06
43)	C4-Phenanthrene/Anthracene	31.12	13973	270.75	584.40
33)	Dibenzothiophene	23.71	273	5.60	12.08
34)	C1-Dibenzothiophene	25.22	447	9.16	19.78
35)	C2-Dibenzothiophene	26.94	2308	47.31	102.12
36)	C3-Dibenzothiophene	28.15	4004	82.07	177.16
48)	Fluoranthene	28.22	655	9.42	20.32
49)	Pyrene	29.00	2046	29.36	63.38
50)	C1-Fluoranthenes/Pyrenes	30.82	13746	197.61	426.54
51)	C2-Fluoranthenes/Pyrenes	32.13	19944	286.71	618.86
52)	C3-Fluoranthenes/Pyrenes	33.46	13664	196.43	423.99
44)	Naphthobenzothiophene	32.26	1430	35.71	77.07
45)	C1-Naphthobenzothiophene	33.70	3791	94.66	204.32
46)	C2-Naphthobenzothiophene	34.73	4442	110.91	239.40
47)	C3-Naphthobenzothiophene	36.21	1663	41.52	89.63
54)	Benz(a)anthracene	33.10	1801	41.25	89.04
55)	Chrysene	33.21	3776	72.54	156.57
56)	C1-Chrysenes	34.48	13112	251.89	543.69
57)	C2-Chrysenes	35.90	13810	265.29	572.64
58)	C3-Chrysenes	37.27	5492	105.50	227.73
59)	C4-Chrysenes	0.00	0	0.00	0.00
64)	Benzo(b)fluoranthene	36.57	713	18.16	39.21
65)	Benzo(k)fluoranthene	36.64	140	3.75	8.09
66)	Benzo(e)pyrene	37.45	687	20.16	43.51
67)	Benzo(a)pyrene	37.63	815	26.83	57.92
75)	Perylene	37.91	257	8.49	18.33
68)	Indeno(1,2,3-c,d)pyrene	42.07	170	7.16	15.45
69)	Dibenzo(a,h)anthracene	42.18	137	5.87	12.67
70)	C1-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
71)	C2-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
72)	C3-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
73)	Benzo(g,h,i)perylene	43.34	182	7.74	16.71
	Total PAH				6979
	Individual Isomers				
9)	2-Methylnaphthalene	15.46	864	25.14	54.27
10)	1-Methylnaphthalene	15.80	275	9.53	20.58
11)	2,6-Dimethylnaphthalene	17.57	241	7.98	17.22
12)	1,6,7-Trimethylnaphthalene	20.41	35	1.24	2.68
39)	1-Methylphenanthrene	26.27	376	9.68	20.88
61)	C29-Hopane	0.00	0	0.00	0.00
62)	18a-Oleanane	0.00	0	0.00	0.00
63)	C30-Hopane	0.00	0	0.00	0.00
	Surrogates				Su Recovery (%)
	(AR-STSU-040-005)				
2)	Naphthalene-d8	13.15	359	9.10	18
20)	Acenaphthene-d10	18.97	251	10.36	21
30)	Phenanthrene-d10	24.04	1184	23.16	46
53)	Chrysene-d12	33.14	1555	42.74	85
74)	Perylene-d12	37.84	787	45.79	92
	Internal Stds				
	(AR-WKIS-0500-007)				
1)	Fluorene-d10	20.75	1193	51.08	
29)	Pyrene-d10	28.93	2563	49.98	
60)	Benzo(a)pyrene-d12	37.56	976	45.61	

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD~1\MS30306\ETX7073.D Vial: 5
Acq On : 28 Sep 2006 1:44 am Operator: TJM
Sample : B-70 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:47 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1193m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	2563m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	976m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.15	136	359	9.10		0.03
20) Acenaphthene-d10	18.97	164	251	10.36		0.00
30) Phenanthrene-d10	24.04	188	1184m	23.16		0.00
53) Chrysene-d12	33.14	240	1555m	42.74		0.00
74) Perylene-d12	37.84	264	787m	45.79		0.00
Target Compounds						Qvalue
3) Decalin	0.00	138	0	N.D.	d	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	925	20.83		
9) 2-Methylnaphthalene	15.46	142	864	25.14		
10) 1-Methylnaphthalene	15.80	142	275	9.53		
11) 2,6-Dimethylnaphthalene	17.57	156	241	7.98		
12) 1,6,7-Trimethylnaphthalene	20.41	170	35	1.24		
13) C2-Naphthalenes	17.57	156	783	17.63		
14) C3-Naphthalenes	20.75	170	835	18.80		
15) C4-Naphthalenes	22.18	184	913m	20.56		
16) Benzothiophene	0.00	134	0	N.D.		
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.03	154	381	8.87		
22) Acenaphthylene	0.00	152	0	N.D.		
23) Acenaphthene	19.09	154	305	10.58		
24) Dibenzofuran	19.68	168	2238	45.87	ng/ml	
25) Fluorene	20.86	166	630	16.29		
26) C1-Fluorenes	22.86	180	179	4.63		
27) C2-Fluorenes	24.58	194	1011	26.14		
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	0.00	266	0	N.D.		
32) Carbazole	0.00	167	0	N.D.	d	
33) Dibenzothiophene	23.71	184	273m	5.60		
34) C1-Dibenzothiophene	25.22	198	447m	9.16		
35) C2-Dibenzothiophene	26.94	212	2308m	47.31		
36) C3-Dibenzothiophene	28.15	226	4004m	82.07		
37) Phenanthrene	24.11	178	3896m	75.49		
38) Anthracene	24.31	178	202m	3.73		
39) 1-Methylphenanthrene	26.27	192	376m	9.68		
40) C1-Phenanthrene/Anthracene	26.17	192	2246m	43.52		
41) C2-Phenanthrene/Anthracene	27.72	206	13461m	260.83		
42) C3-Phenanthrene/Anthracene	29.16	220	19727m	382.24		
43) C4-Phenanthrene/Anthracene	31.12	234	13973m	270.75		
44) Naphthobenzothiophene	32.26	234	1430m	35.71		

(#) = qualifier out of range (m) = manual integration

000094

Data File : D:\GC-MSD~1\MS30306\ETX7073.D Vial: 5
Acq On : 28 Sep 2006 1:44 am Operator: TJM
Sample : B-70 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:47 2006 Quant Results File: 092806.RES

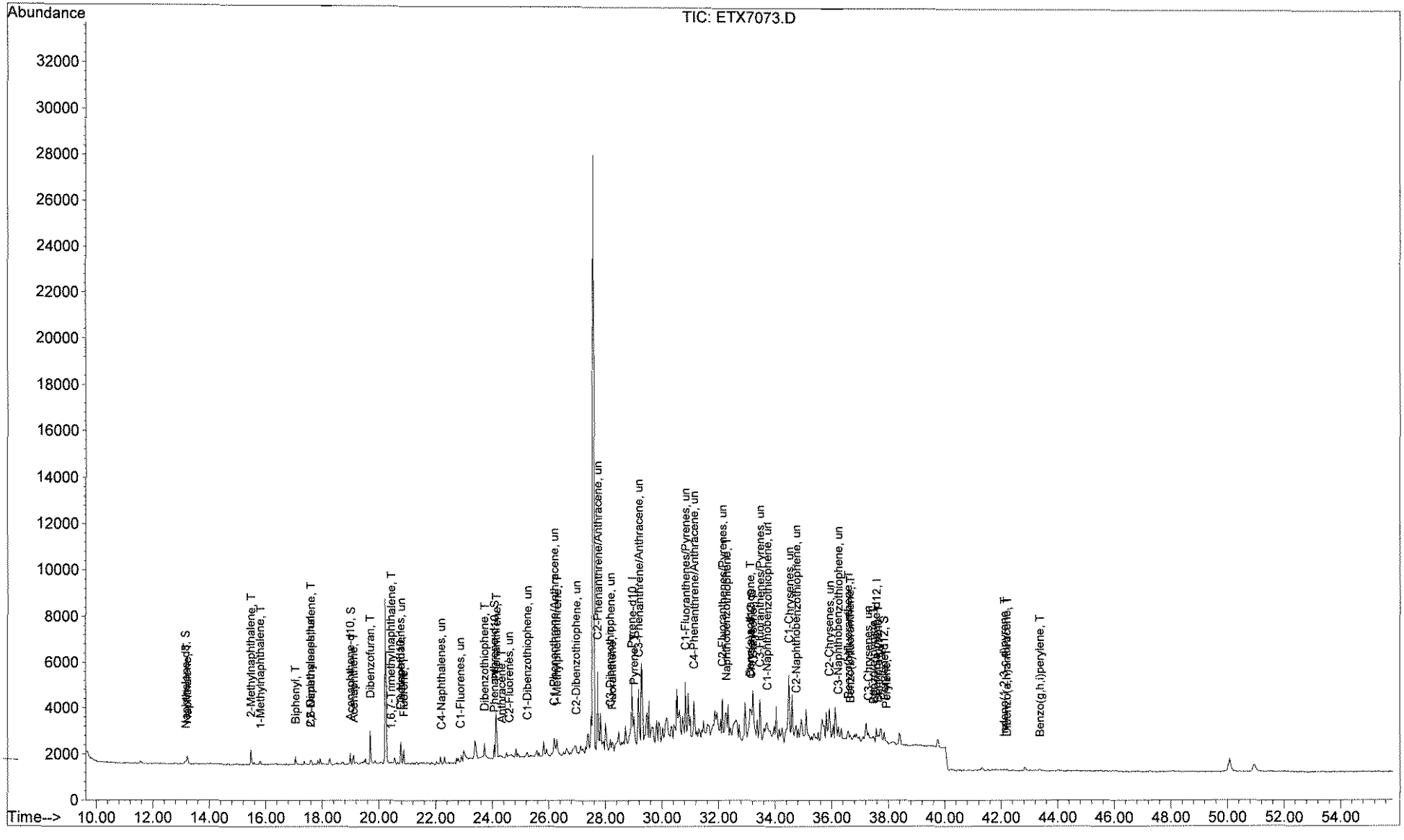
Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45)	C1-Naphthobenzothiophene	33.70	248	3791m	94.66		
46)	C2-Naphthobenzothiophene	34.73	262	4442m	110.91		
47)	C3-Naphthobenzothiophene	36.21	276	1663m	41.52		
48)	Fluoranthene	28.22	202	655m	9.42		
49)	Pyrene	29.00	202	2046m	29.36		
50)	C1-Fluoranthenes/Pyrenes	30.82	216	13746m	197.61	ng/mL	
51)	C2-Fluoranthenes/Pyrenes	32.13	230	19944m	286.71	ng/mL	
52)	C3-Fluoranthenes/Pyrenes	33.46	244	13664m	196.43	ng/mL	
54)	Benz(a)anthracene	33.10	228	1801m	41.25		
55)	Chrysene	33.21	228	3776m	72.54		
56)	C1-Chrysenes	34.48	242	13112m	251.89	ng/mL	
57)	C2-Chrysenes	35.90	256	13810m	265.29	ng/mL	
58)	C3-Chrysenes	37.27	270	5492m	105.50	ng/mL	
59)	C4-Chrysenes	0.00	284	0	N.D.	d	
61)	C29-Hopane	0.00	191	0	N.D.	d	
62)	18a-Oleanane	0.00	191	0	N.D.	d	
63)	C30-Hopane	0.00	191	0	N.D.	d	
64)	Benzo(b)fluoranthene	36.57	252	713m	18.16		
65)	Benzo(k)fluoranthene	36.64	252	140m	3.75		
66)	Benzo(e)pyrene	37.45	252	687m	20.16		
67)	Benzo(a)pyrene	37.63	252	815m	26.83		
68)	Indeno(1,2,3-c,d)pyrene	42.07	276	170m	7.16		
69)	Dibenzo(a,h)anthracene	42.18	278	137m	5.87		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.34	276	182m	7.74		
75)	Perylene	37.91	252	257m	8.49		

(#) = qualifier out of range (m) = manual integration

Data File : D:\GC-MSD~1\MS30306\ETX7073.D Vial: 5
Acq On : 28 Sep 2006 1:44 am Operator: TJM
Sample : B-70 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:47 2006 Quant Results File: 092806.RES

Method : D:\GC-MSD~1\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Tissue, Sediment, and Water Sample Report (Use d-10 Phenanthrene only for Surrogate Corrections)

Data File Name **ETX7074.D** Su Amt = 50 ETX7074.D
Data File Path **D:\GC-MSD~1\MS30306** B-30
Operator **TJM**
Date Acquired **09/28/20 -1:2:**
Method File **PAH-2002**
Sample Name **B-30**
Misc Info
Instrument Name **GC/MS Ins** 09/28/20 -1:2:
Vial Number **6** PAH-2002
Sample Multiplier **1** 1.00
Sample Amount **0**

Peak #	Compound	Ret Time (min)	Target Response (Area)	Conc. (ng/g or ng/L)	Su. Corrected Conc. (ng/g or ng/L)
3)	Decalin	0.00	0	0.00	0.00
4)	C1-Decalin	0.00	0	0.00	0.00
5)	C2-Decalin	0.00	0	0.00	0.00
6)	C3-Decalin	0.00	0	0.00	0.00
7)	C4-Decalin	0.00	0	0.00	0.00
8)	Naphthalene	13.21	1971	43.22	77.61
9+10)	C1-Naphthalenes	15.61	2018	44.25	79.46
13)	C2-Naphthalenes	17.82	2314	50.74	91.12
14)	C3-Naphthalenes	19.85	5910	129.60	232.72
15)	C4-Naphthalenes	22.18	9588	210.26	377.54
16)	Benzothiophene	0.00	0	0.00	0.00
17)	C1-Benzothiophene	0.00	0	0.00	0.00
18)	C2-Benzothiophene	0.00	0	0.00	0.00
19)	C3-Benzothiophene	0.00	0	0.00	0.00
21)	Biphenyl	17.03	592	13.42	24.10
22)	Acenaphthylene	0.00	0	0.00	0.00
23)	Acenaphthene	19.09	599	20.24	36.35
24)	Dibenzofuran	19.68	4042	80.68	144.87
25)	Fluorene	20.86	1188	29.91	53.71
26)	C1-Fluorenes	22.86	1630	41.04	73.70
27)	C2-Fluorenes	24.48	9704	244.35	438.75
28)	C3-Fluorenes	28.93	6173	155.44	279.10
31)	Pentachlorophenol	0.00	0	0.00	0.00
32)	Carbazole	0.00	0	0.00	0.00
38)	Anthracene	24.31	829	14.00	25.14
37)	Phenanthrene	24.11	9097	161.23	289.51
40)	C1-Phenanthrene/Anthracene	25.90	43444	769.99	1382.60
41)	C2-Phenanthrene/Anthracene	27.72	128709	2281.20	4096.13
42)	C3-Phenanthrene/Anthracene	29.30	146403	2594.80	4659.24
43)	C4-Phenanthrene/Anthracene	31.15	81365	1442.09	2589.42
33)	Dibenzothiophene	23.67	720	13.50	24.24
34)	C1-Dibenzothiophene	25.49	5267	98.75	177.32
35)	C2-Dibenzothiophene	26.94	19052	357.22	641.42
36)	C3-Dibenzothiophene	28.15	28397	532.43	956.04
48)	Fluoranthene	28.22	3351	44.06	79.12
49)	Pyrene	29.00	15641	205.31	368.66
50)	C1-Fluoranthenes/Pyrenes	30.82	96872	1273.82	2287.28
51)	C2-Fluoranthenes/Pyrenes	32.13	128679	1692.07	3038.29
52)	C3-Fluoranthenes/Pyrenes	33.46	104511	1374.27	2467.65
44)	Naphthobenzothiophene	32.30	8801	201.01	360.93
45)	C1-Naphthobenzothiophene	33.70	23278	531.65	954.64
46)	C2-Naphthobenzothiophene	35.37	26225	598.96	1075.49
47)	C3-Naphthobenzothiophene	36.21	8827	201.60	362.00
54)	Benz(a)anthracene	33.10	11919	249.71	448.37
55)	Chrysene	33.21	25281	444.23	797.67
56)	C1-Chrysenes	34.48	89686	1575.94	2829.77
57)	C2-Chrysenes	35.90	97150	1707.10	3065.27
58)	C3-Chrysenes	37.27	42256	742.51	1333.26
59)	C4-Chrysenes	40.47	1739	30.56	54.87
64)	Benzo(b)fluoranthene	36.57	4171	88.41	158.75
65)	Benzo(k)fluoranthene	36.60	626	13.94	25.04
66)	Benzo(e)pyrene	37.45	4323	105.53	189.49
67)	Benzo(a)pyrene	37.63	5914	162.00	290.89
75)	Perylene	37.91	1744	47.94	86.08
68)	Indeno(1,2,3-c,d)pyrene	42.08	700	24.53	44.05
69)	Dibenzo(a,h)anthracene	42.15	832	29.66	53.25
70)	C1-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
71)	C2-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
72)	C3-Dibenzo(a,h)anthracene	0.00	0	0.00	0.00
73)	Benzo(g,h,i)perylene	43.35	1373	48.60	87.26
	Total PAH				37208
	Individual Isomers				
9)	2-Methylnaphthalene	15.46	1505	42.65	76.58
10)	1-Methylnaphthalene	15.77	513	17.32	31.10
11)	2,6-Dimethylnaphthalene	17.57	633	20.41	36.65
12)	1,6,7-Trimethylnaphthalene	20.41	528	18.26	32.79
39)	1-Methylphenanthrene	26.27	6446	151.72	272.42
61)	C29-Hopane	40.00	1039	47.70	85.64
62)	18a-Oleanane	41.06	286	13.13	23.57
63)	C30-Hopane	41.30	1372	62.98	113.09
	Surrogates *(AR-STSU-040-005)*				Su Recovery (%)
2)	Naphthalene-d8	13.12	861	21.24	42
20)	Acenaphthene-d10	18.97	575	23.12	46
30)	Phenanthrene-d10	24.04	1556	27.85	56
53)	Chrysene-d12	33.14	1892	47.57	95
74)	Perylene-d12	37.84	933	45.17	90
	Internal Stds *(AR-WKIS-0500-007)*				
1)	Fluorene-d10	20.75	1225	51.08	
29)	Pyrene-d10	28.93	2802	49.98	
60)	Benzo(a)pyrene-d12	37.56	1173	45.61	

Quantitation Report (QT Reviewed)

Data File : D:\GC-MSD-1\MS30306\ETX7074.D Vial: 6
Acq On : 28 Sep 2006 2:48 am Operator: TJM
Sample : B-30 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:50 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1225m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	2802m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	1173m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.12	136	861m	21.24		0.00
20) Acenaphthene-d10	18.97	164	575	23.12		0.00
30) Phenanthrene-d10	24.04	188	1556m	27.85		0.00
53) Chrysene-d12	33.14	240	1892m	47.57		0.00
74) Perylene-d12	37.84	264	933m	45.17		0.00
Target Compounds						Qvalue
3) Decalin	0.00	138	0	N.D.	d	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	1971	43.22		
9) 2-Methylnaphthalene	15.46	142	1505	42.65		
10) 1-Methylnaphthalene	15.77	142	513	17.32		
11) 2,6-Dimethylnaphthalene	17.57	156	633	20.41		
12) 1,6,7-Trimethylnaphthalene	20.41	170	528	18.26		
13) C2-Naphthalenes	17.82	156	2314	50.74		
14) C3-Naphthalenes	19.85	170	5910	129.60		
15) C4-Naphthalenes	22.18	184	9588	210.26		
16) Benzothiophene	0.00	134	0	N.D.	d	
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.03	154	592	13.42		
22) Acenaphthylene	0.00	152	0	N.D.		
23) Acenaphthene	19.09	154	599	20.24		
24) Dibenzofuran	19.68	168	4042	80.68	ng/ml	
25) Fluorene	20.86	166	1188	29.91		
26) C1-Fluorenes	22.86	180	1630	41.04		
27) C2-Fluorenes	24.48	194	9704	244.35		
28) C3-Fluorenes	28.93	208	6173	155.44		
31) Pentachlorophenol	0.00	266	0	N.D.		
32) Carbazole	0.00	167	0	N.D.	d	
33) Dibenzothiophene	23.67	184	720m	13.50		
34) C1-Dibenzothiophene	25.49	198	5267m	98.75		
35) C2-Dibenzothiophene	26.94	212	19052m	357.22		
36) C3-Dibenzothiophene	28.15	226	28397m	532.43		
37) Phenanthrene	24.11	178	9097m	161.23		
38) Anthracene	24.31	178	829m	14.00		
39) 1-Methylphenanthrene	26.27	192	6446m	151.72		
40) C1-Phenanthrene/Anthracene	25.90	192	43444m	769.99		
41) C2-Phenanthrene/Anthracene	27.72	206	128709m	2281.20		
42) C3-Phenanthrene/Anthracene	29.30	220	146403m	2594.80		
43) C4-Phenanthrene/Anthracene	31.15	234	81365m	1442.09		
44) Naphthobenzothiophene	32.30	234	8801m	201.01		

(#) = qualifier out of range (m) = manual integration

Data File : D:\GC-MSD~1\MS30306\ETX7074.D Vial: 6
Acq On : 28 Sep 2006 2:48 am Operator: TJM
Sample : B-30 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Oct 3 14:50 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
45)	C1-Naphthobenzothiophene	33.70	248	23278m	531.65		
46)	C2-Naphthobenzothiophene	35.37	262	26225m	598.96		
47)	C3-Naphthobenzothiophene	36.21	276	8827m	201.60		
48)	Fluoranthene	28.22	202	3351m	44.06		
49)	Pyrene	29.00	202	15641m	205.31		
50)	C1-Fluoranthenes/Pyrenes	30.82	216	96872m	1273.82	ng/mL	
51)	C2-Fluoranthenes/Pyrenes	32.13	230	128679m	1692.07	ng/mL	
52)	C3-Fluoranthenes/Pyrenes	33.46	244	104511m	1374.27	ng/mL	
54)	Benz(a)anthracene	33.10	228	11919m	249.71		
55)	Chrysene	33.21	228	25281m	444.23		
56)	C1-Chrysenes	34.48	242	89686m	1575.94	ng/mL	
57)	C2-Chrysenes	35.90	256	97150m	1707.10	ng/mL	
58)	C3-Chrysenes	37.27	270	42256m	742.51	ng/mL	
59)	C4-Chrysenes	40.47	284	1739m	30.56	ng/mL	
61)	C29-Hopane	40.00	191	1039m	47.70	ng/ml	
62)	18a-Oleanane	41.06	191	286m	13.13	ng/ml	
63)	C30-Hopane	41.30	191	1372m	62.98	ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	4171m	88.41		
65)	Benzo(k)fluoranthene	36.60	252	626m	13.94		
66)	Benzo(e)pyrene	37.45	252	4323m	105.53		
67)	Benzo(a)pyrene	37.63	252	5914m	162.00		
68)	Indeno(1,2,3-c,d)pyrene	42.08	276	700m	24.53		
69)	Dibenzo(a,h)anthracene	42.15	278	832m	29.66		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.35	276	1373m	48.60		
75)	Perylene	37.91	252	1744m	47.94		

(#) = qualifier out of range (m) = manual integration

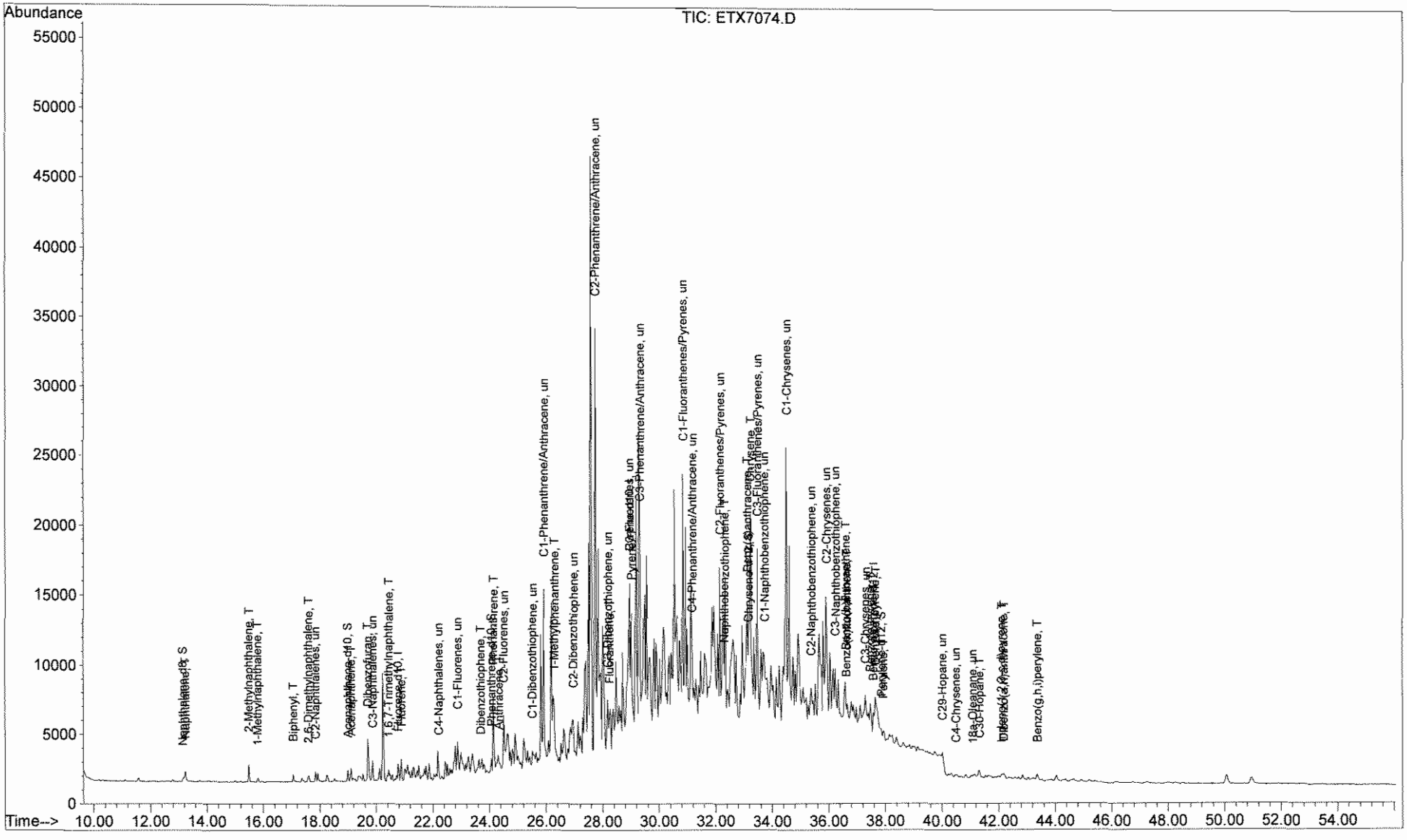
000099

Data File : D:\GC-MSD~1\MS30306\ETX7074.D
Acq On : 28 Sep 2006 2:48 am
Sample : B-30
Misc :
MS Integration Params: rteint.p
Quant Time: Oct 3 14:50 2006

Vial: 6
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : D:\GC-MSD~1\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Total Petroleum Hydrocarbons/ Aliphatic Hydrocarbons Initial Calibration Data

TPH/Aliphatic ICAL
C10B0928.M

Area for TPH Calculations

C10B0928M

	Level 1 GC10801E.D	Level 2 GC10801F.D	Level 3 GC10801G.D	Level 4 GC10801H.D	Level 5 GC10801I.D
n-undecane (n-C11)	10328	85098	221885	318156	391593
n-hexadecane (n-C16)	9843	78030	198895	280470	341624
n-eicosane (n-C20)	9042	69640	175370	247561	299530
n-pentadecane (n-C25)	8362	64019	161003	229232	278079
n-triacontane (n-C30)	7874	60591	153555	218365	267365
n-tetratriacontane (n-C34)	7739	48565	127408	187335	237468
Average Area For Response Factor	8865	67657	173019	246853	302610

Response Factor Report GC#1

Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:18:49 2006
Response via : Initial Calibration

Calibration Files
1 =GC10801E.D 2 =GC10801F.D 3 =GC10801G.D
4 =GC10801H.D 5 =GC10801I.D

		Compound	1	2	3	4	5	Avg	%RSD
1)		n-hexadecane-d34	ISTD						
2)		n-C10	1.244	1.224	1.280	1.326	1.334	1.282	3.80
3)		n-C11	1.197	1.199	1.255	1.296	1.304	1.250	4.09
4)	S	n-dodecane-d26	0.993	0.961	1.010	1.038	1.044	1.009	3.36
5)		n-C12	1.203	1.203	1.261	1.297	1.304	1.254	3.90
6)		n-C13	1.186	1.182	1.234	1.265	1.269	1.227	3.39
7)		n-C14	1.166	1.164	1.209	1.233	1.235	1.201	2.89
8)		n-C15	1.176	1.146	1.179	1.202	1.198	1.180	1.90
9)		n-C16	1.150	1.111	1.137	1.154	1.149	1.140	1.54
10)		5a-androstane	ISTD						
11)		n-C17	0.970	0.958	1.007	0.984	0.995	0.983	1.97
12)		Pristane	0.931	0.910	0.953	0.930	0.940	0.933	1.69
13)		n-C18	0.955	0.927	0.972	0.950	0.960	0.953	1.76
14)		Phytane	0.951	0.931	0.972	0.953	0.961	0.953	1.59
15)		n-C19	0.913	0.893	0.934	0.914	0.920	0.915	1.62
16)	S	n-eicosane-d42	0.787	0.769	0.805	0.790	0.794	0.789	1.67
17)		n-C20	0.911	0.873	0.910	0.891	0.897	0.896	1.73
18)		n-C21	0.878	0.867	0.904	0.888	0.892	0.886	1.57
19)		n-C22	0.858	0.824	0.861	0.844	0.850	0.847	1.74
20)		n-C23	0.870	0.820	0.856	0.844	0.851	0.848	2.20
21)		n-C24	0.855	0.809	0.844	0.832	0.838	0.836	2.04
22)		n-C25	0.842	0.803	0.836	0.826	0.833	0.828	1.82
23)		n-C26	0.901	0.803	0.840	0.830	0.838	0.843	4.26
24)		n-C27	0.916	0.788	0.821	0.811	0.821	0.832	5.92
25)		n-C28	0.963	0.788	0.821	0.812	0.821	0.841	8.25
26)		n-C29	0.876	0.792	0.827	0.817	0.829	0.828	3.69
27)	S	n-triacontane-d62	0.782	0.733	0.768	0.757	0.769	0.762	2.40
28)		n-C30	0.793	0.758	0.795	0.785	0.799	0.786	2.11
29)		n-C31	0.934	0.740	0.779	0.775	0.792	0.804	9.34
30)		n-C32	0.745	0.692	0.728	0.728	0.749	0.728	3.12
31)		n-C33	0.821	0.644	0.689	0.700	0.726	0.716	9.21
32)		n-C34	0.779	0.610	0.662	0.675	0.712	0.688	9.17
33)		TPH	0.893	0.849	0.898	0.890	0.907	0.887	2.54
34)		TRH1	0.893	0.849	0.898	0.890	0.907	0.887	2.54
35)		TRH2	0.893	0.849	0.898	0.890	0.907	0.887	2.54
36)		TRH3	0.893	0.849	0.898	0.890	0.907	0.887	2.54
37)		TRH4	0.893	0.849	0.898	0.890	0.907	0.887	2.54
38)		TRH5	0.893	0.849	0.898	0.890	0.907	0.887	2.54
39)		TRH6	0.893	0.849	0.898	0.890	0.907	0.887	2.54

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801E.D Vial: 96
Acq On : 27 Sep 2006 6:59 pm Operator: TJM
Sample : CS1 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:18 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Mon Sep 18 17:14:19 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc	Units
		Internal Standards				
1)		n-hexadecane-d34	13.55	137017	20.001	ug/mlm
10)		5a-androstane	18.97	158901	20.003	ug/mlm
		System Monitoring Compounds				
4)	S	n-dodecane-d26	9.22	8504	1.247	ug/mlm
16)	S	n-eicosane-d42	18.41	7814	1.247	ug/mlm
27)	S	n-triacontane-d62	30.44	7765	1.285	ug/mlm
		Target Compounds				
2)		n-C10	6.86	10654	1.238	ug/mlm
3)		n-C11	8.18	10328	1.226	ug/mlm
5)		n-C12	9.43	10305	1.214	ug/mlm
6)		n-C13	10.59	10156	1.220	ug/mlm
7)		n-C14	11.67	9987	1.221	ug/mlm
8)		n-C15	12.72	9990	1.244	ug/mlm
9)		n-C16	13.82	9844	1.265	ug/mlm
11)		n-C17	14.98	9633	1.236	ug/mlm
12)		Pristane	15.11	9174	1.236	ug/mlm
13)		n-C18	16.21	9481	1.257	ug/mlm
14)		Phytane	16.39	9291	1.228	ug/mlm
15)		n-C19	17.50	9071	1.255	ug/mlm
17)		n-C20	18.81	9042	1.283	ug/mlm
18)		n-C21	20.14	8718	1.248	ug/mlm
19)		n-C22	21.46	8386	1.262	ug/mlm
20)		n-C23	22.76	8713	1.320	ug/mlm
21)		n-C24	24.04	8487	1.305	ug/mlm
22)		n-C25	25.28	8363	1.307	ug/mlm
23)		n-C26	26.49	8877	1.385	ug/mlm
24)		n-C27	27.66	9025	1.439	ug/mlm
25)		n-C28	28.80	9558	1.518	ug/mlm
26)		n-C29	29.90	8703	1.357	ug/mlm
28)		n-C30	30.98	7875	1.231	ug/mlm
29)		n-C31	32.00	9274	1.460	ug/mlm
30)		n-C32	33.09	7280	1.175	ug/mlm
31)		n-C33	34.32	8156	1.313	ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801E.D Vial: 96
Acq On : 27 Sep 2006 6:59 pm Operator: TJM
Sample : CS1 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:18 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Mon Sep 18 17:14:19 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

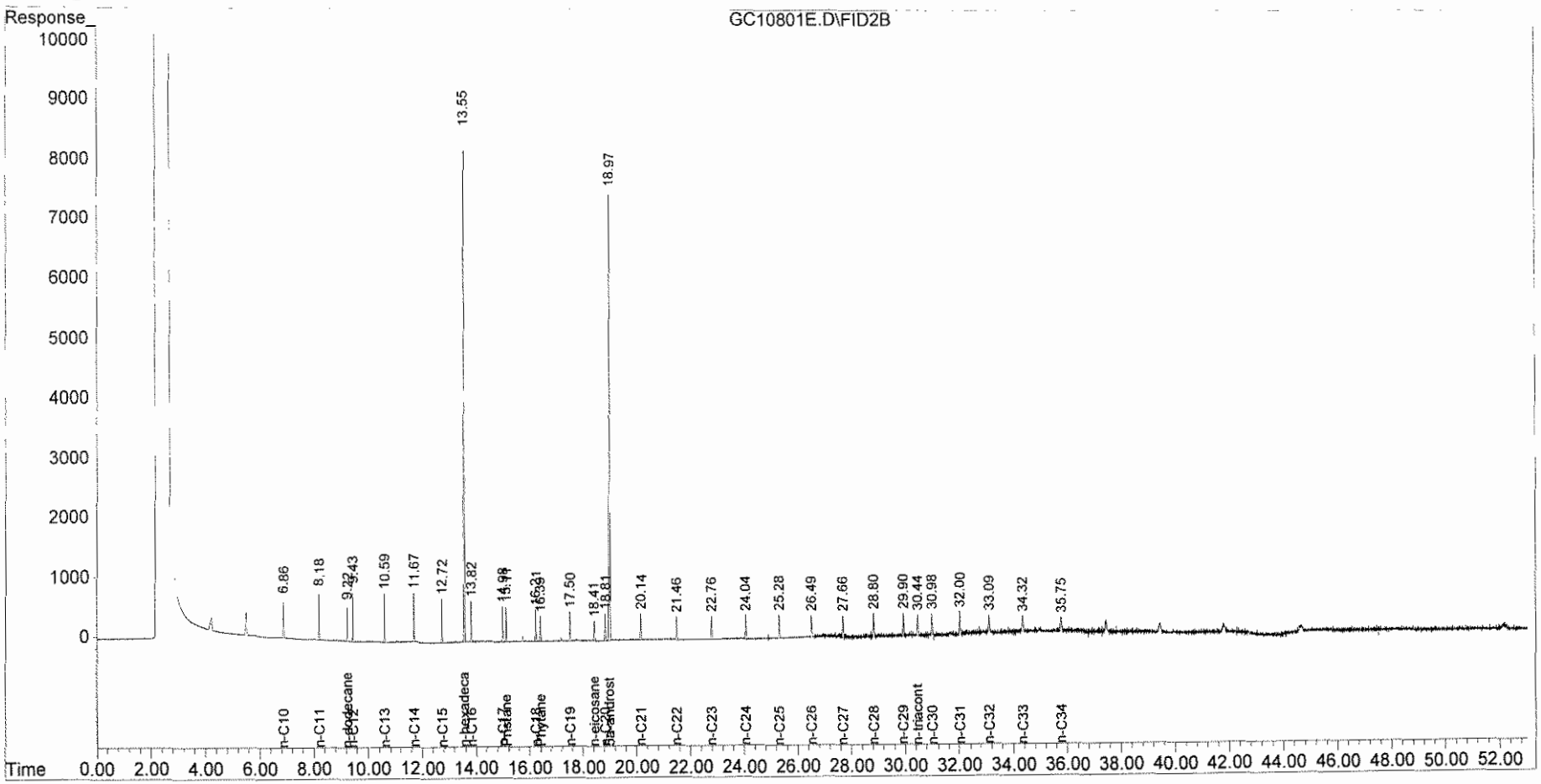
	Compound	R.T.	Response	Conc Units
32)	n-C34	35.75	7739	1.219 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801E.D Vial: 96
Acq On : 27 Sep 2006 6:59 pm Operator: TJM
Sample : CS1 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:18 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Mon Sep 18 17:14:19 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801F.D Vial: 97
Acq On : 27 Sep 2006 7:59 pm Operator: TJM
Sample : CS2 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:07 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:04:45 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc Units
		Internal Standards			
1)		n-hexadecane-d34	13.55	141063	20.001 ug/mlm
10)		5a-androstane	18.97	159448	20.003 ug/mlm
		System Monitoring Compounds			
4)	S	n-dodecane-d26	9.22	67852	9.641 ug/mlm
16)	S	n-eicosane-d42	18.41	61290	9.758 ug/mlm
27)	S	n-triacontane-d62	30.44	58556	9.711 ug/mlm
		Target Compounds			
2)		n-C10	6.86	86338	9.739 ug/mlm
3)		n-C11	8.18	85098	9.806 ug/mlm
5)		n-C12	9.43	84767	9.711 ug/mlm
6)		n-C13	10.59	83126	9.701 ug/mlm
7)		n-C14	11.67	81985	9.748 ug/mlm
8)		n-C15	12.72	80145	9.671 ug/mlm
9)		n-C16	13.82	78030	9.725 ug/mlm
11)		n-C17	14.98	76411	9.758 ug/mlm
12)		Pristane	15.12	72011	9.693 ug/mlm
13)		n-C18	16.21	73954	9.739 ug/mlm
14)		Phytane	16.39	72944	9.605 ug/mlm
15)		n-C19	17.50	71361	9.792 ug/mlm
17)		n-C20	18.82	69640	9.779 ug/mlm
18)		n-C21	20.14	69171	9.866 ug/mlm
19)		n-C22	21.46	64544	9.656 ug/mlm
20)		n-C23	22.77	65742	9.884 ug/mlm
21)		n-C24	24.04	64557	9.895 ug/mlm
22)		n-C25	25.28	64020	9.947 ug/mlm
23)		n-C26	26.49	63593	9.737 ug/mlm
24)		n-C27	27.67	62358	9.692 ug/mlm
25)		n-C28	28.80	62742	9.614 ug/mlm
26)		n-C29	29.90	63219	9.739 ug/mlm
28)		n-C30	30.97	60591	8.970 ug/mlm
29)		n-C31	32.01	59071	8.869 ug/mlm
30)		n-C32	33.09	54304	8.490 ug/mlm
31)		n-C33	34.32	51329	8.105 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

000108

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801F.D Vial: 97
Acq On : 27 Sep 2006 7:59 pm Operator: TJM
Sample : CS2 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:07 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:04:45 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

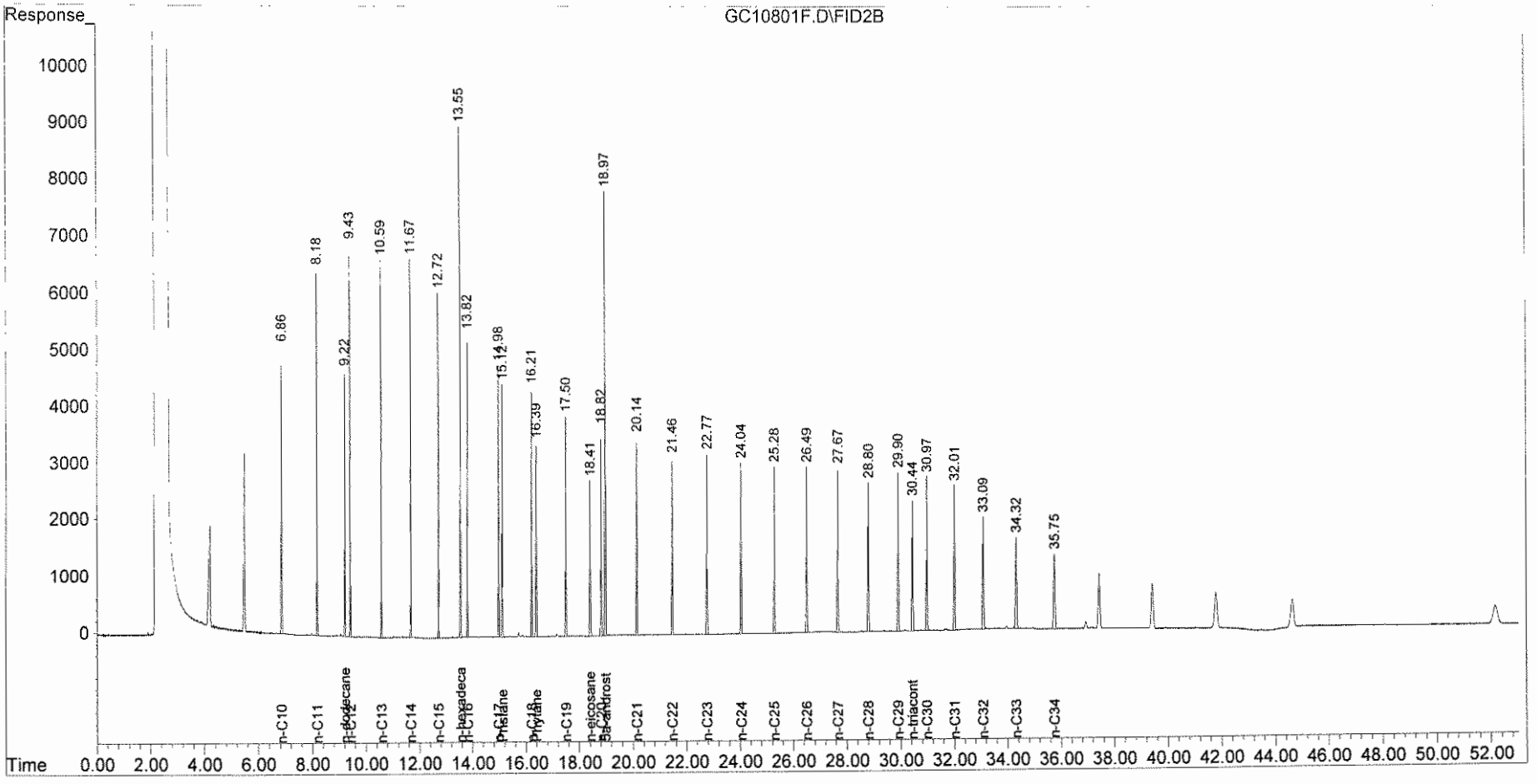
	Compound	R.T.	Response	Conc Units
32)	n-C34	35.75	48566	7.755 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801F.D Vial: 97
Acq On : 27 Sep 2006 7:59 pm Operator: TJM
Sample : CS2 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:07 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:04:45 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



00110

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801G.D Vial: 98
Acq On : 27 Sep 2006 8:59 pm Operator: TJM
Sample : CS3 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:11 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc Units
		Internal Standards			
1)		n-hexadecane-d34	13.55	140569	20.001 ug/mlm
10)		5a-androstane	18.97	154123	20.003 ug/mlm
		System Monitoring Compounds			
4)	S	n-dodecane-d26	9.22	177662	25.302 ug/mlm
16)	S	n-eicosane-d42	18.41	155139	25.568 ug/mlm
27)	S	n-triacontane-d62	30.44	148145	25.765 ug/mlm
		Target Compounds			
2)		n-C10	6.86	224933	25.372 ug/mlm
3)		n-C11	8.18	221885	25.586 ug/mlm
5)		n-C12	9.43	221328	25.400 ug/mlm
6)		n-C13	10.59	216092	25.272 ug/mlm
7)		n-C14	11.67	212264	25.311 ug/mlm
8)		n-C15	12.72	205564	24.874 ug/mlm
9)		n-C16	13.82	198896	24.853 ug/mlm
11)		n-C17	14.98	194115	25.715 ug/mlm
12)		Pristane	15.12	182287	25.435 ug/mlm
13)		n-C18	16.22	187484	25.585 ug/mlm
14)		Phytane	16.39	184172	25.133 ug/mlm
15)		n-C19	17.50	180338	25.629 ug/mlm
17)		n-C20	18.82	175370	25.456 ug/mlm
18)		n-C21	20.14	174263	25.662 ug/mlm
19)		n-C22	21.47	162976	25.165 ug/mlm
20)		n-C23	22.77	165933	25.710 ug/mlm
21)		n-C24	24.05	162742	25.691 ug/mlm
22)		n-C25	25.29	161003	25.737 ug/mlm
23)		n-C26	26.49	160647	25.319 ug/mlm
24)		n-C27	27.67	157136	25.137 ug/mlm
25)		n-C28	28.80	157882	24.961 ug/mlm
26)		n-C29	29.91	159495	25.576 ug/mlm
28)		n-C30	30.98	153556	24.127 ug/mlm
29)		n-C31	32.01	150144	24.314 ug/mlm
30)		n-C32	33.09	138211	23.279 ug/mlm
31)		n-C33	34.32	132800	23.217 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801G.D Vial: 98
Acq On : 27 Sep 2006 8:59 pm Operator: TJM
Sample : CS3 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:11 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

	Compound	R.T.	Response	Conc Units
32)	n-C34	35.75	127409	22.693 ug/mlm

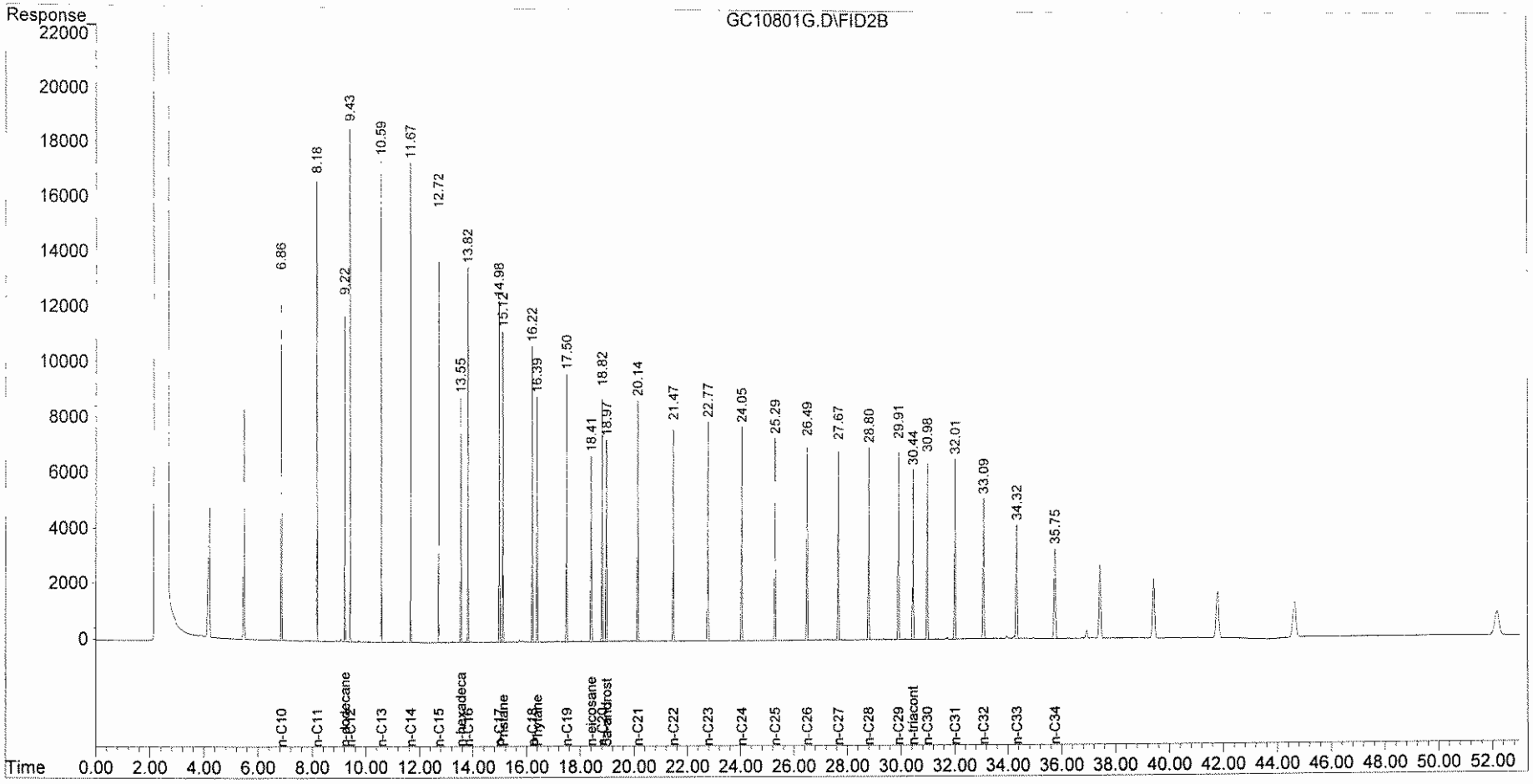
(f)=RT Delta > 1/2 Window (m)=manual int.

00112

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801G.D Vial: 98
Acq On : 27 Sep 2006 8:59 pm Operator: TJM
Sample : CS3 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:11 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



00113

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801H.D Vial: 99
Acq On : 27 Sep 2006 10:00 pm Operator: TJM
Sample : CS4 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:14 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc Units
		Internal Standards			
1)		n-hexadecane-d34	13.55	121984	20.001 ug/mlm
10)		5a-androstane	18.97	138772	20.003 ug/mlm
		System Monitoring Compounds			
4)	S	n-dodecane-d26	9.22	253545	41.610 ug/mlm
16)	S	n-eicosane-d42	18.41	219201	40.122 ug/mlm
27)	S	n-triacontane-d62	30.45	210612	40.681 ug/mlm
		Target Compounds			
2)		n-C10	6.86	323514	42.051 ug/mlm
3)		n-C11	8.19	318157	42.278 ug/mlm
5)		n-C12	9.43	316071	41.799 ug/mlm
6)		n-C13	10.59	307536	41.446 ug/mlm
7)		n-C14	11.68	300704	41.320 ug/mlm
8)		n-C15	12.72	290805	40.550 ug/mlm
9)		n-C16	13.82	280470	40.386 ug/mlm
11)		n-C17	14.99	273390	40.223 ug/mlm
12)		Pristane	15.12	256447	39.742 ug/mlm
13)		n-C18	16.22	263842	39.989 ug/mlm
14)		Phytane	16.39	259988	39.404 ug/mlm
15)		n-C19	17.50	254316	40.140 ug/mlm
17)		n-C20	18.82	247562	39.910 ug/mlm
18)		n-C21	20.15	246581	40.329 ug/mlm
19)		n-C22	21.47	230402	39.511 ug/mlm
20)		n-C23	22.77	235582	40.539 ug/mlm
21)		n-C24	24.05	231045	40.508 ug/mlm
22)		n-C25	25.29	229232	40.698 ug/mlm
23)		n-C26	26.50	228685	40.029 ug/mlm
24)		n-C27	27.67	223644	39.734 ug/mlm
25)		n-C28	28.81	225029	39.512 ug/mlm
26)		n-C29	29.91	226972	40.422 ug/mlm
28)		n-C30	30.98	218366	38.106 ug/mlm
29)		n-C31	32.02	215153	38.695 ug/mlm
30)		n-C32	33.09	199033	37.232 ug/mlm
31)		n-C33	34.33	194248	37.716 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801H.D Vial: 99
Acq On : 27 Sep 2006 10:00 pm Operator: TJM
Sample : CS4 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:14 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

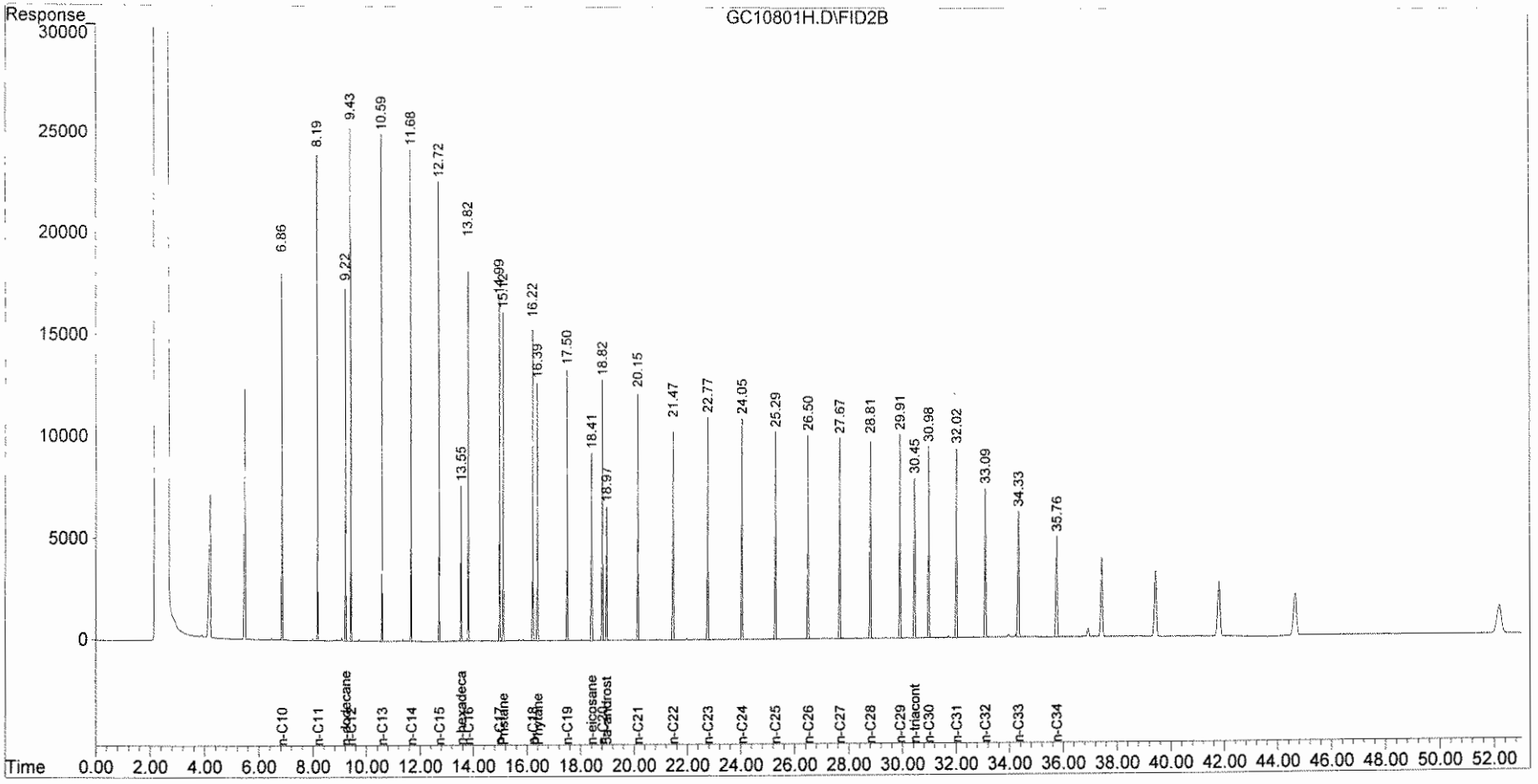
	Compound	R.T.	Response	Conc	Units
32)	n-C34	35.76	187335	37.058	ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801H.D Vial: 99
Acq On : 27 Sep 2006 10:00 pm Operator: TJM
Sample : CS4 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:14 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801I.D Vial: 100
Acq On : 27 Sep 2006 11:00 pm Operator: TJM
Sample : CS5 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:16 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

		Compound	R.T.	Response	Conc Units
		Internal Standards			
1)		n-hexadecane-d34	13.55	119447	20.001 ug/mlm
10)		5a-androstane	18.97	133470	20.003 ug/mlm
		System Monitoring Compounds			
4)	S	n-dodecane-d26	9.22	311937	52.280 ug/mlm
16)	S	n-eicosane-d42	18.41	265159	50.462 ug/mlm
27)	S	n-triacontane-d62	30.45	257182	51.649 ug/mlm
		Target Compounds			
2)		n-C10	6.86	398450	52.891 ug/mlm
3)		n-C11	8.19	391593	53.141 ug/mlm
5)		n-C12	9.43	389195	52.562 ug/mlm
6)		n-C13	10.59	377788	51.995 ug/mlm
7)		n-C14	11.68	368483	51.709 ug/mlm
8)		n-C15	12.72	354962	50.547 ug/mlm
9)		n-C16	13.82	341625	50.236 ug/mlm
11)		n-C17	14.99	332209	50.819 ug/mlm
12)		Pristane	15.12	311496	50.190 ug/mlm
13)		n-C18	16.22	320754	50.546 ug/mlm
14)		Phytane	16.40	315211	49.671 ug/mlm
15)		n-C19	17.50	307672	50.491 ug/mlm
17)		n-C20	18.82	299531	50.206 ug/mlm
18)		n-C21	20.15	297893	50.656 ug/mlm
19)		n-C22	21.47	278896	49.727 ug/mlm
20)		n-C23	22.77	285478	51.076 ug/mlm
21)		n-C24	24.05	280007	51.042 ug/mlm
22)		n-C25	25.29	278079	51.331 ug/mlm
23)		n-C26	26.50	277741	50.547 ug/mlm
24)		n-C27	27.67	272015	50.247 ug/mlm
25)		n-C28	28.81	273559	49.941 ug/mlm
26)		n-C29	29.91	276767	51.248 ug/mlm
28)		n-C30	30.98	267366	48.510 ug/mlm
29)		n-C31	32.02	264348	49.432 ug/mlm
30)		n-C32	33.10	246195	47.884 ug/mlm
31)		n-C33	34.33	242325	48.920 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801I.D Vial: 100
Acq On : 27 Sep 2006 11:00 pm Operator: TJM
Sample : CS5 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:16 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Initial Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :

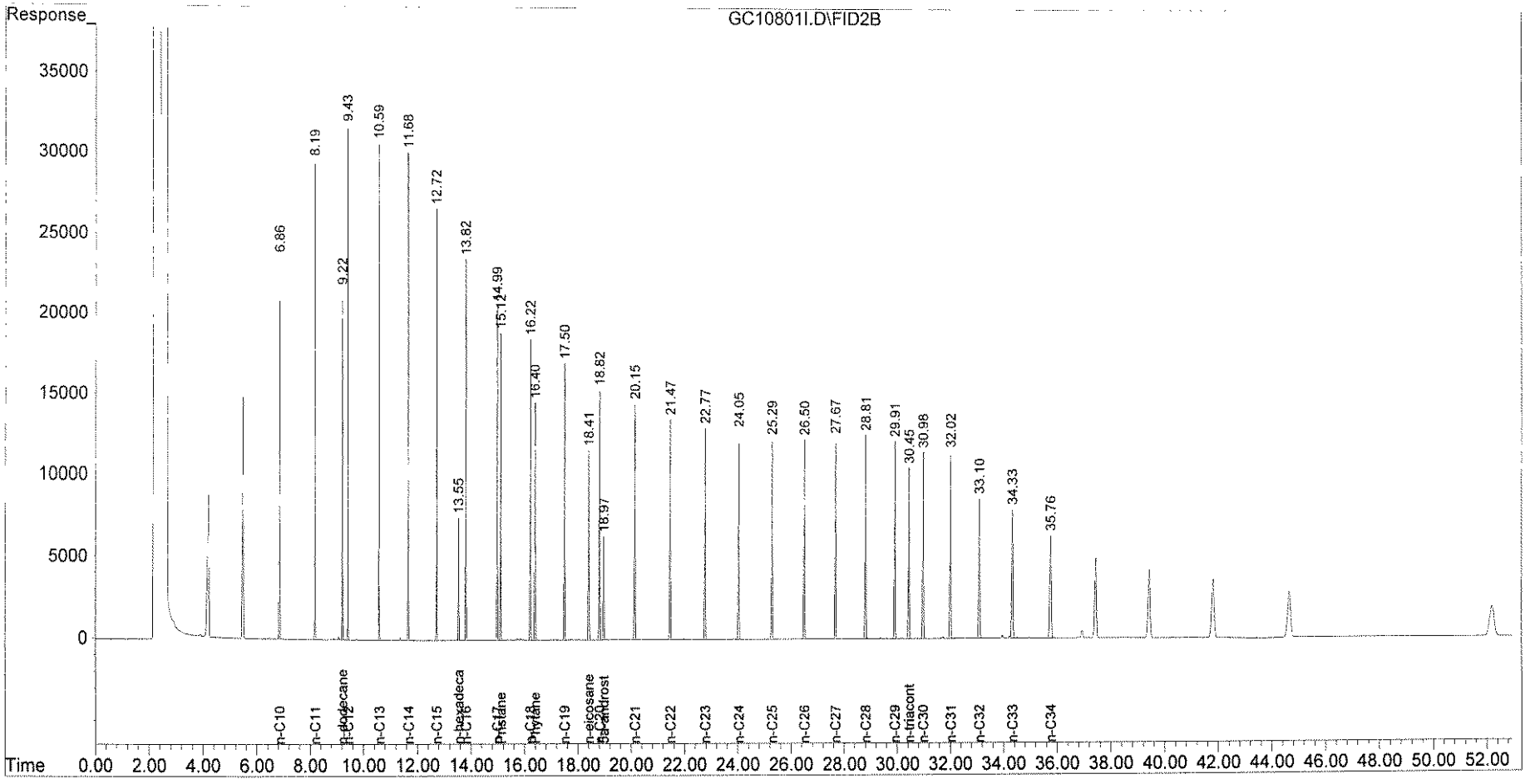
	Compound	R.T.	Response	Conc Units
32)	n-C34	35.76	237468	48.841 ug/mlm

(f)=RT Delta > 1/2 Window (m)=manual int.

Data File : C:\HPCHEM\2\DATA\GC10801\GC10801I.D Vial: 100
Acq On : 27 Sep 2006 11:00 pm Operator: TJM
Sample : CS5 Inst : GC#1
Misc : Multiplr: 1.00
IntFile : autoint1.e
Quant Time: Sep 28 10:16 2006 Quant Results File: C10B0928.RES

Quant Method : C:\HPCHEM\2\METHODS\C10B0928.M (Chemstation Integrator)
Title : C10 - C35 aliphatic
Last Update : Thu Sep 28 10:07:39 2006
Response via : Multiple Level Calibration
DataAcq Meth : ALI_COMP.M

Volume Inj. :
Signal Phase :
Signal Info :



001119

Polycyclic Aromatic Hydrocarbon Initial Calibration Data

PAH ICAL
092806.M

GC/MS 3
(PAH 2002)

Response Factor Report GC/MS Ins

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Initial Calibration

Calibration Files
1 =MS30306D.D 2 =MS30306E.D 3 =MS30306F.D
4 =MS30306G.D 5 =MS30306H.D

		Compound	1	2	3	4	5	Avg	%RSD
1)	I	Fluorene-d10	ISTD						
2)	S	Naphthalene-d8	1.494	1.767	1.721	1.842	1.626	1.690	7.97
3)	T	Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
4)	un	C1-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
5)	un	C2-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
6)	un	C3-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
7)	un	C4-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
8)	T	Naphthalene	1.909	1.886	1.921	2.016	1.775	1.901	4.55
9)	T	2-Methylnaphthalene	1.327	1.447	1.513	1.649	1.421	1.471	8.13
10)	T	1-Methylnaphthalene	1.066	1.277	1.271	1.352	1.209	1.235	8.69
11)	T	2,6-Dimethylnaphthale	1.122	1.325	1.359	1.427	1.233	1.293	9.15
12)	T	1,6,7-Trimethylnaphth	1.119	1.161	1.229	1.326	1.192	1.206	6.52
13)	un	C2-Naphthalenes	1.909	1.886	1.921	2.016	1.775	1.901	4.55
14)	un	C3-Naphthalenes	1.909	1.886	1.921	2.016	1.775	1.901	4.55
15)	un	C4-Naphthalenes	1.909	1.886	1.921	2.016	1.775	1.901	4.55
16)	T	Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
17)	un	C1-Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
18)	un	C2-Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
19)	un	C3-Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
20)	S	Acenaphthene-d10	0.849	1.069	1.088	1.179	1.000	1.037	11.86
21)	T	Biphenyl	1.711	1.743	1.855	2.057	1.829	1.839	7.38
22)	T	Acenaphthylene	1.755	1.941	1.979	2.186	1.951	1.962	7.80
23)	T	Acenaphthene	1.079	1.277	1.251	1.338	1.225	1.234	7.81
24)	T	Dibenzofuran	1.763	2.048	2.266	2.315	2.053	2.089	10.47
25)	T	Fluorene	1.448	1.658	1.763	1.834	1.576	1.656	9.22
26)	un	C1-Fluorenes	1.448	1.658	1.763	1.834	1.576	1.656	9.22
27)	un	C2-Fluorenes	1.448	1.658	1.763	1.834	1.576	1.656	9.22
28)	un	C3-Fluorenes	1.448	1.658	1.763	1.834	1.576	1.656	9.22
29)	I	Pyrene-d10	ISTD						
30)	S	Phenanthrene-d10	0.951	1.011	1.000	0.989	1.033	0.997	3.03
31)	T	Pentachlorophenol	0.068	0.069	0.073	0.074	0.078	0.072	5.54
32)	T	Carbazole	0.978	0.959	0.882	0.870	0.846	0.907	6.40
33)	T	Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
34)	un	C1-Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
35)	un	C2-Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
36)	un	C3-Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
37)	T	Phenanthrene	1.039	1.007	0.984	0.996	1.007	1.006	2.04
38)	T	Anthracene	1.130	1.085	1.033	1.035	0.998	1.056	4.91
39)	T	1-Methylphenanthrene	0.785	0.828	0.726	0.727	0.724	0.758	6.20
40)	un	C1-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04
41)	un	C2-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04
42)	un	C3-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04

(#) = Out of Range

Response Factor Report GC/MS Ins

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Initial Calibration

Calibration Files
1 =MS30306D.D 2 =MS30306E.D 3 =MS30306F.D
4 =MS30306G.D 5 =MS30306H.D

		Compound	1	2	3	4	5	Avg	%RSD
43)	un	C4-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04
44)	T	Naphthobenzothiophene	0.707	0.756	0.765	0.806	0.870	0.781	7.78
45)	un	C1-Naphthobenzothioph	0.707	0.756	0.765	0.806	0.870	0.781	7.78
46)	un	C2-Naphthobenzothioph	0.707	0.756	0.765	0.806	0.870	0.781	7.78
47)	un	C3-Naphthobenzothioph	0.707	0.756	0.765	0.806	0.870	0.781	7.78
48)	T	Fluoranthene	1.227	1.339	1.415	1.392	1.409	1.356	5.77
49)	T	Pyrene	1.389	1.420	1.386	1.291	1.307	1.359	4.14
50)	un	C1-Fluoranthenes/Pyre	1.227	1.339	1.415	1.392	1.409	1.356	5.77
51)	un	C2-Fluoranthenes/Pyre	1.227	1.339	1.415	1.392	1.409	1.356	5.77
52)	un	C3-Fluoranthenes/Pyre	1.227	1.339	1.415	1.392	1.409	1.356	5.77
53)	S	Chrysene-d12	0.675	0.706	0.715	0.721	0.731	0.709	3.02
54)	T	Benz(a)anthracene	0.774	0.832	0.824	0.917	0.910	0.851	7.16
55)	T	Chrysene	0.890	0.966	1.021	1.048	1.151	1.015	9.56
56)	un	C1-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
57)	un	C2-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
58)	un	C3-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
59)	un	C4-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
60)	I	Benzo(a)pyrene-d12	----------ISTD----------						
61)	un	C29-Hopane	0.943	0.847	0.912	0.780	0.753	0.847	9.66
62)	un	18a-Oleanane	0.943	0.847	0.912	0.780	0.753	0.847	9.66
63)	T	C30-Hopane	0.943	0.847	0.912	0.780	0.753	0.847	9.66
64)	T	Benzo(b)fluoranthene	1.750	2.149	1.791	1.782	1.700	1.834	9.78
65)	T	Benzo(k)fluoranthene	1.640	1.910	1.711	1.705	1.762	1.746	5.82
66)	T	Benzo(e)pyrene	1.680	1.669	1.577	1.507	1.531	1.593	4.96
67)	T	Benzo(a)pyrene	1.447	1.522	1.393	1.391	1.344	1.419	4.77
68)	T	Indeno(1,2,3-c,d)pyre	1.159	1.226	1.100	1.038	1.024	1.110	7.61
69)	T	Dibenzo(a,h)anthracen	1.220	1.189	1.049	0.998	0.998	1.091	9.75
70)	un	C1-Dibenzo(a,h)anthra	1.220	1.189	1.049	0.998	0.998	1.091	9.75
71)	un	C2-Dibenzo(a,h)anthra	1.220	1.189	1.049	0.998	0.998	1.091	9.75
72)	un	C3-Dibenzo(a,h)anthra	1.220	1.189	1.049	0.998	0.998	1.091	9.75
73)	T	Benzo(g,h,i)perylene	1.127	1.229	1.076	1.048	1.013	1.099	7.66
74)	S	Perylene-d12	0.712	0.887	0.827	0.792	0.798	0.803	7.89
75)	T	Perylene	1.371	1.525	1.434	1.394	1.349	1.415	4.90

(#) = Out of Range

Response Factor Report GC/MS Ins

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Initial Calibration

Calibration Files
1 =MS30306D.D 2 =MS30306E.D 3 =MS30306F.D
4 =MS30306G.D 5 =MS30306H.D

		Compound	1	2	3	4	5	Avg	%RSD
1)	I	Fluorene-d10	ISTD						
2)	S	Naphthalene-d8	1.494	1.767	1.721	1.842	1.626	1.690	7.97
3)	T	Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
4)	un	C1-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
5)	un	C2-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
6)	un	C3-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
7)	un	C4-Decalin	0.365	0.371	0.343	0.324	0.294	0.339	9.28
8)	T	Naphthalene	1.909	1.886	1.921	2.016	1.775	1.901	4.55
9)	T	2-Methylnaphthalene	1.327	1.447	1.513	1.649	1.421	1.471	8.13
10)	T	1-Methylnaphthalene	1.066	1.277	1.271	1.352	1.209	1.235	8.69
11)	T	2,6-Dimethylnaphthale	1.122	1.325	1.359	1.427	1.233	1.293	9.15
12)	T	1,6,7-Trimethylnaphth	1.119	1.161	1.229	1.326	1.192	1.206	6.52
13)	un	C2-Naphthalenes	1.909	1.886	1.921	2.016	1.775	1.901	4.55
14)	un	C3-Naphthalenes	1.909	1.886	1.921	2.016	1.775	1.901	4.55
15)	un	C4-Naphthalenes	1.909	1.886	1.921	2.016	1.775	1.901	4.55
16)	T	Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
17)	un	C1-Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
18)	un	C2-Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
19)	un	C3-Benzothiophene	1.426	1.695	1.706	1.821	1.576	1.645	9.10
20)	S	Acenaphthene-d10	0.849	1.069	1.088	1.179	1.000	1.037	11.86
21)	T	Biphenyl	1.711	1.743	1.855	2.057	1.829	1.839	7.38
22)	T	Acenaphthylene	1.755	1.941	1.979	2.186	1.951	1.962	7.80
23)	T	Acenaphthene	1.079	1.277	1.251	1.338	1.225	1.234	7.81
24)	T	Dibenzofuran	1.763	2.048	2.266	2.315	2.053	2.089	10.47
25)	T	Fluorene	1.448	1.658	1.763	1.834	1.576	1.656	9.22
26)	un	C1-Fluorenes	1.448	1.658	1.763	1.834	1.576	1.656	9.22
27)	un	C2-Fluorenes	1.448	1.658	1.763	1.834	1.576	1.656	9.22
28)	un	C3-Fluorenes	1.448	1.658	1.763	1.834	1.576	1.656	9.22
29)	I	Pyrene-d10	ISTD						
30)	S	Phenanthrene-d10	0.951	1.011	1.000	0.989	1.033	0.997	3.03
31)	T	Pentachlorophenol	0.068	0.069	0.073	0.074	0.078	0.072	5.54
32)	T	Carbazole	0.978	0.959	0.882	0.870	0.846	0.907	6.40
33)	T	Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
34)	un	C1-Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
35)	un	C2-Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
36)	un	C3-Dibenzothiophene	0.962	1.017	0.965	0.913	0.900	0.951	4.89
37)	T	Phenanthrene	1.039	1.007	0.984	0.996	1.007	1.006	2.04
38)	T	Anthracene	1.130	1.085	1.033	1.035	0.998	1.056	4.91
39)	T	1-Methylphenanthrene	0.785	0.828	0.726	0.727	0.724	0.758	6.20
40)	un	C1-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04
41)	un	C2-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04
42)	un	C3-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04

(#) = Out of Range

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:05 2006
Response via : Initial Calibration

Calibration Files
1 =MS30306D.D 2 =MS30306E.D 3 =MS30306F.D
4 =MS30306G.D 5 =MS30306H.D

		Compound	1	2	3	4	5	Avg	%RSD
43)	un	C4-Phenanthrene/Anthr	1.039	1.007	0.984	0.996	1.007	1.006	2.04
44)	T	Naphthobenzothiophene	0.707	0.756	0.765	0.806	0.870	0.781	7.78
45)	un	C1-Naphthobenzothioph	0.707	0.756	0.765	0.806	0.870	0.781	7.78
46)	un	C2-Naphthobenzothioph	0.707	0.756	0.765	0.806	0.870	0.781	7.78
47)	un	C3-Naphthobenzothioph	0.707	0.756	0.765	0.806	0.870	0.781	7.78
48)	T	Fluoranthene	1.227	1.339	1.415	1.392	1.409	1.356	5.77
49)	T	Pyrene	1.389	1.420	1.386	1.291	1.307	1.359	4.14
50)	un	C1-Fluoranthenes/Pyre	1.227	1.339	1.415	1.392	1.409	1.356	5.77
51)	un	C2-Fluoranthenes/Pyre	1.227	1.339	1.415	1.392	1.409	1.356	5.77
52)	un	C3-Fluoranthenes/Pyre	1.227	1.339	1.415	1.392	1.409	1.356	5.77
53)	S	Chrysene-d12	0.675	0.706	0.715	0.721	0.731	0.709	3.02
54)	T	Benz(a)anthracene	0.774	0.832	0.824	0.917	0.910	0.851	7.16
55)	T	Chrysene	0.890	0.966	1.021	1.048	1.151	1.015	9.56
56)	un	C1-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
57)	un	C2-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
58)	un	C3-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
59)	un	C4-Chrysenes	0.890	0.966	1.021	1.048	1.151	1.015	9.56
60)	I	Benzo(a)pyrene-d12	----------ISTD----------						
61)	un	C29-Hopane	0.943	0.847	0.912	0.780	0.753	0.847	9.66
62)	un	18a-Oleanane	0.943	0.847	0.912	0.780	0.753	0.847	9.66
63)	T	C30-Hopane	0.943	0.847	0.912	0.780	0.753	0.847	9.66
64)	T	Benzo(b)fluoranthene	1.750	2.149	1.791	1.782	1.700	1.834	9.78
65)	T	Benzo(k)fluoranthene	1.640	1.910	1.711	1.705	1.762	1.746	5.82
66)	T	Benzo(e)pyrene	1.680	1.669	1.577	1.507	1.531	1.593	4.96
67)	T	Benzo(a)pyrene	1.447	1.522	1.393	1.391	1.344	1.419	4.77
68)	T	Indeno(1,2,3-c,d)pyre	1.159	1.226	1.100	1.038	1.024	1.110	7.61
69)	T	Dibenzo(a,h)anthracen	1.220	1.189	1.049	0.998	0.998	1.091	9.75
70)	un	C1-Dibenzo(a,h)anthra	1.220	1.189	1.049	0.998	0.998	1.091	9.75
71)	un	C2-Dibenzo(a,h)anthra	1.220	1.189	1.049	0.998	0.998	1.091	9.75
72)	un	C3-Dibenzo(a,h)anthra	1.220	1.189	1.049	0.998	0.998	1.091	9.75
73)	T	Benzo(g,h,i)perylene	1.127	1.229	1.076	1.048	1.013	1.099	7.66
74)	S	Perylene-d12	0.712	0.887	0.827	0.792	0.798	0.803	7.89
75)	T	Perylene	1.371	1.525	1.434	1.394	1.349	1.415	4.90

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306D.D Vial: 41
Acq On : 27 Sep 2006 7:03 pm Operator: TJM
Sample : Cal Level 1 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Fluorene-d10	20.75	176	1426m	51.08 ng/ml	0.00
29) Pyrene-d10	28.93	212	2460m	49.98	0.00
60) Benzo(a)pyrene-d12	37.56	264	842m	45.61	0.00
System Monitoring Compounds					
2) Naphthalene-d8	13.16	136	834m	18.35	0.00
20) Acenaphthene-d10	18.98	164	474m	16.95	0.00
30) Phenanthrene-d10	24.05	188	936m	21.13	0.00
53) Chrysene-d12	33.14	240	664m	17.04	0.00
74) Perylene-d12	37.84	264	263m	17.74	0.00
Target Compounds					Qvalue
3) Decalin	10.57	138	204m	24.31 ng/ml	
4) C1-Decalin	0.00	152	0	N.D. d	
5) C2-Decalin	0.00	166	0	N.D. d	
6) C3-Decalin	0.00	180	0	N.D. d	
7) C4-Decalin	0.00	194	0	N.D. d	
8) Naphthalene	13.21	128	1068m	20.61	
9) 2-Methylnaphthalene	15.46	142	743m	19.76	
10) 1-Methylnaphthalene	15.80	142	596m	17.32	
11) 2,6-Dimethylnaphthalene	17.57	156	628m	18.48	
12) 1,6,7-Trimethylnaphthalene	20.41	170	626m	21.03	
13) C2-Naphthalenes	0.00	156	0	N.D. d	
14) C3-Naphthalenes	0.00	170	0	N.D. d	
15) C4-Naphthalenes	0.00	184	0	N.D. d	
16) Benzothiophene	13.38	134	798m	17.93 ng/ml	
17) C1-Benzothiophene	0.00	148	0	N.D. d	
18) C2-Benzothiophene	0.00	162	0	N.D. d	
19) C3-Benzothiophene	0.00	176	0	N.D. d	
21) Biphenyl	17.04	154	957m	21.23	
22) Acenaphthylene	18.47	152	982m	17.63	
23) Acenaphthene	19.09	154	603m	16.10	
24) Dibenzofuran	19.68	168	986m	18.17 ng/ml	
25) Fluorene	20.86	166	810m	17.00	
26) C1-Fluorenes	0.00	180	0	N.D. d	
27) C2-Fluorenes	0.00	194	0	N.D. d	
28) C3-Fluorenes	0.00	208	0	N.D. d	
31) Pentachlorophenol	23.44	266	67m	29.85 ng/ml	
32) Carbazole	24.89	167	964m	17.67 ng/ml	
33) Dibenzothiophene	23.71	184	948m	15.80	
34) C1-Dibenzothiophene	0.00	198	0	N.D. d	

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306D.D Vial: 41
Acq On : 27 Sep 2006 7:03 pm Operator: TJM
Sample : Cal Level 1 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
35)	C2-Dibenzothiophene	0.00	212	0	N.D.	d	
36)	C3-Dibenzothiophene	0.00	226	0	N.D.	d	
37)	Phenanthrene	24.11	178	1025m	18.88		
38)	Anthracene	24.32	178	1114m	16.66		
39)	1-Methylphenanthrene	26.27	192	774m	16.50		
40)	C1-Phenanthrene/Anthracene	0.00	192	0	N.D.	d	
41)	C2-Phenanthrene/Anthracene	0.00	206	0	N.D.	d	
42)	C3-Phenanthrene/Anthracene	0.00	220	0	N.D.	d	
43)	C4-Phenanthrene/Anthracene	0.00	234	0	N.D.	d	
44)	Naphthobenzothiophene	32.30	234	697m	16.57		
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D.	d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D.	d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D.	d	
48)	Fluoranthene	28.22	202	1211m	17.89		
49)	Pyrene	29.00	202	1370m	18.07		
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D.	d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D.	d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D.	d	
54)	Benz(a)anthracene	33.10	228	764m	15.89		
55)	Chrysene	33.21	228	878m	16.27		
56)	C1-Chrysenes	0.00	242	0	N.D.	d	
57)	C2-Chrysenes	0.00	256	0	N.D.	d	
58)	C3-Chrysenes	0.00	270	0	N.D.	d	
59)	C4-Chrysenes	0.00	284	0	N.D.	d	
61)	C29-Hopane	0.00	191	0	N.D.	d	
62)	18a-Oleanane	0.00	191	0	N.D.	d	
63)	C30-Hopane	42.00	191	348m	19.86	ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	647m	16.82		
65)	Benzo(k)fluoranthene	36.64	252	607m	16.73		
66)	Benzo(e)pyrene	37.45	252	622m	18.02		
67)	Benzo(a)pyrene	37.66	252	535m	20.02		
68)	Indeno(1,2,3-c,d)pyrene	42.10	276	429m	19.68		
69)	Dibenzo(a,h)anthracene	42.20	278	451m	23.68		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.35	276	417m	19.12		
75)	Perylene	37.95	252	507m	18.05		

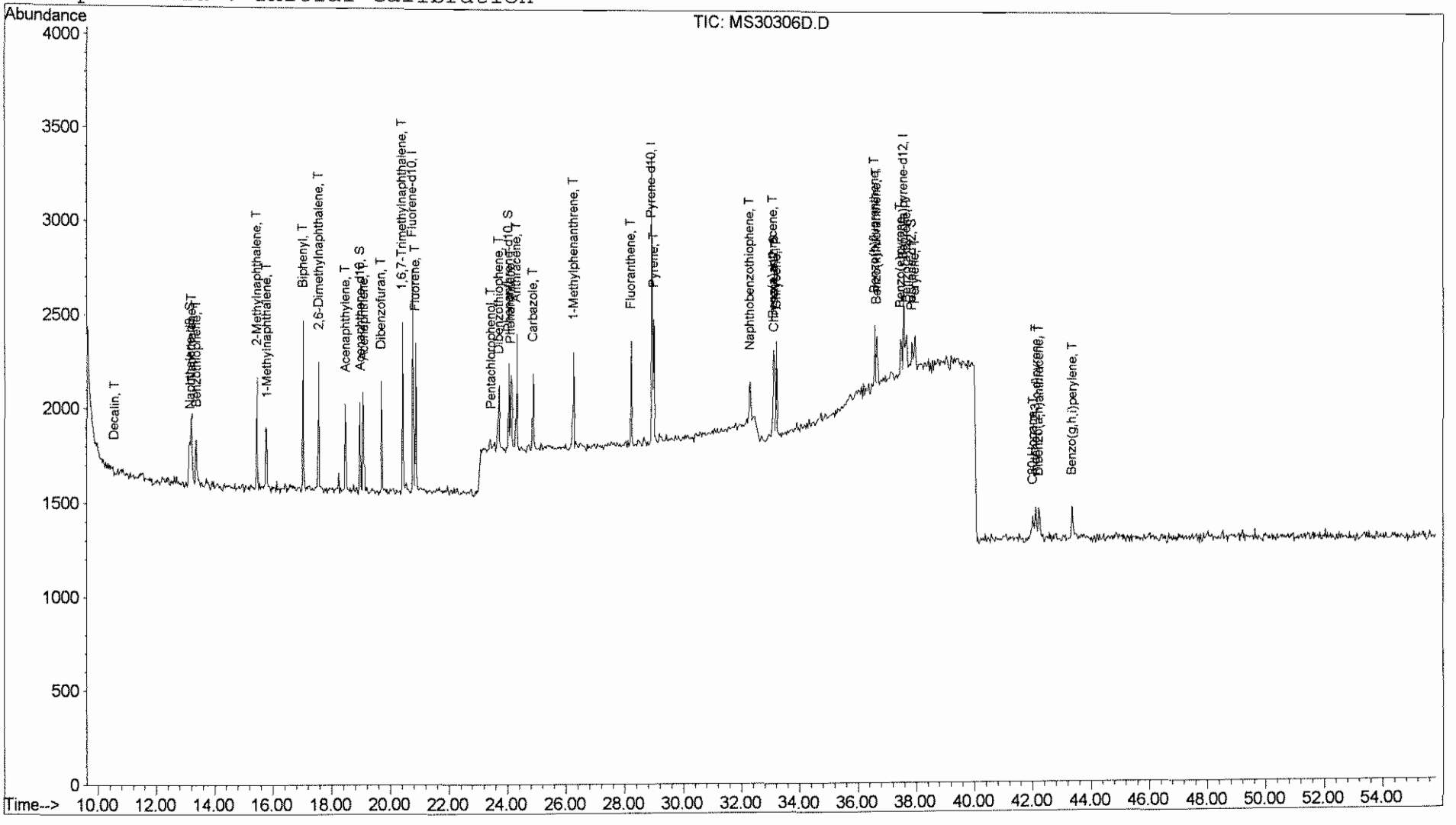
(#) = qualifier out of range (m) = manual integration

Data File : Z:\1\DATA\MS30306\MS30306D.D
Acq On : 27 Sep 2006 7:03 pm
Sample : Cal Level 1
Misc :
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006

Vial: 41
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306E.D Vial: 42
Acq On : 27 Sep 2006 8:07 pm Operator: TJM
Sample : Cal Level 2 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:48 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.77	176	1256m	51.08	ng/ml	0.02
29) Pyrene-d10	28.93	212	2433m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	810m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.15	136	4344m	108.49		0.00
20) Acenaphthene-d10	18.97	164	2628m	106.70		0.00
30) Phenanthrene-d10	24.05	188	4920m	112.29		0.00
53) Chrysene-d12	33.14	240	3439m	89.26		0.00
74) Perylene-d12	37.84	264	1576m	110.52		0.00
Target Compounds						Qvalue
3) Decalin	11.49	138	913m	123.54	ng/ml	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	4648m	101.86		
9) 2-Methylnaphthalene	15.46	142	3569m	107.76		
10) 1-Methylnaphthalene	15.79	142	3144m	103.73		
11) 2,6-Dimethylnaphthalene	17.57	156	3265m	109.08		
12) 1,6,7-Trimethylnaphthalene	20.41	170	2861m	109.13		
13) C2-Naphthalenes	0.00	156	0	N.D.	d	
14) C3-Naphthalenes	0.00	170	0	N.D.	d	
15) C4-Naphthalenes	0.00	184	0	N.D.	d	
16) Benzothiophene	13.38	134	4177m	106.55	ng/ml	
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.03	154	4293m	108.11		
22) Acenaphthylene	18.49	152	4782m	97.45		
23) Acenaphthene	19.09	154	3142m	95.26		
24) Dibenzofuran	19.68	168	5044m	105.54	ng/ml	
25) Fluorene	20.86	166	4086m	97.34		
26) C1-Fluorenes	0.00	180	0	N.D.	d	
27) C2-Fluorenes	0.00	194	0	N.D.	d	
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	23.44	266	338m	152.27	ng/ml	
32) Carbazole	24.89	167	4675m	86.66	ng/ml	
33) Dibenzothiophene	23.71	184	4958m	83.53		
34) C1-Dibenzothiophene	0.00	198	0	N.D.	d	

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306E.D Vial: 42
Acq On : 27 Sep 2006 8:07 pm Operator: TJM
Sample : Cal Level 2 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:48 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
35)	C2-Dibenzothiophene	0.00	212	0	N.D. d	
36)	C3-Dibenzothiophene	0.00	226	0	N.D. d	
37)	Phenanthrene	24.11	178	4912m	91.49	
38)	Anthracene	24.31	178	5292m	80.01	
39)	1-Methylphenanthrene	26.27	192	4040m	87.08	
40)	C1-Phenanthrene/Anthracene	0.00	192	0	N.D. d	
41)	C2-Phenanthrene/Anthracene	0.00	206	0	N.D. d	
42)	C3-Phenanthrene/Anthracene	0.00	220	0	N.D. d	
43)	C4-Phenanthrene/Anthracene	0.00	234	0	N.D. d	
44)	Naphthobenzothiophene	32.30	234	3685m	88.57	
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D. d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D. d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D. d	
48)	Fluoranthene	28.22	202	6535m	97.59	
49)	Pyrene	29.00	202	6929m	92.38	
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D. d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D. d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D. d	
54)	Benz(a)anthracene	33.10	228	4058m	85.36	
55)	Chrysene	33.21	228	4716m	88.37	
56)	C1-Chrysenes	0.00	242	0	N.D. d	
57)	C2-Chrysenes	0.00	256	0	N.D. d	
58)	C3-Chrysenes	0.00	270	0	N.D. d	
59)	C4-Chrysenes	0.00	284	0	N.D. d	
61)	C29-Hopane	0.00	191	0	N.D. d	
62)	18a-Oleanane	0.00	191	0	N.D. d	
63)	C30-Hopane	42.00	191	1505m	89.26 ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	3821m	103.25	
65)	Benzo(k)fluoranthene	36.64	252	3400m	97.40	
66)	Benzo(e)pyrene	37.45	252	2972m	89.52	
67)	Benzo(a)pyrene	37.63	252	2707m	105.28	
68)	Indeno(1,2,3-c,d)pyrene	42.10	276	2182m	104.08	
69)	Dibenzo(a,h)anthracene	42.20	278	2115m	115.43	
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D. d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D. d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D. d	
73)	Benzo(g,h,i)perylene	43.34	276	2187m	104.23	
75)	Perylene	37.95	252	2713m	100.39	

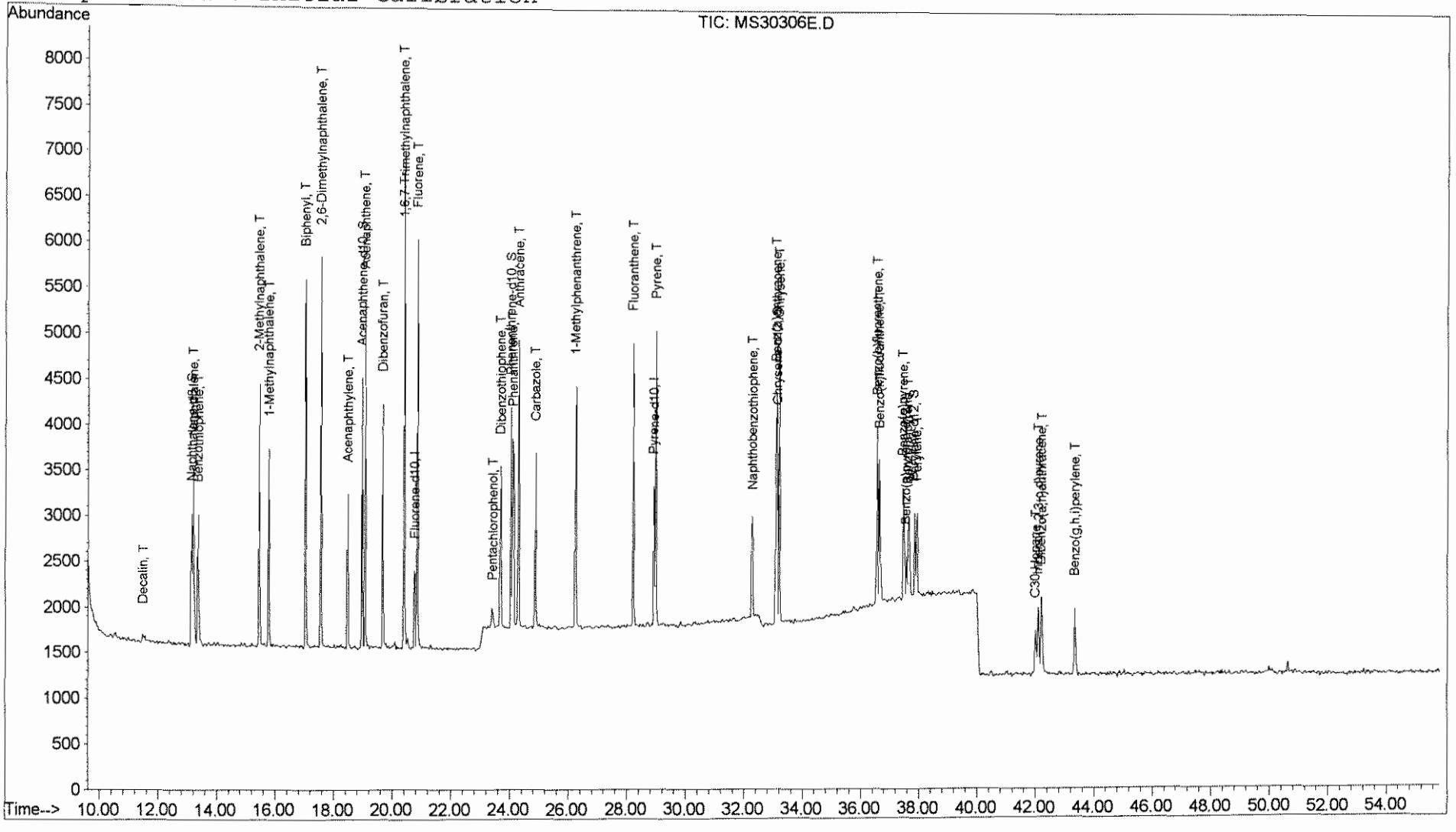
(#) = qualifier out of range (m) = manual integration

Data File : Z:\1\DATA\MS30306\MS30306E.D
Acq On : 27 Sep 2006 8:07 pm
Sample : Cal Level 2
Misc :
MS Integration Params: rteint.p
Quant Time: Sep 28 7:48 2006

Vial: 42
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306F.D Vial: 43
Acq On : 27 Sep 2006 9:11 pm Operator: TJM
Sample : Cal Level 3 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1295m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	2658m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	1010m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.15	136	10909m	264.24		0.00
20) Acenaphthene-d10	18.97	164	6899m	271.66		0.00
30) Phenanthrene-d10	24.05	188	13301m	277.88		0.00
53) Chrysene-d12	33.14	240	9502m	225.74		0.00
74) Perylene-d12	37.84	264	4576m	257.35		0.00
Target Compounds						Qvalue
3) Decalin	10.51	138	2180m	286.09	ng/ml	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	12202m	259.35		
9) 2-Methylnaphthalene	15.46	142	9614m	281.53		
10) 1-Methylnaphthalene	15.80	142	8068m	258.16		
11) 2,6-Dimethylnaphthalene	17.57	156	8634m	279.77		
12) 1,6,7-Trimethylnaphthalene	20.41	170	7805m	288.76		
13) C2-Naphthalenes	0.00	156	0	N.D.	d	
14) C3-Naphthalenes	0.00	170	0	N.D.	d	
15) C4-Naphthalenes	0.00	184	0	N.D.	d	
16) Benzothiophene	13.38	134	10835m	268.06	ng/ml	
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.03	154	11780m	287.73		
22) Acenaphthylene	18.47	152	12568m	248.41		
23) Acenaphthene	19.09	154	7935m	233.34		
24) Dibenzofuran	19.68	168	14382m	291.87	ng/ml	
25) Fluorene	20.86	166	11201m	258.79		
26) C1-Fluorenes	0.00	180	0	N.D.	d	
27) C2-Fluorenes	0.00	194	0	N.D.	d	
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	23.44	266	966m	398.35	ng/ml	
32) Carbazole	24.89	167	11744m	199.27	ng/ml	
33) Dibenzothiophene	23.71	184	12843m	198.07		
34) C1-Dibenzothiophene	0.00	198	0	N.D.	d	

(#) = qualifier out of range (m) = manual integration

000132

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306F.D Vial: 43
Acq On : 27 Sep 2006 9:11 pm Operator: TJM
Sample : Cal Level 3 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
35)	C2-Dibenzothiophene	0.00	212	0	N.D. d	
36)	C3-Dibenzothiophene	0.00	226	0	N.D. d	
37)	Phenanthrene	24.11	178	13110m	223.52	
38)	Anthracene	24.32	178	13755m	190.35	
39)	1-Methylphenanthrene	26.27	192	9667m	190.74	
40)	C1-Phenanthrene/Anthracene	0.00	192	0	N.D. d	
41)	C2-Phenanthrene/Anthracene	0.00	206	0	N.D. d	
42)	C3-Phenanthrene/Anthracene	0.00	220	0	N.D. d	
43)	C4-Phenanthrene/Anthracene	0.00	234	0	N.D. d	
44)	Naphthobenzothiophene	32.27	234	10163m	223.58	
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D. d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D. d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D. d	
48)	Fluoranthene	28.22	202	18856m	257.74	
49)	Pyrene	29.00	202	18472m	225.43	
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D. d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D. d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D. d	
54)	Benz(a)anthracene	33.10	228	10974m	211.29	
55)	Chrysene	33.21	228	13602m	233.31	
56)	C1-Chrysenes	0.00	242	0	N.D. d	
57)	C2-Chrysenes	0.00	256	0	N.D. d	
58)	C3-Chrysenes	0.00	270	0	N.D. d	
59)	C4-Chrysenes	0.00	284	0	N.D. d	
61)	C29-Hopane	0.00	191	0	N.D. d	
62)	18a-Oleanane	0.00	191	0	N.D. d	
63)	C30-Hopane	42.00	191	5051	240.25 ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	9926	215.10	
65)	Benzo(k)fluoranthene	36.64	252	9494	218.11	
66)	Benzo(e)pyrene	37.45	252	8755	211.50	
67)	Benzo(a)pyrene	37.63	252	7726	240.97	
68)	Indeno(1,2,3-c,d)pyrene	42.10	276	6101m	233.38	
69)	Dibenzo(a,h)anthracene	42.20	278	5816m	254.56	
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D. d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D. d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D. d	
73)	Benzo(g,h,i)perylene	43.34	276	5969m	228.14	
75)	Perylene	37.95	252	7955m	236.07	

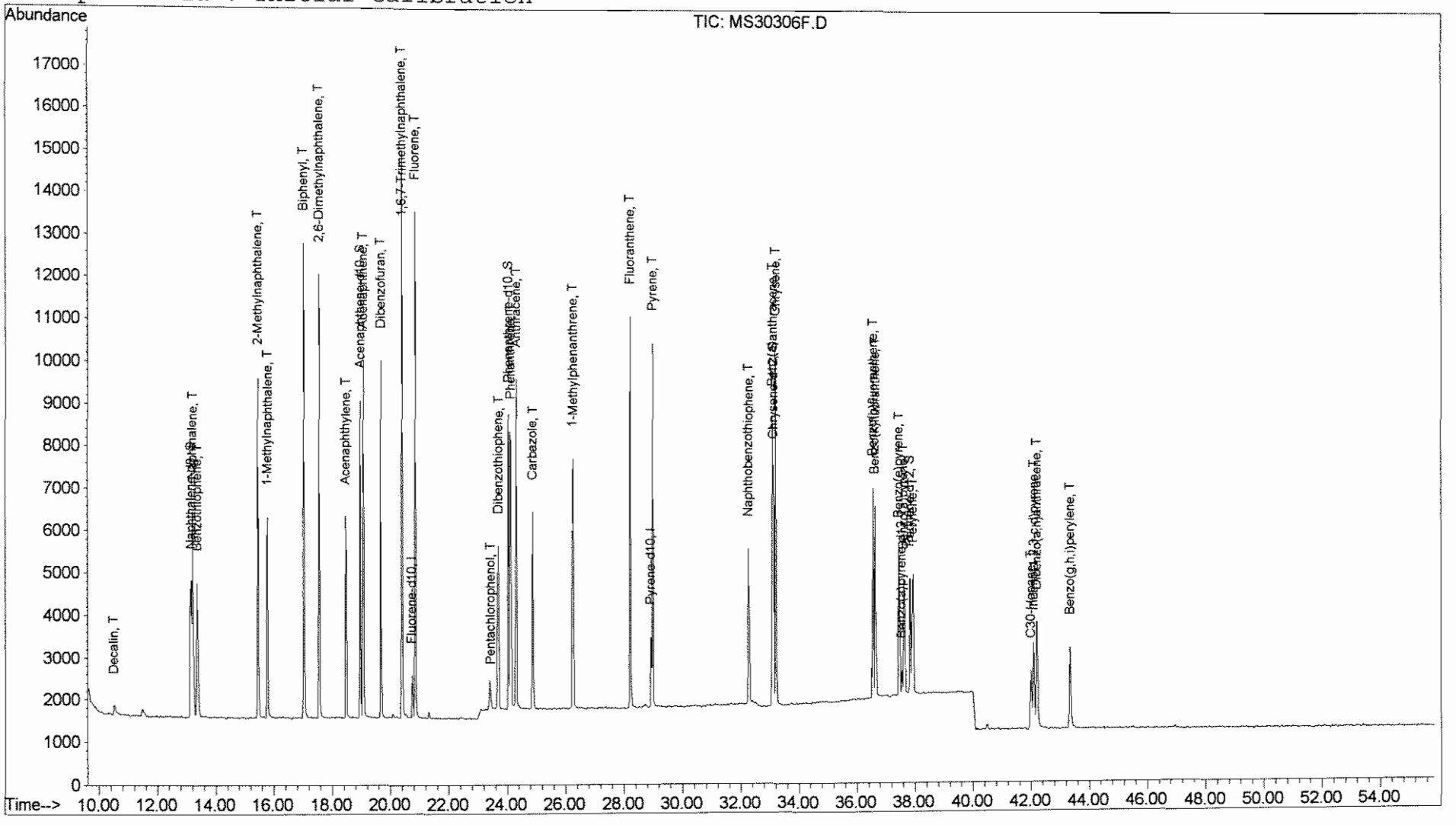
(#) = qualifier out of range (m) = manual integration

Data File : Z:\1\DATA\MS30306\MS30306F.D
Acq On : 27 Sep 2006 9:11 pm
Sample : Cal Level 3
Misc :
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006

Vial: 43
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306G.D Vial: 44
Acq On : 27 Sep 2006 10:15 pm Operator: TJM
Sample : Cal Level 4 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1173m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	2595m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	1044m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.15	136	21148m	565.53		0.00
20) Acenaphthene-d10	18.97	164	13535m	588.40		0.00
30) Phenanthrene-d10	24.05	188	25679m	549.50		0.00
53) Chrysene-d12	33.14	240	18710m	455.28		0.00
74) Perylene-d12	37.84	264	9061m	492.98		0.00
Target Compounds						Qvalue
3) Decalin	10.54	138	3730m	540.41	ng/ml	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	23199m	544.37		
9) 2-Methylnaphthalene	15.46	142	18987m	613.83		
10) 1-Methylnaphthalene	15.80	142	15549m	549.29		
11) 2,6-Dimethylnaphthalene	17.57	156	16415m	587.21		
12) 1,6,7-Trimethylnaphthalene	20.41	170	15257m	623.16		
13) C2-Naphthalenes	0.00	156	0	N.D.	d	
14) C3-Naphthalenes	0.00	170	0	N.D.	d	
15) C4-Naphthalenes	0.00	184	0	N.D.	d	
16) Benzothiophene	13.38	134	20948m	572.15	ng/ml	
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.03	154	23664m	638.12		
22) Acenaphthylene	18.47	152	25149m	548.78		
23) Acenaphthene	19.09	154	15384m	499.44		
24) Dibenzofuran	19.68	168	26617m	596.35	ng/ml	
25) Fluorene	20.86	166	21110m	538.46		
26) C1-Fluorenes	0.00	180	0	N.D.	d	
27) C2-Fluorenes	0.00	194	0	N.D.	d	
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	23.44	266	1920m	810.98	ng/ml	
32) Carbazole	24.89	167	22620m	393.13	ng/ml	
33) Dibenzothiophene	23.71	184	23750m	375.17		
34) C1-Dibenzothiophene	0.00	198	0	N.D.	d	

(#) = qualifier out of range (m) = manual integration

Data File : Z:\1\DATA\MS30306\MS30306G.D Vial: 44
Acq On : 27 Sep 2006 10:15 pm Operator: TJM
Sample : Cal Level 4 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
35)	C2-Dibenzothiophene	0.00	212	0	N.D.	d	
36)	C3-Dibenzothiophene	0.00	226	0	N.D.	d	
37)	Phenanthrene	24.11	178	25906m	452.40		
38)	Anthracene	24.32	178	26901m	381.31		
39)	1-Methylphenanthrene	26.27	192	18904m	382.05		
40)	C1-Phenanthrene/Anthracene	0.00	192	0	N.D.	d	
41)	C2-Phenanthrene/Anthracene	0.00	206	0	N.D.	d	
42)	C3-Phenanthrene/Anthracene	0.00	220	0	N.D.	d	
43)	C4-Phenanthrene/Anthracene	0.00	234	0	N.D.	d	
44)	Naphthobenzothiophene	32.27	234	20950m	472.08		
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D.	d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D.	d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D.	d	
48)	Fluoranthene	28.22	202	36229m	507.23		
49)	Pyrene	29.00	202	33589m	419.87		
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D.	d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D.	d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D.	d	
54)	Benz(a)anthracene	33.10	228	23861m	470.56		
55)	Chrysene	33.21	228	27279m	479.26		
56)	C1-Chrysenes	0.00	242	0	N.D.	d	
57)	C2-Chrysenes	0.00	256	0	N.D.	d	
58)	C3-Chrysenes	0.00	270	0	N.D.	d	
59)	C4-Chrysenes	0.00	284	0	N.D.	d	
61)	C29-Hopane	0.00	191	0	N.D.	d	
62)	18a-Oleanane	0.00	191	0	N.D.	d	
63)	C30-Hopane	42.00	191	8928m	410.83	ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	20414m	427.97		
65)	Benzo(k)fluoranthene	36.64	252	19557m	434.65		
66)	Benzo(e)pyrene	37.45	252	17289m	404.05		
67)	Benzo(a)pyrene	37.63	252	15947m	481.19		
68)	Indeno(1,2,3-c,d)pyrene	42.08	276	11910m	440.75		
69)	Dibenzo(a,h)anthracene	42.20	278	11441m	484.45		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.35	276	12013m	444.20		
75)	Perylene	37.95	252	15986m	458.95		

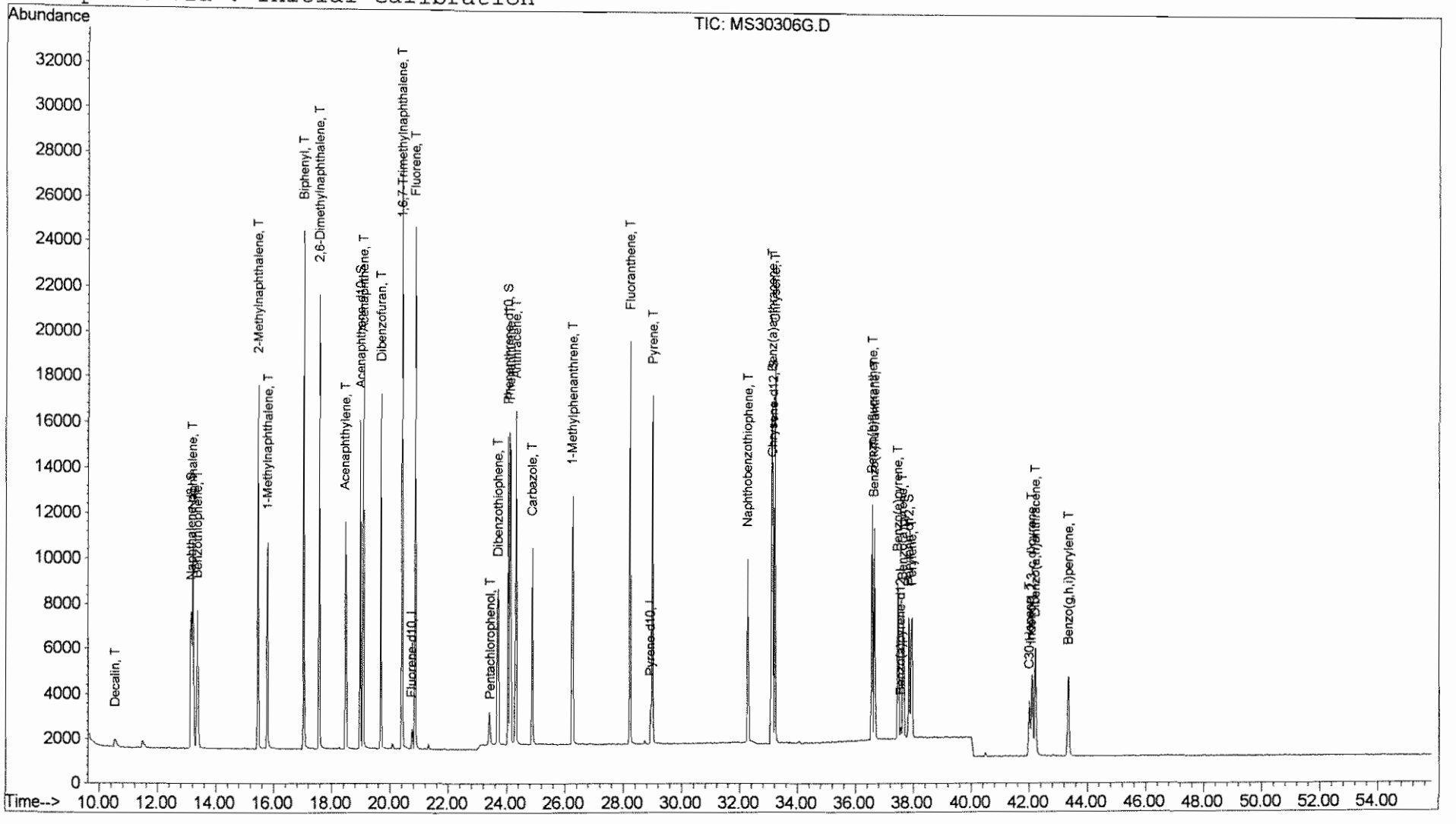
(#) = qualifier out of range (m) = manual integration

Data File : Z:\1\DATA\MS30306\MS30306G.D
Acq On : 27 Sep 2006 10:15 pm
Sample : Cal Level 4
Misc :
MS Integration Params: rteint.p
Quant Time: Sep 28 7:49 2006

Vial: 44
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306H.D Vial: 45
Acq On : 27 Sep 2006 11:18 pm Operator: TJM
Sample : Cal Level 5 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:50 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Fluorene-d10	20.75	176	1409m	51.08	ng/ml	0.00
29) Pyrene-d10	28.93	212	2775m	49.98		0.00
60) Benzo(a)pyrene-d12	37.56	264	1213m	45.61		0.00
System Monitoring Compounds						
2) Naphthalene-d8	13.12	136	44863m	998.77		-0.03
20) Acenaphthene-d10	18.97	164	27574m	997.94		0.00
30) Phenanthrene-d10	24.05	188	57329m	1147.20		0.00
53) Chrysene-d12	33.14	240	40574m	923.28		0.00
74) Perylene-d12	37.84	264	21222m	993.75		0.00
Target Compounds						Qvalue
3) Decalin	10.51	138	8112m	978.43	ng/ml	
4) C1-Decalin	0.00	152	0	N.D.	d	
5) C2-Decalin	0.00	166	0	N.D.	d	
6) C3-Decalin	0.00	180	0	N.D.	d	
7) C4-Decalin	0.00	194	0	N.D.	d	
8) Naphthalene	13.21	128	49058m	958.35		
9) 2-Methylnaphthalene	15.46	142	39310m	1058.00		
10) 1-Methylnaphthalene	15.77	142	33392m	982.04		
11) 2,6-Dimethylnaphthalene	17.57	156	34076m	1014.82		
12) 1,6,7-Trimethylnaphthalene	20.41	170	32940m	1120.06		
13) C2-Naphthalenes	0.00	156	0	N.D.	d	
14) C3-Naphthalenes	0.00	170	0	N.D.	d	
15) C4-Naphthalenes	0.00	184	0	N.D.	d	
16) Benzothiophene	13.35	134	43571m	990.72	ng/ml	
17) C1-Benzothiophene	0.00	148	0	N.D.	d	
18) C2-Benzothiophene	0.00	162	0	N.D.	d	
19) C3-Benzothiophene	0.00	176	0	N.D.	d	
21) Biphenyl	17.03	154	50554m	1134.90		
22) Acenaphthylene	18.47	152	53927m	979.66		
23) Acenaphthene	19.09	154	33816m	913.95		
24) Dibenzofuran	19.68	168	56719m	1057.93	ng/ml	
25) Fluorene	20.86	166	43581m	925.44		
26) C1-Fluorenes	0.00	180	0	N.D.	d	
27) C2-Fluorenes	0.00	194	0	N.D.	d	
28) C3-Fluorenes	0.00	208	0	N.D.	d	
31) Pentachlorophenol	23.41	266	4345m	1716.22	ng/ml	
32) Carbazole	24.89	167	47026m	764.28	ng/ml	
33) Dibenzothiophene	23.68	184	50052m	739.36		
34) C1-Dibenzothiophene	0.00	198	0	N.D.	d	

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : Z:\1\DATA\MS30306\MS30306H.D Vial: 45
Acq On : 27 Sep 2006 11:18 pm Operator: TJM
Sample : Cal Level 5 Inst : GC/MS Ins
Misc : Multiplr: 1.00
MS Integration Params: rteint.p
Quant Time: Sep 28 7:50 2006 Quant Results File: 092806.RES

Quant Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 06:35:50 2006
Response via : Initial Calibration
DataAcq Meth : PAH-2002

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
35)	C2-Dibenzothiophene	0.00	212	0	N.D.	d	
36)	C3-Dibenzothiophene	0.00	226	0	N.D.	d	
37)	Phenanthrene	24.11	178	56041m	915.18		
38)	Anthracene	24.32	178	55469m	735.24		
39)	1-Methylphenanthrene	26.27	192	40273m	761.12		
40)	C1-Phenanthrene/Anthracene	0.00	192	0	N.D.	d	
41)	C2-Phenanthrene/Anthracene	0.00	206	0	N.D.	d	
42)	C3-Phenanthrene/Anthracene	0.00	220	0	N.D.	d	
43)	C4-Phenanthrene/Anthracene	0.00	234	0	N.D.	d	
44)	Naphthobenzothiophene	32.27	234	48280m	1017.35		
45)	C1-Naphthobenzothiophene	0.00	248	0	N.D.	d	
46)	C2-Naphthobenzothiophene	0.00	262	0	N.D.	d	
47)	C3-Naphthobenzothiophene	0.00	276	0	N.D.	d	
48)	Fluoranthene	28.22	202	78451m	1027.13		
49)	Pyrene	29.00	202	72745m	850.35		
50)	C1-Fluoranthenes/Pyrenes	0.00	216	0	N.D.	d	
51)	C2-Fluoranthenes/Pyrenes	0.00	230	0	N.D.	d	
52)	C3-Fluoranthenes/Pyrenes	0.00	244	0	N.D.	d	
54)	Benz(a)anthracene	33.10	228	50645m	933.98		
55)	Chrysene	33.21	228	64054m	1052.35		
56)	C1-Chrysenes	0.00	242	0	N.D.	d	
57)	C2-Chrysenes	0.00	256	0	N.D.	d	
58)	C3-Chrysenes	0.00	270	0	N.D.	d	
59)	C4-Chrysenes	0.00	284	0	N.D.	d	
61)	C29-Hopane	0.00	191	0	N.D.	d	
62)	18a-Oleanane	0.00	191	0	N.D.	d	
63)	C30-Hopane	42.00	191	20016m	792.73	ng/ml	
64)	Benzo(b)fluoranthene	36.57	252	45273m	816.89		
65)	Benzo(k)fluoranthene	36.64	252	46985m	898.75		
66)	Benzo(e)pyrene	37.45	252	40815m	820.97		
67)	Benzo(a)pyrene	37.63	252	35807m	929.91		
68)	Indeno(1,2,3-c,d)pyrene	42.07	276	27295m	869.37		
69)	Dibenzo(a,h)anthracene	42.20	278	26582m	968.75		
70)	C1-Dibenzo(a,h)anthracene	0.00	292	0	N.D.	d	
71)	C2-Dibenzo(a,h)anthracene	0.00	306	0	N.D.	d	
72)	C3-Dibenzo(a,h)anthracene	0.00	320	0	N.D.	d	
73)	Benzo(g,h,i)perylene	43.34	276	26984m	858.76		
75)	Perylene	37.91	252	35944m	888.16		

(#) = qualifier out of range (m) = manual integration

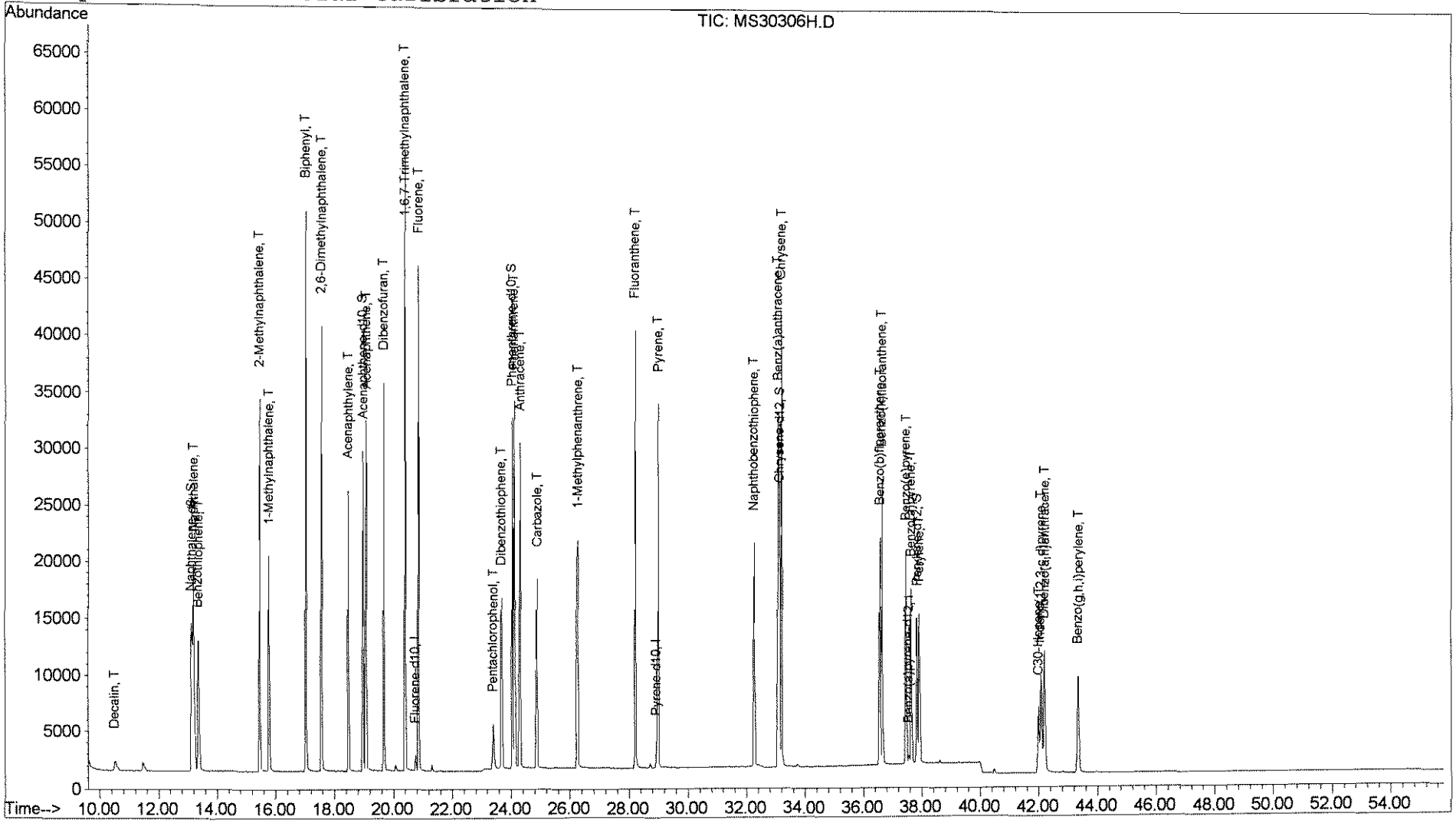
Quantitation Report

Data File : Z:\1\DATA\MS30306\MS30306H.D
Acq On : 27 Sep 2006 11:18 pm
Sample : Cal Level 5
Misc :
MS Integration Params: rteint.p
Quant Time: Sep 28 7:50 2006

Vial: 45
Operator: TJM
Inst : GC/MS Ins
Multiplr: 1.00

Quant Results File: 092806.RES

Method : Z:\1\METHODS\092806.M (RTE Integrator)
Title : PAH Calibration Table (2002)
Last Update : Thu Sep 28 07:50:06 2006
Response via : Initial Calibration



Supporting Documents

Shipping, Sample Receiving, and Project Initiation Documents

B&B LABORATORIES RECEIVING/INTEGRITY REPORT

Job: JO3318 Date Received: 09/23/06 SDG#: 06092301

Sender: Entrix - Buzzards Bay Allison Guzman

1. Number of Shipping Containers: 1

Comments:

2. Airbill Present? (Yes)/No Shipping Company: FedEx

Airbill Number: 7990 0659 9610 Comments:

3. Custody Seals on Container? Comments:
(No) Yes Intact Not Intact

4. Chain of Custody Records? Comments
No (Yes)

5. General Sample Conditions:
Frozen Cool Unrefrigerated
Dry Ice Blue Ice Ice

Temperature/Comments: 3.5°C

6. List of Broken Containers:

7. Number of Samples Expected: ? Number of Samples Received: 3 jars w/ nets

8. Problems/Discrepancies:

9. Resolutions:

10. Checked in by: Wheel Evans Date: 09/23/06

From: Origin ID: (978)687-6180
Allison Willcox Guinan
ENTRIX
13 Branch St #208

Methuen, MA 01844

FedEx Express

CLS052566/17/22

Ship Date: 21SEP06
ActWgt: 15 LB
System#: 9094132/INET2500
Account#: S *********

Dimmed: 20 X 16 X 12 IN

REF: 6330-7003

Delivery Address Bar Code

SHIP TO: (979)693-3446 **BILL THIRD PARTY**

Tom McDonald
B&B Laboratories
1902 Pinon Drive

College Station, TX 77845

PRIORITY OVERNIGHT

FRI
Deliver By:
22SEP06

TRK# 7990 0659 9610

FORM 0201

IAH AA

77845 -TX-US

XH CLLA

Shipping Label: Your shipment is complete

1. Use the 'Print' feature from your browser to send this page to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com. FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery, misdelivery, or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim. Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental, consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss. Maximum for items of extraordinary value is $500, e.g. jewelry, precious metals, negotiable instruments and other items listed in our Service Guide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

00144

CHAIN OF CUSTODY RECORD

B&B Laboratories, Inc.
Home Office 1902 Pinon College Station TX 77845 phone (979) 693-3446 fax (979) 693-6389 http://www.tdi-bi.com

TDI Brooks

Client: ENTRIX

Project ID: 7079607.2000 Buzzards Bay

B&B Contact: Tom McDonald

Sampler Signature: Allison W. Guinan

Sample ID	Sample Date	Sample Time	Sample Matrix	Preservative	Containers Type	Containers No.	Analyses	Other Instructions	Comments
A-70 ✓	9/20/06	1320	Net/sheen	ice	G	1			~~Please extract and~~ MW8
B-70 ✓	↓	1327	Net/sheen	↓	G	1			Please discuss extraction
B-30 ✓	↓	1333	Net/sheen	↓	G	1			and analysis with Rob
									Burnett.
									NO dates on jars

Total # of Containers 3

Relinquished By	Company Name	Date	Time	Received By	Company Name	Date	Time
Printed Name: Allison W. Guinan	ENTRIX	9/21/06	1200	Printed Name: Donell Frank	B&B Labs	9/23/06	1100
Signature: Allison W. Guinan				Signature: Donell Frank			
Printed Name:				Printed Name:			
Signature:				Signature:			

00145

Matrix:

T=Tissue G=Gas
S=Soil/Sediment Ws=Waste
R=Rinseate HW=Hazardous Waste
P=Product

Sample Container: Vol/material

G=Glass C=Core
P=Plastic B=Bag

WHITE Accompanies Shipment
YELLOW Laboratory Retains
PINK Sampler Retains

Page _____ of _____

Cooler No. _____

Delivered-To: donellfrank@tdi-bi.com
X-Virus-Scan: Scanned by clamdmail 0.15 (no viruses);
Tue, 26 Sep 2006 08:22:14 -0500
X-Sender: tommcdonald@tdi-bi.com@mail.tdi-bi.com
X-Mailer: QUALCOMM Windows Eudora Version 5.2.0.9
Date: Tue, 26 Sep 2006 08:26:29 -0500
To: RMarkarian@entrix.com,RBarrick@entrix.com
From: Tom McDonald <tommcdonald@tdi-bi.com>
Subject: Re: Teflon Net samples
Cc: AGuinan@entrix.com,DonellFrank@TDI-BI.com,juanramirez@tdi-bi.com,
suemcdonald@tdi-bi.com

Rob and Ralph: juan is going to take pictures of the nets prior to extraction this morning. Flecks looked like fine sand particles but we will know more after extraction. Tommy

At 02:16 PM 9/25/2006 -0400, RMarkarian@entrix.com wrote:
Thanks Rob,

Obviously we also want to assess the likelihood that the flecks have a B120 origin. Part of our reason for wanting to understand the character and chemical make up of flecks is the possibility of treatment methods which may , when mixed into the sediment , bind and make the flecks a non issue. not sure if there is anything that could work ...

thanks

ENTRIX, Inc.
Ralph Markarian, PhD
Vice President and
Senior Principal
2804 Huey Ave
Drexel Hill, Pa.19026
office- 610-284-7820
fax - 610-284-7821
mobile- 610-715-5330
pager-800-918-1643
www.entrix.com

Rob Barrick
09/25/2006 10:38 AM PDT

To: Ralph Markarian/Entrix@Entrix
cc: Allison Guinan/Entrix@Entrix, DonellFrank@TDI-BI.com, Tom McDonald <tommcdonald@tdi-bi.com>
Subject: Re: Teflon Net samples

Tommy -- if there is anything you can do visually to judge the composition or source-type of the flecks prior to extraction, that would be good. I'd

also like a full TPH/biomarker and alkane run so I can check the potential for a biogenic source. Thanks.

Rob
[redacted]

Ralph Markarian
09/25/2006 11:06 AM EDT

To: Allison Guinan/Entrix@Entrix
cc: DonellFrank@TDI-BI.com, Rob Barrick/Entrix@Entrix, Tom McDonald <tommcdonald@tdi-bi.com>
Subject: Re: Teflon Net samples

we want to know what makes up the flecks .....

ENTRIX, Inc.
Ralph Markarian, PhD
Vice President and
Senior Principal
2804 Huey Ave
Drexel Hill, Pa.19026
office- 610-284-7820
[redacted]- 610-284-7821
mobile- 610-715-5330
pager-800-918-1643
www.entrix.com

Allison Guinan
09/21/2006 09:48 AM EDT

To: Tom McDonald <tommcdonald@tdi-bi.com>, DonellFrank@TDI-BI.com
cc: Rob Barrick/Entrix@Entrix, Ralph Markarian/Entrix@Entrix
Subject: Teflon Net samples

Tommy, Donnell-
I have 3 nets used to collect sheen contained in 8 oz jars, collected Sept 20 (Wednesday). I will send this on wet ice via FEDEX to arrive Friday am. We will need to have these extracted as soon as possible, and run for comparison to B120 fingerprint. Ralph or Rob, if we want something else [redacted] on this, please let Tommy know.
[redacted]st,
Allison

Allison Willcox Guinan
ENTRIX
13 Branch Street #208
Methuen, MA 01844
[redacted] (978) 687-6180 x 23
FX: (978) 687-6280

Environmental Sample Inventory

Log #	JOB#	CLIENT NAME	FILENAME	CLIENT ID	COL. DATE	RECVD	ANALYSIS	MATRIX	COMMENTS	B&B SDG	Client Project #
40393	J03318	Entrix-Buzzards Bay Spill	ETX7072	A-70	09/20/06	09/23/06	PAH, ALI, TPH	OTHER	Teflon net	06092301	7079607-2000
40394	J03318	Entrix-Buzzards Bay Spill	ETX7073	B-70	09/20/06	09/23/06	PAH, ALI, TPH	OTHER	Teflon net	06092301	7079607-2000
40395	J03318	Entrix-Buzzards Bay Spill	ETX7074	B-30	09/20/06	09/23/06	PAH, ALI, TPH	OTHER	Teflon net	06092301	7079607-2000

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

Job #: J03318

SDG: 06092301

Client: Entrix - Buzzard Bay

Initiation Date: 09/30/06

Number of Samples: 3

Matrix: teflon nets

Due Date: _____

Comments: _____

Analyses

☒	PAHs	☐	OCs/PCBs	☒	Aliphatics/TPH	☒	EOM
☐	Dry Wt.	☐	%Lipid	☐	TOC/TIC	☐	_____
☐	Short Columns	☐	Long Columns	☐	_____	☐	_____

Requested QA/QC (per batch of _____ Client Samples)

☐	Blank	☐ Blank Spike	☐ Blank Spike Duplicate
☐	Duplicate _____	☐	Matrix Spike _____
☐	Matrix Spike Duplicate _____	☐	SRM _____

SEE BACK FOR SPECIFIC STANDARDS TO USE

Surrogate(s): ALI, AR. Volume(s): 100ml

Spike Standard(s): — Volume(s): _____

Internal Standard(s): ALI, AR Volume(s): 100ml

Final Extract Volume (ml): 1ml Final Solvent: DCM

Comments: 1:9 Acetone/DCM shake out through Sodium sulfate, GPC, & short columns.

Sample Custodian Signature: [signature] Date: 09/29/06

Project Administrator Signature: [signature] Date: 9/29/06

Extraction Standard Inventory

Organophosphates (OPs)

☐ OP-WKSU-0050-006 (Surrogate)

☐ OP-WKSK-TPT-006 (Surrogate)

☐ OP-WKIS-0100-006 (Int STD)

Aliphatic Hydrocarbons (ALI/TPH)

☒ AL-WKSU-20-008 (Surrogate)

☐ AL-WKSK-100-009 (Spike)

☒ AL-WKIS-200-006 (Int STD)

☐ AL-STSU-200-007 **(High Surrogate)**

☐ AL-WKIS-2000-007 **(High Int STD)**

Polycyclic Aromatic Hydrocarbons (PAHs)

☒ AR-WKSU-0500-016 (Surrogate)

☐ AR-WKSK-1000-013 (Spike)

☒ AR-WKIS-0500-010 (Int STD)

☐ AR-STSU-5000-009 **(High Surrogate)**

☐ AR-STIS-5000-007 **(High Int STD)**

Organochlorine Pesticides/PCBs (OCs/PCBs)

☐ OC-WKSU-1000-009 (Surrogate)

☐ OC-WKSK-0400-007 (Spike)

☐ OC-WKDDMU-928.8-001 (Spike)

☐ OC-WKIS-1000-007 (Int STD)

☐ PEST-WKSU-1000-002 (Surrogate)

(Epsilon-HCH)

Polychlorinated Biphenyls (PCBs by GC/MS)

☐ PCB-WKSU-008-006 (Surrogate)

☐ PCB-INTAroclor-100-001 (Spike)

☐ PCB-WKIS-010-006 (Int STD)

Polybrominated Diphenyl Ether (PBDEs) and Polybrominated Biphenyls (PBBs)

☐ PBDE-WKSU-1.0-005 (Surrogate)

☐ PBDE-WKSK-1-005 (Spike)

☐ PBDE-WKIS-1-003 (Int STD)

☐ PBB-WKSU-5.0-004 (Surrogate)

☐ PBB-WKSK-2500-001 (Spike)

☐ PBB-WKIS-5.0-003 (Int STD)

Linear Alkylbenzenes (LABs)

☐ LAB-WKSK-2500-002 (Spike)

Laboratory Bench Sheet Logs

B&B LABORATORIES ENVIRONMENTAL EXTRACTION LOG

MATRIX
- [x] OTHER
- [ ] WATER
- [ ] SEDIMENT
- [ ] TISSUE

wet

Job #: J03318 SDG #: 0609230|

Client: Entrix Buzzards Bay Spill

Analysis: [x] PAH [ ] PESTS [ ] PCB [x] ALI

Other :

Extraction Solvent: 40:70 DCM/Acetone Lot # 46069

Final Solvent : DCM Lot # 46069 Final Vol : 1.0 ml

Lipids Y / (N)
Dry Wt. Y / (N)
Copper Y / (N)
EOM (Y) / N

Surrogate: 100 µL
PAH: AR-WKSU-500-06
Pest/PCB: —
Aliphatic: AL-WKSU-20-005
Other: —

Spike: — µL
PAH: —
Pest/PCB: —
Aliphatic: —
Other: —

GC Int Std: 100 µL
PAH: AR-WK15-500-011
Pest/PCB: —
Aliphatic: AL-WK16-200-007
Other:

Turbo Vap II
Bath T (C):
Pressure (>20psi):
Check Water Level:
Turbo Vap Date:

General Comments:

Teflon lid

	Added	Witness
Surrogate:	9/26/06 RP	9-26-06 EN
Spike:	—	—
Internal:	9/27/06 RP	9-27-06 EN

	Sample Name	Client ID	Wet Wt. (g or L)	Dry Wt. %	Dry Wt. (g)	Hydromatrix (g)	Extraction Comments
1	ETX7073	B-70					
2	ETX7074	B-30					
3	ETX7072	A-70					
4							
5							
6							
7							
8							
9							
10							
11							
12							

Internal Chain of Custody

Extraction Prep
Date: 9/26/06 Date: 9/26/06
From: To:

Extraction
Date: 9/26/06 Date: 9/26/06
From: To:

Concentration
Date: 9-27-06 Date: 9-27-06
From: To:

Columns SA2
Date: Date:
From: To:

ENV 1516
Page 1 of 2

0153

B&B LABORATORIES ENVIRONMENTAL EXTRACTION LOG

	Sample Name	Client ID	Wet Wt. (g or L)	Dry Wt. %	Dry Wt. (g)	Hydromatrix (g)	Extraction Comments
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

DATE	INITIALS
Columns SA1	
Date: 9-27-06	Date: 9-27-06
From:	To:
Concentration SA2	
Date:	Date:
From:	To:
Concentration SA1	
Date:	Date:
From:	To:
Transfer	
Date:	Date:
From:	To:
HPLC	
Date:	Date:
From:	To:
Concentration	
9-27-06 ~~9-29-06~~	9-27-06 ~~9-29-06~~
From: EC	To: EC
Pest/PCB Int Std Added	
—	—
PAH Int Std Added	
9/27/06 ~~9/29/06~~	RP
Aliphatic Int Std Added	
9/27/06 ~~9/29/06~~	RP
Transfer	
9-27-06 ~~9-29-06~~	EC
Internal Chain of Custody Information	

Dry Weight Page	Lipid/EOM Page	Clean-up/Separation/Other Columns
✓	EOM 197	9-27-06 EC

Sample Storage Box #	HPLC Storage Box #
215	—

QC Review	
Date	Initials
9/27/06	RP

Copied to Folders
9/28/06 RP

2001154

MATRIX: (OTHER) SEDIMENT WATER

Job #: JO3318 SDG #: 0609230

Client: Entrix Buzzards Bay Spill

General comments:

Lab Manager Date/Int: 7/26/06 [illegible]

Transferred by Date/Int: From ENV Pg: ENV 576 From DRY Pg:

Date/Int: Bal. Cal. 7/26/06 [illegible]

Date/Int: 9/26/06 [illegible]

	Sample Name	Client ID	Smpl Wt./Vol (g/L) Wet Wt. Dry Wt.	Dry Wt. (%)	Final Extract Vol (mL)	Wt. of 100 µl EOM Wt. (mg)	EOM (Wet Wt. Basis)	EOM (Dry Wt. Basis)	Comments
1	ETX7073	B-70			3	0.021			
2	ETX7074	B-30			3	0.039			
3	ETX7072	A-70			3	0.110			
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									

EOM 197

EOM Logs

	Sample Name	Client ID	Smpl Wt./Vol (g/L) Wet Wt. Dry Wt.	Dry Wt. (%)	Final Extract Vol (mL)	Wt. of 100 µl EOM Wt. (mg)	EOM (Wet Wt. Basis)	EOM (Dry Wt. Basis)	Comments
17									
18									
19									
20									
21									
22									
23									
24									

$$EOM = \frac{(EOM\ Wt.\ (mg))\ (Final\ Extract\ Vol.\ (ml))}{(Smpl\ Wt/Vol.\ (g/L))\ (0.10\ ml)} \times 1000\%$$

$$\%RPD = \frac{(EOM_1 - EOM_2)}{(EOM_1 + EOM_2) \times 0.5} \times 100\%$$

The Relative Percent Difference (RPD) between duplicates must be ≤ 25%.

Date/Int:	RPD

Sample: _____

Duplicate: _____

Last Page

APPENDIX L

DATA USABILITY SUMMARY TABLES

AQUEOUS DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
Groundwater Analytical, Inc. Lab ID 119879												
TP090408.01	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.02	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

HT – Holding Time
SUR - Surrogate
MB – Method Blank
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
ND – Non-detected

RPD – Relative Percent Difference
%R – Percent recovery
RL – Reporting Limit
J – Reported result is estimated
L – Low bias (actual sample concentration may be higher than reported)
H – High bias (actual sample concentration may be lower than reported)
U – Result was not detected at the reported concentration
R – Result was rejected

AQUEOUS DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.03	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.04	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

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AQUEOUS DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.05	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.06	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

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AQUEOUS DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.07	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.08	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

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MSD – Matrix Spike Duplicate
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NAn – Not analyzed
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C# - Number of carbons in aliphatic chain
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AQUEOUS DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.09	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits and sample results may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL) and detected results for benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, and benzo(g,h,i)perylene are estimated with a low bias (JL).
TP090408.10	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

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AQUEOUS DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.11	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
Groundwater Analytical, Inc. Lab ID 109907												
W1F-02-081307-S1	8/13/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
Groundwater Analytical, Inc. Lab ID 109099												
W1F-02-071807-S1	7/18/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions and PAHs reported from EPH extract (GC/FID)	None
W1F-02-071807-S2	7/18/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions and PAHs reported from EPH extract (GC/FID)	None
Groundwater Analytical, Inc. Lab ID 109511												
W1F-02-071807-S1	7/18/07	PAHs by EPA 8270C-Mod SIM	X	✓	✓	✓	✓	NAn	NAn	NAn	Samples were re-extracted for low level PAHs 18 days after sampling, four days after the extraction holding time expired.	Detected results are estimated with a low bias (JL) and non-detected results are estimated with a low bias (UJL).
W1F-02-071807-S2	7/18/07	PAHs by EPA 8270C-Mod SIM	X	✓	✓	✓	✓	NAn	NAn	NA	Samples were re-extracted for PAHs 18 days after sampling, four days after the extraction holding time expired.	Detected results are estimated with a low bias (JL) and non-detected results are estimated with a low bias (UJL).

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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
Groundwater Analytical, Inc. Lab ID 112302												
W1F-02-102507-S1	10/25/07	MA DEP EPH 04 Rev. 1.1	✓	X	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Extraction surrogates diluted out (DF=10) but qualifiers were not applied to data.	None
		PAHs by EPA 8270C-Mod SIM	✓	X	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Extraction surrogate diluted out (DF=200) but qualifiers were not applied to data.	Several non-detected PAH reporting limits were elevated due to sample dilution.
W1F-02-102507-S2	10/25/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
Brandt Island Road 1	10/26/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None

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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
Brandt Island Road 2	10/26/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
Groundwater Analytical, Inc. Lab ID 113768												
HA-01 2’	12/21/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
HA-02 2.5’	12/21/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None

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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
HA-03 3'	12/21/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
HA-04 2.5'	12/21/07	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
Groundwater Analytical, Inc. Lab ID 87519												
W1F02-P2-SUB-08	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None

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MSD – Matrix Spike Duplicate
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MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
W1F02-P2-SUB-07	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
W1F02-P2-SUB-06	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
W1F02-P2-UIT-02	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None

HT – Holding Time
SUR - Surrogate
MB – Method Blank
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
ND – Non-detected

RPD – Relative Percent Difference
%R – Percent recovery
RL – Reporting Limit
J – Reported result is estimated
L – Low bias (actual sample concentration may be higher than reported)
H – High bias (actual sample concentration may be lower than reported)
U – Result was not detected at the reported concentration
R – Result was rejected

SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
W1F02-P2-LIT-02	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
W1F02-P2-UIT-01	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
W1F02-P2-LIT-01	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None

HT – Holding Time
SUR - Surrogate
MB – Method Blank
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LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
W1F02-P2-SUB-02	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS)	None
W1F02-P2-SUB-05	9/13/05	MA DEP EPH 04 Rev. 1.1	X	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample extracted 15 days after collection, one day after the extraction holding time expired.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	X	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample extracted 15 days after collection, one day after the extraction holding time expired.	All non-detected results are estimated with a low bias (UJL).
W1F02-P2-SUB-04	9/13/05	MA DEP EPH 04 Rev. 1.1	X	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample extracted 15 days after collection, one day after the extraction holding time expired.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	X	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample extracted 15 days after collection, one day after the extraction holding time expired.	All non-detected results are estimated with a low bias (UJL).

HT – Holding Time
SUR - Surrogate
MB – Method Blank
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
ND – Non-detected

RPD – Relative Percent Difference
%R – Percent recovery
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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
W1F02-P2-SUB-01	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Detected results for pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene were less than the reporting limit and lowest calibration standard.	Estimate (J) the detected results for pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene.
W1F02-P2-M-01	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID)	
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Detected sample results for phenanthrene, benzo(a)anthracene, chrysene, and indeno(1,2,3-cd)pyrene were less than the reporting limit and lowest calibration standard.	Estimate (J) the detected results for phenanthrene, benzo(a)anthracene, chrysene, and indeno(1,2,3-cd)pyrene.
DDD-P2-06	9/14/05	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). This sample is a field duplicate of W1F02-P2-M-01; all EPH hydrocarbon fractions in both field duplicate samples were non-detected.	None
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). This sample is a field duplicate of W1F02-P2-M-01. Six PAHs were detected at low concentrations in the parent sample while no PAHs were	None

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SUR - Surrogate
MB – Method Blank
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LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
											reported in its field duplicate. Since the concentrations in the parent sample were less than 3 times the reporting limit, no qualifiers were added due to field duplicate precision.	
W1F02-P2-SUB-03	9/13/05	MA DEP EPH 04 Rev. 1.1	X	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample was extracted 15 days after collection, one day after the extraction holding time expired.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	X	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample was extracted 15 days after collection, one day after the extraction holding time expired.	All non-detected results are estimated with a low bias (UJL).
Groundwater Analytical, Inc. Lab ID 119879												
TP090408.01	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

HT – Holding Time
SUR - Surrogate
MB – Method Blank
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
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RPD – Relative Percent Difference
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RL – Reporting Limit
J – Reported result is estimated
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U – Result was not detected at the reported concentration
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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.02	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.03	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

HT – Holding Time
SUR - Surrogate
MB – Method Blank
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
ND – Non-detected

RPD – Relative Percent Difference
%R – Percent recovery
RL – Reporting Limit
J – Reported result is estimated
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H – High bias (actual sample concentration may be lower than reported)
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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.04	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.05	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

HT – Holding Time
SUR - Surrogate
MB – Method Blank
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
ND – Non-detected

RPD – Relative Percent Difference
%R – Percent recovery
RL – Reporting Limit
J – Reported result is estimated
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U – Result was not detected at the reported concentration
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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.06	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits and sample results may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL) and detected results for phenanthrene, fluoranthene, pyrene, and benzo(b)fluoranthene are estimated with a low bias (JL).
TP090408.07	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

HT – Holding Time
SUR - Surrogate
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LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS – Matrix Spike
MSD – Matrix Spike Duplicate
QC – Quality Control

✓ - QC Criteria met
NA – Not applicable
NAn – Not analyzed
NP – Non-project sample used for QC
X – QC Criteria not met
C# - Number of carbons in aliphatic chain
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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.08	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.09	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

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SEDIMENT DATA USABILITY SUMMARY
Brandt Island West
Mattapoisett, Massachusetts
MassDEP RTN 4-17786

Sample ID	Sample Date	Analysis	HT	SUR	MB	LCS	LCSD	MS	MSD	Dup	Issue/Comment	Use Limitation
TP090408.10	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
TP090408.11	9/4/08	MA DEP EPH 04 Rev. 1.1	✓	✓	✓	✓	✓	NAn	NA	NAn	Hydrocarbon fractions only reported from EPH extract (GC/FID). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).
		PAHs by EPA 8270C-Mod SIM	✓	✓	✓	✓	✓	NAn	NA	NAn	PAHs reported from EPH extract (GC/MS). Sample cooler was received by laboratory at 14.7°C; detection limits may be biased low based on cooler temperature exceeding the upper QC limit of 6°C.	All non-detected results are estimated with a low bias (UJL).

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APPENDIX M
PUBLIC NOTIFICATION

ENVIRO LOGIC LLC
Environmental Consultants

PUBLIC NOTIFICATION SUMMARY

PARTIAL CLASS A-2
RESPONSE ACTION OUTCOME STATEMENT

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

April 27, 2009

EXECUTIVE SUMMARY

We are sending you this notice because property records show that you may own waterfront property in Mattapoisett, Massachusetts located west of Brandt Island, which may be part of assessment and cleanup activities associated with the oil spilled in Buzzards Bay from the Bouchard Barge B120 in April 2003. This portion of the shoreline was identified as shoreline segment WIF-02 – Brandt Island West during the assessment and cleanup operations. Please refer to **Figure 1** for the location of the shoreline that is the subject of this notice. Richard J. Wozmak, P.E., P.H. of EnviroLogic, LLC is the Licensed Site Professional (LSP) overseeing assessment and cleanup activities under Massachusetts regulations (310 CMR 40.0000) and Massachusetts Department of Environmental Protection (MassDEP) oversight, and EnviroLogic is working with GeoInsight, Inc. on this project. Through the assessment process we are required to demonstrate that the affected shoreline meets the MassDEP cleanup standards in accordance with the Massachusetts Contingency Plan (MCP). This notice is to inform you that a Response Action Outcome (RAO) statement has been prepared and is being filed with the MassDEP indicating that all assessment and cleanup activities associated with the oil spill have been completed for this segment of shoreline.

This notice will tell you about documents that are available to show what work has been completed, the level of cleanup that was achieved, and how this work complies with regulations, in case you were unavailable to attend our prior public meetings or review assessment and cleanup reports on the www.buzzardsbay.org website. A copy of this RAO report is also posted on the MassDEP file viewer website at http://public.dep.state.ma.us/wsc%5Fviewer/. We are also letting you know that the cleanup and assessment process has been completed for this segment of the shoreline.

INTRODUCTION

This package of information serves as notification to owners of property that may be within the boundaries of the Brandt Island West shoreline segment, which includes portions of Brandt Island, the west side of the causeway that leads out to Brandt Island, Leisure Shores Beach, and a section of Howard's Beach. Some areas of the shoreline were affected by the release of No. 6 fuel oil that occurred on April 27, 2003 in Buzzards Bay (affected sections of shoreline are collectively referred to as the "Site" in this letter). Activities conducted to assess environmental conditions and clean up sections of shoreline affected by the release were conducted under the state's environmental regulations, referred to as the Massachusetts Contingency Plan (MCP). You may have already received one or more notifications similar to this one for Partial Response Action Outcome (RAO) Statements relating to other shoreline areas, or for the Phase II Comprehensive Site Assessment (CSA) report transmittal relating to this area, filed with the MassDEP in August 2006. This current notification is for the April 27, 2009 transmittal of a Phase IV Final Inspection Report, Phase IV Completion Statement and Partial Class A-2 RAO Statement to the MassDEP, as indicated on the attached *Informational Notice to Property Owners*. The RAO Statement is the regulatory document that completes and concludes assessment and cleanup activities at the Site. The RAO Statement is summarized herein, and a complete copy is available for review at the MassDEP office in Lakeville, Massachusetts and can also be found online at the www.buzzardsbay.org website and the MassDEP file viewer website at http://public.dep.state.ma.us/wsc%5Fviewer/. This notification package also includes a map (**Figure 1**) showing the shoreline segment which is the subject of this letter, and which may include a portion of your property.

This notification is provided to owners of property that may be within the intertidal zone of the shoreline segment, and therefore within the Site boundaries. Note that although some properties in Massachusetts may extend to mean low water, not all properties necessarily extend that far (e.g., the property lines at some properties may only extend to mean high water, which means such properties do not include the intertidal zone), and therefore some properties may not be within the Site boundaries. Evaluating whether a particular property extended to mean low water would require conducting a review of the deed for each property within the segment. Deed research for each property was not conducted and notification is therefore provided to the owners of properties along the shoreline, recognizing that some of these properties may not actually be within the boundaries of the subject area.

BACKGROUND AND RESPONSE ACTION HISTORY

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. Winds and currents drove released oil to the north, northwest, and northeast in the days following the spill until it became stranded on the shoreline. The municipalities where released oil impacted the shoreline to varying degrees included: Westport, Dartmouth, New Bedford, Fairhaven, Gosnold, Mattapoisett, Marion, Wareham, Bourne, and Falmouth. The dispersion of oil by wind and currents resulted in approximately 84 miles of impacted shoreline with varying degrees of

shoreline oiling, ranging from traces to relatively heavy amounts. Shoreline oiling was generally concentrated at exposed points and peninsulas on the northern shore of Buzzards Bay. In addition, a few isolated areas of sporadic shoreline oiling were reported in parts of Rhode Island and the Elizabeth Islands.

Emergency cleanup actions were immediately initiated and were conducted through September 3, 2003 by Unified Command (consisting of the U.S. Coast Guard, MassDEP, and the Responsible Party) in accordance with the federal Oil Pollution Act (OPA) of 1990. In September 2003, oversight of assessment and cleanup activities transitioned from Unified Command to the current LSP. On September 15, 2003, an Immediate Response Action (IRA) Plan was transmitted to MassDEP that outlined steps to perform further cleanup in limited areas of the shoreline; to respond to citizen's complaints of oil along the shoreline; to assess the potential presence of buried oil; and to investigate segments that were not approved by Unified Command as meeting their endpoint cleanup criteria. IRA cleanup activities generally consisted of removing isolated small tarballs or wrack patties, wiping tacky oil from rocks using sorbent material, and removing small rocks with oil that could not be effectively wiped or cleaned. IRA cleanup and assessment activities have been concluded, and are summarized in an IRA Completion Report submitted to MassDEP, dated April 3, 2007.

Concurrent with the IRA activities summarized above, Phase I through Phase IV Comprehensive Response Actions were completed to evaluate potential risks (if any) to human health, safety, public welfare and the environment, associated with the release and to conduct additional cleanup if necessary. Phase I and Phase II activities were summarized in previous reports, including a Phase I Initial Site Investigation Report (Phase I Report), Conceptual Site Model (CSM), Phase II Scope of Work and updated CSM, Phase II CSA Report, and Phase III Remedial Action Plan. The August 2006 Phase II CSA report included a Method 3 Risk Assessment that concluded that a condition of No Significant Risk (NSR) to human health, safety, and the environment had been achieved at this segment. However, at that time, NSR was not concluded with respect to public welfare on this segment on Leisure Shores and a portion of Howard's Beach, where additional limited and focused cleanup was proposed to be conducted.

A Phase IV Remedy Implementation Plan (RIP) was submitted in August 2007, identifying cleanup activities to be conducted on the Leisure Shores and Howard's Beach portion of shoreline segment WIF-02. In September 2007 a total of 53 test pits were excavated using a mini-excavator in two general areas at Leisure Shores and Howards Beach. Some material (consisting mostly of rocks with weathered oil splatter) was removed during the investigation activities for disposal, and other areas were identified for future cleanup activities. On October 25 and 26, 2007 a limited quantity of sediment with small amounts of weathered oil was removed from areas identified during assessment activities on Leisure Shores and Howard's Beach. During a Post-Phase IV RIP inspection conducted on December 7, 2007, local residents pointed out an additional area of rocks with weathered oil splatter that were reportedly uncovered by workers who were widening the stream channel in the fall of 2007 as part of mosquito control activities. A Phase IV RIP Modification was submitted in February 2008, identifying cleanup activities to be conducted in response to the additional area of impact; as well as some additional assessment activities on either side of the stream channel. The Phase IV Modification objectives were carried out between March 2008 and August 2008; including investigative beach trenching, shoreline profiling, and removal of four

5-gallon buckets of sand and rocks, 12 small cobbles or pebbles with oil splatter, and five pieces of pavement.

Inspections conducted after implementing the Phase IV activities included visual shoreline inspection; excavation of a total of 61 test pits at Leisure Shores and Howards Beach on several different dates; and collection of sediment and water samples from test pits. The inspections indicated that cleanup operations reduced the residual oil present at Leisure Shores and Howard's Beach. In general, the residual oil collectively observed in the post-Phase IV cleanup inspections consisted primarily of an occasional small piece of pavement; a rock, pebble, or cobble with hardened residual oil splatter; and small sheens and/or flecks of floating oil particles on the surface of water in test pits. Residual oil at the segment described above exists in quantities so small and sparse that it cannot be easily identified by the untrained eye, and is not expected to affect shoreline use.

On September 30, 2008, 22 additional test pits were excavated at Leisure Shores and Howard's Beach. In a memorandum dated November 28, 2008, MassDEP indicated that site conditions at the time of the inspection were consistent with a condition of NSR to public welfare.

Based upon the information collected through comprehensive response actions, the cleanup objectives identified in the Phase IV RIP have been met and additional response actions are not necessary to achieve an RAO for this segment (i.e., the segment meets the MassDEP cleanup standards). Therefore, we are transmitting the final RAO documents to the MassDEP, thus completing the cleanup actions at this segment as well as the entire Buzzards Bay area previously affected by the release.

CLOSING

Information regarding assessment and cleanup activities for the Site has been presented and discussed at numerous public meetings held at the Whaling Museum in New Bedford. In addition, the reports referenced above as well as the Partial RAO Statement are available for review at the MassDEP office in Lakeville, many of which can also be viewed online at the www.buzzardsbay.org website and the MassDEP file viewer website at http://public.dep.state.ma.us/wsc%5Fviewer/.

Attachments:

Response Action Outcome Conclusions
Informational Notice to Property Owners
Figure 1, RAO Segment Boundary W1F-02

RESPONSE ACTION OUTCOME CONCLUSIONS

As described in the Method 3 Risk Characterization included in the August 2006 Phase II CSA report, a condition of NSR to human health, safety, and the environment was achieved for segment WIF-02. Phase IV activities were conducted at Leisure Shores and Howard's Beach in 2007 and 2008 to characterize residual oil conditions, to remove minor amounts of residual oil, and to address potential issues concerning public welfare risk. Phase IV inspections indicated that the cleanup activities reduced residual oil so that a condition of NSR to public welfare is currently present. New analytical data collected since the August 2006 Risk Characterization were incorporated into an updated Risk Characterization, which indicated that the condition of NSR to human health and the environment that was previously demonstrated was still applicable to this shoreline segment. Therefore, a condition of NSR to human health, public welfare, safety, and the environment has been achieved at this shoreline segment. Hot spots, as defined in the MCP, are not present, and residual oil impacts do not exceed UCLs. No substantial hazards are present at the Site. Uncontrolled sources associated with this release have been eliminated. A site-specific evaluation of the feasibility for achieving or approaching background conditions was conducted and it was concluded that it was not feasible to achieve or approach background. In addition, a REDUA was completed and demonstrated that the data used to support the RAO is acceptable. Therefore, a Partial Class A-2 RAO is appropriate for segment WIF-02. Segment WIF-02 is shown on Figure 2.

This RAO is not based upon the implementation of an Activity and Use Limitation (AUL) to maintain a condition of NSR. Post-RAO monitoring is not necessary to ensure that the conditions upon which the Class A-2 RAO is based are maintained.

ENVIRO LOGIC LLC
Environmental Consultants

April 27, 2009

Mr. Dale S. Barrows
Board of Health
Town of Mattapoisett, MA
P.O. Box 434
16 Main Street
Mattapoisett, MA 02739

Re: Notice of Document Availability
Partial Class A-2 Response Action Outcome Statement
Bouchard Barge B120 Oil Release
Buzzards Bay, Massachusetts
MassDEP Release Tracking Number 4-17786
EnviroLogic Project No. 2002-001B120

Dear Mr. Barrows:

On behalf of the Bouchard Transportation Company, Inc. (Bouchard), EnviroLogic, LLC (EnviroLogic) provides notice that the above-referenced report has concurrently been submitted to the Massachusetts Department of Environmental Protection (MassDEP) Southeast Regional Office relating to the Bouchard Barge B120 oil release in Buzzards Bay, which occurred in April 2003. The attached notification summary has also been sent to owners of properties that may have been affected by the release.

The above-referenced report is being sent to the MassDEP Southeast Regional Office, located at 20 Riverside Drive, Lakeville, Massachusetts 02347. Arrangements to review or obtain a copy of the report may be made by contacting the MassDEP at (508) 946-2700. If you have any questions regarding this notification, please do not hesitate to contact me.

Sincerely,

EnviroLogic, LLC

Richard J. Wozniak, P.E., P.H., LSP, LEP
Principal

Cc: Michael J. Botelho Town of Mattapoisett Town Administrator

Attachment: Notification Summary

J:\Projects\2002-001B120\Brandt Island West\Property Owner Notification\Town Notice-Board of Health.doc

ENVIRO LOGIC LLC
Environmental Consultants

April 27, 2009

Mr. Michael J. Botelho
Town Administrator
Town of Mattapoisett
P.O. Box 435
16 Main Street
Mattapoisett, MA 02739

Re: Notice of Document Availability
Partial Response Action Outcome Statement, Class A-2
Bouchard Barge B120 Oil Release
Buzzards Bay, Massachusetts
MassDEP Release Tracking Number 4-17786
EnviroLogic Project No. 2002-001B120

Dear Mr. Botelho:

On behalf of the Bouchard Transportation Company, Inc. (Bouchard), EnviroLogic, LLC (EnviroLogic) provides notice that the above-referenced report has concurrently been submitted to the Massachusetts Department of Environmental Protection (MassDEP) Southeast Regional Office relating to the Bouchard Barge B120 oil release in Buzzards Bay, which occurred in April 2003. The attached notification summary has also been sent to owners of properties that may have been affected by the release.

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Sincerely,

EnviroLogic, LLC

Richard J. Wozmak, P.E., P.H., LSP, LEP
Principal

Cc: Dale S. Barrows Town of Mattapoisett Board of Health

Attachment: Notification Summary

Z:\Projects\2002-001B120\Brandt Island West\Property Owner Notification\Town Notice-Executive Secretary.doc

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

BWSC122

This notice is related to:
Release Tracking Number

4 - 17786

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: N/A

2. City/Town: Buzzards Bay 3. ZIP Code: N/A

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner:

2. Address of Property For Which This Notice is Being Provided Owned by Property Owner named in B1:

a. Street Address:

b. City/Town: c. ZIP Code:

C. THIS NOTICE IS BEING GIVEN : (check one)

- ☐ 1 Upon Completion of a Phase II Comprehensive Site Assessment.
- ☑ 2. Upon Submittal of a Response Action Outcome (i.e., Site Closure Report).
- ☐ 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
☐ 1 Soil	
☐ 2. Groundwater	
☐ 3. Surface Water	
☑ 4. Sediment	weathered No. 6 Fuel Oil
☐ 5. Indoor Air	
☑ 6. Other: boulders & riprap (specify)	weathered No. 6 Fuel Oil

E. ATTACHMENTS PROVIDED WITH THIS NOTICE. AS REQUIRED BY 310 CMR 40.1406:

- ☑ 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous is or is likely to be Present.
- ☑ 2. A Copy of the Phase II Completion Site Assessment or Response Action Outcome Conclusions.

F. CONTACT INFORMATION RELATED TO THE PARTY PROVIDING THIS NOTICE:

1 Contact Name: EnviroLogic, LLC 2. Street: 50 Nashua Road, Suite 205

3. City/Town: Londonderry 4. State: NH 5. ZIP Code: 03053

6. Telephone: (603) 421-2777 7. Email:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

4 - 17786

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not, as previously suspected, present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/dep/cleanup/oview.htm.

For more information regarding this notice, you may contact the party listed in **Section F** on the reverse side of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://mass.gov/dep/about/region/schedule.htm if you would like to make an appointment to see these files. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Updated (January 19, 2009) Property Owner Addresses For Segment W1F-02
B120 Oil Spill

Map and Lot Number	Property Owner	Mailing Address	Property Location
14B/1	John & Carol A. Russo T/E	173 Brandt Island Road, Mattapoisett, MA 02739	173 Brandt Island Road
14/33B	Robert C. & Velma Frank	Twin Pond Lane, Lincoln, MA 01773	3 Brandt Island Shores
14/33C	David H. & Salwa A. Cahan	3 Turtle Lane, Dover, MA 02030	4 Brandt Island Shores
14/33D	Brandt Island Association C/O Ann Leibowitz Trustee	67 Summer Street, Weston, MA 02493	0 Brandt Island Shores
14/26	Raymond D. Bertrand	679 Plymouth Street, Middleboro, MA 02346	0 Brandt Island Road
14/25	Edwin F. & Alexis A. & Alyssa M. Costa	98 Allen Street, New Bedford, MA 02740	0 Howard Beach East of
14/24	Edwin F. & Alexis A. & Alyssa M. Costa	98 Allen Street, New Bedford, MA 02740	0 Brandt Island Road
14/23	James D. & Sharlene Craig	15 Jyra Lane, North Easton, MA 02356	0 Brandt Island Road
14/10	James D. & Sharlene Craig	15 Jyra Lane, North Easton, MA 02356	150 Brandt Island Road
14/11	Edward J. & Kathleen Tartufo	9 Brookside Road, Mansfield, MA 02048	0 Island View Av
14/61	Stanley A. Tyliszcczak & Lucinda A. Woods	1 Andrews Road, Westborough, MA 01581	140 Brandt Island Road

N
W E
S

Legend

Shoreline Within W1F-02 Segment

0 200 400 800

Approximate Scale in Feet

ENVIRO LOGIC inc
Environmental Consultants
50 Nashua Road, Suite 205
Londonderry, NH 03053
Technically Smart.
Business Sensitive.

PROJECT: B120 Oil Spill

TITLE: W1F-02 Segment Boundary

DESIGNED:	DRAWN:	CHECKED:	APPROVED:	FIGURE
MGC	MGC	JMM	RJW	1
SCALE:	DATE:	NO.:	PROJECT	
1"=400'	2/5/2009	Figure1	2002-001	