

APPENDIX D

**META ENVIRONMENTAL INC.
ENVIRONMENTAL FORENSIC REPORT
MAY 17, 2002**

Environmental Forensic Report

Bay Shore Supplemental

SDG: DB020502, DB020509



Report To:

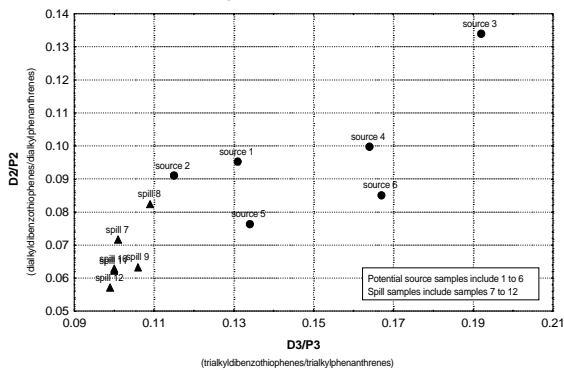
Dvirka and Bartilucci
330 Crossways Park Drive
Woodbury, NY 11797

Report By:

META Environmental, Inc.
49 Clarendon Street
Watertown, MA 02472

May 17, 2002

Figure 1. Double Ratio Plot



Identifying and allocating sources of pollutants in complex environments.

Final Laboratory Report

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Certification

This certifies that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed herein. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Director and Quality Assurance Officer, as verified by the following signatures.

David R. Craig
Laboratory Director, META Environmental, Inc.

Date

David M. Mauro
Quality Assurance Officer, META Environmental, Inc.

Date

Sample Delivery Group Narrative

Project: Bay Shore Supplemental

Client: Dvirka and Bartilucci
330 Crossways Park Drive
Woodbury, NY 11797

Report Contact: Mr. Thomas Fox

Date of Receipt: 5/2, 5/9/02

Sample Summary:

The samples received for this project are summarized in the attached sample login forms.

META Project Number: D07001-60

Chain of Custody

Samples were received in good condition. The internal temperatures of the shipment containers were as follows:

Samples received 5/2/2002	9.6°C
Samples received 5/9/2002	16.9°C

Internal chain of custody procedures were followed after sample receipt. Samples were stored in a locked refrigerator. A sample custody logbook contains the record of sample removal from the secure sample storage area to the sample preparation laboratory. The custody record for the sample extracts is present on the sample extraction logbook page.

The disposal of samples and extracts will be authorized 1 month after the release of this data report. Sample disposal will be documented.

Methods

The samples were prepared by waste dilution (EPA 3580) using dichloromethane (DCM). The extracts were spiked with internal standard and analyzed by GC/FID (EPA 8100 mod.) and GC/MS/SIM (EPA 8260/8270 mod.).

Results

Sample results were presented in summary forms (CLP Form 1 equivalent) which follow this narrative.

Quality Control

Analyte Flags

The detection limits were determined as the sample equivalent of the lowest linear initial calibration standard. Analytes measured between 50% and 100% of the lowest standard were reported as "estimated" and flagged with the letter "J." No value was reported above the calibration range. Undetected analytes were flagged with the letter, "U." Analytes marked with a "B" were detected in the associated blank and should be reviewed for a possible positive bias. No deviations were thought significant enough to compromise the integrity of the reported values.

Holding Times

The samples were extracted within holding times. All samples and extracts were stored at 4°C ± 2°C prior to extraction and analysis. All extracts were analyzed within 40 days of sample preparation.

Blanks

No target analytes were present above the detection limit in the blanks.

Internal Standards

Internal standards were recovered within acceptable QC limits (50%-200%) relative to the continuing calibration standard.

Interpretation

Sample BBMN-21

This sample contained a pyrogenic substance (see Definitions). The pattern of PAHs, especially the ratios of fluoranthene to pyrene and dibenzofuran to fluorene indicate that the pyrogenic material in this sample is manufactured gas plant (MGP) tar, probably from a carburetted water gas (CWG) process. The slightly reduced MAH concentrations relative to PAHs may be indicative of very mild weathering.

Sample BBMN-22

This sample also contained a pyrogenic substance. The pattern and ratios of PAHs indicate that the pyrogenic material in this sample is MGP tar, probably CWG. The slightly reduced MAH concentrations relative to PAHs may be indicative of very mild weathering.

Sample BSW-01

This sample contained pyrogenic and petrogenic substances (see Definitions). The petrogenic material in this sample eluted as an unresolved complex mixture (UCM or "hump") from approximately octane (C8 – 5 minutes) to nonacosane (C29 - 30 minutes) with a maximum at octadecane (C18 – 19 minutes). Examples of common petroleum products with these features include blended fuels such as #4 fuel oil as well as wash oil. The dominance of normal alkanes and the alkane/isoprenoid ratios indicate that this material is relatively unweathered.

The combination of the pattern of PAHs, the high MAH concentrations, and the petrogenic material in this sample strongly suggest that this sample contains used wash oil. Wash oils were used in the gas purification process to remove tar volatiles from the gas stream.

Discussion

The similarity of the diagnostic ratios (Table 1) and FID and ion fingerprints (Appendix B and E) indicate that samples BBMN-21 and BBMN-22 are very similar and are likely derived from the same source. The materials present in sample BSW-01 are substantially different from those found in the other two samples. However, this sample can also likely be traced to the operation of the MGP.

Definitions

Pyrogenic substances are complex mixtures of primarily hydrocarbons produced from organic matter subjected to high temperatures but with insufficient oxygen for complete combustion. Pyrogenic materials are produced by fires, internal combustion engines, and furnaces. They also are formed when coke or gas are produced from coal or oil. Coal-tar based products, such as roofing, pavement sealers, waterproofing, pesticides, and some shampoos contain pyrogenic materials.

Petrogenic substances include crude oil and crude oil derivatives such as gasoline, heating oil, and asphalt.

Pitch is the semi-solid or solid material consisting of high molecular weight hydrocarbons that remain following coal tar distillation.

References

1 "Chemical Source Attribution at Former MGP Sites," EPRI Report 1000728, December 2000.

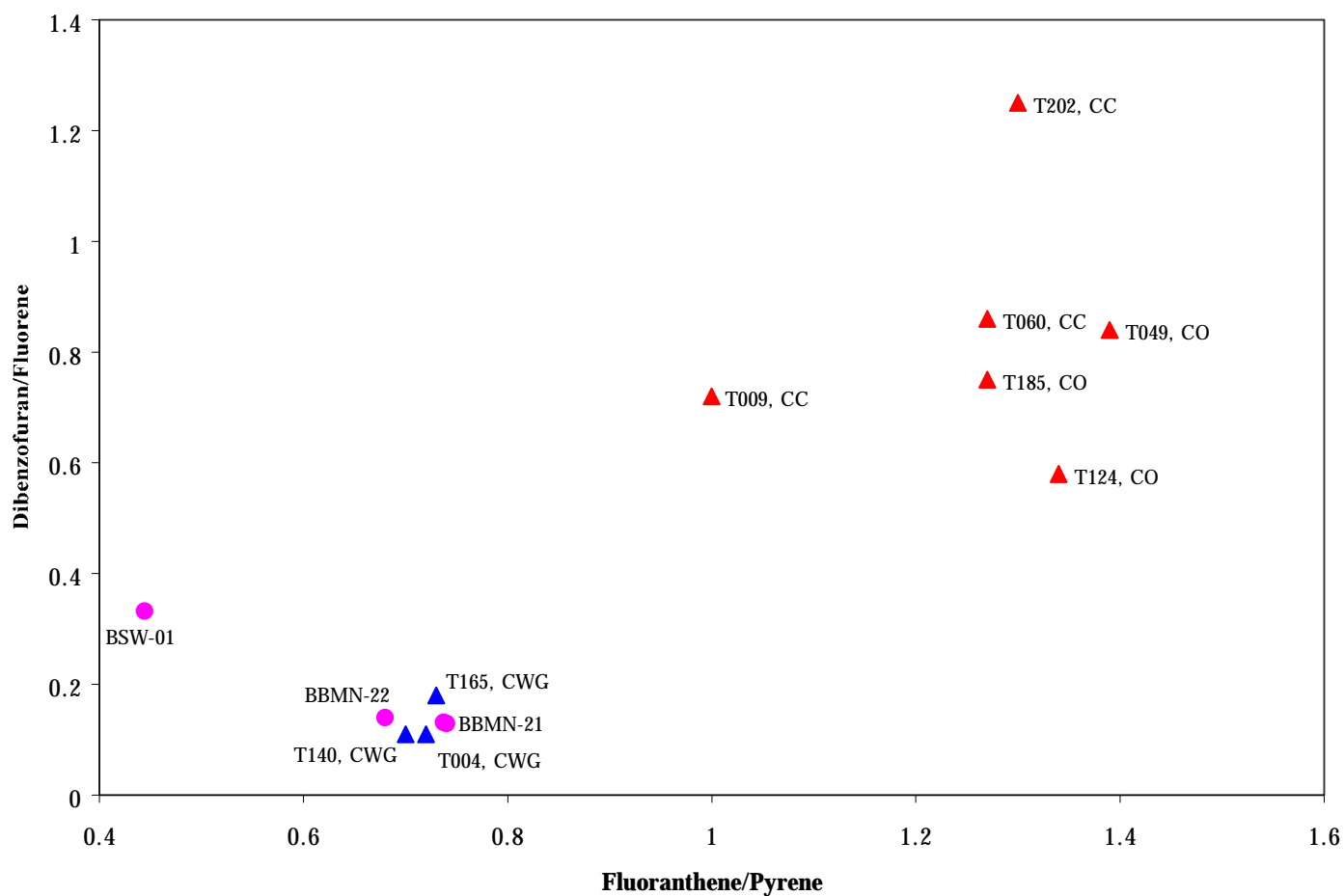
Table 1
Source and Weathering Ratios

Sample	Fl/Py	D/F	C17/Pris	C18/Phy	Pris/Phy	C3D/C3PA	C2D/C2PA
BBMN-21	0.74	0.13	5.87	4.07	0.71	0.50	0.28
BBMN-21 Dup	0.74	0.13	6.50	4.22	0.80	0.50	0.28
BBMN-22	0.68	0.13	5.50	3.69	0.82	0.59	0.32
BSW-01	0.44	0.33	1.92	1.44	0.77	3.11	1.72

Ratios:

Fl/Py	fluoranthene/pyrene
D/F	dibenzofuran/fluorene
C17/Pris	septadecane/pristane
C18/Phy	octadecane/phytane
Pris/Phy	pristane/phytane
C3D/C3PA	trialkyldibenzothiophenes/trialkylphenanthrenes/anthracenes
C2D/C2PA	dialkyldibenzothiophenes/dialkylphenanthrenes/anthracenes
Chry/Pri	Phenanthrene/Phytane

Figure 1 Selected Source Ratios



TXXX Tar Sample from META's in house source library
 CC Coal Carbonization Tar
 CO Coke Oven Tar
 CWG Carburetted Water Gas Tar