



FINAL REPORT

**CONFIDENTIAL
ATTORNEY/CLIENT PRIVILEGE**

Prepared for:

MARATHON PIPE LINE COMPANY

FINDLAY, OHIO

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BATON ROUGE, LOUISIANA

ENVIRONMENTAL SAMPLING REPORT

MUSSEL TISSUE RESULTS

AIRLINE HIGHWAY GASOLINE RELEASE

July 1996

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Blind River Mussel Tissue Sampling Locations and Results

1.0 INTRODUCTION

On or about May 24, 1996, Marathon Pipe Line Company (Marathon) discovered a release of approximately 11,308 barrels of unleaded gasoline in the pipe line right-of-way adjacent to U.S. Highway 61 (Airline Highway) in St. James Parish approximately 3 miles northeast of Gramercy, Louisiana. The release resulted from a ruptured Garyville-to-Zachary 20-inch pipe line owned by Marathon. Two tributaries of Blind River in the vicinity of the gasoline release site served as conduits for the movement of an unknown quantity of the gasoline into the river (Figure 1). A cypress-tupelo gum swamp habitat (McElroy Swamp) surrounds the release site and borders Blind River (Figure 1).

1.1 Purpose

A sampling and analysis plan for mussels was developed after consultation with Louisiana Department of Wildlife and Fisheries (LDWF) personnel. The goals of the sampling plan were to determine if gasoline product had contaminated Blind River mussels and to obtain analytical data of known quality, thus assuring the scientific and legal defensibility of project data. This report summarizes the mussel sampling methods and analytical results from Blind River.

2.0 METHODS

A total of 28 mussels were collected on June 11-12, 1996 from six sample locations along approximately 11 miles of Blind River (Table 1). At least four different species of mussels were tentatively identified in the field as: the giant floater (Pyganodon grandis), flat floater (Anodonta suborbiculata), pimpleback (Quadrula pustulosa), and southern

maple leaf (Quadrula apiculata). A minimum of three mussels were collected at each sample station (Table 1). However, only two mussels were found at the reference (background) site, station 2. Therefore, station 2N was established, and an additional specimen was collected there to pool with mussels from station 2.

Figure 1 indicates the locations of the six mussel sampling stations. Station 1 was located downstream from the release site in the vicinity of the St. James Boat Club boat launch. Station 2 was located farther downstream, north of I-10, in the vicinity of Bayou Fusil and was considered representative of background. Station 2N was located north of station 2, approximately 1,000 feet south of river mile 8. Station 3, located between tributary #9 and tributary #11, was on the fringe of the impact zone, based on the extent of the initial fish kill observed by LDWF personnel. Station 4 was located between the Kansas City Southern Railroad bridge and the vicinity of tributary #5, in the major impact zone. Station 5 was located upstream near the intersection of an access canal and Blind River.

A small boat was used to facilitate locating the mussels. Mussels were collected by diving in deep water or by walking the muddy, sloping bottom in shallow water to locate specimens. Mussels occurred at depths of approximately 1.5 to 10 meters in Blind River.

Individual mussels were not measured or weighed. Whole mussels were arbitrarily divided between Marathon Pipe Line Company and LDWF, with LDWF receiving the majority of even numbered mussels. The sample identification code for the sampling is listed in Table 1. Each mussel was numbered by etching Roman numerals on its shell. The mussels were wrapped in aluminum foil (shiny side outward), individually placed into labeled Ziploc® plastic bags, and stored in a laboratory-supplied cooler packed with

wet ice to chill the sample bags to approximately 4°C. All samples were tracked according to established chain-of-custody procedures and transported to the contract laboratory. The chain-of-custody forms are included as Attachment 1.

American Analytical and Technical Services, Inc. (AATS) of Baton Rouge, Louisiana analyzed the mussel samples for semivolatile compounds. A modified U.S. EPA SW-846 Method 8270 utilizing matrix solid phase dispersion (MSPD) was employed. Two grams of mussel tissue in a solvent-washed C₁₈ media were sonicated, concentrated to 0.5 mL, and 5 uL of the concentrate were injected onto the Gas Chromatograph/Mass Spectrometer (GC/MS). Method detection limits were 0.25 mg/kg*. Each analytical sample represents an individual mussel. No composite samples were used. The remaining mussel tissues were archived in a freezer (to -20°C) at AATS. After tissue extraction, the shells were saved and returned to LDWF for final identification.

The following quality assurance/quality control (QA/QC) samples were collected for every 20 mussel samples:

- matrix spike,
- matrix spike duplicate,
- method blank, and
- laboratory control sample.

* mg/kg = parts per million (ppm) concentration.

The results reported in this summary are based on validated analytical data in accordance with *U.S. EPA SW-846, 3rd Edition* and *National Functional Guidelines for Organic Data Review (USEPA, February 1994)*. Validation of analytical data was performed by Terra Consulting Group, Incorporated of Baton Rouge, Louisiana.

3.0 RESULTS

Table 2 summarizes the analytical results for the Blind River mussels by sampling station. No semivolatile gasoline components were detected in the mussels. Semivolatile compounds detected in mussels were phenol and several phthalate esters, i.e., diethylphthalate, butylbenzylphthalate, and bis(2-ethylhexyl)phthalate. Phenol was detected in 2 of 28 mussels (0.26-0.27 mg/kg), both of which were collected at Station 1. Diethylphthalate was detected in 9 of 28 mussel samples (0.31-0.68 mg/kg) from Stations 3, 4, and 5. Butylbenzylphthalate and bis(2-ethylhexyl)phthalate were detected once each at concentrations of 0.44 mg/kg at Station 5 and 2.4J** mg/kg at Station 3, respectively. Figure 1 shows the results of analyses for semivolatile gasoline components in the Blind River mussels.

4.0 SUMMARY

A total of 28 mussels were collected from approximately an 11 mile reach of Blind River. No semivolatile components of gasoline were detected in the mussels. The detected semivolatile compounds (phenol and phthalate esters) are not known components of Garyville regular unleaded gasoline. The phthalate esters are common laboratory

** J = estimated concentration.

contaminants (USEPA, *Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses*, 1988).

TABLES

TABLE 1
Marathon Pipe Line Company
Summary of Mussel Sampling
Blind River, Louisiana

Date Collected	Site No.	Mussel No.
6/12/96	1	43
6/12/96	1	45
6/12/96	1	47
6/12/96	1	49
6/12/96	2	51
6/12/96	2	53
6/12/96	2N	55
6/11/96	3	29
6/11/96	3	31
6/11/96	3	33
6/11/96	3	35
6/11/96	3	37
6/11/96	3	39
6/11/96	3	41
6/11/96	4	W3
6/11/96	4	W4
6/11/96	4	E6
6/11/96	4	E8
6/11/96	4	E10
6/11/96	4	E12
6/11/96	4	E13
6/11/96	5	15
6/11/96	5	17
6/11/96	5	19
6/11/96	5	21
6/11/96	5	23
6/11/96	5	25
6/11/96	5	27

Table 2
Marathon Pipe Line Company
Airline Highway Release Mussel Samples
Validated Results from AATS
Analytical results are reported in ppm (mg/Kg)

Site Location	SITE1	SITE1	SITE1	SITE1	SITE2	SITE2	SITE2	SITE3
Sample Name	43	45	47	49	51BYU	53BYU	55N	41
Analysis Date	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96
Lab Sample Type	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG
Analyte Name								
Phenol	0.25 U	0.26	0.27	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
bis(2-Chloroethyl)ether	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chlorophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,3-Dichlorobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,4-Dichlorobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,2-Dichlorobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylphenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,2'-oxybis(1-Chloropropane)	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Methylphenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
N-Nitroso-di-n-propylamine	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachloroethane	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Nitrobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Isophorone	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Nitrophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dimethylphenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
bis(2-Chloroethoxy)methane	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dichlorophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,2,4-Trichlorobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Naphthalene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Chloroaniline	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobutadiene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Chloro-3-methylphenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Methylnaphthalene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorocyclopentadiene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,6-Trichlorophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4,5-Trichlorophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Chloronaphthalene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2-Nitroaniline	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dimethylphthalate	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Acenaphthylene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,6-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
3-Nitroaniline	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

TRG=Site Sample, TRGRE=Re-extraction/Re-analysis

U=Non-detected
J=Estimated
UJ=Non-detected, estimated

Table 2
Marathon Pipe Line Company
Airline Highway Release Mussel Samples
Validated Results from AATS
Analytical results are reported in ppm (mg/Kg)

Site Location	SITE1	SITE1	SITE1	SITE1	SITE2	SITE2	SITE2	SITE3
Sample Name	43	45	47	49	51BYU	53BYU	55N	41
Analysis Date	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96	6/17/96
Lab Sample Type	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG
Analyte Name								
Acenaphthene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dinitrophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Nitrophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenzofuran	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
2,4-Dinitrotoluene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Diethylphthalate	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.31
4-Chlorophenyl-phenylether	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Fluorene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Nitroaniline	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4,6-Dinitro-2-methylphenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
N-Nitrosodiphenylamine	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Bromophenyl-phenylether	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Pentachlorophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Phenanthrene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Anthracene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Di-n-butylphthalate	1 U	1.7 U	1.5 U	0.95 U	1.1 U	1 U	1 U	2.1 U
Fluoranthene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Pyrene	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ
Butylbenzylphthalate	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ
3,3'-Dichlorobenzidine	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ
Benzo(a)anthracene	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ
Chrysene	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ
bis(2-Ethylhexyl)phthalate	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	0.25 UJ	2.4 J
Di-n-octylphthalate	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(b)fluoranthene	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(k)fluoranthene	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(a)pyrene	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Indeno(1,2,3-cd)pyrene	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenz(a,h)anthracene	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(g,h,i)perylene	0.25 UJ	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

TRG=Site Sample, TRGRE=Re-extraction/Re-analysis

U=Non-detected
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UJ=Non-detected, estimated

Table 2
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Airline Highway Release Mussel Samples
Validated Results from AATS
Analytical results are reported in ppm (mg/Kg)

Site Location	SITE3	SITE3	SITE3	SITE3	SITE3	SITE3	SITE4	SITE4	SITE4	SITE4	SITE4	SITE4	SITE4	SITE5	SITE5	SITE5	SITE5	SITE5	SITE5	SITE5
Sample Name	29	31	33	35	37	39	E6	E8	E10	E12	E13	W3	W4	15	17	19	21	23	25	27
Analysis Date	6/13/96	6/13/96	6/13/96	6/13/96	6/13/96	6/13/96	6/12/96	6/12/96	6/12/96	6/12/96	6/12/96	6/12/96	6/12/96	6/12/96	6/13/96	6/13/96	6/13/96	6/13/96	6/13/96	6/13/96
Lab Sample Type	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG
Analyte Name	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG	TRG
4-Chlorophenyl-phenylether	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Fluorene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Nitroaniline	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
3,6-Dinitro-2-methylphenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
N-Nitrosodiphenylamine	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
4-Bromophenyl-phenylether	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Hexachlorobenzene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Pentachlorophenol	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Phenanthrene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Anthracene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Di-n-butylphthalate	2.8 U	3.2 U	2.5 U	2.8 U	2.4 U	2.9 U	2.5 U	2.3 U	2.5 U	1.7 U	3.4 U	2.2 U	2.5 U	1.8 U	2.4 U	2.4 U	2.4 U	2.3 U	3.3 U	2 U
Fluoranthene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Pyrene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Butylbenzylphthalate	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.44	0.25 U	0.25 U	0.25 U	0.25 U
3,3'-Dichlorobenzidine	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(a)anthracene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Chrysene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
bis(2-Ethylhexyl)phthalate	0.96 U	0.96 U	1.2 U	1.9 U	0.92 U	1.4 U	2.4 U	2.4 U	0.77 U	0.72 U	1.2 U	1.1 U	0.54 U	0.64 U	1.1 U	1 U	1.1 U	2 U	1.2 U	0.87 U
Di-n-octylphthalate	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(b)fluoranthene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(k)fluoranthene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(a)pyrene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Indeno(1,2,3-cd)pyrene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Dibenz(a,h)anthracene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Benzo(g,h,i)perylene	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

FIGURES

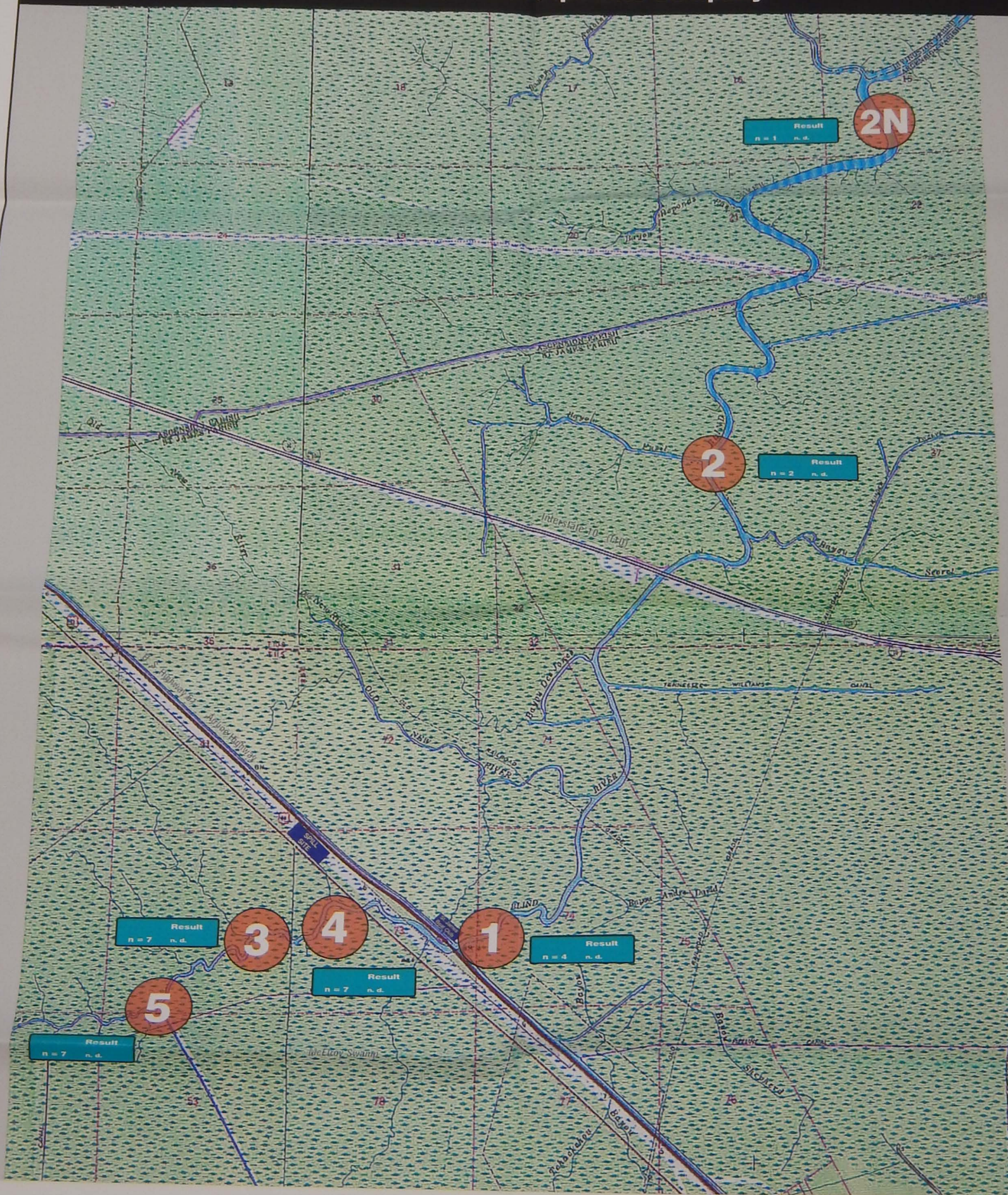
The following figure is too large to be digitized:

Figure 1: Blind River Mussel Tissue Sampling Locations and Results

A digital photo of the figure is provided. Should you need better a resolution please contact LOSCO to view the original hard copy of the figure.



FIGURE 1
BLIND RIVER MUSSEL TISSUE
SAMPLING LOCATIONS AND RESULTS*
Airline Highway Release
Marathon Pipe Line Company



Legend



Sample Station



Sampled (6/11/96) and (6/12/96)

n = Number of observations

n. d. = Analyte not detected



Scale

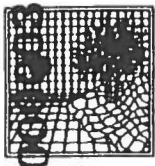
0 0.5 1.0 mile

TERRA
CONSULTING GROUP

* Semivolatile analyses reported as parts per million (mg/kg)

Final Document 7/17/96

ATTACHMENT 1



CHAIN OF CUSTODY RECORD

AMERICAN ANALYTICAL AND TECHNICAL SERVICES, INC.

11950 Industriplex Blvd • Baton Rouge LA 70809

Office: 504-753-8650 • Fax: 504-751-1405

10.10.0

6/11/1996

Nº 9338

SAMPLING FIRM

Marathon-Terra

CLIENT CONTACT

Lance Fontenot

PHONE NUMBER

769-1141

PROJECT NUMBER

PROJECT NAME

Marathon/Terra

SAMPLERS: (Signature)

Lance Fontenot

STA. NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	MATRIX	NO OF CONTAINERS	ANALYTICAL TESTS REQUESTED										REMARKS WHEN DONE
								Sym	Vol	Vol	Vol	Vol	Vol	Vol	Vol	Vol	Vol	
S4W3	6/11	1050		✓	WEST DE	Fw Mussel	1	X	X									
S4W4	6/11	1050		✓	WEST DE	Fw Mussel	1	X	X									
S4E6	6/11	1110		✓	E 2 LOCATION	Fw Mussel	1	X	X									S4E6 = STA. NO
S4E8	6/11	1110		✓	E 2 LOCATION	Fw Mussel	1	X	X									S4E8 = STA. NO.
S4E10	6/11	1110		✓	E 2 LOCATION	Fw Mussel	1	X	X									S4E10 = STA. NO.
S4E12	6/11	1040		✓	? UNKNOWN	Fw Mussel	1	X	X									
S4E13	6/11	1040		✓	? UNKNOWN	Fw Mussel	1	X	X									
S515	6/11	1150		✓	TRANSECT	Fw Mussel	1	X	X									SOUTHERN MAPLE LEAF
S517	6/11	1150		✓	TRANSECT	Fw Mussel	1	X	X									
S519	6/11	1150		✓	TRANSECT	Fw Mussel	1	X	X									
S521	6/11	1150		✓	TRANSECT	Fw Mussel	1	X	X									
S523	6/11	1150		✓	TRANSECT	Fw Mussel	1	X	X									
S525	6/11	1150		✓	TRANSECT	Fw Mussel	1	X	X									
S527	6/11	1150		✓	TRANSECT	Fw Mussel	1	X	X									
S329	6/11	1245		✓	TRANSECT	Fw Mussel	1	X	X									
S331	6/11	1245		✓	TRANSECT	Fw Mussel	1	X	X									

RELINQUISHED BY: (Signature)

Lance Fontenot

DATE

TIME

RECEIVED BY: (Signature)

6/11/96

1700

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED FOR LABORATORY BY: (Signature)

6/11/96

1700

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

REMARKS:

Sharon Stewart

16-2070

6/11/1996

No 9336



CHAIN OF CUSTODY RECORD

AMERICAN ANALYTICAL AND TECHNICAL SERVICES, INC.

11950 Industriplex Blvd • Baton Rouge LA 70809

Office: 504-753-8650 • Fax: 504-751-1405

SAMPLING FIRM

Marathon-Terra

CLIENT CONTACT

L. FONTENOT

PHONE NUMBER

769-1141

PROJECT NUMBER

PROJECT NAME

MARATHON - TERRA / LUFF

SAMPLERS: (Signature)

Lance Fontenot

ANALYTICAL TESTS REQUESTED

 PUT SHELLS INTO
 SAME SAMPLE BAG
 REMARKS WHEN DONE

STA. NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	MATRIX	NO OF CONTAINERS	SEMIVOL.	VOLAT.										
S333	6/11	1245		X	TRANSECT	FW mussels	1	X	X										
S335	6/11	1245		X	TRANSECT	FW mussels	1	X	X										
S337	6/11	1245		X	TRANSECT	FW mussels	1	X	X										
S339	6/11	1245		X	TRANSECT	FW mussels	1	X	X										
S341	6/11	1245		X	TRANSECT	FW mussels	1	X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										
	6/11							X	X										

RELINQUISHED BY: (Signature)

Lance Fontenot

DATE

6/11/96

TIME

1700

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

6/11/96

TIME

17:00

RECEIVED FOR LABORATORY BY: (Signature)

Susan Stewart

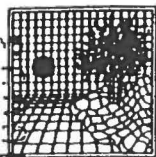
RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

REMARKS:



CHAIN OF CUSTODY RECORD

AMERICAN ANALYTICAL AND TECHNICAL SERVICES, INC.

11950 Industriplex Blvd • Baton Rouge LA 70809

Office: 504-753-8650 • Fax: 504-751-1405

SAMPLING FIRM

TEKRA

CLIENT CONTACT

LANCE FONTENOT

PHONE NUMBER

764-1141

PROJECT NUMBER

PROJECT NAME

MARATHON OIL/PIPELINE

ANALYTICAL TESTS REQUESTED

SAMPLERS (Signature)

L. Nelson

STA. NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	MATRIX	NO OF CONTAINERS	SEMI-VOL	VOLAT.	REMARKS
S143	6/12	1450		✓	BOAT CLUB			✓	✓	
S145	6/12	1450		✓	BOAT CLUB			✓	✓	
S147	6/12	1450		✓	BOAT CLUB			✓	✓	
S149	6/12	1450		✓	BOAT CLUB			✓	✓	
S251BYU	6/12	1100		✓	BYU FUSIL			✓	✓	S251BYU = STA. NO.
S253BYU	6/12	1100		✓	BYU FUSIL			✓	✓	S253BYU = STA. NO
S255N	6/12	1235		✓	NORTH-HI 8.			✓	✓	ABOUT 1,000 S OF MILE 8
	6/12									
	6/12									
	6/12									
	6/12									
	6/12									
	6/12									
	6/12									
	6/12									
	8/12									

RELINQUISHED BY: (Signature)

L. Nelson

DATE

6/14/96

TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED FOR LABORATORY BY: (Signature)

RELINQUISHED BY: (Signature)

DATE

TIME

RECEIVED BY: (Signature)

REMARKS:

