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Ogden Oil Characterization Analysis Including TPH and Oil Fingerprinting by GC/MS SIM

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Date: April 13, 2000

To: Work Assignment Manager M Springer, EPA/ERTC

From: Vinod Kansal, Organic Group Leader, Analytical Section, REAC Vinod Kansal

Subject: Preliminary Results of Project OGDEN RAIL YARD WA# R1A0019

Attached please find the preliminary results of the above referenced project for the following samples:

0119-001, 0119-009

Chain(s) of Custody No.: 0119-0009, 0119-0018, 0119-0028, 02049, 02058, 02060, 02063
Analyses: Full Oil Characterization, TPH and Oil Fingerprinting
No. of Samples: 22 Soil ; 16 Water
Matrix: Soil/Sediment and water

Comments: This Preliminary report contains : TPH, SHC and PAH tables, Hopane + Sterane profiles, and standard GC/MS Fingerprint report

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Central File
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This preliminary report contains all the pertinent tables for a 40+ sample project which requested standard full characterization assessment

Narrative for: OGDEN OIL

Oil Characterization Analysis Including TPH and Oil Fingerprinting by GC/MS SIM
WA #R1A00119

This narrative covers the samples received from the Ogden railyard site between the dates of 3/9/2000 and 3/10/2000. Lockheed Martin/REAC received a total of 22 soil/sediment and 16 water samples for full oil characterization which includes TPH analysis, oil fingerprinting, and quantitation of saturated hydrocarbons and PAH compounds. The samples were extracted and analyzed for oil analysis/oil characterization using an extensive SIM-Oil method. Due to the large volume of samples collected, and limited amount of lab space and extraction equipment, the samples were only extracted for BNA, and the extracts split for both BNA and oil analysis: The extraction procedure for BNA and oil are identical, except for the surrogates spiked. This decision was made to extract all the samples within hold time, and minimize cost, and sample preperation time. Naturally, this decision was made after discussing it with the WAM. The internal standards were added to the "split" sample before injection. There were no "oil" surrogates spiked in the samples to prevent interferences with the BNA chromatograms and TIC compounds; the BNA surrogates did not interfere with the oil-SIM program. The surrogate and MS/MSD for the BNA analysis should serve as sufficient QA for the oil analysis; besides, a MS/MSD program is not required for the oil analysis. Although the samplers collected samples for both BNA and oil analysis, only the BNA sample was extracted. Below is a summary of the samples received, with the analysis request. Samples with a chain of custody number in brackets {} indicate that the chain of custody in brackets contain the duplicate samples. Some chain of custodies were received with duplicate samples, and a separate box checked for both oil analysis, and BNA analysis. As mentioned previously, only the BNA sample was extracted and split for both BNA and full oil analysis.

COC#	Date Recd.	# Samples	Analysis Requested	Matrix
02049 {02058}	3/10/00	20	BNA Oil	Sediment
02050	3/10/00	2	BNA + Oil	Sediment
02063	3/10/00	2	Oil	Surface Water
0119-001 {0119-009}	3/09/00	3	BNA Oil	Surface Water
0119-0019 {0119-0118}	3/09/00	7	BNA Oil	Surface Water
0119-0028	3/09/00	4	BNA + Oil	Surface Water

The two samples received on COC# 02063 were the only samples in which the samplers had requested only oil analysis and no BNA analysis. The oil surrogates were spiked in these samples, and a recovery table has been generated.

The "full scan" oil and TPH method is outlined in the drafts submitted by J.Syslo in May of 1996 titled, "Procedures for the Extraction and Analysis of Oil as Source Oil, and Oil Found in Aqueous and Solid Matrices," and used in conjunction with the method titled "Revised Draft Action Plan for Analyses of Oil Spill Bioremediation Samples". These two methods are a compilation of method 8015B, SW846, D3328, Marine Safety Laboratories Notice 5200.9, and a several other methods used by the US Coast Guard, Environment Canada, and other labs who are currently developing methods for SIM oil analysis and oil characterization techniques. The focus of the methods are to characterize oils based using standard oil fingerprinting techniques, PAH and PAH homologue patterns, saturated hydrocarbon patterns and distributions, and sterane and triterpane compounds and their intrinsic relationships within source oils.

All water samples were analyzed with no dilution. The final volume for most of the soil samples was 5.0mL. All water samples were free of oil contamination. The blank contained trace amounts of saturated hydrocarbons ranging from C24 to C34. These would not be detected by the BNA analysis. This saturated hydrocarbon pattern is most likely due to some

type of lab contamination.....possibly related to the overall glassware washing procedure. The pattern is indicative of a "wax" type compound. This analysts speculates that it is probably related to the soap, or detergents used to rinse the glassware. The contamination is minimal, and will be subtracted from future projects.

In summary, the oil contaminating the site is alleged to be a mixture of a heavy oil such as a motor oil, or some type of grease (lubricant). Due to the absence of normal-saturated hydrocarbons and the lack of the isoprenoids of pristane and phytane, it appears that these samples have undergone a high degree of both evaporative as well as as natural biodegredative weathering. The relatively low abundance of PAH's and PAH homologue patterns, coupled with the hopanes and steranes patterns also supports this premise. There also appears to be a secondary source creosote contaimination, possibly from a refined creosote source of either coal tar, or oil. Besides the unusually high levels of PAH compounds in some of the samples, this is evident by the presence of the compound anthracene in the samples. Uncracked and or refined crude oils normally do not contain detectable levels of anthracene, only phenanthrene. This creosote source can be considered relatively "fresh" as compared to the oil and grease found on the site. This is evident by the presence of the two methyl naphthalene isomers in the samples, which are readily, and quickly removed by evaporative weathering. Overall, the samples contained a mixture of highly weathered fuel oil, (either a mix of #2 and #6), some grease, a creosote source, and possibly a synthetic oil. A more detailed discussion of these classes of oils can be reviewed in the Oil Fingerprinting section of this report.

All calibration checks were within the accepted +- 25% criteria. The analysis required three cal checks consisting of SHC-PAH, TPH, and Hopane/Sterane range. All surrogates were acceptable. As in the past, MS/MSD pairs are not required or requested for oil analysis.

This data package contains all the result tables, and surrogate tables associated with the samples received.

Extraction Procedure

All samples were extracted according to the BNA SOP except for the two water samples requested for oil analysis. One liter of sample was spiked with 50 ul of a 400 ug/ml surrogate solution consisting of d10-Anthracene, 5a Androstane, and d62-Triacontane. The samples were extracted by seperatory funnel as outlined in SW-846 and concentrated to a final volume of 1.0 ml. Prior to analysis, 20 ul of a 500 ppm solution of internal standard mix is added to the 1 ml aliquot that is used for the analysis; 10 ul of the internal standards was added to any 500 ul split BNA extract.

Analytical Procedure

An HP 5890 Gas Chromatograph, equipped with a 5972 Mass Selective Detector and controlled by an HP-ChemStation using windows- based Enviroquant software.

The instrument conditions were:

Column	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.25mm ID, 0.50 µm film thickness
Injection Temperature	290° C
Transfer Temperature	290° C
Temperature Program	50°C for 3 min 10°C/min to 295° C, hold for 10 min 25°C/min to 305° C, hold for 27 min
Splitless Injection	Split time = 0.75 min
Injection Volume	1 µL
Electron Multiplier	+200 EMV above tune

The GC/MS system was calibrated for SHC and PAH compounds using a 5 point range at 1.0, 5.0, 10, 25, and 50.0 µg/mL. The hopane and sterane also uses a 5 point alibration range at 0.5, 1.0, 5.0, 10, 25, and 25.0 µg/mL. The TPH calibration range was 1000, 5000, 10000, 25000, and 50000 ug/mL All samples were quantified using either the average response factor obtained from the calibration range, or the response factors from the calibration check. Before analysis each day, the system was tuned with 50 ng DFTPP in the linear scan mode. Samples were quantified for saturated hydrocarbons, pah's, TPHs, hopanes, steranes and the pah homologues using the internal standard method. The TPH concentration was calculated for each sample by manually integrating the area of the chromatogram produced by extracting ion 85, and dividing by the average response factor from the calibration range. Ion 85 is a widely known representative ion of hydrocarbons and not subjected to phthalate or other unwanted interferences.

An extraction blank was extracted with each of the batches. The blank contained a very minute amount of saturated hydrocarbons ranging from C24 to C34. These would not be detected by the BNA analysis. This saturated hydrocarbon pattern is most likely due to some type of lab contamination.....possibly related to the overall glassware washing procedure. The pattern is indicative of a "wax" type compound. This analysts speculates that it is probably related to the soap, or detergents used to rinse the glassware. The contamination is minimal, and will be subtracted from future projects.

There were no MS/MSD pairs analyzed for this stage of the project. MS/M.D pairs check extraction efficiency for a variety of matrices: The BNA surrogates, and BNA MS/MSD pairs should suffice as a measure of extraction efficiency.

The TPH stock standard was prepared by mixing #2 fuel oil, #6 fuel oil, and a highly weathered crude oil (obtained from a well at a site) at the ration of 1:2:2. Since the oil contaminating the site was unknown, it was speculated that this ratio or oils would be fairly representative of the types of oils that one would encounter at a railroad yard. Other laboratories which analyze TPH by GC/FID of GC/MS use a TPH standard of #2 fuel and motor oil at a 1:1 mixture. The REAC standard is a slight modification of this train of thought.

The SHC results are listed in Table 1.0, and the PAH results listed in Table 2.0. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{DF \times A_u \times V_t}{RF_{ave} \times V_i \times Vol \times D}$$

where

C_u = Concentration of analyte (ug/L)
DF = Dilution Factor
A_u = Area of analyte
V_t = Volume of extract (uL)
RF_{ave} = Average Response Factor (unitless)
V_i = Volume of extract injected (uL)
Vol = Volume of sample (ml)
D = Decimal per cent solids

Response Factor calculation:

The response factor (RF) for the standard is quantitated based on the area response from the average or the calibration range or the continuing calibration check as follows:

$$RF = \frac{A_c}{I_c}$$

where,

RF = Response factor for a specific analyte
A_c = Area of the analyte in the standard
I_c = Mass of the analyte in the standard

$$Rf_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and

n = number of Samples

Analytical Procedure for Full Oil Characterization in Soil using GC/MS

This method outlines the analytical procedure for samples which are extracted and analyzed for oil analysis/oil characterization using the an extensive SIM-Oil method. The complete method is outlined in the drafts submitted by J.Syslo in May of 1996 titled, "Procedures for the Extraction and Analysis of Oil as Source Oil, and Oil Found in Aqueous and Solid Matrices," and used in conjunction with the method titled "Revised Draft Action Plan for Analyses of Oil Spill Bioremediation Samples". These two methods are a compilation of method 8015B, SW846, D3328, Marine Safety Laboratories Notice 5200.9, and a several other methods used by US Coast Guard, Environment Canada, and other labs who are currently developing methods for SIM oil analysis and oil characterization techniques. The focus of the methods are to characterize oils using standard oil fingerprinting techniques, PAH and PAH homologue patterns, saturated hydrocarbon patterns and distributions, and sterane and triterpane compounds and their intrinsic relationships within source oils. This new analytical method is still in the "pilot" stage and is subject to future changes to improve its performance. This method is for the long or full version of the method. This method (called OILSIMI, of HOPSTERI) is refered to as the full scan method and covers all analytical paramaters. An abbreviated method (TPHSIM) has been adopted to quantitate only the TPH and Hopanes in samples.

Extraction Procedure

Prior to extraction each sample was spiked with 500 ul of a 400 ug/ml surrogate mixture containing anthracene-d_{10}, 5a-androstane, and triacontane-d62. Thirty grams of sample was mixed with sufficient anhydrous sodium sulfate, and Soxhlet extracted for 16 hours, then concentrated to a final volume of 10 mL. Prior to analysis, 20 ul of a 500 ppm solution of internal standard mix is added to 1.0 mL of extract used for the analysis. The internal standard solution contains: phenanthrene-d_{10}, chrysene-d_{12}, and perylene-d_{12}, tetradecane-d_{30} and tetracosane-d_{50} .

Analytical Procedure

An HP6890/5972 Gas Chromatograph/Mass Spectrometer (GC/MS), equipped with a 6890 autosampler controlled by a PC Computer equipped with HP Enviroquant Software computer was used to analyze the samples. This is a Selective Ion Monitoring (SIM) analysis run at +250 volts above the tune value.

The instrument conditions were:

Column	Restek Rtx-5 (crossbonded SE-54) 30 meter x 0.25mm ID, 0.50 µm film thickness
Column Flow	1.1 mL/min EPC Enabled
Injection Temperature	290° C
Transfer Temperature	290° C
Source Temperature & Analyzer Temperature	Controlled by thermal transfer of heat from Transfer Line
Temperature Program	50°C for 0.5 min 20° C/min to 295° C hold 8.5 min 25° C/min to 310° C hold 15 min
Splitless Injection	Splitess time = 1.00 min
Injection Volume	1µL Must use 2 mm ID straight liners packed with 10 mm plug of silanized & conditioned glass wool.

Three separate SIM calibration ranges are analyzed for this analysis: a TPH range using 5 oil standards at 1000, 5000, 10000, 25000, and 50000 µg/mL; a hopane and sterane range including the surrogate compounds at 0.5, 1.0, 5.0, 10, and 25 µg/mL; and the Saturated Hydrocarbons and Pahs range including the surrogates at 5, 1.0, 5.0, 10, 25 and 50 µg/mL. The TPH/oil should be a similar product, or ideally obtained from the site.

Two separate method files are used for the analysis: OILSIMI, which contains an id file for the saturated hydrocarbons, pahs, and surrogates, and HOPSTERI which contains only the hopane, sterane, and surrogate compounds. The TPH can be quantitated using either method since one only measures the area of ion 85 for the TPH. The TPH area for each sample is obtained by generating an extracted ion chromatogram of the hydrocarbon ion of m/z 85 then integrating the area of all the peaks including the oil "hump". The resopnse factor is calculated using the internal standard method, using the area of the sum of two hydrocarbon internal standards tetradecane-d_{30} and tetracosane-d_{50}.

Before analysis each day, the system was tuned with 50 ng decafluorotriphenylphosphine (DFTPP) in the linear scan mode, and then must pass three calibration check standards: One being a TPH standard at 10000 µg/mL, a 10 µg/mL standard of the SHC and PAH compounds, and a standard mixture of hopane, sterane and surrogate compounds at 5.0 µg/mL each. The responses of each calibration check were evaluated by comparison to the average response of the calibration curve. If the client were to request a "full scan" analysis, then all three calibration checks would be evaluated. The surrogates would be calculated using OILSIMI method average response factor. The steranes and hopanes are calcuated manually using QuattroPro programs. If the client were to request TPH only, the SHC calibration check need not be analyzed, only the TPH and hopanes calabration checks. The surrogates are calculated using the HOPSTERI method average response factor. The sum of the C29 hopane (17a(H),21B(H)-30-norhopane) and C30 hopane (17a(H),21B(H)-hopane) are use to represent the hopane concentrations for normalizing TPH data. These are the two most abundant hopanes and are widely recommended in oil literature. The concentration of the 15 hopanes and 13 steranes in the samples are calculated based on the hopane and sterane compoounds in the daily check; It is not cost effective to order all the known hopanes and steranes. The hopane and sterane data is gernerally used to establish a "pattern" to either be used for source oil identification or for bioremediation monitoring, so therefore a quantitative result for reach compound is not essential.

The TPH concentration is calculated using the sum of all the peaks in the extracted ion chromatogram using the TPH ion m/z 85. TheTPH results are listed in Table 1.11 and reported as mg/Kg (ppm) in the soil based on dry weight.. The concentration of the TPH was calculated using the following equation:

$$C_u = \frac{DF x A_u x I_{is} x V_t}{A_{is} x RF(or RF_{ave}) x V_i x V_o}$$

where

C_u	=	Concentration of target analyte (mg/Kg)
DF	=	Dilution Factor
A_u	=	Area of target analyte: Ion 85 for TPH
I_{is}	=	Mass of specific internal standard (ng)
V_t	=	Volume of extract (µl)
A_{is}	=	Area of specific internal standard. TPH uses the sum of two internal standards.
RF	=	Response Factor (unitless)
RF_{ave}	=	average Response Factor
V_i	=	Volume of extract injected (µl)
V_o	=	Volume of sample (mL)

The RF_{ave} is used when a sample is associated with an initial calibration curve. The RF is used when a sample is associated with a continuing calibration curve.

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \ x \ I_{is}}{A_{is} \ x \ I_c}$$

where

RF	=	Response factor for a specific analyte
A_c	=	Area of the analyte in the standard
I_{is}	=	Mass of the specific internal standard
A_{is}	=	Area of the specific internal standard
I_c	=	Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and
n = number of Samples

The SHC and PAH results are listed in Table 1.11. The concentration of the detected compounds was calculated using the following equation:

$$C_u = \frac{DF x A_u x I_{is} x V_t}{A_{is} x RF(or RF_{ave}) x V_i x V_o}$$

where

C_u	=	Concentration of target analyte (μg/L)
DF	=	Dilution Factor
A_u	=	Area of target analyte
I_{is}	=	Mass of specific internal standard (ng)
V_t	=	Volume of extract (μl)
A_{is}	=	Area of specific internal standard
RF	=	Response Factor (unitless)
RF_{ave}	=	average Response Factor
V_i	=	Volume of extract injected (μl)
V_o	=	Volume of sample (mL)

The RF_{ave} is used when a sample is associated with an initial calibration curve. The RF is used when a sample is associated with a continuing calibration curve.

Response Factor calculation:

The RF for each specific analyte is quantitated based on the area response from the continuing calibration check as follows:

$$RF = \frac{A_c \times I_{is}}{A_{is} \times I_c}$$

where

RF	=	Response factor for a specific analyte
A_c	=	Area of the analyte in the standard
I_{is}	=	Mass of the specific internal standard
A_{is}	=	Area of the specific internal standard
I_c	=	Mass of the analyte in the standard

$$RF_{ave} = \frac{RF_1 + \ldots + RF_n}{n}$$

and
n = number of Samples

Listed below are the compounds and homologue groups with their respective quantitation internal standard when using the method the full scan OILSIMI.

<u>Naphthalene-d8</u>
nC8 thru nC15 SHCs
Naphthalene & C1N thru C4N isomers

<u>Phenanthrene-d10</u>
nC16 thru nC23 SHCs
Fluorene & C1F thru C3F isomers
Pristane
Phytane
Dibenzothiophene & C1D thru C3D isomers
Phenanthrene
Anthracene & C1P/A thru C3P/A isomers
Anthracene-d10 {surr}
5a-androstane {surr}

<u>Chrysene-d12</u>
Fluoranthene
Pyrene & C1F/P + C2F/P isomers
Chrysene & C1C + C2C isomers
Chloestane {Steranes}

<u>Perylene-d12</u>
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-cd)pyrene
Dibenzo(a,h)anthracene
Benzo(g,h,i)perylene
Hopane {moretane / hopanes}

<u>d50-Tetracosane</u>
nC19 thru nC38
d62-Triacontane {surr}

<u>Sum of d30Tetradecane + d50-Tetracosane</u>
Total TPH using m/z ion 85

When using OILSIMI, below is listed the characteristic ions for all target compounds, internal standards and surrogates.

Compound:	Quant Ion:
d8-Naphthalene {is}	136
Octane C8	85
Nonane C9	85
Decane C10	85
Undecane C11	85
Naphthalene	128
C1-naphthalene isomers	142
C2-naphthalene isomers	156
C3-naphthalene isomers	170
C4-naphthalene isomers	184
Dodecane C12	85
Tridecane C13	85
Tetradecane C14	85
Pentadecane C15	85
d10-Phenanthrene {is}	188
Hexadecane C16	85
Fluorene	166
C1-fluorene isomers	180
C2-fluorene isomers	194
C3-fluorene isomers	208
Heptadecane C17	85
Pristane	85
Dibenzothiophene	184
C1-dibenzothiophene isomers	198
C2-dibenzothiophene isomers	212
C3-dibenzothiophene isomers	226
Octadecane C18	85
Phytane	85
Phenanthrene	178
Anthracene	178
C1-phenanthrene/anthracene isomers	192
C2-phenanthrene/anthracene isomers	206
C3-phenanthrene/anthracene isomers	220
d12-Chrysene {is}	240
C27 Baa-cholestane and other Sterane isomers	217
Fluoranthene	202
Pyrene	202
C1-fluoranthene/pyrene isomers	216
C2-fluoranthene/pyrene isomers	230
Chrysene	228
C1-chrysene isomers	242
C2-chrysene isomers	256
d12-Perylene {is}	264
Benzo(b)fluoranthene	252
Benzo(k)fluoranthene	252
Benzo(e)pyrene	252

Characteristic Ions for Target Compounds and Surrogates (cont'd)

COMPOUND:	Quant Ion:
Benzo(a)pyrene	252
Perylene	252
Indeno(1,2,3-cd)pyrene	276
Dibenzo(a,h)anthracene	278
Benzo(g,h,i)perylene	276
C30 17B(H),21a(H) hopane & other hopane isomers	191
d50-Tetracosane {is}	66
Nonadecane C19	85
Eicosane C20	85
Heneicosane C21	85
Docosane C22	85
Tricosane C23	85
Tetracosane C24	85
Pentacosane C25	85
Hexacosane C26	85
Heptacosane C27	85
Octacosane C28	85
Nonacosane C29	85
Triacontane C30	85
Hentriacontane C31	85
Dotriacontane C32	85
Tritriacontane C33	85
Tetratriacontane C34	85
Pentatriacontane C35	85
Hexatriacontane C36	85
Octatriacontane C38	85
d30-Tetradecane {is}	66
Total TPH	85

uses sum of d30-Tetradecane {is}
& d50-Tetracosane {is}

Some projects only require a only TPH results, which require using the method HOPSTERI: listed below are each compound with the characteristic/quant ion for a TPH only type of analysis using GC/MS. The hopane data is used for normalization procedures.

Compound:	Quant Ion
d30-Tetradecane {is}	66
d50-Tetracosane {is}	66
Total TPH	85
d10-Phenanthrene {is}	188
d10-Anthracene {surr}	188
5a Androstane {surr}	260
d12-Perylene {is}	264
C30 17b(H), 21a(H) Hopane and other hopane isomers	191
d50-Tetracosane {is}	66
d62-Triacontane {surr}	66

TPH RESULTS

TABLE 1.X Results of the TPH Analysis in Water by GC/MS
Using Modifed Method 8015B
WA # R1A00119: Ogden Railyard

Sample No.	Sampling Location	Conc. (mg/L)		TPH MDL (mg/L)
WBLK030900	Water Blank	U		1.0
0119-0070	WR012A	U		1.0
0119-0096	WR018A	U		1.0
0119-0097	WR018ADup	U		1.0
0119-0184	SC2A	U		1.0
0119-0200	33SS1A	U		1.0
0119-0287	WR011A	U		1.0
0119-0288	WR011ADup	U		1.0
0119-0057	WR010A	U		1.0
0119-0228	RD3A	U		1.0
0119-0241	FBA	U		1.0
0119-0328	FBA	U		1.0
0119-0124	WR024A	U		1.0
0119-0124	WR024A MS	U		1.0
0119-0124	WR024A MSD	U		1.0
WBLK0315200	Water Blank	U		1.0
A0119-0326	21SPSA	U		1.0
A0119-0330	FBA	U		1.0
0119-0137	WR026A	U		1.0
0119-0162	BC3A	U		1.0
0119-0162 ms	BC3A MS	0.84	J	1.0
0119-0162 ms	BC3A MSD	U		1.0

TABLE 1.X Results of the TPH Analysis in Soil by GC/MS
Using Modifed Method 8015B
WA # R1A00119: Ogden Railyard
Results Based on Dry Weight

Sample No.	Sampling Location	Conc. (mg/Kg)		TPH MDL (mg/Kg)
SBLK0306	Sand Blank	U		33
B0119-0270	FBA	U		33
B0119-0252	SCIA	1300		280
B0119-0266	RD3ADUP	1600		620
B0119-0265	RD3A	1800		620
B0119-0249	BC3A	170	J	210
B0119-0259	33SS2A	1000		240
B0119-0273	AOI102A	730		230
B0119-0334	FBA	U		33
B0119-0334 ms	FBA	U		33
B0119-0334 msd	FBA	U		33
B0119-0384	21SPSA	130		45
B0119-0300	WR09A	1100		590
B0119-0305	WR012A	790		380
B0119-0309	WR019A	1800		410
B0119-0336	AOIA4A	2100	J	2100
B0119-0307	WR014A	280		260
B0119-0302	WR011A	130	J	310
B0119-0312	WR021ADUP	370		260
B0119-0311	WR021A	200	J	240
B0119-0319	WR025A	410		260
B0119-0314	WR022A	370		230
B0119-0315	WR022ADUP	420		270
B0119-0317	WR24A	2200		570
B0119-0322	WR28A	970		350
B0119-0322 ms	WR28A	1400		350
B0119-0322 msd	WR28A	1200		350

Oil fingerprint Results

Oil Fingerprint Analysis: Using GC/MS Fingerprints
Ogden Rail Yard

This report contains the analytical results for the 22 sediment and 16 water samples received from the Ogden Rail Yard site for Oil Fingerprint Analysis. The traditional oil GC/FID fingerprint method, ASTM method D-3328, is used to characterize an oil, or contaminated soil based on the visual oil pattern generated from a sample chromatogram. This traditional method is most effective when a suspected "source" oil is provided since the GC/FID method relies solely on visually matching hydrocarbon patterns ("fingerprints") of samples with the source. Since the samplers did not provide a source, or suspected source, the lab must improvise, adjust, and adapt their current methods and instrumentation to provide additional investigative information than that of the traditional visual hydrocarbon "fingerprint". The FID method (GC Method 8015B) has been modified so the analyst utilizes a GC/MS as an analytical tool identify or ascertain the origins of the site contamination or site oil. The GC/MS provides additional information on not only the hydrocarbons, but on compounds such as the PAH's , steranes, triterpanes, and isomeric methyl-dibenzothiophene and alkylated PAH compounds which are highly resistant to bio-degradation and or natural weathering.

All the samples were analyzed for qualitative oil fingerprints using the GC/MS to characterize/identify the samples. Although there are many variables that one can investigate with the GC/MS, for this project the following "fingerprints" were used to characterize/identify the oils contaminating the site:

The TPH fingerprint for the hydrocarbons using ion 85.
The hopane patterns between 29 and 50 minutes using ion 191.
The overall PAH "fingerprint" using the pah's and their alkylated homologues.
A selected pah homologue fingerprint using the C1 Fluoranthene and C1 Pyrene isomers (C1 F/P) between 24 and 29 minutes for ion 216. Since most of the oil was weathered, and there wasn't many distinct pah patterns, this pattern remained intact for most of the samples.

The sterane patterns between 30 to 38 minutes (ion 217) were not used because there was either an abundance of background interferences. This may be due to natural steranes in the soil, or a secondary organic source such as animal feces/urine, or an old decaying algae source.

Since no reference oil, or suspected source oils were provided, results are based on matching the samples to five site samples. The samples that were chosen were Location SCIA, RD3A, AOI102A, WR019A and 21SPSA. These samples were fairly representative of the rest of the samples on the site. Traditionally, it is customary for the analyst to write a brief synopsis on each sample analyzed based on the GC/MS data, but due to the enormous volume of samples, I will only comment on the samples which were chosen for comparison. Samples that matched the representative samples can be considered as being contaminated with the same type of oil, or combination of oils.

On the following page is a table summarizing the results of the oil fingerprinting matches. The criteria of M for "match" and PM for "possible match" are derived from ASTM-D3328 reporting criteria. For aesthetic purposes, only the samples with matches, or possible matches were indicated; otherwise the table would be filled with extraneous information such as NM for "not match" and IM for "indeterminate match" for all the non matched samples. The categories for the matching criteria are explained on a page proceeding the table, along with the analysts overall conclusions based on the interpretation of the chromatograms and data.

Below is a list of the "classifications" of oil on the site. Samples with "M" for match with the classified sample are considered to be contaminated with, or have a similar contamination of the classified sample, ie, they have the same type of oil, or mixture of oils in the sample. The mixtures were based on the change in pattern of the hopane compounds, and/or the C1 fluoranthene/pyrene pattern. The C1 flouathene/pyrene pattern was detectable and common in most of the samples, and free of major interferences.

Classifications:

Sample SCIA type:

This sample contained a weathered heavy oil, such as a #6 or #4 oil, or a some type of grease or lubricant derived from a crude source. It contained an abundant hopane pattern which was not contaminated or distorted from interferences or a secondary source of contamination. This judgement is based on the analysts experience with reviewing thousands of hopane patterns normally associated with oils which are derived from a crude source. The sterane pattern was also undistorted and what one would consider "normal" for a crude derived oil. Due to the low abundance of saturated alkanes, this oil has undergone extensive weathering which is possibly due to both evaporative and naturally occurring biodegradative mechanisms. There is a relatively high abundance of odd number saturated alkanes in the C24 thru C34 range compared to the even number alkanes within this range. This pattern has been documented in literature as a result of naturally occurring biodegredation, where the bacteria/organisms have a preference for the even number alkanes over the odd number alkanes. The sample contains a broad distribution of pah compounds at a relatively low concentration, which is normal for a weathered oil.

Sample 21SPSA type:

This sample did not contain a significant amount of oil, but did contain a high level of pah compounds. The pattern of pahs indicate that this sample may be contaminated by a secondary creosote source, or a highly weathered #2 oil or a mixture of both. Since the sample contained high levels of napthalene and the methyl napthalene isomers, it could be assumed that most of the pahs are from a creosote source, such as wood treating products. If the sample contained a weathered #2 oil, usually, the lighter pah compounds are the first ones to disappear. There is no source to compare for this analyst to make ascertain the origin of the high levels of pah compounds. The creosote source of this sample possibly originates from a cracked oil, or creosote source that used a large amount of heat to separate and prepare the creosote mixture. This is evident by the amount of anthracene relative to phenanthrene in the sample. Heavy crude oil samples, and non-cracked oils have insignificant amounts of anthracene in the oil. This sample also had a very unusual hopane pattern, which may be due to a highly degraded and weathered oil source, or may be some naturally occurring phenomena. The sterane pattern is also highly distorted, and not normal for crude oil source. The other samples that were classified as mixtures, used this sample as the "dilution" or source of mixtures. Based on the visual patterns (fingerprints) of the hopanes and steranes, as well as the C1 fluoranthene/pyrene patterns, a relative mixture ratio was established by the analyst. Most of the samples on the site were classified as a mixture of oil of the SCIA type, with various amounts of the pah compounds as well as the unusual hopane pattern of 21SPSA.

Sample WR019A type:

The samples that match this class appear to be a mixture of the SCIA oil and about 20 to 30 % of the pah and unusual hopane pattern of 21SPSA. This presumption is evident in the changes of the hopane patterns and the pattern of the C1 Fluoranthene/Pyrene isomers. Based on the relative peak heights in both patterns, one can estimate that the oil from type SCIA has and additional mixture of about 20 to 30% of the creosote

compounds as well as hopane compounds of 21SPSA. This ratio is highly speculative, and there may be other factors contributing to this change in both pah and hopane patterns. Without secondary proof of another source of contamination, it can be reasonably concluded that there is a mixture of at least two types of oil and or pah source to produce the pah patterns and hopane patterns of these samples. The steranes could not be used as an indicator in this case since there may have been other naturally occurring sources or steranes on the site which affected the patterns. Although there are may other pah patterns for comaparrison, the C1fluoranthene/pyrene pattern was abundant in all the samples. the others pah patterns were either not present, at low concentrations, or had undergone various stages of weathering which altered the patterns so that they could not be used for a conclusive match indicator.

Sample RD3A type:

These samples are similar to the WR019A samples except the mixture of 21SPSA oil is at a level of 30 to 70% compared with the SCIA oil.

Sample AOI102A type:

These samples were totally unique as compared to the other samples. Besides the hopane pattern, the pah patterns were totally different than the other samples. This sample type also contained a large unresolved hump of hydrocarbons, which were mainly composed of either cycloalkanes or compounds with a double bond in them. This assumption is made based on the ration or ion 83 to the tph ion 85 in the entire hump chromatogram. A high level of 83 indicates either a synthetic oil, or an oil that has undergone extensive biodegradation. This oil assessment based on ion 83 is not a standard screening/assessment tool with the standard REAC fingerprinting analysis. This is solely this analysts opinion based on observations of the past few years of oil analysis, and possibly soon to be implemented in the oil characterization program. Additionally, the C1 phenanthrene/anthracene patterns (which was not present in all the other samples, and therefore not used to classify the oils) of these samples were totally dissimilar to all other site samples. The ratio of anthracene to phenanthrene was also unusually high for these samples. This would indicate a different source of pah compounds, or a totally different source of oil, possibly a synthetic oil. In this analysts opinion, this may be an oil similar to that of a refined motor oil. The pah patterns of this oil did not appear in any other oil either because of a low concentration of this type in the other oils, or possibly a localized contamination.

Conclusion:

Traditional oil fingerprinting uses a source oil to compare unknowns so the analyst has a reference to determine whether the contamination, or oil, is derived from the suspected source. For this site, no source was provided, nor a reference given, so the analyst had to evaluate all the samples against each other and try to determine whether there was a common source contamination or multiple sources. After reviewing all the data, this analyst has concluded that the samples at this site are contaminated with a variety of oil: possibly a #6 oil, some type of hevy lubricant, a creosote source unrelated to oil, possibly #2 oil or diesel fuel, a synthetic oil, and maybe even a naturally occurring hopane and or sterane source. With this many types of contaminants, fingerprinting the samples proved somewhat difficult, unless the samples were divided into degrees of contamination classes. The samples appeared to be various mixes of all or some of the above mentioned contaminants. The samples chosen for the classification may not have contained the highest concentrations of contamination, and were chosen for the relative purity of the assessment patterns, as well as randomly according to the order in which they were analyzed.

The water samples did not contain any detectable levels of oil for fingerprinting assessment. Samples that

were analyzed as MS/MSD pairs can be considered as duplicate samples for the oil fingerprinting analysis since these samples were not spiked with any oil compounds.

In the future, this analyst would like to request that the samplers collect a site background sample from the area. This sample should be in an area possibly uphill from the ground slope where it would not receive any oil contamination from the site due to run off of ground water, or contamination from underground aquifers from the site. This is mainly to obtain a sample of what is suspected as "natural" hopane and sterane patterns from the background soil from the Salt Lake City area. Samples from previous sites in this area have also displayed unexplainable unusual hopane and sterane type patterns.

TABLE 1A.X Results of the Oil fingerprint Analysis in Soil by GC/MS
Using Modifed Method 8015B
WA # R1A00119: Ogden Railyard
Samples are Compared to Categorized Site Samples for Matching Puropses

Sample No.	Sampling Location	SCIA	WR019A (20-30% Mix)	RD3A (30-70% Mix)	AOI102A	21SPSA	Additional Internal indicators (1)	Comments
SBLK0306	Sand Blank	X	X	X	X	X	nd	
B0119-0270	FBA	X	X	X	X	X	nd	
B0119-0252	SCIA	M					C1 F/P	Possible weathered #6 oil or heavy lubricant.
B0119-0266	RD3ADUP			M			C1 F/P m	A mixture of possibly two sources of oil
B0119-0265	RD3A			M			C1 F/P m	A mixture of possibly two sources of oil
B0119-0249	BC3A	M					C1 F/P	Possible weathered #6 oil or heavy lubricant.
B0119-0259	33SS2A	M					C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0273	AOI102A				M		C1 P/A	Totally different hopanes, and pah patterns, possible synthetic
B0119-0334	FBA	X	X	X	X	X	nd	
B0119-0334 ms	FBA	X	X	X	X	X	nd	
B0119-0334 msd	FBA	X	X	X	X	X	nd	
B0119-0384	21SPSA					M	C1 F/P m	Possible creosote(pah) source; also unusual hopane pattern
B0119-0300	WR09A					PM	nd	Low pahs, low oil, unusual hopane pattern
B0119-0305	WR012A			M			C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0309	WR019A		M				C1 F/P	Possible weathered #6 oil or heavy lubricant.
B0119-0336	AOIA4A				M		C1 P/A	Totally different hopanes, and pah patterns, possible synthetic
B0119-0307	WR014A		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0302	WR011A		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0312	WR021ADUP		M				nd	Possible weathered #6 oil or heavy lubricant.
B0119-0311	WR021A		M				nd	Possible weathered #6 oil or heavy lubricant.
B0119-0319	WR025A		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0314	WR022A		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0315	WR022ADUP		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0317	WR24A			M			C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0322	WR28A		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0322 ms	WR28A		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.
B0119-0322 msd	WR28A		M				C1 F/P m	Possible weathered #6 oil or heavy lubricant.

X denotes no oil fingerprint detected
M denotes Match
PM denotes Possible match

(1) Samples with additional matching internal indicators:

C1 F/P = C1 methyl Fluorene and Pyrene patterns used as match indicators.
C1 F/P m = C1 methyl Fluorene and Pyrene patterns of the mixtures matched.
nd denotes no pattern detected; Concentration of oil, or pah compounds are insufficient.
C1 P/A = C1 methyl Phenanthrene and Anthracene patterns used as match indicators. This pattern was unique only to these samples.

Saturated Hydrocarbon
Results

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Water
WA# R1A00119: Ogden Railyard

Sample No.	0119-0241		0119-0328		0119-0124		0119-0124 MS		0119-0124MSD	
Sample Location	FBA		FBA		WR024A		WR024A		WR024A	
GC/MS File Name	LM1444		LM1445		LM1446		LM1447		LM1448	
Matrix	Water		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100.00		100.00		100.00		100.00		100.00	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C9	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C10	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C11	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C12	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C13	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C14	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C15	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C16	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C17	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
PRISTANE	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C18	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
PHYTANE	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C19	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C20	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C21	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C22	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C23	U	1.00	U	1.00	U	1.00	0.26 J	1.00	0.15 J	1.00
C24	0.14 J	1.00	0.23 J	1.00	0.34 J	1.00	0.55 J	1.00	0.4 J	1.00
C25	0.23 J	1.00	0.42 J	1.00	0.74 J	1.00	0.78 J	1.00	0.91 J	1.00
C26	0.35 J	1.00	0.69 J	1.00	1.21	1.00	1.17	1.00	1.3	1.00
C27	0.41 J	1.00	0.86 J	1.00	1.67	1.00	1.33	1.00	1.77	1.00
C28	0.44 J	1.00	0.88 J	1.00	1.63	1.00	1.25	1.00	1.83	1.00
C29	0.39 J	1.00	0.76 J	1.00	1.6	1.00	1.14	1.00	1.75	1.00
C30	0.37 J	1.00	0.65 J	1.00	1.2	1.00	0.87 J	1.00	1.29	1.00
C31	0.25 J	1.00	0.46 J	1.00	0.93 J	1.00	0.63 J	1.00	0.97 J	1.00
C32	0.18 J	1.00	0.29 J	1.00	0.5 J	1.00	0.41 J	1.00	0.55 J	1.00
C33	0.14 J	1.00	0.2 J	1.00	0.35 J	1.00	0.27 J	1.00	0.36 J	1.00
C34	U	1.00	0.13 J	1.00	0.18 J	1.00	0.17 J	1.00	0.19 J	1.00
C35	U	1.00	U	1.00	0.11 J	1.00	0.13 J	1.00	0.11 J	1.00
C36	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C37	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C38	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00

Note: The concentration for C37 is estimated
J - Concentrations are estimated and below the MDL
Ogden Waters

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Water
WA# R1A00119: Ogden Railyard

Sample No.	Blank		0119-0070		0119-0096		0119-0097		0119-0184	
Sample Location	WBLK0309		WR012A		WR018A		WR018ADup		SC2A	
GC/MS File Name	LM1434		LM1435		LM1436		LM1437		LM1438	
Matrix	WATER BLANK		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100.00		100.00		100.00		100.00		100.00	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C9	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C10	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C11	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C12	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C13	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C14	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C15	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C16	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C17	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
PRISTANE	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C18	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
PHYTANE	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C19	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C20	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C21	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C22	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C23	U	1.00	0.2 J	1.00	0.1 J	1.00	0.1 J	1.00	0.11 J	1.00
C24	0.17 J	1.00	0.43 J	1.00	0.31 J	1.00	0.34 J	1.00	0.17 J	1.00
C25	0.42 J	1.00	0.8 J	1.00	0.7 J	1.00	0.73 J	1.00	0.41 J	1.00
C26	0.73 J	1.00	1.14	1.00	1.14	1.00	1.24	1.00	0.56 J	1.00
C27	0.86 J	1.00	1.5	1.00	1.55	1.00	1.7	1.00	0.73 J	1.00
C28	0.89 J	1.00	1.47	1.00	1.48	1.00	1.73	1.00	0.72 J	1.00
C29	0.84 J	1.00	1.48	1.00	1.46	1.00	1.63	1.00	0.74 J	1.00
C30	1.37	1.00	1.2	1.00	1.09	1.00	1.22	1.00	0.53 J	1.00
C31	0.58 J	1.00	0.97 J	1.00	0.85 J	1.00	0.89 J	1.00	0.42 J	1.00
C32	0.38 J	1.00	0.59 J	1.00	0.48 J	1.00	0.49 J	1.00	0.22 J	1.00
C33	0.23 J	1.00	0.38 J	1.00	0.28 J	1.00	0.27 J	1.00	0.17 J	1.00
C34	0.15 J	1.00	0.27 J	1.00	0.15 J	1.00	0.13 J	1.00	0.14 J	1.00
C35	0.13 J	1.00	0.23 J	1.00	U	1.00	U	1.00	0.13 J	1.00
C36	U	1.00	0.12 J	1.00	U	1.00	U	1.00	U	1.00
C37	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C38	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00

Note: The concentration for C37 is estimated

J - Concentrations are estimated and below the MDL

Ogden Waters

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Water
WA# R1A00119: Ogden Railyard

Sample No.	0119-0200		0119-0287		0119-0288		0119-0057		0119-0228	
Sample Location	33SS1A		WR011A		WR011ADuP		WR010A		RD3A	
GC/MS File Name	LM1439		LM1440		LM1441		LM1442		LM1443	
Matrix	Water		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100.00		100.00		100.00		100.00		100.00	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C9	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C10	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C11	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C12	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C13	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C14	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C15	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C16	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C17	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
PRISTANE	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C18	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
PHYTANE	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C19	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C20	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C21	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C22	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C23	0.11 J	1.00	0.14 J	1.00	0.12 J	1.00	0.13 J	1.00	U	1.00
C24	0.17 J	1.00	0.38 J	1.00	0.29 J	1.00	0.34 J	1.00	0.23 J	1.00
C25	0.31 J	1.00	0.76 J	1.00	0.53 J	1.00	0.64 J	1.00	0.34 J	1.00
C26	0.54 J	1.00	1.2	1.00	0.79 J	1.00	0.91 J	1.00	0.52 J	1.00
C27	0.59 J	1.00	1.6	1.00	1.05	1.00	1.14	1.00	0.61 J	1.00
C28	0.63 J	1.00	1.56	1.00	1.02	1.00	1.16	1.00	0.61 J	1.00
C29	0.57 J	1.00	1.48	1.00	1.01	1.00	1.07	1.00	0.54 J	1.00
C30	0.45 J	1.00	1.07	1.00	0.71 J	1.00	0.92 J	1.00	0.46 J	1.00
C31	0.3 J	1.00	0.8 J	1.00	0.55 J	1.00	0.72 J	1.00	0.33 J	1.00
C32	0.19 J	1.00	0.4 J	1.00	0.27 J	1.00	0.44 J	1.00	0.21 J	1.00
C33	0.12 J	1.00	0.25 J	1.00	0.18 J	1.00	0.3 J	1.00	0.16 J	1.00
C34	U	1.00	0.12 J	1.00	0.11 J	1.00	0.23 J	1.00	0.11 J	1.00
C35	U	1.00	U	1.00	U	1.00	0.17 J	1.00	U	1.00
C36	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C37	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C38	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00

Note: The concentration for C37 is estimated

J - Concentrations are estimated and below the MDL

Ogden Waters

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Water
WA# R1A00119: Ogden Railyard

Sample No.	WBLK03152000		A0119-326		A0119-0330		0119-0137		0119-0162	
Sample Location	LAB BLANK		21SPSA		FBA		WR026A		BC3A	
GC/MS File Name	LM1459		LM1460		LM1461		LM1462		LM1463	
Matrix	Water		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100		100		100		100		100	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C9	U	1.00	0.52 J	1.00	U	1.00	U	1.00	U	1.00
C10	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C11	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C12	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C13	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C14	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C15	U	1.00	0.16 J	1.00	U	1.00	U	1.00	U	1.00
C16	U	1.00	0.37 J	1.00	U	1.00	U	1.00	U	1.00
C17	U	1.00	0.47 J	1.00	U	1.00	U	1.00	U	1.00
PRISTANE	U	1.00	0.4 J	1.00	U	1.00	U	1.00	U	1.00
C18	U	1.00	0.13 J	1.00	U	1.00	U	1.00	U	1.00
PHYTANE	U	1.00	0.21 J	1.00	U	1.00	U	1.00	U	1.00
C19	U	1.00	0.15 J	1.00	U	1.00	U	1.00	U	1.00
C20	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C21	U	1.00	0.42 J	1.00	U	1.00	U	1.00	U	1.00
C22	U	1.00	0.3 J	1.00	U	1.00	U	1.00	U	1.00
C23	U	1.00	0.57 J	1.00	U	1.00	U	1.00	U	1.00
C24	0.11 J	1.00	0.63 J	1.00	0.15 J	1.00	0.25 J	1.00	0.25 J	1.00
C25	0.23 J	1.00	1.63	1.00	0.32 J	1.00	0.49 J	1.00	0.49 J	1.00
C26	0.43 J	1.00	2.41	1.00	0.62 J	1.00	0.79 J	1.00	0.79 J	1.00
C27	0.55 J	1.00	5.63	1.00	0.94 J	1.00	1	1.00	1	1.00
C28	0.68 J	1.00	4.82	1.00	1.12	1.00	1	1.00	1	1.00
C29	0.64 J	1.00	12.8	1.00	1.11	1.00	0.99 J	1.00	0.99 J	1.00
C30	0.54 J	1.00	3.36	1.00	0.82 J	1.00	0.76 J	1.00	0.76 J	1.00
C31	0.33 J	1.00	2.6	1.00	0.47 J	1.00	0.57 J	1.00	0.57 J	1.00
C32	0.27 J	1.00	1	1.00	0.22 J	1.00	0.3 J	1.00	0.3 J	1.00
C33	0.14 J	1.00	0.69 J	1.00	0.11 J	1.00	0.2 J	1.00	0.2 J	1.00
C34	0.13 J	1.00	0.46 J	1.00	U	1.00	0.12 J	1.00	0.12 J	1.00
C35	U	1.00	0.32 J	1.00	U	1.00	U	1.00	U	1.00
C36	U	1.00	0.25 J	1.00	U	1.00	U	1.00	U	1.00
C37	U	1.00	0.16 J	1.00	U	1.00	U	1.00	U	1.00
C38	U	1.00	0.18 J	1.00	U	1.00	U	1.00	U	1.00

Note: The concentration for C37 is estimated

J - Concentrations are estimated and below the MDL

Ogden Waters

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Water
WA# R1A00119: Ogden Railyard

Sample No.	0119-0162		0119-0162	
Sample Location	BC3A MS		BC3A MSD	
GC/MS File Name	LM1464		LM1465	
Matrix	Water		Water	
Dilution Factor	1.0		1.0	
% Moisture	100		100	
Units	ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL
C8	U	1.00	U	1.00
C9	U	1.00	U	1.00
C10	0.8 J	1.00	U	1.00
C11	U	1.00	U	1.00
C12	0.24 J	1.00	U	1.00
C13	U	1.00	U	1.00
C14	U	1.00	U	1.00
C15	U	1.00	U	1.00
C16	U	1.00	U	1.00
C17	U	1.00	U	1.00
PRISTANE	U	1.00	U	1.00
C18	U	1.00	U	1.00
PHYTANE	U	1.00	U	1.00
C19	U	1.00	U	1.00
C20	U	1.00	U	1.00
C21	0.36 J	1.00	U	1.00
C22	1.09	1.00	U	1.00
C23	0.6 J	1.00	U	1.00
C24	0.73 J	1.00	0.17 J	1.00
C25	1.3	1.00	0.31 J	1.00
C26	1.74	1.00	0.48 J	1.00
C27	3.78	1.00	0.65 J	1.00
C28	2.78	1.00	0.6 J	1.00
C29	3.33	1.00	0.64 J	1.00
C30	2.55	1.00	0.49 J	1.00
C31	2.18	1.00	0.37 J	1.00
C32	1.5	1.00	0.19 J	1.00
C33	0.87 J	1.00	0.14 J	1.00
C34	0.49 J	1.00	U	1.00
C35	0.31 J	1.00	U	1.00
C36	0.17 J	1.00	U	1.00
C37	0.17 J	1.00	U	1.00
C38	0.17 J	1.00	U	1.00

Note: The concentration for C37 is estimated
J - Concentrations are estimated and below the MDL
Ogden Waters

Soil

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	SBLK031300		B0119-0270		B0119-0252		B0119-0266		B0119-0265	
Sample Location	Sand Blank		FBA		SCIA		RD3ADUP		RD3A	
GC/MS File Name	LM1466		LM1467		LM1468		LM1469		LM1470	
Matrix	SAND BLANK		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	100.00		100.00		58.90		26.90		26.70	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	0.03	U	0.03	U	0.3	U	0.6	U	0.6
C9	U	0.03	U	0.03	U	0.3	U	0.6	U	0.6
C10	U	0.03	U	0.03	0.03 J	0.3	U	0.6	U	0.6
C11	U	0.03	U	0.03	0.05 J	0.3	0.06 J	0.6	0.1 J	0.6
C12	U	0.03	U	0.03	0.07 J	0.3	0.1 J	0.6	0.2 J	0.6
C13	U	0.03	U	0.03	0.08 J	0.3	0.08 J	0.6	0.09 J	0.6
C14	U	0.03	U	0.03	0.08 J	0.3	U	0.6	0.06 J	0.6
C15	U	0.03	U	0.03	0.1 J	0.3	0.1 J	0.6	0.2 J	0.6
C16	U	0.03	U	0.03	0.1 J	0.3	0.07 J	0.6	0.09 J	0.6
C17	U	0.03	U	0.03	0.2 J	0.3	0.2 J	0.6	0.2 J	0.6
PRISTANE	U	0.03	U	0.03	0.2 J	0.3	0.07 J	0.6	0.1 J	0.6
C18	U	0.03	U	0.03	0.1 J	0.3	0.09 J	0.6	0.1 J	0.6
PHYTANE	U	0.03	U	0.03	0.2 J	0.3	U	0.6	U	0.6
C19	U	0.03	U	0.03	0.2 J	0.3	0.2 J	0.6	0.2 J	0.6
C20	U	0.03	U	0.03	0.2 J	0.3	0.1 J	0.6	0.2 J	0.6
C21	U	0.03	U	0.03	0.3	0.3	0.6 J	0.6	0.7	0.6
C22	U	0.03	U	0.03	0.2 J	0.3	0.2 J	0.6	0.3 J	0.6
C23	U	0.03	U	0.03	0.6	0.3	0.9	0.6	1.1	0.6
C24	U	0.03	U	0.03	0.4	0.3	0.5 J	0.6	0.6 J	0.6
C25	0.006 J	0.03	U	0.03	2.6	0.3	3.4	0.6	2.9	0.6
C26	0.01 J	0.03	0.009 J	0.03	0.9	0.3	1	0.6	1.3	0.6
C27	0.01 J	0.03	0.01 J	0.03	4	0.3	9.8	0.6	11	0.6
C28	0.02 J	0.03	0.01 J	0.03	1.1	0.3	1.3	0.6	1.8	0.6
C29	0.01 J	0.03	0.01 J	0.03	8.5	0.3	14	0.6	16	0.6
C30	0.01 J	0.03	0.01 J	0.03	1.1	0.3	1	0.6	1.2	0.6
C31	0.007 J	0.03	0.006 J	0.03	6.9	0.3	5.9	0.6	5.4	0.6
C32	0.004 J	0.03	0.004 J	0.03	0.9	0.3	0.7	0.6	0.1 J	0.6
C33	U	0.03	U	0.03	2.1	0.3	1.9	0.6	1.7	0.6
C34	U	0.03	U	0.03	0.7	0.3	1.6	0.6	1.2	0.6
C35	U	0.03	U	0.03	1.5	0.3	1	0.6	1.1	0.6
C36	U	0.03	U	0.03	0.7	0.3	1.1	0.6	1.5	0.6
C37	U	0.03	U	0.03	0.8	0.3	0.6	0.6	0.6	0.6
C38	U	0.03	U	0.03	0.8	0.3	0.5 J	0.6	0.5 J	0.6

Note: The concentration for C37 is estimated
J - Concentrations are estimated and below the MDL
Ogden Soils

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0249		B0119-0259		B0119-0273		B0119-0334		B0119-0334	
Sample Location	BC3A		33SS2A		AOI102A		FBA		FBA MS	
GC/MS File Name	LM1471		LM1472		LM1473		LM1480		LM1481	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	78.60		68.40		71.20		99.60		99.60	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	0.2	U	0.2	U	0.2	U	0.03	U	0.03
C9	U	0.2	U	0.2	U	0.2	U	0.03	U	0.03
C10	U	0.2	0.03 J	0.2	0.03 J	0.2	U	0.03	U	0.03
C11	U	0.2	0.07 J	0.2	0.03 J	0.2	U	0.03	U	0.03
C12	U	0.2	0.03 J	0.2	0.03 J	0.2	U	0.03	U	0.03
C13	U	0.2	0.03 J	0.2	0.03 J	0.2	U	0.03	U	0.03
C14	U	0.2	0.05 J	0.2	0.04 J	0.2	U	0.03	U	0.03
C15	U	0.2	0.08 J	0.2	0.04 J	0.2	U	0.03	U	0.03
C16	U	0.2	0.09 J	0.2	0.04 J	0.2	U	0.03	U	0.03
C17	U	0.2	0.1 J	0.2	0.06 J	0.2	U	0.03	U	0.03
PRISTANE	U	0.2	0.4	0.2	0.07 J	0.2	U	0.03	U	0.03
C18	U	0.2	0.07 J	0.2	0.02 J	0.2	U	0.03	U	0.03
PHYTANE	U	0.2	0.3	0.2	0.03 J	0.2	U	0.03	U	0.03
C19	U	0.2	0.1 J	0.2	0.03 J	0.2	U	0.03	U	0.03
C20	U	0.2	0.1 J	0.2	0.04 J	0.2	U	0.03	U	0.03
C21	U	0.2	0.1 J	0.2	0.07 J	0.2	U	0.03	U	0.03
C22	0.02 J	0.2	0.2 J	0.2	0.04 J	0.2	U	0.03	U	0.03
C23	0.03 J	0.2	0.2 J	0.2	0.06 J	0.2	0.005 J	0.03	U	0.03
C24	0.03 J	0.2	0.2 J	0.2	0.03 J	0.2	0.01 J	0.03	U	0.03
C25	0.09 J	0.2	0.7	0.2	0.2 J	0.2	0.02 J	0.03	0.007 J	0.03
C26	0.07 J	0.2	0.4	0.2	0.07 J	0.2	0.03 J	0.03	0.01 J	0.03
C27	0.1 J	0.2	1.6	0.2	0.2 J	0.2	0.03	0.03	0.02 J	0.03
C28	0.08 J	0.2	0.5	0.2	0.1 J	0.2	0.04	0.03	0.02 J	0.03
C29	0.3	0.2	3.6	0.2	0.04 J	0.2	0.03	0.03	0.02 J	0.03
C30	0.1 J	0.2	0.4	0.2	0.08 J	0.2	0.03 J	0.03	0.02 J	0.03
C31	0.2	0.2	1.1	0.2	0.5	0.2	0.02 J	0.03	0.009 J	0.03
C32	0.1 J	0.2	0.3	0.2	0.07 J	0.2	0.01 J	0.03	0.005 J	0.03
C33	0.2 J	0.2	0.6	0.2	0.1 J	0.2	0.006 J	0.03	U	0.03
C34	0.1 J	0.2	0.3	0.2	0.1 J	0.2	0.004 J	0.03	U	0.03
C35	0.2 J	0.2	0.9	0.2	U	0.2	U	0.03	U	0.03
C36	0.1 J	0.2	0.4	0.2	U	0.2	U	0.03	U	0.03
C37	0.2	0.2	0.6	0.2	U	0.2	U	0.03	U	0.03
C38	0.2 J	0.2	0.5	0.2	U	0.2	U	0.03	U	0.03

Note: The concentration for C37 is estimated

J - Concentrations are estimated and below the MDL

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Soil
WA# R1A00119: *Ogden Railyard*
Results are Based on Dry Weight

Sample No.	B0119-0334		B0119-0384		B0119-0300		B0119-0305		B0119-0309	
Sample Location	FBA MSD		21SPSA		WR09A		WR012A		WR019A	
GC/MS File Name	LM1482		LM1483		LM1484		LM1485		LM1486	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	99.60		74.00		28.40		44.20		40.60	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	0.03	U	0.05	U	0.6	U	0.4	U	0.4
C9	U	0.03	U	0.05	U	0.6	U	0.4	0.06 J	0.4
C10	U	0.03	U	0.05	U	0.6	U	0.4	U	0.4
C11	U	0.03	0.02 J	0.05	U	0.6	U	0.4	U	0.4
C12	U	0.03	0.06	0.05	0.08 J	0.6	U	0.4	0.1 J	0.4
C13	U	0.03	U	0.05	U	0.6	U	0.4	U	0.4
C14	U	0.03	U	0.05	U	0.6	U	0.4	U	0.4
C15	U	0.03	U	0.05	U	0.6	U	0.4	0.1 J	0.4
C16	U	0.03	U	0.05	U	0.6	U	0.4	0.07 J	0.4
C17	U	0.03	0.07	0.05	U	0.6	U	0.4	0.2 J	0.4
PRISTANE	U	0.03	0.03 J	0.05	U	0.6	U	0.4	U	0.4
C18	U	0.03	0.01 J	0.05	U	0.6	U	0.4	U	0.4
PHYTANE	U	0.03	0.03 J	0.05	U	0.6	U	0.4	U	0.4
C19	U	0.03	0.02 J	0.05	0.5 J	0.6	0.4	0.4	U	0.4
C20	U	0.03	0.02 J	0.05	U	0.6	U	0.4	U	0.4
C21	U	0.03	0.04 J	0.05	0.4 J	0.6	0.2 J	0.4	0.3 J	0.4
C22	U	0.03	0.06	0.05	U	0.6	0.1 J	0.4	0.1 J	0.4
C23	U	0.03	0.1	0.05	0.7	0.6	0.4	0.4	0.4	0.4
C24	0.003 J	0.03	0.08	0.05	0.4 J	0.6	0.3 J	0.4	0.4	0.4
C25	0.007 J	0.03	0.3	0.05	1.7	0.6	1.8	0.4	1.2	0.4
C26	0.01 J	0.03	0.2	0.05	0.8	0.6	0.6	0.4	0.6	0.4
C27	0.02 J	0.03	1.1	0.05	9.2	0.6	6	0.4	3.9	0.4
C28	0.02 J	0.03	0.5	0.05	1.4	0.6	1.1	0.4	0.8	0.4
C29	0.02 J	0.03	3	0.05	19	0.6	13	0.4	6.6	0.4
C30	0.01 J	0.03	0.2	0.05	0.6	0.6	0.6	0.4	0.8	0.4
C31	0.007 J	0.03	0.5	0.05	5.3	0.6	5	0.4	3.5	0.4
C32	0.004 J	0.03	0.07	0.05	0.3 J	0.6	0.3 J	0.4	0.7	0.4
C33	U	0.03	0.09	0.05	0.8	0.6	0.9	0.4	1.4	0.4
C34	U	0.03	0.01 J	0.05	0.4 J	0.6	0.9	0.4	0.6	0.4
C35	U	0.03	0.04 J	0.05	0.1 J	0.6	0.3 J	0.4	0.9	0.4
C36	U	0.03	0.1	0.05	2.8	0.6	0.6	0.4	0.6	0.4
C37	U	0.03	0.01 J	0.05	0.1 J	0.6	0.3 J	0.4	1.1	0.4
C38	U	0.03	0.02 J	0.05	0.3 J	0.6	0.1 J	0.4	0.5	0.4

Note: The concentration for C37 is estimated
J - Concentrations are estimated and below the MDL
Ogden Soils

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0336		B0119-0307		B0119-0302		B0119-0312		B0119-0311	
Sample Location	AOI4A		WR014A		WR011A		WR021ADUP		WR021A	
GC/MS File Name	LM1487		LM1488		LM1489		LM1493		LM1494	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	7.80		64.90		53.20		63.90		69.80	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C9	U	2.1	0.03 J	0.3	0.3 J	0.3	0.07 J	0.3	0.04 J	0.2
C10	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C11	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C12	U	2.1	0.05 J	0.3	U	0.3	U	0.3	U	0.2
C13	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C14	U	2.1	0.6	0.3	U	0.3	U	0.3	U	0.2
C15	U	2.1	U	0.3	0.1 J	0.3	U	0.3	U	0.2
C16	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C17	U	2.1	0.06 J	0.3	0.3	0.3	0.04 J	0.3	0.04 J	0.2
PRISTANE	U	2.1	0.03 J	0.3	0.1 J	0.3	U	0.3	U	0.2
C18	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
PHYTANE	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C19	0.3 J	2.1	0.1 J	0.3	0.3 J	0.3	0.03 J	0.3	0.02 J	0.2
C20	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C21	0.9 J	2.1	0.07 J	0.3	0.2 J	0.3	0.08 J	0.3	0.06 J	0.2
C22	0.6 J	2.1	0.04 J	0.3	0.2 J	0.3	0.04 J	0.3	0.03 J	0.2
C23	1.8 J	2.1	0.1 J	0.3	0.5	0.3	0.1 J	0.3	0.08 J	0.2
C24	1.3 J	2.1	0.07 J	0.3	0.4	0.3	0.1 J	0.3	0.06 J	0.2
C25	5.3	2.1	0.3	0.3	1.3	0.3	0.3	0.3	0.2	0.2
C26	2.3	2.1	0.1 J	0.3	0.8	0.3	0.2 J	0.3	0.1 J	0.2
C27	21	2.1	1	0.3	4	0.3	1.1	0.3	0.7	0.2
C28	4.9	2.1	0.2 J	0.3	1.3	0.3	0.3	0.3	0.2 J	0.2
C29	61	2.1	2.7	0.3	7.2	0.3	4	0.3	2.2	0.2
C30	1.6 J	2.1	0.2 J	0.3	1.9	0.3	0.2 J	0.3	0.1 J	0.2
C31	3.5	2.1	0.6	0.3	5.9	0.3	0.7	0.3	0.5	0.2
C32	0.4 J	2.1	0.1 J	0.3	1.9	0.3	0.1 J	0.3	0.07 J	0.2
C33	1 J	2.1	0.2 J	0.3	2.9	0.3	0.2 J	0.3	0.1 J	0.2
C34	2.9	2.1	0.1 J	0.3	1.3	0.3	0.07 J	0.3	0.06 J	0.2
C35	0.9 J	2.1	0.2 J	0.3	1.6	0.3	0.1 J	0.3	0.1 J	0.2
C36	4.8	2.1	0.2 J	0.3	0.7	0.3	0.08 J	0.3	0.1 J	0.2
C37	U	2.1	0.1 J	0.3	0.7	0.3	U	0.3	0.05 J	0.2
C38	1 J	2.1	0.07 J	0.3	0.5	0.3	0.06 J	0.3	0.07 J	0.2

Note: The concentration for C37 is estimated

J - Concentrations are estimated and below the MDL

Ogden Soils

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0319		B0119-0314		B0119-0315		B0119-0317		B0119-0322	
Sample Location	WR025A		WR022A		WR022DUP		WR24A		WR28A	
GC/MS File Name	LM1495		LM1496		LM1497		LM1498		LM1499	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	64.90		72.60		62.10		29.40		48.20	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
C8	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C9	0.03 J	0.3	0.03 J	0.2	0.07 J	0.3	0.06 J	0.6	0.04 J	0.3
C10	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C11	0.03 J	0.3	U	0.2	0.04 J	0.3	U	0.6	U	0.3
C12	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C13	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C14	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C15	0.03 J	0.3	0.03 J	0.2	0.03 J	0.3	0.2 J	0.6	0.07 J	0.3
C16	U	0.3	U	0.2	U	0.3	U	0.6	0.06 J	0.3
C17	0.05 J	0.3	0.06 J	0.2	0.06 J	0.3	0.4 J	0.6	0.2 J	0.3
PRISTANE	U	0.3	0.02 J	0.2	U	0.3	0.1 J	0.6	0.07 J	0.3
C18	U	0.3	0.03 J	0.2	U	0.3	0.8	0.6	0.3 J	0.3
PHYTANE	0.05 J	0.3	0.04 J	0.2	0.04 J	0.3	0.3 J	0.6	0.1 J	0.3
C19	0.09 J	0.3	0.04 J	0.2	0.05 J	0.3	0.2 J	0.6	0.1 J	0.3
C20	0.06 J	0.3	0.03 J	0.2	0.03 J	0.3	0.2 J	0.6	0.09 J	0.3
C21	0.09 J	0.3	0.1 J	0.2	0.1 J	0.3	0.6	0.6	0.2 J	0.3
C22	0.05 J	0.3	0.06 J	0.2	0.07 J	0.3	0.4 J	0.6	0.1 J	0.3
C23	0.2 J	0.3	0.2 J	0.2	0.3 J	0.3	0.9	0.6	0.3	0.3
C24	0.2 J	0.3	0.1 J	0.2	0.1 J	0.3	0.7	0.6	0.3 J	0.3
C25	0.7	0.3	0.5	0.2	0.6	0.3	2.9	0.6	1.1	0.3
C26	0.3 J	0.3	0.2	0.2	0.2 J	0.3	1.4	0.6	0.5	0.3
C27	4.8	0.3	1.5	0.2	2.1	0.3	9.1	0.6	2.8	0.3
C28	0.4	0.3	0.4	0.2	0.5	0.3	2.1	0.6	0.6	0.3
C29	5.4	0.3	3.9	0.2	7	0.3	23	0.6	6	0.3
C30	0.2 J	0.3	0.2	0.2	0.3	0.3	1.5	0.6	0.5	0.3
C31	1.2	0.3	0.9	0.2	1.5	0.3	9.5	0.6	2.4	0.3
C32	0.2 J	0.3	0.2 J	0.2	0.2 J	0.3	0.9	0.6	0.4	0.3
C33	0.3	0.3	0.3	0.2	0.3	0.3	2.1	0.6	0.9	0.3
C34	0.2 J	0.3	0.1 J	0.2	0.1 J	0.3	0.6	0.6	0.3	0.3
C35	0.2 J	0.3	0.2 J	0.2	0.2 J	0.3	1.1	0.6	0.6	0.3
C36	0.2 J	0.3	0.2 J	0.2	0.3	0.3	1.4	0.6	0.3	0.3
C37	0.08 J	0.3	0.07 J	0.2	0.1 J	0.3	0.5 J	0.6	0.4	0.3
C38	0.1 J	0.3	0.1 J	0.2	0.09 J	0.3	0.6	0.6	0.3 J	0.3

Note: The concentration for C37 is estimated
J - Concentrations are estimated and below the MDL
Ogden Soils

TABLE 1.0 Results of the Oil Analysis for Saturated Hyrdrocarbons (SHCs) in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0322		B0119-0322	
Sample Location	WR28A MS		WR28A MSD	
GC/MS File Name	LM1500		LM1501	
Matrix	SOIL		SOIL	
Dilution Factor	1.0		1.0	
% Solid	48.20		48.20	
Units	mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL
C8	U	0.3	U	0.3
C9	0.03 J	0.3	0.04 J	0.3
C10	0.08 J	0.3	0.08 J	0.3
C11	U	0.3	U	0.3
C12	0.4	0.3	U	0.3
C13	U	0.3	U	0.3
C14	U	0.3	U	0.3
C15	0.1 J	0.3	0.09 J	0.3
C16	0.08 J	0.3	0.07 J	0.3
C17	0.3 J	0.3	0.2 J	0.3
PRISTANE	0.1 J	0.3	0.09 J	0.3
C18	0.1 J	0.3	0.1 J	0.3
PHYTANE	0.2 J	0.3	0.1 J	0.3
C19	0.2 J	0.3	0.2 J	0.3
C20	0.1 J	0.3	0.1 J	0.3
C21	0.4	0.3	0.3 J	0.3
C22	0.3 J	0.3	0.2 J	0.3
C23	0.5	0.3	0.5	0.3
C24	0.4	0.3	0.4	0.3
C25	1.5	0.3	1.3	0.3
C26	0.8	0.3	0.8	0.3
C27	5.3	0.3	3.7	0.3
C28	1.3	0.3	1	0.3
C29	15	0.3	8.4	0.3
C30	0.9	0.3	0.8	0.3
C31	3.7	0.3	2.9	0.3
C32	0.5	0.3	0.6	0.3
C33	1.1	0.3	1	0.3
C34	0.4	0.3	0.5	0.3
C35	0.8	0.3	0.7	0.3
C36	0.5	0.3	0.4	0.3
C37	0.5	0.3	0.5	0.3
C38	0.4	0.3	0.3 J	0.3

Note: The concentration for C37 is estimated
J - Concentrations are estimated and below the MDL
Ogden Soils

SHC

Profile Graphs

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	Blank
Sample Location	WBLK0309

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.2
Pentacosane	C25	0.4
Hexacosane	C26	0.7
Heptacosane	C27	0.9
Octacosane	C28	0.9
Nonacosane	C29	0.8
Triacontane	C30	1.4
Hentriacontane	C31	0.6
Dotriacontane	C32	0.4
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.2
Pentatriacontane	C35	0.1
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		7

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.83
RES	7
RES + UCM	7
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

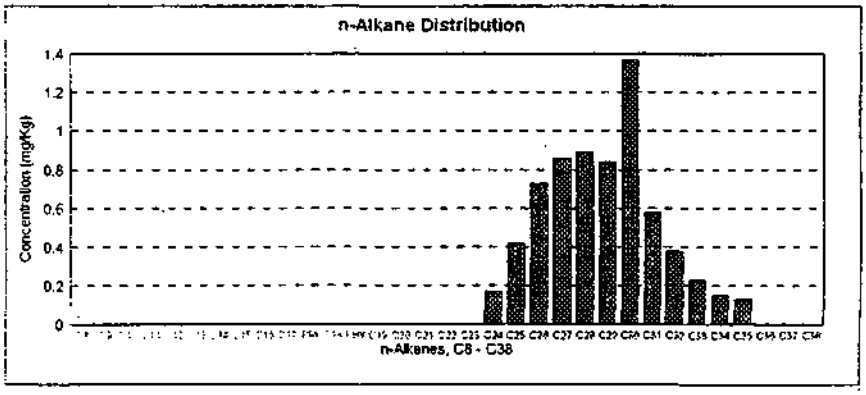


Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0070
Sample Location	WR012A

n-Alkanes	Ch	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.2
Tetracosane	C24	0.4
Pentacosane	C25	0.8
Hexacosane	C26	1.1
Heptacosane	C27	1.5
Octacosane	C28	1.5
Nonacosane	C29	1.5
Triacontane	C30	1.2
Hentriacontane	C31	1.0
Dotriacontane	C32	0.6
Tritriacontane	C33	0.4
Tetratriacontane	C34	0.3
Pentatriacontane	C35	0.2
Hexatriacontane	C36	0.1
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		11

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.07
RES	11
RES + UCM	11
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

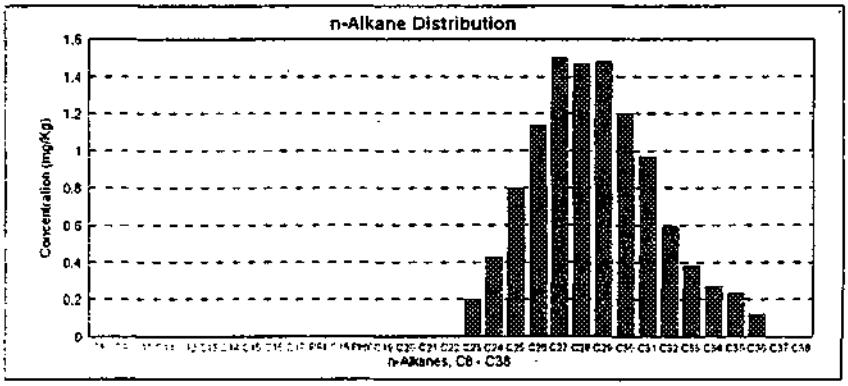


Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0096
Sample Location	WR018A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.3
Pentacosane	C25	0.7
Hexacosane	C26	1.1
Heptacosane	C27	1.6
Octacosane	C28	1.5
Nonacosane	C29	1.5
Triacontane	C30	1.1
Hentriacontane	C31	0.9
Dotriacontane	C32	0.5
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.2
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		10
C17/Pristane		N/A
C18/Phytane		N/A
Pristane/Phytane		N/A
WI		0.00
CPI		1.06
RES		10
RES + UCM		10
RES/(RES+UCM)		1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

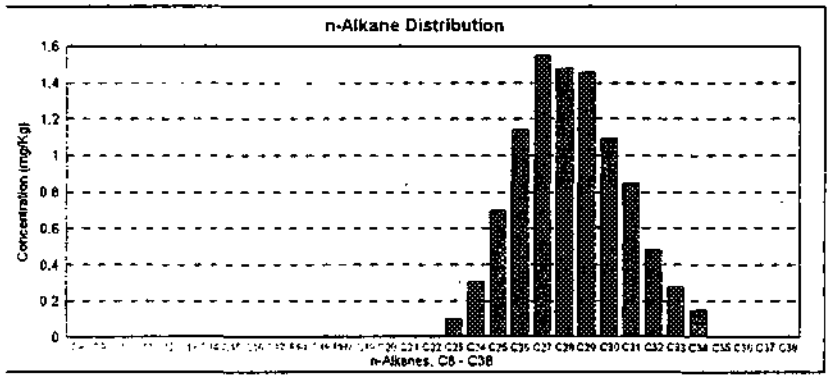


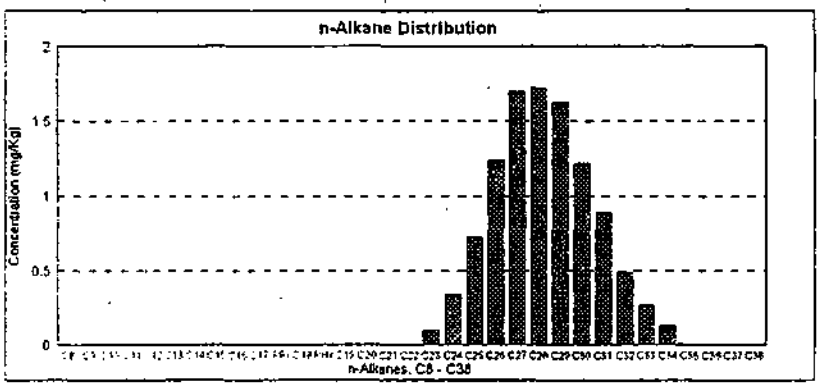
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0097
Sample Location	WR018ADup

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.3
Pentacosane	C25	0.7
Hexacosane	C26	1.2
Heptacosane	C27	1.7
Octacosane	C28	1.7
Nonacosane	C29	1.6
Triacontane	C30	1.2
Hentriacontane	C31	0.9
Dotriacontane	C32	0.5
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		10

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.03
RES	10
RES + UCM	10
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR018ADup

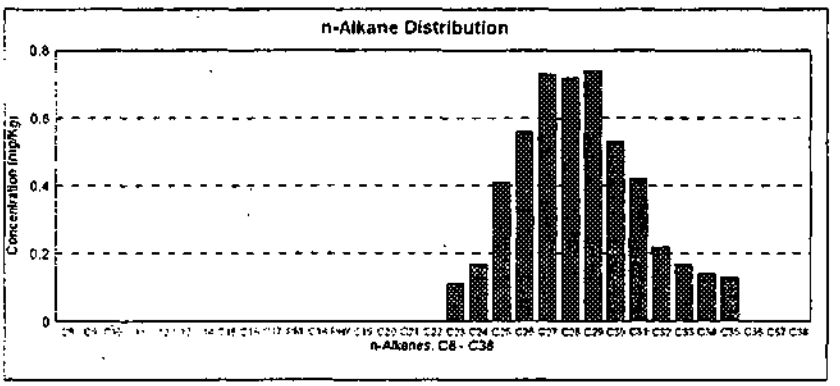
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0184
Sample Location	SC2A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.2
Pentacosane	C25	0.4
Hexacosane	C26	0.6
Heptacosane	C27	0.7
Octacosane	C28	0.7
Nonacosane	C29	0.7
Triacontane	C30	0.5
Hentriacontane	C31	0.4
Dotriacontane	C32	0.2
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.1
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		5

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.16
RES	5
RES + UCM	5
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



SC2A

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0200
Sample Location	33SS1A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.2
Pentacosane	C25	0.3
Hexacosane	C26	0.5
Heptacosane	C27	0.6
Octacosane	C28	0.6
Nonacosane	C29	0.6
Triacontane	C30	0.5
Hentriacontane	C31	0.3
Dotriacontane	C32	0.2
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		4

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.01
RES	4
RES + UCM	4
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

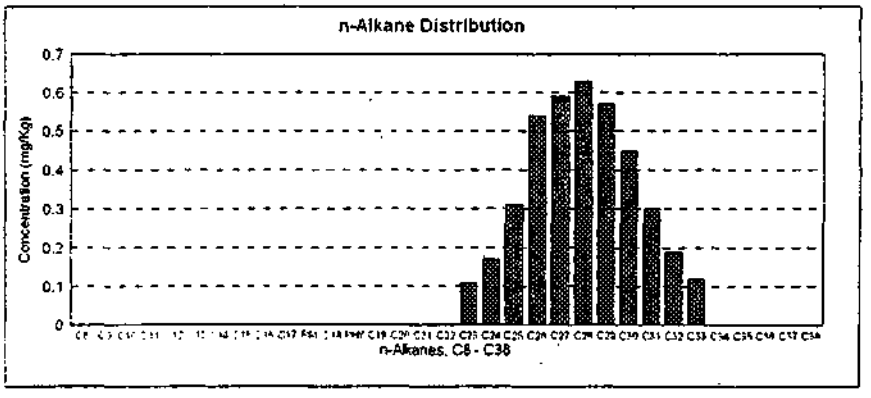


Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0287
Sample Location	WR011A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.4
Pentacosane	C25	0.8
Hexacosane	C26	1.2
Heptacosane	C27	1.6
Octacosane	C28	1.6
Nonacosane	C29	1.5
Triacontane	C30	1.1
Hentriacontane	C31	0.8
Dotriacontane	C32	0.4
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		10

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.06
RES	10
RES + UCM	10
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

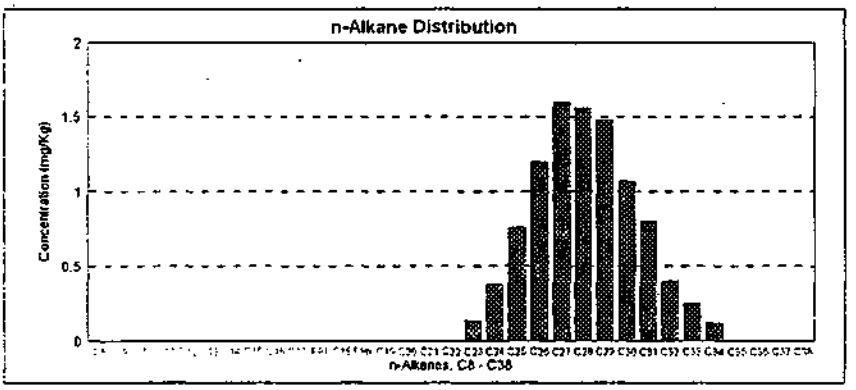


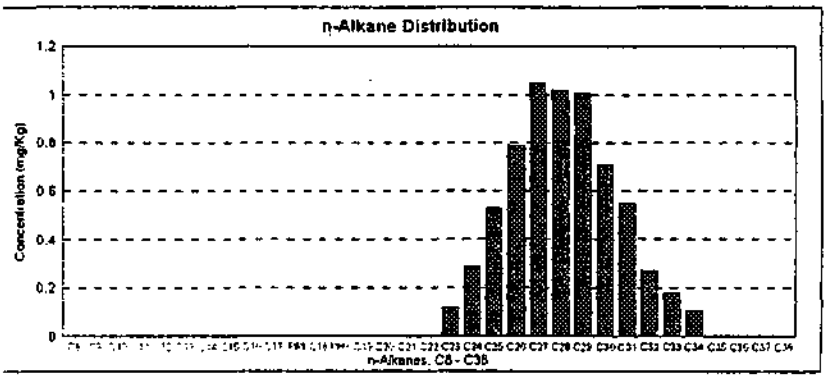
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0288
Sample Location	WR011ADuP

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.3
Pentacosane	C25	0.5
Hexacosane	C26	0.8
Heptacosane	C27	1.1
Octacosane	C28	1.0
Nonacosane	C29	1.0
Triacontane	C30	0.7
Hentriacontane	C31	0.6
Dotriacontane	C32	0.3
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		7

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.08
RES	7
RES + UCM	7
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR011ADuP

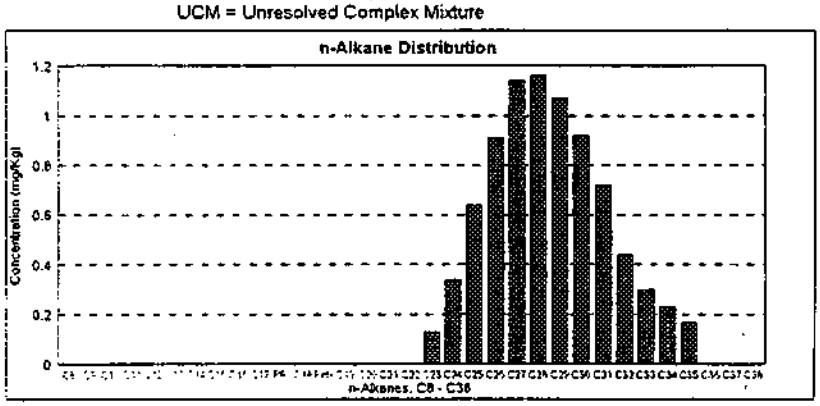
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0057
Sample Location	WR010A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.3
Pentacosane	C25	0.6
Hexacosane	C26	0.9
Heptacosane	C27	1.1
Octacosane	C28	1.2
Nonacosane	C29	1.1
Triacontane	C30	0.9
Hentriacontane	C31	0.7
Dotriacontane	C32	0.4
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.2
Pentatriacontane	C35	0.2
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		8

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.04
RES	8
RES + UCM	8
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR010A

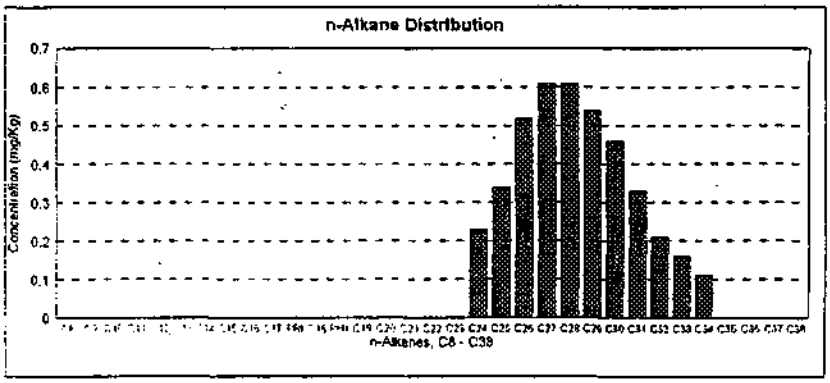
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0228
Sample Location	RD3A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.2
Pentacosane	C25	0.3
Hexacosane	C26	0.5
Heptacosane	C27	0.6
Octacosane	C28	0.6
Nonacosane	C29	0.5
Triacontane	C30	0.5
Hentriacontane	C31	0.3
Dotriacontane	C32	0.2
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		4

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.93
RES	4
RES + UCM	4
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



RD3A

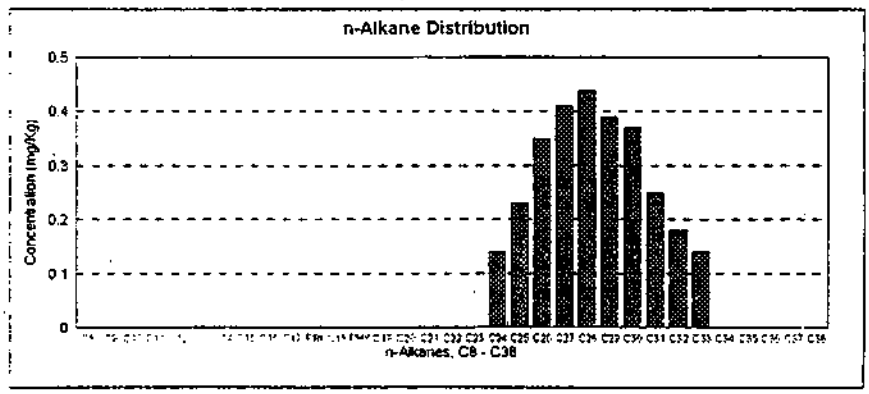
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0241
Sample Location	FBA

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.1
Pentacosane	C25	0.2
Hexacosane	C26	0.4
Heptacosane	C27	0.4
Octacosane	C28	0.4
Nonacosane	C29	0.4
Triacontane	C30	0.4
Hentriacontane	C31	0.3
Dotriacontane	C32	0.2
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		3

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.96
RES	3
RES + UCM	3
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



FBA

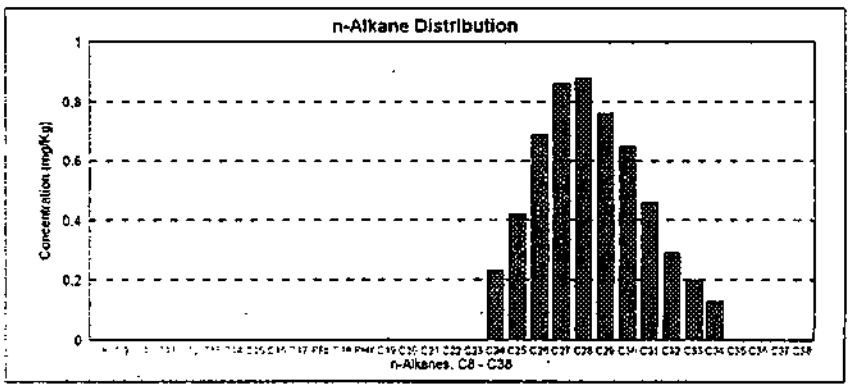
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0328
Sample Location	FBA

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.2
Pentacosane	C25	0.4
Hexacosane	C26	0.7
Heptacosane	C27	0.9
Octacosane	C28	0.9
Nonacosane	C29	0.8
Triacontane	C30	0.7
Hentriacontane	C31	0.5
Dotriacontane	C32	0.3
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		6

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.94
RES	6
RES + UCM	6
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



FBA

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0124
Sample Location	WR024A

n-Alkanes	Cn	Concentration (mg/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.3
Pentacosane	C25	0.7
Hexacosane	C26	1.2
Heptacosane	C27	1.7
Octacosane	C28	1.6
Nonacosane	C29	1.6
Triacontane	C30	1.2
Hentriacontane	C31	0.9
Dotriacontane	C32	0.5
Tritriacontane	C33	0.4
Tetratriacontane	C34	0.2
Pentatriacontane	C35	0.1
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		10

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.07
RES	10
RES + UCM	10
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

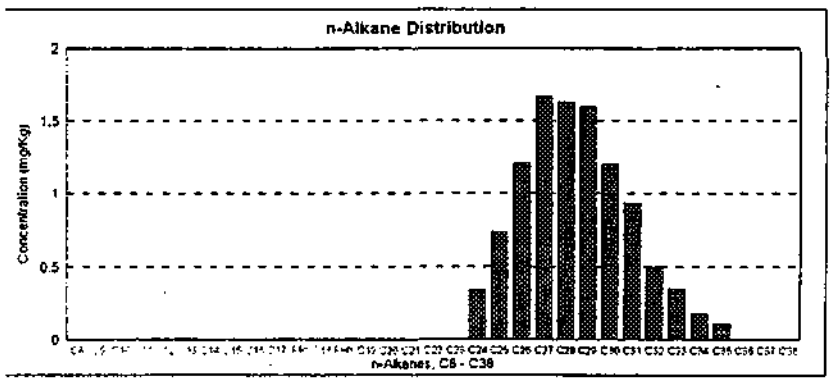


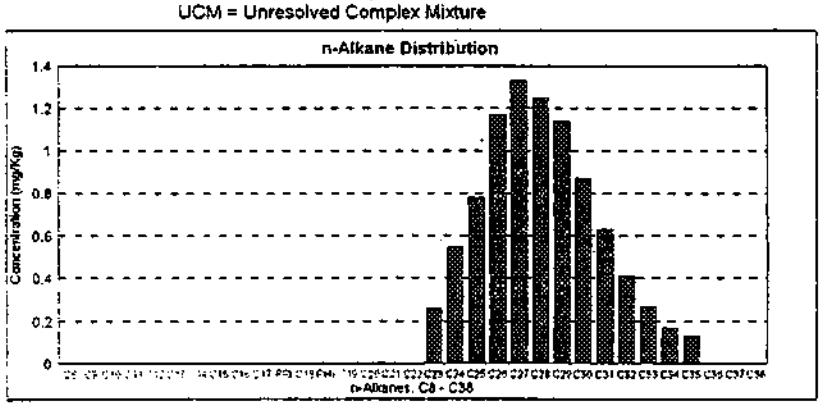
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0124 MS
Sample Location	WR024A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.3
Tetracosane	C24	0.6
Pentacosane	C25	0.8
Hexacosane	C26	1.2
Heptacosane	C27	1.3
Octacosane	C28	1.3
Nonacosane	C29	1.1
Triacontane	C30	0.9
Hentriacontane	C31	0.6
Dotriacontane	C32	0.4
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.2
Pentatriacontane	C35	0.1
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		9

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.03
RES	9
RES + UCM	9
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR024A

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0124MSD
Sample Location	WR024A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.2
Tetracosane	C24	0.4
Pentacosane	C25	0.9
Hexacosane	C26	1.3
Heptacosane	C27	1.8
Octacosane	C28	1.8
Nonacosane	C29	1.8
Triacontane	C30	1.3
Hentriacontane	C31	1.0
Dotriacontane	C32	0.6
Tritriacontane	C33	0.4
Tetratriacontane	C34	0.2
Pentatriacontane	C35	0.1
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		12

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.06
RES	12
RES + UCM	12
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

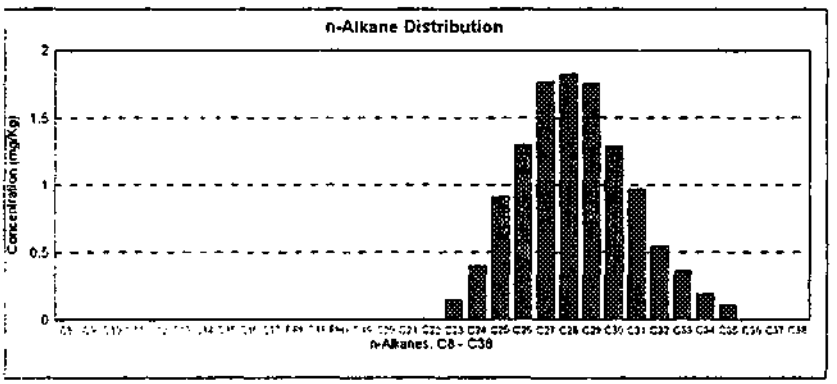


Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	WBLK03152000
Sample Location	LAB BLANK

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.1
Pentacosane	C25	0.2
Hexacosane	C26	0.4
Heptacosane	C27	0.6
Octacosane	C28	0.7
Nonacosane	C29	0.6
Triacontane	C30	0.5
Hentriacontane	C31	0.3
Dotriacontane	C32	0.3
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		4

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.88
RES	4
RES + UCM	4
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture

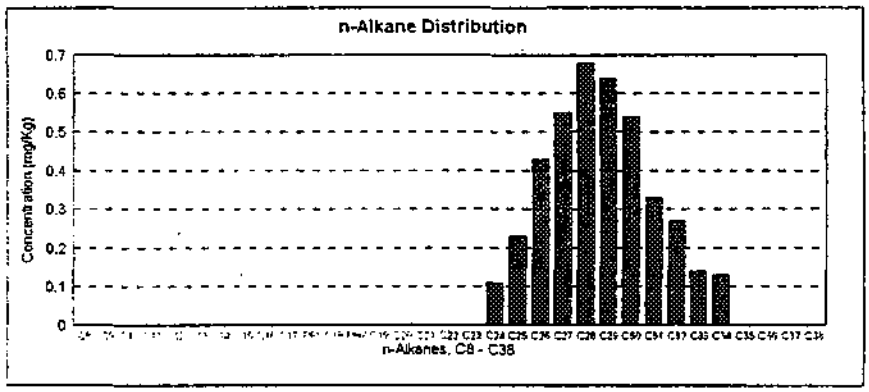


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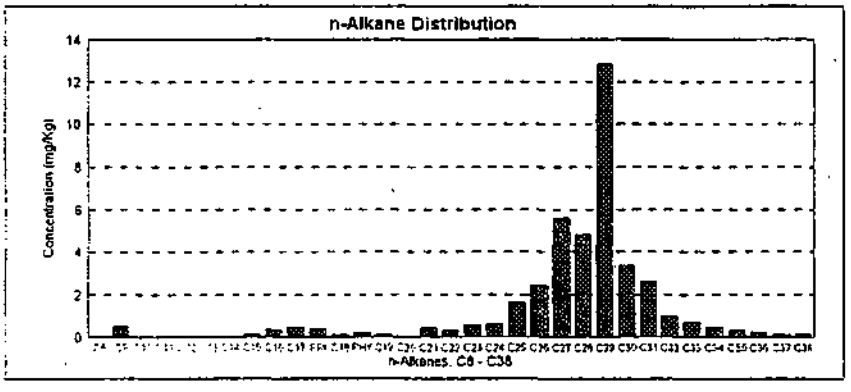
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	A0119-326
Sample Location	21SPSA

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.5
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.2
Hexadecane	C16	0.4
Heptadecane	C17	0.5
Pristane	PRI	0.4
Octadecane	C18	0.1
Phytane	PHY	0.2
Nonadecane	C19	0.2
Eicosane	C20	0.0
Heneicosane	C21	0.4
Docosane	C22	0.3
Tricosane	C23	0.6
Tetracosane	C24	0.6
Pentacosane	C25	1.6
Hexacosane	C26	2.4
Heptacosane	C27	5.6
Octacosane	C28	4.8
Nonacosane	C29	12.8
Triacontane	C30	3.4
Hentriacontane	C31	2.6
Dotriacontane	C32	1.0
Tritriacontane	C33	0.7
Tetratriacontane	C34	0.5
Pentatriacontane	C35	0.3
Hexatriacontane	C36	0.3
Heptatriacontane	C37	0.2
Octatriacontane	C38	0.2
TOTAL		41
C17/Pristane		1.18
C18/Phytane		0.52
Pristane/Phytane		1.90
WI		0.00
CPI		1.83
RES		41
RES + UCM		41
RES/(RES+UCM)		1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



21SPSA

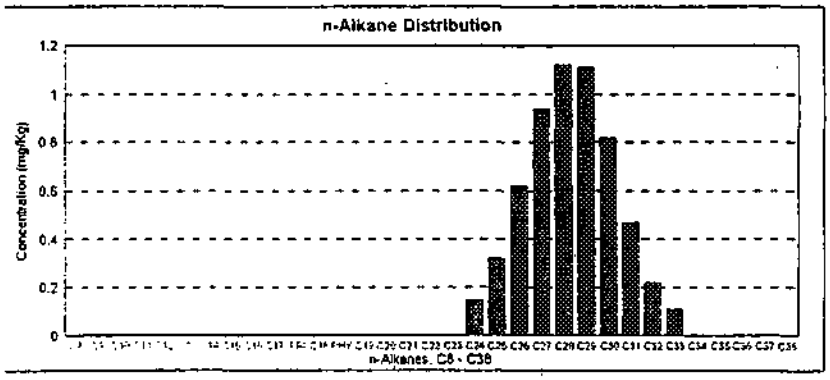
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	A0119-033D
Sample Location	FBA

n-Alkanes	Cn	Concentration (ug/g)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.2
Pentacosane	C25	0.3
Hexacosane	C26	0.6
Heptacosane	C27	0.9
Octacosane	C28	1.1
Nonacosane	C29	1.1
Triacontane	C30	0.8
Hentriacontane	C31	0.5
Dotriacontane	C32	0.2
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		6

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.01
RES	6
RES + UCM	6
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



FBA

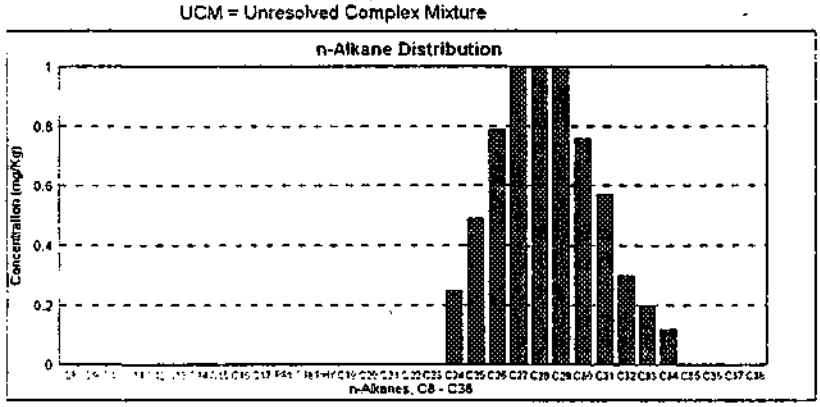
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0137
Sample Location	WR026A

n-Alkanes	Cn.	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.3
Pentacosane	C25	0.5
Hexacosane	C26	0.8
Heptacosane	C27	1.0
Octacosane	C28	1.0
Nonacosane	C29	1.0
Triacontane	C30	0.8
Hentriacontane	C31	0.6
Dotriacontane	C32	0.3
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		6

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.01
RES	6
RES + UCM	6
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR026A

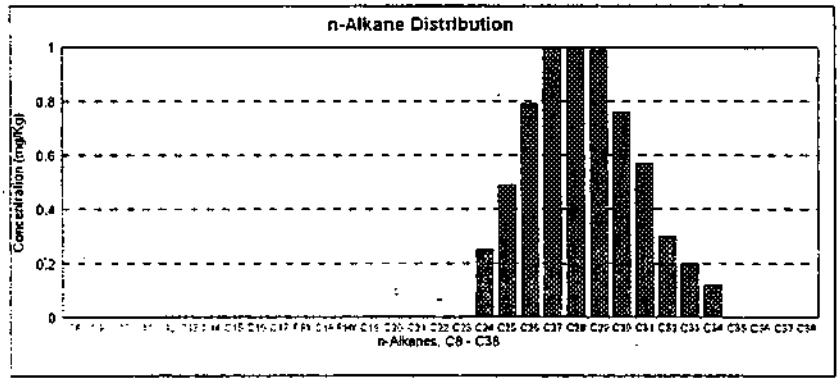
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0162
Sample Location	BC3A

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.3
Pentacosane	C25	0.5
Hexacosane	C26	0.8
Heptacosane	C27	1.0
Octacosane	C28	1.0
Nonacosane	C29	1.0
Triacontane	C30	0.6
Hentriacontane	C31	0.5
Dotriacontane	C32	0.3
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		6

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.01
RES	6
RES + UCM	6
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



BC3A

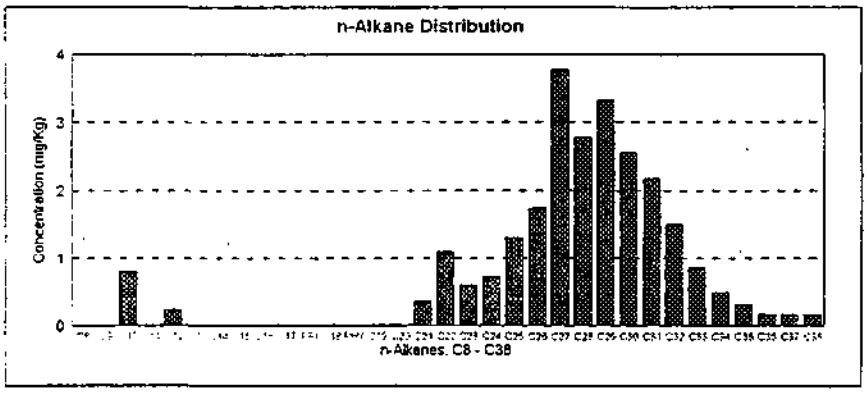
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0162
Sample Location	BC3A MS

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.8
Undecane	C11	0.0
Dodecane	C12	0.2
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.4
Docosane	C22	1.1
Tricosane	C23	0.6
Tetracosane	C24	0.7
Pentacosane	C25	1.3
Hexacosane	C26	1.7
Heptacosane	C27	3.8
Octacosane	C28	2.8
Nonacosane	C29	3.3
Triacontane	C30	2.6
Hentriacontane	C31	2.2
Dotriacontane	C32	1.5
Tritriacontane	C33	0.9
Tetratriacontane	C34	0.5
Pentatriacontane	C35	0.3
Hexatriacontane	C36	0.2
Heptatriacontane	C37	0.2
Octatriacontane	C38	0.2
TOTAL		25

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.16
CPI	1.05
RES	25
RES + UCM	887
RES/(RES+UCM)	0.0290

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



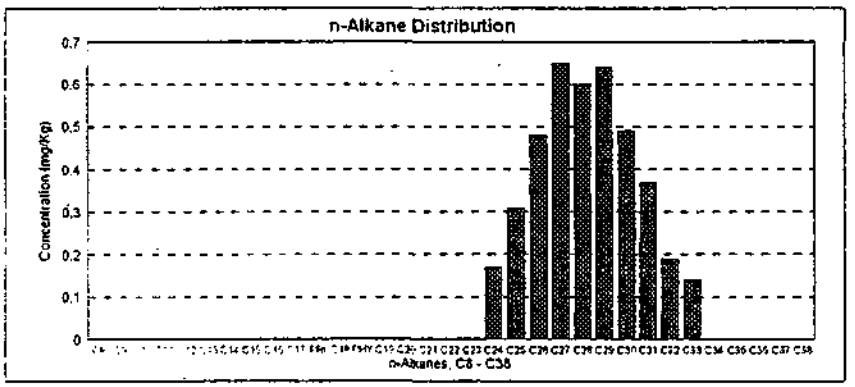
BC3A MS

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	0119-0162
Sample Location	BC3A MSD

n-Alkanes	Cn	Concentration (ug/L)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.2
Pentacosane	C25	0.3
Hexacosane	C26	0.5
Heptacosane	C27	0.7
Octacosane	C28	0.6
Nonacosane	C29	0.6
Triacontane	C30	0.5
Hentriacontane	C31	0.4
Dotriacontane	C32	0.2
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		4
C17/Pristane		N/A
C18/Phytane		N/A
Pristane/Phytane		N/A
WI		0.00
CPI		1.09
RES		4
RES + UCM		4
RES/(RES+UCM)		1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



BC3A MSD

Soils

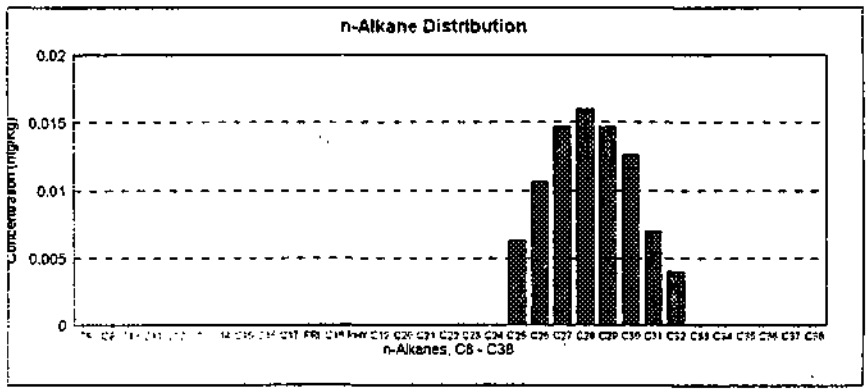
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	SBLK031300
Sample Location	Sand Blank

n-Alkanes	Cn	Concentration (mg/kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.0
Pentacosane	C25	0.0
Hexacosane	C26	0.0
Heptacosane	C27	0.0
Octacosane	C28	0.0
Nonacosane	C29	0.0
Triacontane	C30	0.0
Hentriacontane	C31	0.0
Dotriacontane	C32	0.0
Tritriacontane	C33	0.0
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		0

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.96
RES	0
RES + UCM	0
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



Sand Blank

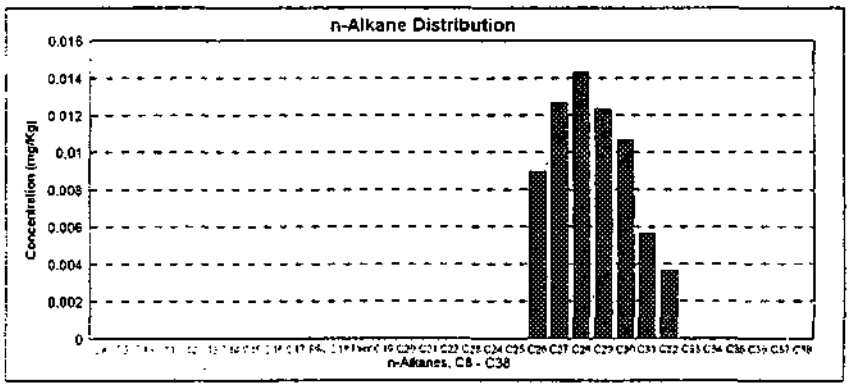
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0270
Sample Location	FBA

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.0
Pentacosane	C25	0.0
Hexacosane	C26	0.0
Heptacosane	C27	0.0
Octacosane	C28	0.0
Nonacosane	C29	0.0
Triacontane	C30	0.0
Hentriacontane	C31	0.0
Dotriacontane	C32	0.0
Tritriacontane	C33	0.0
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		0

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.61
RES	0
RES + UCM	0
RES/(RES+UCM)	NC

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



FBA

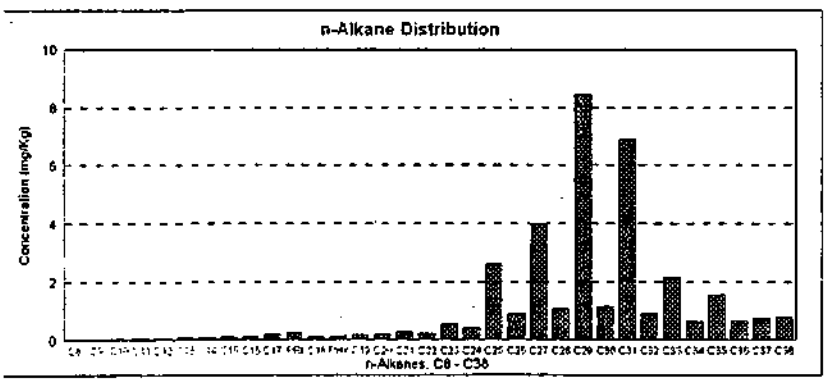
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0252
Sample Location	SCIA

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.1
Dodecane	C12	0.1
Tridecane	C13	0.1
Tetradecane	C14	0.1
Pentadecane	C15	0.1
Hexadecane	C16	0.1
Heptadecane	C17	0.2
Pristane	PRI	0.2
Octadecane	C18	0.1
Phytane	PHY	0.2
Nonadecane	C19	0.2
Eicosane	C20	0.2
Heneicosane	C21	0.3
Docosane	C22	0.2
Tricosane	C23	0.6
Tetracosane	C24	0.4
Pentacosane	C25	2.6
Hexacosane	C26	0.9
Heptacosane	C27	4.0
Octacosane	C28	1.1
Nonacosane	C29	8.5
Triacontane	C30	1.1
Hentriacontane	C31	6.9
Dotriacontane	C32	0.9
Tritriacontane	C33	2.1
Tetratriacontane	C34	0.7
Pentatriacontane	C35	1.5
Hexatriacontane	C36	0.7
Heptatriacontane	C37	0.8
Octatriacontane	C38	0.8
TOTAL		36

C17/Pristane	0.84
C18/Phytane	0.74
Pristane/Phytane	1.63
WI	0.07
CPI	3.62
RES	36
RES + UCM	1381
RES/(RES+UCM)	0.0275

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



SCIA

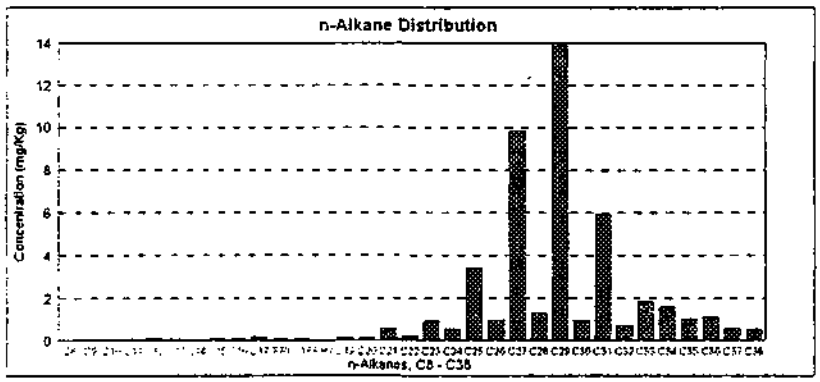
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0266
Sample Location	RD3ADUP

n-Alkanes	C_n	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.1
Dodecane	C12	0.1
Tridecane	C13	0.1
Tetradecane	C14	0.0
Pentadecane	C15	0.1
Hexadecane	C16	0.1
Heptadecane	C17	0.2
Pristane	PRI	0.1
Octadecane	C18	0.1
Phytane	PHY	0.0
Nonadecane	C19	0.2
Eicosane	C20	0.1
Heneicosane	C21	0.6
Docosane	C22	0.2
Tricosane	C23	0.9
Tetracosane	C24	0.5
Pentacosane	C25	3.4
Hexacosane	C26	1.0
Heptacosane	C27	9.8
Octacosane	C28	1.3
Nonacosane	C29	13.9
Triacontane	C30	1.0
Hentriacontane	C31	5.9
Dotriacontane	C32	0.7
Tritriacontane	C33	1.9
Tetratriacontane	C34	1.6
Pentatriacontane	C35	1.0
Hexatriacontane	C36	1.1
Heptatriacontane	C37	0.6
Octatriacontane	C38	0.5
TOTAL		47

C17/Pristane	2.58
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.04
CPI	4.56
RES	47
RES + UCM	1607
RES/(RES+UCM)	0.0295

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



RD3ADUP

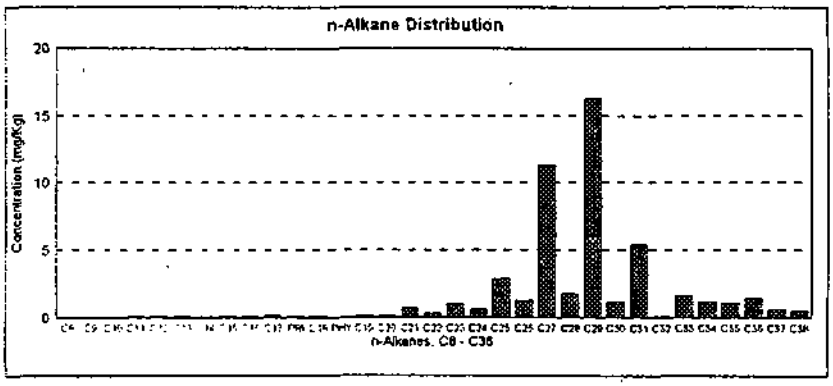
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0265
Sample Location	RD3A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.1
Dodecane	C12	0.2
Tridecane	C13	0.1
Tetradecane	C14	0.1
Pentadecane	C15	0.2
Hexadecane	C16	0.1
Heptadecane	C17	0.2
Pristane	PRI	0.1
Octadecane	C18	0.1
Phytane	PHY	0.0
Nonadecane	C19	0.2
Eicosane	C20	0.2
Heneicosane	C21	0.7
Docosane	C22	0.3
Tricosane	C23	1.1
Tetracosane	C24	0.6
Pentacosane	C25	2.9
Hexacosane	C26	1.3
Heptacosane	C27	11.3
Octacosane	C28	1.8
Nonacosane	C29	16.3
Triacontane	C30	1.2
Hentriacontane	C31	5.4
Dotriacontane	C32	0.1
Tritriacontane	C33	1.7
Tetratriacontane	C34	1.2
Pentatriacontane	C35	1.1
Hexatriacontane	C36	1.5
Heptatriacontane	C37	0.6
Octatriacontane	C38	0.5
TOTAL		51

C17/Pristane	1.77
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.05
CPI	4.56
RES	51
RES + UCM	1820
RES/(RES+UCM)	0.0281

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



RD3A

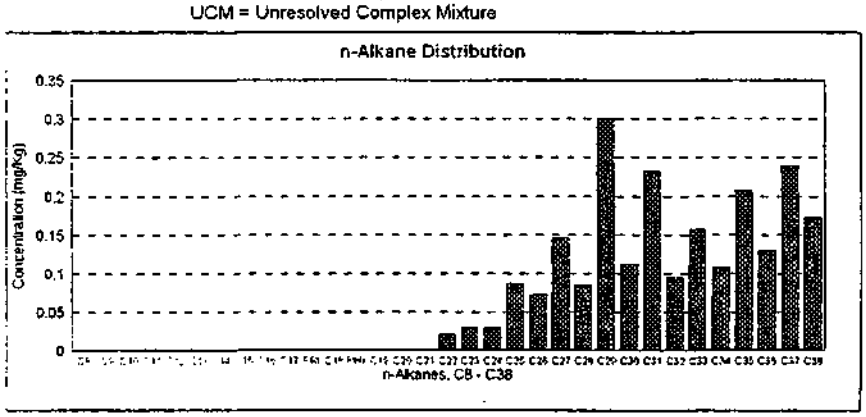
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0249
Sample Location	BC3A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.0
Pentacosane	C25	0.1
Hexacosane	C26	0.1
Heptacosane	C27	0.1
Octacosane	C28	0.1
Nonacosane	C29	0.3
Triacontane	C30	0.1
Hentriacontane	C31	0.2
Dotriacontane	C32	0.1
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.2
Hexatriacontane	C36	0.1
Heptatriacontane	C37	0.2
Octatriacontane	C38	0.2
TOTAL		2

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.70
RES	2
RES + UCM	169
RES/(RES+UCM)	0.01182

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



BC3A

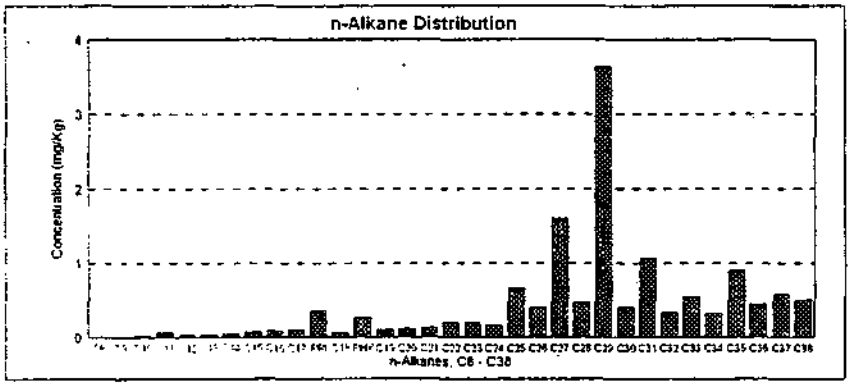
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0259
Sample Location	33SS2A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.1
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.1
Hexadecane	C16	0.1
Heptadecane	C17	0.1
Pristane	PRI	0.4
Octadecane	C18	0.1
Phytane	PHY	0.3
Nonadecane	C19	0.1
Eicosane	C20	0.1
Heneicosane	C21	0.1
Docosane	C22	0.2
Tricosane	C23	0.2
Tetracosane	C24	0.2
Pentacosane	C25	0.7
Hexacosane	C26	0.4
Heptacosane	C27	1.6
Octacosane	C28	0.5
Nonacosane	C29	3.6
Triacontane	C30	0.4
Hentriacontane	C31	1.1
Dotriacontane	C32	0.3
Tritriacontane	C33	0.6
Tetratriacontane	C34	0.3
Pentatriacontane	C35	0.9
Hexatriacontane	C36	0.4
Heptatriacontane	C37	0.6
Octatriacontane	C38	0.5
TOTAL		14

C17/Pristane	0.31
C18/Phytane	0.27
Pristane/Phytane	1.36
WI	0.09
CPI	2.32
RES	14
RES + UCM	1047
RES/(RES+UCM)	0.0134

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



33SS2A

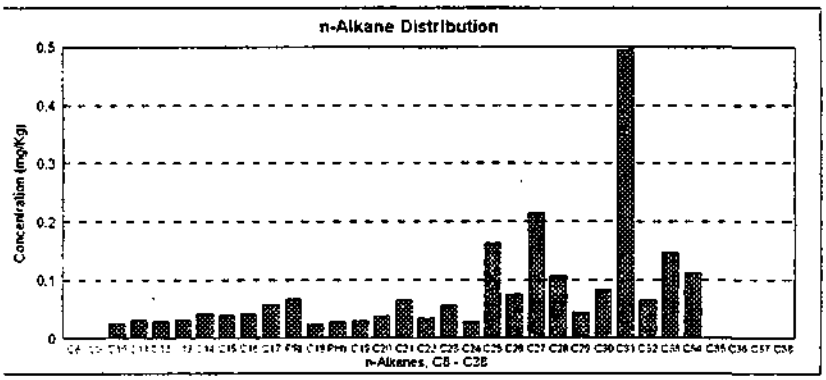
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0273
Sample Location	AOI102A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.1
Pristane	PRI	0.1
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.1
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.0
Pentacosane	C25	0.2
Hexacosane	C26	0.1
Heptacosane	C27	0.2
Octacosane	C28	0.1
Nonacosane	C29	0.0
Triacontane	C30	0.1
Hentriacontane	C31	0.5
Dotriacontane	C32	0.1
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		2

C17/Pristane	0.86
C18/Phytane	0.83
Pristane/Phytane	2.42
WI	0.40
CPI	1.80
RES	2
RES + UCM	731
RES/(RES+UCM)	0.0030

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



AOI102A

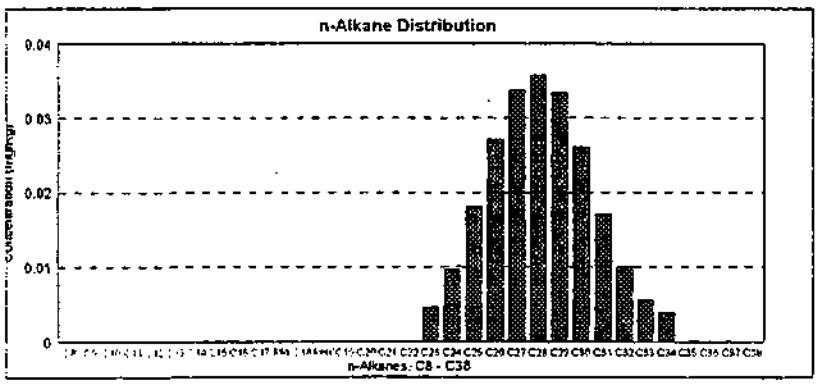
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0334
Sample Location	FBA

n-Alkanes	Cn	Concentration (mg/kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.0
Pentacosane	C25	0.0
Hexacosane	C26	0.0
Heptacosane	C27	0.0
Octacosane	C28	0.0
Nonacosane	C29	0.0
Triacontane	C30	0.0
Hentriacontane	C31	0.0
Dotriacontane	C32	0.0
Tritriacontane	C33	0.0
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		0

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	1.00
RES	0
RES + UCM	0
RES/(RES+UCM)	NC

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



FBA

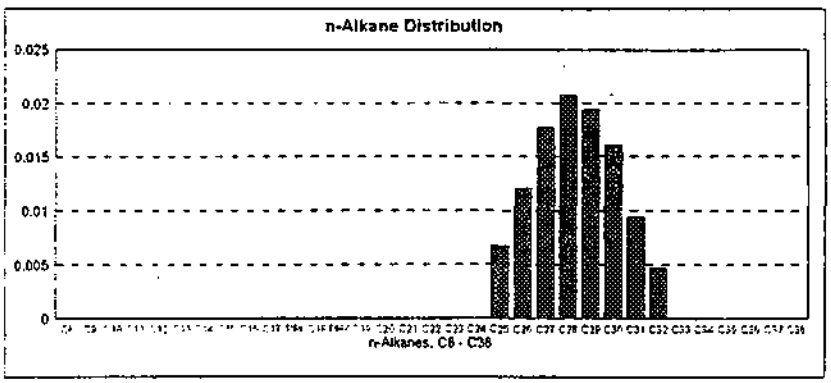
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0334
Sample Location	FBA MS

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.0
Pentacosane	C25	0.0
Hexacosane	C26	0.0
Heptacosane	C27	0.0
Octacosane	C28	0.0
Nonacosane	C29	0.0
Triacontane	C30	0.0
Hentriacontane	C31	0.0
Dotriacontane	C32	0.0
Tritriacontane	C33	0.0
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		0

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.99
RES	0
RES + UCM	0
RES/(RES+UCM)	NC

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



FBA MS

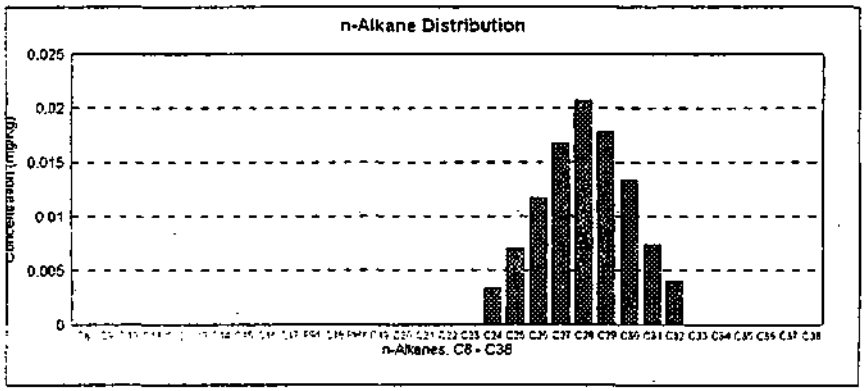
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0334
Sample Location	FBA MSD

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.0
Tricosane	C23	0.0
Tetracosane	C24	0.0
Pentacosane	C25	0.0
Hexacosane	C26	0.0
Heptacosane	C27	0.0
Octacosane	C28	0.0
Nonacosane	C29	0.0
Triacontane	C30	0.0
Hentriacontane	C31	0.0
Dotriacontane	C32	0.0
Tritriacontane	C33	0.0
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.0
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		0

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	0.92
RES	0
RES + UCM	0
RES/(RES+UCM)	1.0000

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



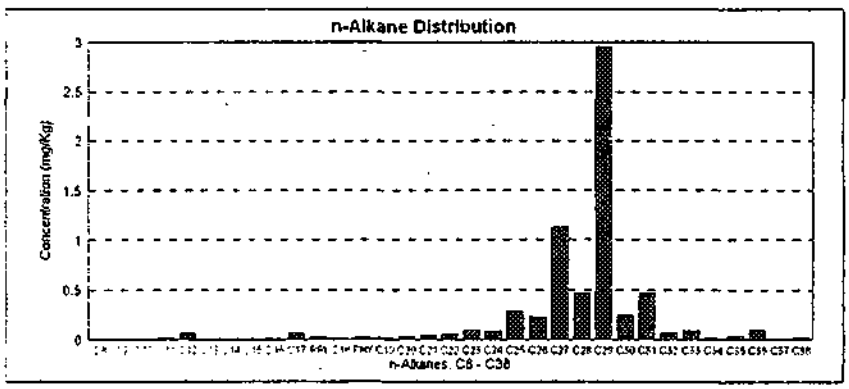
FBA MSD

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0384
Sample Location	21SPSA

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.1
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.1
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.0
Docosane	C22	0.1
Tricosane	C23	0.1
Tetracosane	C24	0.1
Pentacosane	C25	0.3
Hexacosane	C26	0.2
Heptacosane	C27	1.1
Octacosane	C28	0.5
Nonacosane	C29	3.0
Triacontane	C30	0.2
Hentriacontane	C31	0.5
Dotriacontane	C32	0.1
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.0
Pentatriacontane	C35	0.0
Hexatriacontane	C36	0.1
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.0
TOTAL		7
C17/Pristane		2.19
C18/Phytane		0.41
Pristane/Phytane		1.17
WI		0.08
CPI		3.65
RES		7
RES + UCM		108
RES/(RES+UCM)		0.0617

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



21SPSA

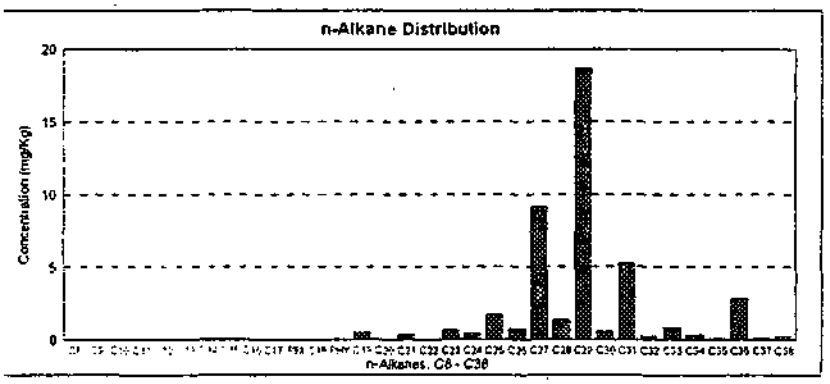
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0300
Sample Location	WR09A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.1
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.5
Eicosane	C20	0.0
Heneicosane	C21	0.4
Docosane	C22	0.0
Tricosane	C23	0.7
Tetracosane	C24	0.4
Pentacosane	C25	1.7
Hexacosane	C26	0.8
Heptacosane	C27	9.2
Octacosane	C28	1.4
Nonacosane	C29	18.7
Triacontane	C30	0.6
Hentriacontane	C31	5.3
Dotriacontane	C32	0.3
Tritriacontane	C33	0.8
Tetratriacontane	C34	0.4
Pentatriacontane	C35	0.1
Hexatriacontane	C36	2.8
Heptatriacontane	C37	0.1
Octatriacontane	C38	0.3
TOTAL		45

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.03
CPI	5.32
RES	45
RES + UCM	1083
RES/(RES+UCM)	0.0412

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR09A

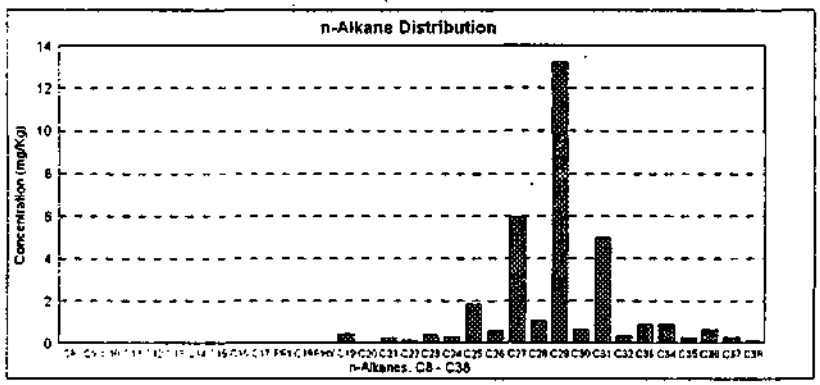
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0305
Sample Location	WR012A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.4
Eicosane	C20	0.0
Heneicosane	C21	0.2
Docosane	C22	0.1
Tricosane	C23	0.4
Tetracosane	C24	0.3
Pentacosane	C25	1.8
Hexacosane	C26	0.6
Heptacosane	C27	6.0
Octacosane	C28	1.1
Nonacosane	C29	13.2
Triacontane	C30	0.6
Hentriacontane	C31	5.0
Dotriacontane	C32	0.3
Tritriacontane	C33	0.9
Tetratriacontane	C34	0.9
Pentatriacontane	C35	0.3
Hexatriacontane	C36	0.6
Heptatriacontane	C37	0.3
Octatriacontane	C38	0.1
TOTAL		33

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	5.10
RES	33
RES + UCM	786
RES/(RES+UCM)	0.0422

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR012A

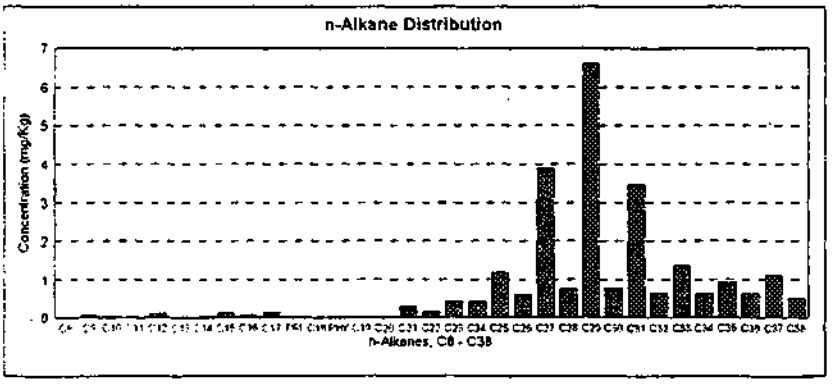
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0309
Sample Location	WR019A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.1
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.1
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.1
Hexadecane	C16	0.1
Heptadecane	C17	0.2
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.3
Docosane	C22	0.1
Tricosane	C23	0.4
Tetracosane	C24	0.4
Pentacosane	C25	1.2
Hexacosane	C26	0.6
Heptacosane	C27	3.9
Octacosane	C28	0.8
Nonacosane	C29	6.6
Triacontane	C30	0.8
Hentriacontane	C31	3.5
Dotriacontane	C32	0.7
Tritriacontane	C33	1.4
Tetratriacontane	C34	0.6
Pentatriacontane	C35	0.9
Hexatriacontane	C36	0.6
Heptatriacontane	C37	1.1
Octatriacontane	C38	0.5
TOTAL		25

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.06
CPI	3.68
RES	25
RES + UCM	1777
RES/(RES+UCM)	0.0140

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR019A

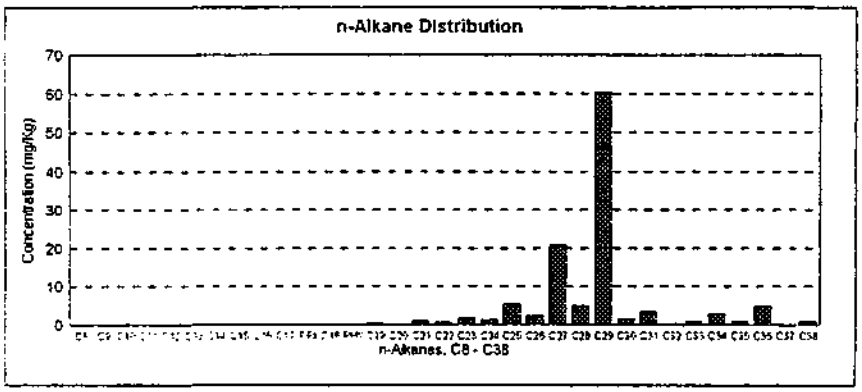
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0336
Sample Location	AOI4A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.3
Eicosane	C20	0.0
Heneicosane	C21	0.9
Docosane	C22	0.6
Tricosane	C23	1.8
Tetracosane	C24	1.3
Pentacosane	C25	5.3
Hexacosane	C26	2.3
Heptacosane	C27	20.7
Octacosane	C28	4.9
Nonacosane	C29	60.7
Triacontane	C30	1.6
Hentriacontane	C31	3.5
Dotriacontane	C32	0.4
Tritriacontane	C33	1.0
Tetratriacontane	C34	2.9
Pentatriacontane	C35	0.9
Hexatriacontane	C36	4.8
Heptatriacontane	C37	0.0
Octatriacontane	C38	1.0
TOTAL		115

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	4.80
RES	115
RES + UCM	2215
RES/(RES+UCM)	0.0520

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



AOI4A

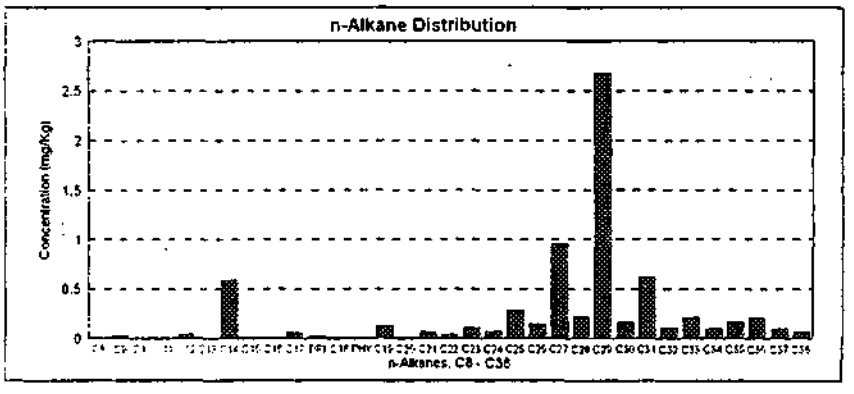
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0307
Sample Location	WR014A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.6
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.1
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.1
Eicosane	C20	0.0
Heneicosane	C21	0.1
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.1
Pentacosane	C25	0.3
Hexacosane	C26	0.1
Heptacosane	C27	1.0
Octacosane	C28	0.2
Nonacosane	C29	2.7
Triacontane	C30	0.2
Hentriacontane	C31	0.6
Dotriacontane	C32	0.1
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.2
Hexatriacontane	C36	0.2
Heptatriacontane	C37	0.1
Octatriacontane	C38	0.1
TOTAL		7

C17/Pristane	2.50
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	1.36
CPI	3.04
RES	7
RES + UCM	279
RES/(RES+UCM)	0.0257

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR014A

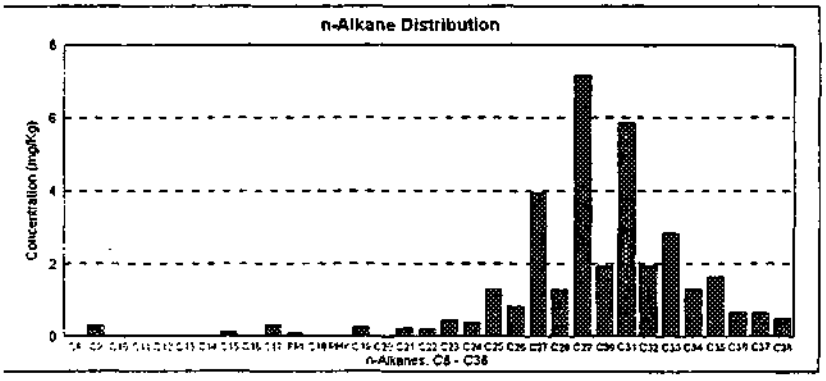
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0302
Sample Location	WR011A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.3
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.1
Hexadecane	C16	0.0
Heptadecane	C17	0.3
Pristane	PRI	0.1
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.3
Eicosane	C20	0.0
Heneicosane	C21	0.2
Docosane	C22	0.2
Tricosane	C23	0.5
Tetracosane	C24	0.4
Pentacosane	C25	1.3
Hexacosane	C26	0.8
Heptacosane	C27	4.0
Octacosane	C28	1.3
Nonacosane	C29	7.2
Triacontane	C30	1.9
Hentriacontane	C31	5.9
Dotriacontane	C32	1.9
Tritriacontane	C33	2.9
Tetratriacontane	C34	1.3
Pentatriacontane	C35	1.6
Hexatriacontane	C36	0.7
Heptatriacontane	C37	0.7
Octatriacontane	C38	0.5
TOTAL		34

C17/Pristane	3.18
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	2.73
RES	34
RES + UCM	132
RES/(RES+UCM)	0.2607

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR011A

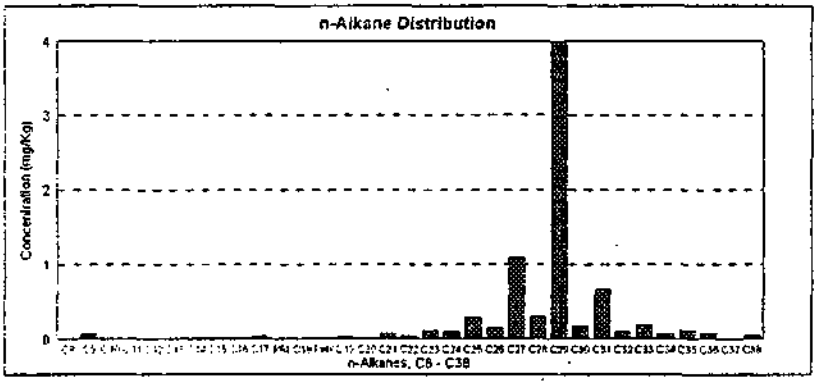
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	80119-0312
Sample Location	WR021ADUP

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.1
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.1
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.1
Pentacosane	C25	0.3
Hexacosane	C26	0.2
Heptacosane	C27	1.1
Octacosane	C28	0.3
Nonacosane	C29	4.0
Triacontane	C30	0.2
Hentriacontane	C31	0.7
Dotriacontane	C32	0.1
Tritriacontane	C33	0.2
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.1
Hexatriacontane	C36	0.1
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.1
TOTAL		8

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	6.15
RES	8
RES + UCM	368
RES/(RES+UCM)	0.0211

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR021ADUP

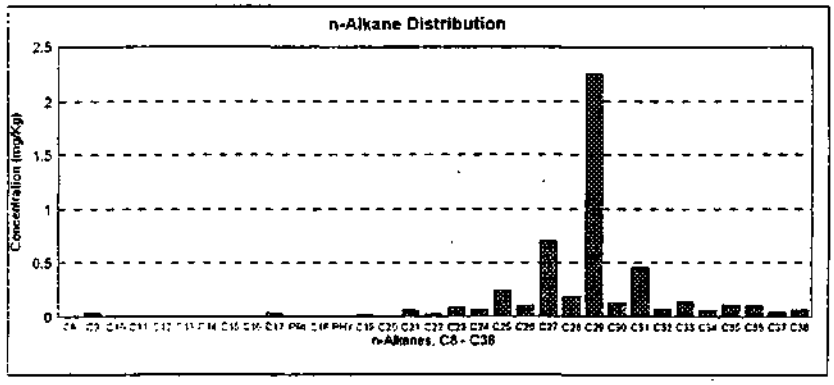
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0311
Sample Location	WR021A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.0
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.1
Docosane	C22	0.0
Tricosane	C23	0.1
Tetracosane	C24	0.1
Pentacosane	C25	0.2
Hexacosane	C26	0.1
Heptacosane	C27	0.7
Octacosane	C28	0.2
Nonacosane	C29	2.2
Triacontane	C30	0.1
Hentriacontane	C31	0.5
Dotriacontane	C32	0.1
Tritriacontane	C33	0.1
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.1
Hexatriacontane	C36	0.1
Heptatriacontane	C37	0.0
Octatriacontane	C38	0.1
TOTAL		5

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	5.17
RES	5
RES + UCM	196
RES/(RES+UCM)	0.0255

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR021A

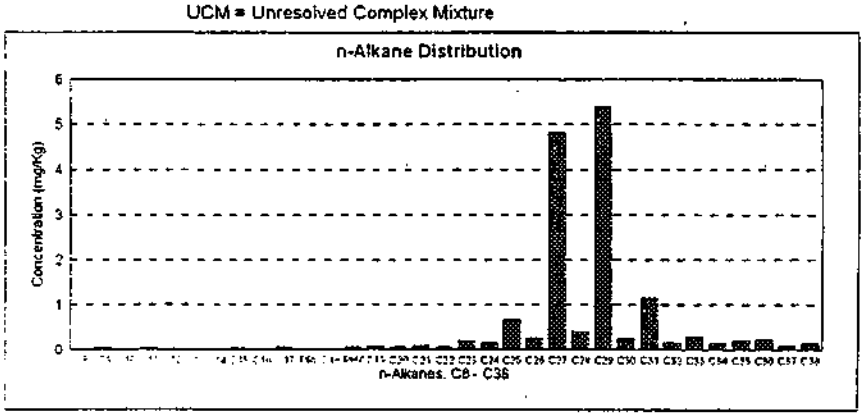
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0319
Sample Location	WR025A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.1
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.1
Eicosane	C20	0.1
Heneicosane	C21	0.1
Docosane	C22	0.1
Tricosane	C23	0.2
Tetracosane	C24	0.2
Pentacosane	C25	0.7
Hexacosane	C26	0.3
Heptacosane	C27	4.8
Octacosane	C28	0.4
Nonacosane	C29	5.4
Triacontane	C30	0.2
Hentriacontane	C31	1.2
Dotriacontane	C32	0.2
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.2
Pentatriacontane	C35	0.2
Hexatriacontane	C36	0.2
Heptatriacontane	C37	0.1
Octatriacontane	C38	0.1
TOTAL		15

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	6.94
RES	15
RES + UCM	427
RES/(RES+UCM)	0.0353

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



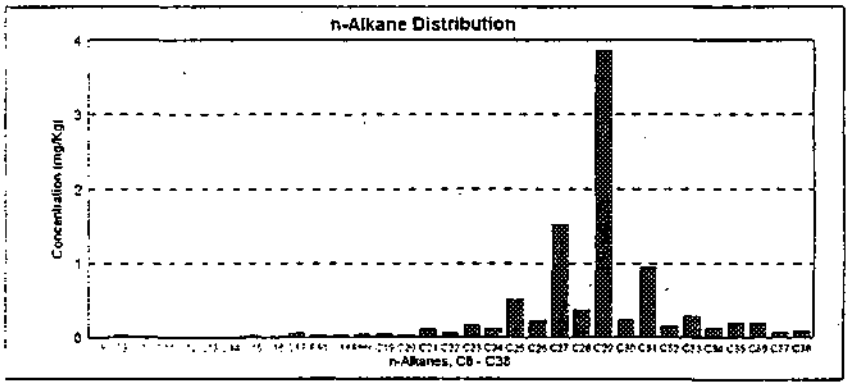
WR025A

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0314
Sample Location	WR022A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.1
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.1
Docosane	C22	0.1
Tricosane	C23	0.2
Tetracosane	C24	0.1
Pentacosane	C25	0.5
Hexacosane	C26	0.2
Heptacosane	C27	1.5
Octacosane	C28	0.4
Nonacosane	C29	3.9
Triacontane	C30	0.2
Hentriacontane	C31	0.9
Dotriacontane	C32	0.2
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.2
Hexatriacontane	C36	0.2
Heptatriacontane	C37	0.1
Octatriacontane	C38	0.1
TOTAL		10
C17/Pristane		2.60
C18/Phytane		0.74
Pristane/Phytane		0.53
WI		0.00
CPI		4.62
RES		10
RES + UCM		371
RES/(RES+UCM)		0.0259

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR022A

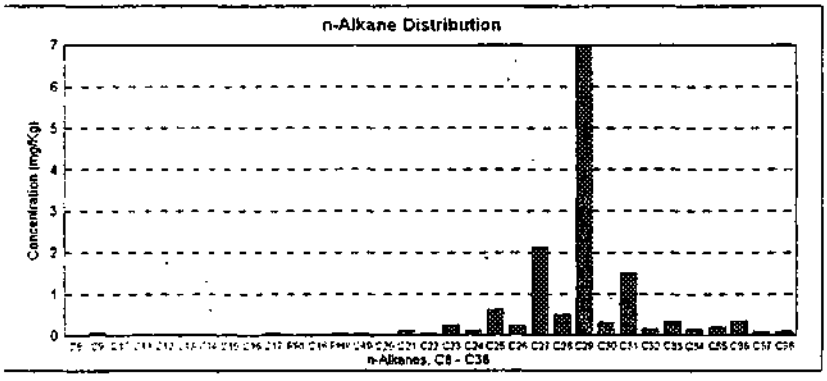
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0315
Sample Location	WR022DUP

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.1
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.0
Hexadecane	C16	0.0
Heptadecane	C17	0.1
Pristane	PRI	0.0
Octadecane	C18	0.0
Phytane	PHY	0.0
Nonadecane	C19	0.0
Eicosane	C20	0.0
Heneicosane	C21	0.1
Docosane	C22	0.1
Tricosane	C23	0.3
Tetracosane	C24	0.1
Pentacosane	C25	0.6
Hexacosane	C26	0.2
Heptacosane	C27	2.1
Octacosane	C28	0.5
Nonacosane	C29	7.0
Triacontane	C30	0.3
Hentriacontane	C31	1.5
Dotriacontane	C32	0.2
Tritriacontane	C33	0.3
Tetratriacontane	C34	0.1
Pentatriacontane	C35	0.2
Hexatriacontane	C36	0.3
Heptatriacontane	C37	0.1
Octatriacontane	C38	0.1
TOTAL		15

C17/Pristane	N/A
C18/Phytane	N/A
Pristane/Phytane	N/A
WI	0.00
CPI	5.02
RES	15
RES + UCM	418
RES/(RES+UCM)	0.0350

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



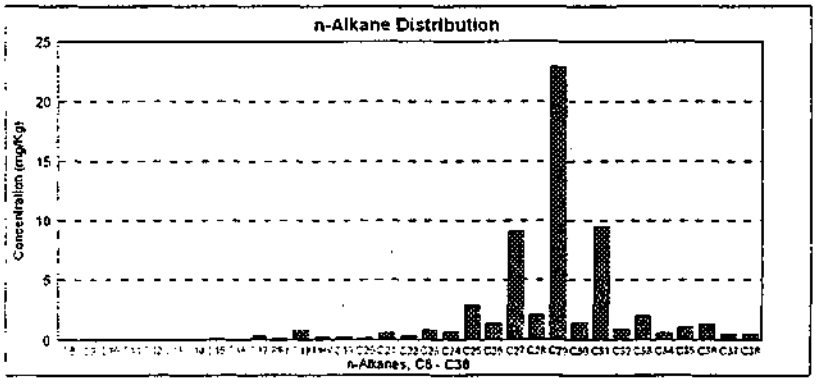
WR022DUP

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0317
Sample Location	WR24A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.1
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.2
Hexadecane	C16	0.0
Heptadecane	C17	0.4
Pristane	PRI	0.1
Octadecane	C18	0.8
Phytane	PHY	0.3
Nonadecane	C19	0.2
Eicosane	C20	0.2
Heneicosane	C21	0.6
Docosane	C22	0.4
Tricosane	C23	0.9
Tetracosane	C24	0.7
Pentacosane	C25	2.9
Hexacosane	C26	1.4
Heptacosane	C27	9.1
Octacosane	C28	2.1
Nonacosane	C29	22.9
Triacontane	C30	1.5
Hentriacontane	C31	9.5
Dotriacontane	C32	0.9
Tritriacontane	C33	2.1
Tetratriacontane	C34	0.6
Pentatriacontane	C35	1.1
Hexatriacontane	C36	1.4
Heptatriacontane	C37	0.5
Octatriacontane	C38	0.6
TOTAL		61
C17/Pristane		3.14
C18/Phytane		3.18
Pristane/Phytane		0.49
WI		0.09
CPI		5.05
RES		61
RES + UCM		2171
RES/(RES+UCM)		0.0283

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR24A

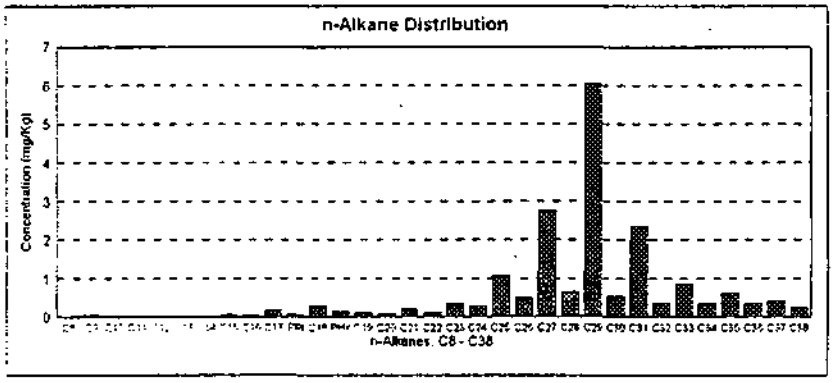
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0322
Sample Location	WR28A

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.0
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.1
Hexadecane	C16	0.1
Heptadecane	C17	0.2
Pristane	PRI	0.1
Octadecane	C18	0.3
Phytane	PHY	0.1
Nonadecane	C19	0.1
Eicosane	C20	0.1
Heneicosane	C21	0.2
Docosane	C22	0.1
Tricosane	C23	0.3
Tetracosane	C24	0.3
Pentacosane	C25	1.1
Hexacosane	C26	0.5
Heptacosane	C27	2.8
Octacosane	C28	0.6
Nonacosane	C29	6.0
Triacontane	C30	0.5
Hentriacontane	C31	2.4
Dotriacontane	C32	0.4
Tritriacontane	C33	0.9
Tetratriacontane	C34	0.3
Pentatriacontane	C35	0.6
Hexatriacontane	C36	0.3
Heptatriacontane	C37	0.4
Octatriacontane	C38	0.3
TOTAL		19

C17/Pristane	2.65
C18/Phytane	1.95
Pristane/Phytane	0.49
WI	0.00
CPI	4.09
RES	19
RES + UCM	968
RES/(RES+UCM)	0.0198

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR28A

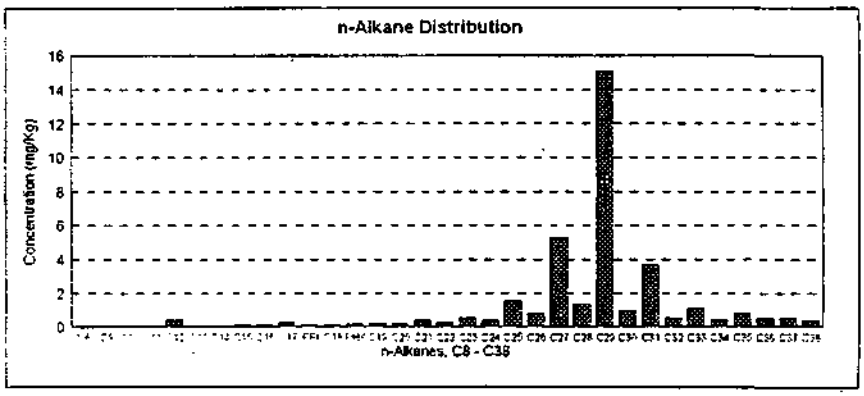
Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0322
Sample Location	WR28A MS

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.1
Undecane	C11	0.0
Dodecane	C12	0.4
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.1
Hexadecane	C16	0.1
Heptadecane	C17	0.3
Pristane	PRI	0.1
Octadecane	C18	0.1
Phytane	PHY	0.2
Nonadecane	C19	0.2
Eicosane	C20	0.1
Heneicosane	C21	0.4
Docosane	C22	0.3
Tricosane	C23	0.5
Tetracosane	C24	0.4
Pentacosane	C25	1.5
Hexacosane	C26	0.8
Heptacosane	C27	5.3
Octacosane	C28	1.3
Nonacosane	C29	15.1
Triacontane	C30	0.9
Hentriacontane	C31	3.7
Dotriacontane	C32	0.5
Tritriacontane	C33	1.1
Tetratriacontane	C34	0.4
Pentatriacontane	C35	0.8
Hexatriacontane	C36	0.5
Heptatriacontane	C37	0.5
Octatriacontane	C38	0.4
TOTAL		36

C17/Pristane	2.59
C18/Phytane	0.58
Pristane/Phytane	0.60
WI	0.18
CPI	4.49
RES	36
RES + UCM	1410
RES/(RES+UCM)	0.0256

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



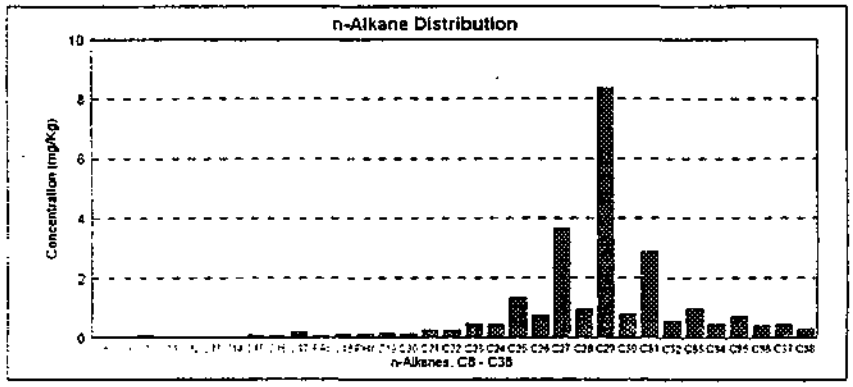
WR28A MS

Table 1.1
Distribution of n-Alkanes and TPH

Sample No.	B0119-0322
Sample Location	WR28A MSD

n-Alkanes	Cn	Concentration (mg/Kg)
Octane	C8	0.0
Nonane	C9	0.0
Decane	C10	0.1
Undecane	C11	0.0
Dodecane	C12	0.0
Tridecane	C13	0.0
Tetradecane	C14	0.0
Pentadecane	C15	0.1
Hexadecane	C16	0.1
Heptadecane	C17	0.2
Pristane	PRI	0.1
Octadecane	C18	0.1
Phytane	PHY	0.1
Nonadecane	C19	0.2
Eicosane	C20	0.1
Heneicosane	C21	0.3
Docosane	C22	0.2
Tricosane	C23	0.5
Tetracosane	C24	0.4
Pentacosane	C25	1.3
Hexacosane	C26	0.8
Heptacosane	C27	3.7
Octacosane	C28	1.0
Nonacosane	C29	8.4
Triacontane	C30	0.8
Hentriacontane	C31	2.9
Dotriacontane	C32	0.6
Tritriacontane	C33	1.0
Tetratriacontane	C34	0.5
Pentatriacontane	C35	0.7
Hexatriacontane	C36	0.4
Heptatriacontane	C37	0.5
Octatriacontane	C38	0.3
TOTAL		25
C17/Pristane		2.37
C18/Phytane		0.77
Pristane/Phytane		0.69
WI		0.03
CPI		3.63
RES		25
RES + UCM		1173
RES/(RES+UCM)		0.0215

WI = Weathering Index
CPI = Carbon Preference Index
RES = All Resolved Hydrocarbons
UCM = Unresolved Complex Mixture



WR28A MSD

Pah Results

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Water
WA# R1A00119: Ogden Railyard

Sample No.	Blank		0119-0070		0119-0096		0119-0097		0119-0184	
Sample Location	WBLK0309		WR012A		WR018A		WR018ADup		SC2A	
GC/MS File Name	LM1434		LM1435		LM1436		LM1437		LM1438	
Matrix	WATER BLANK		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100.00		100.00		100.00		100.00		100.00	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C4N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Fluorene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Dibenzothiophene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Phenanthrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Anthracene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Fluoranthrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1F/P	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2F/P	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Chrysene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(b)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(k)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(e)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(a)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Indeno(1,2,3-cd)pyre	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Dibenzo(a,h)anthrace	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(g,h,i)perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Waters

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Water
WA# R1A00119: Ogden Railyard

Sample No.	0119-0200		0119-0287		0119-0288		0119-0057		0119-0228	
Sample Location	33SS1A		WR011A		WR011ADuP		WR010A		RD3A	
GC/MS File Name	LM1439		LM1440		LM1441		LM1442		LM1443	
Matrix	Water		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100.00		100.00		100.00		100.00		100.00	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C4N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Fluorene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Dibenzothiophene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Phenanthrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Anthracene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Fluoranthrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1F/P	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2F/P	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Chrysene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(b)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(k)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(e)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(a)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Indeno(1,2,3-cd)pyre	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Dibenzo(a,h)anthrace	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(g,h,i)perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Water
WA# R1A00119: Ogden Railyard

Sample No.	0119-0241		0119-0328		0119-0124		0119-0124 MS		0119-0124MSD	
Sample Location	FBA		FBA		WR024A		WR024A		WR024A	
GC/MS File Name	LM1444		LM1445		LM1446		LM1447		LM1448	
Matrix	Water		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100.00		100.00		100.00		100.00		100.00	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C4N	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Fluorene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3F	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Dibenzothiophene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Phenanthrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Anthracene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C3P/A	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Fluoranthrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1F/P	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2F/P	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Chrysene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C1C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(b)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(k)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(e)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(a)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Indeno(1,2,3-cd)pyre	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Dibenzo(a,h)anthrace	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(g,h,i)perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Waters

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Water
WA# R1A00119: Ogden Railyard

Sample No.	WBLK03152000		A0119-326		A0119-0330		0119-0137		0119-0162	
Sample Location	LAB BLANK		21SPSA		FBA		WR026A		BC3A	
GC/MS File Name	LM1459		LM1460		LM1461		LM1462		LM1463	
Matrix	Water		Water		Water		Water		Water	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Moisture	100		100		100		100		100	
Units	ug/L		ug/L		ug/L		ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	1.00	248.00	1.00	U	1.00	U	1.00	U	1.00
C1N	U	1.00	204.00	1.00	U	1.00	U	1.00	U	1.00
C2N	U	1.00	122.00	1.00	U	1.00	U	1.00	U	1.00
C3N	U	1.00	29.80	1.00	U	1.00	U	1.00	U	1.00
C4N	U	1.00	4.54	1.00	U	1.00	U	1.00	U	1.00
Fluorene	U	1.00	27.30	1.00	U	1.00	U	1.00	U	1.00
C1F	U	1.00	14.00	1.00	U	1.00	U	1.00	U	1.00
C2F	U	1.00	3.50	1.00	U	1.00	U	1.00	U	1.00
C3F	U	1.00	0.77 J	1.00	U	1.00	U	1.00	U	1.00
Dibenzothiophene	U	1.00	2.58	1.00	U	1.00	U	1.00	U	1.00
C1D	U	1.00	1.39	1.00	U	1.00	U	1.00	U	1.00
C2D	U	1.00	0.55 J	1.00	U	1.00	U	1.00	U	1.00
C3D	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Phenanthrene	U	1.00	42.50	1.00	U	1.00	U	1.00	U	1.00
Anthracene	U	1.00	9.35	1.00	U	1.00	U	1.00	U	1.00
C1P/A	U	1.00	13.20	1.00	U	1.00	U	1.00	U	1.00
C2P/A	U	1.00	1.84	1.00	U	1.00	U	1.00	U	1.00
C3P/A	U	1.00	0.31 J	1.00	U	1.00	U	1.00	U	1.00
Fluoranthrene	U	1.00	3.71	1.00	U	1.00	U	1.00	U	1.00
Pyrene	U	1.00	6.24	1.00	U	1.00	U	1.00	U	1.00
C1F/P	U	1.00	1.75	1.00	U	1.00	U	1.00	U	1.00
C2F/P	U	1.00	0.23 J	1.00	U	1.00	U	1.00	U	1.00
Chrysene	U	1.00	0.26 J	1.00	U	1.00	U	1.00	U	1.00
C1C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
C2C	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(b)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(k)fluoranthene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(e)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(a)pyrene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Indeno(1,2,3-cd)pyre	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Dibenzo(a,h)anthrace	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00
Benzo(g,h,i)perylene	U	1.00	U	1.00	U	1.00	U	1.00	U	1.00

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Waters

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Water
WA# R1A00119: Ogden Railyard

Sample No.	0119-0162		0119-0162	
Sample Location	BC3A MS		BC3A MSD	
GC/MS File Name	LM1464		LM1465	
Matrix	Water		Water	
Dilution Factor	1.0		1.0	
% Moisture	100		100	
Units	ug/L		ug/L	
Compound Name	Conc.	MDL	Conc.	MDL
Naphthalene	U	1.00	U	1.00
C1N	U	1.00	U	1.00
C2N	U	1.00	U	1.00
C3N	U	1.00	U	1.00
C4N	U	1.00	U	1.00
Fluorene	U	1.00	U	1.00
C1F	U	1.00	U	1.00
C2F	U	1.00	U	1.00
C3F	U	1.00	U	1.00
Dibenzothiophene	U	1.00	U	1.00
C1D	U	1.00	U	1.00
C2D	U	1.00	U	1.00
C3D	U	1.00	U	1.00
Phenanthrene	0.19 J	1.00	U	1.00
Anthracene	U	1.00	U	1.00
C1P/A	0.41 J	1.00	U	1.00
C2P/A	0.99 J	1.00	U	1.00
C3P/A	0.83 J	1.00	U	1.00
Fluoranthrene	0.15 J	1.00	U	1.00
Pyrene	45.90	1.00	39.90	1.00
C1F/P	0.86 J	1.00	U	1.00
C2F/P	0.17 J	1.00	U	1.00
Chrysene	0.22 J	1.00	U	1.00
C1C	0.59 J	1.00	U	1.00
C2C	0.57 J	1.00	U	1.00
Benzo(b)fluoranthene	U	1.00	U	1.00
Benzo(k)fluoranthene	U	1.00	U	1.00
Benzo(e)pyrene	U	1.00	U	1.00
Benzo(a)pyrene	U	1.00	U	1.00
Perylene	0.51 J	1.00	U	1.00
Indeno(1,2,3-cd)pyre	U	1.00	U	1.00
Dibenzo(a,h)anthrace	U	1.00	U	1.00
Benzo(g,h,i)perylene	0.15 J	1.00	U	1.00

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Waters

Soils

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Soil
WA# R1A00119: *Ogden Railyard*
Results are Based on Dry Weight

Sample No.	SBLK031300		B0119-0270		B0119-0252		B0119-0266		B0119-0265	
Sample Location	Sand Blank		FBA		SCIA		RD3ADUP		RD3A	
GC/MS File Name	LM1466		LM1467		LM1468		LM1469		LM1470	
Matrix	SAND BLANK		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	100.00		100.00		58.90		26.90		26.70	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	0.03	U	0.03	0.03 J	0.3	U	0.6	U	0.6
C1N	U	0.03	U	0.03	0.1 J	0.3	U	0.6	U	0.6
C2N	U	0.03	U	0.03	0.5	0.3	U	0.6	U	0.6
C3N	U	0.03	U	0.03	0.4	0.3	U	0.6	0.09 J	0.6
C4N	U	0.03	U	0.03	0.2 J	0.3	U	0.6	U	0.6
Fluorene	U	0.03	U	0.03	U	0.3	U	0.6	U	0.6
C1F	U	0.03	U	0.03	0.1 J	0.3	U	0.6	U	0.6
C2F	U	0.03	U	0.03	0.2 J	0.3	U	0.6	U	0.6
C3F	U	0.03	U	0.03	0.2 J	0.3	U	0.6	U	0.6
Dibenzothiophene	U	0.03	U	0.03	U	0.3	U	0.6	U	0.6
C1D	U	0.03	U	0.03	0.08 J	0.3	U	0.6	U	0.6
C2D	U	0.03	U	0.03	0.2 J	0.3	U	0.6	U	0.6
C3D	U	0.03	U	0.03	0.2 J	0.3	U	0.6	U	0.6
Phenanthrene	U	0.03	U	0.03	0.1 J	0.3	U	0.6	U	0.6
Anthracene	U	0.03	U	0.03	U	0.3	U	0.6	U	0.6
C1P/A	U	0.03	U	0.03	0.3	0.3	U	0.6	U	0.6
C2P/A	U	0.03	U	0.03	0.3 J	0.3	0.1 J	0.6	0.1 J	0.6
C3P/A	U	0.03	U	0.03	0.3	0.3	0.08 J	0.6	0.09 J	0.6
Fluoranthrene	U	0.03	U	0.03	0.1 J	0.3	0.07 J	0.6	0.08 J	0.6
Pyrene	U	0.03	U	0.03	0.2 J	0.3	0.08 J	0.6	0.09 J	0.6
C1F/P	U	0.03	U	0.03	0.2 J	0.3	0.08 J	0.6	0.1 J	0.6
C2F/P	U	0.03	U	0.03	0.3 J	0.3	0.09 J	0.6	0.1 J	0.6
Chrysene	U	0.03	U	0.03	0.1 J	0.3	0.08 J	0.6	0.09 J	0.6
C1C	U	0.03	U	0.03	0.2 J	0.3	0.08 J	0.6	0.1 J	0.6
C2C	U	0.03	U	0.03	0.3 J	0.3	0.07 J	0.6	0.2 J	0.6
Benzo(b)fluoranthene	U	0.03	U	0.03	0.06 J	0.3	U	0.6	U	0.6
Benzo(k)fluoranthene	U	0.03	U	0.03	0.04 J	0.3	U	0.6	U	0.6
Benzo(e)pyrene	U	0.03	U	0.03	0.1 J	0.3	U	0.6	U	0.6
Benzo(a)pyrene	U	0.03	U	0.03	0.06 J	0.3	U	0.6	U	0.6
Perylene	U	0.03	U	0.03	U	0.3	U	0.6	U	0.6
Indeno(1,2,3-cd)pyre	U	0.03	U	0.03	0.04 J	0.3	U	0.6	U	0.6
Dibenzo(a,h)anthrace	U	0.03	U	0.03	U	0.3	U	0.6	U	0.6
Benzo(g,h,i)perylene	U	0.03	U	0.03	0.08 J	0.3	U	0.6	U	0.6

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden-Soils

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0249		B0119-0259		B0119-0273		B0119-0334		B0119-0334	
Sample Location	BC3A		33SS2A		AOI102A		FBA		FBA MS	
GC/MS File Name	LM1471		LM1472		LM1473		LM1480		LM1481	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	*78.60*		*68.40*		*71.20*		*99.60*		*99.60*	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	0.2	0.06 J	0.2	U	0.2	U	0.03	U	0.03
C1N	U	0.2	0.1 J	0.2	0.05 J	0.2	U	0.03	U	0.03
C2N	U	0.2	0.6	0.2	0.1 J	0.2	U	0.03	U	0.03
C3N	U	0.2	0.5	0.2	0.1 J	0.2	U	0.03	U	0.03
C4N	U	0.2	0.3	0.2	0.08 J	0.2	U	0.03	U	0.03
Fluorene	U	0.2	0.3	0.2	U	0.2	U	0.03	U	0.03
C1F	U	0.2	0.5	0.2	U	0.2	U	0.03	U	0.03
C2F	U	0.2	0.4	0.2	U	0.2	U	0.03	U	0.03
C3F	U	0.2	0.03 J	0.2	U	0.2	U	0.03	U	0.03
Dibenzothiophene	U	0.2	0.2 J	0.2	U	0.2	U	0.03	U	0.03
C1D	U	0.2	0.3	0.2	0.04 J	0.2	U	0.03	U	0.03
C2D	U	0.2	0.3	0.2	0.06 J	0.2	U	0.03	U	0.03
C3D	U	0.2	0.2 J	0.2	0.05 J	0.2	U	0.03	U	0.03
Phenanthrene	0.1 J	0.2	3.1	0.2	0.04 J	0.2	U	0.03	U	0.03
Anthracene	0.03 J	0.2	0.8	0.2	0.09 J	0.2	U	0.03	U	0.03
C1P/A	0.1 J	0.2	2.3	0.2	0.1 J	0.2	U	0.03	U	0.03
C2P/A	0.07 J	0.2	1.3	0.2	0.2 J	0.2	U	0.03	U	0.03
C3P/A	0.07 J	0.2	0.7	0.2	0.1 J	0.2	U	0.03	U	0.03
Fluoranthrene	0.2 J	0.2	5.4	0.2	0.07 J	0.2	U	0.03	U	0.03
Pyrene	0.2 J	0.2	5.2	0.2	0.09 J	0.2	U	0.03	1.4	0.03
C1F/P	0.2 J	0.2	4.1	0.2	0.1 J	0.2	U	0.03	U	0.03
C2F/P	0.2 J	0.2	2.9	0.2	0.2	0.2	U	0.03	U	0.03
Chrysene	0.1 J	0.2	3.7	0.2	0.09 J	0.2	U	0.03	U	0.03
C1C	0.09 J	0.2	3.1	0.2	0.1 J	0.2	U	0.03	U	0.03
C2C	0.1 J	0.2	1.4	0.2	0.1 J	0.2	U	0.03	U	0.03
Benzo(b)fluoranthene	0.08 J	0.2	2.6	0.2	0.07 J	0.2	U	0.03	U	0.03
Benzo(k)fluoranthene	0.08 J	0.2	2.6	0.2	0.04 J	0.2	U	0.03	U	0.03
Benzo(e)pyrene	0.08 J	0.2	1.8	0.2	0.08 J	0.2	U	0.03	U	0.03
Benzo(a)pyrene	0.09 J	0.2	2.8	0.2	0.04 J	0.2	U	0.03	U	0.03
Perylene	0.02 J	0.2	0.6	0.2	U	0.2	U	0.03	U	0.03
Indeno(1,2,3-cd)pyre	0.05 J	0.2	1.3	0.2	0.04 J	0.2	U	0.03	U	0.03
Dibenzo(a,h)anthrace	U	0.2	0.6	0.2	U	0.2	U	0.03	U	0.03
Benzo(g,h,i)perylene	0.06 J	0.2	1.4	0.2	0.1 J	0.2	U	0.03	U	0.03

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Soils

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0334		B0119-0384		B0119-0300		B0119-0305		B0119-0309	
Sample Location	FBA MSD		21SPSA		WR09A		WR012A		WR019A	
GC/MS File Name	LM1482		LM1483		LM1484		LM1485		LM1486	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	99.60		74.00		28.40		44.20		40.60	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	0.03	1.1	0.05	U	0.6	U	0.4	U	0.4
C1N	U	0.03	2.1	0.05	U	0.6	U	0.4	U	0.4
C2N	U	0.03	3	0.05	U	0.6	U	0.4	U	0.4
C3N	U	0.03	1.8	0.05	U	0.6	U	0.4	U	0.4
C4N	U	0.03	0.4	0.05	U	0.6	U	0.4	U	0.4
Fluorene	U	0.03	1.3	0.05	U	0.6	U	0.4	U	0.4
C1F	U	0.03	1	0.05	U	0.6	U	0.4	0.09 J	0.4
C2F	U	0.03	0.3	0.05	U	0.6	U	0.4	0.1 J	0.4
C3F	U	0.03	0.07	0.05	U	0.6	U	0.4	U	0.4
Dibenzothiophene	U	0.03	0.3	0.05	U	0.6	U	0.4	U	0.4
C1D	U	0.03	0.2	0.05	U	0.6	U	0.4	U	0.4
C2D	U	0.03	0.05	0.05	U	0.6	U	0.4	U	0.4
C3D	U	0.03	U	0.05	U	0.6	U	0.4	U	0.4
Phenanthrene	U	0.03	4.4	0.05	U	0.6	U	0.4	0.1 J	0.4
Anthracene	U	0.03	1.2	0.05	U	0.6	U	0.4	U	0.4
C1P/A	U	0.03	1.8	0.05	U	0.6	U	0.4	0.2 J	0.4
C2P/A	U	0.03	0.3	0.05	U	0.6	0.05 J	0.4	0.2 J	0.4
C3P/A	U	0.03	0.06	0.05	U	0.6	0.04 J	0.4	0.1 J	0.4
Fluoranthrene	U	0.03	0.8	0.05	U	0.6	0.04 J	0.4	0.1 J	0.4
Pyrene	1.1	0.03	1.4	0.05	U	0.6	0.04 J	0.4	0.1 J	0.4
C1F/P	U	0.03	0.3	0.05	U	0.6	U	0.4	0.09 J	0.4
C2F/P	U	0.03	0.07	0.05	U	0.6	U	0.4	0.1 J	0.4
Chrysene	U	0.03	0.07	0.05	U	0.6	U	0.4	0.09 J	0.4
C1C	U	0.03	0.03 J	0.05	U	0.6	U	0.4	0.09 J	0.4
C2C	U	0.03	0.01 J	0.05	U	0.6	U	0.4	0.08 J	0.4
Benzo(b)fluoranthene	U	0.03	0.02 J	0.05	U	0.6	U	0.4	0.04 J	0.4
Benzo(k)fluoranthene	U	0.03	0.03 J	0.05	U	0.6	U	0.4	0.05 J	0.4
Benzo(e)pyrene	U	0.03	0.04 J	0.05	U	0.6	U	0.4	0.05 J	0.4
Benzo(a)pyrene	U	0.03	0.04 J	0.05	U	0.6	U	0.4	0.05 J	0.4
Perylene	U	0.03	0.01 J	0.05	U	0.6	U	0.4	U	0.4
Indeno(1,2,3-cd)pyre	U	0.03	0.02 J	0.05	U	0.6	U	0.4	U	0.4
Dibenzo(a,h)anthrace	U	0.03	0.008 J	0.05	U	0.6	U	0.4	U	0.4
Benzo(g,h,i)perylene	U	0.03	0.04 J	0.05	U	0.6	U	0.4	0.05 J	0.4

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Soils

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0336		B0119-0307		B0119-0302		B0119-0312		B0119-0311	
Sample Location	AOI4A		WR014A		WR011A		WR021ADUP		WR021A	
GC/MS File Name	LM1487		LM1488		LM1489		LM1493		LM1494	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	7.80		64.90		53.20		63.90		69.80	
Units	*mg/Kg*		*mg/Kg*		*mg/Kg*		*mg/Kg*		*mg/Kg*	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C1N	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C2N	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C3N	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C4N	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Fluorene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C1F	U	2.1	U	0.3	0.04 J	0.3	U	0.3	U	0.2
C2F	U	2.1	U	0.3	0.1 J	0.3	U	0.3	U	0.2
C3F	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Dibenzothiophene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C1D	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C2D	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
C3D	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Phenanthrene	U	2.1	U	0.3	0.03 J	0.3	U	0.3	U	0.2
Anthracene	U	2.1	U	0.3	0.04 J	0.3	U	0.3	U	0.2
C1P/A	U	2.1	U	0.3	U	0.3	0.04 J	0.3	0.04 J	0.2
C2P/A	U	2.1	0.03 J	0.3	0.1 J	0.3	U	0.3	U	0.2
C3P/A	U	2.1	0.04 J	0.3	0.08 J	0.3	U	0.3	U	0.2
Fluoranthrene	U	2.1	0.03 J	0.3	0.06 J	0.3	0.03 J	0.3	U	0.2
Pyrene	U	2.1	0.03 J	0.3	0.05 J	0.3	0.03 J	0.3	0.02 J	0.2
C1F/P	U	2.1	0.04 J	0.3	0.06 J	0.3	U	0.3	U	0.2
C2F/P	U	2.1	0.04 J	0.3	0.07 J	0.3	U	0.3	U	0.2
Chrysene	U	2.1	U	0.3	0.06 J	0.3	U	0.3	U	0.2
C1C	U	2.1	U	0.3	0.07 J	0.3	U	0.3	U	0.2
C2C	U	2.1	0.03 J	0.3	0.08 J	0.3	U	0.3	U	0.2
Benzo(b)fluoranthene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Benzo(k)fluoranthene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Benzo(e)pyrene	U	2.1	U	0.3	0.03 J	0.3	U	0.3	U	0.2
Benzo(a)pyrene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Perylene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Indeno(1,2,3-cd)pyre	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Dibenzo(a,h)anthrace	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2
Benzo(g,h,i)perylene	U	2.1	U	0.3	U	0.3	U	0.3	U	0.2

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Soils

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0319		B0119-0314		B0119-0315		B0119-0317		B0119-0322	
Sample Location	WR025A		WR022A		WR022DUP		WR24A		WR28A	
GC/MS File Name	LM1495		LM1496		LM1497		LM1498		LM1499	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL	
Dilution Factor	1.0		1.0		1.0		1.0		1.0	
% Solid	64.90		72.60		62.10		29.40		48.20	
Units	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL	Conc.	MDL
Naphthalene	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C1N	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C2N	U	0.3	U	0.2	U	0.3	0.09 J	0.6	U	0.3
C3N	U	0.3	U	0.2	U	0.3	0.06 J	0.6	0.04 J	0.3
C4N	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
Fluorene	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C1F	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C2F	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C3F	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
Dibenzothiophene	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C1D	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C2D	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C3D	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
Phenanthrene	0.03 J	0.3	0.03 J	0.2	0.03 J	0.3	0.1 J	0.6	0.08 J	0.3
Anthracene	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
C1P/A	0.08 J	0.3	0.05 J	0.2	0.05 J	0.3	0.3 J	0.6	0.1 J	0.3
C2P/A	0.03 J	0.3	0.03 J	0.2	0.03 J	0.3	0.2 J	0.6	0.07 J	0.3
C3P/A	0.04 J	0.3	0.03 J	0.2	0.03 J	0.3	0.2 J	0.6	0.08 J	0.3
Fluoranthrene	0.04 J	0.3	0.05 J	0.2	0.03 J	0.3	0.1 J	0.6	0.1 J	0.3
Pyrene	0.05 J	0.3	0.04 J	0.2	0.03 J	0.3	0.1 J	0.6	0.1 J	0.3
C1F/P	0.03 J	0.3	0.03 J	0.2	U	0.3	0.1 J	0.6	0.07 J	0.3
C2F/P	0.04 J	0.3	0.02 J	0.2	U	0.3	0.09 J	0.6	0.06 J	0.3
Chrysene	0.03 J	0.3	0.03 J	0.2	0.03 J	0.3	0.1 J	0.6	0.07 J	0.3
C1C	0.03 J	0.3	0.02 J	0.2	U	0.3	0.09 J	0.6	0.07 J	0.3
C2C	0.03 J	0.3	U	0.2	U	0.3	0.09 J	0.6	0.06 J	0.3
Benzo(b)fluoranthene	U	0.3	U	0.2	U	0.3	U	0.6	0.04 J	0.3
Benzo(k)fluoranthene	0.03 J	0.3	U	0.2	U	0.3	0.06 J	0.6	0.05 J	0.3
Benzo(e)pyrene	U	0.3	U	0.2	U	0.3	0.06 J	0.6	0.04 J	0.3
Benzo(a)pyrene	U	0.3	U	0.2	U	0.3	U	0.6	0.04 J	0.3
Perylene	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
Indeno(1,2,3-cd)pyre	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
Dibenzo(a,h)anthrace	U	0.3	U	0.2	U	0.3	U	0.6	U	0.3
Benzo(g,h,i)perylene	U	0.3	U	0.2	U	0.3	0.06 J	0.6	0.04 J	0.3

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Soils

TABLE 2.0 Results of the Oil Analysis for PAH and PAH Homologues in Soil
WA# R1A00119: Ogden Railyard
Results are Based on Dry Weight

Sample No.	B0119-0322		B0119-0322	
Sample Location	WR28A MS		WR28A MSD	
GC/MS File Name	LM1500		LM1501	
Matrix	SOIL		SOIL	
Dilution Factor	1.0		1.0	
% Solid	48.20		48.20	
Units	mg/Kg		mg/Kg	
Compound Name	Conc.	MDL	Conc.	MDL
Naphthalene	U	0.3	U	0.3
C1N	U	0.3	U	0.3
C2N	0.04 J	0.3	U	0.3
C3N	0.06 J	0.3	0.04 J	0.3
C4N	U	0.3	U	0.3
Fluorene	U	0.3	U	0.3
C1F	U	0.3	U	0.3
C2F	U	0.3	U	0.3
C3F	U	0.3	0.1 J	0.3
Dibenzothiophene	U	0.3	U	0.3
C1D	U	0.3	U	0.3
C2D	U	0.3	U	0.3
C3D	U	0.3	U	0.3
Phenanthrene	0.07 J	0.3	0.1 J	0.3
Anthracene	U	0.3	0.03 J	0.3
C1P/A	0.2 J	0.3	0.2 J	0.3
C2P/A	0.1 J	0.3	0.1 J	0.3
C3P/A	0.1 J	0.3	0.1 J	0.3
Fluoranthrene	0.1 J	0.3	0.1 J	0.3
Pyrene	3.5	0.3	3	0.3
C1F/P	0.1 J	0.3	0.09 J	0.3
C2F/P	0.09 J	0.3	0.09 J	0.3
Chrysene	0.09 J	0.3	0.1 J	0.3
C1C	0.08 J	0.3	0.09 J	0.3
C2C	0.08 J	0.3	0.08 J	0.3
Benzo(b)fluoranthene	0.05 J	0.3	0.07 J	0.3
Benzo(k)fluoranthene	0.04 J	0.3	0.07 J	0.3
Benzo(e)pyrene	0.05 J	0.3	0.07 J	0.3
Benzo(a)pyrene	0.04 J	0.3	0.06 J	0.3
Perylene	U	0.3	U	0.3
Indeno(1,2,3-cd)pyre	U	0.3	0.04 J	0.3
Dibenzo(a,h)anthrace	U	0.3	U	0.3
Benzo(g,h,i)perylene	0.04 J	0.3	0.05 J	0.3

Note: All concentrations for substituted PAHs are estimated.
J - Concentrations are estimated and below the MDL
Ogden Soils

PAH

Profile Graphs

Table 2.1
Distribution of PAH Homologues

Sample No.		Blank	
Sample Location		WBLK0309	
Homologue	**CnPAH**	**Concentration (ug/L)**	
Naphthalenes			
Naphthalene	C0N	U	
Methyls	C1N	U	
Dimethyls	C2N	U	
Trimethyls	C3N	U	
Tetramethyls	C4N	U	
TOTAL			0
Fluorenes			
Fluorene	C0F	U	
Methyls	C1F	U	
Dimethyls	C2F	U	
Trimethyls	C3F	U	
TOTAL			0
Dibenzothiophenes			
Dibenzothiophene	C0D	U	
Methyls	C1D	U	
Dimethyls	C2D	U	
Trimethyls	C3D	U	
TOTAL			0
Phenanthrenes			
Phenanthrene	C0P/A		0
Methyls	C1P/A	U	
Dimethyls	C2P/A	U	
Trimethyls	C3P/A	U	
TOTAL			0
Pyrenes			
Pyrene	C0P/F		0
Methyls	C1P/F	U	
Dimethyls	C2P/F	U	
TOTAL			0
Chrysenes			
Chrysene	C0C	U	
Methyls	C1C	U	
Dimethyls	C2C	U	
TOTAL			0
GRAND TOTAL			0

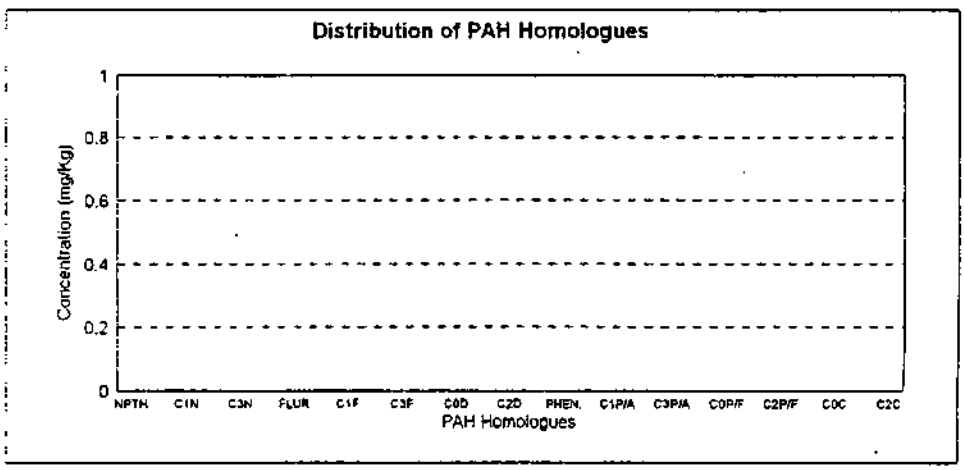


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0070
Sample Location	WR012A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		0

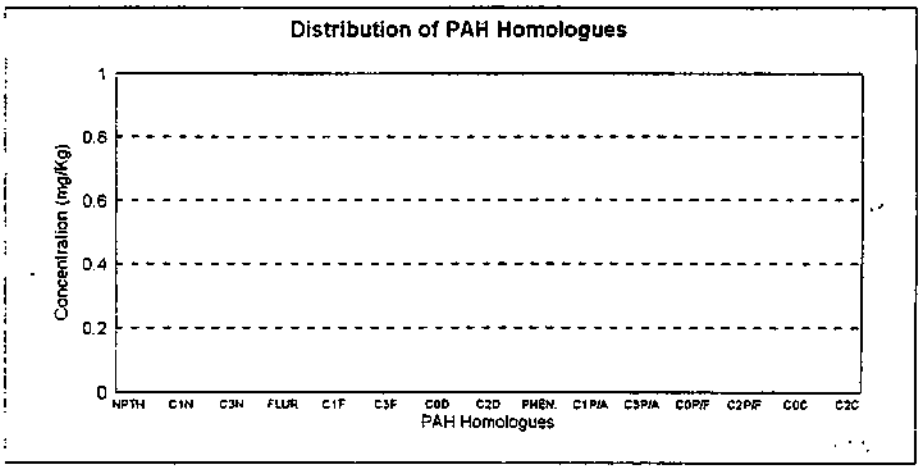


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0096
Sample Location	WR018A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

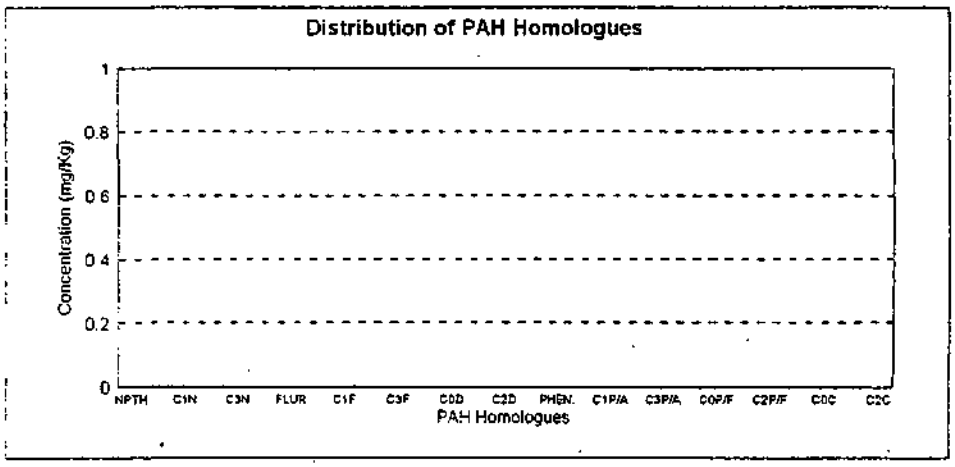


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0097
Sample Location	WR018ADup

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

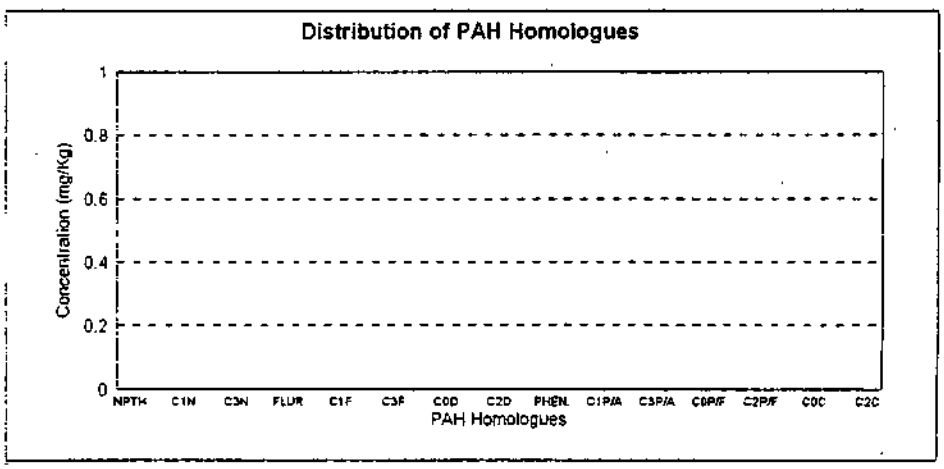


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Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0184
Sample Location	SC2A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

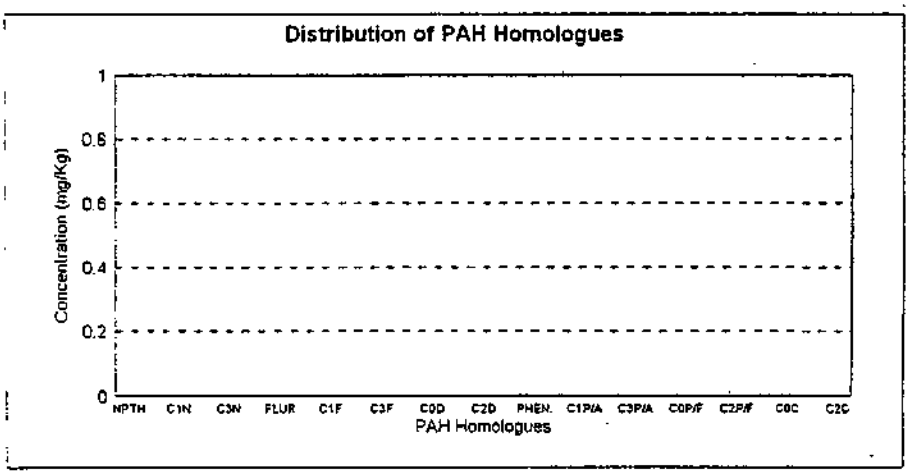


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0200
Sample Location	33SS1A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		0

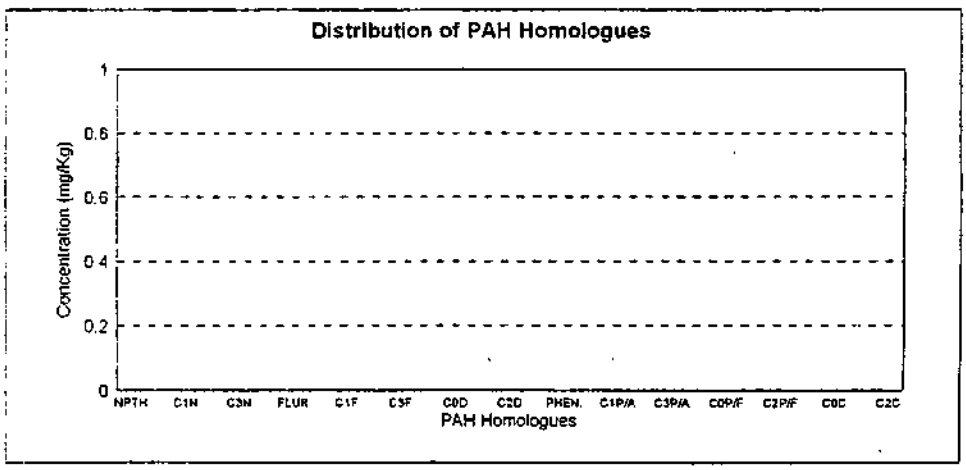


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0287
Sample Location	WR011A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		0

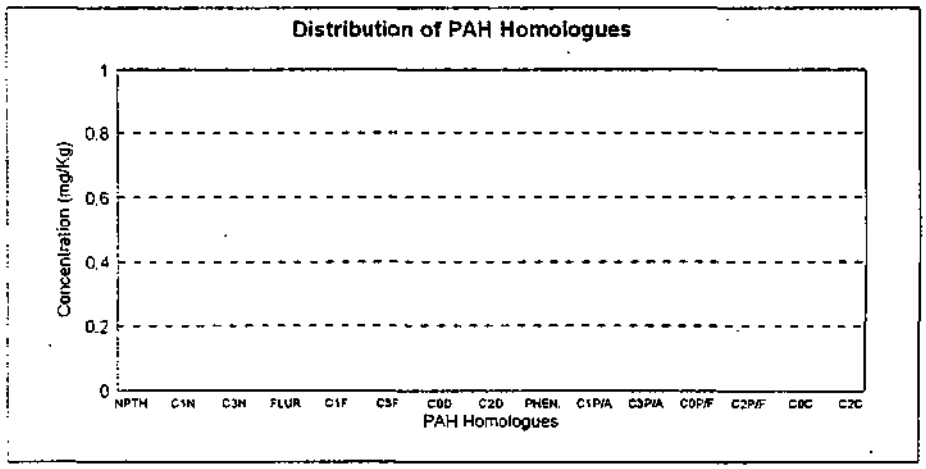


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0288
Sample Location	WR011ADuP

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		0

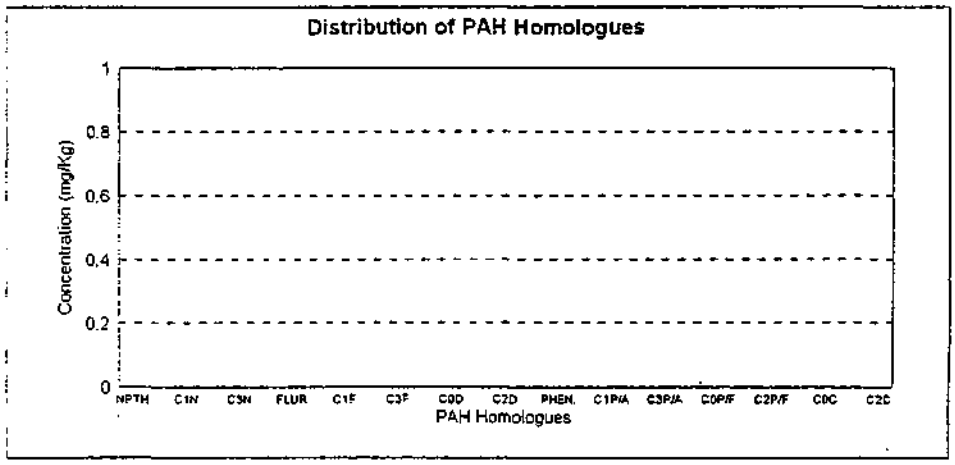


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0057
Sample Location	WR010A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

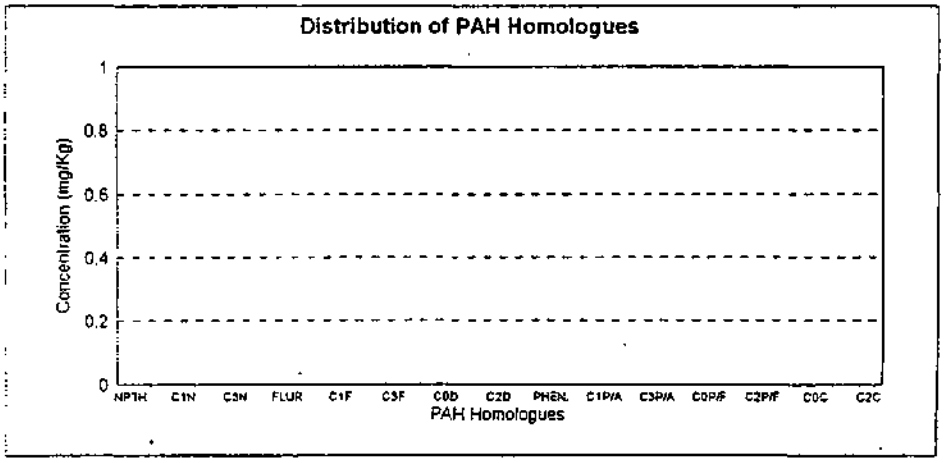


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0228
Sample Location	RD3A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

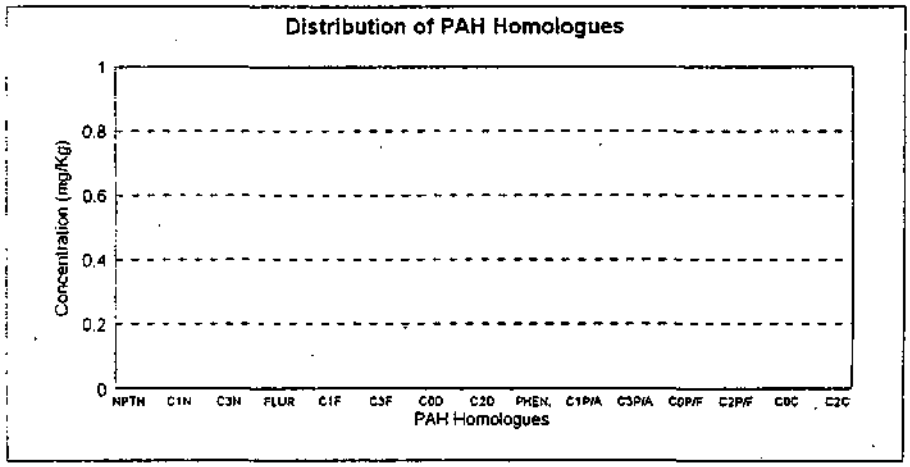


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0241
Sample Location	FBA

Homologue	CnPAH	Concentration (ug/L)	
Naphthalenes			
Naphthalene	C0N	U	
Methyls	C1N	U	
Dimethyls	C2N	U	
Trimethyls	C3N	U	
Tetramethyls	C4N	U	
TOTAL			0
Fluorenes			
Fluorene	C0F	U	
Methyls	C1F	U	
Dimethyls	C2F	U	
Trimethyls	C3F	U	
TOTAL			0
Dibenzothiophenes			
Dibenzothiophene	C0D	U	
Methyls	C1D	U	
Dimethyls	C2D	U	
Trimethyls	C3D	U	
TOTAL			0
Phenanthrenes			
Phenanthrene	C0P/A		0
Methyls	C1P/A	U	
Dimethyls	C2P/A	U	
Trimethyls	C3P/A	U	
TOTAL			0
Pyrenes			
Pyrene	C0P/F		0
Methyls	C1P/F	U	
Dimethyls	C2P/F	U	
TOTAL			0
Chrysenes			
Chrysene	C0C	U	
Methyls	C1C	U	
Dimethyls	C2C	U	
TOTAL			0
GRAND TOTAL			0

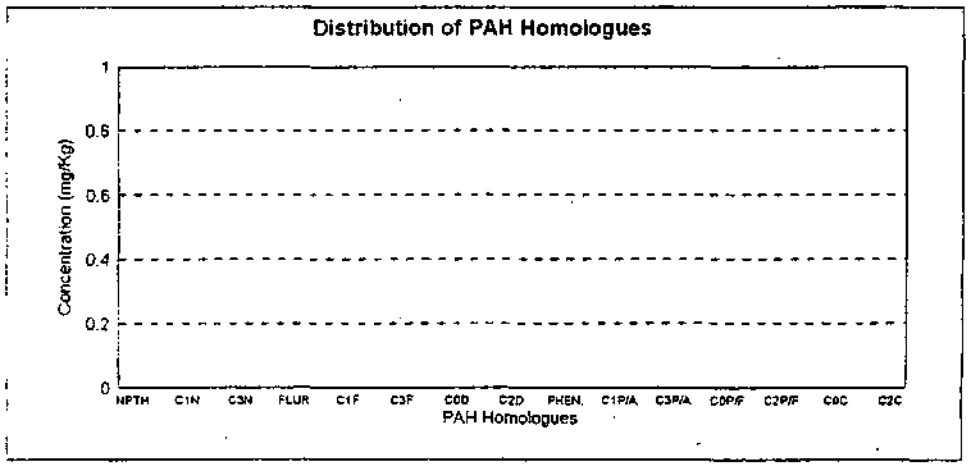


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0328
Sample Location	FBA

Homologue	CnPAH	Concentration (µg/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

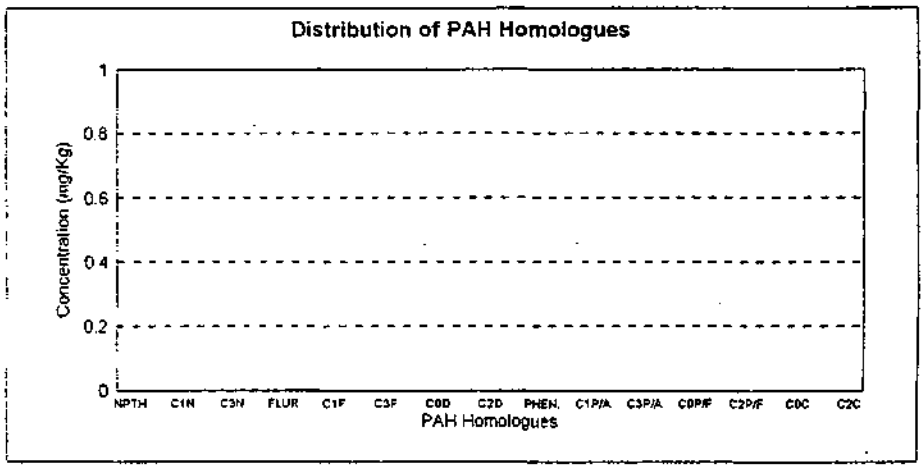


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0124
Sample Location	WR024A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		0

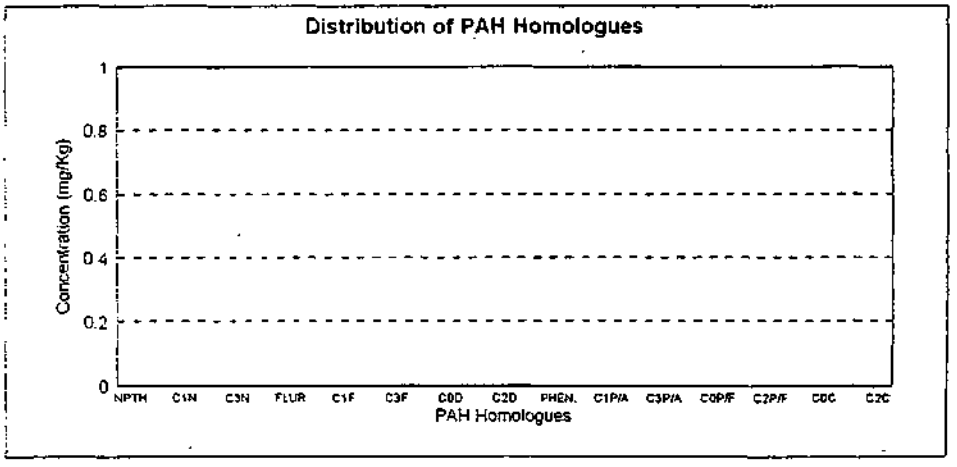


Table 2.1
Distribution of PAH Homologues

Sample No. 0119-0124 MS
Sample Location WR024A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

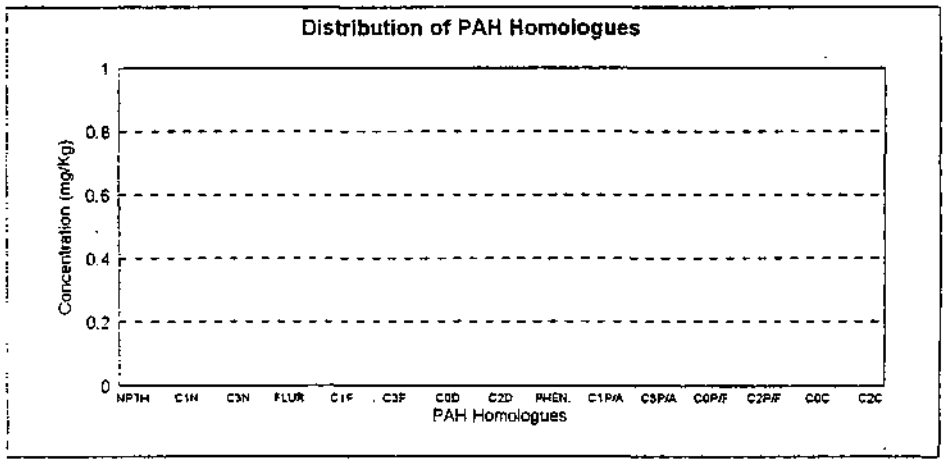


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0124MSD
Sample Location	WR024A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

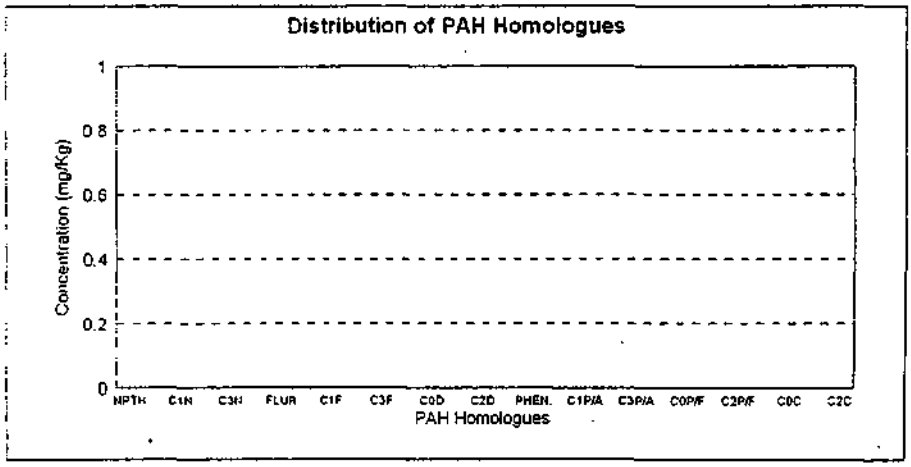


Table 2.1
Distribution of PAH Homologues

Sample No.	WBLK03152000
Sample Location	LAB BLANK

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		0

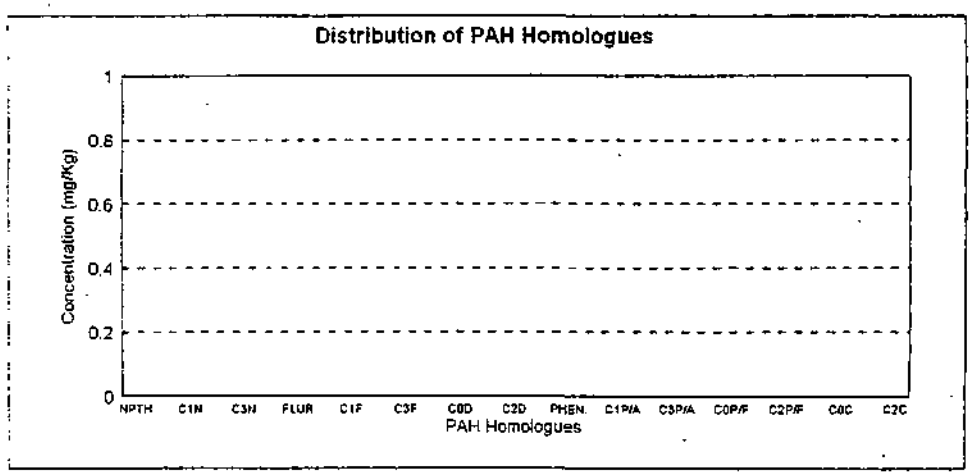


Table 2.1
Distribution of PAH Homologues

Sample No.	A0119-326
Sample Location	21SPSA

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	248
Methyls	C1N	204
Dimethyls	C2N	122
Trimethyls	C3N	29.8
Tetramethyls	C4N	4.54
TOTAL		608.34
Fluorenes		
Fluorene	C0F	27.3
Methyls	C1F	14
Dimethyls	C2F	3.5
Trimethyls	C3F	0.77
TOTAL		45.57
Dibenzothiophenes		
Dibenzothiophene	C0D	2.58
Methyls	C1D	1.39
Dimethyls	C2D	0.55
Trimethyls	C3D	U
TOTAL		4.52
Phenanthrenes		
Phenanthrene	C0P/A	51.85
Methyls	C1P/A	13.2
Dimethyls	C2P/A	1.84
Trimethyls	C3P/A	0.31
TOTAL		67.2
Pyrenes		
Pyrene	C0P/F	9.95
Methyls	C1P/F	1.75
Dimethyls	C2P/F	0.23
TOTAL		11.93
Chrysenes		
Chrysene	C0C	0.26
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0.26
GRAND TOTAL		738

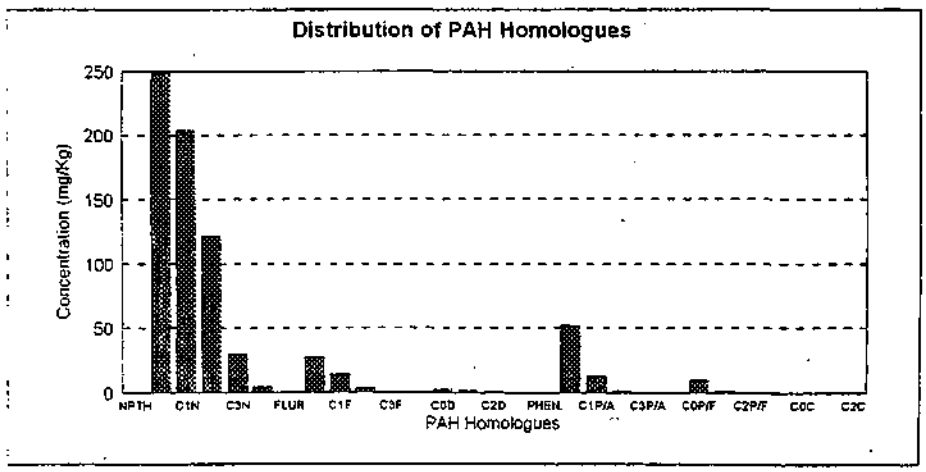


Table 2.1
Distribution of PAH Homologues

Sample No.	A0119-0330
Sample Location	FBA

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

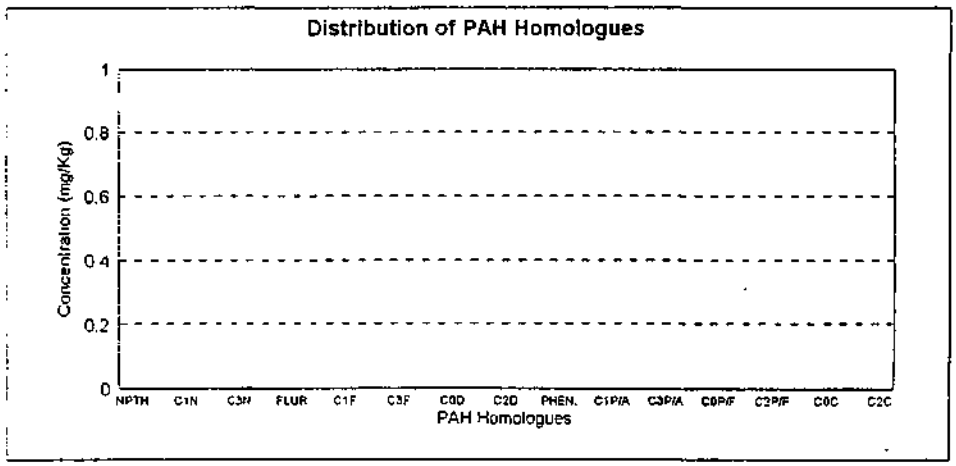


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0137
Sample Location	WR026A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

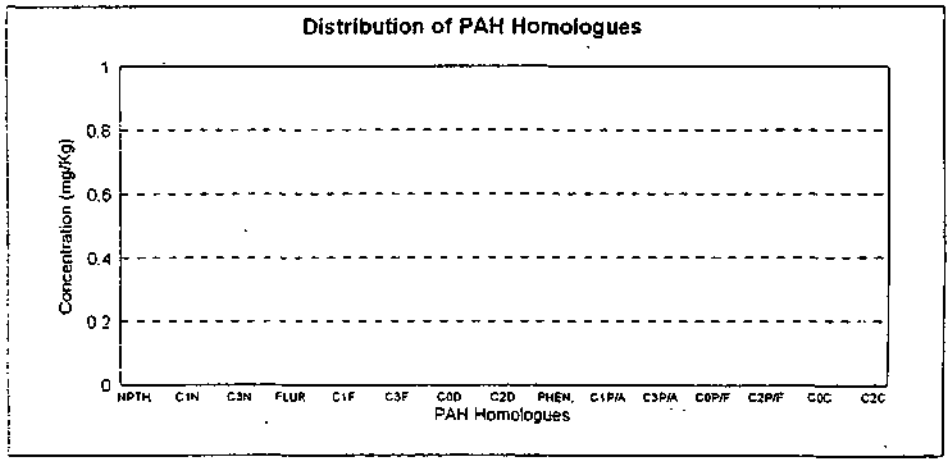


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0162
Sample Location	BC3A

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

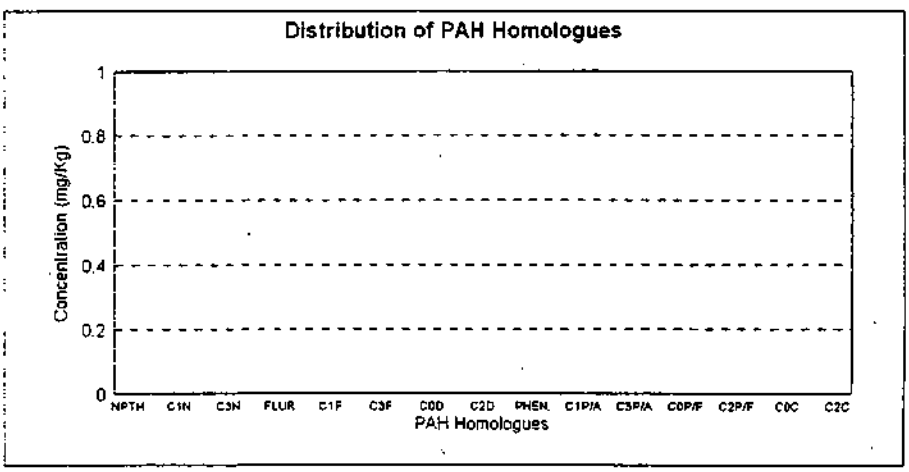


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0162
Sample Location	BC3A MS

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.19
Methyls	C1P/A	0.41
Dimethyls	C2P/A	0.99
Trimethyls	C3P/A	0.83
TOTAL		2.42
Pyrenes		
Pyrene	C0P/F	46.05
Methyls	C1P/F	0.86
Dimethyls	C2P/F	0.17
TOTAL		47.08
Chrysenes		
Chrysene	C0C	0.22
Methyls	C1C	0.59
Dimethyls	C2C	0.57
TOTAL		1.38
GRAND TOTAL		**51**

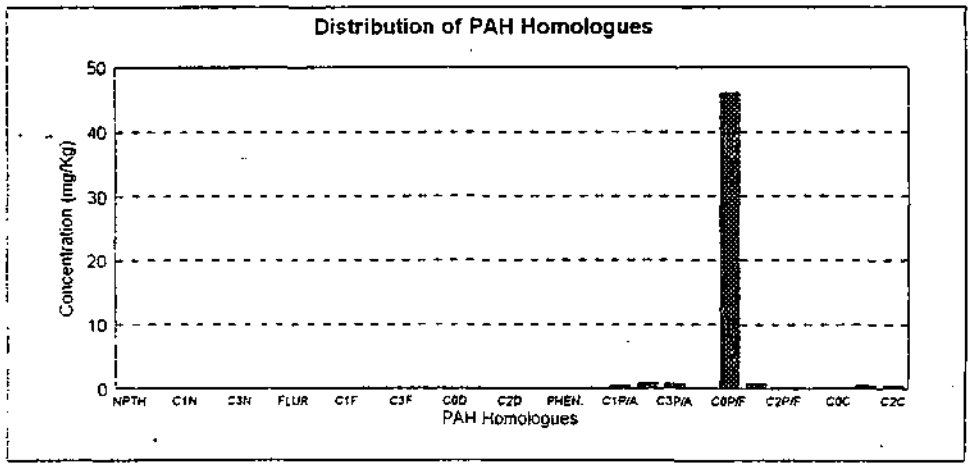
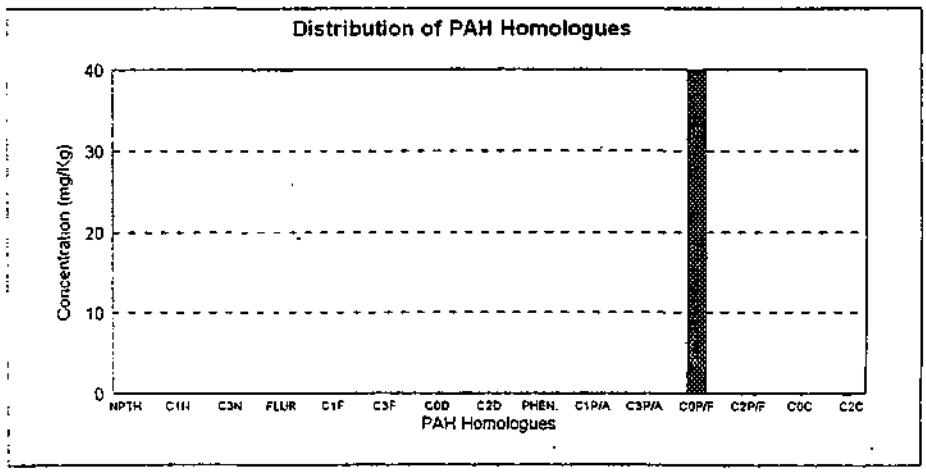


Table 2.1
Distribution of PAH Homologues

Sample No.	0119-0162
Sample Location	BC3A MSD

Homologue	CnPAH	Concentration (ug/L)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	39.9
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		39.9
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**40**



Soils

Table 2.1
Distribution of PAH Homologues

Sample No.	SBLK031300
Sample Location	Sand Blank

Homologue	ChPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

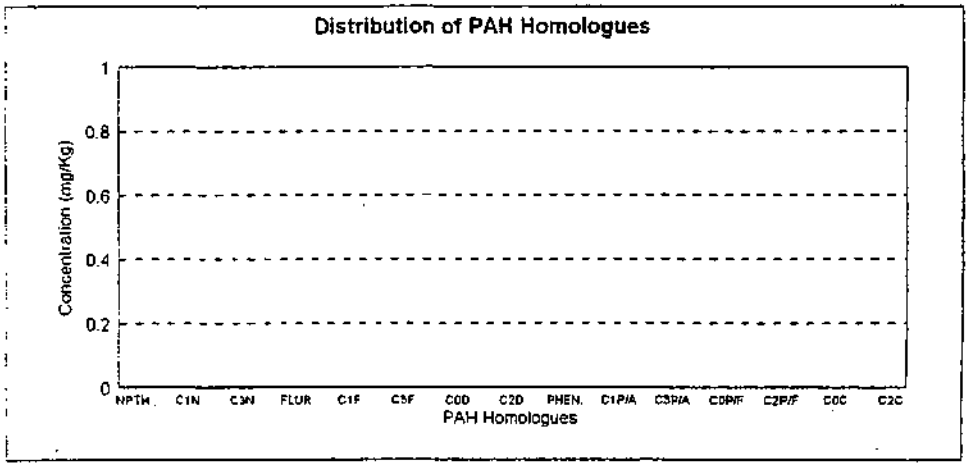


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0270
Sample Location	FBA

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

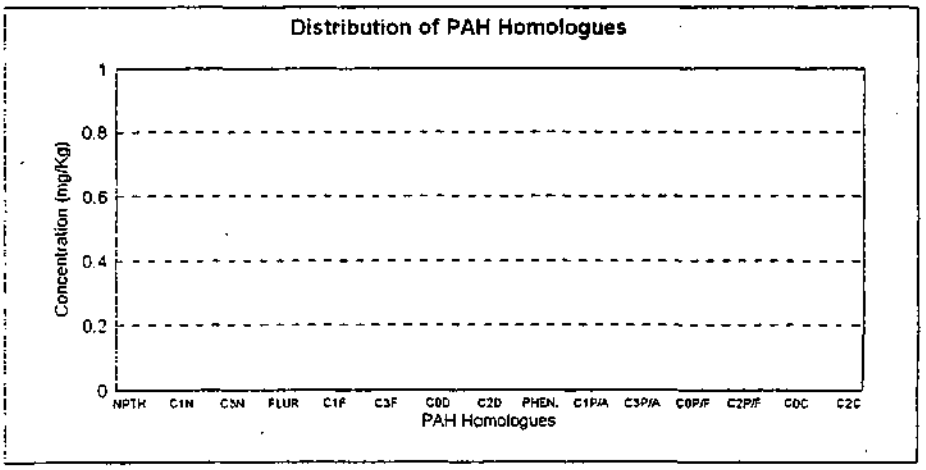


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0252
Sample Location	SCIA

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	31
Methyls	C1N	100
Dimethyls	C2N	550
Trimethyls	C3N	440
Tetramethyls	C4N	200
TOTAL		1321
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	130
Dimethyls	C2F	190
Trimethyls	C3F	250
TOTAL		570
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	85
Dimethyls	C2D	170
Trimethyls	C3D	190
TOTAL		445
Phenanthrenes		
Phenanthrene	C0P/A	99
Methyls	C1P/A	280
Dimethyls	C2P/A	270
Trimethyls	C3P/A	330
TOTAL		979
Pyrenes		
Pyrene	C0P/F	270
Methyls	C1P/F	190
Dimethyls	C2P/F	280
TOTAL		740
Chrysenes		
Chrysene	C0C	130
Methyls	C1C	190
Dimethyls	C2C	270
TOTAL		590
GRAND TOTAL		4645

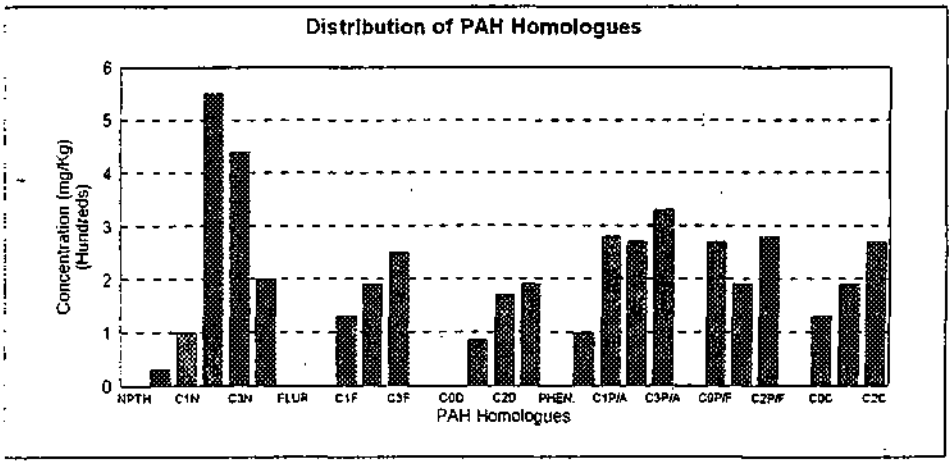


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0266
Sample Location	RD3ADUP

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	120
Trimethyls	C3P/A	81
TOTAL		201
Pyrenes		
Pyrene	C0P/F	155
Methyls	C1P/F	81
Dimethyls	C2P/F	87
TOTAL		323
Chrysenes		
Chrysene	C0C	81
Methyls	C1C	81
Dimethyls	C2C	68
TOTAL		230
GRAND TOTAL		754

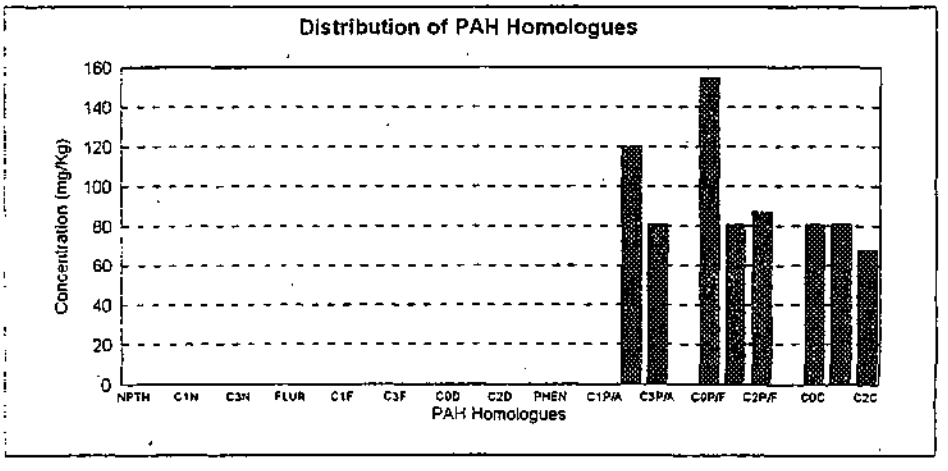


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0265
Sample Location	RD3A

Homologue	CnPAH	Concentration (mg/K
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	87
Tetramethyls	C4N	U
TOTAL		87
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	150
Trimethyls	C3P/A	87
TOTAL		237
Pyrenes		
Pyrene	C0P/F	168
Methyls	C1P/F	100
Dimethyls	C2P/F	110
TOTAL		378
Chrysenes		
Chrysene	C0C	87
Methyls	C1C	100
Dimethyls	C2C	170
TOTAL		357
GRAND TOTAL		**1059**

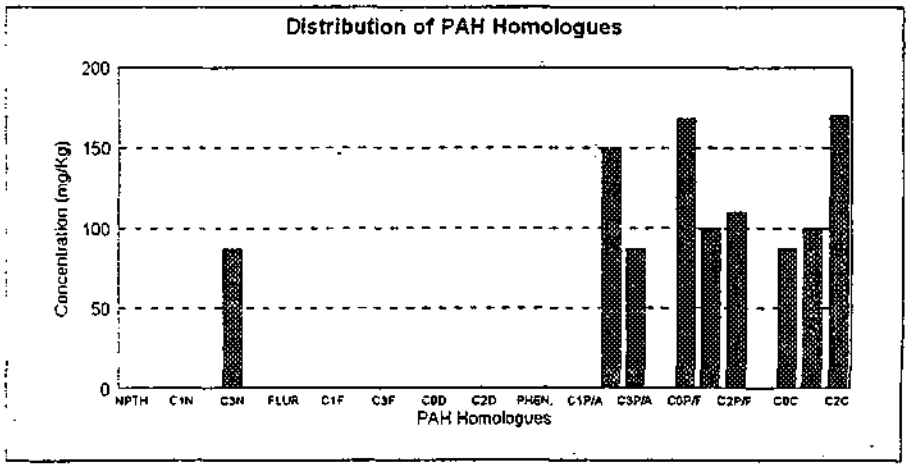


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0249
Sample Location	BC3A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.13
Methyls	C1P/A	0.1
Dimethyls	C2P/A	0.07
Trimethyls	C3P/A	0.07
TOTAL		0.37
Pyrenes		
Pyrene	C0P/F	0.4
Methyls	C1P/F	0.2
Dimethyls	C2P/F	0.2
TOTAL		0.8
Chrysenes		
Chrysene	C0C	0.1
Methyls	C1C	0.09
Dimethyls	C2C	0.1
TOTAL		0.29
GRAND TOTAL		1

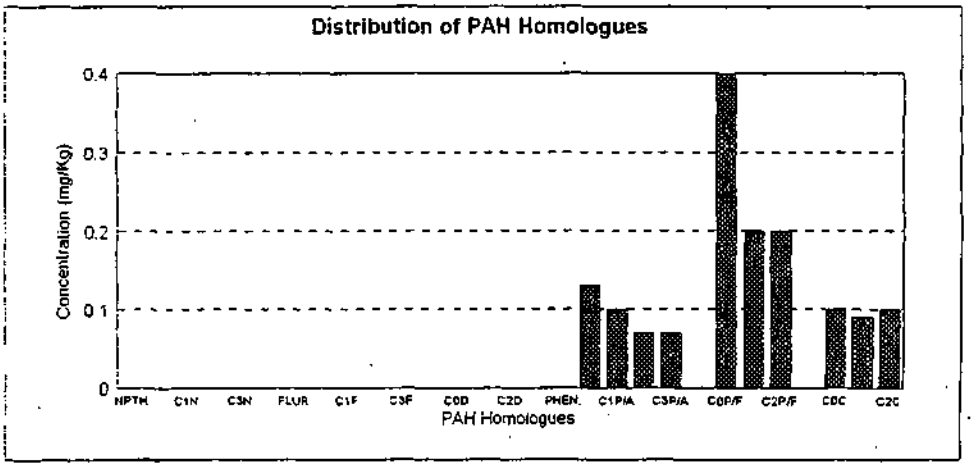


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0259
Sample Location	33SS2A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	0.06
Methyls	C1N	0.1
Dimethyls	C2N	0.6
Trimethyls	C3N	0.5
Tetramethyls	C4N	0.3
TOTAL		1.56
Fluorenes		
Fluorene	C0F	0.3
Methyls	C1F	0.5
Dimethyls	C2F	0.4
Trimethyls	C3F	0.03
TOTAL		1.23
Dibenzothiophenes		
Dibenzothiophene	C0D	0.2
Methyls	C1D	0.3
Dimethyls	C2D	0.3
Trimethyls	C3D	0.2
TOTAL		1
Phenanthrenes		
Phenanthrene	C0P/A	3.9
Methyls	C1P/A	2.3
Dimethyls	C2P/A	1.3
Trimethyls	C3P/A	0.7
TOTAL		8.2
Pyrenes		
Pyrene	C0P/F	10.6
Methyls	C1P/F	4.1
Dimethyls	C2P/F	2.9
TOTAL		17.6
Chrysenes		
Chrysene	C0C	3.7
Methyls	C1C	3.1
Dimethyls	C2C	1.4
TOTAL		8.2
GRAND TOTAL		38

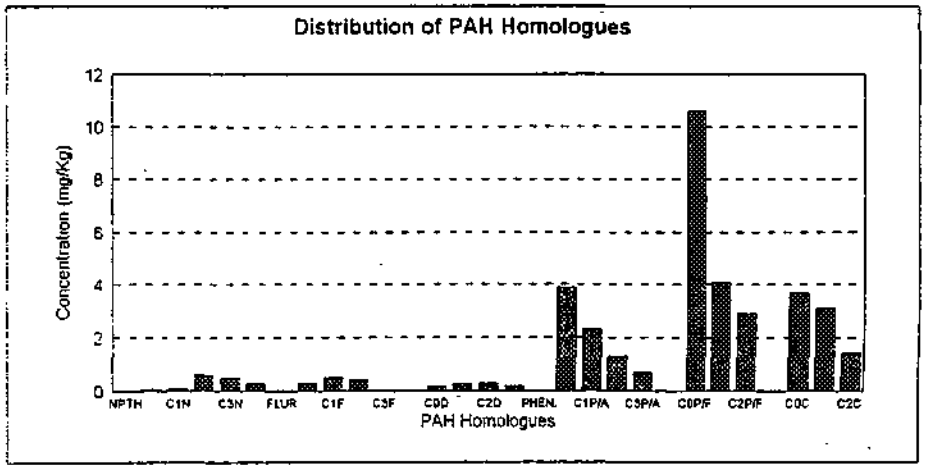


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0273
Sample Location	AOI102A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	0.05
Dimethyls	C2N	0.1
Trimethyls	C3N	0.1
Tetramethyls	C4N	0.08
TOTAL		0.33
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	0.04
Dimethyls	C2D	0.06
Trimethyls	C3D	0.05
TOTAL		0.15
Phenanthrenes		
Phenanthrene	C0P/A	0.13
Methyls	C1P/A	0.1
Dimethyls	C2P/A	0.2
Trimethyls	C3P/A	0.1
TOTAL		0.53
Pyrenes		
Pyrene	C0P/F	0.16
Methyls	C1P/F	0.1
Dimethyls	C2P/F	0.2
TOTAL		0.46
Chrysenes		
Chrysene	C0C	0.09
Methyls	C1C	0.1
Dimethyls	C2C	0.1
TOTAL		0.29
GRAND TOTAL		2

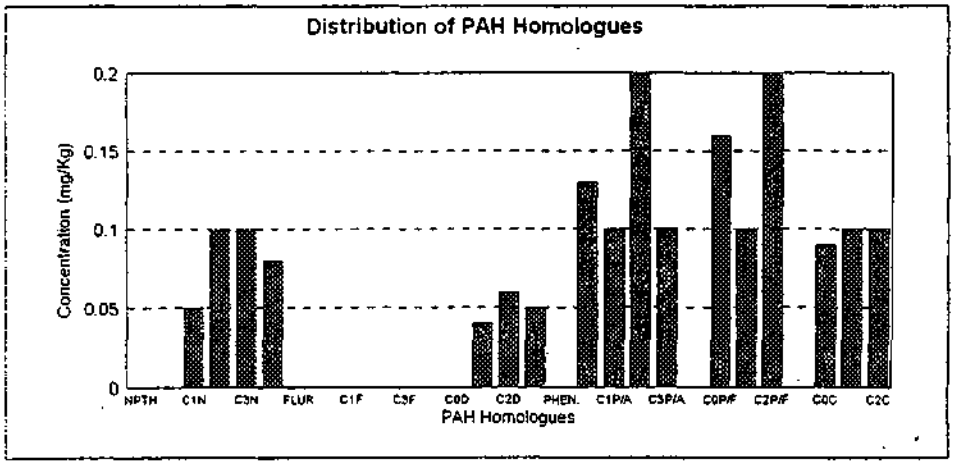


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0334
Sample Location	FBA

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

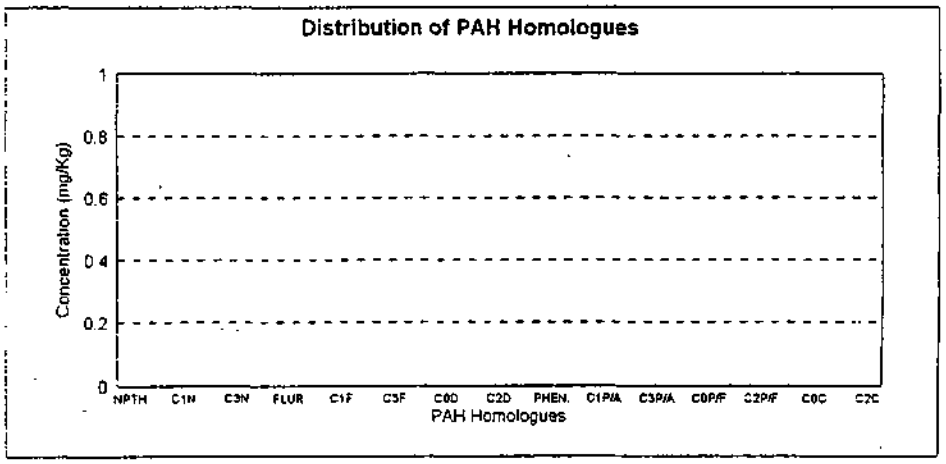


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0334
Sample Location	FBA MS

Homologue	CnPAH	Concentration (mg/K
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	1.4
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		1.4
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		1

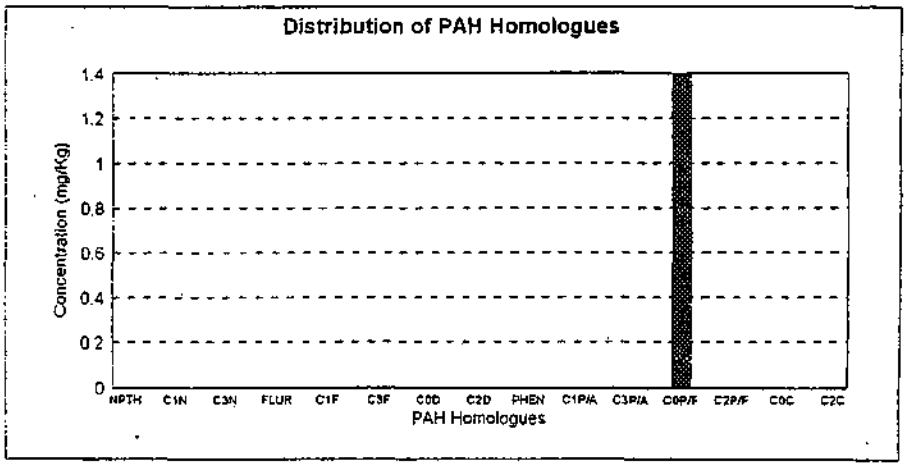


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0334
Sample Location	FBA MSD

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	1.1
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		1.1
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		1

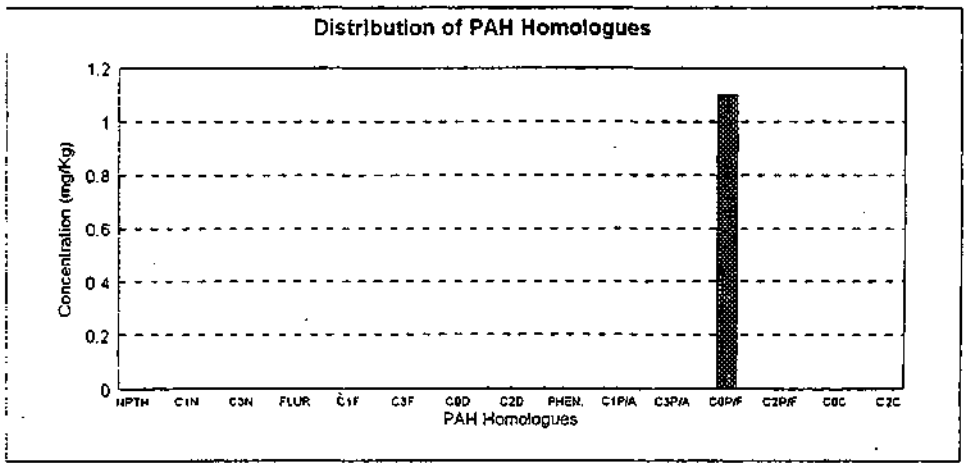


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0384
Sample Location	21SPSA

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	1.1
Methyls	C1N	2.1
Dimethyls	C2N	3
Trimethyls	C3N	1.8
Tetramethyls	C4N	0.4
TOTAL		8.4
Fluorenes		
Fluorene	C0F	1.3
Methyls	C1F	1
Dimethyls	C2F	0.3
Trimethyls	C3F	0.07
TOTAL		2.67
Dibenzothiophenes		
Dibenzothiophene	C0D	0.3
Methyls	C1D	0.2
Dimethyls	C2D	0.05
Trimethyls	C3D	U
TOTAL		0.55
Phenanthrenes		
Phenanthrene	C0P/A	5.6
Methyls	C1P/A	1.8
Dimethyls	C2P/A	0.3
Trimethyls	C3P/A	0.06
TOTAL		7.76
Pyrenes		
Pyrene	C0P/F	2.2
Methyls	C1P/F	0.3
Dimethyls	C2P/F	0.07
TOTAL		2.57
Chrysenes		
Chrysene	C0C	0.07
Methyls	C1C	0.03
Dimethyls	C2C	0.01
TOTAL		0.11
GRAND TOTAL		22

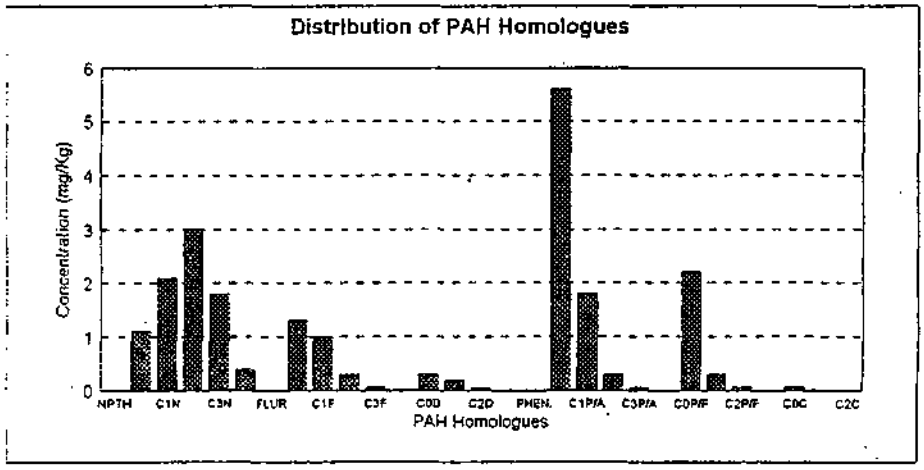


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0300
Sample Location	WR09A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0
Pyrenes		
Pyrene	C0P/F	0
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

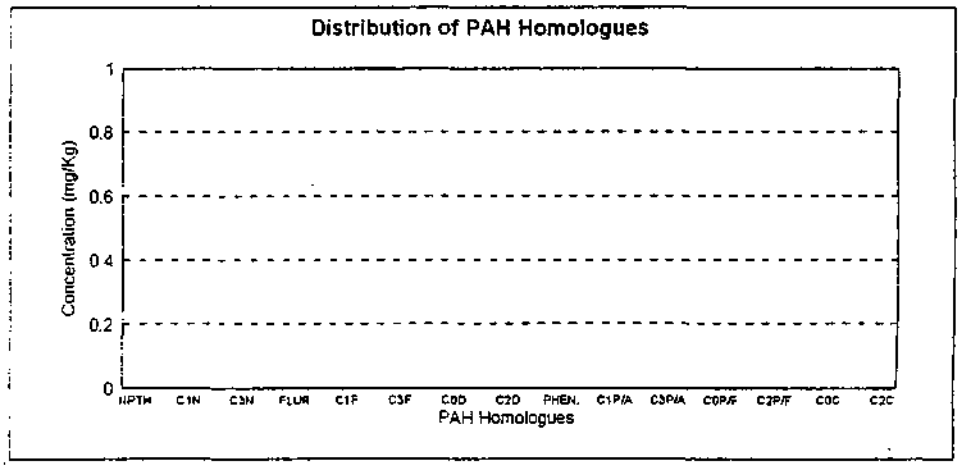


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0305
Sample Location	WR012A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	0.05
Trimethyls	C3P/A	0.04
TOTAL		0.09
Pyrenes		
Pyrene	C0P/F	0.08
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0.08
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

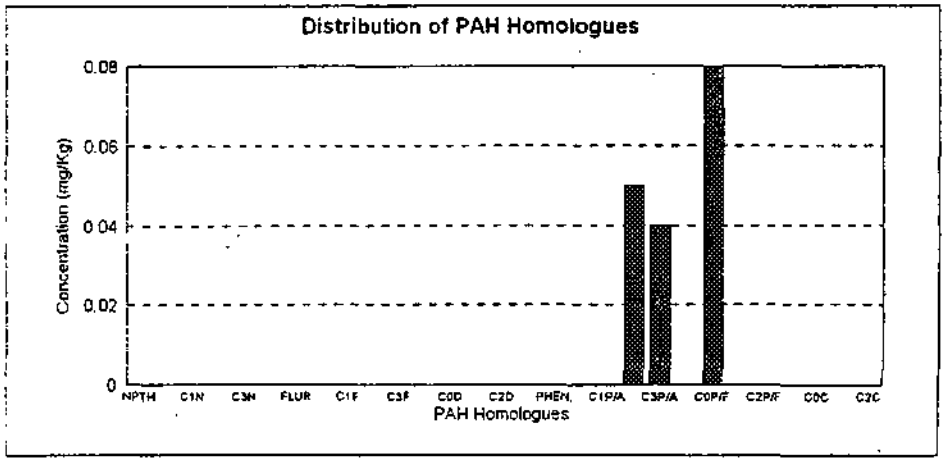


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0309
Sample Location	WR019A

Homologue	CnPAH	Concentration (mg/K
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	0.09
Dimethyls	C2F	0.1
Trimethyls	C3F	U
TOTAL		0.19
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.1
Methyls	C1P/A	0.2
Dimethyls	C2P/A	0.2
Trimethyls	C3P/A	0.1
TOTAL		0.6
Pyrenes		
Pyrene	C0P/F	0.2
Methyls	C1P/F	0.09
Dimethyls	C2P/F	0.1
TOTAL		0.39
Chrysenes		
Chrysene	C0C	0.09
Methyls	C1C	0.09
Dimethyls	C2C	0.08
TOTAL		0.26
GRAND TOTAL		1

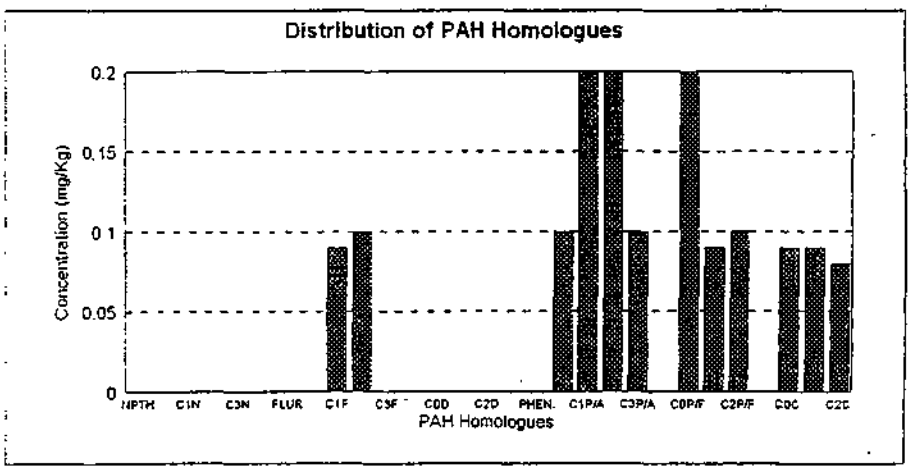


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0336
Sample Location	AOI4A

Homologue	CnPAH	Concentration (mg/Kg)	
Naphthalenes			
Naphthalene	C0N	U	
Methyls	C1N	U	
Dimethyls	C2N	U	
Trimethyls	C3N	U	
Tetramethyls	C4N	U	
TOTAL			0
Fluorenes			
Fluorene	C0F	U	
Methyls	C1F	U	
Dimethyls	C2F	U	
Trimethyls	C3F	U	
TOTAL			0
Dibenzothiophenes			
Dibenzothiophene	C0D	U	
Methyls	C1D	U	
Dimethyls	C2D	U	
Trimethyls	C3D	U	
TOTAL			0
Phenanthrenes			
Phenanthrene	C0P/A		0
Methyls	C1P/A	U	
Dimethyls	C2P/A	U	
Trimethyls	C3P/A	U	
TOTAL			0
Pyrenes			
Pyrene	C0P/F		0
Methyls	C1P/F	U	
Dimethyls	C2P/F	U	
TOTAL			0
Chrysenes			
Chrysene	C0C	U	
Methyls	C1C	U	
Dimethyls	C2C	U	
TOTAL			0
GRAND TOTAL			0

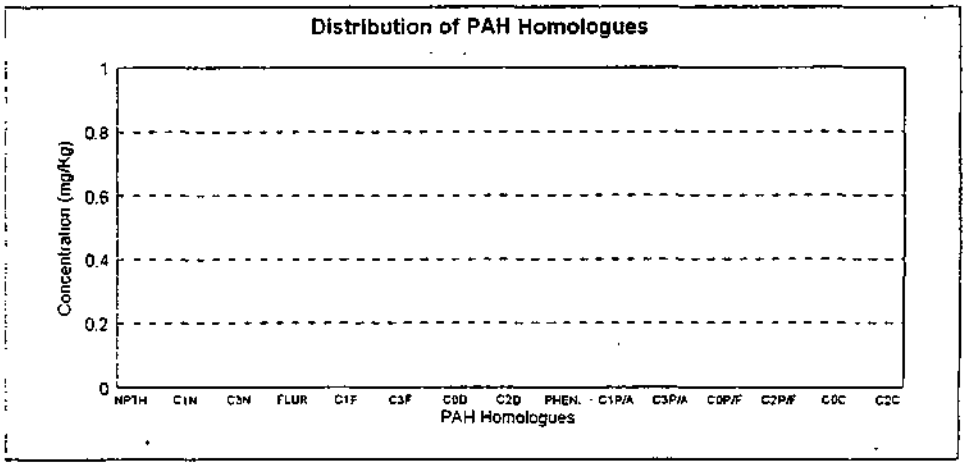


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0307
Sample Location	WR014A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	U
Dimethyls	C2P/A	0.03
Trimethyls	C3P/A	0.04
TOTAL		0.07
Pyrenes		
Pyrene	C0P/F	0.06
Methyls	C1P/F	0.04
Dimethyls	C2P/F	0.04
TOTAL		0.14
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	0.03
TOTAL		0.03
GRAND TOTAL		0

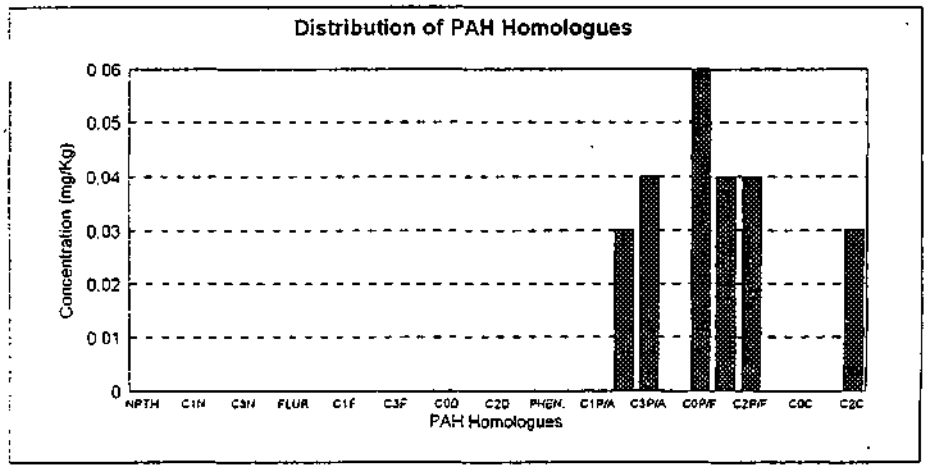


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0302
Sample Location	WR011A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	0.04
Dimethyls	C2F	0.1
Trimethyls	C3F	U
TOTAL		0.14
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.07
Methyls	C1P/A	U
Dimethyls	C2P/A	0.1
Trimethyls	C3P/A	0.08
TOTAL		0.25
Pyrenes		
Pyrene	C0P/F	0.11
Methyls	C1P/F	0.06
Dimethyls	C2P/F	0.07
TOTAL		0.24
Chrysenes		
Chrysene	C0C	0.06
Methyls	C1C	0.07
Dimethyls	C2C	0.08
TOTAL		0.21
GRAND TOTAL		1

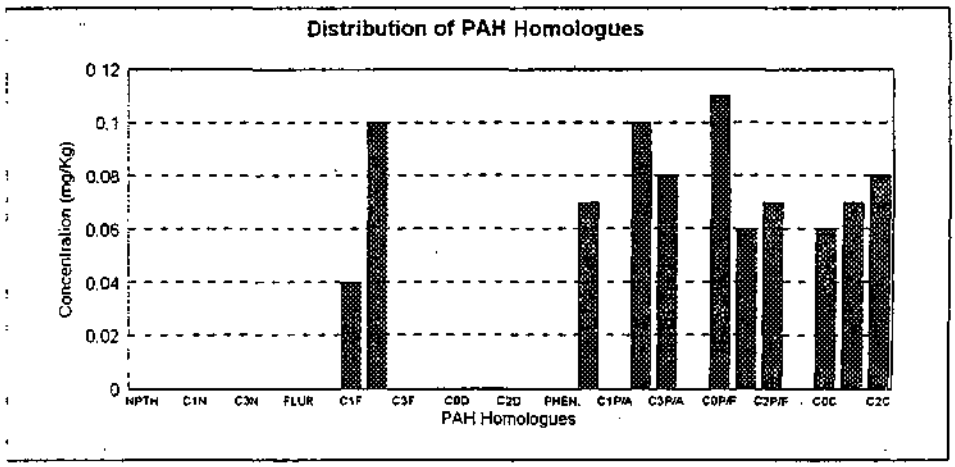


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0312
Sample Location	WR021ADUP

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	0.04
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0.04
Pyrenes		
Pyrene	C0P/F	0.06
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0.06
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		0

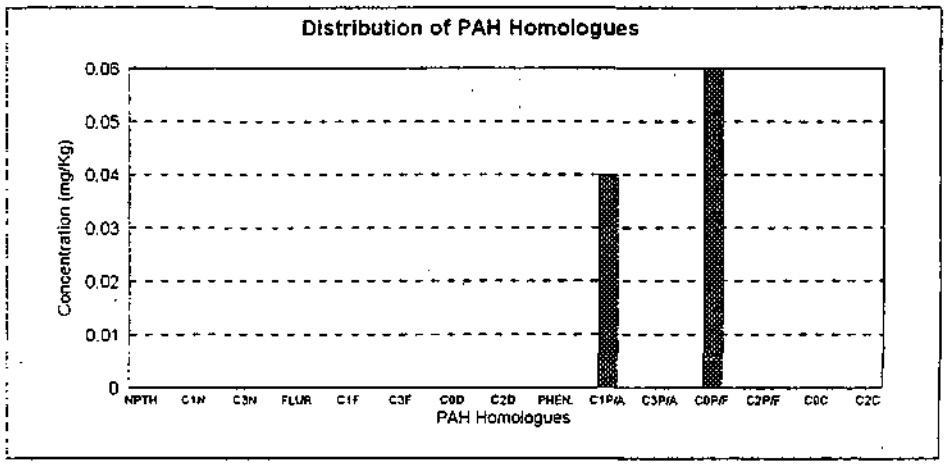


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0311
Sample Location	WR021A

Homologue	CnPAH	Concentration (mg/K
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0
Methyls	C1P/A	0.04
Dimethyls	C2P/A	U
Trimethyls	C3P/A	U
TOTAL		0.04
Pyrenes		
Pyrene	C0P/F	0.02
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0.02
Chrysenes		
Chrysene	C0C	U
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0
GRAND TOTAL		**0**

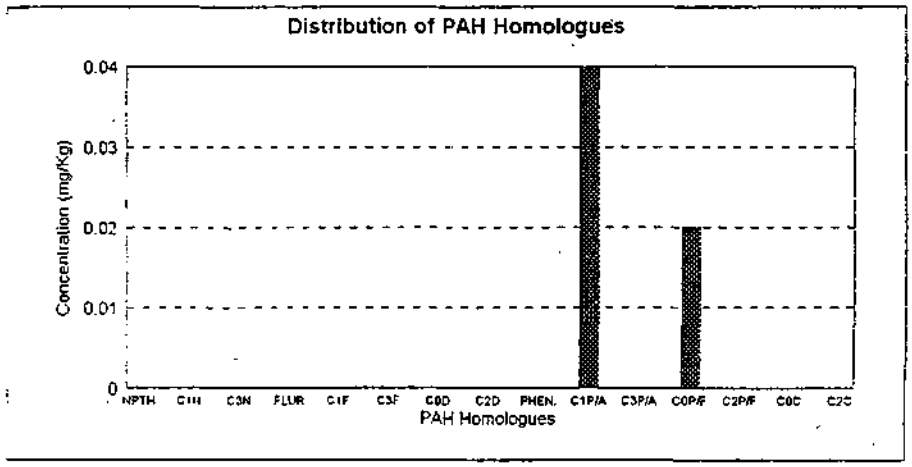


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0319
Sample Location	WR025A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.03
Methyls	C1P/A	0.08
Dimethyls	C2P/A	0.03
Trimethyls	C3P/A	0.04
TOTAL		0.18
Pyrenes		
Pyrene	C0P/F	0.09
Methyls	C1P/F	0.03
Dimethyls	C2P/F	0.04
TOTAL		0.16
Chrysenes		
Chrysene	C0C	0.03
Methyls	C1C	0.03
Dimethyls	C2C	0.03
TOTAL		0.09
GRAND TOTAL		0

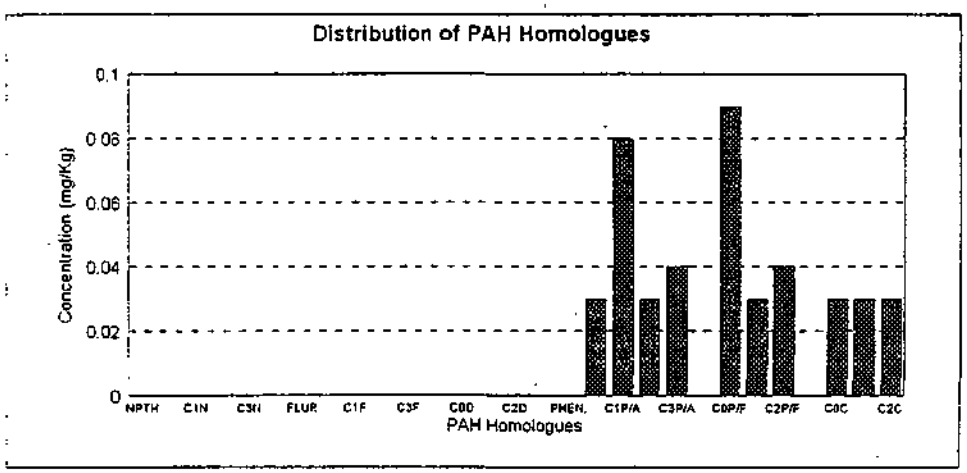


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0314
Sample Location	WR022A

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.03
Methyls	C1P/A	0.05
Dimethyls	C2P/A	0.03
Trimethyls	C3P/A	0.03
TOTAL		0.14
Pyrenes		
Pyrene	C0P/F	0.09
Methyls	C1P/F	0.03
Dimethyls	C2P/F	0.02
TOTAL		0.14
Chrysenes		
Chrysene	C0C	0.03
Methyls	C1C	0.02
Dimethyls	C2C	U
TOTAL		0.05
GRAND TOTAL		**0**

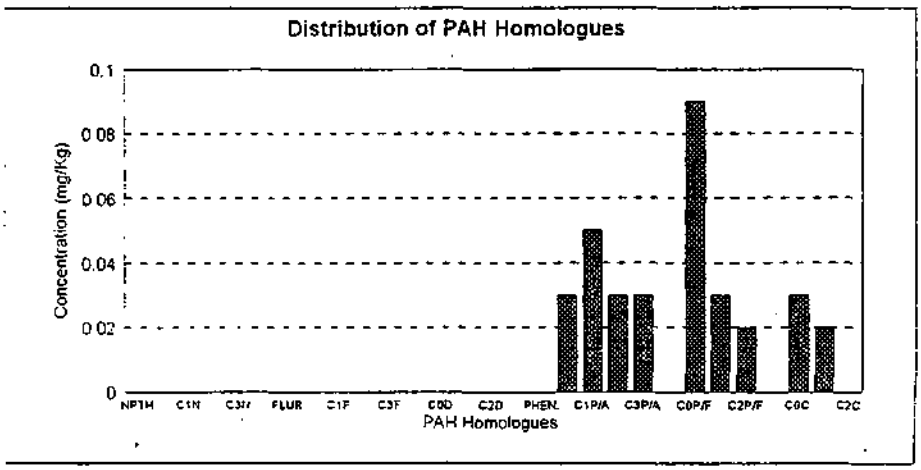


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0315
Sample Location	WR022DUP

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	U
Tetramethyls	C4N	U
TOTAL		0
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.03
Methyls	C1P/A	0.05
Dimethyls	C2P/A	0.03
Trimethyls	C3P/A	0.03
TOTAL		0.14
Pyrenes		
Pyrene	C0P/F	0.06
Methyls	C1P/F	U
Dimethyls	C2P/F	U
TOTAL		0.06
Chrysenes		
Chrysene	C0C	0.03
Methyls	C1C	U
Dimethyls	C2C	U
TOTAL		0.03
GRAND TOTAL		0

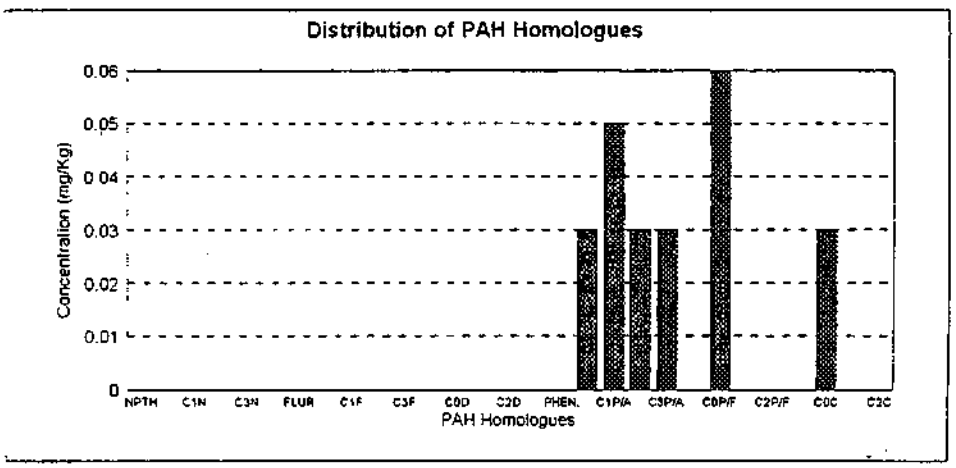


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Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0317
Sample Location	WR24A

Homologue	ChPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	0.09
Trimethyls	C3N	0.06
Tetramethyls	C4N	U
TOTAL		0.15
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.1
Methyls	C1P/A	0.3
Dimethyls	C2P/A	0.2
Trimethyls	C3P/A	0.2
TOTAL		0.8
Pyrenes		
Pyrene	C0P/F	0.2
Methyls	C1P/F	0.1
Dimethyls	C2P/F	0.09
TOTAL		0.39
Chrysenes		
Chrysene	C0C	0.1
Methyls	C1C	0.09
Dimethyls	C2C	0.09
TOTAL		0.28
GRAND TOTAL		2

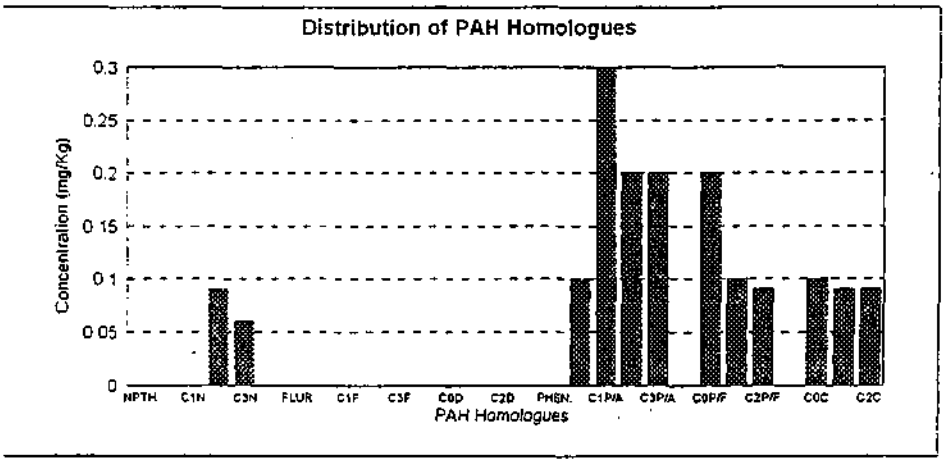


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0322
Sample Location	WR28A

Homologue	CnPAH	Concentration (mg/K
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	0.04
Tetramethyls	C4N	U
TOTAL		0.04
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.08
Methyls	C1P/A	0.1
Dimethyls	C2P/A	0.07
Trimethyls	C3P/A	0.08
TOTAL		0.33
Pyrenes		
Pyrene	C0P/F	0.2
Methyls	C1P/F	0.07
Dimethyls	C2P/F	0.06
TOTAL		0.33
Chrysenes		
Chrysene	C0C	0.07
Methyls	C1C	0.07
Dimethyls	C2C	0.06
TOTAL		0.2
GRAND TOTAL		1

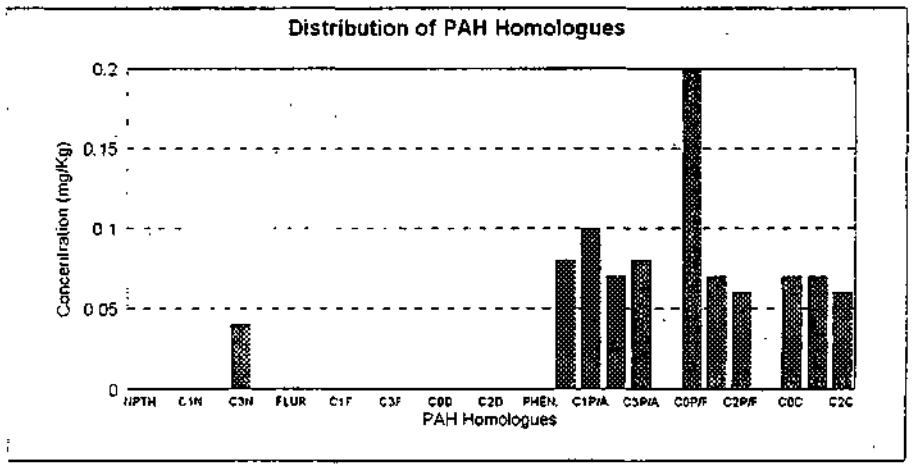


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0322
Sample Location	WR28A MS

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	0.04
Trimethyls	C3N	0.06
Tetramethyls	C4N	U
TOTAL		0.1
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	U
TOTAL		0
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.07
Methyls	C1P/A	0.2
Dimethyls	C2P/A	0.1
Trimethyls	C3P/A	0.1
TOTAL		0.47
Pyrenes		
Pyrene	C0P/F	3.6
Methyls	C1P/F	0.1
Dimethyls	C2P/F	0.09
TOTAL		3.79
Chrysenes		
Chrysene	C0C	0.09
Methyls	C1C	0.08
Dimethyls	C2C	0.08
TOTAL		0.25
GRAND TOTAL		5

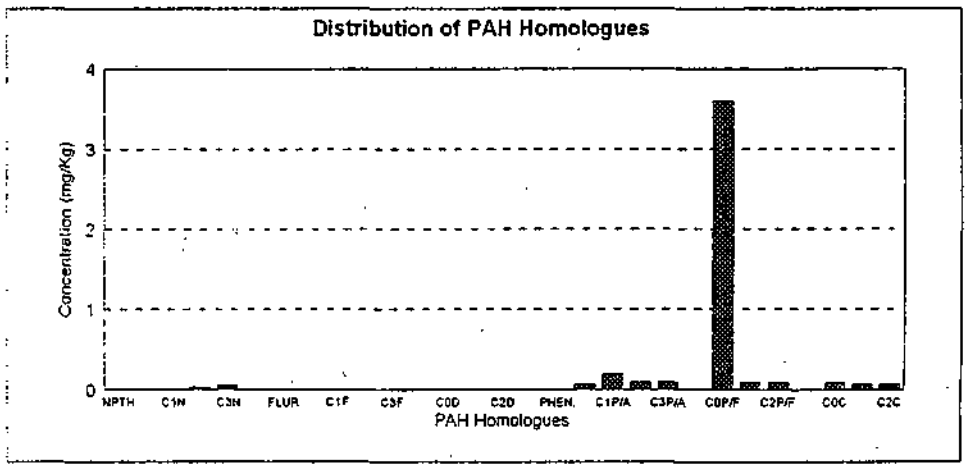
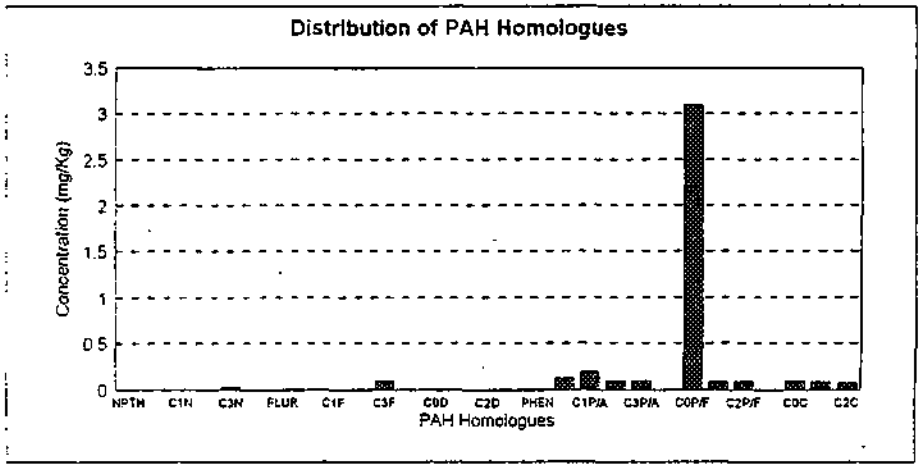


Table 2.1
Distribution of PAH Homologues

Sample No.	B0119-0322
Sample Location	WR28A MSD

Homologue	CnPAH	Concentration (mg/Kg)
Naphthalenes		
Naphthalene	C0N	U
Methyls	C1N	U
Dimethyls	C2N	U
Trimethyls	C3N	0.04
Tetramethyls	C4N	U
TOTAL		0.04
Fluorenes		
Fluorene	C0F	U
Methyls	C1F	U
Dimethyls	C2F	U
Trimethyls	C3F	0.1
TOTAL		0.1
Dibenzothiophenes		
Dibenzothiophene	C0D	U
Methyls	C1D	U
Dimethyls	C2D	U
Trimethyls	C3D	U
TOTAL		0
Phenanthrenes		
Phenanthrene	C0P/A	0.13
Methyls	C1P/A	0.2
Dimethyls	C2P/A	0.1
Trimethyls	C3P/A	0.1
TOTAL		0.53
Pyrenes		
Pyrene	C0P/F	3.1
Methyls	C1P/F	0.09
Dimethyls	C2P/F	0.09
TOTAL		3.28
Chrysenes		
Chrysene	C0C	0.1
Methyls	C1C	0.09
Dimethyls	C2C	0.08
TOTAL		0.27
GRAND TOTAL		4



Sterane Profiles

Sterene Profiles

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0252
SAMPLE LOCATION : SCIA

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.16
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.06
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.11
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.18
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.13
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.11
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.19
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.13
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.17
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.33
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.20
C30 Steranes (Total)	414	C30H54	S13	0.17
Total Steranes				2.0
% C27 Steranes				26.4
% C28 Steranes				28.2
% C29 Steranes				36.9
Ratio 5a,14B,17B/Total Steranes				0.42
Ratio 20S/20R + 20S				0.44

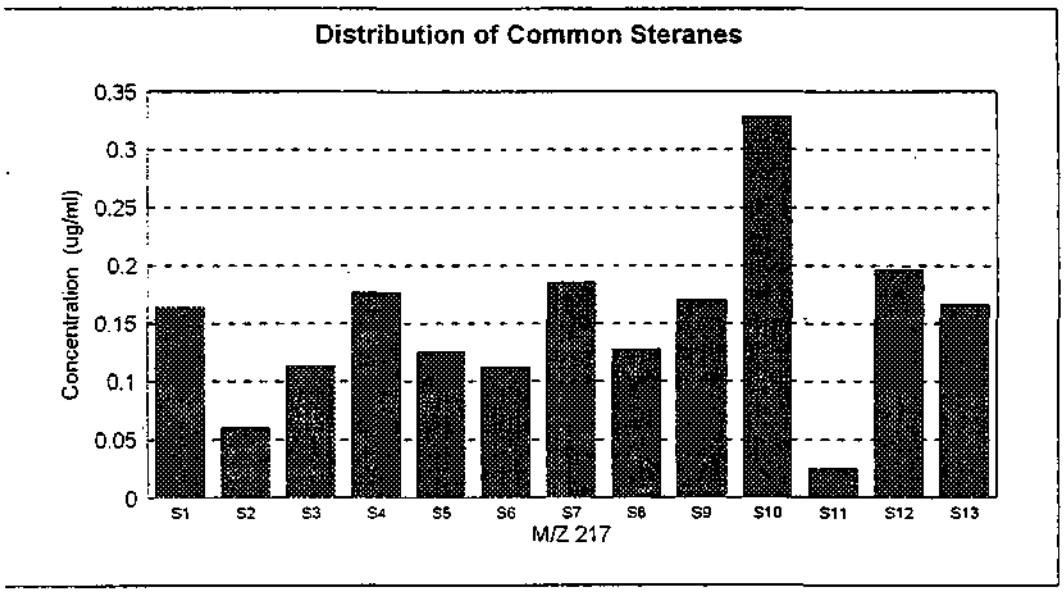


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Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0266
SAMPLE LOCATION : RD3A DUP

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.05
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.02
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.03
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.05
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.03
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.09
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.09
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.04
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.04
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.07
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.04
C30 Steranes (Total)	414	C30H54	S13	0.18
Total Steranes				0.7
% C27 Steranes				19.8
% C28 Steranes				33.0
% C29 Steranes				22.8
Ratio 5a,14B,17B/Total Steranes				0.41
Ratio 20S/20R + 20S				0.44

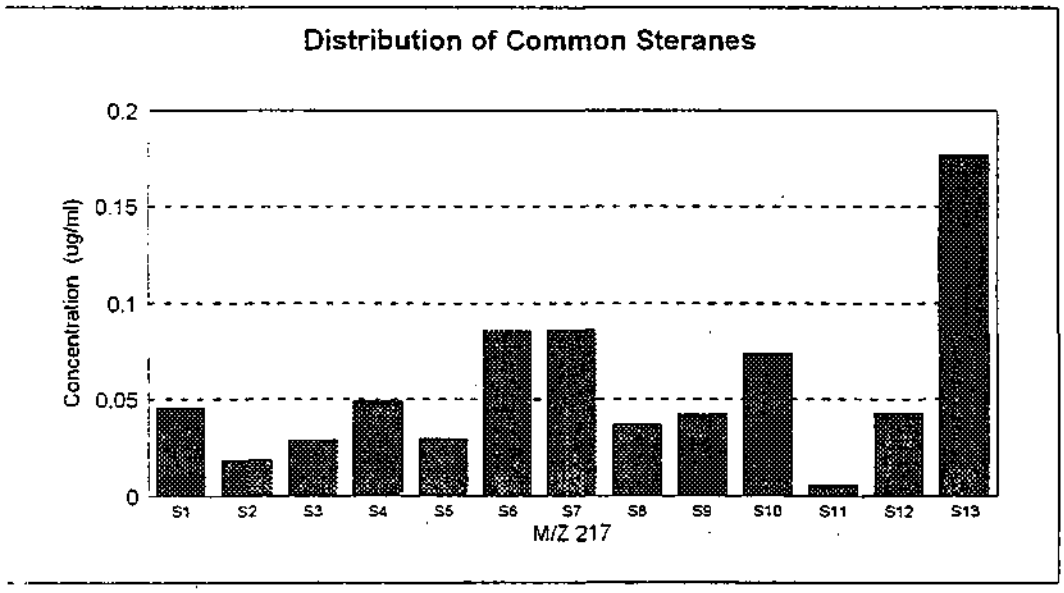

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0265
SAMPLE LOCATION : RD3A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.11
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.05
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.06
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.15
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.08
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.07
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.14
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.08
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.11
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.20
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.16
C30 Steranes (Total)	414	C30H54	S13	0.42
Total Steranes				1.6
% C27 Steranes				22.3
% C28 Steranes				22.4
% C29 Steranes				29.5
Ratio 5a,14B,17B/Total Steranes				0.32
Ratio 20S/20R + 20S				0.42

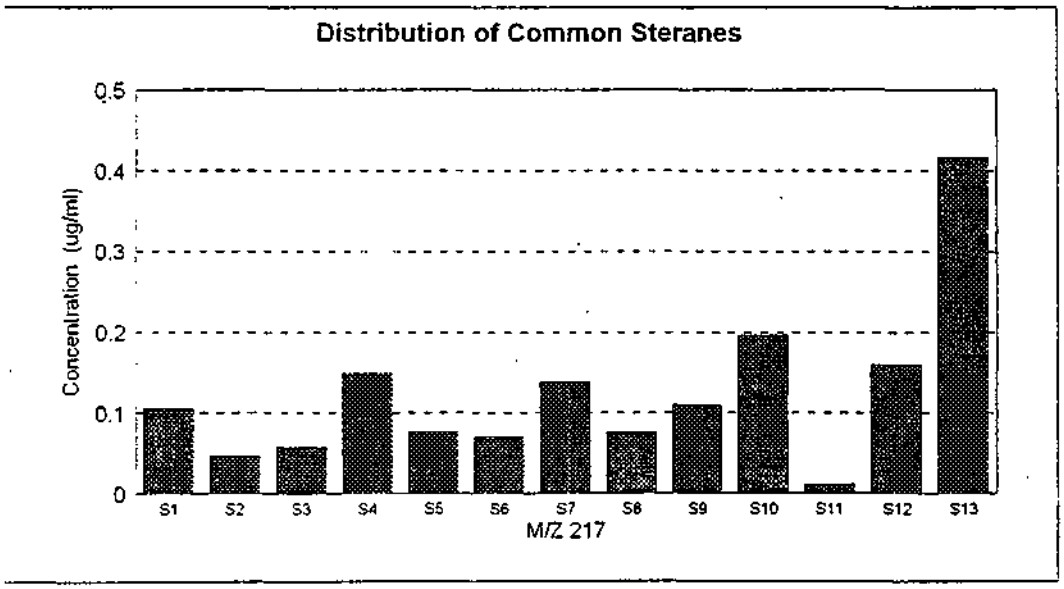

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0249
SAMPLE LOCATION : BC3A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.06
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.02
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.03
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.06
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.05
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.05
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.10
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.04
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.08
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.15
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.09
C30 Steranes (Total)	414	C30H54	S13	0.15
Total Steranes				0.9
% C27 Steranes				18.5
% C28 Steranes				27.3
% C29 Steranes				37.5
Ratio 5a,14B,17B/Total Steranes				0.41
Ratio 20S/20R + 20S				0.46

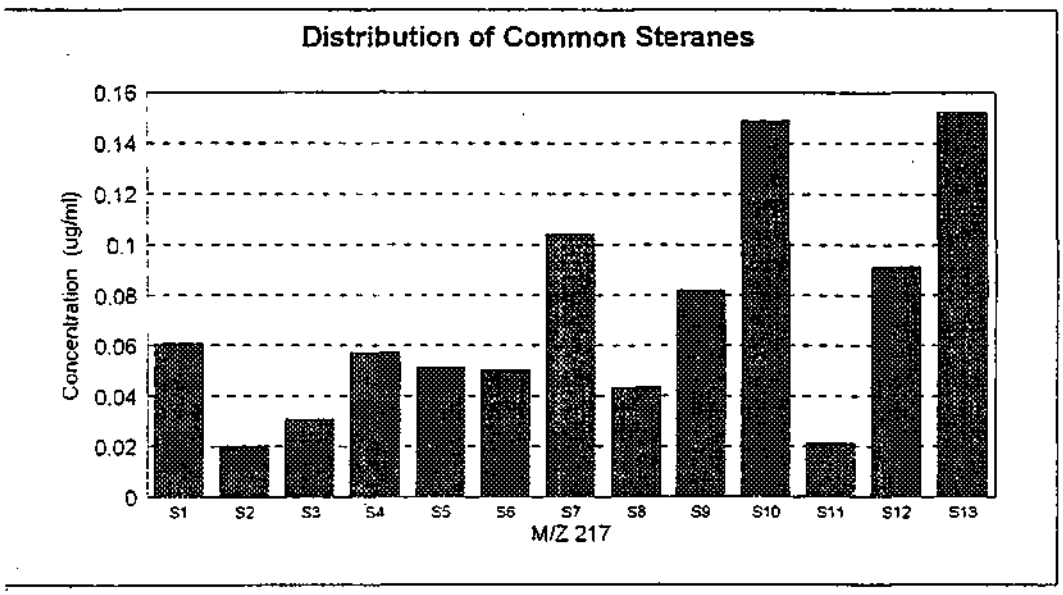

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0259
SAMPLE LOCATION : 33SS2A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.23
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.10
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.15
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.32
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.20
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.18
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.35
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.19
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.23
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.44
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.04
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.28
C30 Steranes (Total)	414	C30H54	S13	0.31
Total Steranes				3.0
% C27 Steranes				26.7
% C28 Steranes				30.6
% C29 Steranes				32.6
Ratio 5a,14B,17B/Total Steranes				0.42
Ratio 20S/20R + 20S				0.44

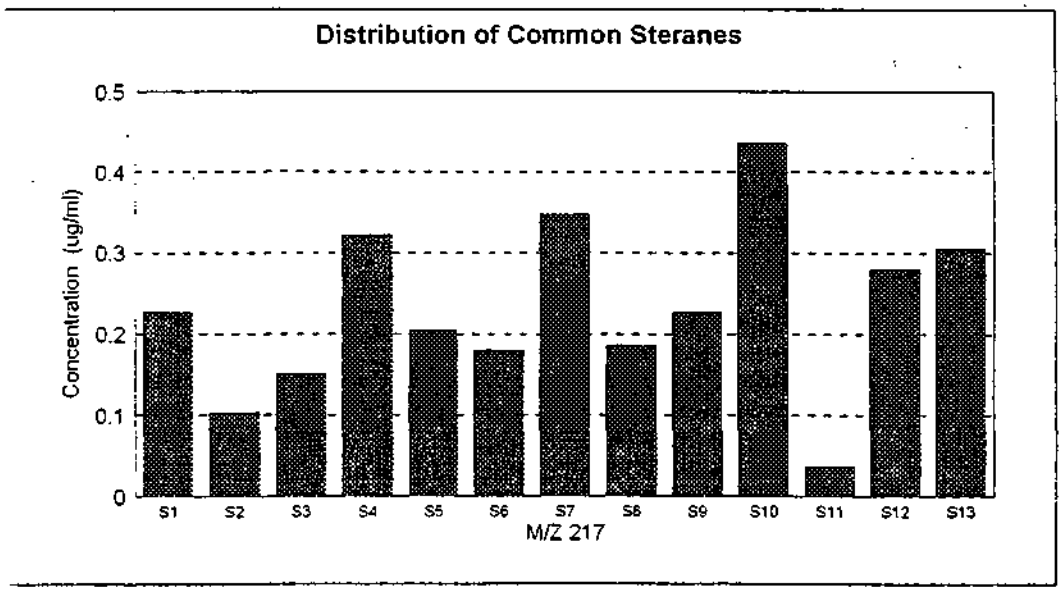

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0273
SAMPLE LOCATION : AOI102A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.00
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.00
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.00
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.00
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.00
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.00
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.00
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.00
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.00
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.00
C30 Steranes (Total)	414	C30H54	S13	0.00
Total Steranes				0.0
% C27 Steranes				30.8
% C28 Steranes				30.8
% C29 Steranes				30.8
Ratio 5a,14B,17B/Total Steranes				0.46
Ratio 20S/20R + 20S				0.50

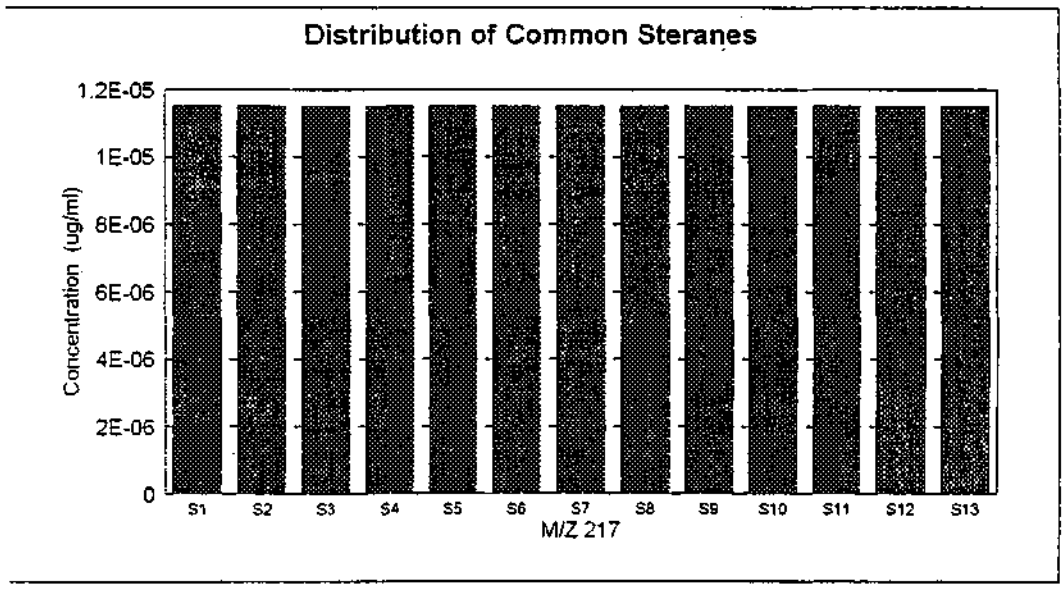

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : 0119-0384
SAMPLE LOCATION : 21SPSA

Compound	MW	Formula	Symbol	Concentration (ug/L)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.00
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.00
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.00
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.00
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.00
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.00
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.00
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.00
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.01
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.01
C30 Steranes (Total)	**414**	**C30H54**	**S13**	**0.08**
Total Steranes				**0.1**
% C27 Steranes				**7.2**
% C28 Steranes				**11.1**
% C29 Steranes				**12.9**
Ratio 5a,14B,17B/Total Steranes				**0.16**
Ratio 20S/20R + 20S				**0.38**

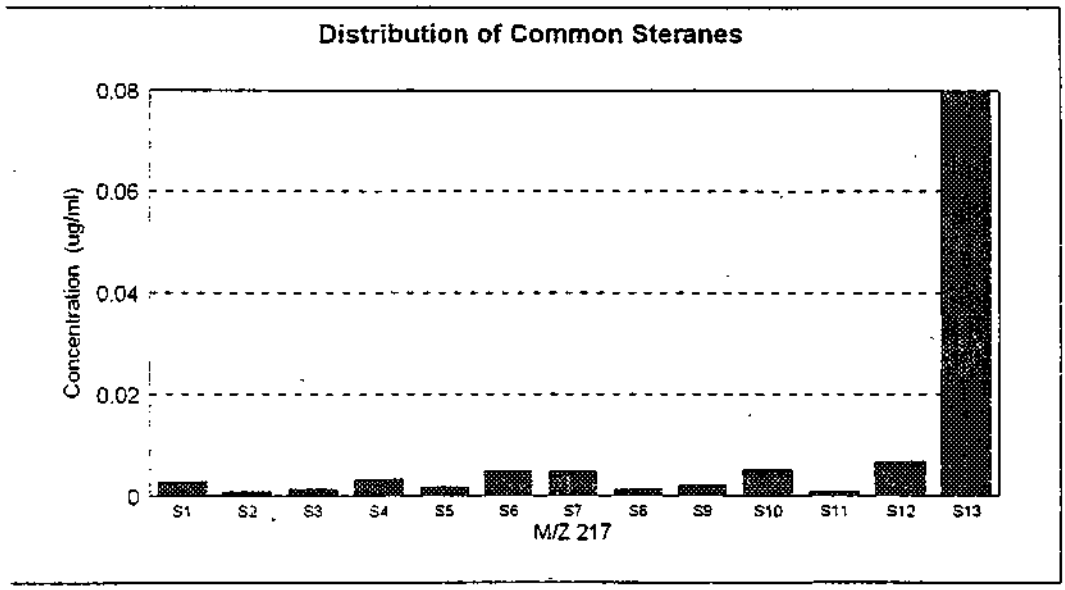

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0300
SAMPLE LOCATION : WR09A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.01
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.00
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.01
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.01
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.01
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.03
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.01
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.02
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.06
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.06
C30 Steranes (Total)	414	C30H54	S13	0.15
Total Steranes				0.4
% C27 Steranes				9.3
% C28 Steranes				12.4
% C29 Steranes				39.7
Ratio 5a,14B,17B/Total Steranes				0.31
Ratio 20S/20R + 20S				0.28

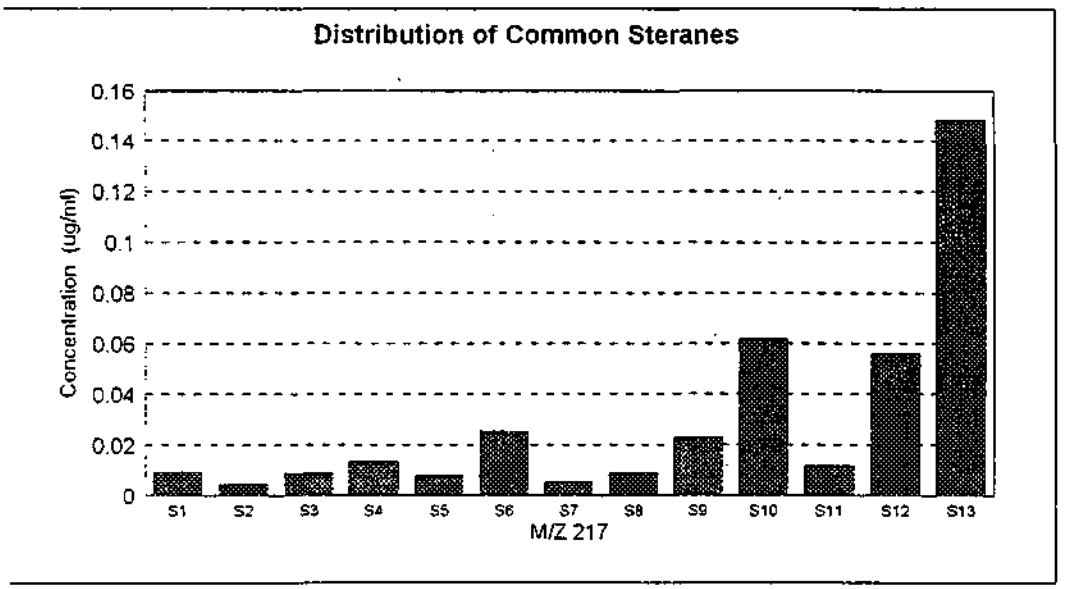

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0305
SAMPLE LOCATION : WR012A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.03
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.01
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.02
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.04
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.02
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.04
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.04
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.03
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.08
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.06
C30 Steranes (Total)	414	C30H54	S13	0.20
Total Steranes				0.6
% C27 Steranes				17.7
% C28 Steranes				18.4
% C29 Steranes				30.3
Ratio 5a,14B,17B/Total Steranes				0.33
Ratio 20S/20R + 20S				0.36

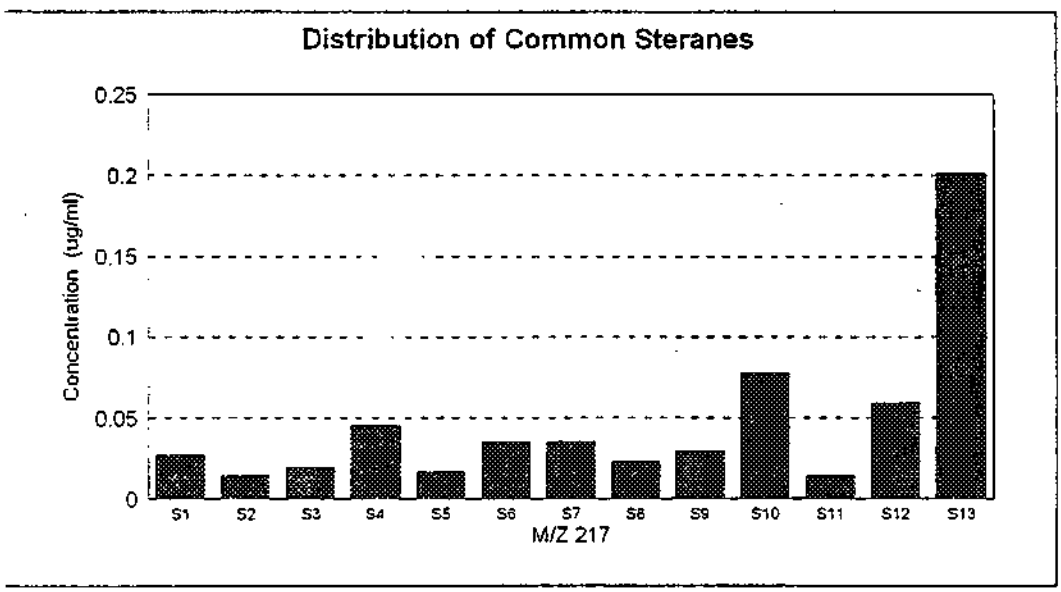

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : 0119-0309
SAMPLE LOCATION : WR019A

Compound	MW	Formula	Symbol	Concentration (ug/L)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.07
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.03
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.05
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.08
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.05
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.15
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.15
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.05
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.08
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.13
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.09
C30 Steranes (Total)	414	C30H54	S13	0.22
Total Steranes				1.2
% C27 Steranes				19.5
% C28 Steranes				34.7
% C29 Steranes				26.8
Ratio 5a,14B,17B/Total Steranes				0.44
Ratio 20S/20R + 20S				0.44

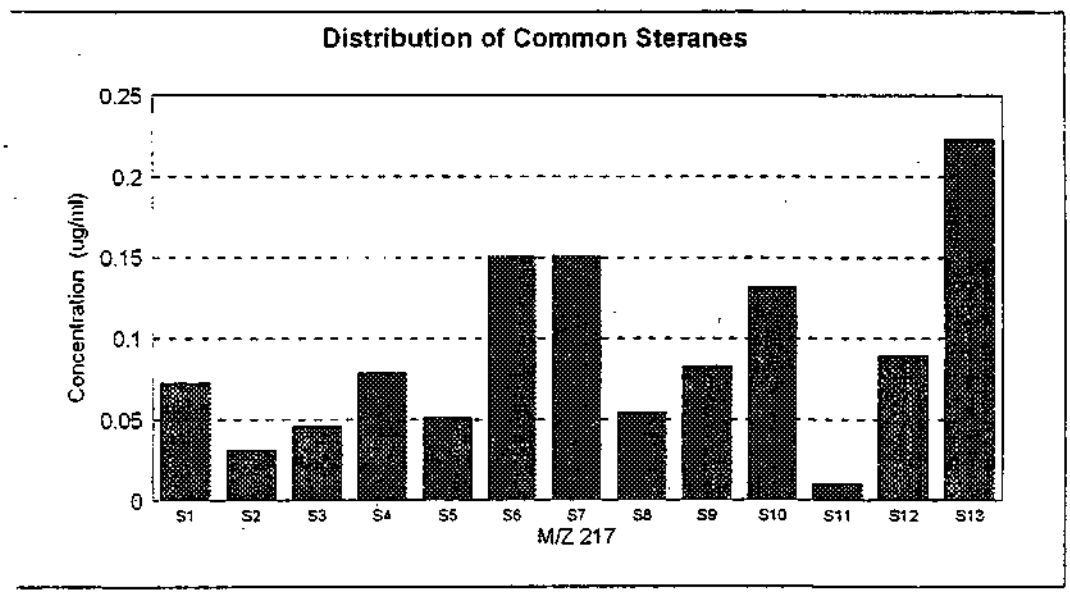

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0307
SAMPLE LOCATION : WR014A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.03
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.01
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.02
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.04
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.02
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.06
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.06
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.03
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.05
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.03
C30 Steranes (Total)	414	C30H54	S13	0.06
Total Steranes				0.4
% C27 Steranes				23.7
% C28 Steranes				36.6
% C29 Steranes				24.5
Ratio 5a,14B,17B/Total Steranes				0.47
Ratio 20S/20R + 20S				0.44

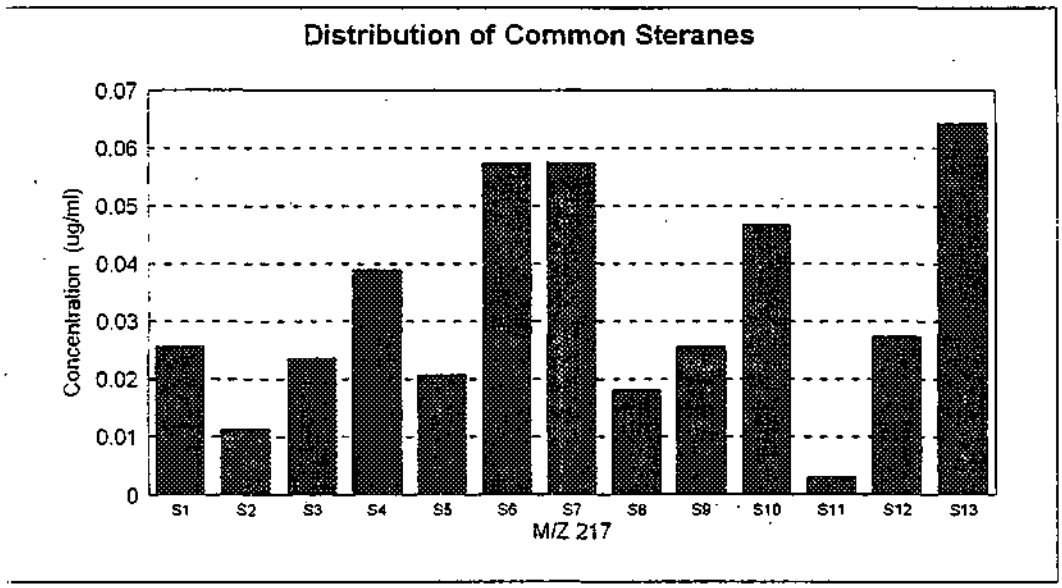

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Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0302
SAMPLE LOCATION : WR011A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.08
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.04
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.04
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.09
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.05
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.02
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.10
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.06
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.10
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.17
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.12
C30 Steranes (Total)	414	C30H54	S13	0.21
Total Steranes				1.1
% C27 Steranes				22.7
% C28 Steranes				20.8
% C29 Steranes				36.9
Ratio 5a,14B,17B/Total Steranes				0.36
Ratio 20S/20R + 20S				0.44

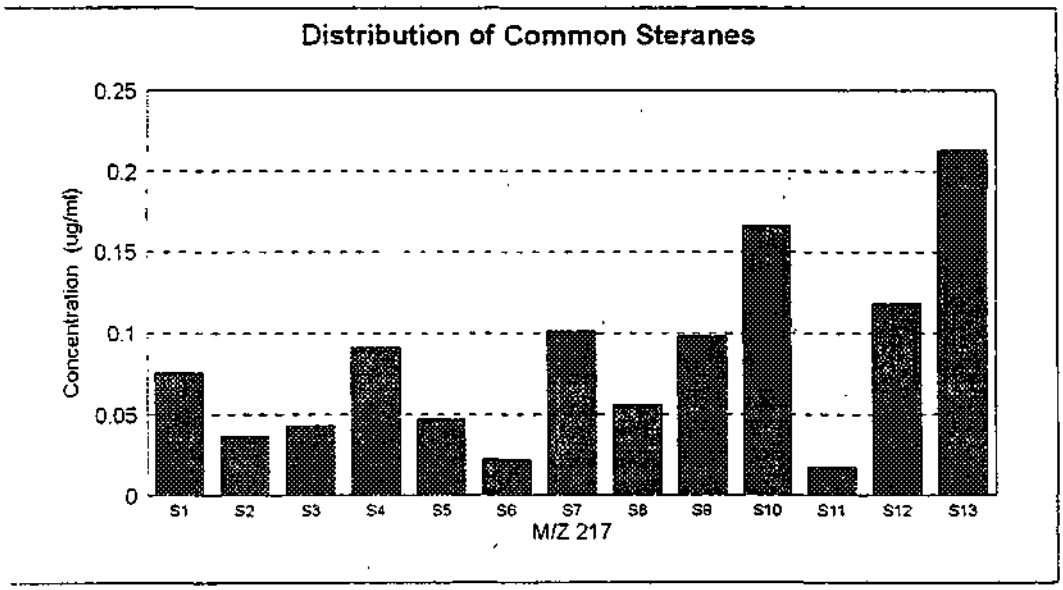

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0312
SAMPLE LOCATION : WR021ADUP

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.02
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.01
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.01
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.03
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.02
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.04
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.04
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.02
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.03
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.02
C30 Steranes (Total)	414	C30H54	S13	0.05
Total Steranes				0.3
% C27 Steranes				21.1
% C28 Steranes				36.9
% C29 Steranes				24.7
Ratio 5a,14B,17B/Total Steranes				0.46
Ratio 20S/20R + 20S				0.43

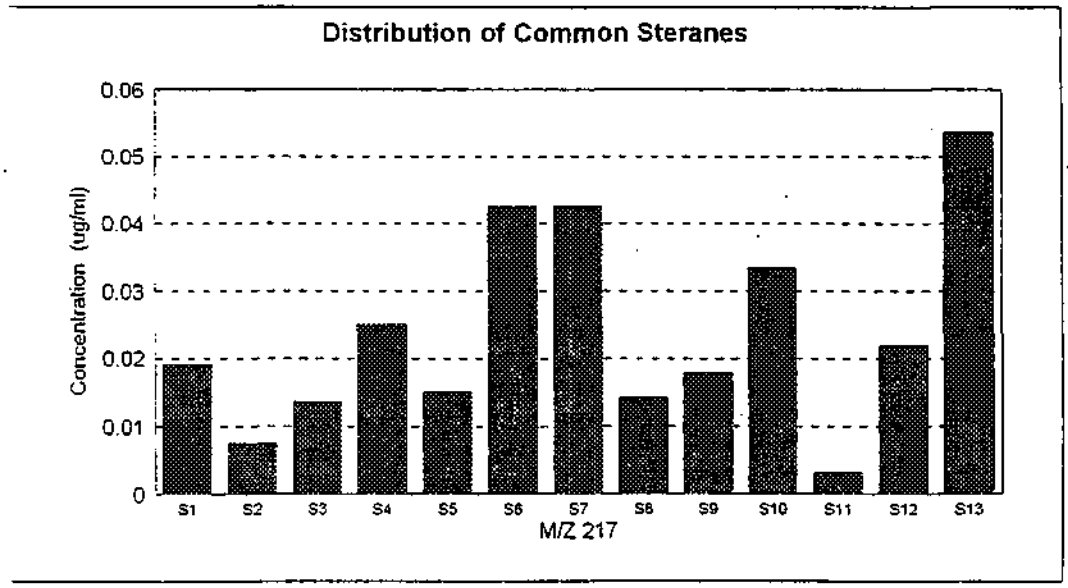

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0311
SAMPLE LOCATION : WR021A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.02
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.01
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.01
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.02
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.01
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.04
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.04
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.02
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.03
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.02
C30 Steranes (Total)	414	C30H54	S13	0.05
Total Steranes				0.3
% C27 Steranes				18.8
% C28 Steranes				39.7
% C29 Steranes				23.9
Ratio 5a,14B,17B/Total Steranes				0.47
Ratio 20S/20R + 20S				0.44

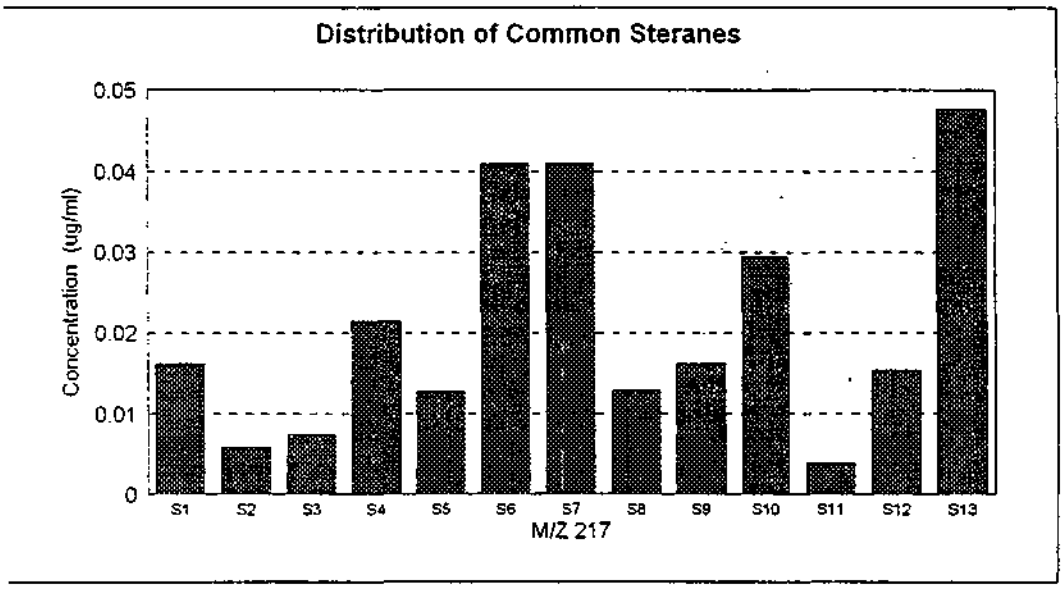

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0319
SAMPLE LOCATION : WR025A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.04
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.02
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.04
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.04
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.03
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.07
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.07
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.03
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.06
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.05
C30 Steranes (Total)	414	C30H54	S13	0.10
Total Steranes				0.6
% C27 Steranes				23.1
% C28 Steranes				33.9
% C29 Steranes				25.1
Ratio 5a,14B,17B/Total Steranes				0.45
Ratio 20S/20R + 20S				0.44

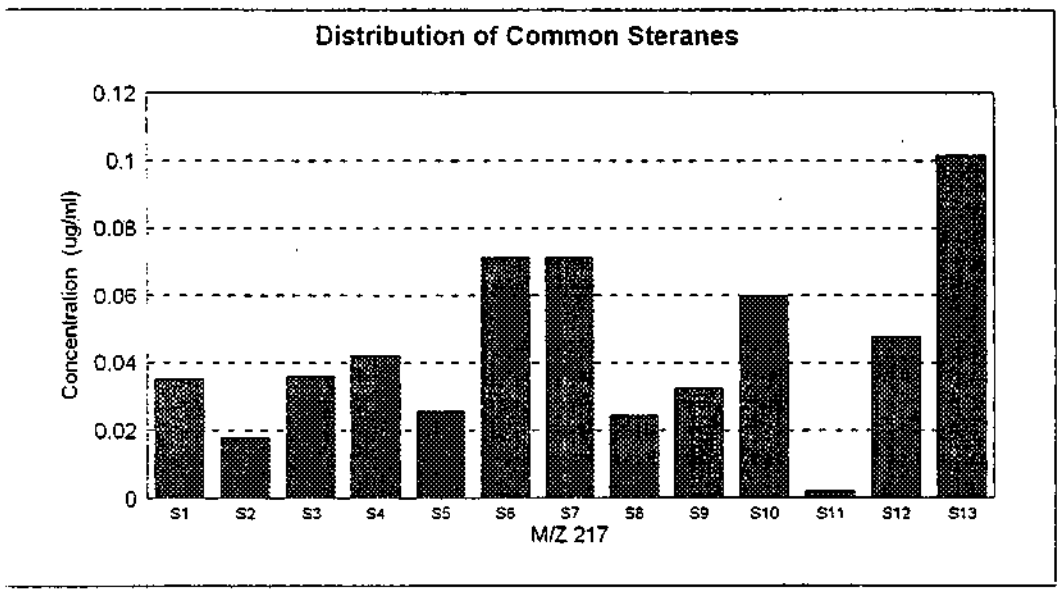

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0314
SAMPLE LOCATION : WR022A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.03
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.01
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.02
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.03
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.02
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.06
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.06
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.02
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.04
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.03
C30 Steranes (Total)	414	C30H54	S13	0.08
Total Steranes				0.4
% C27 Steranes				22.9
% C28 Steranes				34.4
% C29 Steranes				23.4
Ratio 5a,14B,17B/Total Steranes				0.45
Ratio 20S/20R + 20S				0.44

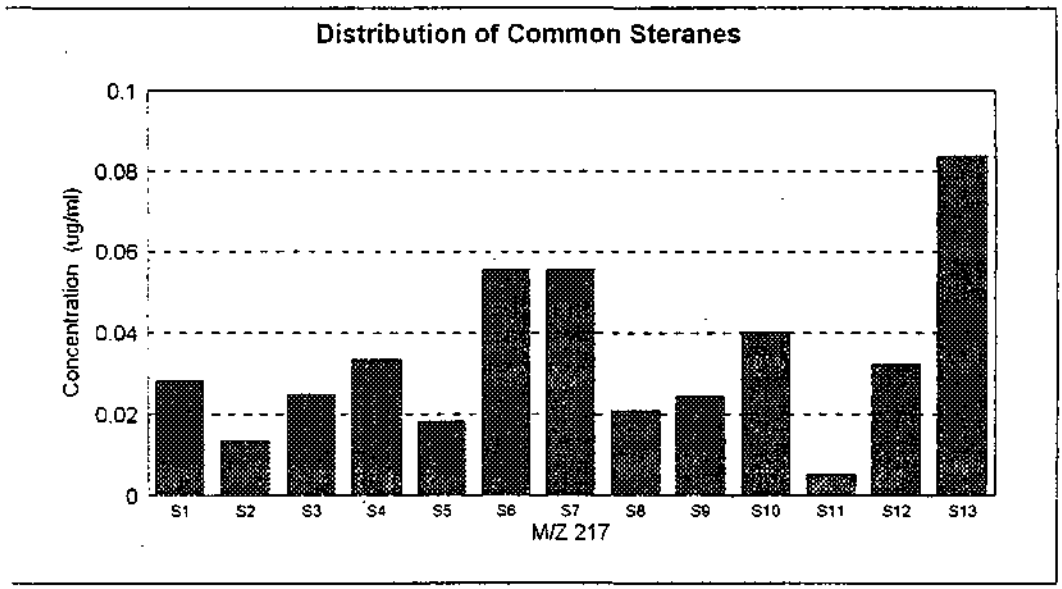

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0315
SAMPLE LOCATION : WR022ADUP

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.03
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.02
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.03
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.04
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.02
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.06
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.06
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.03
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.05
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.00
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.03
C30 Steranes (Total)	414	C30H54	S13	0.09
Total Steranes				0.5
% C27 Steranes				24.1
% C28 Steranes				33.1
% C29 Steranes				23.1
Ratio 5a,14B,17B/Total Steranes				0.45
Ratio 20S/20R + 20S				0.42

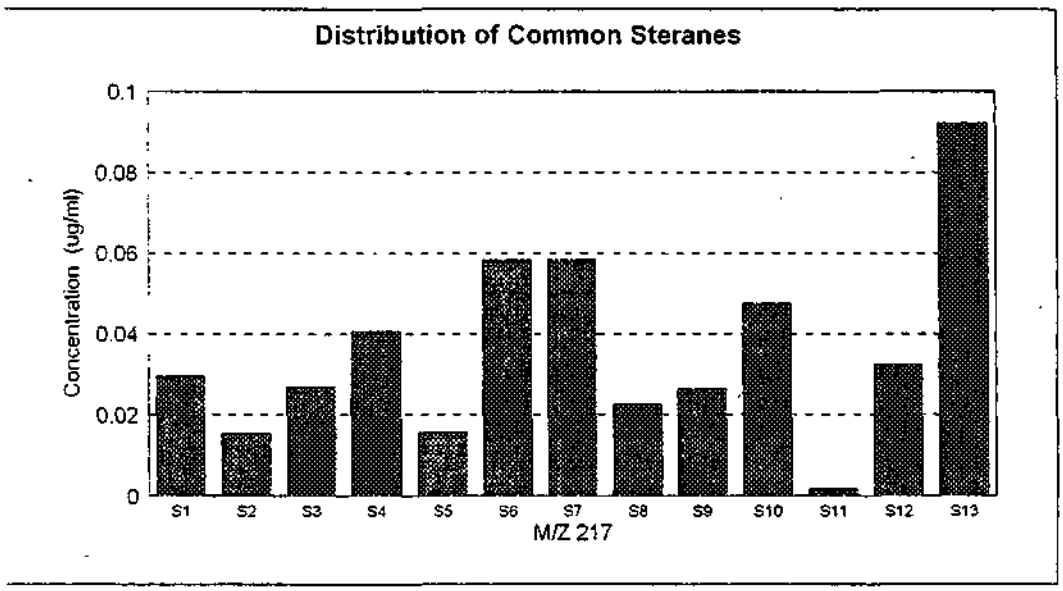

Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0317
SAMPLE LOCATION : WR24A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.14
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.06
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.07
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.16
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.09
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.10
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.15
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.11
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.13
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.25
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.19
C30 Steranes (Total)	414	C30H54	S13	0.49
Total Steranes				2.0
% C27 Steranes				22.2
% C28 Steranes				22.9
% C29 Steranes				30.1
Ratio 5a,14B,17B/Total Steranes				0.33
Ratio 20S/20R + 20S				0.41

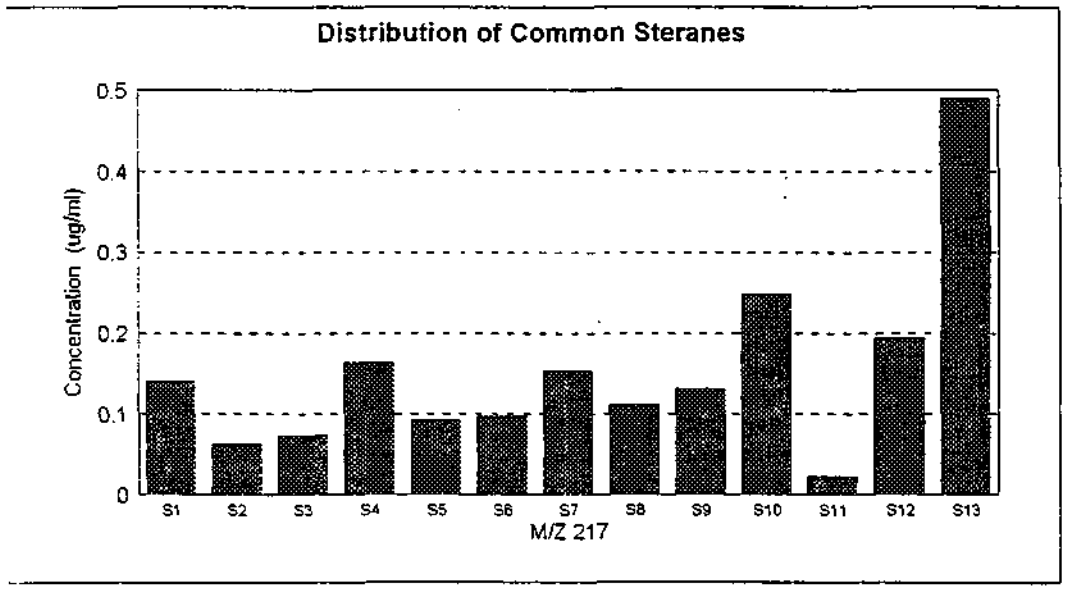

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Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0322
SAMPLE LOCATION : WR28A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.09
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.03
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.05
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.10
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.07
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.05
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.12
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.06
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.08
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.15
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.10
C30 Steranes (Total)	414	C30H54	S13	0.39
Total Steranes				1.3
% C27 Steranes				20.8
% C28 Steranes				23.0
% C29 Steranes				26.2
Ratio 5a,14B,17B/Total Steranes				0.31
Ratio 20S/20R + 20S				0.45

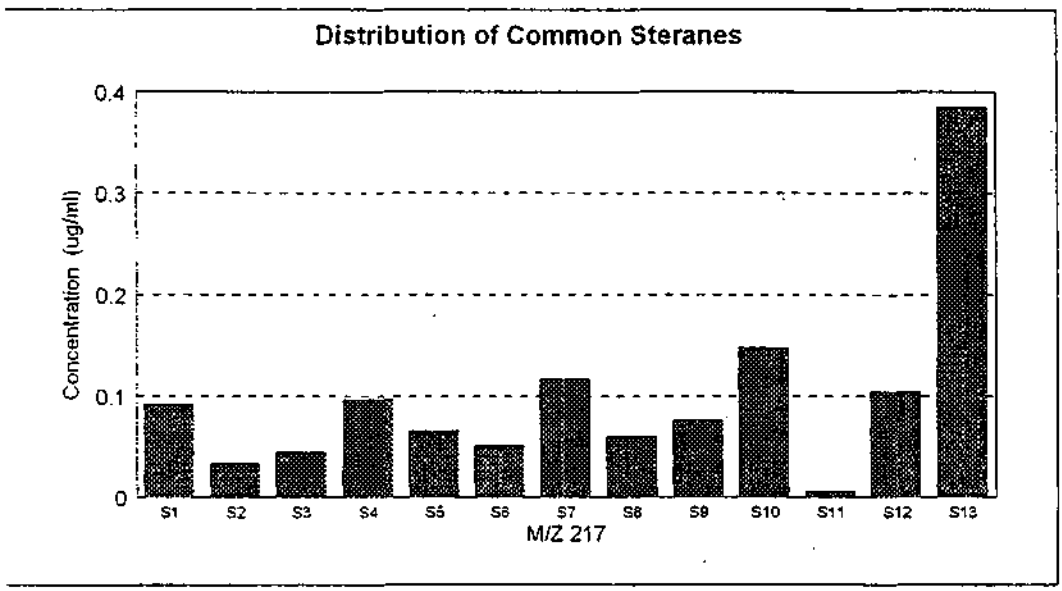


Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0322
SAMPLE LOCATION : WR28A MS

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.12
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.05
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.09
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.14
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.09
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.08
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.15
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.09
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.12
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.21
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.01
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.17
C30 Steranes (Total)	414	C30H54	S13	0.36
Total Steranes				1.7
% C27 Steranes				24.0
% C28 Steranes				24.4
% C29 Steranes				30.3
Ratio 5a,14B,17B/Total Steranes				0.35
Ratio 20S/20R + 20S				0.44

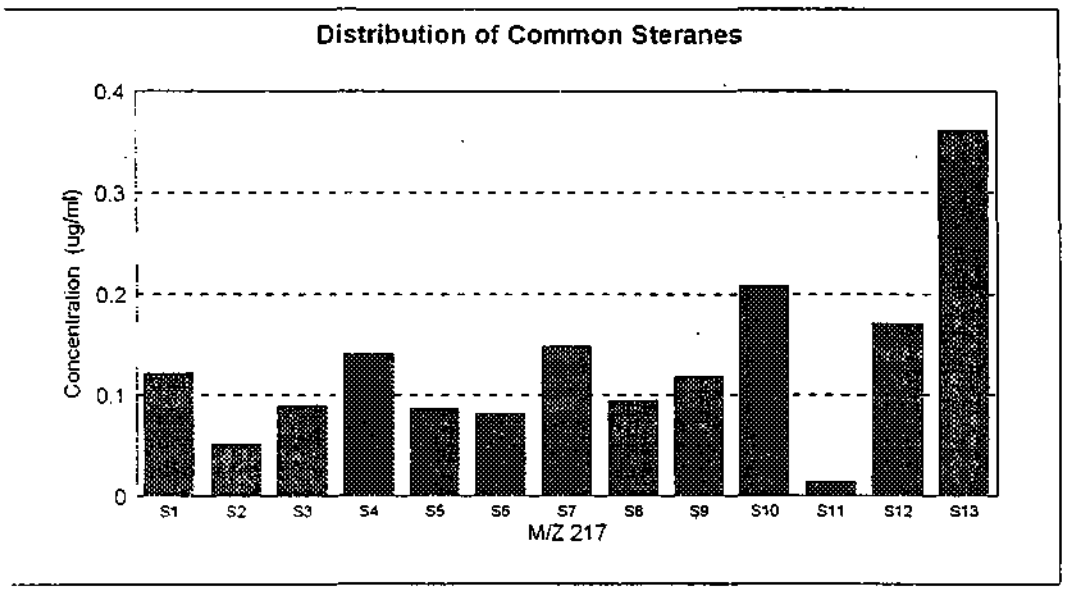
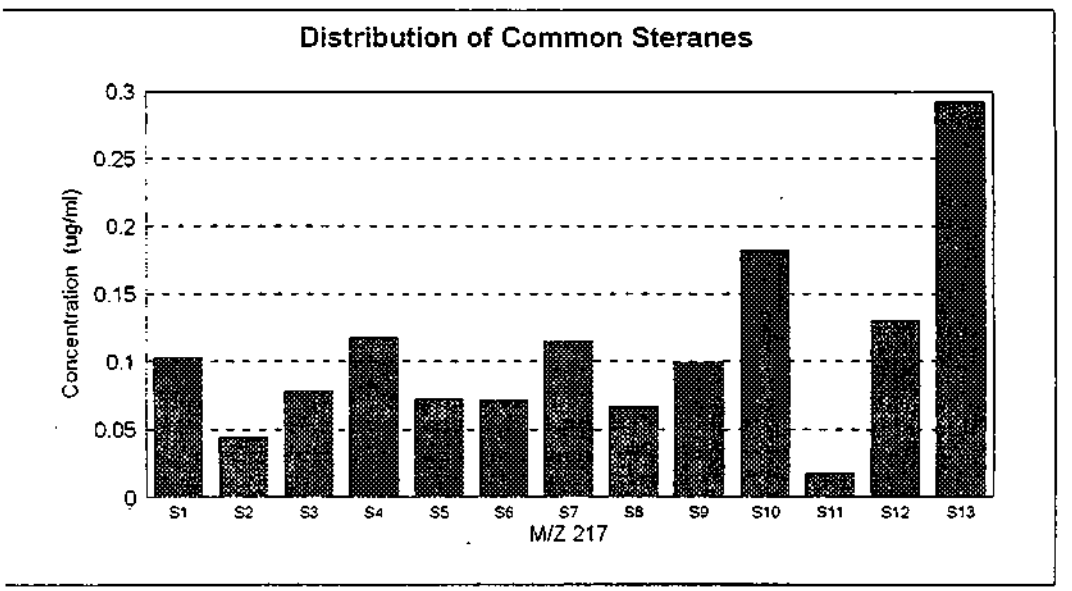


Table 3.0

Distribution of Common Steranes (m/z 217)

SAMPLE NUMBER : B0119-0322
SAMPLE LOCATION : WR28A MSD

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
5a(H),14a(H),17a(H)-cholestane (20S)	372	C27H48	S1	0.10
5a(H),14B(H),17B(H)-cholestane (20R)	372	C27H48	S2	0.04
5a(H),14B(H),17B(H)-cholestane (20S)	372	C27H48	S3	0.08
5a(H),14a(H),17a(H)-cholestane (20R)	372	C27H48	S4	0.12
5a(H),14a(H),17a(H),24-methylcholestane (20S)	386	C28H50	S5	0.07
5a(H),14B(H),17B(H),24-methylcholestane (20R)	386	C28H50	S6	0.07
5a(H),14B(H),17B(H),24-methylcholestane (20S)	386	C28H50	S7	0.12
5a(H),14a(H),17a(H),24-methylcholestane (20R)	386	C28H50	S8	0.07
5a(H),14a(H),17a(H),24-ethylcholestane (20S)	400	C29H52	S9	0.10
5a(H),14B(H),17B(H),24-ethylcholestane (20R)	400	C29H52	S10	0.18
5a(H),14B(H),17B(H),24-ethylcholestane (20S)	400	C29H52	S11	0.02
5a(H),14a(H),17a(H),24-ethylcholestane (20R)	400	C29H52	S12	0.13
C30 Steranes (Total)	**414**	**C30H54**	**S13**	**0.29**
Total Steranes				**1.4**
% C27 Steranes				**24.7**
% C28 Steranes				**23.4**
% C29 Steranes				**30.9**
Ratio 5a,14B,17B/Total Steranes				**0.37**
Ratio 20S/20R + 20S				**0.44**



Hogane Profiles

Hopare Profiles

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : 0119-0162 ms
SAMPLE LOCATION : BC3A MS

Compound	MW	Formula	Symbol	Concentration (ug/L)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.21
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.19
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.54
17a(H),21B(H)-hopane	412	C30H52	T4	0.92
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.20
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.13
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.05
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.17
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.10
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.06
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.04
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.05
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.05
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.06
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.02
Total Triterpanes				2.8
% C30				32.7
% C31-C33				27.2
% C34-C35				6.4
Tm/Ts				0.90
C29/C30				0.59
C32(S)/C32(R)				1.77
C33(S)/C33(R)				1.36
C34(S)/C34(R)				0.91
C35(S)/C35(R)				2.41
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				1.5

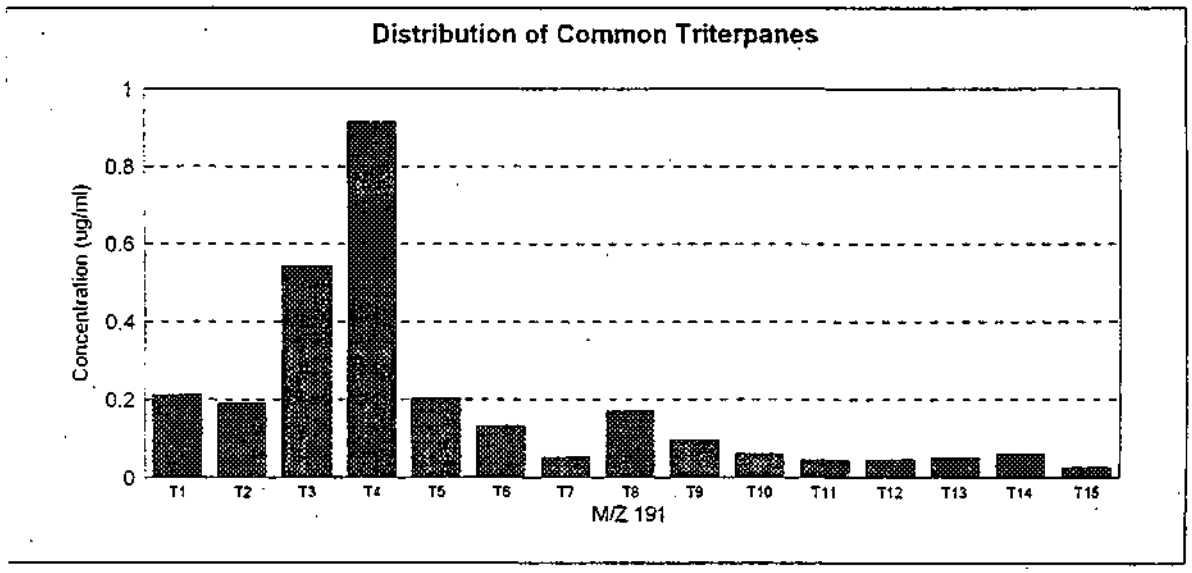


Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0252
SAMPLE LOCATION : SCIA

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.14
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.13
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.45
17a(H),21B(H)-hopane	412	C30H52	T4	0.60
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.20
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.18
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.04
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.12
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.20
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.13
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.14
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.09
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.11
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.11
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.09
Total Triterpanes				2.7
% C30				22.2
% C31-C33				36.9
% C34-C35				14.4
Tm/Ts				0.92
C29/C30				0.74
C32(S)/C32(R)				0.58
C33(S)/C33(R)				0.95
C34(S)/C34(R)				0.80
C35(S)/C35(R)				1.22
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				1.0

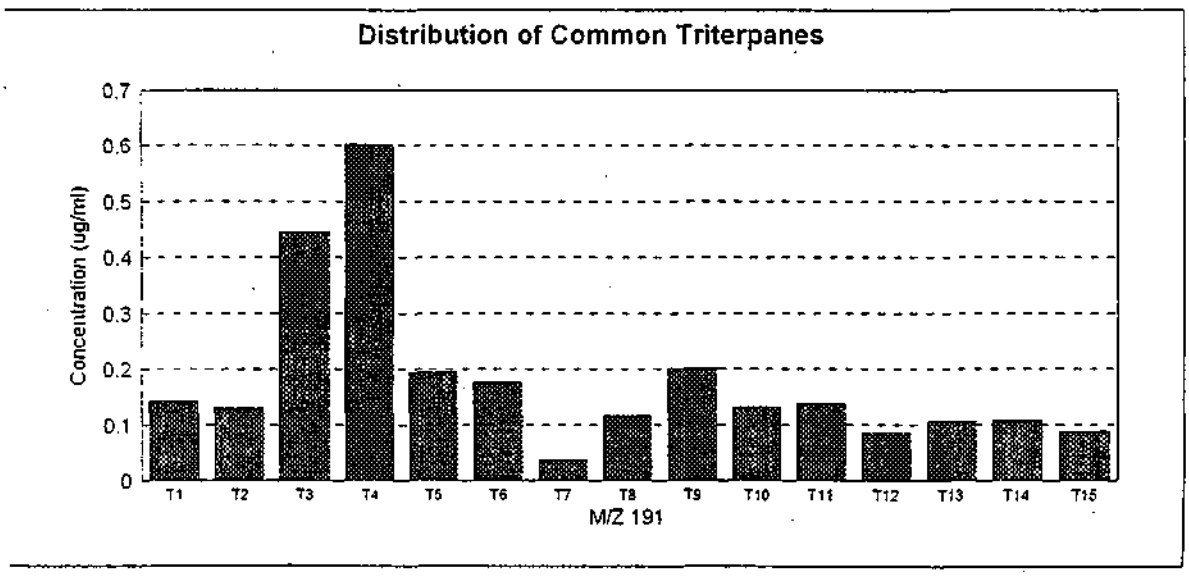


Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0266
SAMPLE LOCATION : RD3A DUP

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.04
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.04
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.14
17a(H),21B(H)-hopane	412	C30H52	T4	0.15
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.05
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.04
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.03
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.11
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.07
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.08
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.03
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.06
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.08
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.03
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.02
Total Triterpanes				1.0
% C30				15.7
% C31-C33				42.7
% C34-C35				19.8
Tm/Ts				0.86
C29/C30				0.89
C32(S)/C32(R)				1.60
C33(S)/C33(R)				2.81
C34(S)/C34(R)				0.79
C35(S)/C35(R)				1.52
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.3

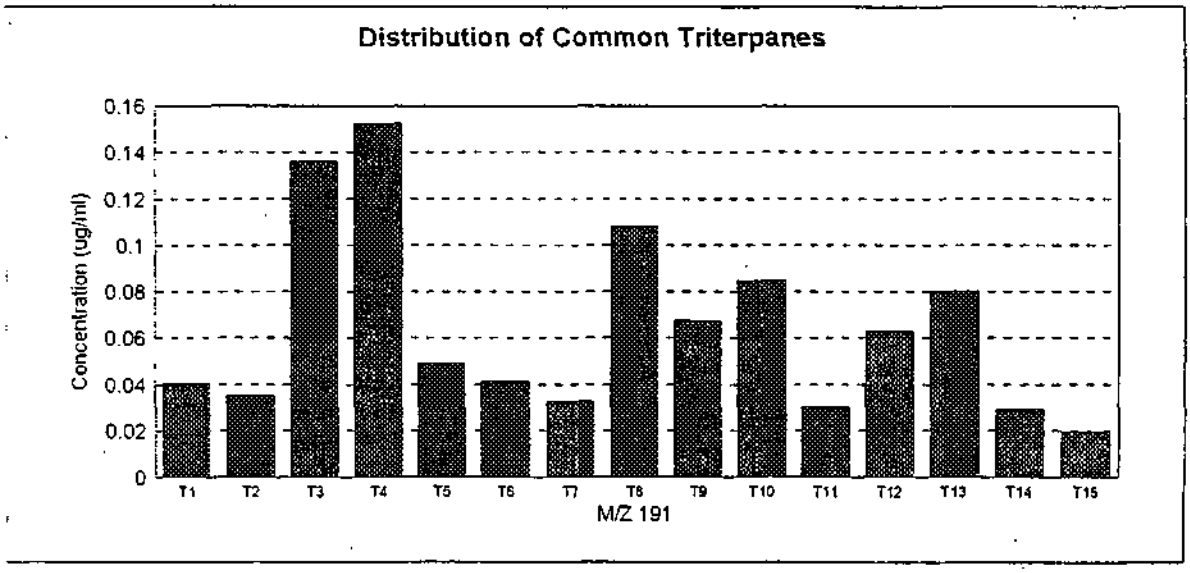


Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0265
SAMPLE LOCATION : RD3A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.10
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.10
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.34
17a(H),21B(H)-hopane	412	C30H52	T4	0.41
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.12
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.16
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.08
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.26
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.25
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.28
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.06
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.18
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.27
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.08
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.06
Total Triterpanes				2.7
% C30				14.9
% C31-C33				44.4
% C34-C35				21.1
Tm/Ts				0.97
C29/C30				0.85
C32(S)/C32(R)				1.04
C33(S)/C33(R)				5.00
C34(S)/C34(R)				0.65
C35(S)/C35(R)				1.37
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.8

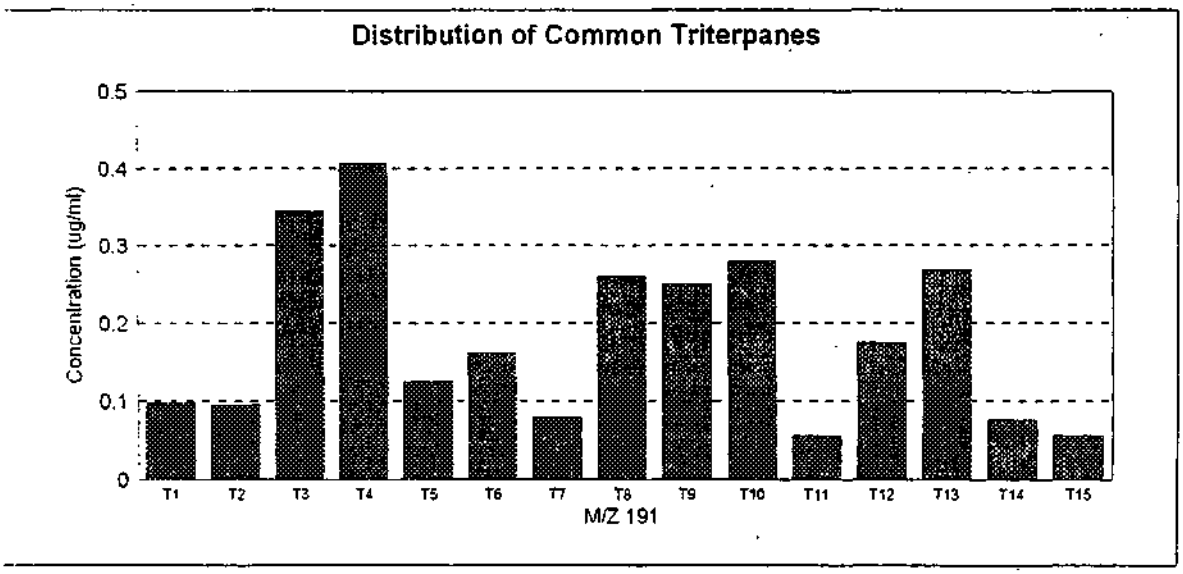


Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0249
SAMPLE LOCATION : BC3A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.06
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.07
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.21
17a(H),21B(H)-hopane	412	C30H52	T4	0.30
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.10
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.08
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.07
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.09
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.06
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.07
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.04
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.04
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.05
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.03
Total Triterpanes				1.3
% C30				23.7
% C31-C33				39.4
% C34-C35				10.9
Tm/Ts				1.17
C29/C30				0.69
C32(S)/C32(R)				1.50
C33(S)/C33(R)				1.86
C34(S)/C34(R)				1.75
C35(S)/C35(R)				1.63
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.5

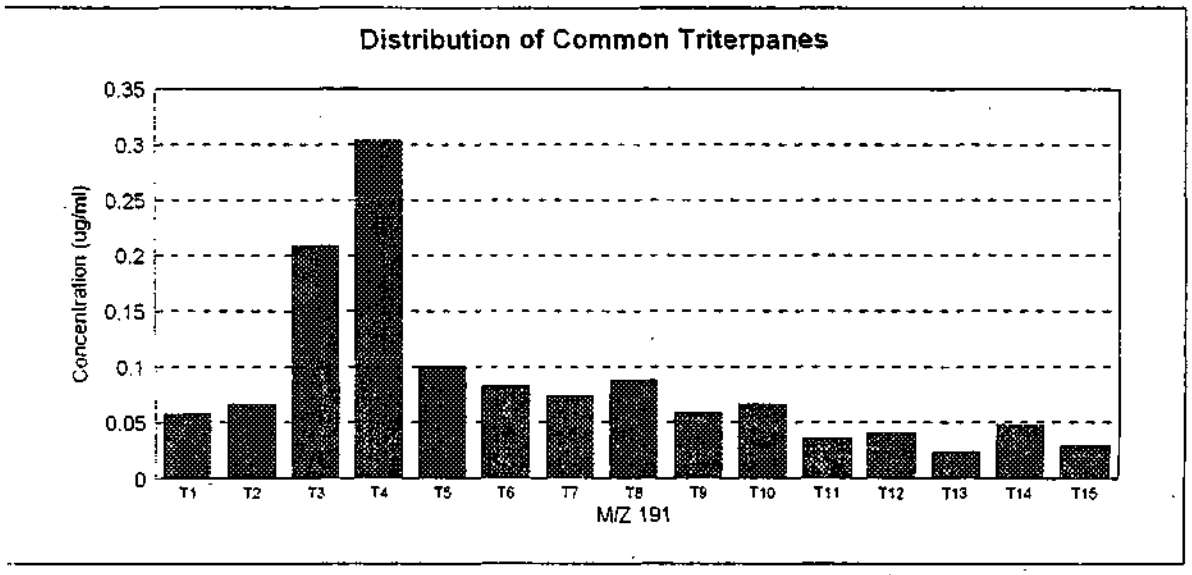


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Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0259
SAMPLE LOCATION : 33SS2A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.20
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.17
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.60
17a(H),21B(H)-hopane	412	C30H52	T4	0.85
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.25
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.23
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.15
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.24
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.16
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.16
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.11
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.10
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.09
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.12
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.09
Total Triterpanes				3.5
% C30				24.2
% C31-C33				36.8
% C34-C35				11.3
Tm/Ts				0.86
C29/C30				0.70
C32(S)/C32(R)				1.49
C33(S)/C33(R)				1.46
C34(S)/C34(R)				1.09
C35(S)/C35(R)				1.37
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				1.5

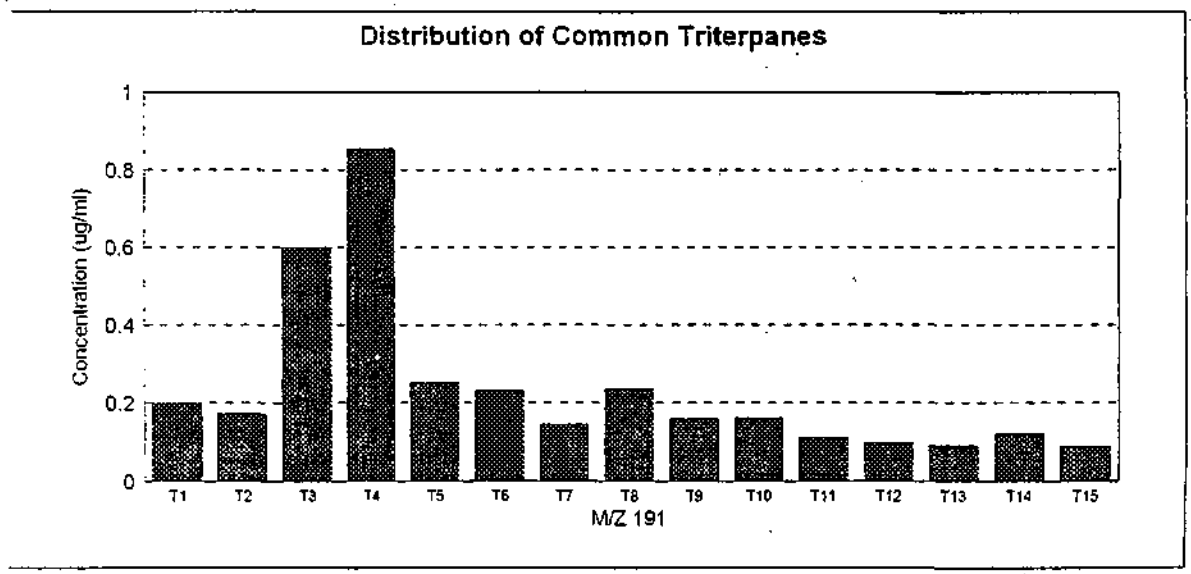

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0273
SAMPLE LOCATION : AOI102A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.06
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.06
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.25
17a(H),21B(H)-hopane	412	C30H52	T4	1.07
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.15
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.13
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.04
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.15
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.08
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.08
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.04
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.08
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.05
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.07
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.06
Total Triterpanes				2.4
% C30				44.9
% C31-C33				28.7
% C34-C35				10.8
Tm/Ts				0.88
C29/C30				0.24
C32(S)/C32(R)				1.83
C33(S)/C33(R)				2.25
C34(S)/C34(R)				1.79
C35(S)/C35(R)				1.20
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				1.3

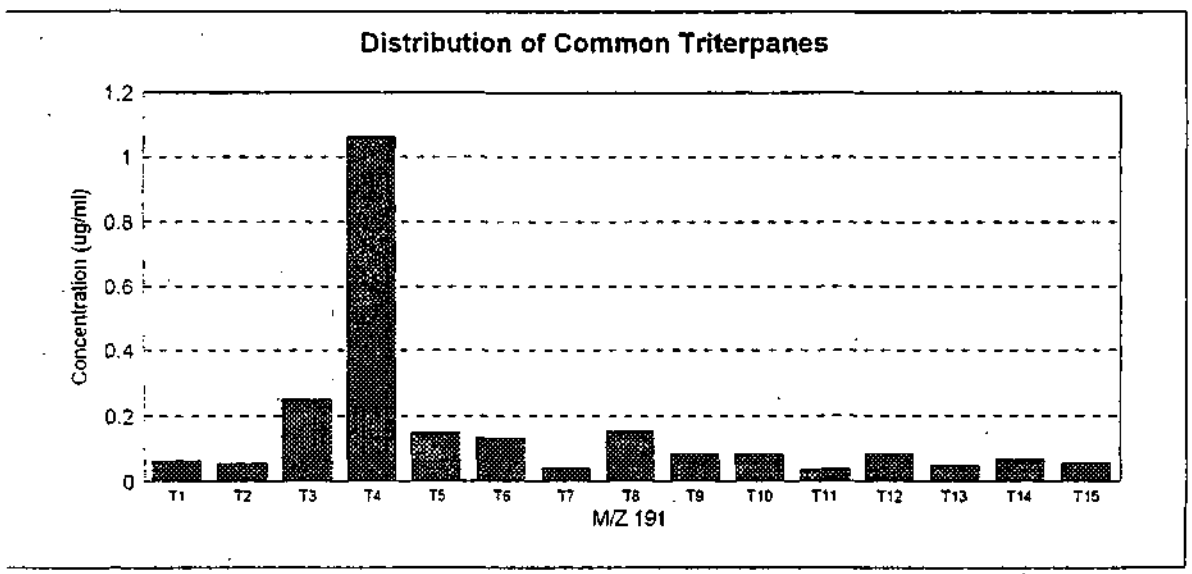

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Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : 0119-0384
SAMPLE LOCATION : 21SPSA

Compound	MW	Formula	Symbol	Concentration (ug/L)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.00
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.00
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.01
17a(H),21B(H)-hopane	412	C30H52	T4	0.01
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.00
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.00
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.00
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.03
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.02
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.02
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.00
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.01
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.01
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.00
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.00
Total Triterpanes				0.1
% C30				5.9
% C31-C33				60.0
% C34-C35				21.9
Tm/Ts				1.43
C29/C30				1.50
C32(S)/C32(R)				1.59
C33(S)/C33(R)				4.25
C34(S)/C34(R)				0.99
C35(S)/C35(R)				1.43
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.0

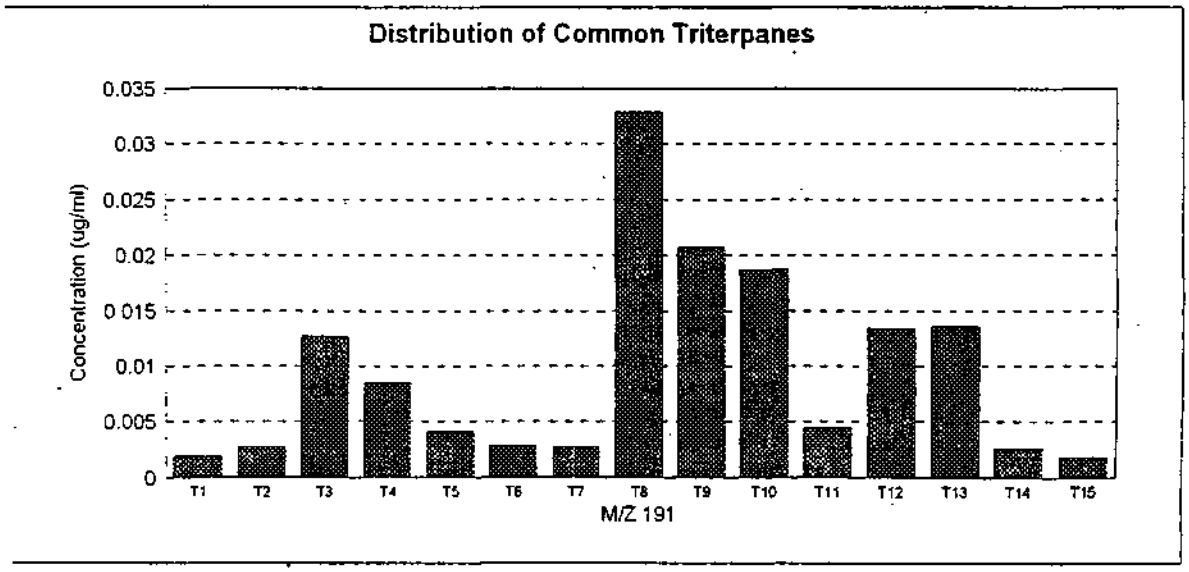

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Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0300
SAMPLE LOCATION : WR09A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.01
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.01
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.09
17a(H),21B(H)-hopane	412	C30H52	T4	0.03
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.02
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.02
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.02
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.21
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.14
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.10
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.03
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.02
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.06
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.01
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.00
Total Triterpanes				0.8
% C30				4.4
% C31-C33				68.4
% C34-C35				12.4
Tm/Ts				1.06
C29/C30				2.57
C32(S)/C32(R)				1.48
C33(S)/C33(R)				3.29
C34(S)/C34(R)				0.37
C35(S)/C35(R)				1.18
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.1

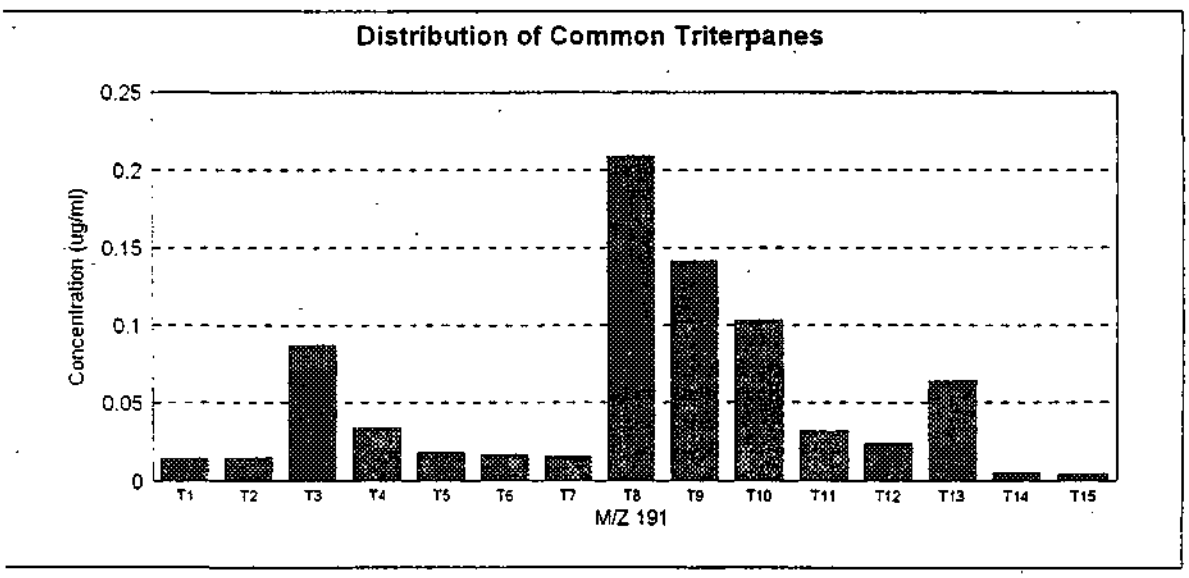

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0305
SAMPLE LOCATION : WR012A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.03
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.03
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.12
17a(H),21B(H)-hopane	412	C30H52	T4	0.11
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.03
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.03
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.03
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.16
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.06
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.11
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.03
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.04
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.05
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.01
Total Triterpanes				0.9
% C30				13.1
% C31-C33				52.4
% C34-C35				13.7
Tm/Ts				0.90
C29/C30				1.07
C32(S)/C32(R)				2.54
C33(S)/C33(R)				4.32
C34(S)/C34(R)				0.71
C35(S)/C35(R)				1.51
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.2

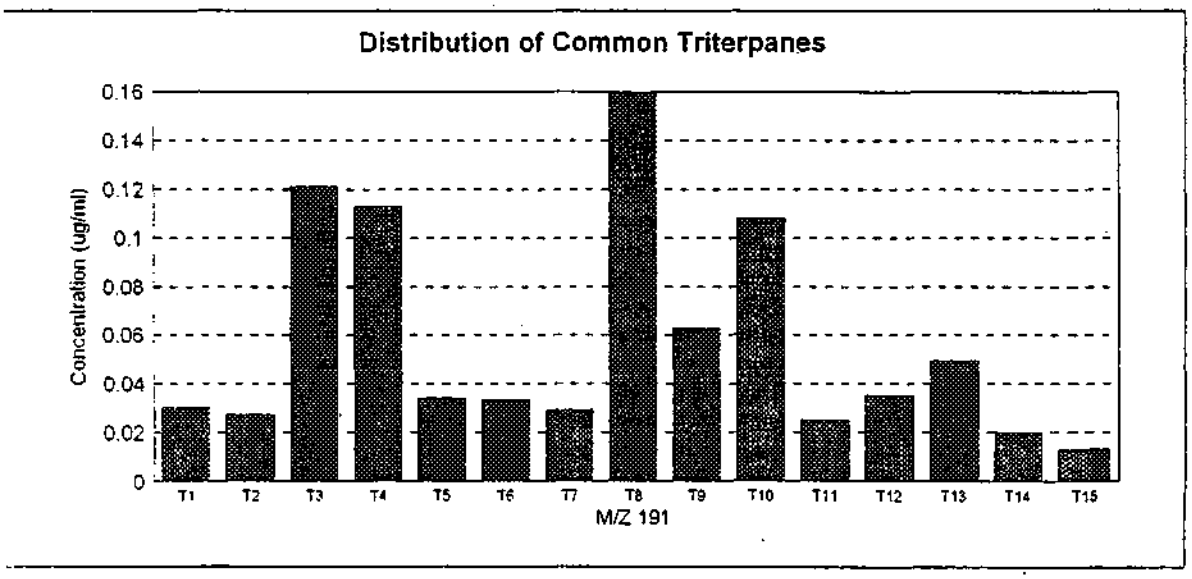

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : 0119-0309
SAMPLE LOCATION : WR019A

Compound	MW	Formula	Symbol	Concentration (ug/L)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.06
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.05
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.18
17a(H),21B(H)-hopane	412	C30H52	T4	0.24
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.08
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.07
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.05
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.15
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.06
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.06
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.03
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.08
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.06
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.06
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.04
Total Triterpanes				1.3
% C30				18.7
% C31-C33				39.6
% C34-C35				18.9
Tm/Ts				0.83
C29/C30				0.76
C32(S)/C32(R)				2.67
C33(S)/C33(R)				1.86
C34(S)/C34(R)				1.19
C35(S)/C35(R)				1.62
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.4

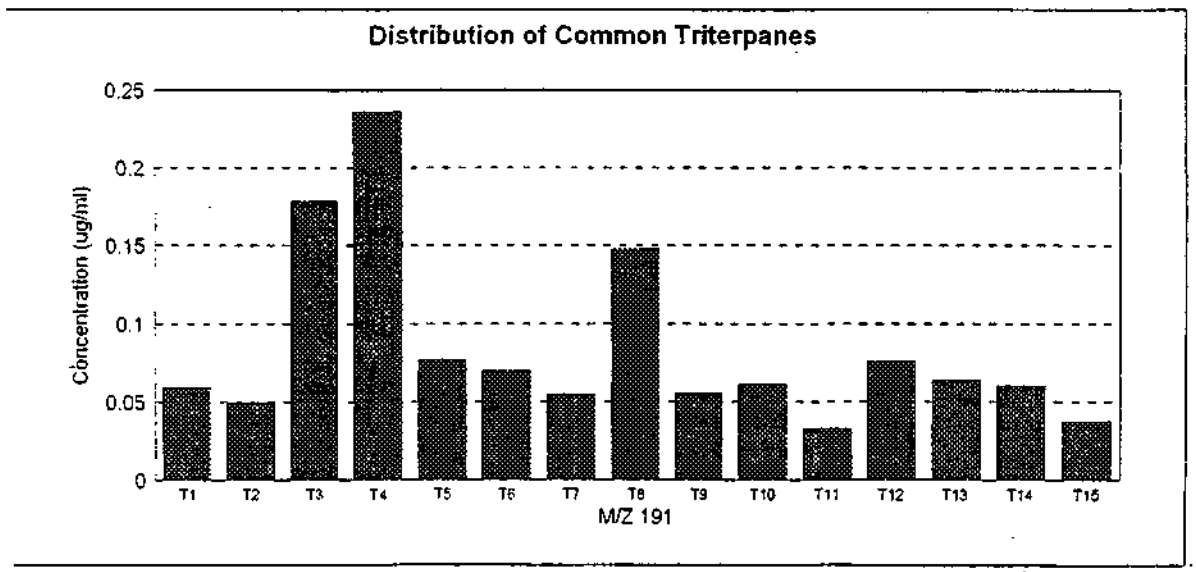

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0307
SAMPLE LOCATION : WR014A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.02
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.02
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.07
17a(H),21B(H)-hopane	412	C30H52	T4	0.09
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.04
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.03
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.03
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.04
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.02
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.02
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.01
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.03
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.01
Total Triterpanes				0.5
% C30				19.6
% C31-C33				38.7
% C34-C35				17.0
Tm/Ts				0.96
C29/C30				0.78
C32(S)/C32(R)				2.49
C33(S)/C33(R)				1.88
C34(S)/C34(R)				1.25
C35(S)/C35(R)				1.17
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.2

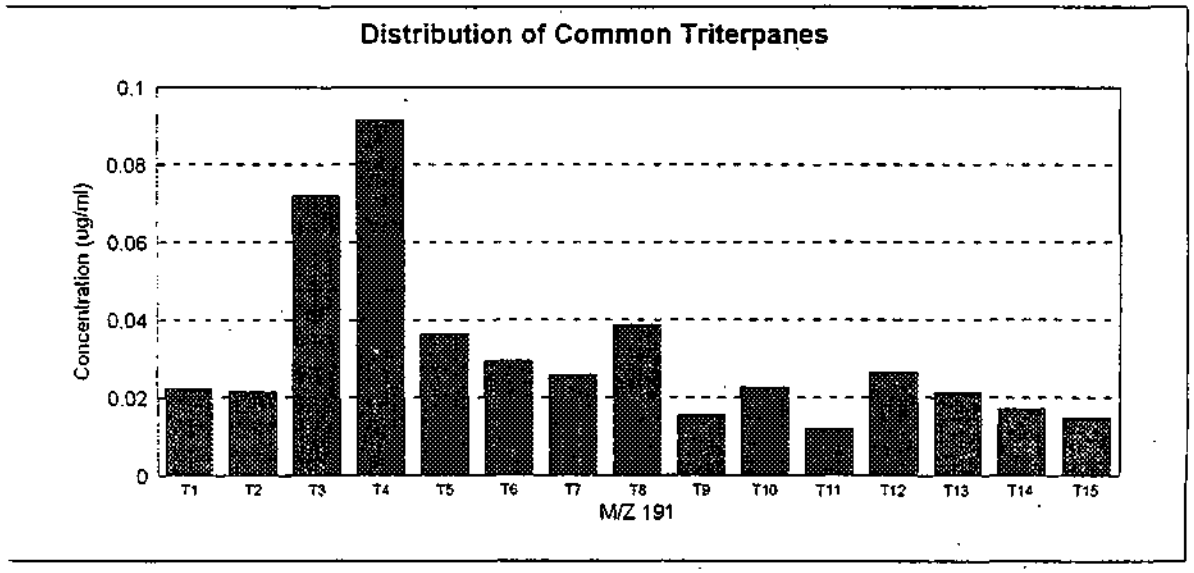

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Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0302
SAMPLE LOCATION : WR011A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.09
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.07
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.27
17a(H),21B(H)-hopane	412	C30H52	T4	0.34
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.12
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.11
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.09
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.19
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.12
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.11
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.07
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.07
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.07
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.07
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.05
Total Triterpanes				1.8
% C30				18.5
% C31-C33				43.4
% C34-C35				14.7
Tm/Ts				0.84
C29/C30				0.79
C32(S)/C32(R)				1.58
C33(S)/C33(R)				1.56
C34(S)/C34(R)				1.00
C35(S)/C35(R)				1.48
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.6

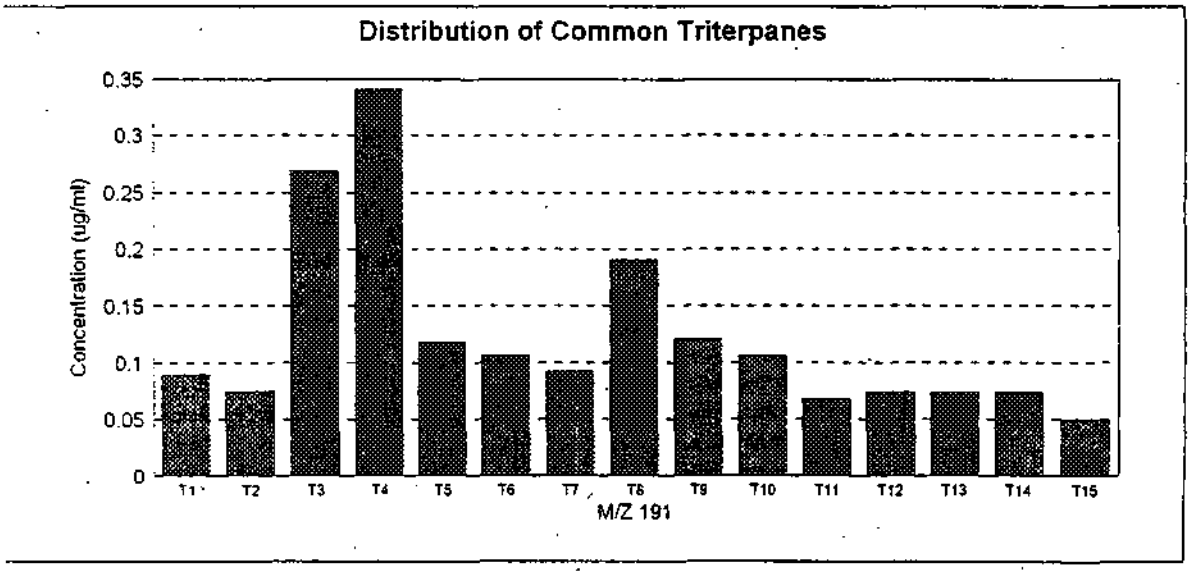

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0312
SAMPLE LOCATION : WR021ADUP

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.01
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.01
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.05
17a(H),21B(H)-hopane	412	C30H52	T4	0.06
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.02
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.02
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.02
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.03
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.02
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.02
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.01
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.03
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.01
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.01
Total Triterpanes				0.3
% C30				17.2
% C31-C33				40.3
% C34-C35				20.2
Tm/Ts				1.06
C29/C30				0.81
C32(S)/C32(R)				1.10
C33(S)/C33(R)				2.13
C34(S)/C34(R)				1.28
C35(S)/C35(R)				1.11
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.1

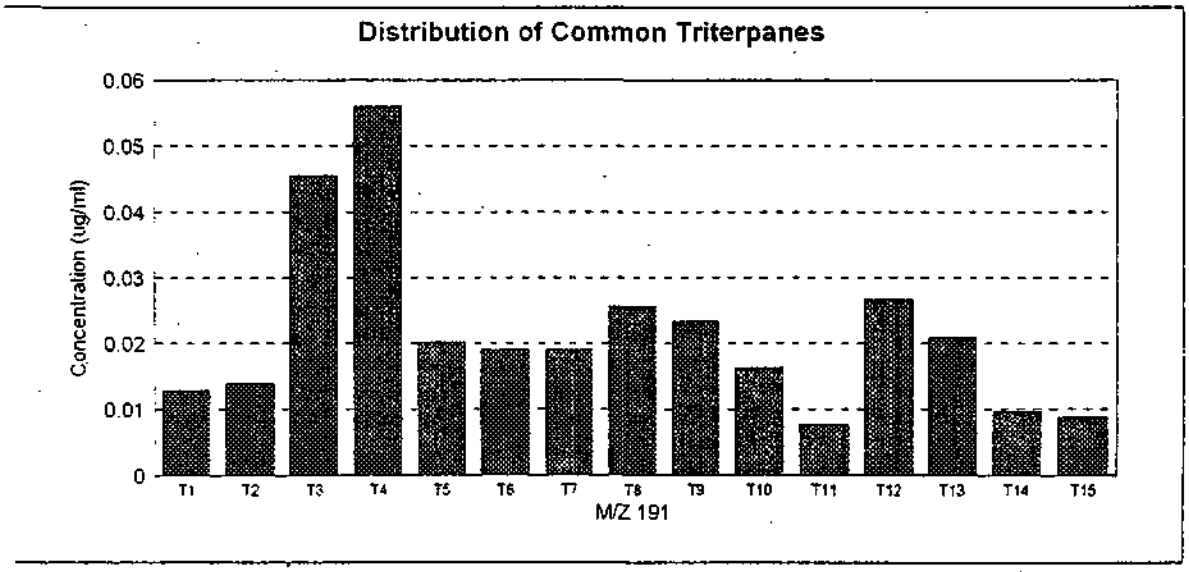

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0311
SAMPLE LOCATION : WR021A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.01
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.01
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.04
17a(H),21B(H)-hopane	412	C30H52	T4	0.05
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.02
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.02
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.02
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.02
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.01
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.01
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.01
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.02
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.01
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.01
Total Triterpanes				0.3
% C30				18.2
% C31-C33				38.9
% C34-C35				20.5
Tm/Ts				0.93
C29/C30				0.75
C32(S)/C32(R)				1.78
C33(S)/C33(R)				2.30
C34(S)/C34(R)				1.44
C35(S)/C35(R)				1.64
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.1

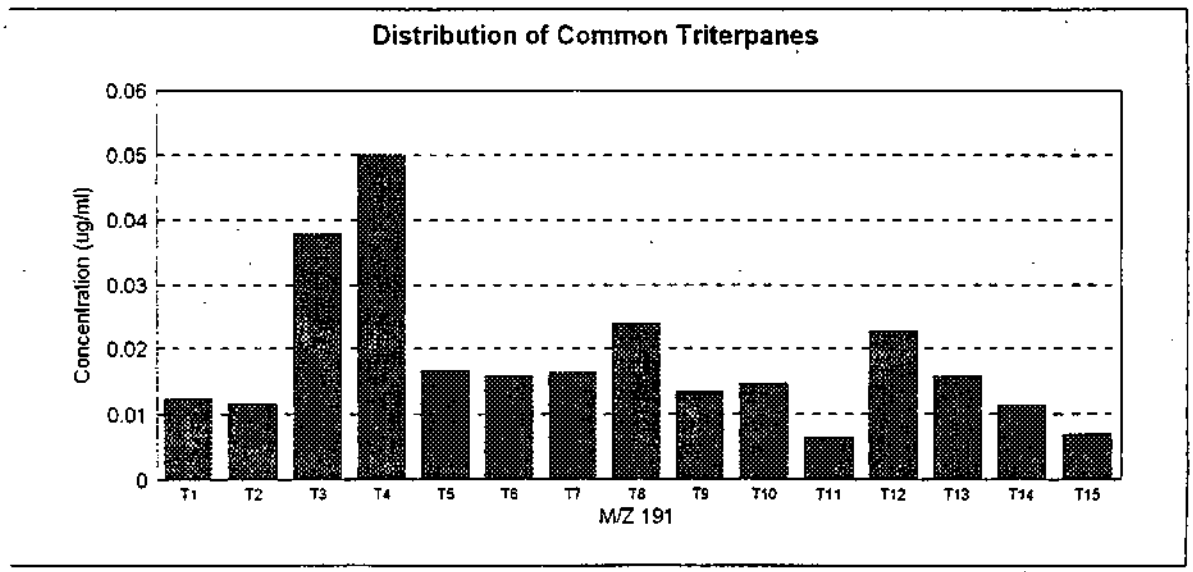

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0319
SAMPLE LOCATION : WR025A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.03
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.03
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.09
17a(H),21B(H)-hopane	412	C30H52	T4	0.12
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.04
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.04
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.03
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.05
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.03
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.04
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.02
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.02
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.03
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.03
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.02
Total Triterpanes				0.6
% C30				19.3
% C31-C33				40.0
% C34-C35				16.3
Tm/Ts				0.91
C29/C30				0.81
C32(S)/C32(R)				1.98
C33(S)/C33(R)				2.45
C34(S)/C34(R)				0.66
C35(S)/C35(R)				1.20
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.2

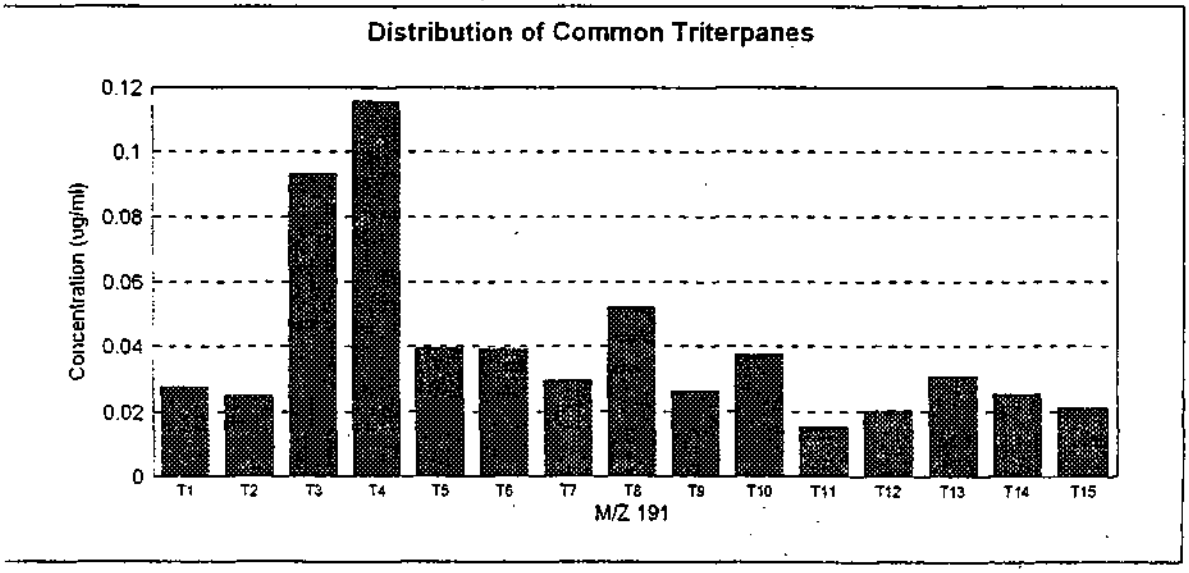

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Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0314
SAMPLE LOCATION : WR022A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.02
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.02
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.07
17a(H),21B(H)-hopane	412	C30H52	T4	0.08
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.03
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.03
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.02
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.04
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.02
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.03
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.01
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.05
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.09
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.02
Total Triterpanes				0.5
% C30				15.6
% C31-C33				32.3
% C34-C35				31.9
Tm/Ts				1.02
C29/C30				0.81
C32(S)/C32(R)				1.77
C33(S)/C33(R)				2.43
C34(S)/C34(R)				0.55
C35(S)/C35(R)				1.16
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.2

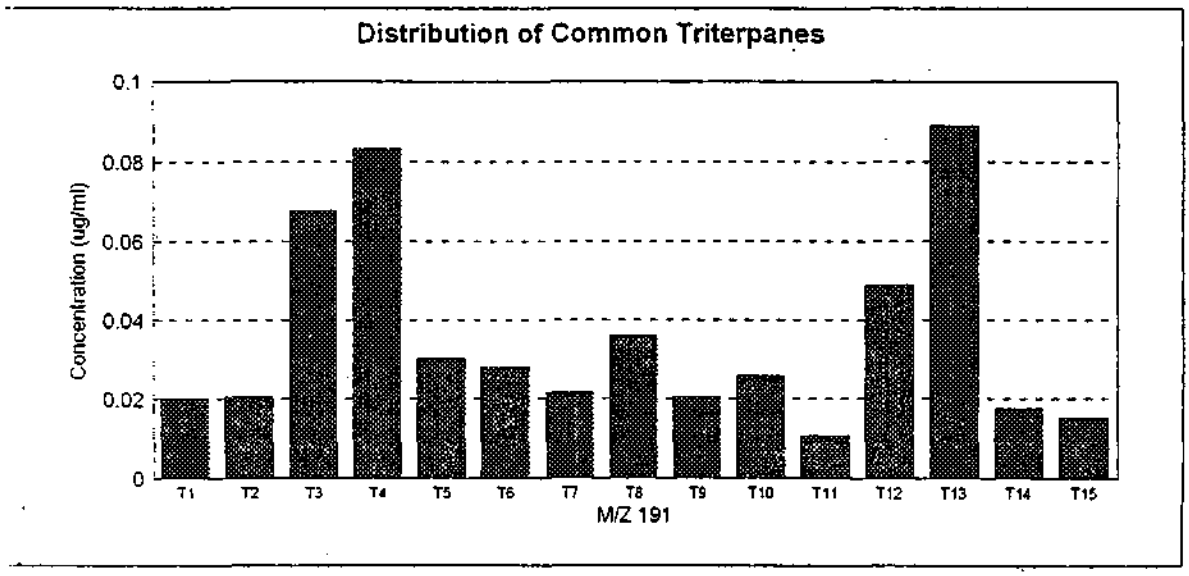

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0315
SAMPLE LOCATION : WR022ADUP

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.02
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.02
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.07
17a(H),21B(H)-hopane	412	C30H52	T4	0.09
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.03
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.03
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.02
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.07
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.04
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.03
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.01
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.04
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.04
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.02
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.01
Total Triterpanes				0.5
% C30				16.2
% C31-C33				41.7
% C34-C35				21.4
Tm/Ts				1.04
C29/C30				0.80
C32(S)/C32(R)				1.68
C33(S)/C33(R)				2.43
C34(S)/C34(R)				0.90
C35(S)/C35(R)				2.19
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.2

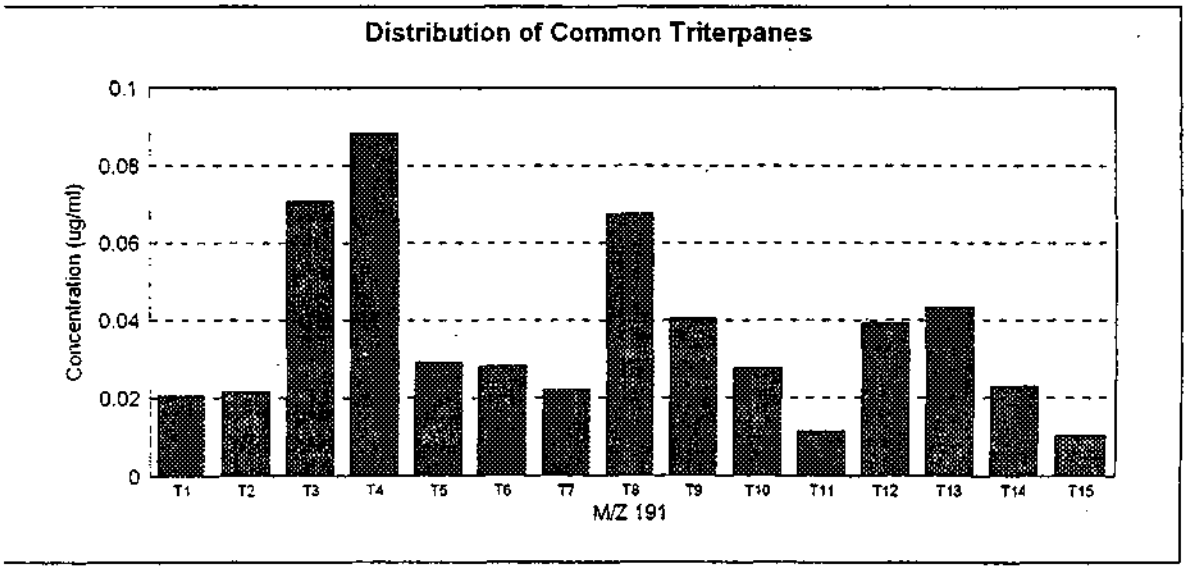

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0317
SAMPLE LOCATION : WR24A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.12
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.10
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.39
17a(H),21B(H)-hopane	412	C30H52	T4	0.49
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.16
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.18
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.13
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.30
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.20
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.16
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.08
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.16
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.16
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.10
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.06
Total Triterpanes				2.8
% C30				17.6
% C31-C33				43.3
% C34-C35				17.3
Tm/Ts				0.91
C29/C30				0.79
C32(S)/C32(R)				1.54
C33(S)/C33(R)				2.10
C34(S)/C34(R)				0.98
C35(S)/C35(R)				1.59
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.9

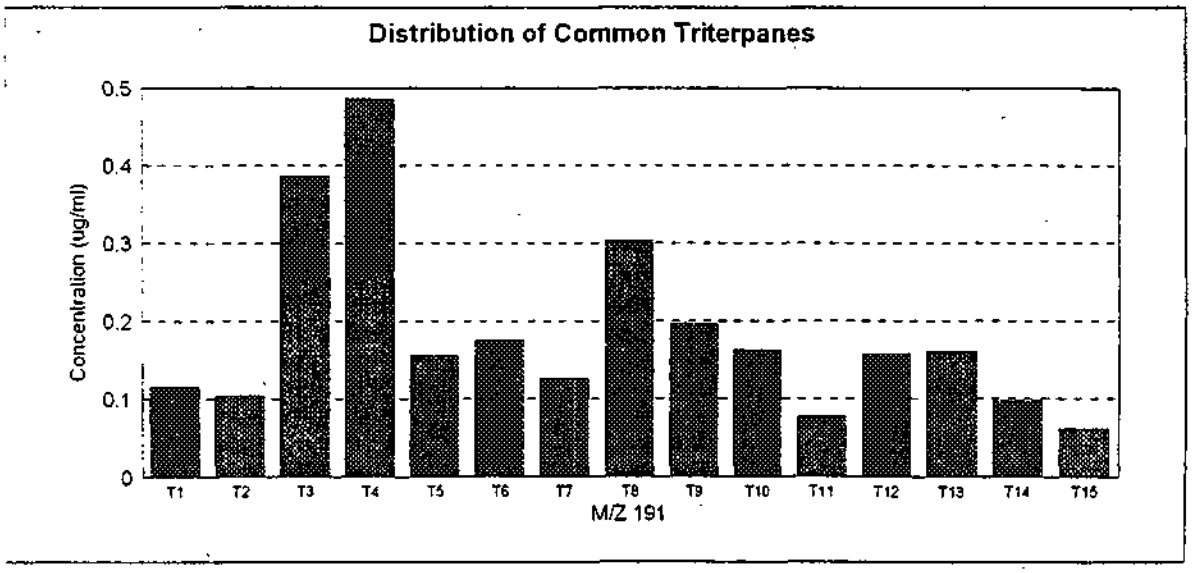

Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0322
SAMPLE LOCATION : WR28A

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.07
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.07
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.24
17a(H),21B(H)-hopane	412	C30H52	T4	0.30
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.11
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.09
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.06
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.06
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.06
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.07
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.04
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.08
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.08
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.06
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.05
Total Triterpanes				1.4
% C30				21.1
% C31-C33				33.9
% C34-C35				18.3
Tm/Ts				1.01
C29/C30				0.80
C32(S)/C32(R)				0.96
C33(S)/C33(R)				1.60
C34(S)/C34(R)				1.01
C35(S)/C35(R)				1.31
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.5

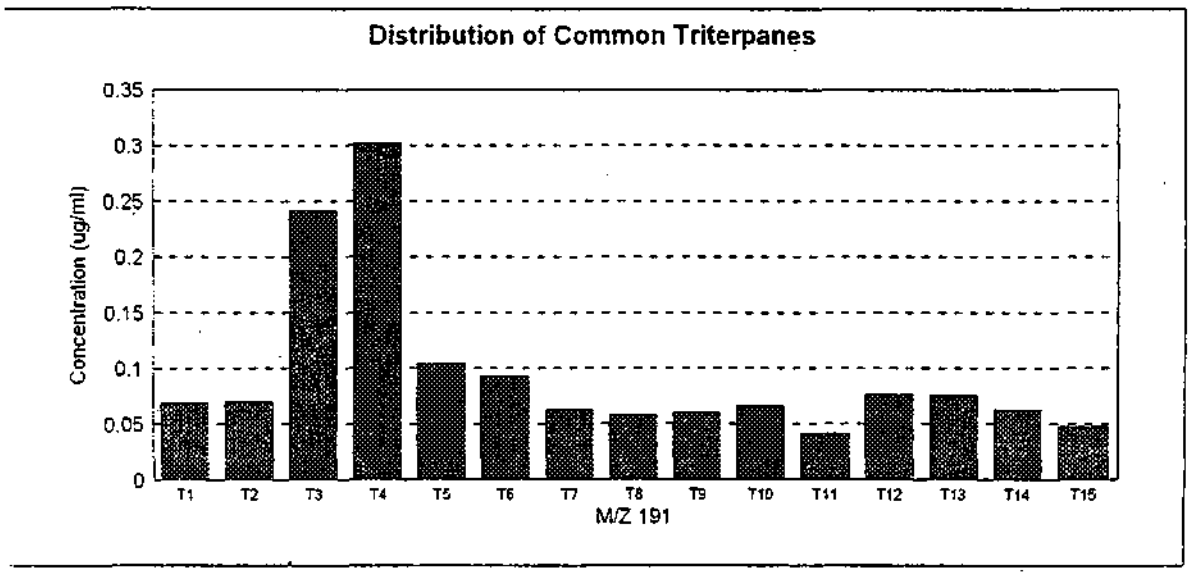

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Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0322
SAMPLE LOCATION : WR28A MS

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.10
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.09
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.33
17a(H),21B(H)-hopane	412	C30H52	T4	0.41
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.14
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.15
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.08
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.16
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.08
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.09
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.06
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.09
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.11
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.08
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.06
Total Triterpanes				2.1
% C30				19.8
% C31-C33				37.7
% C34-C35				17.0
Tm/Ts				0.87
C29/C30				0.80
C32(S)/C32(R)				1.87
C33(S)/C33(R)				1.57
C34(S)/C34(R)				0.85
C35(S)/C35(R)				1.37
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.7

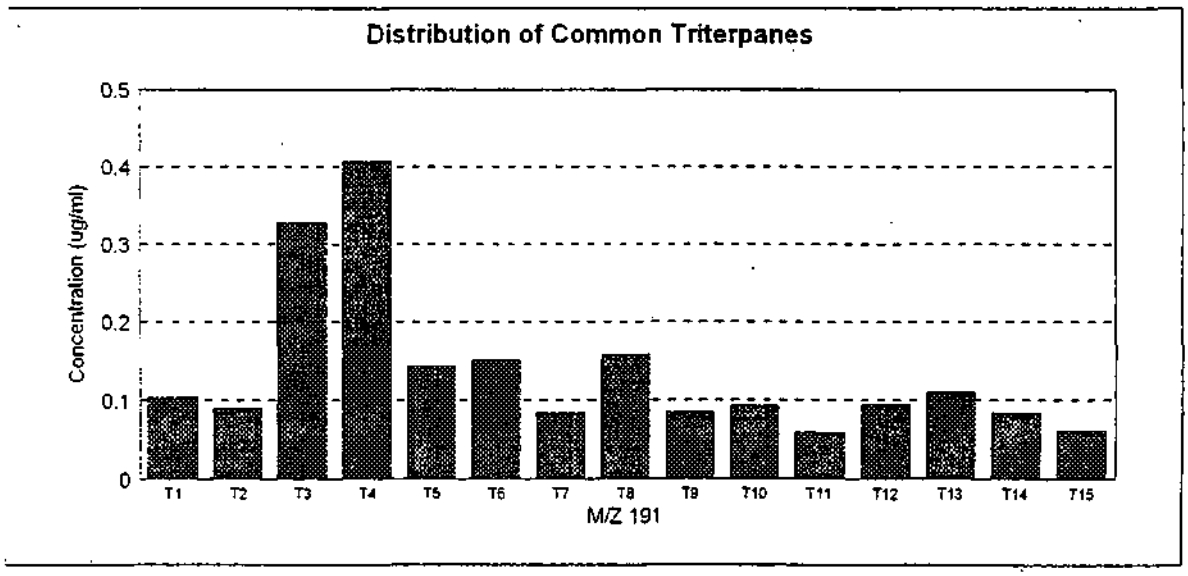

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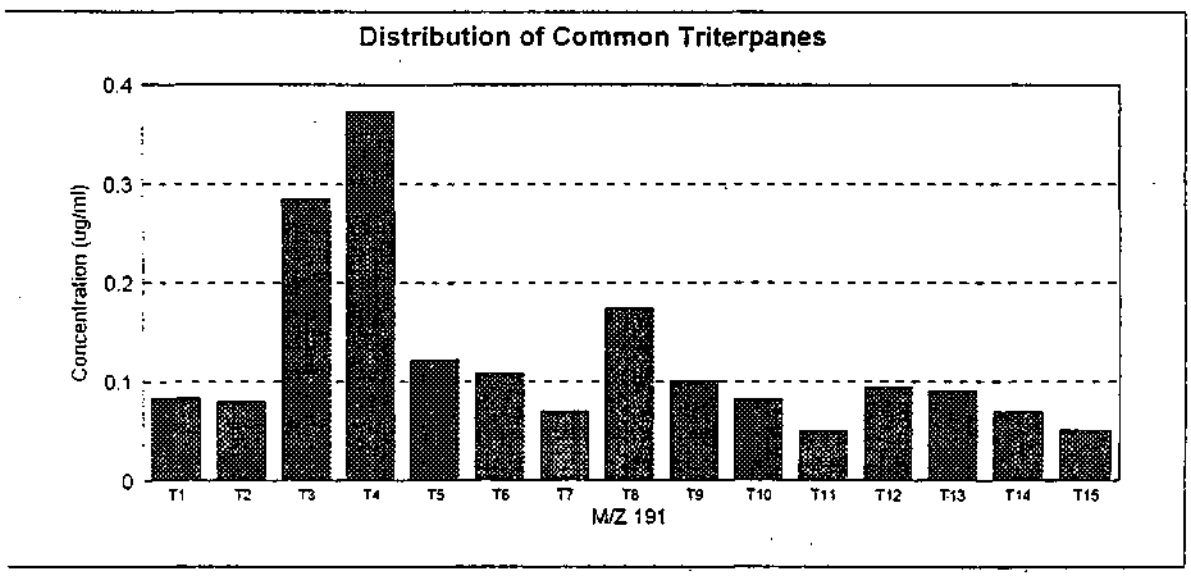
Table 4.0

Distribution of Common Hopanes (m/z 191)

SAMPLE NUMBER : B0119-0322
SAMPLE LOCATION : WR28A MSD

Compound	MW	Formula	Symbol	Concentration (mg/Kg)
18a(H)-22,29,30-trisnorhopane (Ts)	370	C27H46	T1	0.08
17a(H)-22,29,30-trisnorhopane (Tm)	370	C27H46	T2	0.08
17a(H),21B(H)-30-norhopane	398	C29H50	T3	0.28
17a(H),21B(H)-hopane	412	C30H52	T4	0.37
17a(H),21B(H)-30-homohopane (22S)	426	C31H54	T5	0.12
17a(H),21B(H)-30-homohopane (22R)	426	C31H54	T6	0.11
17B(H),21a(H)-homomoretane	426	C31H54	T7	0.07
17a(H),21B(H)-30,31-bishomohopane (22S)	440	C32H56	T8	0.17
17a(H),21B(H)-30,31-bishomohopane (22R)	440	C32H56	T9	0.10
17a(H),21B(H)-30,31,32-trishomohopane (22S)	454	C33H58	T10	0.08
17a(H),21B(H)-30,31,32-trishomohopane (22R)	454	C33H58	T11	0.05
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22S)	468	C34H60	T12	0.09
17a(H),21B(H)-30,31,32,33-tetrakishomohopane (22R)	468	C34H60	T13	0.09
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T14	0.07
17a(H),21B(H)-30,31,32,33,34-pentakishomohopane (22	482	C35H62	T15	0.05
Total Triterpanes				1.8
% C30				20.4
% C31-C33				38.5
% C34-C35				16.7
Tm/Ts				0.95
C29/C30				0.76
C32(S)/C32(R)				1.73
C33(S)/C33(R)				1.65
C34(S)/C34(R)				1.05
C35(S)/C35(R)				1.37
Weathered Percentage (%P) C29/C30 hopanes				NA
Sum of C29 + C30 Hopane (T3+T4)				0.7



Hopane + Sterane
Data Sheets

Hopane + Sterane
Data Sheets

SAMPLE NUMBER	0119-0162 ms	Ogden Railyard	
Sample Location	BC3A MS		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	1.0 Liter	Steranes RF	0.19400
Percent Moisture	100	Hopanes RF	0.52800
Final Volume	1 mL		
Additional Dilution	1 x		
Chrysene d12 Area	811594		
Perylene d12 Area	766770		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. ug/L	Estimated MDL
STERANE (S1)	O	0.1940	0.00	0.00	0.50
STERANE (S2)	O	0.1940	0.00	0.00	0.50
STERANE (S3)	O	0.1940	0.00	0.00	0.50
STERANE (S4)	O	0.1940	0.00	0.00	0.50
STERANE (S5)	O	0.1940	0.00	0.00	0.50
STERANE (S6)	O	0.1940	0.00	0.00	0.50
STERANE (S7)	O	0.1940	0.00	0.00	0.50
STERANE (S8)	O	0.1940	0.00	0.00	0.50
STERANE (S9)	O	0.1940	0.00	0.00	0.50
STERANE (S10)	O	0.1940	0.00	0.00	0.50
STERANE (S11)	O	0.1940	0.00	0.00	0.50
STERANE (S12)	O	0.1940	0.00	0.00	0.50
C30 STERANES (S13)	O	0.1940	0.00	0.00	0.50
TRITERPANE (T1)	8573	0.5280	0.21	0.21	0.50
TRITERPANE (T2)	7701	0.5280	0.19	0.19	0.50
TRITERPANE (T3)	**21996**	**0.5280**	**0.54**	**0.54**	0.50
TRITERPANE (T4)	**37057**	**0.5280**	**0.92**	**0.92**	0.50
TRITERPANE (T5)	8251	0.5280	0.20	0.20	0.50
TRITERPANE (T6)	5370	0.5280	0.13	0.13	0.50
TRITERPANE (T7)	2102	0.5280	0.05	0.05	0.50
TRITERPANE (T8)	6945	0.5280	0.17	0.17	0.50
TRITERPANE (T9)	3929	0.5280	0.10	0.10	0.50
TRITERPANE (T10)	2418	0.5280	0.06	0.06	0.50
TRITERPANE (T11)	1777	0.5280	0.04	0.04	0.50
TRITERPANE (T12)	1848	0.5280	0.05	0.05	0.50
TRITERPANE (T13)	2036	0.5280	0.05	0.05	0.50
TRITERPANE (T14)	2405	0.5280	0.06	0.06	0.50
TRITERPANE (T15)	1000	0.5280	0.02	0.02	0.50
Total of T3+T4	**59053**			**1.46**	

Very Low level of Hopanes...Steranes were not from an oil source and pattern was affected/masked by sterane compounds related to animal feces and waste.

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SAMPLE NUMBER	B0119-0252	Ogden Railyard		
Sample Location	SCIA			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.19400
Percent Solids	100		Hopanes RF	0.52800
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	1100371			
Perylene d12 Area	918091			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	21030	0.1940	0.99	0.16	0.08
STERANE (S2)	7711	0.1940	0.36	0.06	0.08
STERANE (S3)	14457	0.1940	0.68	0.11	0.08
STERANE (S4)	22684	0.1940	1.06	0.18	0.08
STERANE (S5)	16042	0.1940	0.75	0.13	0.08
STERANE (S6)	14324	0.1940	0.67	0.11	0.08
STERANE (S7)	23737	0.1940	1.11	0.19	0.08
STERANE (S8)	16328	0.1940	0.76	0.13	0.08
STERANE (S9)	21778	0.1940	1.02	0.17	0.08
STERANE (S10)	42046	0.1940	1.97	0.33	0.08
STERANE (S11)	3168	0.1940	0.15	0.02	0.08
STERANE (S12)	25183	0.1940	1.18	0.20	0.08
C30 STERANES (S13)	21303	0.1940	1.00	0.17	0.08
TRITERPANE (T1)	41518	0.5280	0.86	0.14	0.08
TRITERPANE (T2)	38219	0.5280	0.79	0.13	0.08
TRITERPANE (T3)	**129665**	**0.5280**	**2.67**	**0.45**	0.08
TRITERPANE (T4)	**175407**	**0.5280**	**3.62**	**0.60**	0.08
TRITERPANE (T5)	57115	0.5280	1.18	0.20	0.08
TRITERPANE (T6)	51679	0.5280	1.07	0.18	0.08
TRITERPANE (T7)	11061	0.5280	0.23	0.04	0.08
TRITERPANE (T8)	34131	0.5280	0.70	0.12	0.08
TRITERPANE (T9)	58567	0.5280	1.21	0.20	0.08
TRITERPANE (T10)	38455	0.5280	0.79	0.13	0.08
TRITERPANE (T11)	40412	0.5280	0.83	0.14	0.08
TRITERPANE (T12)	24839	0.5280	0.51	0.09	0.08
TRITERPANE (T13)	31169	0.5280	0.64	0.11	0.08
TRITERPANE (T14)	31625	0.5280	0.65	0.11	0.08
TRITERPANE (T15)	25833	0.5280	0.53	0.09	0.08
Total of T3+T4	**305072**			**1.05**	

SAMPLE NUMBER	B0119-0266	Ogden Railyard	
Sample Location	RD3A DUP		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.19400
Percent Solids	59	Hopanes RF	0.52800
Final Volume	5 mL		
Additional Dilution	1 x		
Chrysene d12 Area	1128172		
Perylene d12 Area	967942		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	3545	0.1940	0.16	0.05	0.14
STERANE (S2)	1466	0.1940	0.07	0.02	0.14
STERANE (S3)	2255	0.1940	0.10	0.03	0.14
STERANE (S4)	3804	0.1940	0.17	0.05	0.14
STERANE (S5)	2287	0.1940	0.10	0.03	0.14
STERANE (S6)	6644	0.1940	0.30	0.09	0.14
STERANE (S7)	6677	0.1940	0.31	0.09	0.14
STERANE (S8)	2859	0.1940	0.13	0.04	0.14
STERANE (S9)	3254	0.1940	0.15	0.04	0.14
STERANE (S10)	5708	0.1940	0.26	0.07	0.14
STERANE (S11)	438	0.1940	0.02	0.01	0.14
STERANE (S12)	3332	0.1940	0.15	0.04	0.14
C30 STERANES (S13)	13673	0.1940	0.62	0.18	0.14
TRITERPANE (T1)	7284	0.5280	0.14	0.04	0.14
TRITERPANE (T2)	6376	0.5280	0.12	0.04	0.14
TRITERPANE (T3)	**24597**	**0.5280**	**0.48**	**0.14**	0.14
TRITERPANE (T4)	**27523**	**0.5280**	**0.54**	**0.15**	0.14
TRITERPANE (T5)	8903	0.5280	0.17	0.05	0.14
TRITERPANE (T6)	7456	0.5280	0.15	0.04	0.14
TRITERPANE (T7)	5871	0.5280	0.11	0.03	0.14
TRITERPANE (T8)	19482	0.5280	0.38	0.11	0.14
TRITERPANE (T9)	12204	0.5280	0.24	0.07	0.14
TRITERPANE (T10)	15325	0.5280	0.30	0.08	0.14
TRITERPANE (T11)	5459	0.5280	0.11	0.03	0.14
TRITERPANE (T12)	11408	0.5280	0.22	0.06	0.14
TRITERPANE (T13)	14495	0.5280	0.28	0.08	0.14
TRITERPANE (T14)	5284	0.5280	0.10	0.03	0.14
TRITERPANE (T15)	3478	0.5280	0.07	0.02	0.14
Total of T3+T4	52120			0.29	

SAMPLE NUMBER	B0119-0265	Ogden Railyard		
Sample Location	RD3A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.19400
Percent Solids	27		Hopanes RF	0.52800
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	1105073			
Perylene d12 Area	915341			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	3627	0.1940	0.17	0.11	0.31
STERANE (S2)	1613	0.1940	0.08	0.05	0.31
STERANE (S3)	1968	0.1940	0.09	0.06	0.31
STERANE (S4)	5128	0.1940	0.24	0.15	0.31
STERANE (S5)	2626	0.1940	0.12	0.08	0.31
STERANE (S6)	2421	0.1940	0.11	0.07	0.31
STERANE (S7)	4728	0.1940	0.22	0.14	0.31
STERANE (S8)	2612	0.1940	0.12	0.08	0.31
STERANE (S9)	3756	0.1940	0.18	0.11	0.31
STERANE (S10)	6753	0.1940	0.31	0.20	0.31
STERANE (S11)	363	0.1940	0.02	0.01	0.31
STERANE (S12)	5483	0.1940	0.26	0.16	0.31
C30 STERANES (S13)	14300	0.1940	0.67	0.42	0.31
TRITERPANE (T1)	7559	0.5280	0.16	0.10	0.31
TRITERPANE (T2)	7359	0.5280	0.15	0.10	0.31
TRITERPANE (T3)	**26664**	**0.5280**	**0.55**	**0.34**	0.31
TRITERPANE (T4)	**31435**	**0.5280**	**0.65**	**0.41**	0.31
TRITERPANE (T5)	9658	0.5280	0.20	0.12	0.31
TRITERPANE (T6)	12585	0.5280	0.26	0.16	0.31
TRITERPANE (T7)	6136	0.5280	0.13	0.08	0.31
TRITERPANE (T8)	20145	0.5280	0.42	0.26	0.31
TRITERPANE (T9)	19419	0.5280	0.40	0.25	0.31
TRITERPANE (T10)	21619	0.5280	0.45	0.28	0.31
TRITERPANE (T11)	4323	0.5280	0.09	0.06	0.31
TRITERPANE (T12)	13578	0.5280	0.28	0.18	0.31
TRITERPANE (T13)	20808	0.5280	0.43	0.27	0.31
TRITERPANE (T14)	5897	0.5280	0.12	0.08	0.31
TRITERPANE (T15)	4298	0.5280	0.09	0.06	0.31
Total of T3+T4	**58099**			**0.75**	

SAMPLE NUMBER	B0119-0249	Ogden Railyard		
Sample Location	BC3A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.19400
Percent Solids	79		Hopanes RF	0.52800
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	1058694			
Perylene d12 Area	895013			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	5895	0.1940	0.29	0.06	0.11
STERANE (S2)	1962	0.1940	0.10	0.02	0.11
STERANE (S3)	3000	0.1940	0.15	0.03	0.11
STERANE (S4)	5552	0.1940	0.27	0.06	0.11
STERANE (S5)	4985	0.1940	0.24	0.05	0.11
STERANE (S6)	4885	0.1940	0.24	0.05	0.11
STERANE (S7)	10087	0.1940	0.49	0.10	0.11
STERANE (S8)	4196	0.1940	0.20	0.04	0.11
STERANE (S9)	7927	0.1940	0.39	0.08	0.11
STERANE (S10)	14419	0.1940	0.70	0.15	0.11
STERANE (S11)	2056	0.1940	0.10	0.02	0.11
STERANE (S12)	8843	0.1940	0.43	0.09	0.11
C30 STERANES (S13)	14772	0.1940	0.72	0.15	0.11
TRITERPANE (T1)	12800	0.5280	0.27	0.06	0.11
TRITERPANE (T2)	14939	0.5280	0.32	0.07	0.11
TRITERPANE (T3)	**46499**	**0.5280**	**0.98**	**0.21**	0.11
TRITERPANE (T4)	**67755**	**0.5280**	**1.43**	**0.30**	0.11
TRITERPANE (T5)	22421	0.5280	0.47	0.10	0.11
TRITERPANE (T6)	18400	0.5280	0.39	0.08	0.11
TRITERPANE (T7)	16449	0.5280	0.35	0.07	0.11
TRITERPANE (T8)	19613	0.5280	0.42	0.09	0.11
TRITERPANE (T9)	13085	0.5280	0.28	0.06	0.11
TRITERPANE (T10)	14742	0.5280	0.31	0.07	0.11
TRITERPANE (T11)	7932	0.5280	0.17	0.04	0.11
TRITERPANE (T12)	9049	0.5280	0.19	0.04	0.11
TRITERPANE (T13)	5157	0.5280	0.11	0.02	0.11
TRITERPANE (T14)	10609	0.5280	0.22	0.05	0.11
TRITERPANE (T15)	6495	0.5280	0.14	0.03	0.11
Total of T3+T4	**114254**			**0.51**	

SAMPLE NUMBER	B0119-0259	Ogden Railyard		
Sample Location	33SS2A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.19400
Percent Solids	68		Hopanes RF	0.52800
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	1221444			
Perylene d12 Area	983931			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	22128	0.1940	0.93	0.23	0.12
STERANE (S2)	10005	0.1940	0.42	0.10	0.12
STERANE (S3)	14670	0.1940	0.62	0.15	0.12
STERANE (S4)	31300	0.1940	1.32	0.32	0.12
STERANE (S5)	19881	0.1940	0.84	0.20	0.12
STERANE (S6)	17518	0.1940	0.74	0.18	0.12
STERANE (S7)	33770	0.1940	1.43	0.35	0.12
STERANE (S8)	18126	0.1940	0.76	0.19	0.12
STERANE (S9)	22054	0.1940	0.93	0.23	0.12
STERANE (S10)	42329	0.1940	1.79	0.44	0.12
STERANE (S11)	3548	0.1940	0.15	0.04	0.12
STERANE (S12)	27214	0.1940	1.15	0.28	0.12
C30 STERANES (S13)	29704	0.1940	1.25	0.31	0.12
TRITERPANE (T1)	42654	0.5280	0.82	0.20	0.12
TRITERPANE (T2)	36646	0.5280	0.71	0.17	0.12
TRITERPANE (T3)	**127925**	**0.5280**	**2.46**	**0.60**	0.12
TRITERPANE (T4)	**182090**	**0.5280**	**3.50**	**0.85**	0.12
TRITERPANE (T5)	54077	0.5280	1.04	0.25	0.12
TRITERPANE (T6)	49304	0.5280	0.95	0.23	0.12
TRITERPANE (T7)	30983	0.5280	0.60	0.15	0.12
TRITERPANE (T8)	50492	0.5280	0.97	0.24	0.12
TRITERPANE (T9)	33976	0.5280	0.65	0.16	0.12
TRITERPANE (T10)	34438	0.5280	0.66	0.16	0.12
TRITERPANE (T11)	23543	0.5280	0.45	0.11	0.12
TRITERPANE (T12)	20987	0.5280	0.40	0.10	0.12
TRITERPANE (T13)	19235	0.5280	0.37	0.09	0.12
TRITERPANE (T14)	25983	0.5280	0.50	0.12	0.12
TRITERPANE (T15)	19030	0.5280	0.37	0.09	0.12
Total of T3+T4	**310015**			**1.45**	

SAMPLE NUMBER	B0119-0273	Ogden Railyard		
Sample Location	AOI102A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.19400
Percent Solids	71		Hopanes RF	0.52800
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	1046949			
Perylene d12 Area	804150			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	1	0.1940	0.00	0.00	0.12
STERANE (S2)	1	0.1940	0.00	0.00	0.12
STERANE (S3)	1	0.1940	0.00	0.00	0.12
STERANE (S4)	1	0.1940	0.00	0.00	0.12
STERANE (S5)	1	0.1940	0.00	0.00	0.12
STERANE (S6)	1	0.1940	0.00	0.00	0.12
STERANE (S7)	1	0.1940	0.00	0.00	0.12
STERANE (S8)	1	0.1940	0.00	0.00	0.12
STERANE (S9)	1	0.1940	0.00	0.00	0.12
STERANE (S10)	1	0.1940	0.00	0.00	0.12
STERANE (S11)	1	0.1940	0.00	0.00	0.12
STERANE (S12)	1	0.1940	0.00	0.00	0.12
C30 STERANES (S13)	1	0.1940	0.00	0.00	0.12
TRITERPANE (T1)	11429	0.5280	0.27	0.06	0.12
TRITERPANE (T2)	10029	0.5280	0.24	0.06	0.12
TRITERPANE (T3)	**45410**	**0.5280**	**1.07**	**0.25**	0.12
TRITERPANE (T4)	**193182**	**0.5280**	**4.55**	**1.07**	0.12
TRITERPANE (T5)	27028	0.5280	0.64	0.15	0.12
TRITERPANE (T6)	24021	0.5280	0.57	0.13	0.12
TRITERPANE (T7)	7301	0.5280	0.17	0.04	0.12
TRITERPANE (T8)	27997	0.5280	0.66	0.15	0.12
TRITERPANE (T9)	15265	0.5280	0.36	0.08	0.12
TRITERPANE (T10)	15195	0.5280	0.36	0.08	0.12
TRITERPANE (T11)	6742	0.5280	0.16	0.04	0.12
TRITERPANE (T12)	15355	0.5280	0.36	0.08	0.12
TRITERPANE (T13)	8593	0.5280	0.20	0.05	0.12
TRITERPANE (T14)	12363	0.5280	0.29	0.07	0.12
TRITERPANE (T15)	10289	0.5280	0.24	0.06	0.12
Total of T3+T4	**238592**			**1.32**	

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SAMPLE NUMBER	0119-0384	Ogden Railyard	
Sample Location	21SPSA		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.18700
Percent Moisture	74	Hopanes RF	0.54100
Final Volume	1 mL		
Additional Dilution	1 x		
Chrysene d12 Area	791322		
Perylene d12 Area	645463		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. ug/L	Estimated MDL
STERANE (S1)	905	0.1870	0.06	0.00	0.02
STERANE (S2)	300	0.1870	0.02	0.00	0.02
STERANE (S3)	473	0.1870	0.03	0.00	0.02
STERANE (S4)	1081	0.1870	0.07	0.00	0.02
STERANE (S5)	564	0.1870	0.04	0.00	0.02
STERANE (S6)	1621	0.1870	0.11	0.00	0.02
STERANE (S7)	1621	0.1870	0.11	0.00	0.02
STERANE (S8)	434	0.1870	0.03	0.00	0.02
STERANE (S9)	682	0.1870	0.05	0.00	0.02
STERANE (S10)	1726	0.1870	0.12	0.01	0.02
STERANE (S11)	300	0.1870	0.02	0.00	0.02
STERANE (S12)	2226	0.1870	0.15	0.01	0.02
C30 STERANES (S13)	26252	0.1870	1.77	0.08	0.02
TRITERPANE (T1)	1493	0.5410	0.04	0.00	0.02
TRITERPANE (T2)	2133	0.5410	0.06	0.00	0.02
TRITERPANE (T3)	**9874**	**0.5410**	**0.28**	**0.01**	0.02
TRITERPANE (T4)	**6598**	**0.5410**	**0.19**	**0.01**	0.02
TRITERPANE (T5)	3166	0.5410	0.09	0.00	0.02
TRITERPANE (T6)	2171	0.5410	0.06	0.00	0.02
TRITERPANE (T7)	2082	0.5410	0.06	0.00	0.02
TRITERPANE (T8)	25486	0.5410	0.73	0.03	0.02
TRITERPANE (T9)	16036	0.5410	0.46	0.02	0.02
TRITERPANE (T10)	14520	0.5410	0.42	0.02	0.02
TRITERPANE (T11)	3416	0.5410	0.10	0.00	0.02
TRITERPANE (T12)	10407	0.5410	0.30	0.01	0.02
TRITERPANE (T13)	10527	0.5410	0.30	0.01	0.02
TRITERPANE (T14)	2040	0.5410	0.06	0.00	0.02
TRITERPANE (T15)	1430	0.5410	0.04	0.00	0.02
Total of T3+T4	**16472**			**0.02**	

Very Low level of Hopanes...Steranes were not from an oil source and pattern was affected/masked by sterane compounds related to animal feces and waste.

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SAMPLE NUMBER	B0119-0300	Ogden Railyard		
Sample Location	WR09A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.18700
Percent Solids	28		Hopanes RF	0.54100
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	968495			
Perylene d12 Area	757002			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	288	0.1870	0.02	0.01	0.29
STERANE (S2)	141	0.1870	0.01	0.00	0.29
STERANE (S3)	270	0.1870	0.01	0.01	0.29
STERANE (S4)	409	0.1870	0.02	0.01	0.29
STERANE (S5)	242	0.1870	0.01	0.01	0.29
STERANE (S6)	779	0.1870	0.04	0.03	0.29
STERANE (S7)	167	0.1870	0.01	0.01	0.29
STERANE (S8)	280	0.1870	0.02	0.01	0.29
STERANE (S9)	709	0.1870	0.04	0.02	0.29
STERANE (S10)	1911	0.1870	0.11	0.06	0.29
STERANE (S11)	369	0.1870	0.02	0.01	0.29
STERANE (S12)	1731	0.1870	0.10	0.06	0.29
C30 STERANES (S13)	4581	0.1870	0.25	0.15	0.29
TRITERPANE (T1)	976	0.5410	0.02	0.01	0.29
TRITERPANE (T2)	1034	0.5410	0.03	0.01	0.29
TRITERPANE (T3)	**6112**	**0.5410**	**0.15**	**0.09**	0.29
TRITERPANE (T4)	**2382**	**0.5410**	**0.06**	**0.03**	0.29
TRITERPANE (T5)	1266	0.5410	0.03	0.02	0.29
TRITERPANE (T6)	1159	0.5410	0.03	0.02	0.29
TRITERPANE (T7)	1092	0.5410	0.03	0.02	0.29
TRITERPANE (T8)	14598	0.5410	0.36	0.21	0.29
TRITERPANE (T9)	9855	0.5410	0.24	0.14	0.29
TRITERPANE (T10)	7213	0.5410	0.18	0.10	0.29
TRITERPANE (T11)	2194	0.5410	0.05	0.03	0.29
TRITERPANE (T12)	1660	0.5410	0.04	0.02	0.29
TRITERPANE (T13)	4462	0.5410	0.11	0.06	0.29
TRITERPANE (T14)	358	0.5410	0.01	0.01	0.29
TRITERPANE (T15)	304	0.5410	0.01	0.00	0.29
Total of T3+T4	8494			0.12	

SAMPLE NUMBER	B0119-0305	Ogden Railyard		
Sample Location	WR012A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.18700
Percent Solids	44		Hopanes RF	0.54100
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	994717			
Perylene d12 Area	765792			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	1327	0.1870	0.07	0.03	0.19
STERANE (S2)	711	0.1870	0.04	0.01	0.19
STERANE (S3)	951	0.1870	0.05	0.02	0.19
STERANE (S4)	2216	0.1870	0.12	0.04	0.19
STERANE (S5)	822	0.1870	0.04	0.02	0.19
STERANE (S6)	1734	0.1870	0.09	0.04	0.19
STERANE (S7)	1734	0.1870	0.09	0.04	0.19
STERANE (S8)	1135	0.1870	0.06	0.02	0.19
STERANE (S9)	1449	0.1870	0.08	0.03	0.19
STERANE (S10)	3861	0.1870	0.21	0.08	0.19
STERANE (S11)	704	0.1870	0.04	0.01	0.19
STERANE (S12)	2917	0.1870	0.16	0.06	0.19
C30 STERANES (S13)	9918	0.1870	0.53	0.20	0.19
TRITERPANE (T1)	3330	0.5410	0.08	0.03	0.19
TRITERPANE (T2)	2996	0.5410	0.07	0.03	0.19
TRITERPANE (T3)	**13333**	**0.5410**	**0.32**	**0.12**	0.19
TRITERPANE (T4)	**12442**	**0.5410**	**0.30**	**0.11**	0.19
TRITERPANE (T5)	3763	0.5410	0.09	0.03	0.19
TRITERPANE (T6)	3678	0.5410	0.09	0.03	0.19
TRITERPANE (T7)	3219	0.5410	0.08	0.03	0.19
TRITERPANE (T8)	17517	0.5410	0.42	0.16	0.19
TRITERPANE (T9)	6883	0.5410	0.17	0.06	0.19
TRITERPANE (T10)	11863	0.5410	0.29	0.11	0.19
TRITERPANE (T11)	2747	0.5410	0.07	0.03	0.19
TRITERPANE (T12)	3880	0.5410	0.09	0.04	0.19
TRITERPANE (T13)	5437	0.5410	0.13	0.05	0.19
TRITERPANE (T14)	2194	0.5410	0.05	0.02	0.19
TRITERPANE (T15)	1450	0.5410	0.03	0.01	0.19
Total of T3+T4	**25775**			**0.23**	

SAMPLE NUMBER	0119-0309	Ogden Railyard	
Sample Location	WR019A		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.18700
Percent Moisture	41	Hopanes RF	0.54100
Final Volume	5 mL		
Additional Dilution	1 x		
Chrysene d12 Area	610919		
Perylene d12 Area	652105		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. ug/L	Estimated MDL
STERANE (S1)	2018	0.1870	0.18	0.07	0.21
STERANE (S2)	869	0.1870	0.08	0.03	0.21
STERANE (S3)	1283	0.1870	0.11	0.05	0.21
STERANE (S4)	2212	0.1870	0.19	0.08	0.21
STERANE (S5)	1433	0.1870	0.13	0.05	0.21
STERANE (S6)	4198	0.1870	0.37	0.15	0.21
STERANE (S7)	4198	0.1870	0.37	0.15	0.21
STERANE (S8)	1508	0.1870	0.13	0.05	0.21
STERANE (S9)	2306	0.1870	0.20	0.08	0.21
STERANE (S10)	3658	0.1870	0.32	0.13	0.21
STERANE (S11)	287	0.1870	0.03	0.01	0.21
STERANE (S12)	2493	0.1870	0.22	0.09	0.21
C30 STERANES (S13)	6199	0.1870	0.54	0.22	0.21
TRITERPANE (T1)	5138	0.5410	0.15	0.06	0.21
TRITERPANE (T2)	4243	0.5410	0.12	0.05	0.21
TRITERPANE (T3)	**15372**	**0.5410**	**0.44**	**0.18**	0.21
TRITERPANE (T4)	**20254**	**0.5410**	**0.57**	**0.24**	0.21
TRITERPANE (T5)	6661	0.5410	0.19	0.08	0.21
TRITERPANE (T6)	6053	0.5410	0.17	0.07	0.21
TRITERPANE (T7)	4722	0.5410	0.13	0.05	0.21
TRITERPANE (T8)	12713	0.5410	0.36	0.15	0.21
TRITERPANE (T9)	4763	0.5410	0.14	0.06	0.21
TRITERPANE (T10)	5285	0.5410	0.15	0.06	0.21
TRITERPANE (T11)	2805	0.5410	0.08	0.03	0.21
TRITERPANE (T12)	6567	0.5410	0.19	0.08	0.21
TRITERPANE (T13)	5520	0.5410	0.16	0.06	0.21
TRITERPANE (T14)	5210	0.5410	0.15	0.06	0.21
TRITERPANE (T15)	3211	0.5410	0.09	0.04	0.21
Total of T3+T4	**35626**			**0.41**	

Very Low level of Hopanes...Steranes were not from an oil source and pattern was affected/masked by sterane compounds related to animal feces and waste.

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SAMPLE NUMBER	B0119-0307		Ogden Railyard	
Sample Location	WR014A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0	g	Steranes RF	0.18700
Percent Solids	65		Hopanes RF	0.54100
Final Volume	5	mL		
Additional Dilution	1	x		
Chrysene d12 Area	986960			
Perylene d12 Area	789162			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	1853	0.1870	0.10	0.03	0.13
STERANE (S2)	812	0.1870	0.04	0.01	0.13
STERANE (S3)	1700	0.1870	0.09	0.02	0.13
STERANE (S4)	2795	0.1870	0.15	0.04	0.13
STERANE (S5)	1493	0.1870	0.08	0.02	0.13
STERANE (S6)	4124	0.1870	0.22	0.06	0.13
STERANE (S7)	4124	0.1870	0.22	0.06	0.13
STERANE (S8)	1302	0.1870	0.07	0.02	0.13
STERANE (S9)	1842	0.1870	0.10	0.03	0.13
STERANE (S10)	3359	0.1870	0.18	0.05	0.13
STERANE (S11)	226	0.1870	0.01	0.00	0.13
STERANE (S12)	1965	0.1870	0.11	0.03	0.13
C30 STERANES (S13)	4618	0.1870	0.25	0.06	0.13
TRITERPANE (T1)	3723	0.5410	0.09	0.02	0.13
TRITERPANE (T2)	3573	0.5410	0.08	0.02	0.13
TRITERPANE (T3)	**11972**	**0.5410**	**0.28**	**0.07**	0.13
TRITERPANE (T4)	**15252**	**0.5410**	**0.36**	**0.09**	0.13
TRITERPANE (T5)	6079	0.5410	0.14	0.04	0.13
TRITERPANE (T6)	4924	0.5410	0.12	0.03	0.13
TRITERPANE (T7)	4319	0.5410	0.10	0.03	0.13
TRITERPANE (T8)	6461	0.5410	0.15	0.04	0.13
TRITERPANE (T9)	2593	0.5410	0.06	0.02	0.13
TRITERPANE (T10)	3771	0.5410	0.09	0.02	0.13
TRITERPANE (T11)	2001	0.5410	0.05	0.01	0.13
TRITERPANE (T12)	4418	0.5410	0.10	0.03	0.13
TRITERPANE (T13)	3544	0.5410	0.08	0.02	0.13
TRITERPANE (T14)	2856	0.5410	0.07	0.02	0.13
TRITERPANE (T15)	2442	0.5410	0.06	0.01	0.13
Total of T3+T4	**27224**			**0.16**	

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SAMPLE NUMBER	B0119-0302	Ogden Railyard		
Sample Location	WR011A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.18700
Percent Solids	53		Hopanes RF	0.54100
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	1133835			
Perylene d12 Area	858512			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	5107	0.1870	0.24	0.08	0.16
STERANE (S2)	2459	0.1870	0.12	0.04	0.16
STERANE (S3)	2915	0.1870	0.14	0.04	0.16
STERANE (S4)	6199	0.1870	0.29	0.09	0.16
STERANE (S5)	3183	0.1870	0.15	0.05	0.16
STERANE (S6)	1487	0.1870	0.07	0.02	0.16
STERANE (S7)	6850	0.1870	0.32	0.10	0.16
STERANE (S8)	3770	0.1870	0.18	0.06	0.16
STERANE (S9)	6652	0.1870	0.31	0.10	0.16
STERANE (S10)	11237	0.1870	0.53	0.17	0.16
STERANE (S11)	1165	0.1870	0.05	0.02	0.16
STERANE (S12)	8037	0.1870	0.38	0.12	0.16
C30 STERANES (S13)	14403	0.1870	0.68	0.21	0.16
TRITERPANE (T1)	13268	0.5410	0.29	0.09	0.16
TRITERPANE (T2)	11113	0.5410	0.24	0.07	0.16
TRITERPANE (T3)	**39878**	**0.5410**	**0.86**	**0.27**	0.16
TRITERPANE (T4)	**50615**	**0.5410**	**1.09**	**0.34**	0.16
TRITERPANE (T5)	17501	0.5410	0.38	0.12	0.16
TRITERPANE (T6)	15798	0.5410	0.34	0.11	0.16
TRITERPANE (T7)	13685	0.5410	0.29	0.09	0.16
TRITERPANE (T8)	28316	0.5410	0.61	0.19	0.16
TRITERPANE (T9)	17922	0.5410	0.39	0.12	0.16
TRITERPANE (T10)	15686	0.5410	0.34	0.11	0.16
TRITERPANE (T11)	10057	0.5410	0.22	0.07	0.16
TRITERPANE (T12)	10955	0.5410	0.24	0.07	0.16
TRITERPANE (T13)	10933	0.5410	0.24	0.07	0.16
TRITERPANE (T14)	10895	0.5410	0.23	0.07	0.16
TRITERPANE (T15)	7366	0.5410	0.16	0.05	0.16
Total of T3+T4	**90493**			**0.61**	

SAMPLE NUMBER	B0119-0312	Ogden Railyard		
Sample Location	WR021ADUP			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.18700
Percent Solids	64		Hopanes RF	0.54100
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	894518			
Perylene d12 Area	797553			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	1224	0.1870	0.07	0.02	0.13
STERANE (S2)	478	0.1870	0.03	0.01	0.13
STERANE (S3)	872	0.1870	0.05	0.01	0.13
STERANE (S4)	1611	0.1870	0.10	0.03	0.13
STERANE (S5)	969	0.1870	0.06	0.02	0.13
STERANE (S6)	2730	0.1870	0.16	0.04	0.13
STERANE (S7)	2730	0.1870	0.16	0.04	0.13
STERANE (S8)	912	0.1870	0.05	0.01	0.13
STERANE (S9)	1149	0.1870	0.07	0.02	0.13
STERANE (S10)	2145	0.1870	0.13	0.03	0.13
STERANE (S11)	203	0.1870	0.01	0.00	0.13
STERANE (S12)	1411	0.1870	0.08	0.02	0.13
C30 STERANES (S13)	3444	0.1870	0.21	0.05	0.13
TRITERPANE (T1)	2130	0.5410	0.05	0.01	0.13
TRITERPANE (T2)	2307	0.5410	0.05	0.01	0.13
TRITERPANE (T3)	**7531**	**0.5410**	**0.17**	**0.05**	0.13
TRITERPANE (T4)	**9283**	**0.5410**	**0.22**	**0.06**	0.13
TRITERPANE (T5)	3343	0.5410	0.08	0.02	0.13
TRITERPANE (T6)	3155	0.5410	0.07	0.02	0.13
TRITERPANE (T7)	3165	0.5410	0.07	0.02	0.13
TRITERPANE (T8)	4247	0.5410	0.10	0.03	0.13
TRITERPANE (T9)	3857	0.5410	0.09	0.02	0.13
TRITERPANE (T10)	2697	0.5410	0.06	0.02	0.13
TRITERPANE (T11)	1268	0.5410	0.03	0.01	0.13
TRITERPANE (T12)	4404	0.5410	0.10	0.03	0.13
TRITERPANE (T13)	3452	0.5410	0.08	0.02	0.13
TRITERPANE (T14)	1611	0.5410	0.04	0.01	0.13
TRITERPANE (T15)	1447	0.5410	0.03	0.01	0.13
Total of T3+T4	**16814**			**0.10**	

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SAMPLE NUMBER	B0119-0311	Ogden Railyard	
Sample Location	WR021A		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.18700
Percent Solids	70	Hopanes RF	0.54100
Final Volume	5 mL		
Additional Dilution	1 x		
Chrysene d12 Area	885034		
Perylene d12 Area	784078		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	1118	0.1870	0.07	0.02	0.12
STERANE (S2)	400	0.1870	0.02	0.01	0.12
STERANE (S3)	516	0.1870	0.03	0.01	0.12
STERANE (S4)	1487	0.1870	0.09	0.02	0.12
STERANE (S5)	887	0.1870	0.05	0.01	0.12
STERANE (S6)	2834	0.1870	0.17	0.04	0.12
STERANE (S7)	2834	0.1870	0.17	0.04	0.12
STERANE (S8)	890	0.1870	0.05	0.01	0.12
STERANE (S9)	1122	0.1870	0.07	0.02	0.12
STERANE (S10)	2040	0.1870	0.12	0.03	0.12
STERANE (S11)	262	0.1870	0.02	0.00	0.12
STERANE (S12)	1064	0.1870	0.06	0.02	0.12
C30 STERANES (S13)	3304	0.1870	0.20	0.05	0.12
TRITERPANE (T1)	2210	0.5410	0.05	0.01	0.12
TRITERPANE (T2)	2051	0.5410	0.05	0.01	0.12
TRITERPANE (T3)	**6725**	**0.5410**	**0.16**	**0.04**	0.12
TRITERPANE (T4)	**8918**	**0.5410**	**0.21**	**0.05**	0.12
TRITERPANE (T5)	2973	0.5410	0.07	0.02	0.12
TRITERPANE (T6)	2820	0.5410	0.07	0.02	0.12
TRITERPANE (T7)	2926	0.5410	0.07	0.02	0.12
TRITERPANE (T8)	4241	0.5410	0.10	0.02	0.12
TRITERPANE (T9)	2388	0.5410	0.06	0.01	0.12
TRITERPANE (T10)	2615	0.5410	0.06	0.01	0.12
TRITERPANE (T11)	1139	0.5410	0.03	0.01	0.12
TRITERPANE (T12)	4037	0.5410	0.10	0.02	0.12
TRITERPANE (T13)	2813	0.5410	0.07	0.02	0.12
TRITERPANE (T14)	2007	0.5410	0.05	0.01	0.12
TRITERPANE (T15)	1222	0.5410	0.03	0.01	0.12
Total of T3+T4	15643			0.09	

SAMPLE NUMBER	B0119-0319	Ogden Railyard		
Sample Location	WR025A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.18700
Percent Solids	65		Hopanes RF	0.54100
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	964420			
Perylene d12 Area	846541			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	2475	0.1870	0.14	0.04	0.13
STERANE (S2)	1247	0.1870	0.07	0.02	0.13
STERANE (S3)	2520	0.1870	0.14	0.04	0.13
STERANE (S4)	2962	0.1870	0.16	0.04	0.13
STERANE (S5)	1804	0.1870	0.10	0.03	0.13
STERANE (S6)	5007	0.1870	0.28	0.07	0.13
STERANE (S7)	5007	0.1870	0.28	0.07	0.13
STERANE (S8)	1710	0.1870	0.09	0.02	0.13
STERANE (S9)	2289	0.1870	0.13	0.03	0.13
STERANE (S10)	4202	0.1870	0.23	0.06	0.13
STERANE (S11)	145	0.1870	0.01	0.00	0.13
STERANE (S12)	3349	0.1870	0.19	0.05	0.13
C30 STERANES (S13)	7137	0.1870	0.40	0.10	0.13
TRITERPANE (T1)	4913	0.5410	0.11	0.03	0.13
TRITERPANE (T2)	4469	0.5410	0.10	0.03	0.13
TRITERPANE (T3)	**16645**	**0.5410**	**0.36**	**0.09**	0.13
TRITERPANE (T4)	**20644**	**0.5410**	**0.45**	**0.12**	0.13
TRITERPANE (T5)	7042	0.5410	0.15	0.04	0.13
TRITERPANE (T6)	7002	0.5410	0.15	0.04	0.13
TRITERPANE (T7)	5291	0.5410	0.12	0.03	0.13
TRITERPANE (T8)	9256	0.5410	0.20	0.05	0.13
TRITERPANE (T9)	4666	0.5410	0.10	0.03	0.13
TRITERPANE (T10)	6695	0.5410	0.15	0.04	0.13
TRITERPANE (T11)	2735	0.5410	0.06	0.02	0.13
TRITERPANE (T12)	3628	0.5410	0.08	0.02	0.13
TRITERPANE (T13)	5538	0.5410	0.12	0.03	0.13
TRITERPANE (T14)	4530	0.5410	0.10	0.03	0.13
TRITERPANE (T15)	3764	0.5410	0.08	0.02	0.13
Total of T3+T4	**37289**			**0.21**	

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SAMPLE NUMBER	B0119-0314	Ogden Railyard		
Sample Location	WR022A			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.18700
Percent Solids	73		Hopanes RF	0.54100
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	1012114			
Perylene d12 Area	878122			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	2310	0.1870	0.12	0.03	0.11
STERANE (S2)	1108	0.1870	0.06	0.01	0.11
STERANE (S3)	2046	0.1870	0.11	0.02	0.11
STERANE (S4)	2762	0.1870	0.15	0.03	0.11
STERANE (S5)	1500	0.1870	0.08	0.02	0.11
STERANE (S6)	4574	0.1870	0.24	0.06	0.11
STERANE (S7)	4574	0.1870	0.24	0.06	0.11
STERANE (S8)	1720	0.1870	0.09	0.02	0.11
STERANE (S9)	2011	0.1870	0.11	0.02	0.11
STERANE (S10)	3322	0.1870	0.18	0.04	0.11
STERANE (S11)	426	0.1870	0.02	0.01	0.11
STERANE (S12)	2656	0.1870	0.14	0.03	0.11
C30 STERANES (S13)	6903	0.1870	0.36	0.08	0.11
TRITERPANE (T1)	4164	0.5410	0.09	0.02	0.11
TRITERPANE (T2)	4242	0.5410	0.09	0.02	0.11
TRITERPANE (T3)	**14026**	**0.5410**	**0.30**	**0.07**	0.11
TRITERPANE (T4)	**17257**	**0.5410**	**0.36**	**0.08**	0.11
TRITERPANE (T5)	6248	0.5410	0.13	0.03	0.11
TRITERPANE (T6)	5828	0.5410	0.12	0.03	0.11
TRITERPANE (T7)	4503	0.5410	0.09	0.02	0.11
TRITERPANE (T8)	7480	0.5410	0.16	0.04	0.11
TRITERPANE (T9)	4237	0.5410	0.09	0.02	0.11
TRITERPANE (T10)	5348	0.5410	0.11	0.03	0.11
TRITERPANE (T11)	2205	0.5410	0.05	0.01	0.11
TRITERPANE (T12)	10109	0.5410	0.21	0.05	0.11
TRITERPANE (T13)	18403	0.5410	0.39	0.09	0.11
TRITERPANE (T14)	3658	0.5410	0.08	0.02	0.11
TRITERPANE (T15)	3160	0.5410	0.07	0.02	0.11
Total of T3+T4	**31283**			**0.15**	

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SAMPLE NUMBER	B0119-0315	Ogden Railyard		
Sample Location	WR022ADUP			
WA#	R1A00119			
Matrix	Oil			
HIGH, or LOW level	LOW			
Initial Wt. or Vol.	30.0 g		Steranes RF	0.18700
Percent Solids	62		Hopanes RF	0.54100
Final Volume	5 mL			
Additional Dilution	1 x			
Chrysene d12 Area	996928			
Perylene d12 Area	875130			
Internal Standard (ng)	10			

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	2056	0.1870	0.11	0.03	0.13
STERANE (S2)	1064	0.1870	0.06	0.02	0.13
STERANE (S3)	1864	0.1870	0.10	0.03	0.13
STERANE (S4)	2829	0.1870	0.15	0.04	0.13
STERANE (S5)	1084	0.1870	0.06	0.02	0.13
STERANE (S6)	4054	0.1870	0.22	0.06	0.13
STERANE (S7)	4054	0.1870	0.22	0.06	0.13
STERANE (S8)	1564	0.1870	0.08	0.02	0.13
STERANE (S9)	1825	0.1870	0.10	0.03	0.13
STERANE (S10)	3305	0.1870	0.18	0.05	0.13
STERANE (S11)	122	0.1870	0.01	0.00	0.13
STERANE (S12)	2246	0.1870	0.12	0.03	0.13
C30 STERANES (S13)	6404	0.1870	0.34	0.09	0.13
TRITERPANE (T1)	3668	0.5410	0.08	0.02	0.13
TRITERPANE (T2)	3829	0.5410	0.08	0.02	0.13
TRITERPANE (T3)	**12491**	**0.5410**	**0.26**	**0.07**	0.13
TRITERPANE (T4)	**15583**	**0.5410**	**0.33**	**0.09**	0.13
TRITERPANE (T5)	5160	0.5410	0.11	0.03	0.13
TRITERPANE (T6)	5005	0.5410	0.11	0.03	0.13
TRITERPANE (T7)	3915	0.5410	0.08	0.02	0.13
TRITERPANE (T8)	11957	0.5410	0.25	0.07	0.13
TRITERPANE (T9)	7136	0.5410	0.15	0.04	0.13
TRITERPANE (T10)	4900	0.5410	0.10	0.03	0.13
TRITERPANE (T11)	2014	0.5410	0.04	0.01	0.13
TRITERPANE (T12)	6951	0.5410	0.15	0.04	0.13
TRITERPANE (T13)	7681	0.5410	0.16	0.04	0.13
TRITERPANE (T14)	4055	0.5410	0.09	0.02	0.13
TRITERPANE (T15)	1855	0.5410	0.04	0.01	0.13
Total of T3+T4	**28074**			**0.16**	

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SAMPLE NUMBER	B0119-0317	Ogden Railyard	
Sample Location	WR24A		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.18700
Percent Solids	29	Hopanes RF	0.54100
Final Volume	5 mL		
Additional Dilution	1 x		
Chrysene d12 Area	1006842		
Perylene d12 Area	852492		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	4665	0.1870	0.25	0.14	0.28
STERANE (S2)	2074	0.1870	0.11	0.06	0.28
STERANE (S3)	2440	0.1870	0.13	0.07	0.28
STERANE (S4)	5445	0.1870	0.29	0.16	0.28
STERANE (S5)	3076	0.1870	0.16	0.09	0.28
STERANE (S6)	3234	0.1870	0.17	0.10	0.28
STERANE (S7)	5100	0.1870	0.27	0.15	0.28
STERANE (S8)	3681	0.1870	0.20	0.11	0.28
STERANE (S9)	4342	0.1870	0.23	0.13	0.28
STERANE (S10)	8256	0.1870	0.44	0.25	0.28
STERANE (S11)	735	0.1870	0.04	0.02	0.28
STERANE (S12)	6444	0.1870	0.34	0.19	0.28
C30 STERANES (S13)	16274	0.1870	0.86	0.49	0.28
TRITERPANE (T1)	9389	0.5410	0.20	0.12	0.28
TRITERPANE (T2)	8513	0.5410	0.18	0.10	0.28
TRITERPANE (T3)	**31363**	**0.5410**	**0.68**	**0.39**	0.28
TRITERPANE (T4)	**39578**	**0.5410**	**0.86**	**0.49**	0.28
TRITERPANE (T5)	12678	0.5410	0.27	0.16	0.28
TRITERPANE (T6)	14257	0.5410	0.31	0.18	0.28
TRITERPANE (T7)	10203	0.5410	0.22	0.13	0.28
TRITERPANE (T8)	24693	0.5410	0.54	0.30	0.28
TRITERPANE (T9)	16029	0.5410	0.35	0.20	0.28
TRITERPANE (T10)	13242	0.5410	0.29	0.16	0.28
TRITERPANE (T11)	6301	0.5410	0.14	0.08	0.28
TRITERPANE (T12)	12864	0.5410	0.28	0.16	0.28
TRITERPANE (T13)	13122	0.5410	0.28	0.16	0.28
TRITERPANE (T14)	7937	0.5410	0.17	0.10	0.28
TRITERPANE (T15)	5004	0.5410	0.11	0.06	0.28
Total of T3+T4	70941			0.87	

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SAMPLE NUMBER	B0119-0322	Ogden Railyard	
Sample Location	WR28A		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.18700
Percent Solids	48	Hopanes RF	0.54100
Final Volume	5 mL		
Additional Dilution	1 x		
Chrysene d12 Area	1068154		
Perylene d12 Area	900838		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	5319	0.1870	0.27	0.09	0.17
STERANE (S2)	1925	0.1870	0.10	0.03	0.17
STERANE (S3)	2601	0.1870	0.13	0.05	0.17
STERANE (S4)	5608	0.1870	0.28	0.10	0.17
STERANE (S5)	3809	0.1870	0.19	0.07	0.17
STERANE (S6)	2973	0.1870	0.15	0.05	0.17
STERANE (S7)	6759	0.1870	0.34	0.12	0.17
STERANE (S8)	3482	0.1870	0.17	0.06	0.17
STERANE (S9)	4436	0.1870	0.22	0.08	0.17
STERANE (S10)	8587	0.1870	0.43	0.15	0.17
STERANE (S11)	375	0.1870	0.02	0.01	0.17
STERANE (S12)	6043	0.1870	0.30	0.10	0.17
C30 STERANES (S13)	22246	0.1870	1.11	0.39	0.17
TRITERPANE (T1)	9763	0.5410	0.20	0.07	0.17
TRITERPANE (T2)	9888	0.5410	0.20	0.07	0.17
TRITERPANE (T3)	**34125**	**0.5410**	**0.70**	**0.24**	0.17
TRITERPANE (T4)	**42582**	**0.5410**	**0.87**	**0.30**	0.17
TRITERPANE (T5)	14820	0.5410	0.30	0.11	0.17
TRITERPANE (T6)	13098	0.5410	0.27	0.09	0.17
TRITERPANE (T7)	8813	0.5410	0.18	0.06	0.17
TRITERPANE (T8)	8129	0.5410	0.17	0.06	0.17
TRITERPANE (T9)	8503	0.5410	0.17	0.06	0.17
TRITERPANE (T10)	9306	0.5410	0.19	0.07	0.17
TRITERPANE (T11)	5805	0.5410	0.12	0.04	0.17
TRITERPANE (T12)	10808	0.5410	0.22	0.08	0.17
TRITERPANE (T13)	10654	0.5410	0.22	0.08	0.17
TRITERPANE (T14)	8815	0.5410	0.18	0.06	0.17
TRITERPANE (T15)	6729	0.5410	0.14	0.05	0.17
Total of T3+T4	**76707**			**0.54**	

SAMPLE NUMBER	B0119-0322	Ogden Railyard	
Sample Location	WR28A MS		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.18700
Percent Solids	48	Hopanes RF	0.54100
Final Volume	5 mL		
Additional Dilution	1 x		
Chrysene d12 Area	972837		
Perylene d12 Area	809657		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	6423	0.1870	0.35	0.12	0.17
STERANE (S2)	2708	0.1870	0.15	0.05	0.17
STERANE (S3)	4736	0.1870	0.26	0.09	0.17
STERANE (S4)	7397	0.1870	0.41	0.14	0.17
STERANE (S5)	4570	0.1870	0.25	0.09	0.17
STERANE (S6)	4298	0.1870	0.24	0.08	0.17
STERANE (S7)	7789	0.1870	0.43	0.15	0.17
STERANE (S8)	4993	0.1870	0.27	0.09	0.17
STERANE (S9)	6252	0.1870	0.34	0.12	0.17
STERANE (S10)	10940	0.1870	0.60	0.21	0.17
STERANE (S11)	726	0.1870	0.04	0.01	0.17
STERANE (S12)	8967	0.1870	0.49	0.17	0.17
C30 STERANES (S13)	18983	0.1870	1.04	0.36	0.17
TRITERPANE (T1)	13253	0.5410	0.30	0.10	0.17
TRITERPANE (T2)	11495	0.5410	0.26	0.09	0.17
TRITERPANE (T3)	**41518**	**0.5410**	**0.95**	**0.33**	0.17
TRITERPANE (T4)	**51604**	**0.5410**	**1.18**	**0.41**	0.17
TRITERPANE (T5)	18210	0.5410	0.42	0.14	0.17
TRITERPANE (T6)	19143	0.5410	0.44	0.15	0.17
TRITERPANE (T7)	10604	0.5410	0.24	0.08	0.17
TRITERPANE (T8)	20102	0.5410	0.46	0.16	0.17
TRITERPANE (T9)	10740	0.5410	0.25	0.08	0.17
TRITERPANE (T10)	11777	0.5410	0.27	0.09	0.17
TRITERPANE (T11)	7513	0.5410	0.17	0.06	0.17
TRITERPANE (T12)	11926	0.5410	0.27	0.09	0.17
TRITERPANE (T13)	13998	0.5410	0.32	0.11	0.17
TRITERPANE (T14)	10620	0.5410	0.24	0.08	0.17
TRITERPANE (T15)	7761	0.5410	0.18	0.06	0.17
Total of T3+T4	**93122**			**0.74**	

SAMPLE NUMBER	B0119-0322	Ogden Railyard	
Sample Location	WR28A MSD		
WA#	R1A00119		
Matrix	Oil		
HIGH, or LOW level	LOW		
Initial Wt. or Vol.	30.0 g	Steranes RF	0.18700
Percent Solids	48	Hopanes RF	0.54100
Final Volume	5 mL		
Additional Dilution	1 x		
Chrysene d12 Area	1008783		
Perylene d12 Area	826645		
Internal Standard (ng)	10		

COMPOUND	Area	Calib. Avg.RF	Inst Conc.	Conc. mg/Kg	MDL
STERANE (S1)	5625	0.1870	0.30	0.10	0.17
STERANE (S2)	2403	0.1870	0.13	0.04	0.17
STERANE (S3)	4268	0.1870	0.23	0.08	0.17
STERANE (S4)	6445	0.1870	0.34	0.12	0.17
STERANE (S5)	3944	0.1870	0.21	0.07	0.17
STERANE (S6)	3911	0.1870	0.21	0.07	0.17
STERANE (S7)	6292	0.1870	0.33	0.12	0.17
STERANE (S8)	3639	0.1870	0.19	0.07	0.17
STERANE (S9)	5414	0.1870	0.29	0.10	0.17
STERANE (S10)	9948	0.1870	0.53	0.18	0.17
STERANE (S11)	952	0.1870	0.05	0.02	0.17
STERANE (S12)	7106	0.1870	0.38	0.13	0.17
C30 STERANES (S13)	15955	0.1870	0.85	0.29	0.17
TRITERPANE (T1)	10823	0.5410	0.24	0.08	0.17
TRITERPANE (T2)	10273	0.5410	0.23	0.08	0.17
TRITERPANE (T3)	**36853**	**0.5410**	**0.82**	**0.28**	0.17
TRITERPANE (T4)	**48293**	**0.5410**	**1.08**	**0.37**	0.17
TRITERPANE (T5)	15742	0.5410	0.35	0.12	0.17
TRITERPANE (T6)	13955	0.5410	0.31	0.11	0.17
TRITERPANE (T7)	9060	0.5410	0.20	0.07	0.17
TRITERPANE (T8)	22547	0.5410	0.50	0.17	0.17
TRITERPANE (T9)	13015	0.5410	0.29	0.10	0.17
TRITERPANE (T10)	10609	0.5410	0.24	0.08	0.17
TRITERPANE (T11)	6428	0.5410	0.14	0.05	0.17
TRITERPANE (T12)	12271	0.5410	0.27	0.09	0.17
TRITERPANE (T13)	11698	0.5410	0.26	0.09	0.17
TRITERPANE (T14)	8967	0.5410	0.20	0.07	0.17
TRITERPANE (T15)	6554	0.5410	0.15	0.05	0.17
Total of T3+T4	**85146**			**0.66**	

CHAIN of CUSTODY RECORDS

REAC, Edison, NJ
732 (908) 321-[redacted]0
EPA Contract ~~68-C4-0022~~ 68-D99

CHAIN OF CUSTODY RECORD

Project Name: OG[redacted] RAILYARD, UT
Project Number: R1A00119
RFW Contact: C868-C99-223 Phone: 732-632-9345
DAVID ANGWENYI
LM

No: [redacted]02049
SHEET NO. 1 OF 1

031D00

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PEST/PCB	BNA	TAL
215	B0119-0270	FBA	SD	3/7/00	1	8oz GLASS / 4°C	X	X	X
216	B0119-0252	SCIA 1		3/7/00					
217	B0119-0266	RD3ADUP 4		3/7/00					
218	B0119-0265	RD3A 2		3/7/00					
219	B0119-0249	BC3A 14		3/7/00					
220	B0119-0259	33SS2A 16		3/7/00					
221	B0119-0273	AOI102A 15		3/8/00					
222	B0119-0334	FBA		3/8/00					
223	B01A-0291	21SPSA 3		3/7/00					
224	B0119-0300	WR09A 5		3/8/00					
225	B0119-0305	WR12A 7		3/8/00					
226	B0119-0309	WR19A 9		3/8/00					
227	B0119-0336	AOI4A		3/8/00		NOT requested for TAL			
228	B0119-0307	WR14A 6		3/8/00					
229	B0119-0302	WR11A 6		3/8/00					
230	B0119-0312	WR21ADUP 11		3/8/00					
231	B0119-0311	WR21A 10		3/8/00					
232	B0119-0319	WR25A 17		3/8/00					
233	B0119-0314	WR22A 12		3/8/00					
234	B0119-0315	WR22DUP 13		3/8/00					

Matrix:
SD - Sediment, DS - Drum Solids, DL - Drum Liquids, X - Other, PW - Potable Water, GW - Groundwater, SW - Surface Water, SL - Sludge, S - Soil, W - Water, O - Oil, A - Air

Special Instructions:
This is 1 of 2 chains for this cooler.
~~Estimate [illegible] for 0.1?~~

QC'd ☐ = 1ml extracts

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all analyses	Mark Hylton	3/9/00	David Angwenyi	3/10/00	1100am	all/analysis	David Angwenyi	3/10/00	M. Yourn	3/10/00	230

FORM #4 8/94

* U.S. GPO: 1994-383-015

REAC, Edison, NJ
(908) 321-4200
EPA Contract ~~68-G4-0022~~
68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: OGDEN RAIL YARD, UT
Project Number: 121H 00119
~~RFW~~ Contact: DAVID ANGWENYI Phone: 732-632-9345

No: 02050
SHEET NO. 1 OF 1

03/10/00

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	PEST/PCB	BNA	TAL	
235	B01A-0317	WR24A 18	SD	3/8/00	1	8oz GLASS/4°C	X	X	X	
236	B019-0322	WR28A 19	SD	3/8/00	1	8oz GLASS/4°C	X	X	X	

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
This is 2 of 2 chains for this cooler.

QC: BR

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
all/analysis	Mark Huston	3/9/00	David Angwenyi	3/10/00	11:00am	All/Analysis	David Angwenyi	3/10/00	M. Yodnin	3/10/00	2:30

FORM #4 8/94

REAC, E[illegible]n, NJ
732 (~~908~~) 321-4200
EPA Contract ~~08-C4-0022~~ 68-C99-223

CHA[illegible]F CUSTODY RECORD

Project Name: Ogden Rail Yard
Project Number: R1A00119
~~RFW~~ LM Contact: Barry Forsythe Phone: (732) 321-4210

No: 02058

SHEET NO. 1 OF 1

031000

Sample Identification / Analyses Requested

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	OiL			
196	C0119-0259	33552A	Sd	3.7.00	1	8oz amber/4°C	X			
197	C0119-0249	BC3A *		3.7.00						
198	C0119-0273	AOI 102A		3.8.00						
199	C0119-0252	SC1A		3.7.00						
200	C0119-0265	~~RD~~ RD3A								
201	C0119-0324	21SPSA								
202	C0119-0266	RD3ADup								
203	C0119-0300	WR09A		3.8.00						
204	C0119-0302	WR011A								
205	C0119-0305	WR012A								
206	C0119-0307	WR014A								
207	C0119-0309	WR019A				8oz glass / 4°C				
208	C0119-0311	WR021A								
209	C0119-0312	WR021ADup								
210	C0119-0314	WR022A								
211	C0119-0315	WR022ADup								
212	C0119-0317	WR024A *								
213	C0119-0319	WR025A								
214	C0119-0322	WR028A								

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:
* MS/MSD

QC: AD

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Jennifer Rapa	3/9/00	Wm. U. Cole	3/10/00	1040	All/Analysis	Daniel Angwenyi	3/10/00	M. Young	3/13/00	2:38

FORM #4 8/94

REAC, Edison, NJ
732 (908) 321-4200
EPA Contract ~~68-C4-0022~~ 68-C99-223

CHAIN OF CUSTODY RECORD

Project Name: Ogden Rail Yard
Project Number: R1A00119
~~RFW~~ LM Contact: Barry Forsythe Phone: (732) 321-4210

No: 02063

SHEET NO. 1 OF 1

031000

Sample Identification / **Analyses Requested**

REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/Preservative	TAL metals	OiL		
237	A0119-0059	WR010A	SW	3·8·00	1	1 L poly / HNO_3	X			
238	A0119-0330	FBA	↓	↓	1	↓	X			
239	A0119-0326	21SPSA	↓	↓	1	1 L amber / HCl		X *		
240	A0119-0330	FBA	↓	↓	2	1 L amber / HCl		X		

Matrix:

SD -	Sediment	PW -	Potable Water	S -	Soil
DS -	Drum Solids	GW -	Groundwater	W -	Water
DL -	Drum Liquids	SW -	Surface Water	O -	Oil
X -	Other	SL -	Sludge	A -	Air

Special Instructions:

~~* Hold For Analysis~~

* Analyze for oil 3-15-00

QC: [signature]

FB = Field Blank

FOR SUBCONTRACTING USE ONLY

FROM CHAIN OF CUSTODY #

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	[signature]	3/9/00	David Angweny	3/10/00	1100am	All/Analysis	David Angweny	3/10/00	M. Youmi	3/10/00	2:30 pm

FORM #4 8/94

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0119-0001

REAC, Edison, NJ
Contact: Barry Forsythe
732-321-4210
WO#: R1A00119
EPA Contract 68-C99-223

Project Name: Ogden Rail Yard
Location: Ogden, UT
Site Phone:

Page No.: 1 of 1
Cooler #:
Lab: REAC
Contact: David Angwenyi
(732) 632-9345

LAB #	Tag	Sample #	Location	# of Containers	Matrix	Collected	Container/Preservative	Analysis Requested	MS MSD	Comments
144	A 00	0119-0124	WR024A	6	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables	Y	Rens dup 17
145	A	0119-0137	WR026A	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		147
146	A	0119-0162	BC3A	6	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables	Y	148
										149

Special Instructions:

GC [illegible]

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Jennifer Royce	3/7/00	David Angwenyi	3/9/00	1130	All/Analysis	David Angwenyi	3/9/00	M-Yourin	3/9/00	1:00

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0119-0009

REAC, Edison, NJ
Contact: Barry Forsythe
732-321-4200
WO#: R1A00119
EPA Contract 68-C99-223

Project Name: Ogden Rail Yard
Location: Ogden, UT
Site Phone:

Page No.: 1 of 1
Cooler #:
Lab: REAC
Contact: David Angwenyi
(732) 632-9345

130900

LAB #	Tag	Sample #	Location	# of Containers	Matrix	Collected	Container/Preservative	Analysis Requested	MS MSD	Comments
147	A	0119-0125	WR024A	6	Surface water	03/07/00	32 oz Amber/HCl	Oil	Y	
148	A	0119-0138	WR028A	2	Surface water	03/07/00	32 oz Amber/HCl	Oil		
149	A	0119-0163	BC3A	6	Surface water	03/07/00	32 oz Amber/HCl	Oil	Y	

Special Instructions:
QC: 1 [illegible]

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Jennifer Vega	3/7/00	Wm. H. Cole	1100	3/9/00	All/Analysis	Wm. H. Cole	3/9/00	M. Younis	3/9/00	115

USEPA ERT

These are samples on COC 0119-0019

CHAIN OF CUSTODY RECORD

COC # 0119-0

REAC, Edison, NJ
Contact: Barry Forsythe
732-321-4210
WO#: R1A00119
EPA Contract 68-C99-223

Project Name: Ogden Rail Yard
Location: Ogden, UT
Site Phone:

Page No.: 1 of 1
Cooler #:
Lab: REAC
Contact: David Angwenyl
(732)632-9345

030900

LAB #	Tag	Sample #	Location	# of Containers	Matrix	Collected	Container/Preservative	Analysis Requested	MS MSD	Comments
118	A	0119-0071	WR012A	2	Surface water	03/07/00	32 oz Amber/HCl	Oil		
119	A	0119-0098	WR016A		Surface water	03/07/00	32 oz Amber/HCl	Oil		
120	A	0119-0099	WR016ADup		Surface water	03/07/00	32 oz Amber/HCl	Oil		
121	A	0119-0185	SC2A		Surface water	03/07/00	32 oz Amber/HCl	Oil		
122	A	0119-0201	33SS1A		Surface water	03/07/00	32 oz Amber/HCl	Oil		
123	A	0119-0289	WR011A		Surface water	03/07/00	32 oz Amber/HCl	Oil		
124	A	0119-0290	WR011ADup		Surface water	03/07/00	32 oz Amber/HCl	Oil		

Special Instructions:
QC: D

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Jennifer Rosa	3/8/00	Wm. H. Cle	3/9/00	1040	ALL/ANALYSIS	Wm. H. Cle	3/9/00	M. Younis	3/9/00	12:00

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0119-0019

REAC, Edison, NJ
Contact: Barry Forsythe
732-321-4210
WO#: R1A00119
EPA Contract 68-C99-223

Project Name: Ogden Rail Yard
Location: Ogden, UT
Site Phone:

* see COC 0119-0018

Page No.: 1 of 1
Cooler #:
Lab: REAC
Contact: David Angwenyl
(732)632-9345

050700

LAB #	Tag	Sample #	Location	# of Containers	Matrix	Collected	Container/Preservative	Analysis Requested	MS MSD	Comments
164	A	0119-0070	WR012A	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		Reac dup
165	A	0119-0096	WR018A	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		118
166	A	0119-0097	WR018ADup	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		119
167	A	0119-0184	SC2A	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		120
168	A	0119-0200	33SS1A	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		121
169	A	0119-0287	WR011A	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		122
170	A	0119-0288	WR011ADup	2	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		123
										124

Special Instructions:
QC: [illegible]

REFERENCE COC:
we have them

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Jennifer Ryan	3/8/00							M. Young	3/9/00	1:15

USEPA ERT | **CHAIN OF CUSTODY RECORD** | **COC # 0119-0028**

REAC, Edison, NJ
Contact: Barry Forsythe
732-321-4210
WO#: R1A00119
EPA Contract 68-C99-223

Project Name: Ogden Rail Yard
Location: Ogden, UT
Site Phone:

Page No.: 1 of 1
Cooler #:
Lab: REAC
Contact: David Angwenyi
(732)632-9345

030900

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	MS MSD	Comments
157	A	0119-0057	WR010A	Surface water	03/08/00	32 oz Amber/4 C	Base neutral/acid extractables		
158	A	0119-0056	WR010A	Surface water	03/08/00	32 oz Amber/HCl	Oil		
159	A	0119-0228	RD3A	Surface water	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		
160	A	0119-0229	RD3A	Surface water	03/07/00	32 oz Amber/HCl	Oil *		
161	A	0119-0241	FBA	Blank	03/07/00	32 oz Amber/4 C	Base neutral/acid extractables		
162	A	0119-0242	FBA	Blank	03/07/00	32 oz Amber/HCl	Oil		
163	A	0119-0328	FBA	Blank	03/08/00	32 oz Amber/4 C	Base neutral/acid extractables		

Special Instructions: QC: [illegible]

* They extracted BNA sample and split for oil

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Jennifer Royd	3/8/00	Wm. H. [illegible]	3/8/00	1105	All/ANALYSIS	Wm. H. [illegible]	3/8/00	M. Young	3/9/00	1[illegible]

Lockheed Martin Technology Services Group
Environmental Services REAC
2890 Woodbridge Avenue, Building 209 Annex Edison, NJ 08837-3679
Telephone 732-321-4200 Facsimile 732-494-4021

LOCKHEED MARTIN

Date: June 23, 2000

To: Work Assignment Manager M. D. Sprenger, EPA/ERTC

From: Vinod Kansal, Organic Group Leader, Analytical Section, REAC Vinod Kansal

Subject: Preliminary Results of Project Ogden Rail Yard WA# RIA00119

Attached please find the preliminary results of the above referenced project for the following samples:

Chain(s) of Custody No.: 119-0112 & 119-0115
Analyses: Oil Fingerprinting
No. of Samples: 22
Matrix: Water, Sediment, and Soil

Comments: see the attached report

cc Raj Singhvi, V.Kansal
Central File
~~D. Angwenyi~~
Task Leader: B. Forsythe
Analyst: C.W. Chiang

Preliminary Analytical Report Summary Date: June 23, 2000

Subject: Oil Fingerprinting Analysis for Water and Soil Samples on the Ogden Rail Yard site (R1A00119)

This summary reports results of oil fingerprinting analysis for 22 samples (chain of custody # 119-0112 & 0115) on the Ogden Rail Yard site. The samples include 6 in surface water, 5 in sediment, and 11 in soil.

The samples were analyzed by a modified method 8015B in which the GC-MS/SIM technique was used. Procedures of sample analysis are described in the next section. In this case, the analysis calls for generating several "oil fingerprinting patterns" that include saturate hydrocarbons (saturates) profile, polynuclear aromatic hydrocarbons (PAHs) profile, total petroleum hydrocarbons (TPH) profile, and sterane/hopane profiles of each sample. These profiles were subsequently used to match either with known oil sources (e.g., fuel oils) or among the samples for identification.

Both saturate and PAHs profiles were obtained from the quantitation reports of target analytes that include C_8-C_{38} normal alkanes and 33 PAHs and their homologues. TPH profiles were generated as extracted ion chromatogram (EIC) at m/z = 85 from the samples' total ion chromatogram (TIC); both sterane and hopane profiles were generated as EIC at m/z = 217 and 191, respectively, from the samples' TIC.

Results of the analysis are categorized in two tables: Table 1 for water samples and Table 2 for sediment/soil samples. The fingerprinting pattern matching is based on ASTM D-3328. The method calls for "m" as match, "pm' as possible match, and "nm" as not match either with known oil sources or among the samples. In addition, "nd" indicates as "no oil fingerprinting detected", and "nt" denotes "no distinguishable oil fingerprinting due to week oil patterns".

The analysis results of the six surface water samples show that they have no distinguishable patterns of both saturates and PAHs, nor did their THP profiles. The target analytes of saturates reported were due to glassware contamination during the extraction. As a result, the water samples are identified as "nt" such that no oil contamination was found from these sampling locations.

Table 2 shows that the PAHs concentrations of the sixteen sediment/soil samples were all below MDL; their TPH profiles show no pattern-matching with that of the prepared TPH standard. Their saturates profiles are sorted into six different patterns, sterane profiles are sorted into seven different patterns, and hopane profiles are sorted into nine different patterns. Based on these assessments, the samples are identified as follows:

m:	0119-1096 (duplicate of 0119-1097) and 0119-1106
m:	0119-1122 and 0119-1124
pm:	0119-1127, 0119-1129, and 0119-1139 (duplicate of 0119-1140)
pm:	0119-1051, 0119-1165, and 0119-1072
nm:	0119-1086, 0119-11091, 0119-1120, and 0119-1147

Based on the summaries of Table 2, the hopane patterns of the five sediment samples (i.e., 0119-1086, 0119-1091, 0119-1096, 0119-1097, and 0119-1106) seem indicate that their sampling locations contain low amount of oil contamination. But since their oil fingerprinting patterns do not match any known oil sources, and without detectable TPH profiles, it is difficult to determine the sources of oil contamination.

With no hopane patterns detected in the remaining eleven soil samples, they are believed to be no oil contamination was found in their sampling locations.

All calibration checks passed the acceptable criteria. The surrogate recovery of sample extraction is reported based on the results of BNA analysis. No matrix spike/matrix spike duplicate is required for the analysis. The data package includes saturate profiles, PAHs profiles, TPH profiles (i.e., EIC at m/z = 85), and sterane/hopane profiles profiles (i.e., EIC at m/z = 217 and 191, respectively) of all samples. The package also includes other supporting documents such as a 5-point calibration report, a continuing calibration check report, sample injection log, extraction log, %solid report, and sample acquisition files.

TABLE 1. Results of Oil fingerprinting Analysis in Water Samples Using Modifed Method 8015B WA # R1A00119: Ogden Railyard (May 2000)

Sample No.	Sampling Location	Saturates	PAHs	TPH	Sterane	Hopane	Final identification
WBLK051500	Lab Blank	nd	nd	nd	nd	nd	nt
0119-1007	OR02B	nd	nd	nd	nd	nd	nt
0119-1025	BVP03B	nd	nd	nd	nd	nd	nt
WBLK051700	Lab Blank	nd	nd	nd	nd	nd	nt
0119-1043	21SP04B	nd	nd	nd	nd	nd	nt
WBLK051800	Lab Blank	nd	nd	nd	nd	nd	nt
0119-1049	21SP04BDUP	nd	nd	nd	nd	nd	nt
0119-1076	FB1B	nd	nd	nd	nd	nd	nt
0119-1082	FB2B	nd	nd	nd	nd	nd	nt

nd denotes "no pattern/profile detected".
nt denotes "no discernable or distinguishable oil fingerprinting such that a pattern match could not be determined due to week/no oil pattern".

TABLE 2. Results of Oil fingerprinting Analysis in Sediemtn/Soil Samples Using Modifed Method 8015B
WA # R1A00119: Ogden Railyard (May 2000)

Sample No.	Sampling Location	Saturates	PAHs	TPH	Sterane	Hopane
SBLK051600	Lab Blank	nd	nd	nd	nd	nd
0119-1086	OR02B	nr	nd	nd	s1	h1
0119-1091	BVP03B	p1	nd	nd	s2	h2
0119-1096	21SP04B	p2	nd	nd	s1	h3
0119-1097	21SP04BDUP	p2	nd	nd	s1	h3
0119-1106	21SP11B	p2	nd	nd	s1	h3
0119-1120	RZ105B	p3	nd	nd	s3	h4
0119-1122	RZ106B	p4	nd	nd	s4	h5
0119-1124	RZ107B	p4	nd	nd	s4	h5
0119-1127	RZ109B	p5	nd	nd	s5	h6
0119-1129	RZ110B	p5	nd	nd	s6	no
0119-1139	RZ208B	p3	nd	nd	s6	no
0119-1140	RZ208BDUP	p3	nd	nd	s6	no
0119-1147	RZ304B	p6	nd	nd	s6	no
0119-1151	RZ307B	p5	nd	nd	s5	h7
0119-1165	RZ407B	p5	nd	nd	s7	h8
0119-1172	21SPP03B	p5	nd	nd	s6	h9

nd denotes no oil pattern detected.
nr denotes the concentration is below MDL.
p1 to p6 denote six different saturate profiles.
s1 to s7 denote seven different sterane profiles.
h1 to h9 denote nine different hopane profiles.
no denotes hopane profile is too low to be detected as pattern.

The Analytical Method of Oil Fingerprinting Analysis in Water/Soil Samples

The method outlines procedures for oil fingerprinting analysis. It is based on the drafts submitted in May 1996 by J. Syslo, with titles of "Procedures for the Extraction and Analysis of Oil as Source Oil, and Oil Found in Aqueous and Solid Matrices." and "Revised Draft Action Plan for Analyses of Oil Spill Bioremediation Samples". The two drafts are a compilation of SW846's 8015B, ASTM's D3328, Marine Safety Laboratories Notice 5200.9, and several other methods used by the US Coast Guard, Environment Canada, and other labs that are currently developing methods and techniques for oil analysis/oil characterization. The method characterizes oil samples using standard oil fingerprinting techniques, PAHs and their homologue patterns, saturated hydrocarbon patterns and distributions, and steranes and triterpanes (hopanes) isomers and distributions, as well as their overall intrinsic relationships with sources of oils. This new analytical method is still in "pilot" stage and is subjected to future changes to improve its performance.

Extraction Procedure

The samples were extracted based on the BNA SOP. Approximately one liter of a water sample was spiked with 500 µL of a BNA surrogate mix. The water sample's pH was first adjusted at around 3, followed by being extracted with 60 mL of methylene chloride for two minutes. After the extraction, the organic layer was collected in a volumetric flask. The extraction was repeated three times. The sample's pH was then adjusted at around 11. The same methylene chloride extraction at the acid condition was repeated three times. The methylene chloride extracted solution collected from the two separate extractions was subsequently combined and concentrated down a final volume of 1 mL.

Approximately 30 grams of a soil sample was spiked with 500 µL of a BNA surrogate mix. The sample was then mixed with sufficient amount of anhydrous sodium sulfate, followed by Soxhlet extraction with 300 mL of methylene chloride for 16 hours. The methylene chloride extracted solution was then concentrated to a final volume of 5 mL.

Analytical Procedure

One milliliter of the final extract of each sample was transferred to a GC vial, followed by spiking with 20 µL of an internal standard mix, prior to instrumental analysis. The internal standard mix contains phenanthrene-d_{10}, chrysene-d_{12}, perylene-d_{12}, tetradecane-d_{30}, and tetracosane-d_{50} (500 µg/mL each).

A HP 5890 gas chromatograph/5972 mass selective detector (GC-MS) equipped with a 7673 autosampler was used to analyze samples. The instrument is operated on a PC equipped with the HP Chemstion/Enviroquant.

The instrument operating conditions are as follows:

Column	Rtx-5, 30 meter x 0.25mm ID, 0.50 µm film thickness fused silica capillary (Restek)
Column flow	Helium at 1.1 mL/min (constant flow)
Injection temperature	290 °C
Transferline temperature	290 °C
Source temperature	170 °C
Temperature program	50 °C for 0.5 min ramp to 295° C at 20° C/min (hold 8.5 min) ramp to 305° C at 25° C/min (hold 15 min)
Injection mode	Splitess (purge time = 1 min)
Injection volume	1µL
Liner	2 mm ID straight, packed with about 10 mm of silanized & conditioned glass wool.
Scan mode	Selective Ion Monitoring (SIM)
Electronic multiplier	200 volts above the tune's value

A method file was set up to use the above operating conditions to acquire all samples and to quantitate saturates,

PAHs, and TPH. Quantiation of saturates and PAHs are processed on Enviroquant, whereas PAHs' homologue isomers are identified and quantitated by manual search.

The calibration range of saturates and PAHs include C_8-C_{38} normal alkanes, pristane, phytane, and 16 PAHs at 1.0, 5.0, 10, 25 and 50 µg/mL. The TPH/oil standard should be an original source, a similar product, or ideally obtained from the sampling site.

Saturates and PAHs are quantitated using their individual average response factors. Quantitation of PAHs' homologue isomers was based on their parent PAHs' average response factors. The average response factor, RF_{ave}, is used when target analytes are quantitated with an initial calibration range. The continuing calibration response factor, RF_{cc}, is used when target analytes are quantitated with a continuing calibration standard.

Response Factor calculations

The response factor of each specific analyte at each calibration concentration is calculated based on the following equation:

$$RF = \frac{Ac \times Iis}{Ais \times Ic}$$

where
RF = Response factor for a specific analyte
A_c = Area of the analyte in the standard
I_{is} = Mass of the specific internal standard
A_{is} = Area of the specific internal standard
I_c = Mass of the analyte in the standard

The average response factor, RF_{ave}, is defined as follows:

$$RF_{ave} = \frac{RF_1 + RF_2 + \ldots RF_n}{n}$$

where n is the number of calibration standards. Usually, n = 5.

The average response factor of each analyte of saturates and PAHs, is calculated either using Evironquant. The standard deviation (%RSD) of the five-point calibration range is also calculated. The criteria of an acceptable calibration range are that %RSD < 30%.

Analyte Concentration Calculations

Saturates and PAHs were calculated using the average response factors of the method. The concentration of the detected analytes was calculated using the following equation:

$$C\ (mg/Kg\ or\ mg/L) = \frac{DF A_u I_{is} V_t}{A_{is} RF_{ave} (or\ RFcc) V_i (or\ W_{t0})}$$

where
DF = Dilution Factor
A_u = Area of target analyte
I_{is} = Mass of specific internal standard (ng)
V_t = Final volume of extract (µL)
A_{is} = Area of specific internal standard
RF_{cc} = Continuing calibration response Factor
RF_{ave} = average Response Factor
V_i = Sample volume (L)
Wt_o = Sample weight (g)

The TPH profile of each sample is obtained by generating an extracted ion chromatogram (EIC) at m/z = 85 from its total ion chromatogram (TIC). The whole EIC is subsequently integrated as one peak. The response factor of each TPH standard is calculated based on area sum of the two internal standards, tetradecane-d_{30} and tetracosane-d_{50}.

The sterane and hopane profile of each sample are obtained by generating their EICs at m/z = 217 and 191, respectively, from its TIC. In case the sample was suspected as containing one of known oil sources, steranes and hopane are calculated manually using QuattroPro. The sum of C_{29} hopane(17a(H),21B(H)-30-norhopane) and C_{30} hopane (17a(H),21B(H)-hopane) are use to represent hopane concentrations for normalizing TPH data because they are widely recommended in oil literature. In this case, another method file (e.g., HOPSTERI) will be used to establish the response factor of C_{29} hopane (17a(H),21B(H)-30-norhopane) and C_{30} hopane (17a(H),21B(H)-hopane). The calibration range of the sterane/hopane is 0.5, 1.0, 5.0, 10, and 25 ppm. The response factor and average response factor are calculated using the same equation described above. The concentrations of the 15 hopanes and 13 steranes in the samples are calculated based on the hopane and sterane compounds either from their initial calibration range or from their daily check. The hopane and sterane data are generally used to establish a "pattern" to be used for oil source identification.

Sample Analysis

The GC-MS is first tuned by injecting 50 ng of decafluorotriphenylphosphine (DFTPP) in the linear scan mode. After the system passed the DFTPP tune criteria, three mid-range calibration standards are used as daily calibration check standards: TPH standard at 10000 µg/mL, saturates and PAHs at 10 µg/mL, and hopane/sterane and surrogates of at 5.0 µg/mL. The response factor of each continuing calibration check standard (RFcc) is evaluated by comparison to the average response of it original calibration range. Continuing calibration check evaluation for saturates, PAHs, hopane, sterane, and surrogates is conducted on Enviroquant; Continuing calibration check evaluation for TPH is performed manually on Quattro Pro. The samples can be acquired once all three calibration checks passed the acceptable criteria (e.g., ±30%).

Table 1 of the appendix lists analytes of staruates, PAHs, and their corresponding internal standards used in the method. Table II lists quant ion of analytes , surrogates, and internal standard used in the method.

APPENDIX

Table I. Analytes of Saturates, PAHs and their Corresponding Internal Standa

Naphthalene-d_8
n-C_8 thru n-C_{15} SHCs
Naphthalene
C1N thru C4N isomers

Phenanthrene-d_{10}
n-C_{16} thru n-C_{23} SHCs
Fluorene
C1F thru C3F isomers
Pristane
Phytane
Dibenzothiophene
C1D thru C3D isomers
Phenanthrene
Anthracene
C1P/A thru C3P/A isomers
Anthracene-d_{10} {surr}
5a-androstane {surr}

Chrysene-d_{12}
Fluoranthene
Pyrene
C1F/P & C2F/P isomers
Chrysene
C1C & C2C isomers
Chloestane {Steranes}

Perylene-d_{12}
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-cd)pyrene
Dibenzo(a,h)anthracene
Benzo(g,h,i)perylene
Hopane {moretane / hopanes}

d_{50}-Tetracosane
n-C_{19} thru n-C_{36}, & n-C_{38}
d62-Triacontane {surr}

Sum of d_{30}-Tetradecane + d_{50}-Tetracosane
Total TPH using m/z ion 85

Table II. Quant Ions of Saturates, PAHs, Surrogates, and Internal Standards.

Compound:	Quant Ion:
d8-Naphthalene {is}	136
Octane C8	85
Nonane C9	85
Decane C10	85
Undecane C11	85
Naphthalene	128
C1-naphthalene isomers	142
C2-naphthalene isomers	156
C3-naphthalene isomers	170
C4-naphthalene isomers	184
Dodecane C12	85
Tridecane C13	85
Tetradecane C14	85
Pentadecane C15	85
d10-Phenanthrene {is}	188
Hexadecane C16	85
Fluorene	166
C1-fluorene isomers	180
C2-fluorene isomers	194
C3-fluorene isomers	208
Heptadecane C17	85
Pristane	85
Dibenzothiophene	184
C1-dibenzothiophene isomers	198
C2-dibenzothiophene isomers	212
C3-dibenzothiophene isomers	226
Octadecane C18	85
Phytane	85
Phenanthrene	178
Anthracene	178
C1-phenanthrene/anthracene isomers	192
C2-phenanthrene/anthracene isomers	206
C3-phenanthrene/anthracene isomers	220
d12-Chrysene {is}	240
C27 Baa-cholestane and other Sterane isomers	217
Fluoranthene	202
Pyrene	202
C1-fluoranthene/pyrene isomers	216
C2-fluoranthene/pyrene isomers	230
Chrysene	228
C1-chrysene isomers	242
C2-chrysene isomers	256
d12-Perylene {is}	264
Benzo(b)fluoranthene	252
Benzo(k)fluoranthene	252
Benzo(e)pyrene	252

(continued)

Table II. (continued)

COMPOUND	Quant Ion
Benzo(a)pyrene	252
Perylene	252
Indeno(1,2,3-cd)pyrene	276
Dibenzo(a,h)anthracene	278
Benzo(g,h,i)perylene	276
C30 17B(H),21a(H) hopane & other hopane isomers	191
d50-Tetracosane {is}	66
Nonadecane C19	85
Eicosane C20	85
Heneicosane C21	85
Docosane C22	85
Tricosane C23	85
Tetracosane C24	85
Pentacosane C25	85
Hexacosane C26	85
Heptacosane C27	85
Octacosane C28	85
Nonacosane C29	85
Triacontane C30	85
Hentriacontane C31	85
Dotriacontane C32	85
Tritriacontane C33	85
Tetratriacontane C34	85
Pentatriacontane C35	85
Hexatriacontane C36	85
Octatriacontane C38	85
d30-Tetradecane {is}	66
Total TPH uses sum of d30-Tetradecane {is} & d50-Tetracosane {is}	85

Chain of Custody

USEPA ERT | **CHAIN OF CUSTODY RECORD** | **COC # 119-0112**

REAC, Edison, NJ
Contact: Barry Forsythe
732-321-4210
WO#: R1A00119
EPA Contract 68-C99-223

Project Name: Ogden Rail Yard
Location: Ogden, Utah
Site Phone:

Page No.: 1 of 1
Cooler #:
Lab: REAC
Contact:
(732) 632-9345

051200

LAB #	Tag	Sample #	Location	# of containers	Matrix	Collected	Container/Preservative	Analysis Requested	MS MSD	Comments
194	A	0119-1007	OR02B	2	Surface water	05/09/00	1 liter amber/4 C	BNA and Oil Fingerprinting		
195	A	0119-1025	BVP03B	2	Surface water	05/09/00	1 liter amber/4 C	BNA and Oil Fingerprinting		
196	A	0119-1043	21SP04B	6	Surface water	05/10/00	1 liter amber/4 C	BNA and Oil Fingerprinting	Y	
197	A	0119-1049	21SP04BDup	2	Surface water	05/10/00	1 liter amber/4 C	BNA and Oil Fingerprinting		
199	A	0119-1076	FB1B	2	Surface water	05/09/00	1 liter amber/4 C	BNA and Oil Fingerprinting		
200	A	0119-1082	FB2B	2	Surface water	05/09/00	1 liter amber/4 C	BNA and Oil Fingerprinting		

Special Instructions:

QC: [signature]

* 0019-1007 1 bottle rec'd broken
* 0019-1025 1 bottle rec'd broken 5/12/00 (CB)

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All/Analysis	Jennifer Royo	5/10/00	C Gasser	5/12/00	10:00	Acc/ANAL	Wm. H Cole	5/12/00	[signature]	5/12/00	10:50

USEPA ERT

CHAIN OF CUSTODY RECORD

COC # 0119-0115

REAC, Edison, NJ
Contact: Barry Forsythe
732-321-4210
WO#: R1A00119
EPA Contract 68-C99-223

Project Name: Ogden Rail Yard
Location: Ogden, Utah
Site Phone:

Page No.: 1 of 1
Cooler #:
Lab: REAC
Contact:
(732) 632-9345

051200

LAB #	Tag	Sample #	Location	Matrix	Collected	Container/Preservative	Analysis Requested	MS MSD	Comments
228	B	0119-1086 ✓	OR02B	Sediment	05/09/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
229	B	0119-1091	BVP03B	Sediment	05/09/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil	Y	
230	B	0119-1096	21SP04B	Sediment	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil	Y	
231	B	0119-1097	21SP04BDup	Sediment	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
232	B	0119-1106	21SP11B	Sediment	05/09/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
233	B	0119-1120 ✓	RZ105B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
234	B	0119-1122 ✓	RZ106B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
235	B	0119-1124 ✓	RZ107B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
236	B	0119-1127 ✓	RZ109B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
237	B	0119-1129 ✓	RZ110B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
238	B	0119-1139 ✓	RZ208B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil	Y N	
239	B	0119-1140 ✓	RZ208BDup	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil	Y N	
240	B	0119-1147 ✓	RZ304B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
241	B	0119-1151 ✓	RZ307B	Soil	05/10/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
242	B	0119-1165 ✓	RZ407B	Soil	05/09/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		
243	B	0119-1172	21SPP03B	Soil	05/09/00	8 oz glass/4 C	TAL metals + BNA + Pest/PCB + Oil		

Special Instructions:
cc: Dave K

REFERENCE COC:

Items/Reason	Relinquished By	Date	Received By	Date	Time	Items/Reason	Relinquished By	Date	Received By	Date	Time
All Analysis	Jennifer Royo	5/11/00	[illegible]	5/12/00	13:40	ALL ANALYSIS	[illegible]	5/12/00	[illegible]	5/12/00	1:45 pm