TDI - BROOKS INTERNATIONAL, INC. B&B Laboratories, Inc. College Station, TX

Arcadis Mayflower AR Project (Contract # B0086003.1302) July 30, 2013 through August 4, 2013 Collection Dates

Determination of: Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment/Soil Samples

(QC Batch ENV 3081)

September 13, 2013

Technical Report 13-3100

Arcadis Mayflower AR Project (Contract # B0086003.1302) July 30, 2013 through August 4, 2013 Collection Dates Table of Contents B&B Laboratories September 13, 2013

Heading

Page Number

| Sample/Analyses Description | 1 |
|--|------|
| Sediment Samples | |
| Polycyclic Aromatic Hydrocarbon Concentration | |
| Polycyclic Aromatic Hydrocarbon Histograms | 27 |
| Polycyclic Aromatic Hydrocarbon Total Ion Chromatograms | |
| Total Petroleum Hydrocarbons/Aliphatic Hydrocarbons Raw Data | |
| Polycyclic Aromatic Hydrocarbon Raw Data | |
| Polycyclic Aromatic Hydrocarbon Initial Calibration Data and Initial Calibration | |
| Verification Data | .252 |
| PAH ICAL AR 70057.M GC/MS 7 (PAH-2012) | .253 |
| PAH Mass Discrimination Ratio | |
| PAH Internal Standard Area Data | |
| SRM-2779 Reference Oil Aliphatic and PAH Resolution Checks | |
| Supporting Documents | .294 |
| Shipping, Sample Receiving, and Project Initiation Documents | .295 |
| Laboratory Bench Sheet Logs | .344 |
| Last Page | .355 |

Narrative

Technical Report 13-3100 Arcadis Mayflower AR Project (Contract # B0086003.1302) Sediment/Soil Samples July 30, 2013 through August 4, 2013 Collection Dates

September 13, 2013

Introduction

B&B Laboratories received a shipment of two (2) ice chests that were sent by Daniel Mays of Arcadis using FedEx on July 30, 2013 and arrived on July 31, 2013 in College Station, Texas. The ice chests arrived sealed and in good condition.

| Cooler Number | Temperature | Samples Received | | |
|---------------|-----------------------------|---|--|--|
| 1 | 6.6°C 2.9°C (Temp Blank) | Nineteen (19) sediments in 8oz or 4oz ja Two (2) 1L water samples in B/R ambe bottles. | | |
| 2 | 4.9°C 3.6°C (Temp Blank) | Nineteen (19) sediments in 8oz or 4oz jars Two (2) 1L water samples in B/R amber bottles. | | |

B&B Laboratories received a shipment of one (1) ice chest that was sent by Daniel Mays of Arcadis using FedEx on August 1, 2013 and arrived on August 2, 2013 in College Station, Texas. The ice chest arrived sealed and in good condition.

| Cooler Number | Temperature | Samples Received | |
|---------------|-----------------------------|---------------------------------------|--|
| 1 | 8.1°C 4.6°C (Temp Blank) | Fifteen (15) soils in 8oz or 4oz jars | |

B&B Laboratories received a shipment of three (3) ice chests that were sent by Daniel Mays of Arcadis using FedEx on August 5, 2013 and arrived on August 6, 2013 in College Station, Texas. The ice chests arrived sealed and in good condition.

| Cooler Number | Temperature | Samples Received | | |
|---------------|-----------------------------|--|--|--|
| 1 | 5.0°C 1.6°C (Temp Blank) | Twenty-one (21) soils in 8oz or 4oz jars | | |
| 2 | 0.2°C 1.2°C (Temp Blank) | Twenty (20) sediments in 8oz or 4oz jars Two (2) 1L water samples in B/R amber bottles. | | |
| 3 | 0.0°C 1.1°C (Temp Blank) | Twenty-one (21) sediments in 8oz or 4oz jars Two (2) 1L water samples in B/R amber bottles. | | |

The water and sediment/soil samples were collected between July 29, 2013 and August 3, 2013 in support of the Mayflower AR, Project (Arcadis-US Contract # B0086003.1302). The water samples were logged in according to B&B Laboratories standard operating procedure (B&B 1009) and were stored in an accesscontrolled refrigerator (4.0°C) prior to analysis. The sediment/soil samples were logged in according to B&B Laboratories standard operating procedure (B&B 1009) and were stored in an accesscontrolled refrigerator (4.0°C) prior to analysis. The sediment/soil samples were logged in according to B&B Laboratories standard operating procedure (B&B 1009) and were stored in an access-controlled freezer (<-16.0°C) prior to analysis. Selected sediment/soil samples were analyzed for Total Petroleum Hydrocarbons (TPH) and C₉ to C₄₀ Aliphatic Hydrocarbons (ALI) by GC/FID, Polycyclic Aromatic Hydrocarbons (PAH) by GC/MS-SIM, and selected biological markers by GC/MS-SIM.

The analytical results for PAH, selected hopane's, and TAS compounds in the sediment/soil samples are included in this report.

Analytical Methods

The standard operating procedures for TPH, ALI, PAH, hopanes, and TAS are listed in Table 1.

| Matrix | Extraction | PAH |
|---------------|------------|----------|
| Sediment/soil | B&B 1003 | B&B 1006 |

Table 1. Standard Operating Procedures for each analytical test.

Data Reporting

The reporting units for each analyte are listed in Table 2. Analytes that are detected below the method detection limit are qualified as "J". Analytes that are detected in the procedural blanks greater than 3X MDL are qualified with a "B". Analytical interference's that are detected in the sample are qualified with an "I". Analytes not detected in the samples are qualified with a "U". The RPD for analytes in duplicate samples that are <3X MDL are qualified with a "X". Spiked levels of analytes in matrix spikes that are <50% of the native levels are considered invalid spikes and are qualified with a "Y". Any QC result reported to be outside the corresponding QC criteria is discussed in the QA/QC variance section of this report. Data Qualifier Definitions are listed in Table 3. The method detection limits (MDL) for each analyte are listed in Table 4.

| Table 2. Ar | nalytical | reporting | units. |
|-------------|-----------|-----------|--------|
|-------------|-----------|-----------|--------|

| <u>M</u> atrix | PAH |
|----------------|----------|
| Sediment/soil | ng/dry g |

| Table 3. | Data | Qualifier | Definitions. |
|----------|------|-----------|--------------|
|----------|------|-----------|--------------|

| Qualifier | Definition | | |
|-----------|---|--|--|
| В | Analyte detected in the procedural blank greater than 3X MDL | | |
| D | Diluted Value | | |
| E | Analyte concentration exceeds the calibration range of the GC/MS for that specific analysis. | | |
| | Analytical interference | | |
| J | Analyte detected below the method detection limit | | |
| L | Loss due to matrix effect | | |
| NA | Not Applicable | | |
| U | Analyte not detected | | |
| x | Analyte <3X MDL | | |
| Y | Spiked level of analyte <50% of the native concentration | | |
| * | Outside QA limits, refer to narrative | | |

| РАН | Sediment/Soil MDLs |
|------------------------------|----------------------------------|
| Sample size | 15.0 g, 1ml final extract volume |
| Unit of measure | ng/g |
| | |
| cis/trans Decalin | 0.132 |
| C1-Decalins | 0.263 |
| C2-Decalins | 0.263 |
| C3-Decalins | 0.263 |
| C4-Decalins | 0.263 |
| Naphthalene | 0.342 |
| C1-Naphthalenes | 1.03 |
| C2-Naphthalenes | 0.684 |
| C3-Naphthalenes | 0.684 |
| C4-Naphthalenes | 0.684 |
| Benzothiophene | 0.090 |
| C1-Benzothiophenes | 0.180 |
| C2-Benzothiophenes | 0.180 |
| C3-Benzothiophenes | 0.180 |
| C4-Benzothiophenes | 0.180 |
| Biphenyl | 0.294 |
| Acenaphthylene | 0.041 |
| Acenaphthene | 0.103 |
| Dibenzofuran | 0.204 |
| Fluorene | 0.183 |
| C1-Fluorenes | 0.367 |
| C2-Fluorenes | 0.367 |
| C3-Fluorenes | 0.367 |
| Carbazole | 0.150 |
| Anthracene | 0.115 |
| Phenanthrene | 0.208 |
| C1-Phenanthrenes/Anthracenes | 0.077 |
| C2-Phenanthrenes/Anthracenes | 0.285 |
| C3-Phenanthrenes/Anthracenes | 0.285 |
| C4-Phenanthrenes/Anthracenes | 0.285 |
| Dibenzothiophene | 0.116 |
| C1-Dibenzothiophenes | 0.064 |
| C2-Dibenzothiophenes | 0.232 |
| C3-Dibenzothiophenes | 0.232 |
| C4-Dibenzothiophenes | 0.232 |
| Fluoranthene | 0.333 |
| Pyrene | 0.136 |
| C1-Fluoranthenes/Pyrenes | 0.469 |
| C2-Fluoranthenes/Pyrenes | 0.469 |
| C3-Fluoranthenes/Pyrenes | 0.469 |
| C4-Fluoranthenes/Pyrenes | 0.469 |
| Naphthobenzothiophene | 0.128 |
| C1-Naphthobenzothiophenes | 0.256 |
| C2-Naphthobenzothiophenes | 0.256 |
| C3-Naphthobenzothiophenes | 0.256 |
| C4-Naphthobenzothiophenes | 0.256 |
| Benz(a)anthracene | 0.192 |
| Chrysene/Triphenylene | 0.116 |
| C1-Chrysenes | 0.232 |

Table 4. Method Detection Limits.

| PAH (continued) Sample size | Sediment/Soil MDLs 15.0 g, 1ml final extract volume |
|--|--|
| Unit of measure | ng/g |
| C2-Chrysenes | 0.232 |
| C3-Chrysenes | 0.232 |
| C4-Chrysenes | 0.232 |
| Benzo(b)fluoranthene | 0.203 |
| | |
| Benzo(k,j)fluoranthene | 0.098 |
| Benzo(a)fluoranthene | 0.098 |
| Benzo(e)pyrene | 0.177 |
| Benzo(a)pyrene | 0.101 |
| | 1.27 |
| Indeno(1,2,3-c,d)pyrene | 0.050 |
| Dibenzo(a,h)anthracene | 0.064 |
| Benzo(g,h,i)perylene | 0.088 |
| Individual Alkyl Isomers, TAS, and Hopanes | |
| 2-Methylnaphthalene | 1.30 |
| 1-Methylnaphthalene | 0.546 |
| 2,6-Dimethylnaphthalene | 0.261 |
| 1,6,7-TrimethyInaphthalene | 0.127 |
| 1-Methylfluorene | 0.191 |
| 4-Methyldibenzothiophene | 0.091 |
| 2/3-Methyldibenzothiophene | 0.091 |
| 1-Methyldibenzothiophene | 0.091 |
| 3-Methylphenanthrene | 0.097 |
| 2/4-Methylphenanthrene | 0.097 |
| 2-Methylanthracene | 0.097 |
| 9-Methylphenanthrene | 0.097 |
| 1-Methylphenanthrene | 0.097 |
| 3,6-Dimethylphenanthrene | 0.110 |
| Retene | 0.231 |
| 2-Methylfluoranthene | 0.223 |
| Benzo(b)fluorene | 0.125 |
| C29-Hopane | 0.575 |
| 18a-Oleanane | 0.575 |
| C30-Hopane | 0.575 |
| C20-TAS | 0.575 |
| C21-TAS | |
| C26(20S)-TAS | 0.575 0.575 |
| | |
| C26(20R)/C27(20S)-TAS | 0.575 |
| C28(20S)-TAS | 0.575 |
| C27(20R)-TAS | 0.575 |
| C28(20R)-TAS | 0.575 |

Quality Assurance/Quality Control – Sediment/soil

Polycyclic Aromatic Hydrocarbons (PAH)

The quality assurance/quality control procedure for this program included the analyses of a procedural blank, laboratory duplicate, a matrix spike/matrix spike duplicate, and a sediment SRM (NIST SRM 1941b) of no more than 19 samples. A standard reference oil (NIST 2779) was analyzed with this data set. Procedural blanks are used to determine that sample preparation and analyses are free of contaminants. The laboratory duplicate sample is used to determine the precision of the analysis. The matrix spike/matrix spike duplicate is used to measure accuracy and precision of the analysis. A SRM is a material for which a mean and confidence interval are certified for specific analytes. SRMs are selected based on matrix similarities as well as type and level of certified analytes. All SRMs are traceable to NIST. SRMs are used to verify analytical accuracy. All QC samples are subject to the identical preparation and analysis steps as samples. The QC criterion for blanks specifies no more than 2 analytes to exceed 3x target MDL unless analyte not detected in associated sample(s) or analyte concentration >10x blank value. The QC criteria for spike recoveries are between 40-120% (except for Biphenyl which is 40% to 140%, Decalin which is 25% to 120%, and Perylene which is 10-120%). The QC criterion for RPDs for valid spiked duplicates is ≤30%. The QC criterion for RPDs for valid laboratory duplicates is ≤30%. The QC criterion for the reference sediment 1941b SRM is \pm 30% the NIST certified concentration range for those compounds whose concentration is greater than the laboratory method detection limit. The QC criterion for the reference oil 2779 SRM is ± 20% the NIST reference range for those compounds whose concentration is greater than the detection limit of10 ng/g.

Surrogate solutions equivalent to 5-10X the MDL are prepared for various hydrocarbon analyses. The appropriate surrogate solution is added to every sample including quality control samples. The data are corrected based on surrogate recovery up to 100%. The QC criteria for surrogate recoveries are between 40-120%, except d12-perylene whose recovery criteria are 10-120%. Refer to Table 5 for Method Performance Criteria for PAH.

Quality Assurance/Quality Control Variances – Sediment/Soil

Polycyclic Aromatic Hydrocarbons (PAH)

Initial Calibration (Six Point)

Observation

No variances were observed.

Initial Calibration Verification

Observation

• No variances were observed.

Mass Discrimination Ratio

Observation

No variances were observed.

Internal Standard Area Response

Observation

No variances were observed.

Continuing Calibration Checks

Observation

• No variances were observed.

Surrogate Recoveries

Observation

- d10-Acenaphthene was detected outside of the QC recovery limits of 40 to 120% in ARC1641 (SED-DA-012 (0.5-1.0).
- d12-Perylene was detected outside of the QC% recovery limits of 10 to 120% in fifteen (15) client submitted samples and three (3) internal QC samples (which used client submitted samples; MS, MSD, and Duplicate).

Comment

- It is unknown as to why d10-Acenaphtene was detected outside of the % recovery limits.
- The recovery of this surrogate outside the QC limits is due to a matrix effect and is qualified with an "L" when appropriate.

Procedural Blank

Observation

No variances were observed.

Matrix Spike/Matrix Spike Duplicate

Observation

- Perylene was detected outside of the QC %recovery limits of 40% to 120% in ENV3081C MS (SO-DA-015 (0-0.5) MS/MSD)). Perylene was detected outside of the QC %recovery limits of 40% to 120% in ENV3081D MSD (SO-DA-015 (0-0.5) MS/MSD)).
- Phenanthrene, Fluoranthene, Chrysene/Triphenylene, Benzo(b)fluoranthene and Benoz(e)pyrene were detected outside of the laboratory QC recovery limits of 40 to 120% in ENV3081C MS (SO-DA-015 (0-0.5) MS/MSD)) and ENV3081D MSD (SO-DA-015 (0-0.5) MS/MSD)).

Comment

- It is unknown as to why Perylene was detected outside of the laboratory QC recovery limits. Though it is suspected that this is a matrix effect as seen in other samples from this project.
- Phenanthrene, Fluoranthene, Chrysene/Triphenylene, Benzo(b)fluoranthene and Benoz(e)pyrene are invalid spikes due to high native concentrations of PAH in the samples. These peaks are qualified with a "Y".

Laboratory Duplicate

Observation

No variances were observed.

Laboratory Control Standard (Solution, Sediment, and Petroleum)

Observation

No variances were observed

Additional QC Batch Information

Observation

- The concentrations reported for the C1-Naphthalenes, C1-Dibenzothiophenes, and the C1-Phenanthrene/Anthracenes are calculated using the RRF of the parent compound (Naphthalene, Dibenzothiophene, and Phenanthrene). The concentration of these individual isomers is based on their RRF or an individual isomer from the same family.
- Labeling of Perylene outside of the calibration range of the GC/MS with an "E" code was made in consultation with Dr. Ted Sauer.
- Labeling of d12- Perylene outside of the laboratory recovery limits is labeled with the "L" qualifier to indicate a loss due to matrix effect was made in consultation with Dr. Ted Sauer.

| | | | /deal 22 C205/023 | | 김 이 김 김 씨는 것 이 집 집에 들었다. 이 문 것 같아요. 이 문 것 같아요. 이 있 않 ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? |
|----------|------------------------|---------------------------|--------------------|-------------|---|
| Table 5 | Method Performance | Criteria for Extended PAH | (Parent and Alk | vl Homologs |) and Related Compounds. |
| 10010 01 | inventouri orrorniunou | | In whome which run | Junionogo | , and Related Compoundo. |

| Element or Sample Type | Minimum Frequency | Measurement Quality Objective/ Acceptance Criteria | Corrective Action |
|--|---|---|---|
| Tuning | Prior to every sequence | Tune as specified in laboratory SOP | Resolve before proceeding. |
| Initial Calibration (All parent PAH and selected alkyl homologue PAH) | Prior to every sequence, or as needed based on continuing calibration/verification check. | 6-point calibration curve over two orders of magnitude RPD $\leq 20\%$ | Resolve before proceeding. |
| Continuing Calibration Verification (CCV) | Every 12 hours or 6-9 field samples | $RPD \le 25\%$, No more than 2 analytes can be between 25% and 35% RPD. | Perform instrument maintenance. Re-analyze affected samples. |
| Initial Calibration Verification (Second Source or can be met if CCV is second source) | Per initial calibration | %R target analytes 80-120% | Resolve before proceeding. |
| SRM 1941b for sediment; SRM 1974c for tissue If available use SRMs for appropriate matrices | One per batch/every 20 field samples | Within ±30% of NIST 95% uncertainty range for analytes within the quantitation range. No more than 2 analytes may exceed this criterion. | Resolve before proceeding. |
| SRM 2779 Reference Oil | One per batch/every 20 field samples | Peak resolution >70% of 4/9- methylphenanthrene from 1- methylphenanthrene (m/z 192). Within ±20% of NIST 95% uncertainty range for analytes within the quantitation range. No more than 2 analytes may exceed this criterion. | Resolve before proceeding. |
| Matrix Spike/Matrix Spike Duplicate (Sediments, Soils, Tissues only) | One per batch/every 20 field samples | %R 40% - 120% for target analytes, except biphenyl (40-140%), decalin (25-120%) and perylene (10-120%); RPD \leq 30%, average %R 60-120% for valid spikes. No more than 2 analytes may exceed 40-120% recovery or >35% RPD. | Evaluate impact to data, discuss with lab manager to determine if corrective action is needed. |
| Blank Spike/Blank Spike Duplicate | One per batch/every 20 field samples | See MS/MSD criteria above. | Evaluate impact to data, discuss with lab manager to determine if corrective action is needed. |
| Procedural Blank | One per batch/every 20 field samples | No more than 2 analytes to exceed 3x target MDL unless analyte not detected in associated sample(s) or analyte concentration >10x blank value | Resolve before proceeding. Lab manager may be contacted to resolve issues. |
| Laboratory Duplicate (not required for aqueous samples) | One per batch/every 20 field samples | $RPD \le 30\%$ if analyte concentration is 3x greater than the MDL, no more than 2 individual analyte RPDs with conc. 3x MDL can exceed 35%. | Evaluate impact to data, discuss with lab manager, and determine if corrective action is needed. |

Table 5. Continued. Method Performance Criteria for Extended PAH (Parent and Alkyl Homologs) and Related Compounds.

| Element or Sample Type | Minimum Frequency | Measurement Quality Objective/ Acceptance Criteria | Corrective Action |
|------------------------|--|---|--|
| Mass Discrimination | Initial calibration and CCVs (mid- level) | Ratio for the concentration of Benzo[g,h,i]perylene to phenanthrene ≥ 0.70 | Resolve before proceeding. |
| Internal Standard (IS) | Every sample | 50% - 200% of the area of the IS in the associated calibration standard | Resolve before proceeding. |
| Surrogates | Every sample | %R 40-120% except d12-perylene which is 10-120% | Re-extract affected samples. Evaluate impact to data, discuss with lab manager, if corrective action is needed. |

We appreciate the opportunity to serve your analytical needs and please do not hesitate to contact us should you have any questions

Juan A. Ramirez Environmental Laboratory Manager

rella frand

Donell S. Frank Project Quality Manager

Sample/Analyses Description

Arcadis - Mayflower AR Sample Inventory

| # | File Number | Client Identification | Collection Date | Received Date Analysis | Analysis | Matrix | Comments | B&B SDG | Client Project # |
|----|----------------|--------------------------|-----------------|------------------------|----------|----------|--------------------------------------|----------|------------------|
| | | | | | | | | | |
| - | ARC1600 | SED-DA-020 (0.5-1.0) | 07/30/13 | 07/31/13 | PAH | Sediment | no wet sample remaining. 44 analytes | 13073101 | B0086003 1302 |
| 2 | ARC1601 | SED-DA-020 (1.0-1.5) | 07/30/13 | 07/31/13 | PAH | Sediment | 44 analytes | 13073101 | B0086003 1302 |
| ო | ARC1618 | SO-DA-012 (0-0.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003 1302 |
| 4 | ARC1619 | SO-DA-012 (0.5-1.0) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003 1302 |
| 5 | ARC1620 | SO-DA-012 (1.0-1.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003 1302 |
| 9 | ARC1621 | SO-DA-013 (0-0.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 2 | ARC1622 | SO-DA-013 (0.5-1.0) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| œ | ARC1623 | SO-DA-013 (1.0-1.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| ი | ARC1624 | SO-DA-014 (0-0.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 10 | ARC1625 | SO-DA-014 (0.5-1.0) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 7 | ARC1626 | SO-DA-014 (1.0-1.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 12 | ARC1627 | SO-DA-DUP-01-080113 | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 13 | ARC1628 | SO-DA-015 (0-0.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 4 | ARC1629 | SO-DA-015 (0.5-1.0) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 15 | ARC1630 | SO-DA-015 (1.0-1.5) | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes | 13080201 | B0086003.1302 |
| 16 | ARC1631 | SO-DA-015 (0-0.5) MS/MSD | 08/01/13 | 08/02/13 | PAH | Soil | 44 analytes, 1 of 2 | 13080201 | B0086003.1302 |
| 17 | ARC1641 | SED-DA-012 (0.5-1.0) | 08/04/13 | 08/06/13 | PAH | Sediment | 44 analytes | 13080601 | B0086003.1302 |
| 18 | ARC1642 | SED-DA-012 (1.0-1.5) | 08/04/13 | 08/06/13 | PAH | Sediment | 44 analytes | 13080601 | B0086003.1302 |
| 19 | ARC1643 | SED-DA-013 (0.5-1.0) | 08/04/13 | 08/06/13 | PAH | Sediment | 44 analytes | 13080601 | B0086003.1302 |
| 20 | ARC1644 | SED-DA-013 (1.0-1.5) | 08/04/13 | 08/06/13 | PAH | Sediment | 44 analytes | 13080601 | B0086003.1302 |
| | | | | | | | | | |

Sediment Samples

Polycyclic Aromatic Hydrocarbon Concentration

Arcadis - Mayflower AR Polycyclic Aromatic Hydrocarbon Data Client Submitted Samples

Sample Name ARC1600.D ARC1601.D ARC1618.D ARC1619.D ARC1620.D **Client Name** SED-DA-020 (0.5-1.0) SED-DA-020 (1.0-1.5) SO-DA-012 (0-0.5) SO-DA-012 (1.0-1.5) SO-DA-012 (0.5-1.0) Matrix Sediment Sediment Soil Soil Soil **Collection Date** 07/30/13 07/30/13 08/01/13 08/01/13 08/01/13 **Received Date** 07/31/13 07/31/13 08/02/13 08/02/13 08/02/13 08/13/13 Extraction Date 08/13/13 08/13/13 08/13/13 08/13/13 **Extraction Batch** ENV 3081 ENV 3081 ENV 3081 ENV 3081 ENV 3081 **Date Acquired** 8/17/13 15:31 8/17/13 16:40 8/17/13 17:48 8/17/13 20:05 8/17/13 21:14 Method PAH-2012.M PAH-2012.M PAH-2012.M PAH-2012.M PAH-2012.M Sample Dry Weight (g) 15.0 15.0 15,1 15.0 15.0 % Dry 28 60 88 87 82 % Moisture 72 40 12 13 18 Dilution 1X 1X 1X 1X 1X Target Compounds Su. Corrected Q Su. Corrected 0 Su. Corrected Q Su. Corrected Q Su. Corrected Q Conc. (ng/dry g) cis/trans Decalin NA NA NA NA NA C1-Decalins NA NA NA NA NA C2-Decalins NA NA NA NA NA C3-Decalins NA NA NA NA NA C4-Decalins NA NA NA NA NA Naphthalene 10.9 5.80 2 35 2 47 4.88 C1-Naphthalenes 11.2 4.45 1.84 2.07 3.72 C2-Naphthalenes 28.9 9.31 2.89 3.26 624 C3-Naphthalenes 29.7 9.54 2.23 2.56 8.94 C4-Naphthalenes 36.3 12.9 4.18 <0.7 U <0.7 U Benzothiophene NA NA NA NA NA C1-Benzothiophenes NA NA NA NA NA C2-Benzothiophenes NA NA NA NA NA C3-Benzothiophenes NA NA NA NA NA C4-Benzothiophenes NA NA NA NA NA Biphenyl NA NA NA NA NA Acenaphthylene 3.98 0.961 2.16 0.727 1.29 Acenaphthene 6.17 0.118 1.67 0 179 0.420 Dibenzofuran NA NA NA NA NA Fluorene 15.7 9.55 2.75 3.62 5.67 C1-Fluorenes 11.3 5.44 1.61 1.07 2.52 <0.4 U C2-Fluorenes 49.8 15.2 <0.4 U <0.4 U C3-Fluorenes 49.0 <0.4 11.3 U <0.4 U <0.4 U Carbazole NA NA NA NA NA Anthracene 8.77 1.86 3.73 0.876 1.71 Phenanthrene 46.1 35.5 12.7 12.5 19.1 C1-Phenanthrenes/Anthracenes 42.2 12.1 6.78 5.26 8.45 C2-Phenanthrenes/Anthracenes 93.5 14.8 10.3 <0.3 U 7.23 C3-Phenanthrenes/Anthracenes 129 7.57 11.9 <0.3 U 2.97 C4-Phenanthrenes/Anthracenes 122 9.19 10.6 <0.3 U 3.60 Dibenzothiophene 11.8 2.75 1.27 1.14 2.11 C1-Dibenzothiophenes 26.3 2.86 1.57 1.36 3.41 C2-Dibenzothiophenes 72.2 5.44 5.22 1.62 3.68 C3-Dibenzothiophenes 7.50 145 11.1 1.33 3.77 C4-Dibenzothiophenes 137 5.05 9.29 <0.2 U <0.2 U Fluoranthene 33.2 11.6 15.9 6.39 12.3 Pyrene 22.6 5.83 10.3 3.22 7.75 C1-Fluoranthenes/Pyrenes 73.5 7.61 10.4 2.10 5.96 C2-Fluoranthenes/Pyrenes 160 <0.5 U 16.9 3.98 9.15 C3-Fluoranthenes/Pyrenes 171 <0.5 U 8.81 1.84 3 98 C4-Fluoranthenes/Pyrenes 189 <0.5 U <0.5 U 16.2 5.12 Naphthobenzothiophene NA NA NA NA NA C1-Naphthobenzothiophenes NA NA NA NA NA C2-Naphthobenzothiophenes NA NA NA NA NA C3-Naphthobenzothiophenes NA NA NA NA NA C4-Naphthobenzothiophenes NA NA NA NA NA Benz(a)anthracene 8.97 2.14 6.92 1.57 2.61 Chrysene/Triphenylene 56.2 7.02 17.1 4.63 8.30 C1-Chrysenes 369 <0.2 U 13.1 2.85 6.25 C2-Chrysenes 219 <0.2 U 13.2 2.77 4.94 C3-Chrysenes 164 <0.2 U 10.3 1.95 3.10 C4-Chrysenes 79.5 <0.2 U 6.29 <0.2 U <0.2 U Benzo(b)fluoranthene 43.8 10.2 25.2 6.16 9.28 Benzo(k,j)fluoranthene 11.8 2.73 11.8 2.18 3.15 Benzo(a)fluoranthene NA NA NA NA NA 38.2 4.72 Benzo(e)pyrene 15.3 3.75 5.07 Benzo(a)pyrene 10.9 1.87 4.64 0 676 1.57 Е 337 0.951 J Perviene 562 0.228 J 2.76 Indeno(1,2,3-c,d)pyrene 17.0 3.33 6.88 1.76 2.22 Dibenzo(a,h)anthracene 7.3 8.77 2.36 0.580 0.740 Benzo(g,h,i)perylene 33.6 3.08 7.01 2.12 1.68 Total PAHs 3356 597 324 88.4 186

Arcadis - Mayflower AR Polycyclic Aromatic Hydrocarbon Data Client Submitted Samples

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture Dilution | ARC1600.D SED-DA-020 (0.5-1.0) Sediment 07/30/13 08/13/13 ENV 3081 8/17/13 15:31 PAH-2012.M 15.0 28 72 1X | ARC1601 D SED-DA-020 (1.0-1.5) Sediment 07/30/13 07/31/13 08/13/13 ENV 3081 8/17/13 16:40 PAH-2012.M 15.0 60 40 1X | ARC1618.D SO-DA-012 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 17:48 PAH-2012.M 15.1 88 12 1X | ARC1619.D SO-DA-012 (0.5-1.0) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 20:05 PAH-2012.M 15.0 87 13 1X | ARC1620.D SO-DA-012 (1.0-1.5) Soil 08/02/13 08/02/13 08/13/13 ENV 3081 B/17/13 21:14 PAH-2012.M 15.0 82 18 1X |
|--|--|--|---|---|---|
| Target Compounds | Su. Corrected Q Conc. (ng/dry g) | Su. Corrected C Conc. (ng/dry g) | Su. Corrected Conc. (ng/dry g) | Q Su. Corrected Q Conc. (ng/dry g) | Su. Corrected Q Conc. (ng/dry g) |
| individual Aikyr isomers and hopanes | | | | | |
| 2-Methyinaphthalene | 12.8 | 4.92 | 2.07 | 2.33 | 4.03 |
| 1-Methylnaphthalene | 5.46 | 2.33 | 0.927 | 1.04 | 2.04 |
| 2.6-Dimethylnaphthalene | NA | NA | NA | NA | NA |
| 1.6.7-Trimethylnaphthalene | NA | NA | NA | NA | NA |
| 1-Methylfluorene | NA | NA | NA | NA | NA |
| 4-Methyldibenzothiophene | NA | NA | NA | NA | NA |
| 2/3-Methyldibenzothiophene | NA | NA | NA | NA | NA |
| 1-Methyldibenzothiophene | NA | NA | NA | NA | NA |
| 3-Methylphenanthrene | NA | NA | NA | NA | NA |
| 2-Methylphenanthrene | NA | NA | NA | NA | NA |
| | NA | NA | NA | NA | NA |
| 2-Methylanthracene | NA | | | | |
| 4/9-Methylphenanthrene | | NA | NA | NA | NA |
| 1-Methylphenanthrene | NA | NA | NA | NA | NA |
| 3,6-Dimethylphenanthrene | NA | NA | NA | NA | NA |
| Retene | NA | NA | NA | NA | NA |
| 2-Methylfluoranthene | NA | NA | NA | NA | NA |
| Benzo(b)fluorene | NA | NA | NA | NA | NA |
| C29-Hopane | NA | NA | NA | NA | NA |
| 18a-Oleanane | NA | NA | NA | NA | NA |
| C30-Hopane | NA | NA | NA | NA | NA |
| C20-TAS | NA | NA | NA | NA | NA |
| C21-TAS | NA | NA | NA | NA | NA |
| C26(20S)-TAS | NA | NA | NA | NA | NA |
| C26(20R)/C27(20S)-TAS | NA | NA | NA | NA | NA |
| C28(20S)-TAS | NA | NA | NA | NA | NA |
| C27(20R)-TAS | NA | NA | NA | NA | NA |
| C28(20R)-TAS | NA | NA | NA | NA | NA |
| Surrogate Recovery | | | | | |
| Naphthalene-d8 | 90 | 83 | 78 | 77 | 82 |
| Acenaphthene-d10 | 87 | 86 | 71 | 71 | 85 |
| Phenanthrene-d10 | 93 | 94 | 90 | 86 | 92 |
| Chrysene-d12 | 95 | 79 | 83 | 83 | 90 |
| Perylene-d12 | 71 | 62 | 1 | LOL | 4 L |

6

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture Dilution | ARC1621.D SO-DA-013 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 22:22 PAH-2012.M 15.1 83 17 1X | ARC1622.D SO-DA-013 (0.5-1.0) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 23:31 PAH-2012.M 15.0 85 15 1X | Ì | ARC1623.D SO-DA-013 (1.0-1.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 0:39 PAH-2012.M 15.1 85 15 1X | | ARC1624.D SO-DA-014 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 1:48 PAH-2012.M 15.1 82 18 1X | | ARC1625.D SO-DA-014 (0.5-1.0) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 2:56 PAH-2012.M 15.0 81 19 1X |
|--|---|---|-------|--|-----|--|---|--|
| Target Compounds | Su. Corrected C Conc. (ng/dry g) | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Q Conc. (ng/dry g) |
| cis/trans Decalin | NA | NA | | NA | | NA | | NA |
| C1-Decalins | NA | NA | | NA | | NA | | NA |
| C2-Decalins | NA NA | NA NA | | NA NA | | NA NA | | NA |
| C3-Decalins C4-Decalins | NA | NA | | NA | | NA | | NA |
| Naphthalene | 1.19 | 0.668 | | 1.17 | | 2.85 | | 1.63 |
| C1-Naphthalenes | 1.05 | 0.413 | | 0.953 | J | 2.15 | | 1.39 |
| C2-Naphthalenes | 1.95 2.41 | 0.965 | | 1.67 2.85 | | 4.03 3.28 | | 2.92 2.54 |
| C3-Naphthalenes C4-Naphthalenes | 1.59 | <0.7 | | <0.7 | U | <0.7 | U | <0.7 U |
| Benzothiophene | NA | NA | | NA | | NA | | NA |
| C1-Benzothiophenes | NA | NA | | NA | | NA | | NA |
| C2-Benzothiophenes | NA NA | NA NA | | NA NA | | NA NA | | NA |
| C3-Benzothiophenes C4-Benzothiophenes | NA | NA | | NA | | NA | | NA |
| Biphenyl | NA | NA | | NA | | NA | | NA |
| Acenaphthylene | 0.209 | 0.052 | | 0.099 | ÷. | 1.90 | | 0.540 |
| Acenaphthene Dibenzofuran | 0.054 J NA | 0.069 NA | | 0.049 NA | J | 0.318 NA | | 0.201 NA |
| Fluorene | 1.74 | 0.862 | | 2.72 | | 3.19 | | 5.78 |
| C1-Fluorenes | 0.874 | 0.258 | | 0.674 | | 1.69 | | 2.31 |
| C2-Fluorenes | <0.4 U | | | <0.4 | | <0.4 | | <0.4 U |
| C3-Fluorenes Carbazole | <0.4 U NA | <0.4 NA | | <0.4 NA | U | <0.4 NA | U | <0.4 U NA |
| Anthracene | 0.228 | 0.047 | | <0.1 | U | 2.37 | | 0.668 |
| Phenanthrene | 6.00 | 2.26 | | 6.90 | | 14.8 | | 19.8 |
| C1-Phenanthrenes/Anthracenes | 4.66 8.28 | <0.1 <0.3 | | <0.1 <0.3 | | 7.31 7.38 | | 6.44 6.67 |
| C2-Phenanthrenes/Anthracenes C3-Phenanthrenes/Anthracenes | 6.58 | <0.3 | | <0.3 | | 7.58 | | 6.69 |
| C4-Phenanthrenes/Anthracenes | 5.50 | <0.3 | | <0.3 | | 7.18 | | 4.95 |
| Dibenzothiophene | 0.681 | 0.101 | | 0.211 | | 1.26 | | 1.10 |
| C1-Dibenzothiophenes C2-Dibenzothiophenes | 1.50 4.44 | 0.150 0.188 | | 0.187 | | 1.47 | | 0.725 |
| C3-Dibenzothiophenes | 7.38 | 0.270 | | <0.2 | U | 3.20 | | 2.56 |
| C4-Dibenzothiophenes | 5.69 | <0.2 | | <0.2 | U | <0.2 | υ | <0.2 U |
| Fluoranthene | 3.59 | 0.462 | | 0.903 | | 17.9 | | 6.19 |
| Pyrene C1-Fluoranthenes/Pyrenes | 2.73 2.73 | 0.331 <0.5 | | 0.367 | U | 12.4 7.91 | | 2.78 2.61 |
| C2-Fluoranthenes/Pyrenes | 4.32 | <0.5 | | <0.5 | | 13.0 | | 5.39 |
| C3-Fluoranthenes/Pyrenes | 2.91 | <0.5 | | <0.5 | | 5.05 | | 2.77 |
| C4-Fluoranthenes/Pyrenes Naphthobenzothiophene | 4.04 NA | <0.5 NA | | <0.5 NA | U | 11.0 NA | | 6.43 NA |
| C1-Naphthobenzothiophenes | NA | NA | | NA | | NA | | NA |
| C2-Naphthobenzothiophenes | NA | NA | | NA | | NA | | NA |
| C3-Naphthobenzothiophenes | NA NA | NA | | NA | | NA NA | | NA NA |
| C4-Naphthobenzothiophenes Benz(a)anthracene | 1.14 | 0.149 | | 0.117 | J | 6.34 | | 1.68 |
| Chrysene/Triphenylene | 3.16 | 0.154 | | 0.125 | | 15.8 | | 3.92 |
| C1-Chrysenes | 3.47 | <0.2 | | <0.2 | | 8.60 | | 3.80 |
| C2-Chrysenes | 4.29 3.47 | <0.2 <0.2 | | <0.2 <0.2 | | 8.34 7.71 | | 4.38 4.95 |
| C3-Chrysenes C4-Chrysenes | <0.2 U | | | <0.2 | | <0.2 | U | <0.2 U |
| Benzo(b)fluoranthene | 3.73 | 0.280 | | 0.203 | J | 25.8 | | 5.62 |
| Benzo(k,j)fluoranthene | 1.40 | 0.083 | | 0.061 | J | 9.78 | | 1.85 |
| Benzo(a)fluoranthene Benzo(e)pyrene | NA 2.67 | NA 0.202 | | NA 0.147 | ar. | NA 15.36 | | NA 3.68 |
| Benzo(a)pyrene | 1.10 | 0.062 | | <0.1 | | 3.65 | | 0.833 |
| Perylene | 0.280 J | 0.028 | J | <1.3 | | 0.64 | J | 0.239 J |
| Indeno(1,2,3-c,d)pyrene | 1.26 | 0.095 | | 0.063 | , | 8.62 | | 1.72 |
| Dibenzo(a,h)anthracene Benzo(g,h,i)perylene | 0.399 | 0.030 | | 0.021 | | 2.70 8.13 | | 0.605 1.85 |
| Deuro(B'II'I)hei Jierie | 1.02 | 0.105 | | 0.000 | ~ | 0.15 | | 1,00 |
| Total PAHs | 110 | 10.0 | (| 19.8 | _ | 262 | | 129 |

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture | ARC1621.D SO-DA-013 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 22:22 PAH-2012.M 15.1 83 17 | | ARC1622.D -DA-013 (0.5-1.0) Soil 08/01/13 08/02/13 08/02/13 08/13/13 ENV 3081 8/17/13 23:31 PAH-2012.M 15.0 85 15 | | ARC1623.D SO-DA-013 (1.0-1.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 0:39 PAH-2012.M 15.1 85 15 | | ARC1624.D SO-DA-014 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 1:48 PAH-2012.M 15.1 82 18 | S | ARC1625.D GO-DA-014 (0.5-1.0 Soil 08/02/13 08/13/13 ENV 3081 8/18/13 2:56 PAH-2012.M 15.0 81 19 | D) |
|--|---|---|---|---|--|---|--|---|---|----|
| Dilution | 1X | | 1X | | 15 1X | | 18 1X | | 19 1X | |
| Target Compounds | Su. Corrected C Conc. (ng/dry g) | | Su. Corrected conc. (ng/dry g) | Q | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected C Conc. (ng/dry g) | 2 | Su. Corrected Conc. (ng/dry g) | Q |
| Individual Alkyl Isomers and Hopanes | | | | | | | | | | |
| 2-Methylnaphthalene | 1.16 | J | 0.451 | | 1.05 | _ | 2.43 | | 1.5 | |
| 1-Methylnaphthalene 2.6-Dimethylnaphthalene | 0.548 NA | | 0.221 NA | 3 | 0.500 NA | J | 1.06 NA | | 0.69 N | |
| 1,6,7-Trimethylnaphthalene | NA | | NA | | NA | | NA | | N | |
| 1-Methylfluorene | NA | | NA | | NA | | NA | | N | |
| 4-Methyldibenzothiophene | NA | | NA | | NA | | NA | | N | |
| 2/3-Methyldibenzothiophene | NA | | NA | | NA | | NA | | N | |
| 1-Methyldibenzothiophene | NA | | NA | | NA | | NA | | N | |
| 3-Methylphenanthrene | NA | | NA | | NA | | NA | | N | |
| 2-Methylphenanthrene | NA | | NA | | NA | | NA | | N | |
| 2-Methylanthracene | NA | | NA | | NA | | NA | | N | |
| 4/9-Methylphenanthrene | NA | | NA | | NA | | NA | | N | |
| 1-Methylphenanthrene | NA | | NA | | NA | | NA | | N | |
| 3,6-Dimethylphenanthrene | NA | | NA | | NA | | NA | | N | |
| Retene | NA | | NA | | NA | | NA | | N | |
| 2-Methylfluoranthene | NA | | NA | | NA | | NA | | N | |
| Benzo(b)fluorene | NA | | NA | | NA | | NA | | N | |
| C29-Hopane | NA | | NA | | NA | | NA | | N | |
| 18a-Oleanane | NA | | NA | | NA | | NA | | N | |
| C30-Hopane | NA | | NA | | NA | | NA | | N | |
| C20-TAS | NA | | NA | | NA | | NA | | N | |
| C21-TAS | NA | | NA | | NA | | NA | | N | |
| C26(20S)-TAS | NA | | NA | | NA | | NA | | N | |
| C26(20R)/C27(20S)-TAS | NA | | NA | | NA | | NA | | N | |
| C28(20S)-TAS | NA | | NA | | NA | | NA | | N | |
| C27(20R)-TAS | NA | | NA | | NA | | NA | | N | |
| C28(20R)-TAS | NA | | NA | | NA | | NA | | N | A |
| Surrogate Recovery | | | | | | | | | | |
| Naphthalene-d8 | 77 | | 78 | | 78 | | 79 | | 84 | |
| Acenaphthene-d10 | 79 | | 78 | | 77 | | 77 | | 79 | |
| Phenanthrene-d10 | 87 | | 81 | | 82 | | 84 | | 85 | |
| Chrysene-d12 | 87 | | 85 | | 83 | | 87 | | 89 | |
| Perylene-d12 | 2 L | | 13 | | 4 | L | 0 L | | 0 | L |

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture Dilution | ARC1626.D SO-DA-014 (1.0-1.5) Soil 08/02/13 08/02/13 08/13/13 ENV 3081 8/18/13 4:05 PAH-2012.M 15.1 83 17 1X | 5 | ARC1627.D SO-DA-DUP-01-080113 Soil 08/01/13 08/13/13 ENV 3081 8/18/13 6:22 PAH-2012.M 15.1 80 20 1X | ARC1622 SO-DA-015 Soil 08/01/1 08/02/1 08/13/1 ENV 308 8/18/13 7 PAH-2012 15.0 84 16 1X | (0-0.5) 3 3 3 3 3 3 3 3 3 3 3 0 | | ARC1629.D SO-DA-015 (0.5-1.0) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 8:39 PAH-2012.M 15.1 84 16 1X | | ARC1630.D SO-DA-015 (1.0-1.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 9:47 PAH-2012.M 15.1 82 18 1X |
|---|---|---|---|---|---|----|---|---------------|---|
| Target Compounds | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Q Conc. (ng/dry g) | Su. Correc Conc. (ng/d | | Q | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Q Conc. (ng/dry g) |
| cis/trans Decalin C1-Decalins C2-Decalins C3-Decalins C4-Decalins C4-Decalins Naphthalene C1-Naphthalenes C2-Naphthalenes C3-Naphthalenes C3-Naphthalenes C4-Naphthalenes C4-Benzothiophenes C3-Benzothiophenes C3-Benzothiophenes C3-Benzothiophenes C4-Benzothiophenes C3-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C4-Benzothiophenes C3-Fluorenes C3-Fluorenes C3-Fluorenes C3-Fluorenes C3-Fluorenes C3-Phenanthrenes/Anthracenes C3-Phenanthrenes/Anthracenes C3-Phenzothiophenes C3-Dibenzothiophenes C3-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Dibenzothiophenes C4-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes | NA NA NA NA NA NA NA NA NA NA NA NA NA N | | NA NA NA NA NA NA NA NA NA NA NA NA NA N | | NA NA NA NA NA NA NA NA NA NA NA NA NA N | UU | NA NA NA NA NA NA 2.74 2.27 4.07 2.57 <0.7 NA NA NA NA NA NA 0.530 0.340 0.317 1.16 3.15 0.320 0.390 0.317 1.17 1.17 1.16 3.15 0.300 0.340 0.340 0.390 0.340 0.340 0.390 0.317 1.17 1.16 3.15 0.300 0.300 0.300 0.300 0.317 1.17 1.17 1.16 3.15 0.20 0.20 0.00 0.300 0.300 0.17 1.17 1.16 3.15 0.20 0.20 0.00 0.00 0.00 0.00 0.00 0.0 | υ υυ υυ | NA NA NA NA NA NA 2.30 1.55 2.51 2.02 <0.7 U NA NA NA NA NA NA NA NA NA 0.288 0.118 NA 2.18 0.940 <0.4 U NA 0.40 <0.4 U NA 0.349 6.92 4.85 7.81 7.05 7.98 0.857 1.23 2.79 6.09 <0.2 U 3.15 1.80 2.62 <0.5 U <0.5 U <0.5 U <0.5 U <0.5 U NA |
| C2-Naphthobenzothiophenes C3-Naphthobenzothiophenes C4-Naphthobenzothiophenes Benz(a)anthracene Chrysene/Triphenylene C1-Chrysenes C2-Chrysenes C3-Chrysenes C4-Chrysenes Benzo(b)fluoranthene Benzo(a)fluoranthene Benzo(a)fluoranthene Benzo(a)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene Total PAHs | NA NA NA 0.263 0.476 <0.2 U <0.2 U <0.2 U <0.2 U <0.2 U 0.687 0.240 NA 0.364 <0.1 U 0.043 0.160 0.043 0.042 0.082 0.082 | | NA NA NA 12.3 24.4 11.6 9.96 <0.2 U 45.6 16.2 NA 26.2 9.04 1.92 15.6 4.80 16.6 397 | | NA NA 6.73 17.2 22.5 28.6 27.4 14.0 31.5 12.2 NA 22.5 3.28 1.27 8.80 3.59 10.6 540 | L | NA NA NA 1.54 6.08 12.5 15.7 12.2 <0.2 8.00 2.56 NA 6.75 1.56 0.572 2.42 1.08 3.57 225 | U | NA NA NA 0.991 3.35 6.59 6.16 5.28 <0.2 U 3.92 0.909 NA 2.52 0.392 0.322 J 1.02 0.433 1.23 98.5 |

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture Dilution | ARC1626.D SO-DA-014 (1.0-1.5) Soil 08/02/13 08/02/13 08/13/13 ENV 3081 8/18/13 4:05 PAH-2012.M 15.1 83 17 1X | S | ARC1627.D O-DA-DUP-01-080113 Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 6:22 PAH-2012.M 15.1 80 20 1X | adia. | ARC1628.D SO-DA-015 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 7:30 PAH-2012.M 15.0 84 16 1X | | ARC1629.D SO-DA-015 (0.5-1.0) Soil 08/02/13 08/02/13 08/13/13 ENV 3081 8/18/13 8:39 PAH-2012.M 15.1 84 16 1X | 11 | ARC1630.D SO-DA-015 (1.0-1.5 Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 9:47 PAH-2012.M 15.1 82 18 1X | 5) |
|--|--|---|---|-------|--|---|--|----|---|----|
| Target Compounds Individual Alkyl Isomers and Hopanes | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected C Conc. (ng/dry g) | 2 | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Conc. (ng/dry g) | Q |
| individual Aikyrisoniers and riopanes | | | | | | | | | | |
| 2-Methyinaphthalene | 0.653 | | 2.70 | | 4.79 | | 2.59 | | 1.7 | |
| 1-Methylnaphthalene | 0.310 | J | 1.13 | | 2.21 | | 1.10 | | 0.80 | |
| 2,6-Dimethylnaphthalene | NA | | NA | | NA | | NA | | N | |
| 1,6,7-Trimethylnaphthalene | NA | | NA | | NA | | NA | | N | A |
| 1-Methylfluorene | NA | | NA | | NA | | NA | | N | A |
| 4-Methyldibenzothiophene | NA | | NA | | NA | | NA | | N | |
| 2/3-Methyldibenzothiophene | NA | | NA | | NA | | NA | | N | |
| 1-Methyldibenzothiophene | NA | | NA | | NA | | NA | | N | A |
| 3-Methylphenanthrene | NA | | NA | | NA | | NA | | N | |
| 2-Methylphenanthrene | NA | | NA | | NA | | NA | | N | |
| 2-Methylanthracene | NA | | NA | | NA | | NA | | N | |
| 4/9-Methylphenanthrene | NA | | NA | | NA | | NA | | N | A |
| 1-Methylphenanthrene | NA | | NA | | NA | | NA | | N/ | A |
| 3,6-Dimethylphenanthrene | NA | | NA | | NA | | NA | | N | A |
| Retene | NA | | NA | | NA | | NA | | N/ | A |
| 2-Methylfluoranthene | NA | | NA | | NA | | NA | | N | A |
| Benzo(b)fluorene | NA | | NA | | NA | | NA | | N/ | A |
| C29-Hopane | NA | | NA | | NA | | NA | | N | A |
| 18a-Oleanane | NA | | NA | | NA | | NA | | N | A |
| C30-Hopane | NA | | NA | | NA | | NA | | N | A |
| C20-TAS | NA | | NA | | NA | | NA | | N/ | A |
| C21-TAS | NA | | NA | | NA | | NA | | N | |
| C26(20S)-TAS | NA | | NA | | NA | | NA | | N/ | A |
| C26(20R)/C27(20S)-TAS | NA | | NA | | NA | | NA | | N | A |
| C28(20S)-TAS | NA | | NA | | NA | | NA | | N | A |
| C27(20R)-TAS | NA | | NA | | NA | | NA | | N | A |
| C28(20R)-TAS | NA | | NA | | NA | | NA | | N | A |
| Surrogate Recovery | | | | _ | | | | | | |
| Naphthalene-d8 | 79 | | 110 | | 63 | | 77 | | 82 | |
| Acenaphthene-d10 | 69 | | 83 | | 69 | | 61 | | 71 | |
| Phenanthrene-d10 | 66 | | 83 | | 74 | | 81 | | 76 | |
| Chrysene-d12 | 88 | | 88 | | 79 | | 80 | | 91 | |
| Perylene-d12 | 0 | L | 1 | L. | 2 L | | 1 | L | 0 | L |

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture Dilution | ARC1641.D SED-DA-012 (0.5-1.0) Sediment 08/06/13 08/06/13 08/13/13 ENV 3081 8/18/13 10:56 PAH-2012.M 15.0 84 16 1X | ARC1642.D SED-DA-012 (1.0-1.5) Sediment 08/04/13 08/06/13 08/13/13 ENV 3081 8/18/13 12:04 PAH-2012.M 15.0 83 17 1X | ARC1643.D SED-DA-013 (1.0-1.5) Sediment 08/04/13 08/06/13 08/13/13 ENV 3081 8/18/13 13:13 PAH-2012.M 15.1 84 16 1X | ARC1644.D SED-DA-013 (1.0-1.5) Sediment 08/04/13 08/06/13 08/13/13 ENV 3081 8/18/13 14:22 PAH-2012.M 15.1 83 17 1X |
|--|--|--|--|--|
| Target Compounds | Su. Corrected Q Conc. (ng/dry g) | Su. Corrected Conc. (ng/dry g) | Q Su. Corrected (Conc. (ng/dry g) | 2 Su. Corrected (Conc. (ng/dry g) |
| cis/trans Decalin | NA | NA | NA | NA |
| C1-Decalins | NA | NA | NA | NA |
| C2-Decalins | NA | NA | NA | NA |
| C3-Decalins | NA | NA | NA | NA |
| C4-Decalins | NA | NA | NA | NA |
| Naphthalene C1-Naphthalenes | 1.62 1.25 | 1.61 1.83 | 1.17 1.40 | 1.23 1.70 |
| C2-Naphthalenes | 1.25 | 2.44 | 3.67 | 3.39 |
| C3-Naphthalenes | <0.7 U | 1.73 | 4.47 | 2.04 |
| C4-Naphthalenes | <0.7 U | <0.7 1 | | |
| Benzothiophene | NA | NA | NA | NA |
| C1-Benzothiophenes | NA | NA | NA | NA |
| C2-Benzothiophenes | NA | NA | NA | NA |
| C3-Benzothiophenes | NA | NA | NA | NA |
| C4-Benzothiophenes | NA | NA | NA | NA |
| Biphenyl Acenaphthylene | NA <0.04 U | NA <0.04 U | NA J 0.072 | NA 0.05 |
| Acenaphthene | <0.1 U | <0.1 U | | |
| Dibenzofuran | NA | NA | NA | NA NA |
| Fluorene | 2.09 | 2.58 | 2.54 | 5.57 |
| C1-Fluorenes | 0.523 | 1.01 | 0.887 | 1.80 |
| C2-Fluorenes | <0.4 U | <0.4 L | | |
| C3-Fluorenes | <0.4 U | <0.4 l | 8 | |
| Carbazole | NA | NA | NA | NA |
| Anthracene Phenanthrene | <0.1 U 5.23 | <0.1 U 7.29 | J <0.1 L 6.42 | J <0.1 L 14.9 |
| C1-Phenanthrenes/Anthracenes | <0.1 U | 4.16 | <0.1 L | |
| C2-Phenanthrenes/Anthracenes | <0.3 U | <0.3 L | | |
| C3-Phenanthrenes/Anthracenes | <0.3 U | <0.3 L | | 5// S750/S |
| C4-Phenanthrenes/Anthracenes | <0.3 U | <0.3 L | J <0.3 L | |
| Dibenzothiophene | 0.406 | 0.589 | 0.469 | 0.621 |
| C1-Dibenzothiophenes | 0.369 | 0.575 | 0.434 | 0.507 |
| C2-Dibenzothiophenes | 0.322 | 0.466 | 0.372 | 0.595 |
| C3-Dibenzothiophenes C4-Dibenzothiophenes | <0.2 U <0.2 U | 0.316 <0.2 L | 0.342 J <0.2 L | <0.2 L |
| Fluoranthene | 0.688 | 0.916 | 0.868 | J <0.2 U 1.85 |
| Pyrene | 0.052 J | 0.076 | | 0.048 |
| C1-Fluoranthenes/Pyrenes | <0.5 U | <0.5 L | | |
| C2-Fluoranthenes/Pyrenes | <0.5 U | <0.5 L | √ <0.5 L | ×0.5 ر |
| C3-Fluoranthenes/Pyrenes | <0.5 U | <0.5 L | | |
| C4-Fluoranthenes/Pyrenes | <0.5 U | <0.5 L | | |
| Naphthobenzothiophene | NA | NA | NA | NA |
| C1-Naphthobenzothiophenes C2-Naphthobenzothiophenes | NA NA | NA NA | NA NA | NA NA |
| C3-Naphthobenzothiophenes | NA | NA | NA | NA |
| C4-Naphthobenzothiophenes | NA | NA | NA | NA |
| Benz(a)anthracene | 0.082 J | 0.089 J | | |
| Chrysene/Triphenylene | 0.085 J | 0.067 J | | |
| C1-Chrysenes | <0.2 U | <0.2 L | | |
| C2-Chrysenes | <0.2 U | <0.2 L | | |
| C3-Chrysenes C4-Chrysenes | <0.2 U <0.2 U | <0.2 L <0.2 L | | |
| Benzo(b)fluoranthene | <0.2 U | <0.2 L | | |
| Benzo(k,j)fluoranthene | <0.1 U | <0.1 L | | |
| Benzo(a)fluoranthene | NA | NA | NA | NA |
| Benzo(e)pyrene | <0.2 U | <0.2 L | | <0.2 |
| Benzo(a)pyrene | <0.1 U | <0.1 L | | |
| Perylene | 0.063 J | <1.3 L | | |
| ndeno(1,2,3-c,d)pyrene | <0.1 U | <0.1 L | | |
| Dibenzo(a,h)anthracene | <0.1 U <0.1 U | <0.1 L <0.1 L | | |
| Benzo(g,h,i)perylene | 50.1 0 | SU.1 C | SU.1 L | <0.1 U |
| Total PAHs | | | 23.7 | |

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture | ARC1641.D SED-DA-012 (0.5-1.0) Sediment 08/04/13 08/06/13 08/13/13 ENV 3081 8/18/13 10:56 PAH-2012.M 15.0 84 | ARC1642.D SED-DA-012 (1.0-1.5 Sediment 08/04/13 08/06/13 08/13/13 ENV 3081 8/18/13 12:04 PAH-2012.M 15.0 83 17 | Sediment 08/04/13 08/06/13 08/13/13 ENV 3081 8/18/13 13:13 PAH-2012.M 15.1 84 16 | ARC1644.D SED-DA-013 (1.0-1.5) Sediment 08/04/13 08/06/13 08/13/13 ENV 3081 8/18/13 14:22 PAH-2012.M 15.1 83 17 |
|--|--|---|---|--|
| Dilution | 1X | 1X | 1X | 1X |
| Target Compounds | Su. Corrected C Conc. (ng/dry g) | Su. Corrected Conc. (ng/dry g) | Q Su. Corrected Conc. (ng/dry g) | Q Su. Corrected Q Conc. (ng/dry g) |
| Individual Alkyl Isomers and Hopanes | | conc. (ng/ury g/ | Conc. (ig/ury g) | Conc. (ng/ury g) |
| 2-Methylnaphthalene | 1.49 | 2.12 | 2 1.46 | 1.93 |
| 1-Methylnaphthalene | 0.536 | 0.848 | 3 0.828 | 0.83 |
| 2,6-Dimethylnaphthalene | NA | NA | A NA | NA |
| 1,6,7-Trimethylnaphthalene | NA | NA | | NA |
| 1-Methylfluorene | NA | NA | A NA | NA |
| 4-Methyldibenzothiophene | NA | NA | | NA |
| 2/3-Methyldibenzothiophene | NA | NA | A NA | NA |
| 1-Methyldibenzothiophene | NA | NA | A NA | NA |
| 3-Methylphenanthrene | NA | NA | A NA | NA |
| 2-Methylphenanthrene | NA | NA | A NA | NA |
| 2-Methylanthracene | NA | NA | NA NA | NA |
| 4/9-Methylphenanthrene | NA | NA | | NA |
| 1-Methylphenanthrene | NA | NA | | NA |
| 3,6-Dimethylphenanthrene | NA | NA | | NA |
| Retene | NA | NA | | NA |
| 2-Methylfluoranthene | NA | NA | | NA |
| Benzo(b)fluorene | NA | NA | | NA |
| C29-Hopane | NA | NA | | NA |
| 18a-Oleanane | NA | NA | | NA |
| C30-Hopane | NA | NA | | NA |
| C20-TAS | NA | NA | NA | NA |
| C21-TAS | NA | NA | | NA |
| C26(20S)-TAS | NA | NA | | NA |
| C26(20R)/C27(20S)-TAS | NA | NA | | NA |
| C28(20S)-TAS | NA | NA | | NA |
| C27(20R)-TAS | NA | NA | NA | NA |
| C28(20R)-TAS | NA | NA | NA | NA |
| Surrogate Recovery | | | | |
| Naphthalene-d8 | 79 | 79 | 76 | 80 |
| Acenaphthene-d10 | 32 * | | 79 | 50 |
| Phenanthrene-d10 | 73 | 74 | 72 | 73 |
| Chrysene-d12 | 88 | 89 | 88 | 88 |
| Perylene-d12 | 0 L | 0 | L 18 | 0 L |

| Sample Name | ENV3081A.D | |
|-----------------------|------------------|--|
| Client Name | Procedural Blank | |
| Matrix | Sediment | |
| Collection Date | NA | |
| Received Date | NA | |
| Extraction Date | 08/13/13 | |
| Extraction Batch | ENV 3081 | |
| Date Acquired | 8/17/13 9:48 | |
| Method | PAH-2012.M | |
| Sample Dry Weight (g) | 15.0 | |
| % Dry | NA | |
| % Moisture | NA | |
| Dilution | 1X | |

| Target Compounds | Su. Corrected Conc. (ng/dry g) | Q | 3X MDL | Actual MDL |
|--|-----------------------------------|-----|---------------|------------|
| cis/trans Decalin | NA | | 0.395 | 0.132 |
| C1-Decalins | NA | | 0.790 | 0.263 |
| C2-Decalins | NA | | 0.790 | 0.263 |
| C3-Decalins | NA | | 0.790 | 0.263 |
| C4-Decalins | NA | | 0.790 | 0.263 |
| Naphthalene | 0.102 | J | 1.03 | 0.342 |
| C1-Naphthalenes | | U | 3.09 | 1.03 |
| C2-Naphthalenes | <0.7 | | 2.05 | 0.684 |
| C3-Naphthalenes | <0.7 | | 2.05 | 0.684 |
| C4-Naphthalenes Benzothiophene | <0.7 NA | U | 2.05 0.270 | 0.684 |
| C1-Benzothiophenes | NA | | 0.540 | 0.090 |
| C2-Benzothiophenes | NA | | 0.540 | 0.180 |
| C3-Benzothiophenes | NA | | 0.540 | 0.180 |
| C4-Benzothiophenes | NA | | 0.540 | 0.180 |
| Biphenyl | NA | | 0.881 | 0.294 |
| Acenaphthylene | <0.04 | U | 0.122 | 0.041 |
| Acenaphthene | <0.1 | | 0.308 | 0.103 |
| Dibenzofuran | NA | 19 | 0.613 | 0.204 |
| Fluorene | <0.2 | U | 0.550 | 0.183 |
| C1-Fluorenes | <0.4 | U | 1.10 | 0.367 |
| C2-Fluorenes | <0.4 | U | 1.10 | 0.367 |
| C3-Fluorenes | <0.4 | U | 1.10 | 0.367 |
| Carbazole | NA | | 0.449 | 0.150 |
| Anthracene | <0.1 | U | 0.346 | 0.115 |
| Phenanthrene | 0.057 | J | 0.624 | 0.208 |
| C1-Phenanthrenes/Anthracenes | <0.1 | | 0.232 | 0.077 |
| C2-Phenanthrenes/Anthracenes | <0.3 | | 0.855 | 0.285 |
| C3-Phenanthrenes/Anthracenes | <0.3 | | 0.855 | 0.285 |
| C4-Phenanthrenes/Anthracenes | <0.3 | | 0.855 | 0.285 |
| Dibenzothiophene | <0.1 | | 0.348 | 0.116 |
| C1-Dibenzothiophenes C2-Dibenzothiophenes | <0.1 <0.2 | | 0.191 | 0.064 |
| C3-Dibenzothiophenes | <0.2 | | 0.696 | 0.232 |
| C4-Dibenzothiophenes | <0.2 | | 0.696 | 0.232 |
| Fluoranthene | <0.2 | | 1.00 | 0.333 |
| Pyrene | <0.1 | | 0.408 | 0.136 |
| C1-Fluoranthenes/Pyrenes | <0.5 | | 1.41 | 0.469 |
| C2-Fluoranthenes/Pyrenes | <0.5 | | 1.41 | 0.469 |
| C3-Fluoranthenes/Pyrenes | <0.5 | U | 1.41 | 0.469 |
| C4-Fluoranthenes/Pyrenes | <0.5 | U | 1.41 | 0.469 |
| Naphthobenzothiophene | NA | | 0.383 | 0.128 |
| C1-Naphthobenzothiophenes | NA | | 0.767 | 0.256 |
| C2-Naphthobenzothiophenes | NA | | 0.767 | 0.256 |
| C3-Naphthobenzothiophenes | NA | | 0.767 | 0.256 |
| C4-Naphthobenzothiophenes | NA | | 0.767 | 0.256 |
| Benz(a)anthracene | <0.2 | | 0.577 | 0.192 |
| Chrysene/Triphenylene | <0.1 | 1.1 | 0.347 | 0.116 |
| C1-Chrysenes | <0.2 | | 0.695 | 0.232 |
| C2-Chrysenes | <0.2 | | 0.695 | 0.232 |
| C3-Chrysenes | <0.2 | | 0.695 | 0.232 |
| C4-Chrysenes | <0.2 <0.2 | | 0.695 | 0.232 |
| Benzo(b)fluoranthene Benzo(k,j)fluoranthene | <0.2 | | 0.294 | 0.203 |
| Benzo(a)fluoranthene | ×0.1 NA | 0 | 0.294 | 0.098 |
| Benzo(e)pyrene | <0.2 | U | 0.530 | 0.177 |
| Benzo(a)pyrene | <0.2 | | 0.304 | 0.101 |
| Perylene | <1.3 | | 3.80 | 1.27 |
| Indeno(1,2,3-c,d)pyrene | <0.1 | | 0.151 | 0.050 |
| Dibenzo(a,h)anthracene | <0.1 | | 0.193 | 0.064 |
| Benzo(g,h,i)perylene | <0.1 | | 0.264 | 0.088 |
| Total PAHs | 0.159 | | | |

| Sample Name | ENV3081A.D | |
|-----------------------|------------------|--|
| Client Name | Procedural Blank | |
| Matrix | Sediment | |
| Collection Date | NA | |
| Received Date | NA | |
| Extraction Date | 08/13/13 | |
| Extraction Batch | ENV 3081 | |
| Date Acquired | 8/17/13 9:48 | |
| Method | PAH-2012.M | |
| Sample Dry Weight (g) | 15.0 | |
| % Dry | NA | |
| % Moisture | NA | |
| Dilution | 1X | |

| Target Compounds | Su. Corrected Conc. (ng/dry g) | Q | 3X MDL | Actual MDI |
|--------------------------------------|-----------------------------------|---|-----------|------------|
| Individual Alkyl Isomers and Hopanes | Conc. (ng/dry g) | | WDL | |
| 2-Methylnaphthalene | <1.3 | U | 3.89 | 1.30 |
| 1-Methylnaphthalene | < 0.5 | U | 1.64 | 0.546 |
| 2.6-Dimethylnaphthalene | NA | | 0.782 | 0.261 |
| 1,6,7-Trimethylnaphthalene | NA | | 0.382 | 0.127 |
| 1-Methylfluorene | NA | | 0.574 | 0.191 |
| 4-Methyldibenzothiophene | NA | | 0.274 | 0.091 |
| 2/3-Methyldibenzothiophene | NA | | 0.274 | 0.091 |
| 1-Methyldibenzothiophene | NA | | 0.274 | 0.091 |
| 3-Methylphenanthrene | NA | | 0.291 | 0.097 |
| 2-Methylphenanthrene | NA | | 0.291 | 0.097 |
| 2-Methylanthracene | NA | | 0.291 | 0.097 |
| 4/9-Methylphenanthrene | NA | | 0.291 | 0.097 |
| 1-Methylphenanthrene | NA | | 0.291 | 0.097 |
| 3,6-Dimethylphenanthrene | NA | | 0.329 | 0.110 |
| Retene | NA | | 0.694 | 0.231 |
| 2-Methylfluoranthene | NA | | 0.668 | 0.223 |
| Benzo(b)fluorene | NA | | 0.374 | 0.125 |
| C29-Hopane | NA | | 1.72 | 0.575 |
| 18a-Oleanane | NA | | 1.72 | 0.575 |
| C30-Hopane | NA | | 1.72 | 0.575 |
| C20-TAS | NA | | 1.72 | 0.575 |
| C21-TAS | NA | | 1.72 | 0.575 |
| C26(20S)-TAS | NA | | 1.72 | 0.575 |
| C26(20R)/C27(20S)-TAS | NA | | 1.72 | 0.575 |
| C28(20S)-TAS | NA | | 1.72 | 0.575 |
| C27(20R)-TAS | NA | | 1.72 | 0.575 |
| C28(20R)-TAS | NA | | 1.72 | 0.575 |
| Surrogate Recovery | | | | |
| Naphthalene-d8 | 85 | | | |
| Acenaphthene-d10 | 86 | | | |
| Phenanthrene-d10 | 77 | | | |
| Chrysene-d12 | 98 | | | |
| Pervlene-d12 | 86 | | | |

Arcadis - Mayflower AR Polycyclic Aromatic Hydrocarbon Data Matrix Spike Report

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture Dilution | ARC1628.D SO-DA-015 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 7:30 PAH-2012.M 15.0 84 16 1X | ENV3081C.D MS (SO-DA-015 (0-0.5) MS/MSD Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 12:05 PAH-2012.M 15.0 80 20 1X |)) | MSC |) (SC | ENV3081D.D -DA-015 (0-0.5) Soil 08/02/13 08/13/13 ENV 3081 8/17/13 13:14 PAH-2012.M 15.0 80 20 1X | MS/I | MSD) | | | | |
|---|--|---|---------------|-----------------------------------|-------|--|---------------|-----------------------------------|------|--------------------------------|---|------------------------------------|
| Target Compounds | Su. Corrected Conc. (ng/dry g) | Q Su. Corrected Conc. (ng/dry g) | Q | Recovery Q (%) | Q1 | Su. Corrected Conc. (ng/dry g) | Q | Recovery ((%) | Q Q1 | RPD (%) | Q | Spike Amount (ng) |
| cis/trans Decalin C1-Decalins C2-Decalins C3-Decalins C4-Decalins | NA NA NA NA 4.309 | NA NA NA NA | | 59 | | NA NA NA NA | | 49 | | 0 | | 100 |
| Naphthalene C1-Naphthalenes C2-Naphthalenes C3-Naphthalenes C4-Naphthalenes Benzothiophenes C1-Benzothiophenes C3-Benzothiophenes C4-Benzothiophenes Biphenyl | 4.306 8.427 7.76 <0.7 NA NA NA NA NA | NA NA NA NA NA | | | | 7.52 NA NA NA NA NA NA NA SA SO | U | 48 | | 9 | | 100 |
| Acenaphthylene Acenaphthene | 1.560 0.482 | 5.68 6.67 | | 62 93 | | 4.92 5.83 | | 51 80 | | 14 14 | | 99.2 100 |
| Dibenzofuran Fluorene C1-Fluorenes C2-Fluorenes C3-Fluorenes | NA 3.789 2.885 <0.4 <0.4 | U NA | | 57 | | NA 7.30 NA NA | | 53 | | 4 | | 100 |
| Carbazole Anthracene Phenanthrene C1-Phenanthrenes/Anthracenes C2-Phenanthrenes/Anthracenes C3-Phenanthrenes/Anthracenes | NA 2.419 18.88 9.12 16.545 29.121 | 16.45 NA NA | L | 58 -37 | Y | NA 5.88 16.09 NA NA | L | 52 -42 | Y | 7 2 | | 100 99.1 |
| C4-Phenanthrenes/Anthracenes Dibenzothiophene C1-Dibenzothiophenes C2-Dibenzothiophenes C3-Dibenzothiophenes C4-Dibenzothiophenes | 37.483 1.869 4.334 10.589 22.021 21.90 | NA 8.83 NA NA NA | | 106 | | NA 8.80 NA NA NA | | 106 | | 0 | | 98.6 |
| Fluoranthene Pyrene C1-Fluoranthenes/Pyrenes C2-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes Naphthobenzothiophene C1-Naphthobenzothiophenes C2-Naphthobenzothiophenes C3-Naphthobenzothiophenes C4-Naphthobenzothiophenes | 17.66 12.515 13.261 26.628 15.185 36.394 NA NA NA NA | 22.28 19.74 NA NA NA NA NA NA NA | | 69 108 | Y | 21.96 19.38 NA NA NA NA NA NA NA | | 65 103 | Y | 1 | | 100 100 |
| Benz(a)anthracene Chrysene/Triphenylene C1-Chrysenes C2-Chrysenes C3-Chrysenes C4-Chrysenes | 6.735 17.2 22.52 28.63 27.44 14.02 | 11.42 63.73 NA NA NA | | 70 702 | Y | 11.41 58.23 NA NA NA | | 70 620 | Y | 0 9 | | 100 99.4 |
| Benzo(b)fluoranthene Benzo(k,j)fluoranthene | 31.47 12.221 | 39.48 18.09 | | 120 88 | Y | 34.76 16.34 | | 50 62 | Y | 13 10 | | 100 100 |
| Benzo(a)fluoranthene Benzo(e)pyrene Benzo(a)pyrene Perylene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene | NA 22.486 3.280 1.269 8.805 3.592 10.570 | L 1.08 13.53 8.62 | L J,L L | 454 82 -3 72 76 69 | Y | NA 43.45 7.32 1.20 12.94 9.94 14.88 | L J,L L | 316 61 -1 63 96 65 | Y | 19 17 10 4 14 2 | | 100 100 98.3 99.1 99.1 |
| Average % Recovery | | | | 116 | | | | 97 | | | | |

Arcadis - Mayflower AR Polycyclic Aromatic Hydrocarbon Data Matrix Spike Report

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method Sample Dry Weight (g) % Dry % Moisture Dilution | ARC1628.D SO-DA-015 (0-0.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 7:30 PAH-2012.M 15.0 84 16 1X | MS (| ENV3081C.D (SO-DA-015 (0-0.5) M: Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 12:05 PAH-2012.M 15.0 80 20 1X | S/MSD |) | M | SD (S | ENV3081D.D D-DA-015 (0-0.5) I Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 13:14 PAH-2012.M 15.0 80 20 1X | MS/ | MSD) | | | | |
|--|--|------|--|--|---|-----------------|-------|---|-----|-----------------|------|------------|---|----------------------|
| Target Compounds | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Conc. (ng/dry g) | | Q | Recovery (%) | Q Q1 | Su. Corrected Conc. (ng/dry g) | Q | Recovery (%) | Q Q1 | RPD (%) | Q | Spike Amount (ng) |
| Individual Alkyl Isomers and Ho | panes | | | | | | | | | 1.00 | | 5.000 | | , |
| 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphthalene 1-Methyldibenzothiophene 4-Methyldibenzothiophene 1-Methyldibenzothiophene 1-Methyldibenzothiophene 3-Methylphenanthrene 2-Methylphenanthrene 2-Methylphenanthrene 1-Methylphenanthrene 3,6-Dimethylphenanthrene 8enzo(b)fluorene C29-Hopane 18a-Oleanane C30-Hopane C30-Hopane C20-TAS C26(20S)-TAS C26(20S)-TAS C28(20S)-TAS C28(20S)-TAS C28(20S)-TAS | 4.792 2.211 NA NA NA NA NA NA NA NA NA NA NA NA NA | | | 8.79 7.13 NA NA NA NA NA NA NA NA NA NA NA NA NA | | 60 74 | | 8.12 6.62 NA NA NA NA NA NA NA NA NA NA NA NA NA | | 50 66 | | 87 | | 100 100 |
| Surrogate Recovery | | | | | | | | | | | | | | |
| Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 Chrysene-d12 Perylene-d12 | 63 69 74 79 2 | L | 68 84 85 98 6 | | L | | | 102 81 91 103 3 | L | | | | | |

Arcadis - Mayflower AR Polycyclic Aromatic Hydrocarbon Data Laboratory Duplicate Report

| Sample Name Client Name Matrix Collection Date Received Date Extraction Date Extraction Batch Date Acquired Method | ARC1626.D SO-DA-014 (1.0-1.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/18/13 4:05 PAH-2012.M | | ENV3081E.D Dupl. (SO-DA-014 (1.0-1.5) Soil 08/01/13 08/02/13 08/13/13 ENV 3081 8/17/13 14:22 PAH-2012.M |) | | | | |
|--|--|--------|---|--------|----------|------|----------------|-------------|
| Sample Dry Weight (g) % Dry | 15.1 83 | | 15.1 83 | | | | | |
| % Moisture | 17 | | 17 | | | | | |
| Dilution | 1X | | 1X | | | | | |
| Target Compounds | Su. Corrected Conc. (ng/dry g) | Q | Su. Corrected Conc. (ng/dry g) | Q | RPD % | Q Q1 | 3X MDL | MDL |
| cis/trans Decalin | NA | | NA | | | | 0.395 | 0.132 |
| C1-Decalins | NA | | NA | | | | 0.790 | 0.263 |
| C2-Decalins C3-Decalins | NA NA | | NA | | | | 0.790 0.790 | 0.263 |
| C4-Decalins | NA | | NA | | | | 0.790 | 0.263 |
| Naphthalene | 0.949 | | 0.804 | | 16 | х | 1.03 | 0.342 |
| C1-Naphthalenes | 0.592 | J | | | 10 | × | 3.09 | 1.03 |
| C2-Naphthalenes C3-Naphthalenes | 0.883 | | 0.917 0.961 | | 4 13 | × | 2.05 | 0.684 |
| C4-Naphthalenes | <0.7 | U | <0.7 | | 15 | ^ | 2.05 | 0.684 |
| Benzothiophene | NA | | NA | | | | 0.270 | 0.090 |
| C1-Benzothiophenes | NA | | NA | | | | 0.540 | 0.180 |
| C2-Benzothiophenes C3-Benzothiophenes | NA NA | | NA NA | | | | 0.540 | 0.180 |
| C4-Benzothiophenes | NA | | NA | | | | 0.540 | 0.180 |
| Biphenyl | NA | | NA | | | | 0.881 | 0.294 |
| Acenaphthylene | 0.091 | | 0.089 | | 2 | × | 0.122 | 0.041 |
| Acenaphthene Dibenzofuran | 0.039 NA | J | 0.037 NA | | 6 | х | 0.308 0.613 | 0.103 |
| Fluorene | 1.29 | | 1.11 | | 15 | | 0.55 | 0.183 |
| C1-Fluorenes | 0.408 | | 0.394 | | 3 | x | 1.10 | 0.367 |
| C2-Fluorenes | <0.4 | U | <0.4 | 0.0227 | | | 1.10 | 0.367 |
| C3-Fluorenes Carbazole | <0.4 NA | U | <0.4 NA | | | | 1.10 0.449 | 0.367 |
| Anthracene | 0.075 | J | 0.072 | | 5 | х | 0.346 | 0.115 |
| Phenanthrene | 3.27 | | 2.85 | | 14 | | 0.624 | 0.208 |
| C1-Phenanthrenes/Anthracenes | <0.1 | U | <0.1 | | | | 0.232 | 0.077 |
| C2-Phenanthrenes/Anthracenes C3-Phenanthrenes/Anthracenes | <0.3 <0.3 | UU | <0.3 <0.3 | | | | 0.855 0.855 | 0.285 |
| C4-Phenanthrenes/Anthracenes | <0.3 | U | <0.3 | | | | 0.855 | 0.285 |
| Dibenzothiophene | 0.240 | | 0.244 | | 2 | х | 0.348 | 0.116 |
| C1-Dibenzothiophenes | 0.178 | | 0.182 | | 2 | × | 0.191 | 0.064 |
| C2-Dibenzothiophenes C3-Dibenzothiophenes | 0.252 | U | 0.247 | п | 2 | X | 0.696 | 0.232 0.232 |
| C4-Dibenzothiophenes | <0.2 | Ŭ | <0.2 | | | | 0.696 | 0.232 |
| Fluoranthene | 0.717 | | 0.784 | | 9 | × | 1.00 | 0.333 |
| Pyrene | 0.223 | | 0.343 | | 42 | × | 0.408 | 0.136 |
| C1-Fluoranthenes/Pyrenes C2-Fluoranthenes/Pyrenes | <0.5 <0.5 | U U | <0.5 <0.5 | | | | 1.41 1.41 | 0.469 0.469 |
| C3-Fluoranthenes/Pyrenes | <0.5 | U | <0.5 | | | | 1.41 | 0.469 |
| C4-Fluoranthenes/Pyrenes | <0.5 | U | <0.5 | U | | | 1.41 | 0.469 |
| Naphthobenzothiophene | NA | | NA | | | | 0.383 | 0.128 |
| C1-Naphthobenzothiophenes C2-Naphthobenzothiophenes | NA NA | | NA NA | | | | 0.767 | 0.256 |
| C3-Naphthobenzothiophenes | NA | | NA | | | | 0.767 | 0.256 |
| C4-Naphthobenzothiophenes | NA | | NA | | | | 0.767 | 0.256 |
| Benz(a)anthracene | 0.263 | | 0.251 | | 5 | X | 0.577 | 0.192 |
| Chrysene/Triphenylene C1-Chrysenes | 0.476 <0.2 | U | 0.568 | ш | 18 | | 0.347 | 0.116 0.232 |
| C2-Chrysenes | <0.2 | Ŭ | <0.2 | | | | 0.695 | 0.232 |
| C3-Chrysenes | <0.2 | U | <0.2 | | | | 0.695 | 0.232 |
| C4-Chrysenes | <0.2 | U | <0.2 | U | - | | 0.695 | 0.232 |
| Benzo(b)fluoranthene Benzo(k,j)fluoranthene | 0.687 0.240 | | 0.696 | | 1 5 | х | 0.609 | 0.203 0.098 |
| Benzo(a)fluoranthene | NA | | NA | | 3 | 0 | 0.294 | 0.098 |
| Benzo(e)pyrene | 0.364 | | 0.386 | | 6 | х | 0.530 | 0.177 |
| Benzo(a)pyrene | <0.1 | U | <0.1 | | | | 0.304 | 0.101 |
| Perylene Indeno(1,2,3-c,d)pyrene | 0.04 0.160 | J | 0.04 0.145 | J | 7 9 | X | 3.800 0.151 | 1.267 |
| Dibenzo(a,h)anthracene | 0.042 | J | 0.033 | J | 23 | × | 0.193 | 0.064 |
| Benzo(g,h,i)perylene | 0.082 | J | 0.099 | | 18 | х | 0.264 | 0.088 |
| Total PAHs | 12.7 | | 12.0 | | 5 | | | |

Arcadis - Mayflower AR Polycyclic Aromatic Hydrocarbon Data Laboratory Duplicate Report

| Sample Name | ARC1626.D | | ENV3081E.D | | | | | |
|---------------------------------|---------------------|---|-----------------------------|---|-----|------|-------|-------|
| Client Name | SO-DA-014 (1.0-1.5) | | Dupl. (SO-DA-014 (1.0-1.5)) | | | | | |
| Matrix | Soil | | Soil | | | | | |
| Collection Date | 08/01/13 | | 08/01/13 | | | | | |
| Received Date | 08/02/13 | | 08/02/13 | | | | | |
| Extraction Date | 08/13/13 | | 08/13/13 | | | | | |
| Extraction Batch | ENV 3081 | | ENV 3081 | | | | | |
| Date Acquired | 8/18/13 4:05 | | 8/17/13 14:22 | | | | | |
| Method | PAH-2012.M | | PAH-2012.M | | | | | |
| Sample Dry Weight (g) | 15.1 | | 15.1 | | | | | |
| % Dry | 83 | | 83 | | | | | |
| % Moisture | 17 | | 17 | | | | | |
| Dilution | 1X | | 1X | | | | | |
| Tarrat Compounds | Su. Corrected | Q | Su. Corrected | Q | RPD | Q Q1 | 3X | MDL |
| Target Compounds | | Q | | u | | QQI | | MDL |
| | Conc. (ng/dry g) | | Conc. (ng/dry g) | | % | | MDL | |
| ndividual Alkyl Isomers and Hop | anes | | | | | | | |
| 2-Methylnaphthalene | 0.653 | J | 0.596 | | 9 | × | 3.89 | 1.30 |
| 1-Methylnaphthalene | 0.310 | J | 0.270 | J | 14 | × | 1.64 | 0.546 |
| 2,6-Dimethylnaphthalene | NA | | NA | | | | 0.782 | 0.261 |
| 1,6,7-Trimethylnaphthalene | NA | | NA | | | | 0.382 | 0.127 |
| 1-Methylfluorene | NA | | NA | | | | 0.574 | 0.191 |
| 4-Methyldibenzothiophene | NA | | NA | | | | 0.274 | 0.091 |
| 2/3-Methyldibenzothiophene | NA | | NA | | | | 0.274 | 0.091 |
| 1-Methyldibenzothiophene | NA | | NA | | | | 0.274 | 0.091 |
| 3-Methylphenanthrene | NA | | NA | | | | 0.291 | 0.097 |
| 2-Methylphenanthrene | NA | | NA | | | | 0.291 | 0.097 |
| 2-Methylanthracene | NA | | NA | | | | 0.291 | 0.097 |
| 4/9-Methylphenanthrene | NA | | NA | | | | 0.291 | 0.097 |
| I-Methylphenanthrene | NA | | NA | | | | 0.291 | 0.097 |
| 3,6-Dimethylphenanthrene | NA | | NA | | | | 0.329 | 0.110 |
| Retene | NA | | NA | | | | 0.694 | 0.231 |
| 2-Methylfluoranthene | NA | | NA | | | | 0.668 | 0.223 |
| Benzo(b)fluorene | NA | | NA | | | | 0.374 | 0.125 |
| C29-Hopane | NA | | NA | | | | 1.72 | 0.575 |
| 8a-Oleanane | NA | | NA | | | | 1.72 | 0.575 |
| C30-Hopane | NA | | NA | | | | 1.72 | 0.575 |
| C20-TAS | NA | | NA | | | | 1.72 | 0.575 |
| C21-TAS | NA | | NA | | | | 1.72 | 0.575 |
| C26(20S)-TAS | NA | | NA | | | | 1.72 | 0.575 |
| C26(20R)/C27(20S)-TAS | NA | | NA | | | | 1.72 | 0.575 |
| 228(20S)-TAS | NA | | NA | | | | 1.72 | 0.575 |
| C27(20R)-TAS | NA | | NA | | | | 1.72 | 0.575 |
| C28(20R)-TAS | NA | | NA | | | | 1.72 | 0.575 |
| Surrogate Recovery | | | | | | | | |
| | 79 | | 78 | | | | | |
| Naphthalene-d8 | 69 | | 78 | | | | | |
| Acenaphthene-d10 | 66 | | 82 | | | | | |
| Phenanthrene-d10 | 88 | | 82 | | | | | |
| Chrysene-d12 | | | | | | | | |

| Sample Name | ENV3081B.D |
|-----------------------|---------------|
| Client Name | SRM 1941b |
| Matrix | Sediment |
| Collection Date | NA |
| Received Date | NA |
| Extraction Date | 08/13/13 |
| Extraction Batch | ENV 3081 |
| Date Acquired | 8/17/13 10:57 |
| Method | PAH-2012.M |
| Sample Dry Weight (g) | 4.0 |
| % Dry | 98 |
| % Moisture | 2 |
| Dilution | 1X |

| Target Compounds | Su. Corrected G Conc. (ng/dry g) |) RPD (%) | | -30% Certified Conc. | |
|------------------------------|-------------------------------------|--------------|---|-------------------------|------------|
| cis/trans Decalin | 37.4 | | (ng/dry g) | (ng/dry g) | (ng/dry g) |
| C1-Decalins | 15.6 | | | | |
| C2-Decalins | 21.7 | | | | |
| C3-Decalins | 29.2 | | | | |
| C4-Decalins | 42.0 | | | | |
| Naphthalene | 769 | 10 | 848 ± 95 | 527 | 1226 |
| C1-Naphthalenes | 219 | 10 | 040 I 90 | 521 | 1220 |
| C2-Naphthalenes | 204 | | | | |
| C3-Naphthalenes | 156 | | | | |
| C4-Naphthalenes | 89.1 | | | | |
| Benzothiophene | 31.0 | | | | |
| C1-Benzothiophenes | 29.4 | | | | |
| C2-Benzothiophenes | 8.47 | | | | |
| C3-Benzothiophenes | 18.6 | | | | |
| C4-Benzothiophenes | 17.3 | | | | |
| Biphenyl | 65.1 | | | | |
| Acenaphthylene | 69.4 | | | | |
| Acenaphthene | 30.7 | | | | |
| Dibenzofuran | 81.7 | | | | |
| Fluorene | 52.2 | 48 | 85 ± 15 | 49.0 | 130 |
| C1-Fluorenes | 52.2 | 40 | 00 I 10 | 40.0 | 130 |
| C2-Fluorenes | 128 | | | | |
| C3-Fluorenes | 175 | | | | |
| Carbazole | 18.4 | | | | |
| Anthracene | 178 | 3 | 184 ± 18 | 116 | 263 |
| Phenanthrene | 404 | 1 | 406 ± 44 | 253 | 585 |
| C1-Phenanthrenes/Anthracenes | 261 | | 400 1 44 | 200 | 505 |
| C2-Phenanthrenes/Anthracenes | 255 | | | | |
| C3-Phenanthrenes/Anthracenes | 202 | | | | |
| C4-Phenanthrenes/Anthracenes | 131 | | | | |
| Dibenzothiophene | 48.4 | | | | |
| C1-Dibenzothiophenes | 68.6 | | | | |
| C2-Dibenzothiophenes | 106 | | | | |
| C3-Dibenzothiophenes | 123 | | | | |
| C4-Dibenzothiophenes | 55.5 | | | | |
| Fluoranthene | 690 | 6 | 651 ± 50 | 421 | 911 |
| Pyrene | 523 | 11 | 581 ± 39 | 379 | 806 |
| C1-Fluoranthenes/Pyrenes | 402 | | | | |
| C2-Fluoranthenes/Pyrenes | 424 | | | | |
| C3-Fluoranthenes/Pyrenes | 191 | | | | |
| C4-Fluoranthenes/Pyrenes | 171 | | | | |
| Naphthobenzothiophene | 151 | | | | |
| C1-Naphthobenzothiophenes | 130 | | | | |
| C2-Naphthobenzothiophenes | 118 | | | | |
| C3-Naphthobenzothiophenes | 86.2 | | | | |
| C4-Naphthobenzothiophenes | 36,9 | | | | |
| Benz(a)anthracene | 344 | 3 | 335 ± 25 | 217 | 468 |
| Chrysene/Triphenylene | 431 | 8 | 399 ± 36 | 254 | 566 |
| C1-Chrysenes | 299 | 253 | 101.0 | | 10000 |
| C2-Chrysenes | 183 | | | | |
| C3-Chrysenes | 117 | | | | |
| C4-Chrysenes | 69.1 | | | | |
| Benzo(b)fluoranthene | 516 | 13 | 453 ± 21 | 302 | 616 |
| Benzo(k,j)fluoranthene | 431 | 3 | 442 ± 23 | 293 | 605 |
| Benzo(a)fluoranthene | 88.5 | 1973 | 2000-000-000-000-000-000-000-000-000-00 | 0.000 | 10.000 |
| Benzo(e)pyrene | 359 | 10 | 325 ± 25 | 210 | 455 |
| Benzo(a)pyrene | 274 | 27 | 358 ± 17 | 239 | 488 |
| Perylene | 338 | 16 | 397 ± 45 | 246 | 575 |
| ndeno(1,2,3-c,d)pyrene | 292 | 16 | 341 ± 57 | 199 | 517 |
| Dibenzo(a,h)anthracene | 75.3 | 35 | 53 ± 10 | 30.1 | 81.9 |
| Benzo(g,h,i)perylene | 265 | 15 | 307 ± 45 | 183 | 458 |
| | | | | | |

| Sample Name | ENV3081B.D |
|-----------------------|---------------|
| Client Name | SRM 1941b |
| Matrix | Sediment |
| Collection Date | NA |
| Received Date | NA |
| Extraction Date | 08/13/13 |
| Extraction Batch | ENV 3081 |
| Date Acquired | 8/17/13 10:57 |
| Method | PAH-2012.M |
| Sample Dry Weight (g) | 4.0 |
| % Dry | 98 |
| % Moisture | 2 |
| Dilution | 1X |

| | | | _ | | | |
|--------------------------------------|-----------------------------------|--------|------------|------------------------------|-------------------------|-----------------------|
| Target Compounds | Su. Corrected Conc. (ng/dry g) | Q | RPD (%) | SRM 1941b Certified Conc. | -30% Certified Conc. | +30% Certified Con |
| Individual Alkyl Isomers and Hopanes | | | 1 | (ng/dry g) | (ng/dry g) | (ng/dry g) |
| 2-Methylnaphthalene | 24 | | | | | |
| 1-Methylnaphthalene | 110 | 5 | | | | |
| 2,6-Dimethylnaphthalene | 10 | () (i) | | | | |
| 1,6,7-Trimethylnaphthalene | 32. | 1 | | | | |
| 1-Methylfluorene | 29.3 | 3 | | | | |
| 4-Methyldibenzothiophene | 43.3 | 2 | | | | |
| 2/3-Methyldibenzothiophene | 28.9 | 9 | | | | |
| 1-Methyldibenzothiophene | 11.9 | 9 | | | | |
| 3-Methylphenanthrene | 104 | 1 | 1 | 105 ± 13 | 64.4 | 153 |
| 2-Methylphenanthrene | 105 | 5 | | | | |
| 2-Methylanthracene | 66.9 |) | | | | |
| 4/9-Methylphenanthrene | 73.8 | 3 | | | | |
| 1-Methylphenanthrene | 71.4 | 1 | 2 | 73.2 ± 5.9 | 47.1 | 103 |
| 3,6-Dimethylphenanthrene | 24.7 | 7 | | | | |
| Retene | 23.0 |) | | | | |
| 2-Methylfluoranthene | 68.2 | 2 | | | | |
| Benzo(b)fluorene | 83.0 |) | | | | |
| C29-Hopane | 280 |) | | | | |
| 18a-Oleanane | 70.9 |) | | | | |
| C30-Hopane | 373 | 3 | | | | |
| C20-TAS | 12.6 | 5 | | | | |
| C21-TAS | 4.56 | 5 | | | | |
| C26(20S)-TAS | 2.53 | 3 | | | | |
| C26(20R)/C27(20S)-TAS | 10.2 | 2 | | | | |
| C28(20S)-TAS | 5.00 |) | | | | |
| C27(20R)-TAS | 9.05 | 5 | | | | |
| C28(20R)-TAS | 6.54 | 1 | | | | |
| Surrogate Recovery | | | | | | |
| Naphthalene-d8 | 73 | | | | | |
| Acenaphthene-d10 | 79 | | | | | |
| Phenanthrene-d10 | 74 | | | | | |
| Chrysene-d12 | 84 | | | | | |
| Perylene-d12 | 81 | | | | | |

| Sample Name | MS70057K.D | |
|--------------------|--------------------------|--|
| Client Name | AR-SRM2779-WK4.0-002 | |
| Matrix | Gulf of Mexico Crude Oil | |
| Collection Date | NA | |
| Received Date | NA | |
| Extraction Date | NA | |
| Extraction Batch | ENV 3081 | |
| Date Acquired | 8/17/13 8:39 | |
| Method | PAH-2012.M | |
| Sample Weight (mg) | 4.1 | |

| Target Compounds | Su. Corrected Conc. (ng/mg) | | Q Q1 | RPD (%) | SRM 2779 Certified Value (ug/g) | -20% Certified Value (ug/g) | +20% Certified Value (ug/g) |
|--|--------------------------------|------------|------|------------|---------------------------------------|-----------------------------------|-----------------------------------|
| cis/trans Decalin | | 696 | | | | | |
| C1-Decalins | | 992 | | | | | |
| C2-Decalins | | 827 | | | | | |
| C3-Decalins | | 719 | | | | | |
| C4-Decalins | | 505 | | | | | |
| Naphthalene | | 693 | | 21 | 855 ± 46 | 647 | 1081 |
| C1-Naphthalenes | | 1435 | | | | | |
| C2-Naphthalenes | | 1742 | | | | | |
| C3-Naphthalenes | | 1181 | | | | | |
| C4-Naphthalenes | | 604 | | | | | |
| Benzothiophene | | 7.42 | J | | | | |
| C1-Benzothiophenes | | 28.0 | | | | | |
| C2-Benzothiophenes | | 20.9 | | | | | |
| C3-Benzothiophenes | | 34.4 | | | | | |
| C4-Benzothiophenes | | 24.5 | | | | | |
| Biphenyl | | 150 | 525 | | | | |
| Acenaphthylene | | 8.39 | J | | | | |
| Acenaphthene | | 17.2 | | | | | |
| Dibenzofuran | | 28.5 | | | | | |
| Fluorene | | 98.4 | | | | | |
| C1-Fluorenes | | 260 | | | | | |
| C2-Fluorenes | | 365 | | | | | |
| C3-Fluorenes | | 254 | 4 | | | | |
| Carbazole | | 2.9 | | | | | |
| Anthracene | | 2.7 | J | 23 | 3.42 ± 0.59 | 2.26 | 4.81 |
| Phenanthrene C1-Phenanthrenes/Anthracenes | | 215 | | 18 | 258 ± 27 | 185 | 342 |
| | | 469 493 | | | | | |
| C2-Phenanthrenes/Anthracenes C3-Phenanthrenes/Anthracenes | | 371 | | | | | |
| C4-Phenanthrenes/Anthracenes | | 228 | | | | | |
| Dibenzothiophene | | 42.5 | | 20 | 51.8 ± 2.1 | 39.8 | 64.7 |
| C1-Dibenzothiophenes | | 121 | | 20 | 01.0 ± 2.1 | 39.0 | 04.7 |
| C2-Dibenzothiophenes | | 154 | | | | | |
| C3-Dibenzothiophenes | | 122 | | | | | |
| C4-Dibenzothiophenes | | 46.0 | | | | | |
| Fluoranthene | | 4.79 | J | 9 | 4.36 ± 0.40 | 3.17 | 5.71 |
| Pyrene | | 11.6 | | 24 | 14.81 ± 0.39 | 11.5 | 18.2 |
| C1-Fluoranthenes/Pyrenes | | 80.7 | | - | 1.1.0.1 2 0.000 | 1110 | 10.2 |
| C2-Fluoranthenes/Pyrenes | | 171 | | | | | |
| C3-Fluoranthenes/Pyrenes | | 118 | | | | | |
| C4-Fluoranthenes/Pyrenes | | 125 | | | | | |
| Naphthobenzothiophene | | 28.8 | | | | | |
| C1-Naphthobenzothiophenes | | 48.9 | | | | | |
| C2-Naphthobenzothiophenes | | 67.7 | | | | | |
| C3-Naphthobenzothiophenes | | 44.9 | | | | | |
| C4-Naphthobenzothiophenes | | 18.9 | | | | | |
| Benz(a)anthracene | | 6.08 | J | 14 | 7.03 ± 0.85 | 4.94 | 9.5 |
| Chrysene/Triphenylene | | 40.4 | | 16 | 47.4 ± 1.7 | 36.6 | 58.9 |
| C1-Chrysenes | | 109 | | | | | |
| C2-Chrysenes | | 137 | | | | | |
| C3-Chrysenes | | 96.2 | | | | | |
| C4-Chrysenes | | 49.9 | | | | | |
| Benzo(b)fluoranthene | | 4.34 | | 26 | 5.62 ± 0.34 | 4.22 | 7.15 |
| Benzo(k,j)fluoranthene | | 1.38 | | | | | |
| Benzo(a)fluoranthene | | <10 | ST21 | | | | |
| Benzo(e)pyrene | | 8.75 | | 21 | 10.78 ± 0.60 | 8.14 | 13.7 |
| Benzo(a)pyrene | | 2.04 | | | | | |
| Perylene | | .960 | | | | | |
| Indeno(1,2,3-c,d)pyrene | | .637 | | | | | |
| Dibenzo(a,h)anthracene | | .721 | | 23 | 0.574 ± 0.091 | 0.386 | 0.798 |
| Benzo(g,h,i)perylene | | 1.59 | J | 28 | 2.11 ± 0.26 | 1.48 | 2.84 |
| Total PAHs | 1 | 4134 | | | | | |

| Sample Name | MS70057K.D | | | | |
|--------------------|--|--|--|--|--|
| Client Name | AR-SRM2779-WK4.0-002 Gulf of Mexico Crude Oil | | | | |
| Matrix | | | | | |
| Collection Date | NA | | | | |
| Received Date | NA NA | | | | |
| Extraction Date | | | | | |
| Extraction Batch | ENV 3081 | | | | |
| Date Acquired | 8/17/13 8:39 | | | | |
| Method | PAH-2012.M | | | | |
| Sample Weight (mg) | 4.1 | | | | |

| Target Compounds | Su. Corrected Conc. (ng/mg) | Q | RPD (%) | SRM 2779 Certified Value | -20% Certified Value | +20% Certified Value |
|--------------------------------------|--------------------------------|--------|------------|-----------------------------|-------------------------|-------------------------|
| Individual Alkyl Isomers and Hopanes | | | 1000 | (ug/g) | (ug/g) | (ug/g) |
| 2-Methylnaphthalene | | 1411 | 14 | 1630 ± 50 | 1264 | 2016 |
| 1-Methylnaphthalene | | 937 | 20 | 1140 ± 20 | 896 | 1392 |
| 2,6-Dimethylnaphthalene | | 826 | | | | |
| 1,6,7-Trimethylnaphthalene | | 242 | | | | |
| 1-Methylfluorene | | 203 | | | | |
| 4-Methyldibenzothiophene | | 84.1 | | | | |
| 2/3-Methyldibenzothiophene | | 39.4 | | | | |
| 1-Methyldibenzothiophene | | 24.6 | | | | |
| 3-Methylphenanthrene | | 184 | 11 | 206 ± 32 | 139 | 286 |
| 2-Methylphenanthrene | | 194 | 17 | 230 ± 14 | 173 | 293 |
| 2-Methylanthracene | | 15.1 | | 200 2 14 | | 200 |
| 4/9-Methylphenanthrene | | 223 | 4 | 232 ± 19 | 170 | 301 |
| 1-Methylphenanthrene | | 142 | 17 | 169 ± 10 | 127 | 215 |
| 3,6-Dimethylphenanthrene | | 65.9 | | 100 1 10 | 121 | 210 |
| Retene | | 11.8 | | | | |
| 2-Methylfluoranthene | | 5.05 J | | | | |
| Benzo(b)fluorene | | 14.3 | | | | |
| C29-Hopane | | 23.2 | | | | |
| 18a-Oleanane | | <10 U | | | | |
| C30-Hopane | | 46.6 | | | | |
| C20-TAS | | 7.35 J | | | | |
| C21-TAS | | 7.63 J | | | | |
| C26(20S)-TAS | | 3.46 J | | | | |
| C26(20R)/C27(20S)-TAS | | 12.2 | | | | |
| C28(20S)-TAS | | 8.64 J | | | | |
| C27(20R)-TAS | | 7.40 J | | | | |
| C28(20R)-TAS | | 0.81 J | | | | |
| Surrogate Recovery | | | | | | |
| Naphthaiene-d8 | 87 | | | | | |
| Acenaphthene-d10 | 99 | | | | | |
| Phenanthrene-d10 | 87 | | | | | |
| Chrysene-d12 | 91 | | | | | |
| Perylene-d12 | 92 | | | | | |
| Peak Resolution | | | | | | |
| 4/9-Methylphenanthrene from | | | | | | |
| | 909/ | | | | | |
| 1-Methylyphenanthrene (m/z 192) | 80% | | | | | |

| Sample Name | MS70057J.D | | | | |
|--------------------|-----------------|--|--|--|--|
| Client Name | AR-WKCC-250-038 | | | | |
| Matrix | Solution | | | | |
| Collection Date | NA | | | | |
| Received Date | NA | | | | |
| Extraction Date | NA | | | | |
| Extraction Batch | ENV 3081 | | | | |
| Date Acquired | 8/17/13 7:31 | | | | |
| Method | PAH-2012.M | | | | |
| Sample Volume (mL) | 1.0 | | | | |
| | | | | | |

| Target Compounds | Concentration (ng/mL) | Q | RPD (%) | LCM Certified Conc. (ng/mL) | -15% Certified Conc. (ng/mL) | +15% Certified Conc (ng/mL) |
|--|--------------------------|---|-------------|-----------------------------------|------------------------------------|-----------------------------------|
| cis/trans Decalin | 253 | 3 | 2.5 | 247 | 210 | 284 |
| C1-Decalins | NA | | | | | |
| C2-Decalins | NA | | | | | |
| C3-Decalins | NA | | | | | |
| C4-Decalins | NA | | | | | |
| Naphthalene | 240 | | 4.0 | 250 | 213 | 288 |
| C1-Naphthalenes | NA | | | | | |
| C2-Naphthalenes C3-Naphthalenes | NA NA | | | | | |
| C4-Naphthalenes | NA | | | | | |
| Benzothiophene | 235 | | 5.4 | 249 | 211 | 286 |
| C1-Benzothiophenes | NA | | 0.4 | 245 | 211 | 200 |
| C2-Benzothiophenes | NA | | | | | |
| C3-Benzothiophenes | NA | | | | | |
| C4-Benzothiophenes | NA | į | | | | |
| Biphenyl | 232 | | 6.4 | 248 | 211 | 285 |
| Acenaphthylene | 221 | | 11.5 | 248 | 211 | 285 |
| Acenaphthene | 238 | £ | 5.2 | 251 | 213 | 288 |
| Dibenzofuran | 233 | | 6.6 | 249 | 211 | 286 |
| Fluorene | 235 | | 6.5 | 251 | 213 | 288 |
| C1-Fluorenes | NA | | | | | |
| C2-Fluorenes | NA | | | | | |
| C3-Fluorenes | NA | | 1252 | V2-92-1 | 2010 | 102 |
| Carbazole | 218 | | 12.9 | 248 | 211 | 285 |
| Anthracene | 244 | | 2.8 | 251 | 213 | 288 |
| Phenanthrene | 249 | | 0.3 | 248 | 211 | 285 |
| C1-Phenanthrenes/Anthracenes | NA | | | | | |
| C2-Phenanthrenes/Anthracenes C3-Phenanthrenes/Anthracenes | NA NA | | | | | |
| C3-Phenanthrenes/Anthracenes | NA | | | | | |
| Dibenzothiophene | 234 | | 5.1 | 247 | 210 | 283 |
| C1-Dibenzothiophenes | NA | | 0.1 | 247 | 210 | 203 |
| C2-Dibenzothiophenes | NA | | | | | |
| C3-Dibenzothiophenes | NA | | | | | |
| C4-Dibenzothiophenes | NA | | | | | |
| Fluoranthene | 247 | | 1.4 | 250 | 213 | 288 |
| Pyrene | 250 | | 0.0 | 250 | 213 | 288 |
| C1-Fluoranthenes/Pyrenes | NA | | | | | |
| C2-Fluoranthenes/Pyrenes | NA | | | | | |
| C3-Fluoranthenes/Pyrenes | NA | | | | | |
| C4-Fluoranthenes/Pyrenes | NA | | | | | |
| Naphthobenzothiophene | 273 | | 8.0 | 252 | 214 | 289 |
| C1-Naphthobenzothiophenes | NA | | | | | |
| C2-Naphthobenzothiophenes | NA | | | | | |
| C3-Naphthobenzothiophenes | NA | | | | | |
| C4-Naphthobenzothiophenes | NA | | 2.0 | 250 | 040 | 007 |
| Benz(a)anthracene | 259 275 | | 3.8 10.0 | 250 249 | 212 | 287 |
| Chrysene/Triphenylene C1-Chrysenes | NA | | 10.0 | 249 | 211 | 286 |
| C2-Chrysenes | NA | | | | | |
| C3-Chrysenes | NA | | | | | |
| C4-Chrysenes | NA | | | | | |
| Benzo(b)fluoranthene | 233 | | 7.5 | 251 | 213 | 288 |
| Benzo(k,j)fluoranthene | 271 | | 8.4 | 249 | 212 | 286 |
| Benzo(a)fluoranthene | NA | | 0.53% | | 10.17 | |
| Benzo(e)pyrene | 249 | | 0.1 | 249 | 212 | 286 |
| Benzo(a)pyrene | 268 | | 7.0 | 250 | 212 | 287 |
| Perylene | 267 | | 6.3 | 250 | 213 | 288 |
| ndeno(1,2,3-c,d)pyrene | 247 | | 0.6 | 246 | 209 | 283 |
| Dibenzo(a,h)anthracene | 248 | | 0.1 | 248 | 211 | 285 |
| Benzo(g,h,i)perylene | 253 | | 2.0 | 248 | 211 | 285 |

| Sample Name | MS70057J.D |
|--------------------|-----------------|
| Client Name | AR-WKCC-250-038 |
| Matrix | Solution |
| Collection Date | NA |
| Received Date | NA |
| Extraction Date | NA |
| Extraction Batch | ENV 3081 |
| Date Acquired | 8/17/13 7:31 |
| Method | PAH-2012.M |
| Sample Volume (mL) | 1.0 |
| | |

| Target Compounds | Concentration | | Q RPD | LCM | -15% | +15% |
|--------------------------------------|---------------|-----|-------|-----------------|-----------------|---------------|
| | (ng/mL) | | (%) | Certified Conc. | Certified Conc. | Certified Con |
| Individual Alkyl Isomers and Hopanes | | | | (ng/mL) | (ng/mL) | (ng/mL) |
| 2-Methylnaphthalene | | 234 | 6.6 | 250 | 213 | 288 |
| 1-Methylnaphthalene | | 238 | 4.6 | 250 | 212 | 287 |
| 2,6-Dimethylnaphthalene | | 232 | 7.5 | 250 | 213 | 288 |
| 1,6,7-Trimethylnaphthalene | | 235 | 6.3 | 250 | 213 | 288 |
| 1-Methylfluorene | | 229 | 9.3 | 252 | 214 | 290 |
| 4-Methyldibenzothiophene | | 261 | 3.3 | 252 | 214 | 290 |
| 2/3-Methyldibenzothiophene | | NA | | | | |
| 1-Methyldibenzothiophene | | NA | | | | |
| 3-Methylphenanthrene | | NA | | | | |
| 2-Methylphenanthrene | | NA | | | | |
| 2-Methylanthracene | | NA | | | | |
| 4/9-Methylphenanthrene | | NA | | | | |
| 1-Methylphenanthrene | | 258 | 4.4 | 247 | 210 | 284 |
| 3,6-Dimethylphenanthrene | | 242 | 3.4 | 250 | 213 | 288 |
| Retene | | 195 | 13.8 | 223 | 190 | 257 |
| 2-Methylfluoranthene | | 224 | 11.6 | 252 | 214 | 289 |
| Benzo(b)fluorene | | 223 | 12.4 | 252 | 214 | 290 |
| C29-Hopane | | NA | | | | |
| 18a-Oleanane | | NA | | | | |
| C30-Hopane | | 275 | 9.6 | 250 | 213 | 288 |
| C20-TAS | | NA | | | | |
| C21-TAS | | NA | | | | |
| C26(20S)-TAS | | NA | | | | |
| C26(20R)/C27(20S)-TAS | | 251 | 0.2 | 250 | 213 | 288 |
| C28(20S)-TAS | | NA | 202 | | | 200 |
| C27(20R)-TAS | | NA | | | | |
| C28(20R)-TAS | | NA | | | | |
| Surrogate Recovery | | | | | | |
| Naphthalene-d8 | 95 | | | | | |
| Acenaphthene-d10 | 93 | | | | | |
| Phenanthrene-d10 | 94 | | | | | |
| Chrysene-d12 | 113 | | | | | |
| Perylene-d12 | 99 | | | | | |

| Sample Name | MS700571.D |
|--------------------|------------------|
| Client Name | AR-WKICV-250-004 |
| Matrix | Solution |
| Collection Date | NA |
| Received Date | NA |
| Extraction Date | NA |
| Extraction Batch | ENV 3081 |
| Date Acquired | 8/17/13 6:22 |
| Method | PAH-2012.M |
| Sample Volume (mL) | 1.0 |

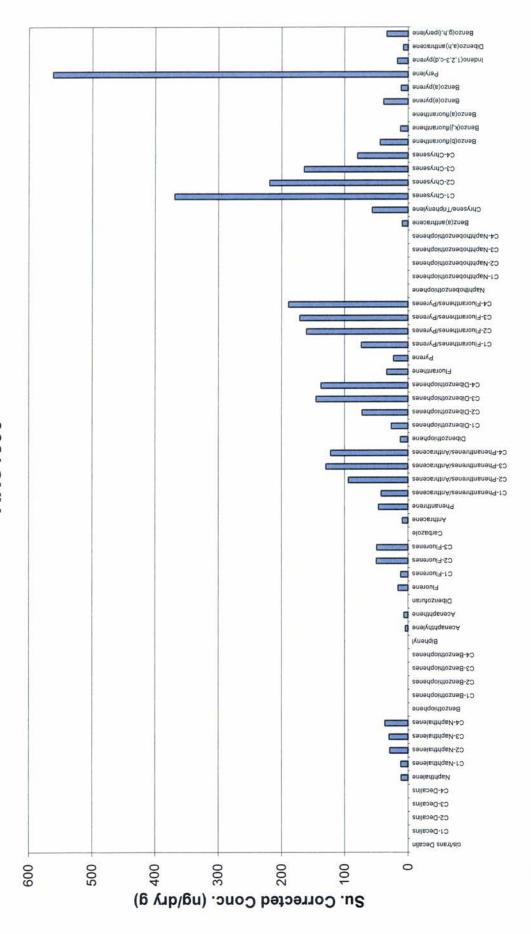
| Target Compounds | Concentration (ng/mL) | | Q RPD (%) | ICV Certified Conc. (ng/mL) | -20% Certified Conc. (ng/mL) | +20% Certified Conc (ng/mL) |
|--|--------------------------|------------|--------------|-----------------------------------|------------------------------------|-----------------------------------|
| cis/trans Decalin | | 273 | 8.8 | 250 | 200 | 300 |
| C1-Decalins | | NA | | | | |
| C2-Decalins | | NA | | | | |
| C3-Decalins | | NA | | | | |
| C4-Decalins | | NA | | | | |
| Naphthalene | | 277 | 10.4 | 250 | 200 | 300 |
| C1-Naphthalenes | | NA | | | | |
| C2-Naphthalenes C3-Naphthalenes | | NA NA | | | | |
| C4-Naphthalenes | | NA | | | | |
| Benzothiophene | | 279 | 10.8 | 250 | 200 | 300 |
| C1-Benzothiophenes | | NA | 10.0 | 200 | 200 | 500 |
| C2-Benzothiophenes | | NA | | | | |
| C3-Benzothiophenes | | NA | | | | |
| C4-Benzothiophenes | | NA | | | | |
| Biphenyl | | 277 | 9.9 | 251 | 201 | 301 |
| Acenaphthylene | | 270 | | | | |
| Acenaphthene | | 286 | 13.5 | 250 | 200 | 300 |
| Dibenzofuran | | 280 | 11.4 | 250 | 200 | 300 |
| Fluorene | | 282 | 12.0 | 250 | 200 | 300 |
| C1-Fluorenes | | NA | | | | |
| C2-Fluorenes C3-Fluorenes | | NA | | | | |
| C3-Fluorenes Carbazole | | NA | 2.0 | 050 | 000 | 000 |
| Anthracene | | 243 270 | 3.0 7.8 | 250 250 | 200 | 300 |
| Phenanthrene | | 268 | 6.9 | 250 | 200 200 | 300 300 |
| C1-Phenanthrenes/Anthracenes | | NA | 0.9 | 250 | 200 | 300 |
| C2-Phenanthrenes/Anthracenes | | NA | | | | |
| C3-Phenanthrenes/Anthracenes | | NA | | | | |
| C4-Phenanthrenes/Anthracenes | | NA | | | | |
| Dibenzothiophene | | 257 | 2.6 | 250 | 200 | 300 |
| C1-Dibenzothiophenes | | NA | | | | |
| C2-Dibenzothiophenes | | NA | | | | |
| C3-Dibenzothiophenes | | NA | | | | |
| C4-Dibenzothiophenes | | NA | | | | |
| Fluoranthene | | 273 | 8.9 | 250 | 200 | 300 |
| Pyrene | | 275 | 9.5 | 250 | 200 | 300 |
| C1-Fluoranthenes/Pyrenes | | NA | | | | |
| C2-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes | | NA | | | | |
| C4-Fluoranthenes/Pyrenes | | NA NA | | | | |
| Naphthobenzothiophene | | NA | | | | |
| C1-Naphthobenzothiophenes | | NA | | | | |
| C2-Naphthobenzothiophenes | | NA | | | | |
| C3-Naphthobenzothiophenes | | NA | | | | |
| C4-Naphthobenzothiophenes | | NA | | | | |
| Benz(a)anthracene | | 297 | 17.0 | 250 | 200 | 300 |
| Chrysene/Triphenylene | | 295 | 16.4 | 250 | 200 | 300 |
| C1-Chrysenes | | NA | | | | |
| C2-Chrysenes | | NA | | | | |
| C3-Chrysenes | | NA | | | | |
| C4-Chrysenes | | NA | | | | |
| Benzo(b)fluoranthene | | 257 | 2.8 | 250 | 200 | 300 |
| Benzo(k,j)fluoranthene | | 215 | 15.3 | 250 | 200 | 300 |
| Benzo(a)fluoranthene | | NA | 6.6 | 050 | 000 | 000 |
| Benzo(e)pyrene | | 264 271 | 5.5 | 250 | 200 | 300 |
| Benzo(a)pyrene Perylene | | 271 284 | 8.1 12.7 | 250 251 | 200 200 | 300 |
| ndeno(1,2,3-c,d)pyrene | | 204 277 | 10.2 | 250 | 200 | 301 300 |
|)ibenzo(a,h)anthracene | | 284 | 12.6 | 250 | 200 | 300 |
| JIDENZO(3.D)ADIDIACEDE | | | | | | |

| Sample Name | MS70057I.D |
|--------------------|------------------|
| Client Name | AR-WKICV-250-004 |
| Matrix | Solution |
| Collection Date | NA |
| Received Date | NA |
| Extraction Date | NA |
| Extraction Batch | ENV 3081 |
| Date Acquired | 8/17/13 6:22 |
| Method | PAH-2012.M |
| Sample Volume (mL) | 1.0 |
| | |

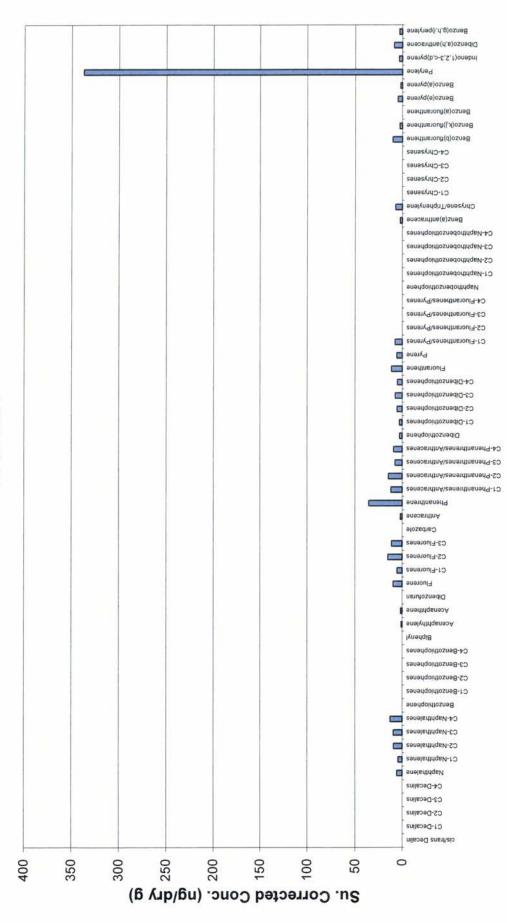
| | | | _ | | | | |
|--------------------------------------|--------------------------|-----|---|------------|------------------------|-------------------------|------------------------|
| Target Compounds | Concentration (ng/mL) | | Q | RPD (%) | ICV Certified Conc. | -20% Certified Conc. | +20% Certified Cond |
| Individual Alkyl Isomers and Hopanes | (| | | 6.3 | (ng/mL) | (ng/mL) | (ng/mL) |
| 2-Methylnaphthalene | | 286 | | 13.3 | 250 | 200 | 301 |
| 1-Methylnaphthalene | | 285 | | 12.7 | 251 | 200 | 301 |
| 2,6-Dimethylnaphthalene | | 277 | | 10.3 | 250 | 200 | 300 |
| 1,6,7-Trimethylnaphthalene | | 291 | | 15.0 | 250 | 200 | 301 |
| 1-Methylfluorene | | NA | | | | | |
| 4-Methyldibenzothiophene | | NA | | | | | |
| 2/3-Methyldibenzothiophene | | NA | | | | | |
| 1-Methyldibenzothiophene | | NA | | | | | |
| 3-Methylphenanthrene | | NA | | | | | |
| 2-Methylphenanthrene | | NA | | | | | |
| 2-Methylanthracene | | NA | | | | | |
| 4/9-Methylphenanthrene | | NA | | | | | |
| 1-Methylphenanthrene | | 284 | | 12.8 | 250 | 200 | 300 |
| 3,6-Dimethylphenanthrene | | NA | | 0700 | | | |
| Retene | | NA | | | | | |
| 2-Methylfluoranthene | | NA | | | | | |
| Benzo(b)fluorene | | NA | | | | | |
| C29-Hopane | | NA | | | | | |
| 18a-Oleanane | | NA | | | | | |
| C30-Hopane | | NA | | | | | |
| C20-TAS | | NA | | | | | |
| C21-TAS | | NA | | | | | |
| C26(20S)-TAS | | NA | | | | | |
| C26(20R)/C27(20S)-TAS | | NA | | | | | |
| C28(20S)-TAS | | NA | | | | | |
| C27(20R)-TAS | | NA | | | | | |
| C28(20R)-TAS | | NA | | | | | |
| Surrogate Recovery | | | | | | | |
| Naphthalene-d8 | | 229 | | 9.0 | 250 | 200 | 300 |
| Acenaphthene-d10 | | 224 | | 10.8 | 250 | 200 | 300 |
| Phenanthrene-d10 | | 207 | | 19.1 | 250 | 200 | 300 |
| Chrysene-d12 | | 252 | | 0.7 | 250 | 200 | 300 |
| Perylene-d12 | | 213 | | 16.2 | 250 | 200 | 300 |

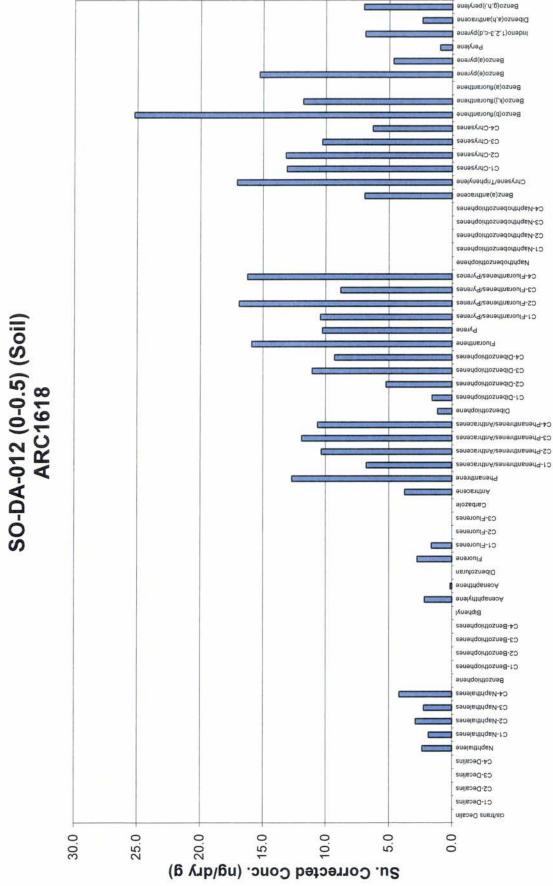
Polycyclic Aromatic Hydrocarbon Histograms

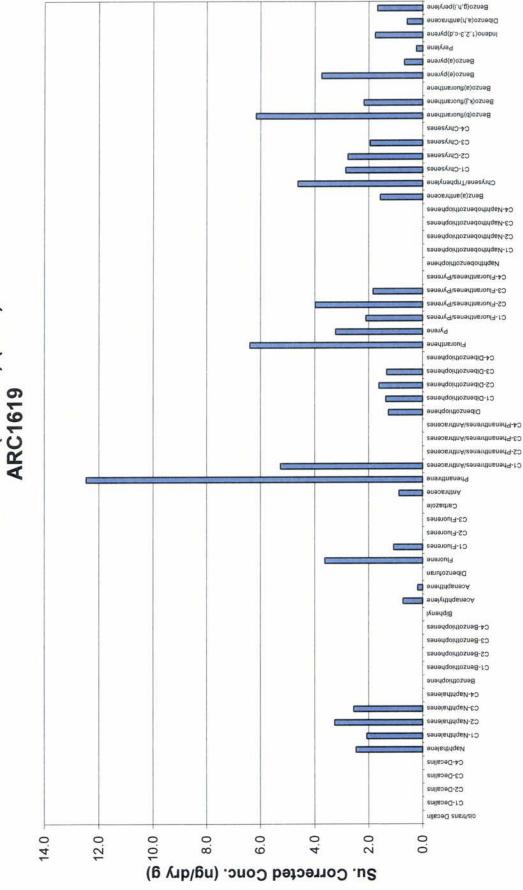
SED-DA-020 (0.5-1.0) (Sediment) ARC1600



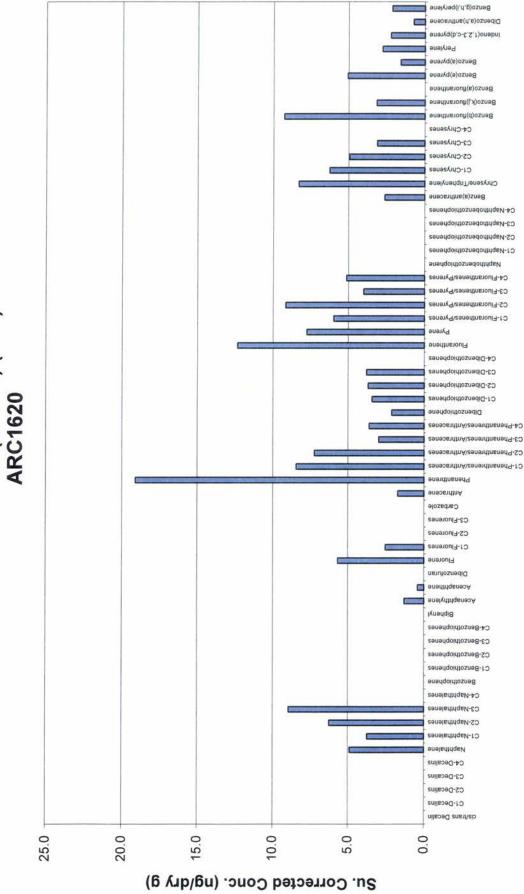
SED-DA-020 (1.0-1.5) (Sediment) ARC1601



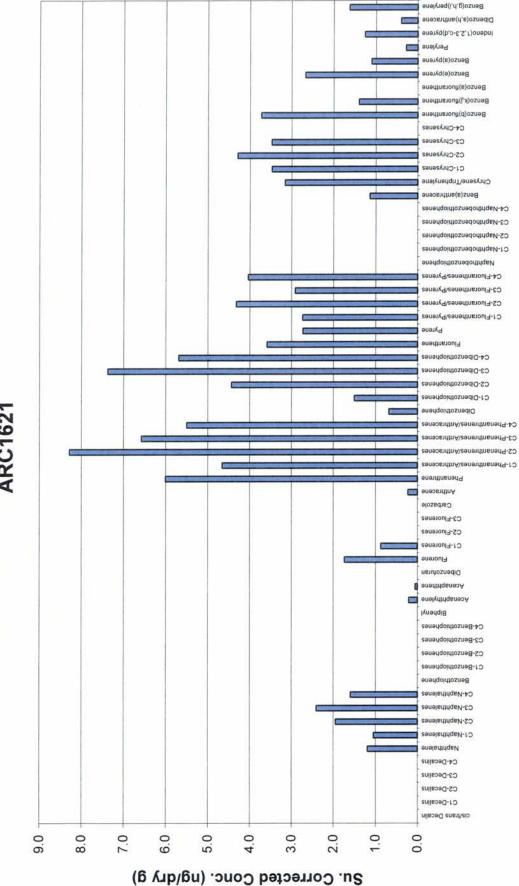




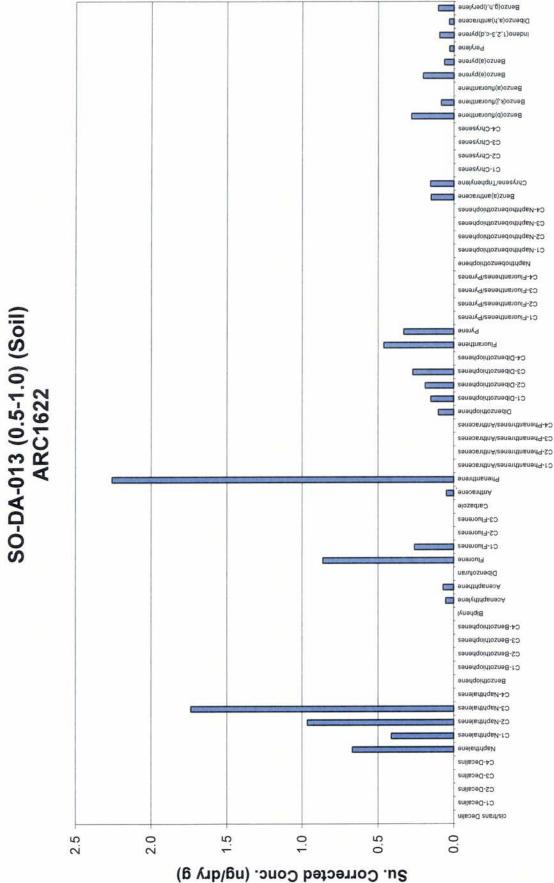
SO-DA-012 (0.5-1.0) (Soil) ARC1619



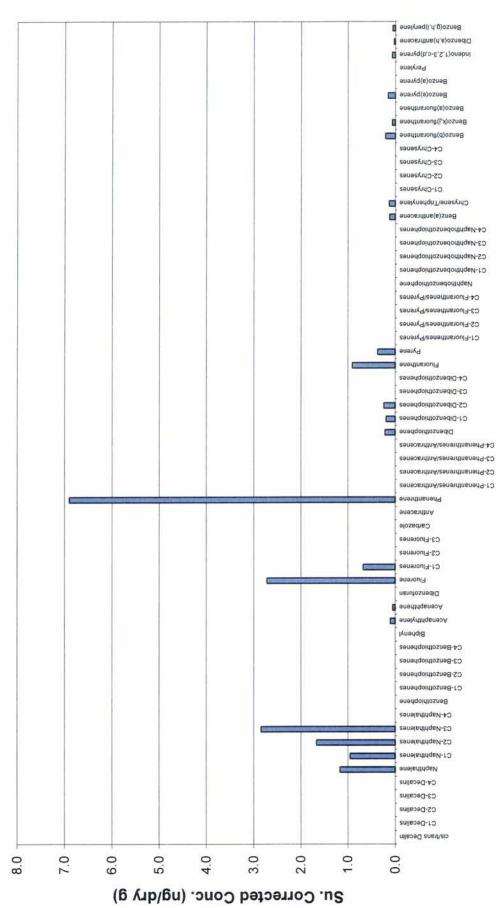
SO-DA-012 (1.0-1.5) (Soil) ARC1620



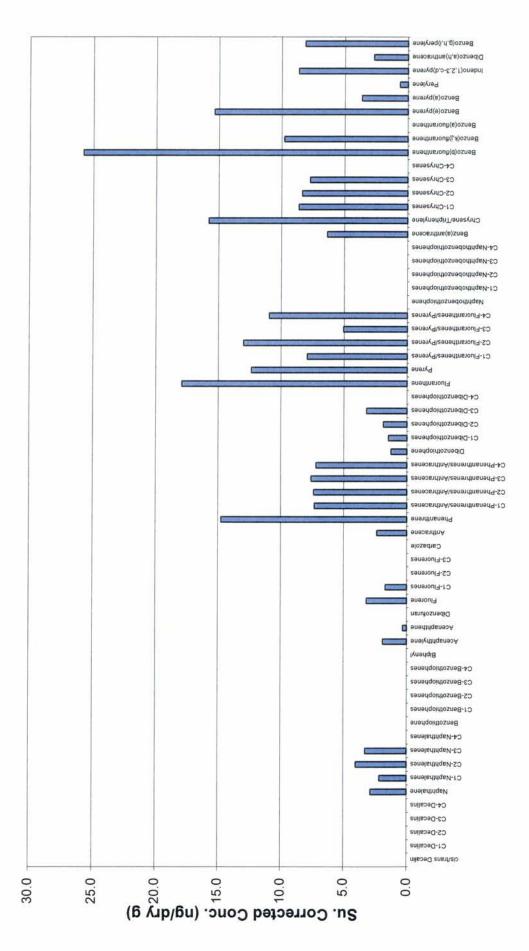
SO-DA-013 (0-0.5) (Soil) ARC1621



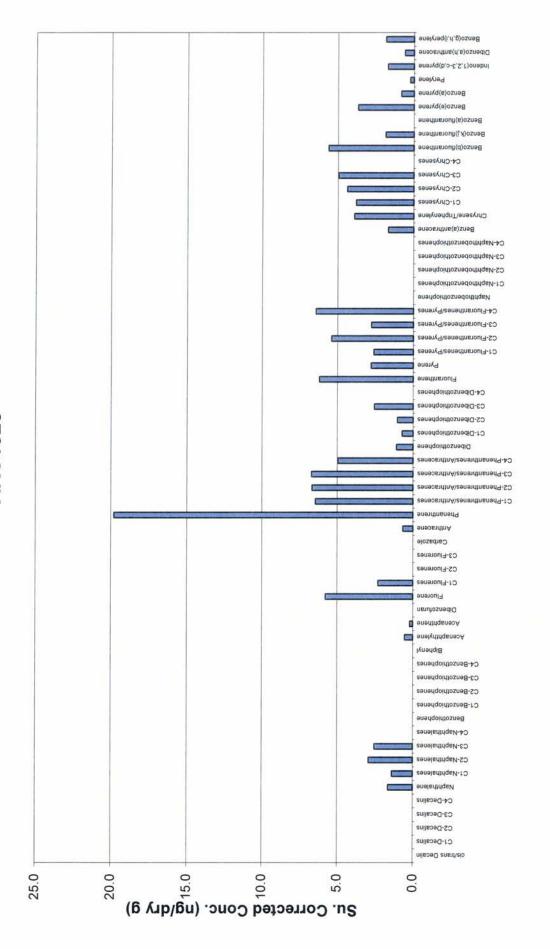




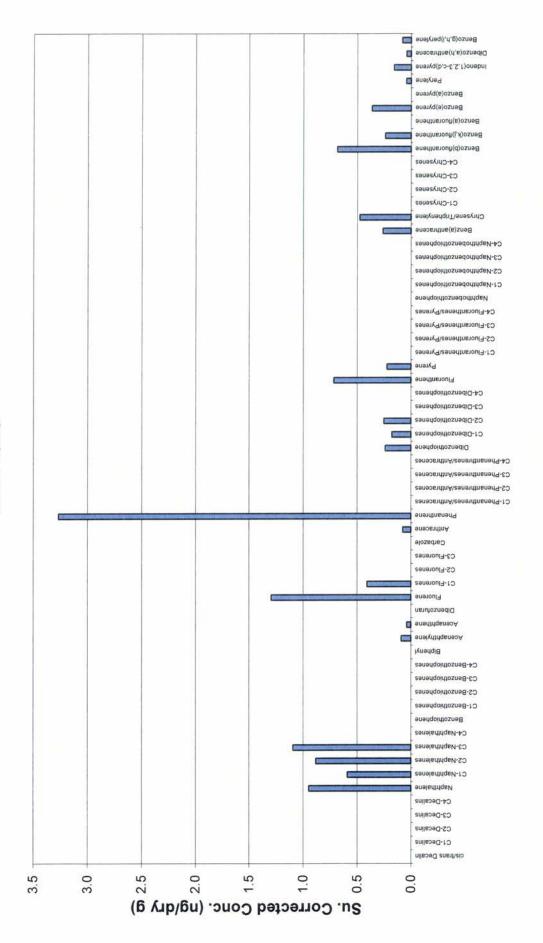




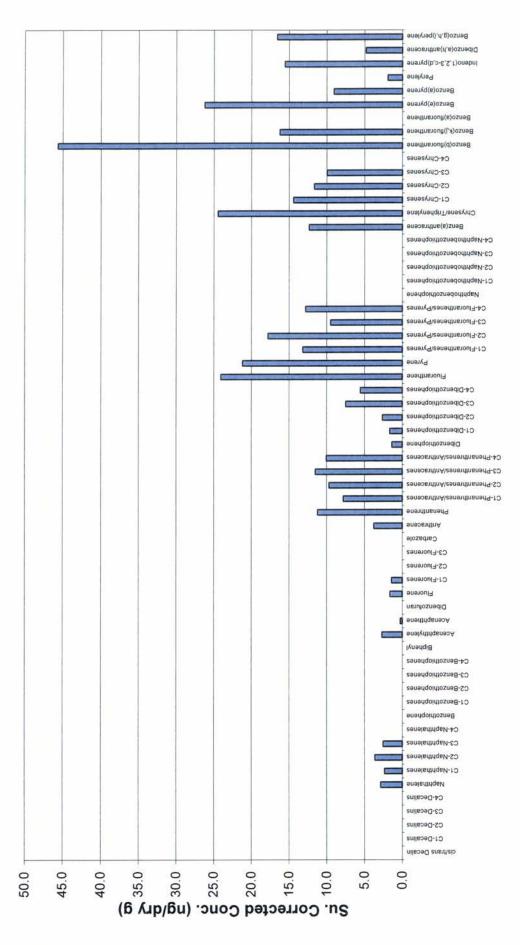
SO-DA-014 (0.5-1.0) (Soil) ARC1625



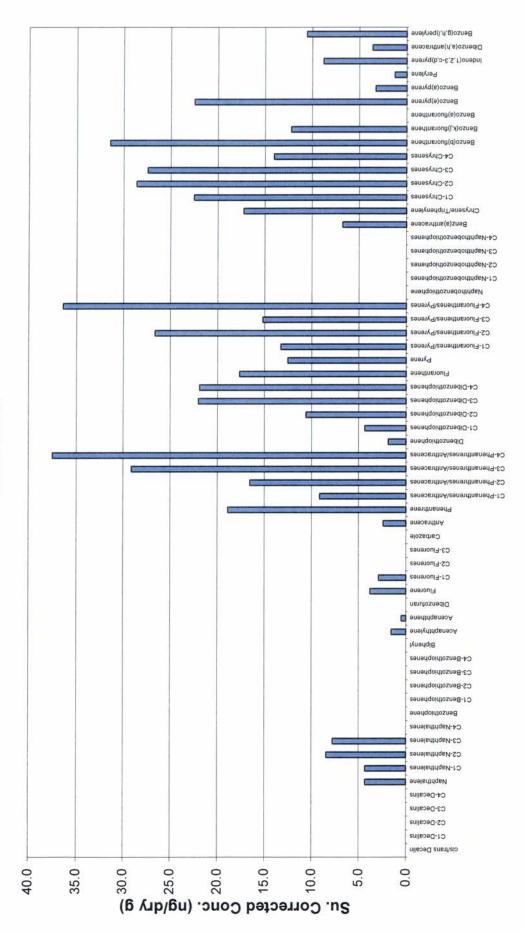
SO-DA-014 (1.0-1.5) (Soil) ARC1626



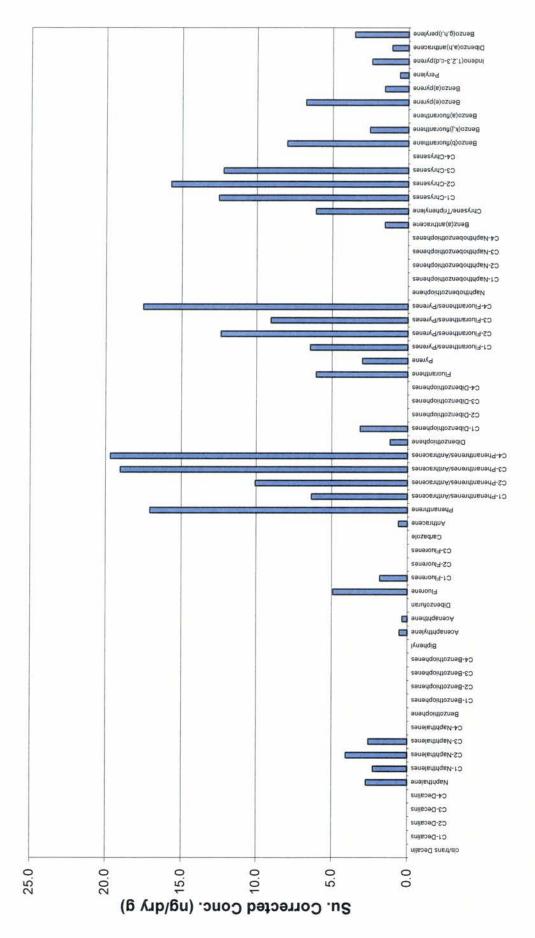
SO-DA-DUP-01-080113 (Soil) ARC1627



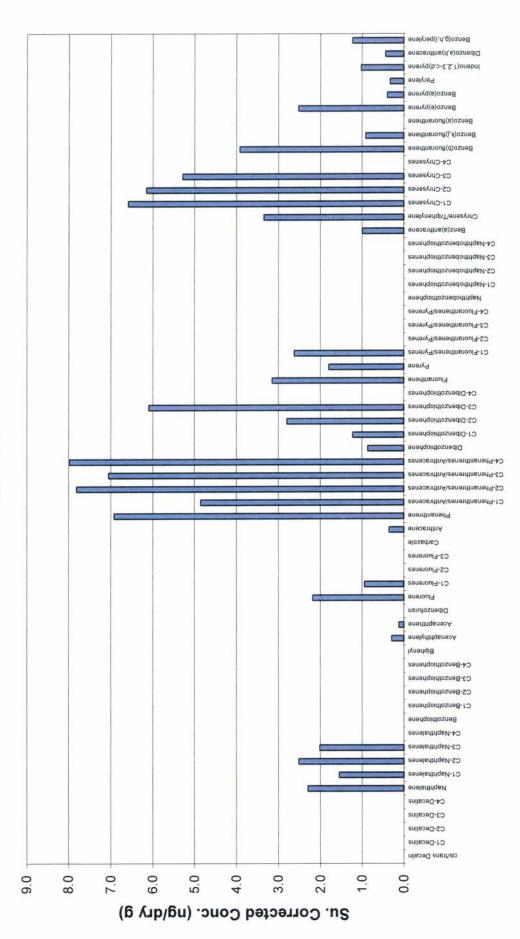
SO-DA-015 (0-0.5) (Soil) ARC1628



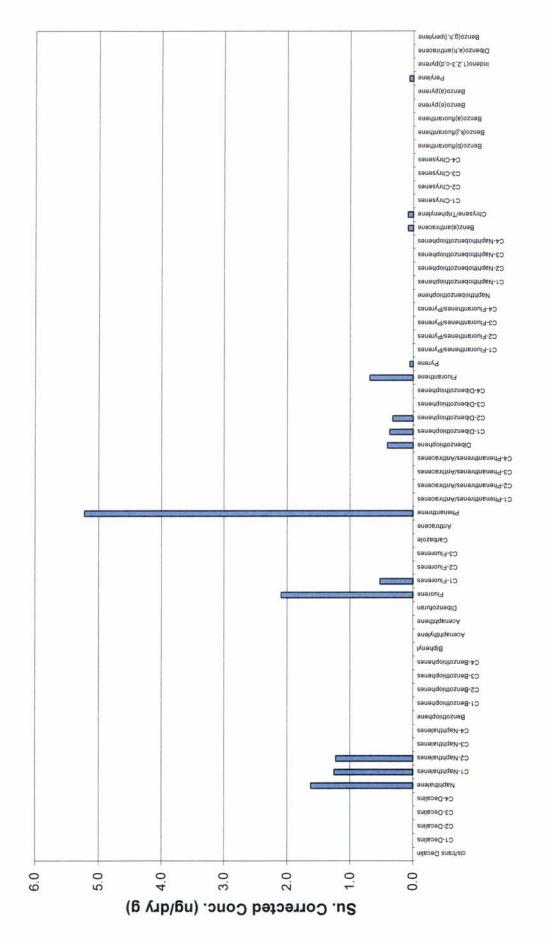




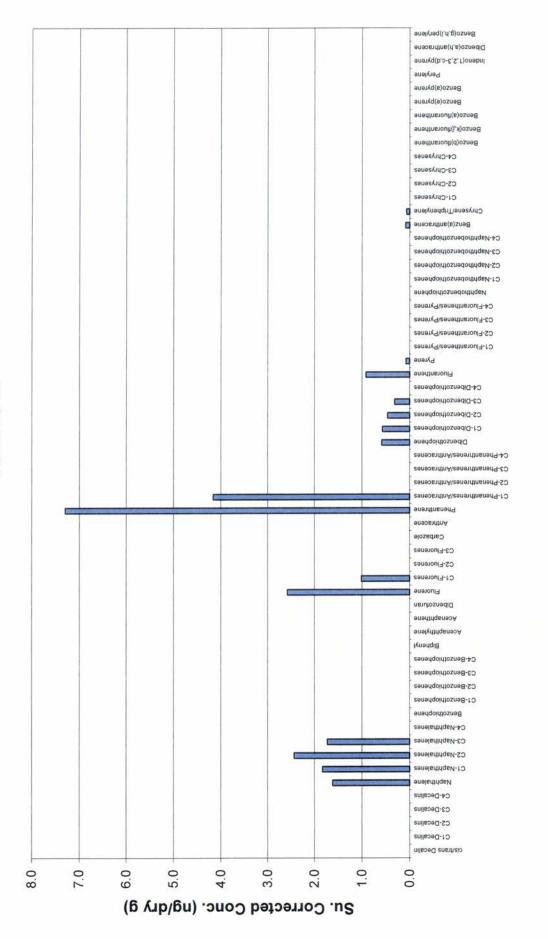




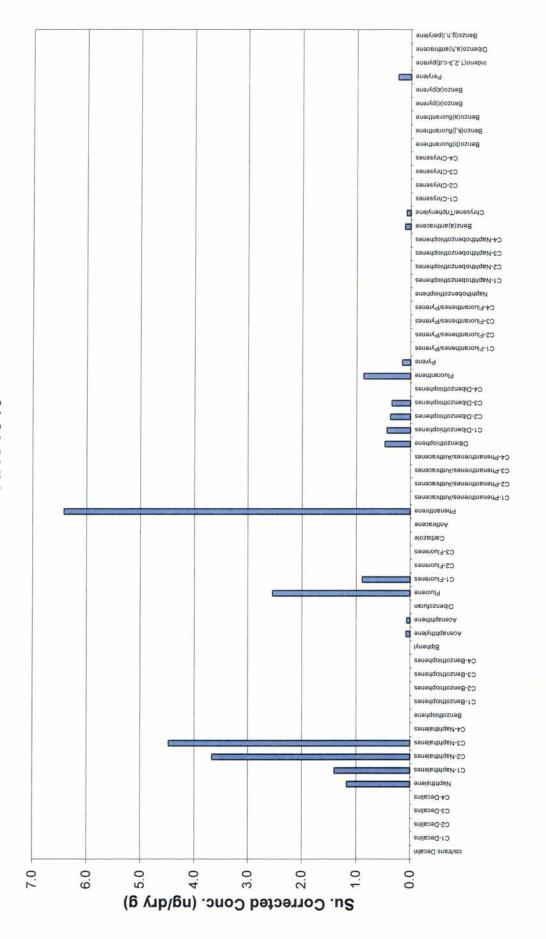
SED-DA-012 (0.5-1.0) (Sediment) ARC1641



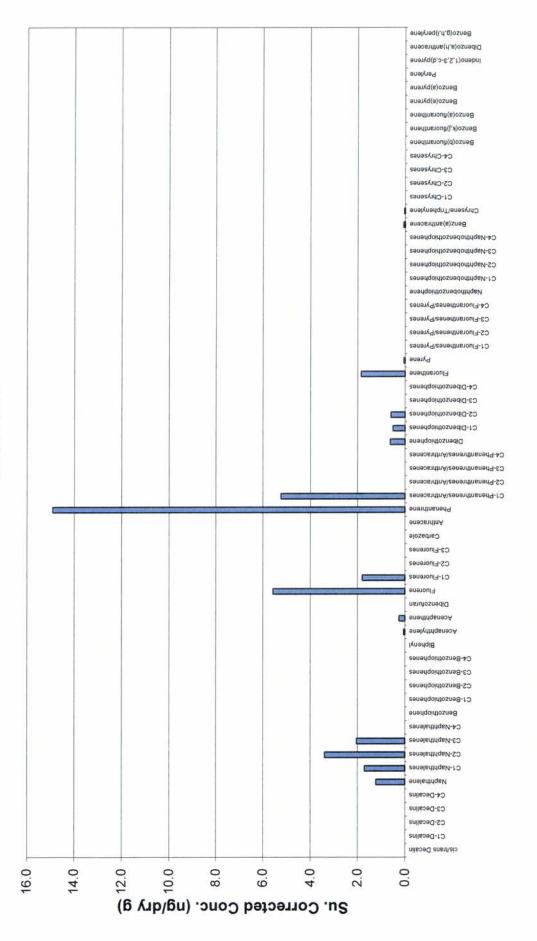
SED-DA-012 (1.0-1.5) (Sediment) ARC1642



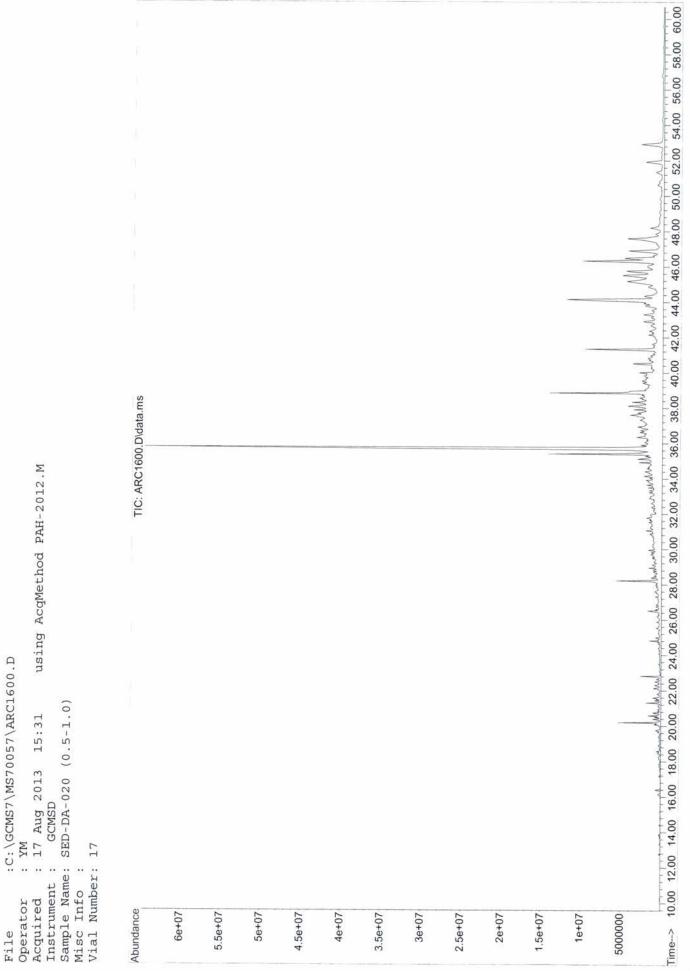
SED-DA-013 (0.5-1.0) (Sediment) ARC1643

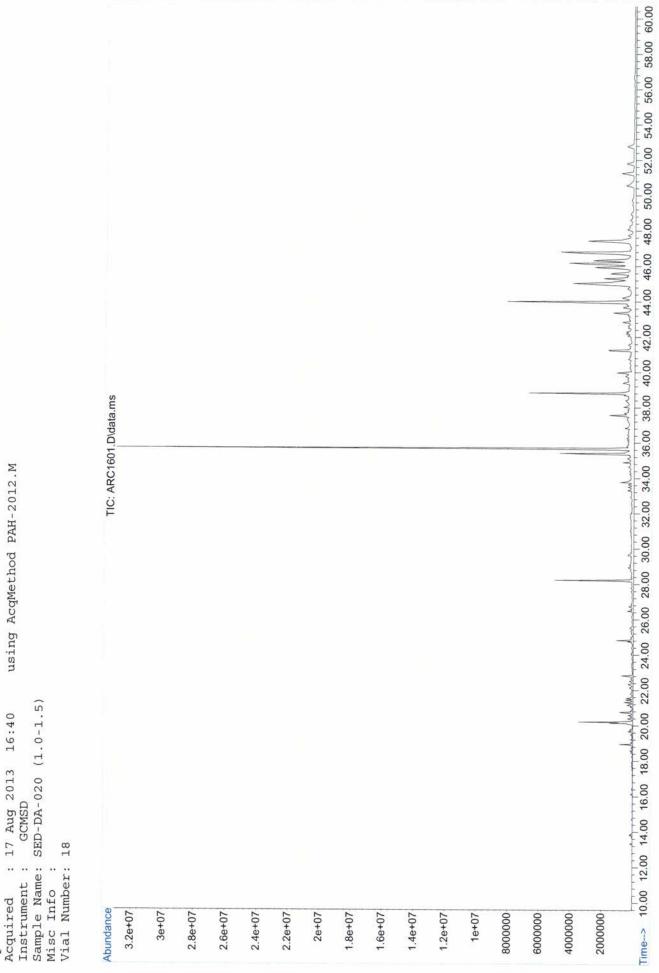


SED-DA-013 (1.0-1.5) (Sediment) ARC1644



Polycyclic Aromatic Hydrocarbon Total Ion Chromatograms





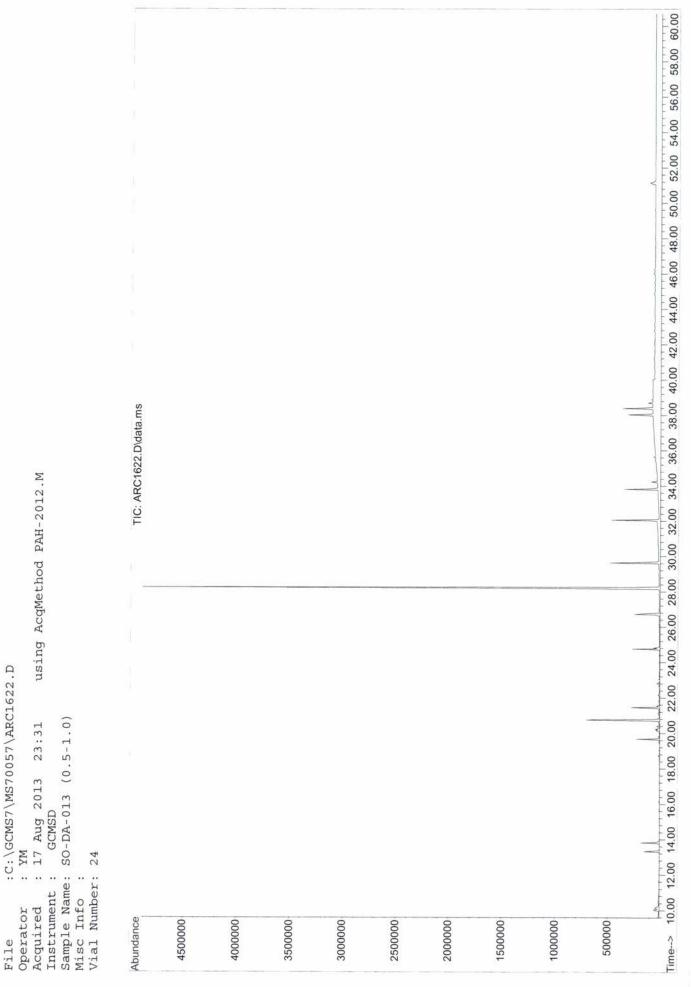
:C:\GCMS7\MS70057\ARC1601.D : YM

Operator

| File :C:\GCMS7\MS70057\ARC1618.D Operator :YM Acquired :17 Aug 2013 17:48 us Instrument : GCMSD Sample Name: SO-DA-012 (0-0.5) Misc Info : Vial Number: 19 | L618.D using AcqMet | using AcgMethod PAH-2012.M |
|--|------------------------|--|
| Abundance | | TIC: ARC1618.D\data.ms |
| 4500000 | | |
| 4000000 | | |
| 3500000 | | |
| 3000000 | | |
| 2500000 | | |
| 2000000 | | |
| 1500000 | | |
| 1000000 | | |
| 200000 | | and the second and the se |
| Time> 10.00 12.00 14.00 16.00 18.00 20.00 22.00 24.00 | 26.00 | 28.00 30.00 32.00 34.00 36.00 38.00 40.00 42.00 44.00 46.00 48.00 50.00 52.00 54.00 56.00 58.00 60.00 |

| | | | | | | | | | | | | 54.00 56.00 58.00 60.00 |
|---|------------------------|--------|---------|---------|---------|---------|---------|---------|---------|---------|----------------|---|
| | | | | | | | | | | | Marin | 48.00 50.00 52.00 |
| | | | | | | | | | | | Jury hard Mary | 38.00 40.00 42.00 44.00 46.00 48.00 50.00 52.00 |
| Ψ. | TIC: ARC1620.D\data.ms | | | | | | | | | | Infrash Manual | 32.00 34.00 36.00 38.00 40.00 |
| .D using AcqMethod PAH-2012.M | TIC: AR | | | | | | | | | | | 28.00 30.00 32.00 34 |
| 20.D using AcqMe | | | | | | | | | | | | |
| :C:\GCMS7\MS70057\ARC1620.D : YM : 17 Aug 2013 21:14 us : GCMSD : SO-DA-012 (1.0-1.5) : 22 | | | | | | | | | | | | 14.00 16.00 18. |
| File : Operator : Acquired : Instrument : Sample Name: Misc Info : Vial Number: | Abundance | 500000 | 4500000 | 4000000 | 3500000 | 3000000 | 2500000 | 2000000 | 1500000 | 1000000 | 200000 | Time> 10.00 12.00 |

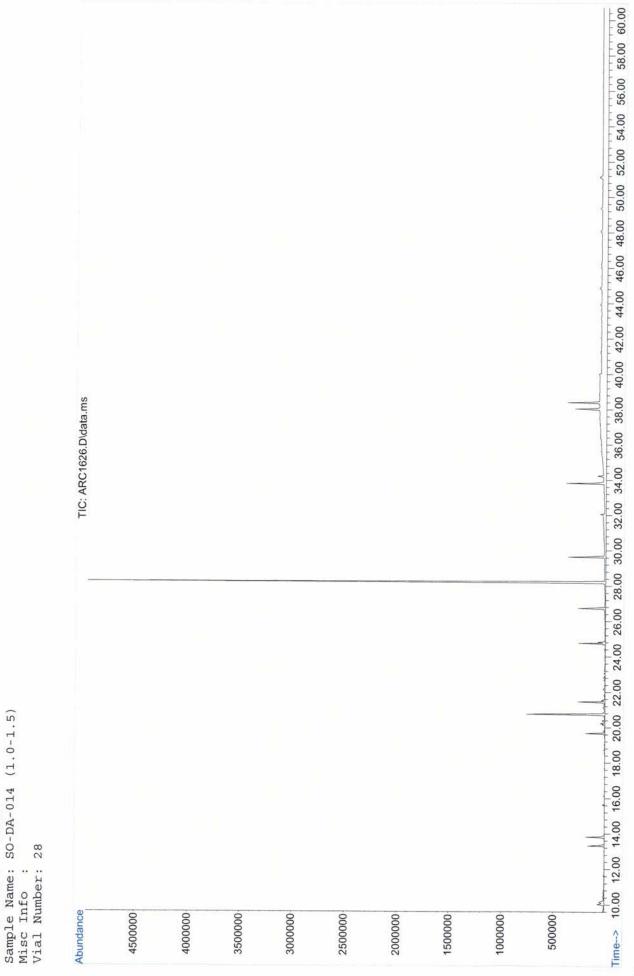
| File :C:\GCMS7\MS Operator :YM Acquired :17 Aug 20 Instrument : GCMSD Sample Name: SO-DA-013 Misc Info : Vial Number: 23 | :C:\GCMS7\MS70057\ARC1621.D : YM : 17 Aug 2013 22:22 us : GCMSD : SO-DA-013 (0-0.5) : 23 | 621.D using AcqMet | .D using AcqMethod PAH-2012.M | 5 | | | | |
|---|---|---|----------------------------------|------------------------|----------------------|-------------------|------------------|-------|
| | | | | | | | | |
| Abundance 5000000 | | | TIC: ARC | TIC: ARC1621.D\data.ms | | | | |
| | | | | | | | | |
| 4500000 | | | | | | | | |
| 400000 | | | | | | | | |
| 350000 | | | | | | | | |
| 3000000 | | | | | | | | |
| 2500000 | | | | | | | | |
| 2000000 | | | | | | | | |
| 1500000 | | | | | | | | |
| 1000000 | | | | | | | | |
| 500000 | | | 2 2 | | | | | |
| where we have a second s | And have not a second | " | and marches a | representation | monor | - V | | |
| Time> 10.00 12.00 14.00 | 16.00 18.00 20.00 22 | 16.00 18.00 20.00 22.00 24.00 26.00 28.00 30.00 32.00 34.00 36.00 38.00 40.00 42.00 44.00 46.00 48.00 50.00 52.00 54.00 56.00 58.00 60.00 | 0 30.00 32.00 34.00 | 0 36.00 38.00 40.00 | 42.00 44.00 46.00 48 | 00 50.00 52.00 54 | 1.00 56.00 58.00 | 60.00 |



| .D using AcqMethod PAH-2012.M | TIC: ARC1623.D\data.ms | | | | | | | | | | |
|---|------------------------|--------|--------|--------|--------|--------|--------|--------|---------|--------|---|
| 23.D using AcqMe | | | | | | | | | | | |
| :C:\GCMS7\MS70057\ARCI623.D r :YM d :I8 Aug 2013 00:39 us ent : GCMSD Name: S0-DA-013 (1.0-1.5) fo : mber: 25 | | | | | | | | | | | 10.00 12.00 14.00 16.00 18.00 20.00 22.00 26.00 |
| File :C Operator : Acquired : Instrument : Sample Name: Misc Info : Vial Number: | Abundance | 450000 | 400000 | 350000 | 300000 | 250000 | 200000 | 150000 | 1000000 | 500000 | Time-> |

| | 50000 | | | | 1000000 | | | 1500000 | | | 250000 | | 300000 | | 350000 | | 4000000 | | 4500000 | | Abundance TIC: ARC1624.D\data.ms | Misc Info : Vial Number: 26 | |
|---|---|---|--|--|---|--|--|--|--|--|---|---|--|--|--|---|---|---|--|---|---|--|---|
| 200000 | | | | | | 1000000 | 1000000 | 1000000 | 1000000 | | 100000 150000 | 2500000 2000000 1500000 1000000 | 2500000 1500000 1500000 1500000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 1000000 | 300000 2000000 150000 1000000 1000000 1000000 100000 100000 100000 100000 100000 100000 100000 100000 10000 10000 10000 100000 100000 100000 100000 100000 100000 100000 1000000 100000 1000000 100000 1000000 1000000 10 | 3000000 2500000 150000 150000 100000 | 350000 3000000 2500000 15000000 15000000 100000 | 3300000 2500000 1000000 1000000 10000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 10000 | 400000 3500000 2500000 1500000 1500000 1000000 | 400000 350000 2500000 2500000 1500000 15000000 15000000 150000 150000 150000000 1500000000 | 450000 3500000 3500000 2500000 1500000 1500000 | | TC. ACC1624 Dudata ms | TIC ARC1624 Didata.ms |
| 1500000 | | 1000000 | 1000000 | | 1500000 | 1500000 | | | | | | 2500000 | 250000 | 3000000 | 3000000 | 3500000 30000000 2500000 | 3500000 | 400000 350000 350000 00 00 00 00 00 00 00 00 00 00 00 0 | 4000000 3500000 3000000 2500000 30 300000 30 30 30 30 30 30 30 30 | 450000 400000 350000 300000 250000 | | TIC: ARC1624.Didata.ms | WM GCNSD SO-DA-014 (0-0.5) 26 TC: ARC1624.Didata.ms |
| 1C. ARC 1624 Didata ms | 1C. ARC1624 Didata ins | 1C: ARC1624.Didata.ms | 1C. ARC1624.Didata.ms | 1C. ARC 1624 Didata tra | 1C. ARC1624.D/data.ms | 1C. ARC1624.D1data.ms | 26 | 1C: ARC1624.Didata.ms | 1C: ARC1624.D/data.ms | 1C: ARC1624.D/data.ms | 26 | 26 TIC: ARC1624.D\data.ms | 26 TIC: ARC1624.Didata.ms | 26 TIC: ARC1624.Didata.ms | 26 TIC: ARC1624.D\data.ms | 2 GTIC: ARC1624.D\data.ms | 2 6 TIC: ARC1624.D\data.ms | 2 6 TIC: ARC1624.D\data.ms | 2 6 TIC: ARC1624.D\data.ms | 26 TIC: ARC1624.D\data.ms | | | : YM : 18 Aug 2013 1:48 |
| 26 TC: ARC1624 Didata ms | 26 50-DA-014 (0-0.5) TIC: ARC1624.Didata.ms | 26 So-DA-014 (0-0.5) TC: ARC1624.Didatums | 26 So-DA-014 (0-0.5) TC: ARC1624 Didata ms | 26 10: ARC1624 Didata.ms | 26 26-DA-014 (0-0.5) TC: ARC1624.Dutatams | 26 10. ARC1624.Didata.ms | 26 30-Dh-014 (0-0.5) 1C: ARC1624 Didatams | 26 26 30-Dh-014 (0-0.5) 70: ARC1624.Ddata.ms | GCNSD 20-014 (0-0.5) S0-DA-014 (0-0.5) TIC: ARCIE24.Didata.ms | GCMSD So-DA-014 (0-0.5) So-DA-014 (0-0.5) TIC: ARC1624.Didata.ms | GCMSD So-DA-014 (0-0.5) So-DA-014 (0-0.5) TIC: ARC1024.D/data.ms | GCMSD GCMSD 4119 Avgneellou FAH-2012.19 GCMSD S0-DA-014 (0-0.5) TIC: ARC1624.Didata.ms | GONSD 20-014 (0-0.5) S0-DA-014 (0-0.5) TIC: ARC1624.Didata.ms | GCMSD 50-DA-014 (0-0.5) S0-DA-014 (0-0.5) TIC: ARC1624.D\data.ms | GCMSD SO-DA-014 (0-0.5) SO-DA-014 (0-0.5) 26 TIC: ARC1624.Didata.ms | GCMSD 2014 (0-0.5) S0-DA-014 (0-0.5) 26 TIC: ARC1624.D\data.ms | GCMSD 50-DA-014 (0-0.5) S0-DA-014 (0-0.5) 26 TIC: ARC1624.Didata.ms | GCMSD 0-014 (0-0.5) S0-DA-014 (0-0.5) 26 TIC: ARC1624.D\data.ms | GCMSD GCMSD FAIN-2012.M GCMSD S0-DA-014 (0-0.5) S0-DA-014 (0-0.5) Z6 | SO-DA-014 (0-0.5) TIC: ARC1624.D\data.ms | CCMSD 2013 1.10 GCMSD 20-DA-014 (0-0.5) 26 | GCMSD 114 (0-0.5) | |
| CC:\GCWG7\/MS70057\ARC1624.D ttor YM ttor YM ttor 2013 1:48 using AcqWethod PAH-2012.M turnent : occWSD ThE : Name SO-DA-014 (0-0.5) ThE : The : CCWSD ThE : The : CCWSD ThE : The : CCWSD ThE | C:.,GGKb57/M870057/M870057/M8C1624.D tert : YM red : 18 Arg 2013 1:48 using AcgPtethod PAH-2012.M mit : GCKB2 mit : GCKB2 Info : Sc-DA-014 (0-0.5) Info : Tick Acff624 Ddatams 00 00 00 00 00 00 00 00 00 0 | C:.,GGCMS7/MS70057/MSC1624.D tcr: YM red: 18 Ang 2013 1:48 using AcgMethod PAH-2012.M c. BAIR: 20-DA-014 (0-0.5) ThE: S-DA-014 (0-0.5) ThE: Monther: 26 00 00 00 00 00 00 00 00 00 0 | C: (GCWG7/\MR71057/ARC1624.D red : 1 May 2013 1:48 using AcqMethod PAH-2012.M red : 1 May 2013 1:48 using AcqMethod PAH-2012.M rement : accMSD info maker: 26 maker: 26 m | C: (GCMST/MS70057/ARC1624.D trot : YM mit : Mag 2013 1:48 using AcqWethod PAH-2012.M mit : GCMSD Info : S-DA-014 (0-0.5) Info : TC: ARC1624.Ddata.ms 00 00 00 00 00 00 00 00 00 0 | C:\GCMS7\MS70057\ARC1624.D tor :'MW red : 18 Mg 2013 1:48 using AcqMethod PAH-2012.M umment : a cOMSD Inte : SO-DA-014 (0-0.5) Inte : SO-DA-014 (0-0.5) The : TC: ARC1624 Ddata.ms 00 00 00 00 00 00 00 00 00 0 | C: \CGNS7\MS70057\ARC1624.D Tred: : IM red: : IM red: : I8 Aug 2013 1:48 using AcqMethod PAH-2012.M rement: : cCMSD info: : COMSD info: | C:\GCMS7\MS70057\ARCL624.D tor: :W red: :B Aug 2013 1:48 using AcgMethod PAH-2012.M .e Name: :SO-DA-014 (0-0.5) Info: :SO-DA-014 (0-0.5) Number: 26 TC:ARC1624.Ddata.ms 00 00 00 00 00 00 00 00 00 0 | C:\GCMS7\MS70057\ARCIE24.D red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M rement : acrMsD e Name: SO-DA-014 (0-0.5) Tirto Number: 26 00 00 00 00 00 00 00 00 00 0 | C:\GCMS7\MS70057\ARC1624.D tect : YM tect : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M turnet : GCMSD Tric : GCMSD 00 00 00 00 00 00 00 00 00 0 | :C:\GCMS7\MS70057\ARC1624.D red ::MM :ument : 2013 1:48 using AcqMethod PAH-2012.M :ument : GCMSD Info Mumber: 26 00 00 00 00 00 00 | IC:\GGMST\MST0057\ARC1624.D ted : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M .red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M . Number: S0-DA-014 (0-0.5) ThE : Number: 26 TC:ARC1624.DidaLms 00 00 00 00 00 00 00 00 00 0 | C:\GGNS7\MS70057\ARC1624.D red IB Aug 2013 1:48 using AcqMethod PAH-2012.M cument : GGNSD e Name: SO-DA-014 (0-0.5) Info : Number: 26 00 00 00 00 00 00 00 00 00 0 | IC:\GCMST\MST0057\ARC1624.D tor XM Led 18 Aug 2013 1:48 using AcgMethod PAH-2012.M Led Sconsponder (0-0.5) Info : Number: 26 Number: | IC:\GCM97\MS70057\ARC1624.D ttor : YM tred : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M turnent : GCM5D the Name : S0-DA-014 (0-0.5) Info : Number: 26 Number: 26 Number: 26 Number: 26 Number: 26 | IC:\GCMS7\MS70057\ARC1624.D itor : YM Ired : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M ument : GCMSD e Name : SO-DA-014 (0-0.5) Info : Number: 26 Number: 26 No | IC:\GGMS7\MS70057\ARC1624.D Itor : YM .red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M .ument : GGMSD .umber : 26 Number : 26 Number : 26 NIC: ARC1624.D\data.ms | :C:\GCMS7\MS70057\ARC1624.D red : YM red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M :ument : GCMSD :e Name: SO-DA-014 (0-0.5) Info : Number: 26 Number: 26 TIC: ARC1624.D\data.ms | :C:\GCMS7\MS70057\ARC1624.D ttor :YM red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M ument : GCMSD e Name: SO-DA-014 (0-0.5) Info : Number: 26 TIC: ARC1624.D\data.ms TIC: ARC1624.D\data.ms | :C:\GCMS7\MS70057\ARC1624.D ttor : YM .red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M .ument : GCMSD .e Name: S0-DA-014 (0-0.5) Info : Number: 26 TIC: ARC1624.D\data.ms | :C:\GCMS7\MS70057\ARC1624.D tor : YM .red : 18 Aug 2013 1:48 using AcqMethod PAH-2012.M .ument : GCMSD . Info : Number: 26 Number: 26 TIC:ARC1624.DMata.ms | :C:\GCMS7\MS70057\ARC1624 ttor :YM .red : 18 Aug 2013 1:48 .ument : GCMSD .ument :SO-DA-014 (0-0.5) Info : Number: 26 | :C:\GCMS7\MS70057\ARC1624 ttor :YM .red : 18 Aug 2013 1:48 .ument : GCMSD .e Name: SO-DA-014 (0-0.5) | |

| Misc Info : Vial Number: 27 Abundance 5000000 | | TIC: ARC1625.D\data.ms | | |
|--|-------|------------------------|--|--|
| 4500000 | | | | |
| 4000000 | | | | |
| 3500000 | | | | |
| 3000000 | | | | |
| 2500000 | | | | |
| 2000000 | | | | |
| 1500000 | | | | |
| 1000000 | | | | |
| 500000 | | | | |
| | Juhan | manulum | | |



using AcqMethod PAH-2012.M

:C:\GCMS7\MS70057\ARC1626.D : YM

4:05

18 Aug 2013 GCMSD

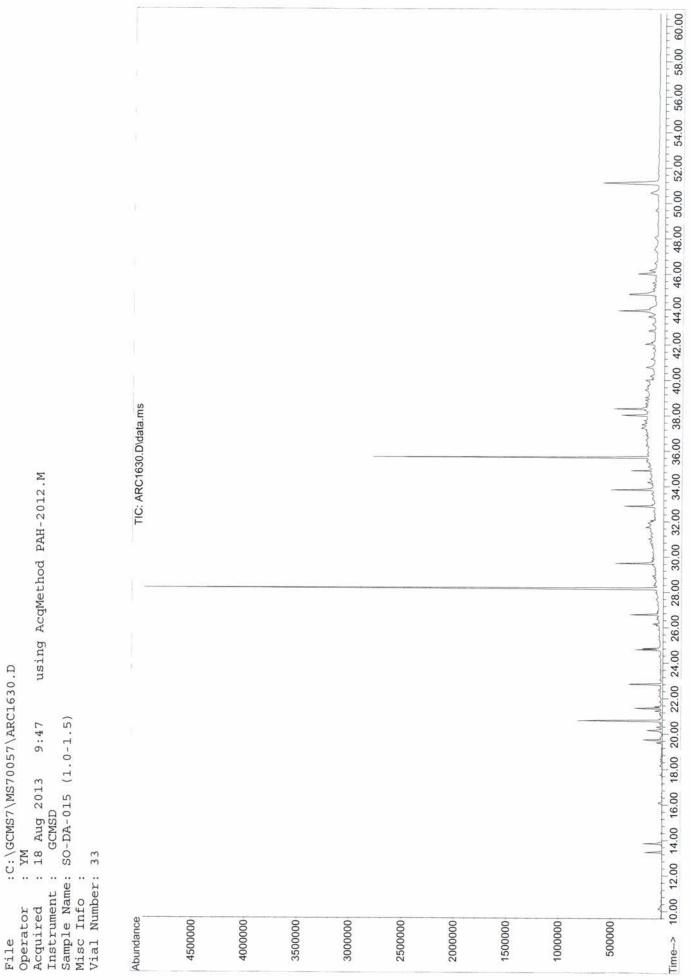
Acquired : Instrument :

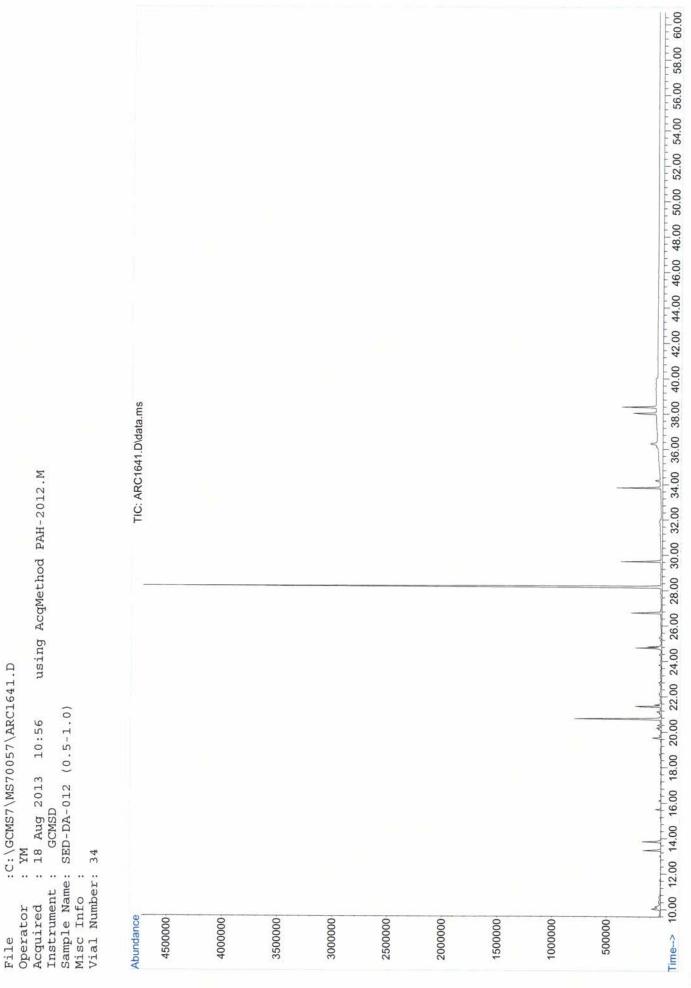
Operator

| S70057\ARC1627.D 13 6:22 using AcqMethod PAH-2012.M -01-080113 | TIC: ARC1627.D\data.ms | | | | | | | | | a and a second a second and a second a | 00 34.00 36.00 38.00 4 |
|--|------------------------|---------|--------|--------|--------|---------|----------|--------|---------|--|-------------------------------------|
| <pre>File :C:\GCMS7\MS70057\ARC1627.D Operator :YM Acquired : 18 Aug 2013 6:22 us Instrument : GCMSD Sample Name: S0-DA-DUP-01-080113 Misc Info : 20 Vial Winber: 30</pre> | | 4500000 | 400000 | 350000 | 300000 | 2500000 | 2000000- | 150000 | 1000000 | 200000 | Time> 10.00 12.00 14.00 16.00 18.00 |

| | using AcqMethod PAH-2012.M | TIC: ARC1628.D\data.ms | | | | | | | | | | Marker Marker and Marker and Marker Marker and Ma | 28.00 30.00 32.00 34.00 36.00 38.00 40.00 42.00 44.00 46.00 48.00 50.00 52.00 54.00 56.00 58.00 60.00 |
|-------------------------------------|----------------------------|------------------------|--------|--------|--------|--------|---------|---------|---------|---------|---------|--|---|
| 628.D | using AcgMe | | | | | | | | | | | Mu Jacob Marine | 24.00 26.00 |
| S70057\ARC1 | 13 7:30 (0-0.5) | | | | | | | | | | | Mudhall | 18.00 20.00 2 |
| :C:\GCMS7\MS70057\ARC1628.D : YM | | | | | | | | | | | | | 2.00 14.00 16.00 |
| File Operator | nt ame o ber | Abundance | 500000 | 450000 | 400000 | 350000 | 3000000 | 2500000 | 2000000 | 1500000 | 1000000 | 50000 | Time> 10.00 12 |

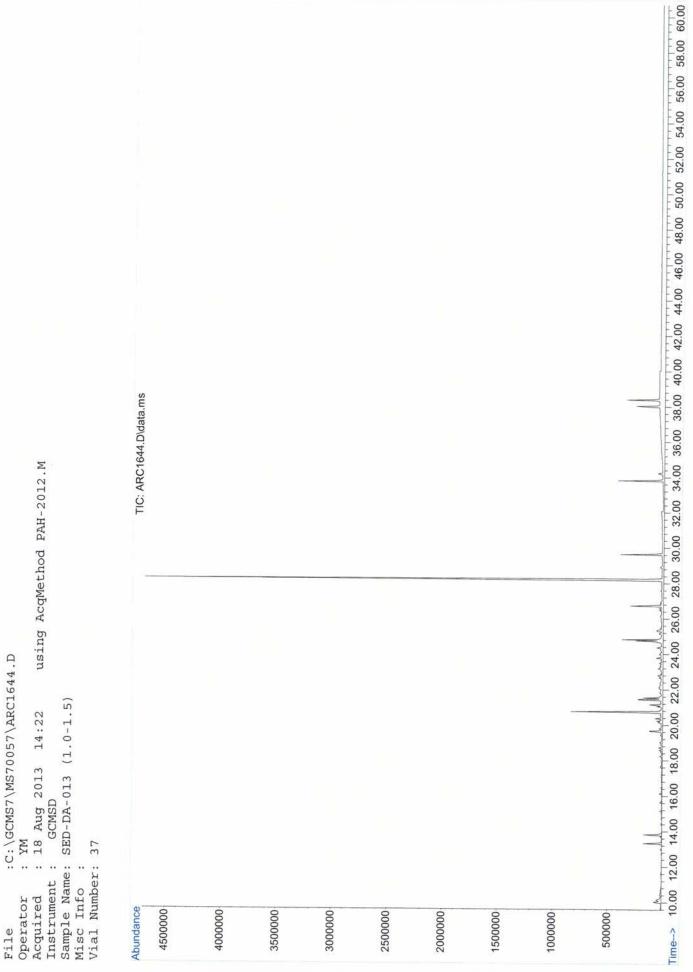
| .D using AcgMethod PAH-2012.M | TIC: ARC1629.D\data.ms | | | | | | | | | Marken Marken and Mark Mark Mark Mark Mark Mark Mark Mark | 28.00 30.00 32.00 34.00 36.00 38.00 40.00 42.00 44.00 46.00 48.00 50.00 52.00 54.00 56.00 58.00 60.00 |
|--|------------------------|---------|---------|--------|--------|--------|---------|---------|---------|---|---|
| 570057\ARC1629 L3 8:39 (0.5-1.0) | | | | | | | | | | when the second when the second se | 24.00 26.00 |
| File :C:\GCMS7\MS Operator :YM Acquired : 18 Aug 201 Instrument : GCMSD Sample Name: SO-DA-015 Misc Info : Vial Number: 32 | Abundance 5000000 | 4500000 | 4000000 | 350000 | 300000 | 250000 | 2000000 | 1500000 | 1000000 | 50000 | Time> 10.00 12.00 14.00 |





| File ::(:(GCMS7/MS70057/ARC1642.D Operator :Y Arguinted :18 Aug 2013 12:04 using AcgMethod PAH-2012.M Tattument: acMSD Sample Rame :SED-DA-012 (1.0-1.5) Mundher: 35 Anundane 400000 350000 250000 250000 1600000 160000 160000 160000000 1600000 1600000 1600000 16 |
|--|
|--|

| File Operator Acquired | :C:\GCMS7\MS70057\ARC1643.D : YM : 18 Aug 2013 13:13 us | 643.D using AcaMethod PAH-2012.M |
|---|---|--|
| Instrument : (Sample Name: SE Misc Info : Vial Number: 36 | 3CMSD D-DA-013 (1 | |
| Abundance | | TIC: ARC1643.D\data.ms |
| 4500000 | | |
| 4000000 | | |
| 3500000 | | |
| 300000 | | |
| 2500000 | | |
| 2000000 | | |
| 150000 | | |
| 100000 | | |
| 50000 | | |
| Time> 10.00 | 10.00 12 00 14 00 16 00 18 00 20 00 22 00 26 00 26 00 | 28 00 30 00 32 00 34 00 38 00 40 00 44 00 44 00 46 00 50 00 50 00 51 00 50 00 50 00 50 00 50 00 50 00 50 00 50 |
| | | 20.00 |



Polycyclic Aromatic Hydrocarbon Raw Data

B&B LABORATORIES PAHs QA FORM

| Extraction Page:ENV 3081 | | Analyst:Y. Miao |
|---|---|--|
| Client:Aracadis Mayflower | | Date:9/13/2013 |
| Job: #:J13034 | | Project Quality Manager: W Jank |
| SDG #:various | | Date: 05(13/13 |
| Initial Calibration: | | ICV |
| No failure: | S | No failures |
| Surrogate Recoveries: | in fourteen client and | side of laboratory QC %recovery limits due to matrix effect three internal QC samples that used client submitted sediments as outside of the recovey limits in ARC6141 |
| Procedural Blank: | No failures | |
| Blank Spike: | NA | |
| Blank Spike Duplicate: | NA | |
| Laboratory Duplicate: | No failures | |
| Matrix Spike: Five | ······································ | d outside of the laboratory QC %recovery limits s are labelled with Y - invalid spike due to high nat\ive Is in the sample. |
| Matirx Spike Duplicate: Five M 05/13/13 | Perylene was detected Four other compounds | d outside of the laboratory QC %recovery limits s are labelled with Y - invalid spike due to high nat\ive |
| SRM/LCS (Solution, Tissue, Sedimen | concentrations of PAH | Is in the sample. |
| | (1941b) no failures | |
| Solution n | | |
| CCC (from a second source): | No failures | |
| SRM-2279 Reference Oil | No failures | |
| Mass Discrimination Check (benzo(gh | i)perylene/phenanthrer No failures | ne >0.7) |

| Inst | Commer Operato | nt: Arc or: YM ch: C:\ crol E | adis-Mayf | lower AR-S \DATA\MS70 d: | 0056\MS70057.s Sediments-PAH (08/16/13) 0057\ | | |
|---------------|----------------------------|--|--------------------------|--------------------------------|---|--|--|
| | crument Cont a Analysis | | 입장 승규는 동안 방송에 가슴을 걸었다. 것 | | | | |
| Dala | a Anarysis | EC | st-seq cill | u. | | | |
| | Method Sect | ions 1 | o Run | Sequence | Barcode Options | | |
| | (X) Full Me | | | () On M | Mismatch, Inject Anyway Mismatch, Don't Inject | | |
| | () Reproce | ssing | Only | | | | |
| | | | | (X) Barc | code Disabled | | |
| Ť | Line | | Comple | Nome /Mio | | | |
| 1) | | 1 | Meronsin | e Name/Mis | Solvent rinse | | |
| 2) | | | | | AR-WKC1-020-030 | | |
| 3) | Sample | | | | AR-WKC2-100-030 | | |
| 4) | Sample | | | | AR-WKC3-250-030 | | |
| 5) | Sample | | | | AR-WKC4-500-030 | | |
| 6) | | | | | AR-WKC5-1000-030 | | |
| 7) | Sample | 7 | MS70057G | PAH-2012 | AR-WKC6-5000-030 | | |
| 8) | Sample | 8 | MS70057H | PAH-2012 | AR-WKISSU-250-002 | | |
| 9) | Sample | 9 | MS70057I | PAH-2012 | AR-WKICV-250-004 | | |
| 10) | Sample | | | | AR-WKCC-250-038 | | |
| 11) | Sample | 11 | MS70057K | PAH-2012 | AR-SRM2779-WK4.0-002 | | |
| 12) | Sample | | ENV3081A | | | | |
| 13) | Sample | | ENV3081B | | | | |
| 14) | Sample | | ENV3081C | | | | |
| 15) | Sample | | ENV3081D | | | | |
| 16) | Sample | | ENV3081E | | | | |
| 17) 18) | Sample | | ARC1600 | | | | |
| 19) | Sample Sample | | ARC1601 ARC1618 | | | | |
| 20) | Sample | | | | AR-WKCC-250-038 | | |
| 21) | Sample | | ARC1619 | | AR WREE 250 050 | | |
| 22) | Sample | | ARC1620 | | | | |
| 23) | Sample | | | PAH-2012 | | | |
| 24) | Sample | 24 | | PAH-2012 | | | |
| 25) | Sample | 25 | ARC1623 | PAH-2012 | | | |
| 26) | Sample | 26 | ARC1624 | PAH-2012 | | | |
| 27) | Sample | 27 | ARC1625 | PAH-2012 | | | |
| 28) | Sample | 28 | ARC1626 | PAH-2012 | | | |
| 29) | Sample | 29 | | | AR-WKCC-250-038 | | |
| 30) | Sample | 30 | ARC1627 | PAH-2012 | | | |
| 31) | Sample | 31 | ARC1628 | PAH-2012 | | | |
| 32) | Sample | 32 | ARC1629 | PAH-2012 | | | |
| 33) 34) | Sample Sample | 33 34 | ARC1630 ARC1641 | PAH-2012 PAH-2012 | | | |
| 35) | Sample | 34 | ARC1641 ARC1642 | PAH-2012 PAH-2012 | | | |
| 36) | Sample | | ARC1643 | PAH-2012 | | | |
| 37) | Sample | 37 | | PAH-2012 | | | |
| 38) | Sample | 38 | | | AR-WKCC-250-038 | | |
| 0.00000000000 | | | | | | | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057J.D Acq On : 17 Aug 2013 7:31 am Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 22 11:34:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| 2 | | Compound | AvgRF | CCRF | %Dev Ar | ea% 1 | Dev(min) |
|----|----|----------------------------|-------|-------|---------|-------|----------|
| 1 | I | Fluorene-d10 | 1.000 | 1.000 | 0.0 | 91 | 0.00 |
| | S | Naphthalene-d8 | 1.692 | 1.611 | 4.8 | 93 | 0.00 |
| | Т | cis/trans Decalin | 0.290 | 0.297 | -2.4 | 95 | 0.00 |
| | un | C1-Decalins | 0.290 | 0.000 | 100.0# | 0# | -12.32# |
| | un | C2-Decalins | 0.290 | 0.000 | 100.0# | 0# | -13.52# |
| 6 | | C3-Decalins | 0.290 | 0.000 | 100.0# | 0# | |
| 7 | | C4-Decalins | 0.290 | 0.000 | 100.0# | | -18.33# |
| 8 | т | Naphthalene | 1.889 | 1.814 | 4.0 | 94 | 0.00 |
| 9 | т | 2-Methylnaphthalene | 1.190 | 1.115 | 6.3 | 92 | 0.00 |
| 10 | Т | 1-Methylnaphthalene | 1.099 | 1.050 | 4.5 | 93 | 0.00 |
| 11 | | 2,6-Dimethylnaphthalene | 1.117 | 1.036 | 7.3 | 91 | 0.00 |
| 12 | | 1,6,7-Trimethylnaphthalene | 0.989 | 0.929 | 6.1 | 92 | 0.00 |
| | un | C2-Naphthalenes | 1.889 | 0.000 | 100.0# | 0# | |
| 14 | un | C3-Naphthalenes | 1.889 | 0.000 | 100.0# | | -20.37# |
| | un | C4-Naphthalenes | 1.889 | 0.000 | 100.0# | | -22.26# |
| 16 | | Benzothiophene | 1.541 | 1.460 | 5.3 | 92 | 0.00 |
| | un | C1-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -15.49# |
| 18 | un | C2-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -17.92# |
| | un | C3-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -20.31# |
| 20 | un | C4-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -22.23# |
| 21 | S | Acenaphthene-d10 | 0.973 | 0.906 | 6.9 | 92 | 0.00 |
| 22 | т | Biphenyl | 1.618 | 1.517 | 6.2 | 92 | 0.00 |
| 23 | Т | Acenaphthylene | 1.844 | 1.643 | 10.9 | 90 | 0.00 |
| | Т | Acenaphthene | 1.052 | 0.999 | 5.0 | 93 | -0.03 |
| 25 | т | Dibenzofuran | 1.790 | 1.676 | 6.4 | 91 | 0.00 |
| | т | Fluorene | 1.414 | 1.325 | 6.3 | 92 | 0.00 |
| 27 | т | 1-Methylfluorene | 0.933 | 0.850 | 8.9 | 89 | 0.00 |
| 28 | un | C1-Fluorenes | 1.414 | 0.000 | 100.0# | | -23.51# |
| | un | C2-Fluorenes | 1.414 | 0.000 | 100.0# | | -24.79# |
| 30 | un | C3-Fluorenes | 1.414 | 0.000 | 100.0# | | -27.59# |
| 31 | I | Pyrene-d10 | 1.000 | 1.000 | 0.0 | 86 | 0.00 |
| 32 | S | Phenanthrene-d10 | 1.010 | 0.945 | 6.4 | 88 | 0.00 |
| 33 | Т | Carbazole | 0.962 | 0.845 | 12.2 | 85 | 0.00 |
| 34 | Т | Dibenzothiophene | 1.044 | 0.993 | 4.9 | 90 | 0.00 |
| 35 | Т | 4-Methyldibenzothiophene | 0.851 | 0.880 | -3.4 | 94 | 0.00 |
| 36 | un | 2/3-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.21# |
| 37 | un | 1-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.52# |
| 38 | un | C2-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -27.83# |
| 39 | un | C3-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -28.49# |
| 40 | un | C4-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -31.09# |
| 41 | Т | Phenanthrene | 1.263 | 1.267 | -0.3 | 92 | 0.00 |
| 42 | Т | Anthracene | 1.171 | 1.139 | 2.7 | 92 | 0.00 |
| 43 | un | 3-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | -26.93# |
| 44 | un | 2-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | -26.93# |
| 45 | un | 2-Methylanthracene | 0.783 | 0.000 | 100.0# | | -26.73# |
| 46 | un | 4/9-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | -26.93# |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057J.D Acq On : 17 Aug 2013 7:31 am Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 22 11:34:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | | Compound | AvgRF | CCRF | %Dev Ar | ea% 1 | Dev(min) |
|----|-------|-----------------------------|-------|-------|---------|-------|----------|
| 47 | Т | 1-Methylphenanthrene | 0.783 | 0.818 | -4.5 | 97 | 0.00 |
| 48 | T | 3,6-Dimethylphenanthrene | 0.673 | 0.651 | 3.3 | 92 | -0.03 |
| 49 | | Retene | 0.371 | 0.323 | 12.9 | 84 | 0.00 |
| | un | C2-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -28.56# |
| | un | C3-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -29.43# |
| | un | C4-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -32.06# |
| 53 | т | Naphthobenzothiophene | 1.305 | 1.414 | -8.4 | 100 | 0.00 |
| 54 | un | C1-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -34.55# |
| 55 | un | C2-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -36.02# |
| 56 | un | C3-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | | -37.42# |
| 57 | un | C4-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | | -37.92# |
| 58 | т | Fluoranthene | 1.139 | 1.123 | 1.4 | 94 | -0.03 |
| 59 | Т | Pyrene | 1.480 | 1.480 | 0.0 | 91 | 0.00 |
| 60 | т | 2-Methylfluoranthene | 0.942 | 0.838 | 11.0 | 85 | 0.00 |
| 61 | т | Benzo(b)fluorene | 0.795 | 0.702 | 11.7 | 86 | 0.00 |
| 62 | un | C1-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -30.71# |
| 63 | un | C2-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -32.18# |
| 64 | un | C3-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -34.00# |
| 65 | un | C4-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -35.09# |
| 66 | S | Chrysene-d12 | 1.105 | 1.253 | -13.4 | 102 | -0.04 |
| 67 | т | Benz(a)anthracene | 1.344 | 1.395 | -3.8 | 95 | 0.00 |
| 68 | т | Chrysene/Triphenylene | 1.138 | 1.257 | -10.5 | 102 | -0.04 |
| 69 | un | C1-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -35.83# |
| 70 | un | C2-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -36.99# |
| 71 | un | C3-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -38.11# |
| 72 | un | C4-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -39.74# |
| 73 | I | Benzo(a)pyrene-d12 | 1.000 | 1.000 | 0.0 | 81 | 0.00 |
| 74 | un | C29-Hopane | 0.371 | 0.000 | 100.0# | 0# | -40.28# |
| 75 | un | 18a-Oleanane | 0.371 | 0.000 | 100.0# | 0# | -42.34# |
| 76 | Т | C30-Hopane | 0.371 | 0.409 | -10.2 | 94 | 0.00 |
| 77 | Т | Benzo(b)fluoranthene | 1.391 | 1.291 | 7.2 | 82 | -0.04 |
| 78 | Т | Benzo(k,j)fluoranthene | 1.059 | 1.152 | -8.8 | 98 | 0.00 |
| 79 | un | Benzo(a)fluoranthene | 1.059 | 0.000 | 100.0# | 0# | -37.34# |
| 80 | Т | Benzo(e)pyrene | 1.281 | 1.283 | -0.2 | 90 | -0.04 |
| 81 | т | Benzo(a)pyrene | 1.258 | 1.350 | -7.3 | 95 | -0.04 |
| 82 | Т | Indeno(1,2,3-c,d)pyrene | 1.586 | 1.595 | -0.6 | 90 | -0.04 |
| 83 | Т | Dibenzo(a,h)anthracene | 1.273 | 1.274 | -0.1 | 90 | -0.04 |
| | un | C1-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -48.31# |
| 85 | un | C2-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -50.30# |
| | un | C3-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -51.23# |
| 87 | | Benzo(g,h,i)perylene | 1.385 | 1.414 | -2.1 | 91 | -0.04 |
| | S | Perylene-d12 | 1.181 | 1.164 | 1.4 | 88 | 0.00 |
| 89 | | Perylene | 1.282 | 1.365 | -6.5 | 94 | -0.04 |
| 90 | S | 5(b)H-Cholane | 0.198 | 0.181 | 8.6 | 83 | 0.00 |
| | un | C20-TAS | 1.412 | 0.000 | 100.0# | | -33.30# |
| 92 | un | C21-TAS | 1.412 | 0.000 | 100.0# | 0# | -34.24# |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057J.D Acq On : 17 Aug 2013 7:31 am Operator : YM Sample : AR-WKCC-250-038 Misc . ALS Vial : 10 Sample Multiplier: 1 Quant Time: Aug 22 11:34:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min Max. RRF Dev : 25% Max. Rel. Area : 200% Compound AvgRF CCRF %Dev Area% Dev(min) 1.4120.000100.0#0#-38.70#1.4121.415-0.290-0.041.4120.000100.0#0#-40.24#1.4120.000100.0#0#-41.09#1.4120.000100.0#0#-41.42# 93 un C26(20S)-TAS 94 T C26(20R)/C27(20S)-TAS 95 un C28(20S)-TAS 96 un C27(20R)-TAS 97 un C28(20R)-TAS

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

| Data Path : C:\GCMS7\MS70057\ Data File : MS70057J.D Acq On : 17 Aug 2013 7:31 Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 10 Sample Multipl Quant Time: Aug 22 11:34:28 201 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration | ier: 1 3 \AR70057. | | | | | |
|--|--------------------------|------|--------------------|--------------|-----|----------|
| QLast Update : Sat Aug 17 22:39 Response via : Initial Calibrat | :35 2013 ion | | | | | |
| Compound | R.T. | QIon | Response | Conc Un | its | Dev(Min) |
| Internal Standards | | | | | | |
| 1) Fluorene-d10 | 21.455 | 176 | 402288m | 251.05 | | 0.00 |
| 31) Pyrene-d10 73) Benzo(a)pyrene-d12 | 29.635 | 212 | 711768m | 250.63 | | 0.00 |
| 73) Benzo(a)pyrene-d12 | 38.386 | 264 | 764621m | 250.32 | | 0.00 |
| System Monitoring Compounds | | | | | | |
| | 13.822 | | | | | 0.00 |
| 21) Acenaphthene-d10 | 19.672 | 164 | 363198m | 232.98 | | 0.00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 671194m 890011m | 234.06 | | 0.00 |
| 66) Chrysene-d12 | 33.809 | 240 | 890011m | 283.55 | | -0.04 |
| 88) Perylene-d12 | 38.697 | 264 | 889260m | 246.57 | | 0.00 |
| 90) 5(b)H-Cholane | 34.235 | 217 | 138121m | 228.02 | | 0.00 |
| Target Compounds | | | | | | Qvalue |
| 3) cis/trans Decalin | 11.176 | 138 | | | | |
| 4) Cl-Decalins | 0.000 | | 0 | N.D. | d | |
| 5) C2-Decalins | 0.000 | | 0 | N.D. N.D. | d | |
| 6) C3-Decalins | 0.000 | | 0 | N.D. | | |
| | | | 0 | | d | |
| 8) Naphthalene | 13.878 | 128 | 726824m | 240.15 | | |
| 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene | 16.134 | 142 | 4469/1m | 234.37 | | |
| 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene | 10.468 | 142 | 420018m 415131m | 238.41 | | |
| 12) 1,6,7-Trimethylnaphtha | | | 372283m | | | |
| 13) C2-Naphthalenes | 0.000 | 1/0 | | | 4 | |
| 14) C3-Naphthalenes | 0.000 | | 0 | N.D. N.D. | d | |
| 15) C4-Naphthalenes | 0.000 | | õ | N.D. | u | |
| 16) Benzothiophene | 14.045 | 134 | 581460m | 235.47 | | |
| 17) Cl-Benzothiophenes | 0.000 | | 0 | N.D. | d | |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. | | |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. | | |
| 20) C4-Benzothiophenes | 0.000 | | 0 | N.D. | d | |
| 22) Biphenyl | 17.694 | 154 | 602369m | 232.30 | | |
| 23) Acenaphthylene | 19.171 | 152 | 653121m | 221.07 | | |
| 24) Acenaphthene | 19.756 | 154 | 401045m | 237.82 | | |
| 25) Dibenzofuran | 20.368 | 168 | 668094m | 232.87 | | |
| 26) Fluorene | 21.538 | 166 | 531995m | 234.81 | | |
| 27) 1-Methylfluorene | 23.506 | 180 | 342958m | 229.47 | | |
| 28) C1-Fluorenes | 0.000 | | 0 | N.D. | | |
| 29) C2-Fluorenes 30) C3-Fluorenes | 0.000 | | 0 | N.D. N.D. | | |
| 33) Carbazole | 25.583 | 167 | 594716m | 217.76 | u | |
| 34) Dibenzothiophene | 24.406 | 184 | 694991m | 234.35 | | |
| 35) 4-Methyldibenzothiophene | 25.895 | 198 | 630277m | 260.66 | | |
| 36) 2/3-Methyldibenzothiop | 0.000 | | 000027711 | N.D. | | |
| 37) 1-Methyldibenzothiophene | 0.000 | | 0 | N.D. | d | |
| 38) C2-Dibenzothiophenes | 0.000 | | 0 | N.D. | | |
| 39) C3-Dibenzothiophenes | 0.000 | | 0 | N.D. | | |
| 40) C4-Dibenzothiophenes | 0.000 | | 0 | N.D. | | |
| 41) Phenanthrene | 24.821 | 178 | 891646m | 248.54 | | |
| 42) Anthracene | 24.995 | 178 | 811438m | 243.90 | | |
| | | | | | | |

| Data Path : C:\GCMS7\MS70057\ Data File : MS70057J.D Acq On : 17 Aug 2013 7:31 am Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 10 Sample Multiplier: 1 Quant Time: Aug 22 11:34:28 2013 Quant Time: Aug 22 11:34:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) | | | | | | | | | |
|--|--------------|------------|--------------------|---------------|--------------|--|--|--|--|
| Compound | R.T. | QIon | Response | Conc Un: | its Dev(Min) | | | | |
| | | | | | | | | | |
| 43) 3-Methylphenanthrene | | | | N.D. | | | | | |
| 44) 2-Methylphenanthrene | 0.000 | | 0 | N.D. | d | | | | |
| 45) 2-Methylanthracene 46) 4/9-Methylphenanthrene 47) 1-Methylphenanthrene 48) 3,6-Dimethylphenanthrene 49) Betene | 0.000 | | 0 | N.D. | | | | | |
| 40) 4/9-Methylphenanthrene | 26 934 | 192 | 574450m | N.D. | u | | | | |
| 48) 3 6-Dimethylphenanthrene | 28.934 | 206 | 462522m | 230.40 | | | | | |
| 49) Retene | 30.708 | 234 | 204816m | 194 53 | | | | | |
| <pre>49) Retene 50) C2-Phenanthrenes/Anthr</pre> | 0.000 | 201 | 0 | N.D. | d | | | | |
| 51) C3-Phenanthrenes/Anthr | 0.000 | | 0 | | | | | | |
| 52) C4-Phenanthrenes/Anthr | | | 0 | N.D. | | | | | |
| 53) Naphthobenzothiophene | 32.955 | 234 | 1010084m | 272.59 | | | | | |
| 54) Cl-Naphthobenzothiophenes | 0.000 | | 0 | N.D. | | | | | |
| 55) C2-Naphthobenzothiophenes | | | 0 | | | | | | |
| 56) C3-Naphthobenzothiophenes | | | 0 | | | | | | |
| 57) C4-Naphthobenzothiophenes | | | 0 | | d | | | | |
| 58) Fluoranthene | 28.908 | 202 | 798006m | 246.73 | | | | | |
| 59) Pyrene | 29.704 | 202 | 1050581m | 249.99 | | | | | |
| 60) 2-Methylfluoranthene | 30.466 | 216 | 599172m | 224.08 | | | | | |
| Benzo(b)fluorene C1-Fluoranthenes/Pyrenes C2-Fluoranthenes/Pyrenes | 0 000 | 210 | 0 0 | 222.72 N D | d | | | | |
| 63) C2-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. | d | | | | |
| 64) C3-Fluoranthenes/Pyrenes | 0.000 | | õ | N.D. | | | | | |
| 65) C4-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. | d | | | | |
| 65) C4-Fluoranthenes/Pyrenes 67) Benz(a)anthracene 68) Chrysene/Triphenylene 69) C1-Chrysenes | 33.770 | 228 | 988437m | 259.05 | | | | | |
| 68) Chrysene/Triphenylene | 33.886 | 228 | 887194m | 274.62 | | | | | |
| 69) C1-Chrysenes | 0.000 | | 0 | N.D. | d | | | | |
| 70) C2-Chrysenes | 0.000 | | 0 | N.D. | d | | | | |
| 71) C3-Chrysenes | 0.000 | | 0 | N.D. | | | | | |
| 72) C4-Chrysenes | 0.000 | | 0 | N.D. | | | | | |
| 74) C29-Hopane | 0.000 | | 0 | N.D. | | | | | |
| 75) 18a-Oleanane | 0.000 42.783 | 101 | 0 | N.D. | a | | | | |
| 76) C30-Hopane 77) Benzo(b)fluoranthene | 37.300 | 191 252 | 312166m 987749m | | | | | | |
| 78) Benzo(k,j)fluoranthene | 37.416 | 252 | 875941m | 270.75 | | | | | |
| 79) Benzo(a)fluoranthene | 0.000 | 252 | 0 | N.D. | d | | | | |
| 80) Benzo(e)pyrene | 38.270 | 252 | 975488m | | | | | | |
| 81) Benzo(a)pyrene | 38.464 | 252 | | | | | | | |
| 36 (EAN) 25 - 25 20 MILE 20 MILE 20 20 20 MILE 20 20 20 20 20 20 20 20 20 20 20 20 20 | 43.152 | 276 | 1197387m | 247.15 | | | | | |
| | 43.225 | 278 | 964225m | 248.04 | | | | | |
| | 0.000 | | 0 | N.D. | | | | | |
| 85) C2-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. | | | | | |
| 86) C3-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. | d | | | | |
| 87) Benzo(g,h,i)perylene | 44.516 | 276 | | | | | | | |
| 89) Perylene | 38.774 | 252 | 1043382m | 266.54 N D | d | | | | |
| 91) C20-TAS 92) C21-TAS | 0.000 | | 0 | N.D. N.D. | | | | | |
| 93) C26(20S)-TAS | 0.000 | | 0 | N.D. N.D. | | | | | |
| 94) C26(20R)/C27(20S)-TAS | 39.395 | 231 | 1080511m | 250.55 | u | | | | |
| 95) C28(20S)-TAS | 0.000 | 2 J L | 080511 | N.D. | d | | | | |
| 96) C27(20R)-TAS | 0.000 | | 0 | N.D. | | | | | |
| 97) C28(20R)-TAS | 0.000 | | 0 | N.D. | | | | | |
| | | | | | | | | | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057J.D Acq On : 17 Aug 2013 7:31 am Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 10 Sample Multiplier: 1 Quant Time: Aug 22 11:34:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) (#) = qualifier out of range (m) = manual integration (+) = signals summed

н Sample Multiplier: 7:31 am C:\GCMS7\MS70057 17 Aug 2013 7: YM AR-WKCC-250-038 MS70057J.D 10 •• ... Data Path Data File Operator ALS Vial Acq On Sample Misc

PAH Calibration Table-2013A C:\GCMS7\MS70057\AR70057.M 2013 Sat Aug 17 22:39:35 Initial Calibration 22 11:34:28 2013 Time: Aug ••, Method QLast Update Response via Title Quant Quant Quant

52.00 50.00 48.00 46.00 44.00 T,enslyneq(i,d,g)osned T,enesching(h,s)of had rad (b,s-£,5,1)onebal T, ensqoHopane, T 42.00 40.00 C26(20R)/C27(20S)-TAS,T 38.00 TIC: MS70057J.D\data.ms T,enshinerouli(p,b)shoreflerouli([,j)oznaB 36.00 34.00 S, anslord)-H(d)d ChrysenerTightenenda Tagenthracene,T T,enertophoradorhdosN 32.00 T,eneteRe T,eneroult(d)ozne8 30.00 T.enerthylfluoranthene.T T,enerd10,IPyrene,T T,enertheneul¹ 28.00 T,enendhorenanthrene, 2,6-Dimethylphened T.9n9nthrenanthrene,T 26.00 T,enertothiophenzothiophene, T T, slozedne D T,enenthrenent, enecentry Dibenzothiophene,T,Phene,d10,S 24.00 T, Anethylfluorene, T 22.00 T,eneleditidanithtemiT-S, 8, f Fluorene, T Fluorene-d10,1 20.00 T,nshintoznediQ T,ənəlytitiqsnəcA T,ənəritiqตใญใ&-ənəritiqsnəcA 18.00 T,9n9lsrthqsnlyth9miQ-8,2 16.00 T, eneledtingentydten S-Mercer T, eneledtingentydten - f 14.00 T,ensishings to single displaying the single of the single 12.00 T,nilsoed anst/ais 10.00 50000 600000 Abundance 650000 250000 200000 550000 500000 450000 400000 350000 300000 50000 100000 Ó Time-->

14

60.00

58.00

56.00

54.00

Data Path : C:\GCMS7\MS70057\ Data File : MS70057L.D Acq On : 17 Aug 2013 6:57 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 20 Sample Multiplier: 1

Quant Time: Aug 18 20:06:35 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | | Compound | AvgRF | CCRF | %Dev Ar | ea%] | Dev(min) |
|----|----|----------------------------|-------|-------|---------|-------|----------|
| 1 | I | Fluorene-d10 | 1.000 | 1.000 | 0.0 | 84 | 0.00 |
| 2 | S | Naphthalene-d8 | 1.692 | 1.544 | 8.7 | 83 | 0.00 |
| 3 | Т | cis/trans Decalin | 0.290 | 0.294 | -1.4 | 88 | 0.00 |
| 4 | un | C1-Decalins | 0.290 | 0.000 | 100.0# | 0# | -12.32# |
| 5 | un | C2-Decalins | 0.290 | 0.000 | 100.0# | 0# | -13.52# |
| 6 | un | C3-Decalins | 0.290 | 0.000 | 100.0# | 0# | -15.88# |
| 7 | un | C4-Decalins | 0.290 | 0.000 | 100.0# | 0# | -18.33# |
| 8 | Т | Naphthalene | 1.889 | 1.734 | 8.2 | 83 | 0.00 |
| 9 | Т | 2-Methylnaphthalene | 1.190 | 1.093 | 8.2 | 84 | 0.00 |
| 10 | Т | 1-Methylnaphthalene | 1.099 | 1.007 | 8.4 | 83 | 0.00 |
| 11 | Т | 2,6-Dimethylnaphthalene | 1.117 | 1.033 | 7.5 | 84 | 0.00 |
| 12 | т | 1,6,7-Trimethylnaphthalene | 0.989 | 0.905 | 8.5 | 84 | 0.00 |
| 13 | un | C2-Naphthalenes | 1.889 | 0.000 | 100.0# | 0# | -18.89# |
| 14 | un | C3-Naphthalenes | 1.889 | 0.000 | 100.0# | | -20.37# |
| 15 | un | C4-Naphthalenes | 1.889 | 0.000 | 100.0# | | -22.26# |
| 16 | т | Benzothiophene | 1.541 | 1.412 | 8.4 | 83 | 0.00 |
| 17 | un | C1-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -15.49# |
| 18 | un | C2-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -17.92# |
| | un | C3-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -20.31# |
| 20 | un | C4-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -22.23# |
| 21 | S | Acenaphthene-d10 | 0.973 | 0.890 | 8.5 | 84 | 0.00 |
| 22 | т | Biphenyl | 1.618 | 1.479 | 8.6 | 83 | 0.00 |
| 23 | Т | Acenaphthylene | 1.844 | 1.722 | 6.6 | 87 | 0.00 |
| 24 | т | Acenaphthene | 1.052 | 0.965 | 8.3 | 84 | 0.00 |
| 25 | | Dibenzofuran | 1.790 | 1.652 | 7.7 | 83 | 0.00 |
| 26 | Т | Fluorene | 1.414 | 1.310 | 7.4 | 85 | 0.00 |
| | т | 1-Methylfluorene | 0.933 | 0.878 | 5.9 | 86 | 0.00 |
| 28 | un | C1-Fluorenes | 1.414 | 0.000 | 100.0# | | -23.51# |
| | un | C2-Fluorenes | 1.414 | 0.000 | 100.0# | 0# | -24.79# |
| | un | C3-Fluorenes | 1.414 | 0.000 | 100.0# | | -27.59# |
| 31 | I | Pyrene-d10 | 1.000 | 1.000 | 0.0 | 85 | 0.00 |
| 32 | S | Phenanthrene-d10 | 1.010 | 0.935 | 7.4 | 86 | 0.00 |
| 33 | Т | Carbazole | 0.962 | 0.907 | 5.7 | 90 | 0.00 |
| 34 | т | Dibenzothiophene | 1.044 | 0.968 | 7.3 | 87 | 0.00 |
| 35 | т | 4-Methyldibenzothiophene | 0.851 | 0.782 | 8.1 | 83 | 0.00 |
| | un | 2/3-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | | -26.21# |
| | un | 1-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.52# |
| | un | C2-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | | -27.83# |
| | un | C3-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | | -28.49# |
| | un | C4-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | | -31.09# |
| 41 | | Phenanthrene | 1.263 | 1.161 | 8.1 | 83 | 0.00 |
| 42 | | Anthracene | 1.171 | 1.110 | 5.2 | 89 | 0.00 |
| | un | 3-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | -26.93# |
| | un | 2-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | |
| | un | 2-Methylanthracene | 0.783 | | 100.0# | | -26.93# |
| | | | | 0.000 | | | -26.73# |
| 46 | un | 4/9-Methylphenanthrene | 0.783 | 0.000 | 100.0# | 0# | -26.93# |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057L.D Acq On : 17 Aug 2013 6:57 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 20 Sample Multiplier: 1

Quant Time: Aug 18 20:06:35 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | | AT DOV. 250 MAR. ROL. AT | .ca . 200 | | | | |
|----|----|-----------------------------|-----------|-------|------------------|---------|----------|
| _ | | Compound | AvgRF | CCRF | %Dev Ar | ea% | Dev(min) |
| 47 | т | 1-Methylphenanthrene | 0.783 | 0.722 | 7.8 | 85 | 0.00 |
| 48 | т | 3,6-Dimethylphenanthrene | 0.673 | 0.636 | 5.5 | 89 | 0.00 |
| 49 | т | Retene | 0.371 | 0.358 | 3.5 | 92 | 0.00 |
| 50 | un | C2-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | 0# | -28.56# |
| 51 | un | C3-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -29.43# |
| 52 | un | C4-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -32.06# |
| 53 | Т | Naphthobenzothiophene | 1.305 | 1.176 | 9.9 | 83 | 0.00 |
| 54 | un | C1-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -34.55# |
| 55 | un | C2-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -36.02# |
| 56 | un | C3-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -37.42# |
| 57 | un | C4-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -37.92# |
| 58 | т | Fluoranthene | 1.139 | 1.070 | 6.1 | 88 | 0.00 |
| 59 | | Pyrene | 1.480 | 1.391 | 6.0 | 85 | 0.00 |
| 60 | Т | 2-Methylfluoranthene | 0.942 | 0.893 | 5.2 | 90 | 0.00 |
| 61 | Т | Benzo(b)fluorene | 0.795 | 0.771 | 3.0 | 94 | 0.00 |
| 62 | un | C1-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | |
| | un | C2-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -32.18# |
| 64 | un | C3-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -34.00# |
| 65 | un | C4-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -35.09# |
| 66 | S | Chrysene-d12 | 1.105 | 0.994 | 10.0 | 81 | -0.04 |
| 67 | Т | Benz(a)anthracene | 1.344 | 1.214 | 9.7 | 82 | 0.00 |
| 68 | Т | Chrysene/Triphenylene | 1.138 | 1.016 | 10.7 | 81 | -0.04 |
| 69 | un | C1-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -35.83# |
| 70 | un | C2-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -36.99# |
| | un | C3-Chrysenes | 1.138 | 0.000 | 100.0# | | -38.11# |
| 72 | un | C4-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -39.74# |
| 73 | I | Benzo(a)pyrene-d12 | 1.000 | 1.000 | 0.0 | 70 | 0.00 |
| 74 | un | C29-Hopane | 0.371 | 0.000 | 100.0# | | -40.28# |
| 75 | un | 18a-Oleanane | 0.371 | 0.000 | 100.0# | | -42.34# |
| 76 | Т | C30-Hopane | 0.371 | 0.393 | -5.9 | 79 | 0.00 |
| 77 | т | Benzo(b) fluoranthene | 1.391 | 1.374 | 1.2 | 76 | 0.00 |
| 78 | Т | Benzo(k,j)fluoranthene | 1.059 | 1.217 | -14.9 | 90 | 0.00 |
| 79 | un | Benzo(a)fluoranthene | 1.059 | 0.000 | 100.0# | 0# | -37.34# |
| 80 | Т | Benzo(e)pyrene | 1.281 | 1.312 | -2.4 | 80 | 0.00 |
| 81 | т | Benzo(a)pyrene | 1.258 | 1.233 | 2.0 | 76 | -0.04 |
| 82 | т | Indeno(1,2,3-c,d)pyrene | 1.586 | 1.199 | 24.4 | 59 | 0.00 |
| 83 | т | Dibenzo(a,h)anthracene | 1.273 | 1.002 | 21.3 | 62 | 0.00 |
| 84 | un | C1-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -48.31# |
| 85 | un | C2-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | | -50.30# |
| | un | C3-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | | -51.23# |
| 87 | Т | Benzo(g,h,i)perylene | 1.385 | 0.939 | 32.2# | 53 | 0.00 |
| 88 | S | Perylene-d12 | 1.181 | 1.170 | 0.9 | 77 | 0.00 |
| 89 | т | Perylene | 1.282 | 1.220 | 4.8 | 73 | -0.04 |
| 90 | S | 5(b)H-Cholane | 0.198 | 0.226 | -14.1 | 90 | 0.00 |
| | un | C20-TAS | 1.412 | 0.000 | 100.0# | | -33.30# |
| 92 | un | C21-TAS | 1.412 | 0.000 | 100.0# | | -34.24# |
| | | | | | New MARKAN MARKA | (31.4M) | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057L.D Acq On : 17 Aug 2013 6:57 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 20 Sample Multiplier: 1 Quant Time: Aug 18 20:06:35 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min Max. RRF Dev : 25% Max. Rel. Area : 200% Compound AvgRF CCRF %Dev Area% Dev(min) 1.4120.000100.0#0#-38.70#1.4121.520-7.6840.001.4120.000100.0#0#-40.24#1.4120.000100.0#0#-41.09#1.4120.000100.0#0#-41.42# 93 un C26(20S)-TAS 94 T C26(20R)/C27(20S)-TAS 95 un C28(20S)-TAS 96 un C27(20R)-TAS

(#) = Out of Range

97 un C28(20R)-TAS

SPCC's out = 0 CCC's out = 0

| Data Acq C Opera Sampl Misc | Path : C:\GCMS7\MS70057\ File : MS70057L.D On : 17 Aug 2013 6:57 p ator : YM Le : AR-WKCC-250-038 : Jial : 20 Sample Multipli | | | | | | |
|---|---|---|---------------------------------|--|--|-----|----------|
| Quant Quant QLast | Time: Aug 18 20:06:35 2013 Method : C:\GCMS7\MS70057\ Title : PAH Calibration T Update : Sat Aug 17 22:39: Onse via : Initial Calibrati | AR70057 Table-201 35 2013 | | | | | |
| | Compound | R.T. | QIon | Response | Conc Un | its | Dev(Min) |
| 1) 31) | ernal Standards Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 21.455 29.635 | 176 212 | 373875m 705293m | 251.05 250.63 | | 0.00 |
| 2) 21) 32) 66) 88) | Acenaphthene-d10 | 24.752 33.809 38.697 | 164 188 240 264 | 331509m 658445m 699428m 778535m | 228.82 231.72 224.88 247.85 | | -0.04 |
| <pre>3) 4) 5) 6) 7) 8) 9) 10) 11) 12) 13) 14) 15) 16) 17) 18) 19) 20) 22) 23) 24) 25) 26) 27) 28) 29) 30) 33) 34) 35) 36) 37)</pre> | C2-Decalins C3-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphtha C2-Naphthalenes C3-Naphthalenes C4-Naphthalenes Benzothiophene C1-Benzothiophenes C2-Benzothiophenes C3-Benzothiophenes C4-Benzothiophenes Biphenyl Acenaphthylene Acenaphthylene Acenaphthylene Dibenzofuran Fluorene 1-Methylfluorene C1-Fluorenes C2-Fluorenes C3-Fluorenes Carbazole Dibenzothiophene 4-Methyldibenzothiophene 2/3-Methyldibenzothiop | 0.000 0.000 0.000 13.878 16.134 16.468 18.223 | 128 142 142 156 170 | 0 645657m | N.D. N.D. N.D. 229.55 229.79 228.71 231.21 228.61 N.D. | | Qvalue |
| 40) 41) | C3-Dibenzothiophenes C4-Dibenzothiophenes Phenanthrene Anthracene | 0.000 0.000 24.822 24.995 | 178 178 | 0 0 809329m 783441m | N.D. N.D. 227.67 237.65 | | |
| 14/ | | | 270 | | 201.00 | | |

| | | - | | | |
|--|------------------|------------|--------------------|-------------------|----|
| Data Path : C:\GCMS7\MS70057\ Data File : MS70057L.D | | | | | |
| Acq On : 17 Aug 2013 6:57 g | om | | | | |
| Operator : YM Sample : AR-WKCC-250-038 | | | | | |
| Misc : ALS Vial : 20 Sample Multipli | or. 1 | | | | |
| | | | | | |
| Quant Time: Aug 18 20:06:35 2013 Quant Method : C:\GCMS7\MS70057\ | AR70057 | | | | |
| Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: | | 13A | | | |
| Response via : Initial Calibrati | on | | | | |
| Compound | R.T. | QIon | Response | Conc Units Dev(Mi | n) |
| 43) 3-Methylphenanthrene | 0.000 | | 0 | N.D. d | |
| 44) 2-Methylphenanthrene45) 2-Methylanthracene | 0.000 | | 0 | N.D. d | |
| 45) 2-Methylanthracene | 0.000 | | 0 | N.D. d | |
| 46) 4/9-Methylphenanthrene | 0.000 | | 0 | N.D. d | |
| 47) 1-Methylphenanthrene | 26.934 | 192 | 502375m | 228.12 | |
| 47) 1-Methylphenanthrene48) 3,6-Dimethylphenanthrene49) Retene | 28.042 | 206 | 448069m | 236.44 | |
| 50) C2-Phenanthrenes/Anthr | 30.708 | 234 | 225230m 0 | | |
| 51) C3-Phenanthrenes/Anthr | | | 0 | N.D. d N.D. d | |
| 52) C4-Phenanthrenes/Anthr | | | õ | N.D. | |
| 53) Naphthobenzothiophene | 32.955 | 234 | | | |
| 54) Cl-Naphthobenzothiophenes | | | 0 | N.D. d | |
| 55) C2-Naphthobenzothiophenes | | | 0 | N.D. d | |
| 56) C3-Naphthobenzothiophenes | | | 0 | N.D. d | |
| 57) C4-Naphthobenzothiophenes | | | 0 | N.D. d | |
| 58) Fluoranthene | | | 753481m | | |
| 59) Pyrene | | | 978403m | | |
| 60) 2-Methylfluoranthene | | | 632521m | | |
| 61) Benzo(b)fluorene62) C1-Fluoranthenes/Pyrenes | | 210 | 547217m 0 | 244.56 N.D. d | |
| 63) C2-Fluoranthenes/Pyrenes | | | 0 | N.D. d | |
| 64) C3-Fluoranthenes/Pyrenes | | | 0 | N.D. d | |
| 65) C4-Fluoranthenes/Pyrenes | 0.000 | | õ | N.D. d | |
| 67) Benz(a)anthracene | 33.770 | 228 | 852636m | 225.51 | |
| 68) Chrysene/Triphenylene | 33.886 | 228 | 710199m | 221.85 | |
| 69) Cl-Chrysenes | 0.000 | | 0 | N.D. d | |
| 70) C2-Chrysenes | 0.000 | | 0 | N.D. d | |
| 71) C3-Chrysenes | 0.000 | | 0 | N.D. d | |
| 72) C4-Chrysenes | 0.000 | | 0 | N.D. d | |
| 74) C29-Hopane | 0.000 | | 0 | N.D. d | |
| 75) 18a-Oleanane | 0.000 | 101 | 0 | N.D. d | |
| 76) C30-Hopane 77) Benzo(b)fluoranthene | 42.783 | 191 | 261208m | 264.52 | |
| 78) Benzo(k,j)fluoranthene | 37.339 37.417 | 252 252 | 915876m 805878m | 247.52 285.99 | |
| 79) Benzo(a) fluoranthene | 0.000 | 252 | 00587811 | N.D. | |
| 80) Benzo(e)pyrene | 38.309 | 252 | 869124m | 254.95 | |
| 81) Benzo(a)pyrene | 38.464 | 252 | 818719m | | |
| 82) Indeno(1,2,3-c,d)pyrene | 43.189 | 276 | | 185.71 | |
| 83) Dibenzo(a,h)anthracene | 43.262 | 278 | 660305m | 195.02 | |
| 84) Cl-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d | |
| 85) C2-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d | |
| <pre>86) C3-Dibenzo(a,h)anthrac</pre> | 0.000 | | 0 | N.D. d | |
| 87) Benzo(g,h,i)perylene | 44.553 | 276 | 618626m | 167.84 | |
| 89) Perylene | 38.774 | 252 | 812413m | 238.28 | |
| 91) C20-TAS | 0.000 | | 0 | N.D. d | |
| 92) C21-TAS | 0.000 | | 0 | N.D. d | |
| 93) C26(20S)-TAS 94) C26(20B)/C27(20S)-TAS | 0.000 | 221 | 0 1010902m | N.D. d | |
| 94) C26(20R)/C27(20S)-TAS 95) C28(20S)-TAS | 39.434 0.000 | 231 | 1010902m 0 | 269.13 N.D. d | |
| 96) C27(20R)-TAS | 0.000 | | 0 | N.D. d | |
| 97) C28(20R) - TAS | 0.000 | | 0 | N.D. d | |
| (a) (a) (b) (b) (b) (b) (b) (b) (b) (b) (b) (b | 0.000 | | 0 | AT I AP I WA | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057L.D Acq On : 17 Aug 2013 6:57 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 20 Sample Multiplier: 1 Quant Time: Aug 18 20:06:35 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QION Response Conc Units Dev(Min) (#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 06 06:44:03 2013

Sample Multiplier: 1 6:57 pm : C:\GCMS7\MS70057\ : AR-WKCC-250-038 : 17 Aug 2013 : YM Data Path : C:\GCMS7\MS Data File : MS70057L.D : 20 Operator Sample ALS Vial Acq On Misc

Quant Time: Aug 18 20:06:35 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | | | | | | | | | { | |
|---|--|---|--|--|-------|-------------|-------|---|-------------|--------------------|
| | | | | | | | | | { | |
| | | T | ,ənəlynəq(i,h | 6)ozuəg | | | | | } | |
| | Т,9 | aneocationea(ke)b | eno(Dwenze | ouj — | | S30-Hopane |) | | / > } | |
| | | | | | | | | ł | { | |
| T, SAT-(80S)75 | C26(20K)/C2 | | | | | | | | 1 | |
| S'ZLP-6 | S(G)))))(G))) S(G)))))(G))) Beuso(x'))((G)) | | ນມລາ (ມລ d(ເຊິ່ງດັ່ວນີ້ມີລິດ | | | | | | | |
| T, anabit T, anabit T, anabit T, anabit T, anabit T, anabit S S the | noufi(į,i)ozn98 | T,enedine | euzo(p)iluote | 8 | | | |) | | |
| | | | | | | | | | 1 | |
| 2 T,ansata | and the contraction of the contr | | биацф <u>і (</u> ара | Cµùa | | 2,9n6lo12-F | f(d)2 | | | |
| 2 | T,enertqoi | Iaphthobenzothi | N | | | | | | | 1 |
| - | | | | | | | | | 5 | 4 |
| | סומוווופווב'ו | T,9r | Retener Rivoren Rivoren | əa — | | | | | 5 | |
| | Pyrene,T oranthene,T | oufilyrtt9M-S T,9r | Pyrene-d10,1 Retene,7 Piluoren | | | | | | 5 | A NULUL A |
| | | | Prene,T Pytene-d10,L | Fluorar | 9'£ — | | | | 5 | ما سواسالمالمر |
| | Т,элэтүЧ | | henanthrene, Menanthrene, 1,015 | Fluorar | 9'8 — | | | | 5 | لا مسلمالمالمال |
| | Т,элэтүЧ | T T | M-† — — henantinsnah T,anartin T,anartin P,9fa-anary? | qlydfamiQ- noran | 9'2 — | | | | 2 | 1 - multiplication |
| T,eneriqo | Pintoznedibiyrtam-I-dia ene, T Pyrene, T | t Topping the second se | Zole,T M-r — 1-M henanthrene, T,eneitt P yrene-d10,1 | Carba Pinethylp Fluoran | 9,5 – | | | | 2 | 1 - 20 - 21 WINNIN |
| T,ə T,ənəriqc | T,ene T,enery | t Topping the second se | Zole,T M-r — 1-M henanthrene, T,eneitt P yrene-d10,1 | Carba Pinethylp Fluoran | 9'8 | | | | 5 | |
| T,ə T,ənəriqc | roulflyrtiaM-t อเกอวิธิทิทริศักรรร อเก่ยราคงไข่กาย กาย กาย กาย กาย กาย กาย กาย กาย กาย | Ten 2010-0-0-10, St 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 | inendoirtiosmed T,eios M-r M-r M-r T,enentinened T,enenti | Carba Pinethylp Fluoran | 9'E | | | | 5 | |
| T,ener T,e T,eneriqc | anaJ ລີຖືກກູຊາກຣາວເປ ກາງ ກາງ ກາງ ກາງ ກາງ ກາງ ກາງ ກາງ ກາງ ກາງ | 1 | Fluorene Portogintoznoc T.eloz M-1 M-1 M-1 M-1 M-1 M-1 M-1 M-1 M-1 M-1 | Carba Pinethylp Fluoran | 9,5 - | | | | 5 | |
| T,ener T,e T,eneriqc | ا-юоғоон ا Pnorene - t Pno-J5-ЯНЭЯ-t Pno-J5-ЯНЭЯ Phorenzon Phorene - T Pyrene, T Pyrene, T | 2,0f,b ,6 f9 zofuran.T 1,01b-d 10,5b- 10,5p 10,5 | AfdStesseeA enabled | Carba Pinethylp Fluoran | 9'8 | | | | 5 | |
| T,ənəlsrtiriqsr T,ənər T,ə | າໄγ(thamnT-5, ∂. f T, an aoull noothiy(thaM- f nnaວັ ດຊີເຖິງຊີເ ກດຊັດ naວັດຊີເຊິ່ງຊີງ nagaine thanaoull that thanaoull thanaoull thanaoull thanaoull thanaoull thanaoull thanaoull that that that that that that that th | T,neaulos 1,016-4 1,016-4 10,55 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 | AfdStesseeA enabled | Carba Pinethylp Fluoran | 9,6 - | | | | 5 | |
| T,enelerthden T,enelerthden T,ene T,enedqc | ا-юоғоон ا Pnorene - t Pno-J5-ЯНЭЯ-t Pno-J5-ЯНЭЯ Phorenzon Phorene - T Pyrene, T Pyrene, T | 2,0f,b ,6 f9 zofuran.T 1,01b-d 10,5b- 10,5p 10,5 | AfdStesseeA enabled | Carba Pinethylp Fluoran | 9'6 | | | | 5 | |
| T,ənəlsritrider T,ənəlsritrider T,ənə T,ənəriqq | yanlydhamidrafia (2.6.0.5.7.6.1. 7.anaroa คาควิธีที่ที่ที่มีการกลาย การประการกลาย การกราย การการการกราย การกราย การการการการการการการการการการการการการก | T. nenylend 2. 0f. 2. 2. 0f. 2. 2. 0f. 2. 2. 0f. 2. 1. 0f. 5. 1. 0 | AfdStesseeA enabled | Dite Carba Carba Carba Carba Carba | 9'8 | | | | 5 | |
| T,enelerthden T,enelerthden T,ene T,enedqc | yanlydhamidrafia (2.6.0.5.7.6.1. 7.anaroa คาควิธีที่ที่ที่มีการกลาย การประการกลาย การกราย การการการกราย การกราย การการการการการการการการการการการการการก | T,eneishtfråg T,eneiver T,eneiver T,ofter T | nalkründesnity naisründesnity Areas | 1-Meth Carba Carba Carba Carba Carba Carba | | | | | 5 | |
| T,enelerthden T,enelerthden T,ene T,enedqc | yanlydhamidrafia (2.6.0.5.7.6.1. 7.anaroa คาควิธีที่ที่ที่มีการกลาย การประการกลาย การกราย การการการกราย การกราย การการการการการการการการการการการการการก | T,eneishtfråg T,eneiver T,eneiver T,ofter T | Acreacy Addresserve Construction Acreación Anon Anon Anon Anon Anon Anon Anon An | 1-Meth Carba Carba Carba Carba Carba Carba | | | | | | |
| T,enelerthden T,enelerthden T,ene T,enedqc | yanlydhamidrafia (2.6.0.5.7.6.1. 7.anaroa คาควิธีที่ที่ที่มีการกลาย การประการกลาย การกราย การการการกราย การกราย การการการการการการการการการการการการการก | T,eneishtfråg T,eneiver T,eneiver T,ofter T | nalkründesnity naisründesnity Areas | 1-Meth Carba Carba Carba Carba Carba Carba | | | | | 5 | |

00 58.00 60.00

Data Path : C:\GCMS7\MS70057\ Data File : MS70057M.D Acq On : 18 Aug 2013 5:13 am Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 29 Sample Multiplier: 1

Quant Time: Aug 18 20:13:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| 200 | | Compound | AvgRF | CCRF | %Dev A | rea% 1 | Dev(min) |
|-----|----|----------------------------|-------|-------|--------|--------|----------|
| 1 | I | Fluorene-d10 | 1.000 | 1.000 | 0.0 | 95 | 0.00 |
| 2 | S | Naphthalene-d8 | 1.692 | 1.584 | 6.4 | 96 | 0.00 |
| 3 | | cis/trans Decalin | 0.290 | 0.302 | -4.1 | 102 | 0.00 |
| 4 | un | C1-Decalins | 0.290 | 0.000 | 100.0# | 0# | |
| 5 | un | C2-Decalins | 0.290 | 0.000 | 100.0# | | -13.52# |
| 6 | un | C3-Decalins | 0.290 | 0.000 | 100.0# | | -15.88# |
| 7 | un | C4-Decalins | 0.290 | 0.000 | 100.0# | | -18.33# |
| 8 | Т | Naphthalene | 1.889 | 1.781 | 5.7 | 96 | 0.00 |
| 9 | т | 2-Methylnaphthalene | 1.190 | 1.106 | 7.1 | 96 | 0.00 |
| 10 | Т | 1-Methylnaphthalene | 1.099 | 1.034 | 5.9 | 96 | 0.00 |
| 11 | т | 2,6-Dimethylnaphthalene | 1.117 | 1.039 | 7.0 | 96 | 0.00 |
| 12 | Т | 1,6,7-Trimethylnaphthalene | 0.989 | 0.957 | 3.2 | 100 | 0.00 |
| 13 | un | C2-Naphthalenes | 1.889 | 0.000 | 100.0# | 0# | -18.89# |
| 14 | un | C3-Naphthalenes | 1.889 | 0.000 | 100.0# | | -20.37# |
| 15 | un | C4-Naphthalenes | 1.889 | 0.000 | 100.0# | | -22.26# |
| 16 | т | Benzothiophene | 1.541 | 1.458 | 5.4 | 97 | 0.00 |
| 17 | un | C1-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -15.49# |
| 18 | un | C2-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -17.92# |
| 19 | un | C3-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -20.31# |
| 20 | un | C4-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -22.23# |
| 21 | S | Acenaphthene-d10 | 0.973 | 0.897 | 7.8 | 96 | 0.00 |
| 22 | т | Biphenyl | 1.618 | 1.502 | 7.2 | 95 | 0.00 |
| 23 | т | Acenaphthylene | 1.844 | 1.732 | 6.1 | 99 | 0.00 |
| 24 | т | Acenaphthene | 1.052 | 1.002 | 4.8 | 98 | -0.03 |
| 25 | т | Dibenzofuran | 1.790 | 1.667 | 6.9 | 95 | 0.00 |
| 26 | Т | Fluorene | 1.414 | 1.335 | 5.6 | 97 | 0.00 |
| 27 | Т | 1-Methylfluorene | 0.933 | 0.860 | 7.8 | 95 | 0.00 |
| 28 | un | C1-Fluorenes | 1.414 | 0.000 | 100.0# | 0# | -23.51# |
| 29 | un | C2-Fluorenes | 1.414 | 0.000 | 100.0# | 0# | -24.79# |
| 30 | un | C3-Fluorenes | 1.414 | 0.000 | 100.0# | 0# | -27.59# |
| 31 | | Pyrene-d10 | 1.000 | 1.000 | 0.0 | 103 | 0.00 |
| 32 | S | Phenanthrene-d10 | 1.010 | 0.809 | 19.9 | 90 | 0.00 |
| 33 | Т | Carbazole | 0.962 | 0.767 | 20.3 | 92 | 0.00 |
| 34 | Т | Dibenzothiophene | 1.044 | 0.868 | 16.9 | 94 | 0.00 |
| 35 | Т | 4-Methyldibenzothiophene | 0.851 | 0.779 | 8.5 | 100 | 0.00 |
| 36 | un | 2/3-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.21# |
| 37 | un | 1-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.52# |
| | un | C2-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | | -27.83# |
| 39 | un | C3-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -28.49# |
| 40 | un | C4-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -31.09# |
| 41 | Т | Phenanthrene | 1.263 | 1.103 | 12.7 | 96 | 0.00 |
| 42 | Т | Anthracene | 1.171 | 1.043 | 10.9 | 101 | 0.00 |
| 43 | un | 3-Methylphenanthrene | 0.783 | 0.000 | 100.0# | 0# | -26.93# |
| 44 | un | 2-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | -26.93# |
| | un | 2-Methylanthracene | 0.783 | 0.000 | 100.0# | | -26.73# |
| 46 | un | 4/9-Methylphenanthrene | 0.783 | 0.000 | 100.0# | 0# | -26.93# |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057M.D Acq On : 18 Aug 2013 5:13 am Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 29 Sample Multiplier: 1

Quant Time: Aug 18 20:13:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| - | | Compound | AvgRF | CCRF | %Dev Are | a% I | Dev(min) |
|----|----|-----------------------------|-------|-------|----------|------|----------|
| 47 | Т | 1-Methylphenanthrene | 0.783 | 0.730 | 6.8 1 | 04 | 0.00 |
| 48 | т | 3,6-Dimethylphenanthrene | 0.673 | 0.582 | 13.5 | 99 | -0.03 |
| 49 | т | Retene | 0.371 | 0.292 | 21.3 | 91 | 0.00 |
| 50 | un | C2-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | 0# | -28.56# |
| 51 | un | C3-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -29.43# |
| 52 | un | C4-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -32.06# |
| 53 | Т | Naphthobenzothiophene | 1.305 | 1.208 | 7.4 1 | 03 | 0.00 |
| 54 | un | C1-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -34.55# |
| 55 | un | C2-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -36.02# |
| 56 | un | C3-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -37.42# |
| 57 | un | C4-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -37.92# |
| 58 | т | Fluoranthene | 1.139 | 0.996 | 12.6 | 99 | -0.03 |
| 59 | Т | Pyrene | 1.480 | 1.309 | 11.6 | 97 | 0.00 |
| 60 | т | 2-Methylfluoranthene | 0.942 | 0.761 | 19.2 | 93 | 0.00 |
| 61 | т | Benzo(b)fluorene | 0.795 | 0.642 | 19.2 | 94 | 0.00 |
| 62 | un | C1-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -30.71# |
| 63 | un | C2-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -32.18# |
| 64 | un | C3-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | | -34.00# |
| 65 | un | C4-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -35.09# |
| 66 | S | Chrysene-d12 | 1.105 | 1.054 | 4.6 1 | 03 | -0.04 |
| 67 | т | Benz(a) anthracene | 1.344 | 1.231 | 8.4 1 | 01 | 0.00 |
| 68 | т | Chrysene/Triphenylene | 1.138 | 1.037 | 8.9 1 | 00 | -0.04 |
| 69 | un | C1-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -35.83# |
| 70 | un | C2-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -36.99# |
| 71 | un | C3-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -38.11# |
| 72 | un | C4-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -39.74# |
| 73 | I | Benzo(a)pyrene-d12 | 1.000 | 1.000 | 0.0 | 79 | 0.00 |
| 74 | un | C29-Hopane | 0.371 | 0.000 | 100.0# | 0# | -40.28# |
| 75 | un | 18a-Oleanane | 0.371 | 0.000 | 100.0# | | -42.34# |
| 76 | т | C30-Hopane | 0.371 | 0.394 | | 89 | 0.00 |
| 77 | т | Benzo(b) fluoranthene | 1.391 | 1.564 | | 97 | -0.04 |
| 78 | Т | Benzo(k,j)fluoranthene | 1.059 | 0.965 | | 81 | 0.00 |
| 79 | un | Benzo(a)fluoranthene | 1.059 | 0.000 | 100.0# | 0# | -37.34# |
| 80 | т | Benzo(e)pyrene | 1.281 | 1.251 | | 86 | 0.00 |
| 81 | Т | Benzo(a)pyrene | 1.258 | 1.259 | -0.1 | 87 | -0.04 |
| 82 | Т | Indeno(1,2,3-c,d)pyrene | 1.586 | 1.181 | 25.5# | 66 | 0.00 |
| 83 | т | Dibenzo(a,h)anthracene | 1.273 | 0.988 | | 69 | 0.00 |
| 84 | un | C1-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | | -48.31# |
| 85 | un | C2-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | | -50.30# |
| | un | C3-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | | -51.23# |
| 87 | т | Benzo(g,h,i)perylene | 1.385 | 0.937 | | 59 | 0.00 |
| 88 | S | Perylene-d12 | 1.181 | 1.142 | | 85 | 0.00 |
| 89 | | Perylene | 1.282 | 1.266 | | 86 | -0.04 |
| 90 | | 5(b)H-Cholane | 0.198 | 0.199 | | 89 | 0.00 |
| | un | C20-TAS | 1.412 | 0.000 | 100.0# | | -33.30# |
| | un | C21-TAS | 1.412 | 0.000 | 100.0# | | -34.24# |
| | | | | | | | |

| Qua | ntitatio | n Repo | ort (QT | Reviewed | .) |
|---|-----------------------------------|------------|--------------------|------------------|--------------|
| Data Path : C:\GCMS7\MS70057\ Data File : MS70057M.D Acq On : 18 Aug 2013 5:13 Operator : YM Sample : AR-WKCC-250-038 Misc : | am | | | | |
| ALS Vial : 29 Sample Multipl | ier: 1 | | | | |
| Quant Time: Aug 18 20:13:10 201 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration QLast Update : Sat Aug 17 22:39 Response via : Initial Calibrat | \AR70057 Table-203 :35 2013 | | | | |
| | | QIon | Response | Conc Un | its Dev(Min) |
| Internal Standards | | | | | |
| Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 21.455 | 176 | 421661m | 251.05 | 0.00 |
| 31) Pyrene-d10 | 29.635 | 212 | 852816m | 250.63 | 0.00 |
| 73) Benzo(a)pyrene-d12 | 38.386 | 264 | 750512m | 250.32 | 0.00 |
| System Monitoring Compounds | | | | | |
| 2) Naphthalene-d8 | 13.822 | 136 | 665277m | 234.07 | 0.00 |
| 21) Acenaphthene-d10 | 19.672 | 164 | 376783m | 230.59 | 0.00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 688735m | 200.46 | 0.00 |
| 66) Chrysene-d12 88) Perylene-d12 | 33.809 | 240 | 896417m | 238.36 | -0.04 |
| 88) Perylene-d12 | 38.697 | 264 | 856217m | 241.87 | 0.00 |
| 90) 5(b)H-Cholane | 34.235 | 217 | 149127m | 250.82 | 0.00 |
| Target Compounds | | | | | Qvalue |
| 3) cis/trans Decalin | 11.176 | 138 | 125411m | 257.39 | |
| 4) Cl-Decalins | 0.000 | | 0 | N.D. | d |
| 5) C2-Decalins | 0.000 | | 0 | N.D. | d |
| 6) C3-Decalins | 0.000 | | 0 0 | N.D. | d |
| /) C4-Decalins | 0.000 | | 0 | N.D. | d |
| 8) Naphthalene | 13.878 | 128 | 747701m | 235.70 | |
| 9) 2-Methylnaphthalene | 16.134 | 142 | 464863m | 232.55 | |
| 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene | 16.468 | 142 | 433838m | 234.94 | |
| | | | | | |
| 1,6,7-Trimethylnaphtha C2-Naphthalenes | 0.000 | 110 | | | 2 |
| 14) C3-Naphthalenes | 0.000 | | 0 | N.D. N.D. | |
| 15) C4-Naphthalenes | 0.000 | | 0 | N.D. | u |
| 16) Benzothiophene | 14.045 | 134 | 608509m | 235.10 | |
| 17) C1-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 20) C4-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 22) Biphenyl | 17.694 | 154 | 625002m | 229.96 | |
| 23) Acenaphthylene | 19.171 | 152 | 721311m | 232.93 | |
| 24) Acenaphthene | 19.756 | 154 | 421438m | 238.44 | |
| 25) Dibenzofuran | 20.368 | 168 | 696292m | 231.54 | |
| 26) Fluorene 27) 1-Methylfluorene | 21.538 23.506 | 166 180 | 561642m 364030m | 236.51 232.38 | |
| 28) Cl-Fluorenes | 0.000 | 100 | 364030m 0 | 232.38 N.D. | 6 |
| 29) C2-Fluorenes | 0.000 | | 0 | N.D. | |
| 30) C3-Fluorenes | 0.000 | | õ | N.D. | |
| 33) Carbazole | 25.583 | 167 | 646859m | 197.68 | 1913 1913 |
| 34) Dibenzothiophene | 24.406 | 184 | 728031m | 204.89 | |
| 35) 4-Methyldibenzothiophene | 25.895 | 198 | 667982m | 230.56 | |
| 36) 2/3-Methyldibenzothiop | | | 0 | N.D. | d |

0.000

24.995 178

0.000

0

0

0

0

0

890145m 223.31

24.821 178 930059m 216.37

N.D. d

N.D. d

N.D. d

N.D. d

N.D. d

41) Phenanthrene

42) Anthracene

39) C3-Dibenzothiophenes40) C4-Dibenzothiophenes

36) 2/3-Methyldibenzothiop... 0.000

37) 1-Methyldibenzothiophene 0.000

38) C2-Dibenzothiophenes 0.000

Data Path : C:\GCMS7\MS70057\ Data File : MS70057M.D Acq On : 18 Aug 2013 5:13 am Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 29 Sample Multiplier: 1 Quant Time: Aug 18 20:13:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QION Response Conc Units Dev(Min)

 43) 3-Methylphenanthrene
 0.000
 0
 N.D. d

 44) 2-Methylphenanthrene
 0.000
 0
 N.D. d

 45) 2-Methylanthracene
 0.000
 0
 N.D. d

 46) 4/9-Methylphenanthrene
 0.000
 0
 N.D. d

 47) 1-Methylphenanthrene
 26.934
 192
 614195m
 230.65

 48) 3,6-Dimethylphenanthrene
 28.007
 206
 495893m
 216.41

 49) Retene
 30.708
 234
 22180m
 176.12

 50) C2-Phenanthrenes/Anthr..
 0.000
 0
 N.D. d

 51) C3-Phenanthrenes/Anthr..
 0.000
 0
 N.D. d

 53) Naphthobenzothiophene
 32.955
 234
 1033961m
 232.89

 54) C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55) C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 56) C3-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 57) C4-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 58) Fluoranthene
 28.908
 202
 848364m
 218.92

 -----0 N.D. d 0 N.D. d

 56)
 C3-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 57)
 C4-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 58)
 Fluoranthene
 28.908
 202
 848364m
 218.92

 59)
 Pyrene
 29.704
 202
 1113739m
 221.19

 60)
 2-Methylfluoranthene
 30.466
 216
 652046m
 203.52

 61)
 Benzo(b)fluorene
 31.089
 216
 550886m
 203.61

 62)
 C1-Fluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 63)
 C2-Fluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 64)
 C3-Fluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 67)
 Benz (a) anthracene
 33.770
 228
 104552m
 228.69

 68)
 Chrysenes
 0.000
 0
 N.D. d
 70

 701
 C2-Chrysenes
 0.000
 0
 N.D. d

 71)
 C3-Chrysenes
 0.000
 0
 N.D. d

 72)
 C4-Chrysenes
 0.000
 0
 N.D. d

 73)
 Benzo (k) f

 89)
 Perylene
 38.774
 252
 94987300
 247.21

 91)
 C20-TAS
 0.000
 0
 N.D. d

 92)
 C21-TAS
 0.000
 0
 N.D. d

 93)
 C26(20S)-TAS
 0.000
 0
 N.D. d

 94)
 C26(20R)/C27(20S)-TAS
 39.434
 231
 1114791m
 263.36

 95)
 C28(20S)-TAS
 0.000
 0
 N.D. d

 96)
 C27(20R)-TAS
 0.000
 0
 N.D. d

 97)
 C28(20R)-TAS
 0.000
 0
 N.D. d

Sample Multiplier: 1 5:13 am Data Path : C:\GCMS7\MS70057\ Data File : MS70057M.D : AR-WKCC-250-038 : 18 Aug 2013 : YM : 29 •• Operator Sample ALS Vial Acq On Misc

Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Quant Time: Aug 18 20:13:10 2013

| | | | | | | | | | | | | | | 1111 |
|-------|---------------|-----------------------|-----------------------|------------|------------------------|---------------------------|----------------------|------------|--------|----------|----------------|------------|-------------------|-----------|
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | 1.1.1 |
| | | | | | | | | | | | | | | Li in |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | 'q'ɓ)ozuəş | 3 | | | | | |
| | | | | | Т, өд | 93891X46 | ubelozyad | @pu | T,s | ensqoH-0 | - C3 | | | |
| | | | | | | | | | | | | | | |
| | | | Į. | T, SAT-(S | 02)/22)/(30 | -C26(20E | | | | | | | | |
| | | 1'25'1 | | | | Harkd(e)oz | Ben | | | | | | 1 | |
| | | | | | | ∦√∯® zuəg | | | | | | | 1 | E |
| | | | | | | | | | | | | | $\langle \rangle$ | |
| | | | | | | | | | | S,enel | p)H-Chol |)g | | - |
| | | | idtoznado | | Chrysen | | | | | | | | |) F |
| | | T anadoo | idtosnado | 4140EN | | | | | | | | | T |] E |
| | | | | 1/21/21/0 | | 0014-7 | T,ens | Refene, | nea | | | | } | |
| | | Τ,6 |),I Pyrene | | ivenorani Pi | 41014-5 | | | | | | | _ | |
| | | | | 100 | 0.0000000 | udulunouur | | Fluoranthe | - | | | | | |
| | 13 | ອນອງນານເຊເ | iəqqiydiəf | | anthrena | nethylph | 7-9.5 | | | | | | | |
| T.an | | zuəqiplkr | | | | | | 010700100 | | | | | | |
| | 1 | T,an J JBF | 04Koeuay | J | S'OLP | T,s anthrene- | | Carbazole | , | - | | | | SE |
| | | T,ens | ethylfluore | W-L | | 1. | soo quoidi | | | | | | | |
| | | | | | | | | | | | | | | |
| | henlydfaet | ninT-7,8,1 | T, snaroul | 3 | | 1,01b- | Fluorene | | | | | | | SF. |
| utud | | | | T,ənərttri | qenecenap. T,neruto | 01p-auaqt | - Vceusby | | | | _ | | _ | והההורייי |
| qiqq | | uomunudr | snlydtemi | Т,9г | aphthyle | Acen | | | | | | | | J. |
| чцųd | 1'9 | | | 790 | | | | _ | | | | | | 76 |
| rdidq | T,9 | T,lynsr T,lynsr | | | T,eneler | tingeniviti T, analeri | ethylnaphi 2-Me | M-1 | | | | | | ŧ |
| :utud | T,9 | | | | | | | | | | | | | 153 |
| sdidq | Т,9 | | | | | | | | | | | | | E |
| ւփոզ | Т,9 | | | | T,e | nəlerliriq | P ;anang | HABSHAB | | | | | | |
| ццd | Т,9 | | | | T,e | nəlertiriqê | P :313161 | HARAAB | | | | | | |
| ujud | Т,9 | | | | T,a | nolertiriqë | 9 -313460 | HRSH98 | | | T,nil | eceO erest | ı/siə - | |
| -utud | 650000 e,T | | 550000 | 500000 | 450000 a,T | 400000 400000 | 到相信 320000 | 300000 | 250000 | 200000 | 150000- In. | trans Deca | 20000 | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057N.D Acq On : 18 Aug 2013 3:30 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 38 Sample Multiplier: 1 Quant Time: Aug 22 11:30:30 2013

Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | | Compound | AvgRF | CCRF | %Dev Ar | ea% I | Dev(min) |
|----|----|----------------------------|-------|-------|---------|-------|----------|
| 1 | I | Fluorene-d10 | 1.000 | 1.000 | 0.0 | 89 | 0.00 |
| 2 | | Naphthalene-d8 | 1.692 | 1.550 | 8.4 | 88 | 0.00 |
| 3 | | cis/trans Decalin | 0.290 | 0.288 | 0.7 | 91 | 0.00 |
| 4 | | C1-Decalins | 0.290 | 0.000 | 100.0# | | -12.32# |
| 5 | un | C2-Decalins | 0.290 | 0.000 | 100.0# | | -13.52# |
| 6 | un | C3-Decalins | 0.290 | 0.000 | 100.0# | | -15.88# |
| 7 | un | C4-Decalins | 0.290 | 0.000 | 100.0# | | -18.33# |
| 8 | T | Naphthalene | 1.889 | 1.749 | 7.4 | 88 | 0.00 |
| 9 | T | 2-Methylnaphthalene | 1.190 | 1.089 | 8.5 | 88 | 0.00 |
| 10 | Ť | 1-Methylnaphthalene | 1.099 | 1.021 | 7.1 | 89 | 0.00 |
| | | 2,6-Dimethylnaphthalene | 1.117 | 0.999 | 10.6 | 86 | 0.00 |
| 12 | | 1,6,7-Trimethylnaphthalene | 0.989 | 0.953 | 3.6 | 93 | 0.00 |
| | un | C2-Naphthalenes | 1.889 | 0.000 | 100.0# | | -18.89# |
| | un | C3-Naphthalenes | 1.889 | 0.000 | 100.0# | | -20.37# |
| | un | C4-Naphthalenes | 1.889 | 0.000 | 100.0# | | -22.26# |
| 16 | | Benzothiophene | 1.541 | 1.419 | 7.9 | 88 | 0.00 |
| | un | Cl-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -15.49# |
| | un | C2-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -17.92# |
| | un | C3-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -20.31# |
| | un | C4-Benzothiophenes | 1.541 | 0.000 | 100.0# | | -22.23# |
| 21 | | Acenaphthene-d10 | 0.973 | 0.890 | 8.5 | 89 | 0.00 |
| 22 | | Biphenyl | 1.618 | 1.450 | 10.4 | 86 | 0.00 |
| 23 | T | Acenaphthylene | 1.844 | 1.652 | 10.4 | 88 | 0.00 |
| 24 | | Acenaphthene | 1.052 | 1.003 | 4.7 | 92 | -0.03 |
| 25 | | Dibenzofuran | 1.790 | 1.612 | 9.9 | 86 | 0.00 |
| 26 | | Fluorene | 1.414 | 1.284 | 9.2 | 87 | 0.00 |
| 27 | | 1-Methylfluorene | 0.933 | 0.804 | 13.8 | 83 | 0.00 |
| | un | Cl-Fluorenes | 1.414 | 0.000 | 100.0# | | -23.51# |
| | un | C2-Fluorenes | 1.414 | 0.000 | 100.0# | | -24.79# |
| | un | C3-Fluorenes | 1.414 | 0.000 | 100.0# | | -27.59# |
| 30 | un | C3-FILOIENES | 1.111 | 0.000 | 100.0# | 0 π | 27.55# |
| 31 | I | Pyrene-d10 | 1.000 | 1.000 | 0.0 | 95 | 0.00 |
| 32 | | Phenanthrene-d10 | 1.010 | 0.783 | 22.5 | 80 | 0.00 |
| 33 | т | Carbazole | 0.962 | 0.722 | 24.9 | 80 | 0.00 |
| 34 | т | Dibenzothiophene | 1.044 | 0.861 | 17.5 | 86 | 0.00 |
| 35 | Т | 4-Methyldibenzothiophene | 0.851 | 0.774 | 9.0 | 91 | 0.00 |
| 36 | un | 2/3-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.21# |
| 37 | un | 1-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.52# |
| 38 | un | C2-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -27.83# |
| 39 | un | C3-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -28.49# |
| 40 | un | C4-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -31.09# |
| 41 | т | Phenanthrene | 1.263 | 1.063 | 15.8 | 85 | 0.00 |
| 42 | Т | Anthracene | 1.171 | 0.982 | 16.1 | 88 | 0.00 |
| 43 | un | 3-Methylphenanthrene | 0.783 | 0.000 | 100.0# | 0# | -26.93# |
| 44 | un | 2-Methylphenanthrene | 0.783 | 0.000 | 100.0# | 0# | -26.93# |
| 45 | un | 2-Methylanthracene | 0.783 | 0.000 | 100.0# | 0# | -26.73# |
| 46 | un | 4/9-Methylphenanthrene | 0.783 | 0.000 | 100.0# | 0# | -26.93# |
| | | | | | | | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057N.D Acq On : 18 Aug 2013 3:30 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 38 Sample Multiplier: 1

Quant Time: Aug 22 11:30:30 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | | Compound | AvgRF | CCRF | %Dev Ar | ea% 1 | Dev(min) |
|----|----|-----------------------------|-------|-------|---------|-------|----------|
| 47 | т | 1-Methylphenanthrene | 0.783 | 0.744 | 5.0 | 98 | 0.00 |
| | т | 3,6-Dimethylphenanthrene | 0.673 | 0.582 | 13.5 | 91 | -0.03 |
| 49 | | Retene | 0.371 | 0.270 | 27.2# | 77 | 0.00 |
| | un | C2-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -28.56# |
| | un | C3-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -29.43# |
| | un | C4-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -32.06# |
| 53 | Т | Naphthobenzothiophene | 1.305 | 0.000 | 100.0# | | -32.96# |
| 54 | un | C1-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | |
| 55 | un | C2-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -36.02# |
| 56 | un | C3-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | | -37.42# |
| 57 | un | C4-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | -37.92# |
| 58 | Т | Fluoranthene | 1.139 | 0.998 | 12.4 | 92 | -0.03 |
| 59 | Т | Pyrene | 1.480 | 1.272 | 14.1 | 87 | 0.00 |
| 60 | Т | 2-Methylfluoranthene | 0.942 | 0.713 | 24.3 | 80 | 0.00 |
| 61 | Т | Benzo(b)fluorene | 0.795 | 0.604 | 24.0 | 82 | 0.00 |
| | un | C1-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -30.71# |
| 63 | un | C2-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -32.18# |
| 64 | un | C3-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -34.00# |
| 65 | un | C4-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | 0# | -35.09# |
| 66 | S | Chrysene-d12 | 1.105 | 1.091 | 1.3 | 98 | -0.04 |
| 67 | т | Benz(a) anthracene | 1.344 | 1.211 | 9.9 | 91 | 0.00 |
| 68 | т | Chrysene/Triphenylene | 1.138 | 1.098 | 3.5 | 98 | -0.04 |
| 69 | un | C1-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -35.83# |
| 70 | un | C2-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -36.99# |
| | un | C3-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -38.11# |
| 72 | un | C4-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -39.74# |
| 73 | I | Benzo(a)pyrene-d12 | 1.000 | 1.000 | 0.0 | 71 | 0.00 |
| 74 | un | C29-Hopane | 0.371 | 0.000 | 100.0# | 0# | -40.28# |
| 75 | un | 18a-Oleanane | 0.371 | 0.000 | 100.0# | 0# | -42.34# |
| 76 | т | C30-Hopane | 0.371 | 0.418 | -12.7 | 84 | 0.00 |
| 77 | т | Benzo(b)fluoranthene | 1.391 | 1.310 | 5.8 | 73 | -0.04 |
| 78 | Т | Benzo(k,j)fluoranthene | 1.059 | 1.242 | -17.3 | 93 | 0.00 |
| | un | Benzo(a)fluoranthene | 1.059 | 0.000 | 100.0# | 0# | -37.34# |
| 80 | т | Benzo(e)pyrene | 1.281 | 1.264 | 1.3 | 78 | 0.00 |
| 81 | т | Benzo(a)pyrene | 1.258 | 1.295 | -2.9 | 80 | -0.04 |
| 82 | т | Indeno(1,2,3-c,d)pyrene | 1.586 | 1.173 | 26.0# | 58 | 0.00 |
| 83 | Т | Dibenzo(a,h)anthracene | 1.273 | 0.979 | 23.1 | 61 | -0.04 |
| 84 | un | C1-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -48.31# |
| 85 | un | C2-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -50.30# |
| | un | C3-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -51.23# |
| 87 | | Benzo(g,h,i)perylene | 1.385 | 0.924 | 33.3# | 52 | -0.04 |
| 88 | | Perylene-d12 | 1.181 | 1.129 | 4.4 | 75 | 0.00 |
| 89 | | Perylene | 1.282 | 1.296 | -1.1 | 78 | -0.04 |
| 90 | S | 5(b)H-Cholane | 0.198 | 0.194 | 2.0 | 78 | 0.00 |
| | un | C20-TAS | 1.412 | 0.000 | 100.0# | | -33.30# |
| 92 | un | C21-TAS | 1.412 | 0.000 | 100.0# | 0# | -34.24# |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057N.D Acq On : 18 Aug 2013 3:30 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 38 Sample Multiplier: 1 Quant Time: Aug 22 11:30:30 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min Max. RRF Dev : 25% Max. Rel. Area : 200% AVGRF CCRF Compound %Dev Area% Dev(min) 1.4120.000100.0#0#-38.70#1.4121.489-5.583-0.041.4120.000100.0#0#-40.24#1.4120.000100.0#0#-41.09#1.4120.000100.0#0#-41.42# 93 un C26(20S)-TAS 94 T C26(20R)/C27(20S)-TAS 95 un C28(20S)-TAS 96 un C27(20R)-TAS 97 un C28(20R)-TAS

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

| (ST HEATENED) | (QT | Reviewed) | |
|---------------|-----|-----------|--|
|---------------|-----|-----------|--|

| Data Path : C:\GCMS7\MS70057\ Data File : MS70057N.D Acq On : 18 Aug 2013 3:30 Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 38 Sample Multipl Quant Time: Aug 22 11:30:30 201 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration QLast Update : Sat Aug 17 22:39 Response via : Initial Calibrat | ier: 1 3 \AR70057. Table-201 :35 2013 | | | | |
|--|---|-----|--------------------|----------------|--------------|
| Compound | R.T. | | | | its Dev(Min) |
| | | | | | |
| Internal Standards | 21 455 | 170 | 202707- | 251 05 | 0.00 |
| Fluorene-d10 Pyrene-d10 | 21.455 | 1/6 | 393/8/m | 251.05 | 0.00 |
| 31) Pyrene-d1073) Benzo(a)pyrene-d12 | 29.035 | 212 | 669077m | 250.03 | 0.00 |
| (3) Benzo(a)pyrene-diz | 38.380 | 264 | 66907711 | 250.52 | 0.00 |
| System Monitoring Compounds | | | | | |
| | 13.822 | 136 | 608273m | 229.16 | 0.00 |
| Naphthalene-d8 Acenaphthene-d10 | 19.672 | 164 | 349160m | | 0.00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 612989m | 194.01 | 0.00 |
| 32) Phenanthrene-d10 66) Chrysene-d12 | 33.809 | 240 | 612989m 853556m | 246.81 | -0.04 |
| 88) Perylene-d12 | 38.697 | 264 | 754424m | 239.06 | 0.00 |
| | 34.235 | | | | 0.00 |
| | | | | | |
| Target Compounds | | | | | Qvalue |
| 3) cis/trans Decalin | 11.176 | 138 | | | - 12-1 - |
| 4) C1-Decalins | 0.000 | | 0 | N.D. | d |
| 5) C2-Decalins | 0.000 | | 0 | N.D. N.D. | d |
| 6) C3-Decalins | 0.000 | | 0 | N.D. | |
| 7) C4-Decalins | 0.000 | 100 | 0 | N.D. | a |
| 8) Naphthalene | 13.8/8 | 128 | 685/9/m | 231.49 | |
| 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene | 16.134 | 142 | 42/542III | 229.02 | |
| 10) I-Methyinaphthalene | 10.400 | 156 | 399004III | 231.00 | |
| 12) 1,6,7-Trimethylnaphtha | 21 065 | 170 | 373573m | 223.01 | |
| 13) C2-Naphthalenes | 0.000 | 1/0 | 0 | 240.75 N.D. | 5 |
| 14) C3-Naphthalenes | 0.000 | | 0 | | |
| 15) C4-Naphthalenes | 0.000 | | 0 | N.D. | <u>.</u> |
| 16) Benzothiophene | 14.045 | 134 | 553128m | 228.83 | |
| 17) Cl-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 20) C4-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 22) Biphenyl | 17.694 | 154 | 563619m | 222.05 | |
| 23) Acenaphthylene | 19.170 | 152 | 642505m | 222.17 | |
| 24) Acenaphthene | 19.755 | 154 | 394180m | 238.80 | |
| 25) Dibenzofuran | 20.368 | 168 | 629118m | | |
| 26) Fluorene | 21.538 | 166 | 504405m | 227.44 | |
| 27) 1-Methylfluorene | 23.506 | 180 | 317524m | 217.04 | 3 |
| 28) C1-Fluorenes | 0.000 | | 0 | N.D. | |
| 29) C2-Fluorenes | 0.000 | | 0 | N.D. | |
| 30) C3-Fluorenes 33) Carbazole | 0.000 | 167 | 0 560007m | N.D. 186.11 | u |
| 33) Carbazole 34) Dibenzothiophene | 25.583 24.406 | 184 | 663814m | 203.16 | |
| 35) 4-Methyldibenzothiophene | 24.406 | 198 | 610349m | 203.16 | |
| 36) 2/3-Methyldibenzothiop | 0.000 | 170 | 01034911 | 229.09 N.D. | |
| 37) 1-Methyldibenzothiophene | 0.000 | | 0 | N.D. | d |
| 38) C2-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 39) C3-Dibenzothiophenes | 0.000 | | õ | N.D. | |
| 40) C4-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 41) Phenanthrene | 24.821 | 178 | 823963m | 208.45 | 1228 |
| 42) Anthracene | 24.995 | 178 | 770673m | 210.24 | |
| | | | | | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057N.D Acq On : 18 Aug 2013 3:30 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 38 Sample Multiplier: 1 Quant Time: Aug 22 11:30:30 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration
 Compound
 R.T. QIon
 Response
 Conc Units

 43)
 3-Methylphenanthrene
 0.000
 0
 N.D. d

 44)
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 45)
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 46)
 4/9-Methylphenanthrene
 26.934
 192
 5759427
 235.20

 48)
 3.6-Dimethylphenanthrene
 26.934
 192
 5759427
 235.20

 48)
 3.6-Dimethylphenanthrene
 26.934
 192
 5759427
 235.20

 49)
 Retene
 30.708
 234
 188475m
 162.47

 50)
 C2-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 51)
 C3-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 51)
 C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 52)
 Pyrene
 29.704
 202
 994715m
 214.83

 53)
 Pyrene
 29.704
 202
 994715m
 214.83

 51)
 < Compound R.T. QION Response Conc Units Dev(Min) -----87) Benzo(g,h,i)perylene44.516276612027m165.2889) Perylene38.774252867182m253.16 89) Perylene 91) C20-TAS

 89)
 Perylene
 38.774
 252
 867182m
 253.16

 91)
 C20-TAS
 0.000
 0
 N.D. d

 92)
 C21-TAS
 0.000
 0
 N.D. d

 93)
 C26(20S)-TAS
 0.000
 0
 N.D. d

 94)
 C26(20R)/C27(20S)-TAS
 39.395
 231
 995281m
 263.74

 95)
 C28(20S)-TAS
 0.000
 0
 N.D. d

 96)
 C27(20R)-TAS
 0.000
 0
 N.D. d

 97)
 C28(20R)-TAS
 0.000
 0
 N.D. d

Data Path : C:\GCMS7\MS70057\ Data File : MS70057N.D Acq On : 18 Aug 2013 3:30 pm Operator : YM Sample : AR-WKCC-250-038 Misc : ALS Vial : 38 Sample Multiplier: 1 Quant Time: Aug 22 11:30:30 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) (#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : C:\GCMS7\MS70057\ Data File : MS70057N.D Acq On : 18 Aug 2013 3:30 pm Operator : YM Sample : AR-WKCC-250-038 Misc : AR-WKCC-250-038 Misc : 38 Sample Multiplier: 1 Quant Time: Aug 22 11:30:30 2013

Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| Abundance | 600000 | 550000 | 500000 | 450000 | 400000 | 350000 | 300000 | 250000 | 20000 | 150000 | 100000 | 50000 | |
|-------------------------|----------------|--|---|----------------|------------------|--------------------------|------------------------|-------------------------|---------|------------|-----------|-------|-----------|
| | | | | | | | | | | | ans Decal | - | |
| | | | | | T,enele | suludəh B ^u ğ | BAGBANAST | 88 _N — | | | | | _ |
| | | | | | T,ens | elertirdenh T,enele | utudeuiva (diem-S | I9M-1 | | | | | |
| | | | lynshqia Menthqenly | /dtemiQ-8 | | | | | | | | | _ |
| | | | anahthen | T,ən | anaphthyle | - Ace 2,01b-9n | ə qiqdeuə : | ₩ <u> </u> | | | | | |
| ler | lertingenlynte | mhT-7,8,1 | 728 | | T,nenuto | | norene-d1 | 13 | | | | | |
| | | T,eneroul | | 95 - XII: 1663 | | | | | _ | | | | |
| | T.en | липенад | | пшқизәМ∙ | | nthrene-d T | anariqoid: | Dipenzol | | | | - | |
| | | Phenetrother Shereotion Shereotion | | | | | | T, elozedie. | - Ci | | | | |
| | T,ənə | ylbrenanth | | Gusuppro | nqqiydi9miC | 1-9.5 | | | | | | | 3 |
| | | | TISABASAT | | ud (| | Fluoranth | | | | | | - Martin |
| | | | I princif . | | Inoranthen | Rethyffl | T,9 | T,enetero (b)fluoren | genzo | | | | |
| TIC: I | | | | | | | | | | | | | 7 |
| MS700 | T,enecenet | ie Grift Hegin | engri thene | Chryse | | | | | S | ,enslord). | H(d)2 | | |
| TIC: MS70057N.D\data.ms | | | | | | | | | | | |) | \langle |
| O\data. | | | T,9i | upranther | ia <i>nana</i> a | nll((¦,≯)oz∩ | 98 | | | | | | |
| sm | | | /CS2(S02) -Sizeue- (a) b) b) CS02) C | | | T.enery | d(ə)ozuə g | | | | | | |
| | | | () | () | | | | | | | | 4 | |
| | | | | | | | | | T,ensqo | C30-H9 | | | |
| | | | | Г | ้คนอวธานานี้ | | | i'q'6)ozuəj əpuj | | | | | |
| | | | | | | 111 | 1011010-01 | 4.46) | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Data File Name MS70057H.D Data File Path C:\GCMS7\MS70057\ Operator YM Date Acquired 8/17/2013 5:14 Acq. Method File PAH-2012.M Sample Name AR-WKISSU-250-002 Misc Info 0 Instrument Name GCMSD Vial Number 8 Sample Multiplier 1

Sample Amount 0

Surrogate/Internal Multiplier Factor: 1.00 AR-WKSU-2500-001: (ng/mL) Naphthalene-d8 250.125 Accenaphthene-d10 250.163 Phenanthrene-d10 250.194 Chrysene-d12 250.038 Perylene-d12 250.031 5(b)H-Cholane 250.000

Copy data below to Spread Sheet

MS70057H.D AR-WKISSU-250-002 8/17/2013 PAH-2012.M 1

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--|--|----------|-----------------|---------------|------------------|
| | | (minute) | (area) | | Concentration |
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 4) | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 5) | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 6) | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 7) | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 8) | Naphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 9)+10) | C1-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 13) | C2-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 14) | C3-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 100000 | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthylene | 0.00 | 0 | 0.0000 | 0.0000 |
| 100000 COLORS | Acenaphthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1. | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 5.3.72 | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2000 5 | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| | Anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Phenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| a service of the second second by the | C1-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 10/201 | C2-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 23 | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 2 - S - S - S - S - S - S - S - S - S - | Pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 2 (CD) | C1-Fluoranthenes/Pyrenes C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 7.53.V32 | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 0.0000 |
| 1.02 Sec. | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| States | Benz(a)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Chrysene/Triphenylene | 0.00 | õ | 0.0000 | 0.0000 |
| Provide and Provide an | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 053345 | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| NY 1625 | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(k,j)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.0 M M M | Benzo(e)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Perylene | 0.00 | 0 | 0.0000 | 0.0000 |
| 5 C () () | Indeno(1,2,3-c,d)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzo(a,h)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 84) | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 87) | Benzo(g,h,i)perylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|------------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 10) | 1-Methylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 36) | 2/3-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 37) | 1-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 2012 | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.000 | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1.1. | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1 | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| St. 199 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | 244,5587 | | | |
| 21 | Naphthalene-d8 | 13.82 | 654690 | 233.04 | 93.17 |
| | Acenaphthene-d10 | 19.67 | 367053 | 227.27 | 90.85 |
| | Phenanthrene-d10 | 24.75 | 671146 | 210.43 | 84.11 |
| | Chrysene-d12 | 33.81 | 835802 | 239.41 | 95.75 |
| | Pervlene-d12 | 38.70 | 908839 | 229.74 | 91.88 |
| | 5(b)H-Cholane | 34.24 | 150836 | 227.02 | 90.81 |
| 501 | Internal Standards | | | | |
| 11 | Fluorene-d10 | 21.46 | 416777 | 251.05 | |
| | Pyrene-d10 | 29.63 | 791643 | 250.63 | |
| 0.00 | Benzo(a)pyrene-d12 | 38.39 | 838710 | 250.33 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : MS70057H.D Acq On : 17 Aug 2013 5:14 am Operator : YM Sample : AR-WKISSU-250-002 Misc . ALS Vial : 8 Sample Multiplier: 1 Quant Time: Aug 17 22:41:52 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QION Response Conc Units Dev(Min) Compound Internal Standards21.455176416777m251.050.0031) Pyrene-d1029.635212791643m250.630.0073) Benzo(a)pyrene-d1238.387264838710m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136654690m233.040.0021) Acenaphthene-d1019.672164367053m227.270.0032) Phenanthrene-d1024.752188671146m210.430.0066) Chrysene-d1233.809240835802m239.41-0.0488) Perylene-d1238.697264908839m229.740.0090) 5 (b)H-Cholane34.236217150836m227.020.00
 90)
 5(b)H-Cholane
 34.236
 217
 150836m
 227.02

 Target Compounds
 3)
 cis/trans Decalin
 0.000
 0
 N.D. d

 3)
 cis/trans Decalins
 0.000
 0
 N.D. d

 5)
 C2-Decalins
 0.000
 0
 N.D. d

 6)
 C3-Decalins
 0.000
 0
 N.D. d

 7)
 C4-Decalins
 0.000
 0
 N.D. d

 8)
 Naphthalene
 0.000
 0
 N.D. d

 9)
 2-Methylnaphthalene
 0.000
 0
 N.D. d

 11)
 2,6-Dimethylnaphthalene
 0.000
 0
 N.D. d

 13)
 C2-Naphthalenes
 0.000
 0
 N.D. d

 14)
 C3-Naphthalenes
 0.000
 0
 N.D. d

 15)
 C4-Naphthalenes
 0.000
 0
 N.D. d

 16)
 Benzothiophenes
 0.000
 0
 N.D. d

 17)
 C1-Benzothiophenes
 0.000
 0
 N.D. d

 20)
 <td Ovalue

Data Path : C:\msdchem\2\data\MS70057\ Data File : MS70057H.D Acq On : 17 Aug 2013 5:14 am Operator : YM Sample : AR-WKISSU-250-002 : Misc ALS Vial : 8 Sample Multiplier: 1 Quant Time: Aug 17 22:41:52 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration
 Compound
 R.T. QION Response Conc Units

 441
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 451
 C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 521
 C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 521
 C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 521
 C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 531
 Naphthobenzothiophenes
 0.000
 0
 N.D. d

 541
 C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 591
 Pyrene
 0.000
 0
 N.D. d

 612
 C1-Fluoranthenes/Pyrenes< R.T. QIon Response Conc Units Dev(Min) Compound Data Path : C:\msdchem\2\data\MS70057\ Data File : MS70057H.D Acq On : 17 Aug 2013 5:14 am Operator : YM Sample : AR-WKISSU-250-002 Misc : ALS Vial : 8 Sample Multiplier: 1 Quant Time: Aug 17 22:41:52 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

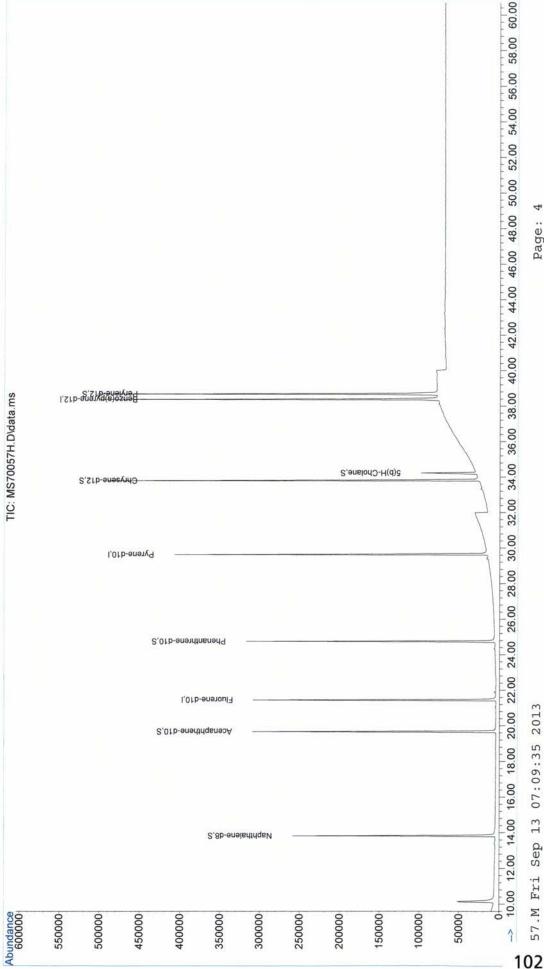
(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:09:33 2013

(QT Reviewed) Quantitation Report

C:\msdchem\2\data\MS70057\ Sample Multiplier: 1 am 5:14 AR-WKISSU-250-002 17 Aug 2013 MS70057H.D WЖ ω •• ... •• •• Data File Data Path Operator ALS Vial Acq On Sample Misc

: PAH Calibration Table-2013A Quant Method : C:\GCMS7\MS70057\AR70057.M QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Quant Time: Aug 17 22:41:52 2013 Title Quant



Page:

| Data File Name | MS70057K.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|----------------------|---------------------------------------|---------|-------|
| Data File Path | C:\GCM57\M570057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/17/2013 8:39 | Acenaphthene-d10 | 250.163 | C |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | t |
| Sample Name | AR-SRM2779-WK4.0-002 | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | AR-SI |
| Vial Number | 11 | | | |
| Sample Multiplier | 0.24461 | | | |
| Sample Amount | 0 | | | |

Copy data below to Spread Sheet

MS70057K.D R-SRM2779-WK4.0-002 8/17/2013 PAH-2012.M 4.088140305

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---|--|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | 607.0100 | Concentration |
| 575 S. | cis/trans Decalin | 11.18 | 1763180 | 607.0413 | 695.6610 |
| 2013 C | C1-Decalins | 12.68 | 2514950 | 865.8705 | 992.2756 |
| | C2-Decalins | 13.74 | 2095520 | 721.4625 | 826.7861 |
| | C3-Decalins | 16.69 | 1823180 | 627.7011 | 719.3368 |
| 7) | C4-Decalins | 17.72 | 1278740 | 440.2540 | 504.5250 |
| 8) | Naphthalene | 13.88 | 11438200 | 604.8692 | 693.1717 |
| 9)+10) | C1-Naphthalenes | 16.30 | 23672400 | 1251.8320 | 1434.5822 |
| 13) | C2-Naphthalenes | 18.50 | 28742400 | 1519.9454 | 1741.8364 |
| 14) | C3-Naphthalenes | 20.51 | 19491000 | 1030.7132 | 1181.1831 |
| 15) | C4-Naphthalenes | 22.82 | 9969700 | 527.2128 | 604.1786 |
| | Benzothiophene | 14.07 | 99944 | 6.4776 | 7.4233 |
| | C1-Benzothiophenes | 15.63 | 377192 | 24.4468 | 28.0157 |
| | C2-Benzothiophenes | 18.25 | 280829 | 18.2012 | 20.8584 |
| 1.1.1 | C3-Benzothiophenes | 20.31 | 462538 | 29.9782 | 34.3546 |
| 5 15 7 5 F | C4-Benzothiophenes | 22.10 | 329962 | 21.3857 | 24.5077 |
| Contraction of the second s | 이렇게 집 것 같아? 집 것 같아? 가 가 귀 가 봐요? 그 가 가 가 가 가 가 가 가 가 가 가 가 가 가 가 가 가 가 | 17.69 | 2114940 | 130.5371 | 149.5937 |
| | Biphenyl | 19.17 | 135204 | 7.3244 | 8.3937 |
| | Acenaphthylene | | | | |
| | Acenaphthene | 19.78 | 158467 | 15.0400 | 17.2356 |
| 2022 | Dibenzofuran | 20.37 | 446182 | 24.8900 | 28.5236 |
| | Fluorene | 21.54 | 1216040 | 85.9014 | 98.4418 |
| - 10 March 10 | C1-Fluorenes | 23.51 | 3211780 | 226.8812 | 260.0027 |
| | C2-Fluorenes | 25.34 | 4513390 | 318.8271 | 365.3715 |
| 30) | C3-Fluorenes | 26.83 | 3134730 | 221.4383 | 253.7653 |
| 33) | Carbazole | 25.58 | 47724 | 2.5572 | 2.9305 |
| 42) | Anthracene | 24.99 | 53835 | 2.3679 | 2.7136 |
| 41) | Phenanthrene | 24.82 | 4591350 | 187.2803 | 214.6206 |
| 3)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 26.72 | 10038886 | 409.4842 | 469.2632 |
| | C2-Phenanthrenes/Anthracenes | 28.39 | 10539300 | 429.8947 | 492.6534 |
| | C3-Phenanthrenes/Anthracenes | 29.95 | 7933060 | 323.5872 | 370.8265 |
| | C4-Phenanthrenes/Anthracenes | 31.78 | 4871420 | 198.7043 | 227.7124 |
| - 175 A. | | | | | |
| | Dibenzothiophene | 24.41 | 750956 | 37.0552 | 42.4648 |
| | C1-Dibenzothiophenes | 26.21 | 2134767 | 105.3381 | 120.7160 |
| | C2-Dibenzothiophenes | 27.31 | 2714820 | 133.9607 | 153.5171 |
| 39) | C3-Dibenzothiophenes | 28.80 | 2156390 | 106.4054 | 121.9391 |
| 40) | C4-Dibenzothiophenes | 29.81 | 814304 | 40.1811 | 46.0470 |
| 58) | Fluoranthene | 28.94 | 92303 | 4.1761 | 4.7857 |
| 59) | Pyrene | 29.70 | 291827 | 10.1616 | 11.6451 |
| 62) | C1-Fluoranthenes/Pyrenes | 30.85 | 1557090 | 70.4477 | 80.7321 |
| 63) | C2-Fluoranthenes/Pyrenes | 32.33 | 3292160 | 148.9474 | 170.6917 |
| 64) | C3-Fluoranthenes/Pyrenes | 34.00 | 2270330 | 102.7171 | 117.7124 |
| 1221.020 | C4-Fluoranthenes/Pyrenes | 35.17 | 2403050 | 108.7216 | 124.5934 |
| | Naphthobenzothiophene | 32.96 | 635864 | 25.1109 | 28.7768 |
| | C1-Naphthobenzothiophenes | 34.12 | 1081000 | 42.6896 | 48.9217 |
| 5252763 | 한 건가 잘 많은 것이 같은 것을 알려야 하는 것이 가지 않는 것을 알려야 한다. 이번 사람이 있는 것이 같은 것이 없는 것이 없 않는 것이 없는 것이 않는 것이 없는 것이 없 않는 것이 없는 것이 없 않는 것이 없는 것이 없 않 않이 않이 않이 않이 않 않 않이 않이 않 않이 않이 않 않 않이 않이 | 36.02 | 1495470 | 59.0574 | 67.6790 |
| | C2-Naphthobenzothiophenes | | 991128 | 39.1405 | 44.8545 |
| | C3-Naphthobenzothiophenes | 37.18 | | | |
| | C4-Naphthobenzothiophenes | 38.19 | 416596 | 16.4517 | 18.8535 |
| 250.00 | Benz(a)anthracene | 33.77 | 138412 | 5.3082 | 6.0831 |
| 112260 | Chrysene/Triphenylene | 33.89 | 777990 | 35.2395 | 40.3840 |
| 69) | C1-Chrysenes | 35.13 | 2101670 | 95.1961 | 109.0934 |
| 70) | C2-Chrysenes | 36.60 | 2643280 | 119.7285 | 137.2072 |
| 71) | C3-Chrysenes | 38.00 | 1853290 | 83.9455 | 96.2004 |
| 72) | C4-Chrysenes | 39.43 | 961100 | 43.5335 | 49.8888 |
| 77) | Benzo(b)fluoranthene | 37.30 | 112367 | 3.7907 | 4.3441 |
| | Benzo(k,j)fluoranthene | 37.34 | 27180 | 1.2041 | 1.3798 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 5-0-5-5 C | Benzo(e)pyrene | 38.31 | 208507 | 7.6350 | 8.7496 |
| | Benzo(a)pyrene | 38.46 | 47640 | 1.7763 | 2.0356 |
| | Perviene | 38.70 | 22879 | 0.8376 | 0.9599 |
| C22C024 | | 43.19 | 18803 | 0.5562 | 0.6374 |
| | Indeno(1,2,3-c,d)pyrene | | | | |
| | Dibenzo(a,h)anthracene | 43.23 | 17066 | 0.6292 | 0.7210 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20140 Mile | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.51 | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(g,h,i)perylene | 44.55 | 40943 | 1.3866 | 1.5890 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | 11-11-1 | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 14668500 | 1230.9998 | 1410.7088 |
| 10) | 1-Methylnaphthalene | 16.47 | 9003900 | 817.9685 | 937.3806 |
| 11) | 2,6-Dimethylnaphthalene | 18.22 | 8065010 | 721.1274 | 826.4021 |
| 12) | 1,6,7-Trimethylnaphthalene | 21.06 | 2088010 | 210.8093 | 241.5846 |
| 27) | 1-Methylfluorene | 23.51 | 1650250 | 176.7156 | 202.5136 |
| 35) | 4-Methyldibenzothiophene | 25.89 | 1212250 | 73.3617 | 84.0715 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 568408 | 34.3985 | 39.4202 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 354109 | 21.4297 | 24.5581 |
| 43) | 3-Methylphenanthrene | 26.48 | 2439670 | 160.6356 | 184.0862 |
| 44) | 2-Methylphenanthrene | 26.59 | 2566980 | 169.0184 | 193.6928 |
| 45) | 2-Methylanthracene | 26.73 | 200056 | 13.1723 | 15.0953 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 2949410 | 194.1991 | 222.5494 |
| 47) | 1-Methylphenanthrene | 26.93 | 1882770 | 123.9681 | 142.0657 |
| 48) | 3,6-Dimethylphenanthrene | 28.04 | 752055 | 57.5443 | 65.9449 |
| 49) | Retene | 30.74 | 73801 | 10.2573 | 11.7547 |
| 60) | 2-Methylfluoranthene | 30.47 | 80456 | 4.4030 | 5.0458 |
| 61) | Benzo(b)fluorene | 31.09 | 192338 | 12.4640 | 14.2836 |
| 74) | C29-Hopane | 40.76 | 160487 | 20.2875 | 23.2492 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 42.05 | 321944 | 40.6977 | 46.6390 |
| 91) | C20-TAS | 33.34 | 192973 | 6.4131 | 7.3493 |
| | C21-TAS | 34.43 | 200214 | 6.6537 | 7.6250 |
| 93) | C26(20S)-TAS | 38.54 | 90772 | 3.0166 | 3.4570 |
| 94) | C26(20R)/C27(20S)-TAS | 39.47 | 320275 | 10.6437 | 12.1975 |
| 95) | C28(20S)-TAS | 40.24 | 226916 | 7.5411 | 8.6420 |
| | C27(20R)-TAS | 40.68 | 194237 | 6.4551 | 7.3974 |
| | C28(20R)-TAS | 41.49 | 21156 | 0.7031 | 0.8057 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 904559 | 53.39 | 87.26 |
| | Acenaphthene-d10 | 19.67 | 587823 | 60.35 | 98.62 |
| 32) | Phenanthrene-d10 | 24.75 | 1046520 | 53.40 | 87.26 |
| 66) | Chrysene-d12 | 33.81 | 1188150 | 55.39 | 90.57 |
| 10000 | Pervlene-d12 | 38.70 | 1414500 | 56.21 | 91.91 |
| 90) | 5(b)H-Cholane | 34.24 | 302037 | 71.46 | 116.86 |
| 10 | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 614846 | 61.41 | |
| 1000 | Pyrene-d10 | 29.63 | 1189790 | 61.31 | |
| 10000 | Benzo(a)pyrene-d12 | 38.39 | 1305020 | 61.23 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : MS70057K.D Acq On : 17 Aug 2013 8:39 am Operator : YM Sample : AR-SRM2779-WK4.0-002 Misc : ALS Vial : 11 Sample Multiplier: 0.24461 Quant Time: Aug 22 11:50:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QION Response Conc Units Dev(Min) Compound Internal Standards21.455176614846m251.050.0031) Pyrene-d1029.6352121189790m250.630.0073) Benzo(a)pyrene-d1238.3862641305016m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136904559m53.390.0021) Acenaphthene-d1019.672164587823m60.350.0032) Phenanthrene-d1024.7521881046517m53.400.0066) Chrysene-d1233.8092401188150m55.39-0.0488) Perylene-d1238.6972641414497m56.210.0090) 5 (b)H-Cholane34.235217302037m71.460.00 Target Compounds Qvalue Iarget Compounds3) cis/trans Decalin11.1761381763180m607.044) C1-Decalins12.6801522514954m865.875) C2-Decalins13.7381662095516m721.466) C3-Decalins16.6911801823184m627.707) C4-Decalins17.7221941278738m440.258) Naphthalene13.87812811438185m604.879) 2-Methylnaphthalene16.13414214668514m1231.0010) 1-Methylnaphthalene16.4681429003899m817.9711) 2, 6-Dimethylnaphthalene18.2231568065011m721.1312) 1, 6, 7-Trimethylnaphtha...21.0651702088005m210.8113) C2-Naphthalenes18.50215628742417m151995 11)2,6-Dimethylnaphthalene18.221363063011m721.1312)1,6,7-Trimethylnaphtha...21.0651702088005m210.8113)C2-Naphthalenes18.50215628742417m1519.9514)C3-Naphthalenes20.50817019490955m1030.7115)C4-Naphthalenes22.8201849969700m527.2116)Benzothiophene14.07313499944m6.4817)C1-Benzothiophenes15.633148377192m24.4518)C2-Benzothiophenes18.251162280829m18.2019)C3-Benzothiophenes20.313176462538m29.9820)C4-Benzothiophenes22.096190329962m21.3922)Biphenyl17.6941542114935m130.5423)Acenaphthylene19.171152135204m7.3224)Acenaphthene19.783154158467m15.0425)Dibenzofuran20.3681661216039m85.9027)1-Methylfluorene23.5061803211782m226.8829)C2-Fluorenes25.3411944513387m318.8330)C3-Fluorenes26.8302083134733m221.4433)Carbazole25.58316747724m2.5634)Dibenzothiophene24.406184750956m37.0635)4-Methyldibenzothiophene26.207198<t 36) 2/3-Methyldibenzothiop... 26.207 198 568408m 34.40 36)2/3-Methyldibenzothiop...26.207198568408m34.4037)1-Methyldibenzothiophene26.518198354109m21.4338)C2-Dibenzothiophenes27.3152122714823m133.9639)C3-Dibenzothiophenes28.8042262156393m106.4140)C4-Dibenzothiophenes29.808240814304m40.1841)Phenanthrene24.8211784591346m187.2842)Anthracene24.99517853835m2.3743)3-Methylphenanthrene26.4841922439665m160.64

| Data Path : C:\msdchem\2\data\MS70057\ Data File : MS70057K.D Acq On : 17 Aug 2013 8:39 am Operator : YM Sample : AR-SRM2779-WK4.0-002 Misc : ALS Vial : 11 Sample Multiplier: 0.24461 Quant Time: Aug 22 11:50:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration | | | | | | | | | | |
|---|------------------|------------|---------------------|--------------------|---|--|--|--|--|--|
| Compound | | | | Conc Units Dev(Min |) | | | | | |
| (A) 2 Mothylphoponthropo | | | | 1.00.00 | - | | | | | |
| 44) 2-Methylphenanthrene | 26.587 | 192 | 200056m | 13 17 | | | | | | |
| 45) 2-Methylanthracene46) 4/9-Methylphenanthrene | 26.864 | 192 | 2949410m | 194.20 | | | | | | |
| 47) 1-Methylphenanthrene | 26.934 | 192 | 1882772m | 123.97 | | | | | | |
| 47) 1-Methylphenanthrene48) 3,6-Dimethylphenanthrene | 28.042 | 206 | 752055m | 57.54 | | | | | | |
| 49) Retene | 30.743 | 234 | 73801m | 10.26 | | | | | | |
| 50) C2-Phenanthrenes/Anthr | 28.388 | 206 | 10539259m | 429.89 | | | | | | |
| 51) C3-Phenanthrenes/Anthr | | | | | | | | | | |
| 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene | 31.782 | 234 | 4871416m | 198.70 | | | | | | |
| 54) C1-Naphthobenzothiophenes | 32.955 | 234 | 1081001m | 25.11 42 69 | | | | | | |
| 55) C2-Naphthobenzothiophenes | | | | | | | | | | |
| 56) C3-Naphthobenzothiophenes | 37.184 | 276 | 991128m | 39.14 | | | | | | |
| 57) C4-Naphthobenzothiophenes | 38.192 | 290 | 416596m | 16.45 | | | | | | |
| 56) C3-Naphthobenzothiophenes 57) C4-Naphthobenzothiophenes 58) Fluoranthene | 28.942 | 202 | 92303m | 4.18 | | | | | | |
| 59) Pyrene | 29.704 | 202 | 291827m | 10.16 | | | | | | |
| 60) 2-Methylfluoranthene | 30.466 | 216 | 80456m 192338m | 4.40 | | | | | | |
| 61) Benzo(b)fluorene | 31.089 | 216 | 192338m | 12.46 | | | | | | |
| 62) C1-Fluoranthenes/Pyrenes | | | | | | | | | | |
| 63) C2-Fluoranthenes/Pyrenes | 32.334 | 230 | 3292157m | 148.95 | | | | | | |
| 64) C3-Fluoranthenes/Pyrenes65) C4-Fluoranthenes/Pyrenes67) Benz(a)anthracene | 34.003 | 244 | 2270334m | 102.72 | | | | | | |
| 67) Benz(a) anthracene | 33.770 | 228 | 2403049m 138412m | 5.31 | | | | | | |
| 68) Chrysene/Triphenylene | 33.886 | 228 | 777990m | 35 24 | | | | | | |
| 69) C1-Chrysenes | | | 2101672m | | | | | | | |
| 70) C2-Chrysenes | 36.602 | 256 | | | | | | | | |
| 71) C3-Chrysenes | 37.998 | 270 | 1853289m | 83.95 | | | | | | |
| 72) C4-Chrysenes | 39.434 | 284 | 961100m | 43.53 | | | | | | |
| 74) C29-Hopane | 40.755 | 191 | 160487m | 20.29 | | | | | | |
| 75) 18a-Oleanane | 0.000 | 1.01 | 0 | N.D. d | | | | | | |
| 76) C30-Hopane77) Benzo(b)fluoranthene | 42.046 | 191 | 321944m | 40.70 | | | | | | |
| 78) Benzo(k, j)fluoranthene | 37.300 37.339 | 252 252 | 112367m 27180m | 3.79 1.20 | | | | | | |
| 79) Benzo(a)fluoranthene | 0.000 | 494 | 0 | N.D. d | | | | | | |
| 80) Benzo(e)pyrene | 38.309 | 252 | 208507m | 7.63 | | | | | | |
| 81) Benzo(a)pyrene | 38.464 | 252 | 47640m | 1.78 | | | | | | |
| 82) Indeno(1,2,3-c,d)pyrene | 43.188 | 276 | 18803m | 0.56 | | | | | | |
| 83) Dibenzo(a,h)anthracene | 43.225 | 278 | 17066m | 0.63 | | | | | | |
| 84) Cl-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d | | | | | | |
| 85) C2-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d | | | | | | |
| 86) C3-Dibenzo(a,h)anthrac | 0.000 | 0.7.6 | 0 | N.D. d | | | | | | |
| 87) Benzo(g,h,i)perylene 89) Perylene | 44.553 | 276 | 40943m | 1.39 | | | | | | |
| 91) C20-TAS | 38.697 33.343 | 252 231 | 22879m 192973m | 0.84 | | | | | | |
| 92) C21-TAS | 33.343 | 231 | 200214m | 6.41 6.65 | | | | | | |
| 93) C26(20S)-TAS | 38.542 | 231 | 90772m | 3.02 | | | | | | |
| 94) C26(20R)/C27(20S)-TAS | 39.473 | 231 | 320275m | 10.64 | | | | | | |
| 95) C28(20S)-TAS | 40.239 | 231 | 226916m | 7.54 | | | | | | |
| 96) C27(20R)-TAS | 40.681 | 231 | 194237m | 6.46 | | | | | | |
| 97) C28(20R)-TAS | 41.492 | 231 | 21156m | 0.70 | | | | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : MS70057K.D Acq On : 17 Aug 2013 8:39 am Operator : YM Sample : AR-SRM2779-WK4.0-002 Misc : ALS Vial : 11 Sample Multiplier: 0.24461 Quant Time: Aug 22 11:50:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Sample Multiplier: 0.24461 C:\msdchem\2\data\MS70057\ 8:39 am AR-SRM2779-WK4.0-002 : 17 Aug 2013 : YM : MS70057K.D : 11 •• ••• Data File Data Path Operator ALS Vial Acq On Sample Misc

Quant Time: Aug 22 11:50:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| bundance | 1.3e+07 | 1.2e+07 | 1.1e+07- | 1e+07- | 0000006 | 8000000 | 700000 | 600000 | 500000 | 400000 | 300000 | 200000 | 1000000 | 70 |
|-------------------------|---------|------------|-----------|-----------|---------------|--|---------------|-----------------|-----------------------------------|--|--|---|---------|------------|
| | | | | | | | | | | | T,nil | ecel suer | cis/ | JA. |
| | | | | | | | T,eneledt | HOEN | | | | l-Decalins, Decalins | | MANNAN ANA |
| | | | | | | | 1 91000 | udav | | | | ananqointo anqointozn | 52.0 | "Indution" |
| | T, | ənəleritid | hethyinat | -S T,9 | nəlsrindi | enlydfam- | ı — | | | | C | ecalins, un | | NUM |
| | | | | an availe | - 414 × 014 (| ALCOMPANE ALCOMP | dojetnýci (re | 8+809'Z | | | T,Iynəriqi | lu, snil s calins, u | + | MAM |
| | | | | un'seuer | annqev-: | 70 | | | | T,en s | lydidgna: 2,01b-ana | A Alsianasi | | The second |
| | | | | | | | | nD,857 T,ene | lishingen Ishingen Ishingen | C3-M | senenqoid 7 a r | C3-Bonzol | | |
| | | | | | | | | | | un 1'əu | iophenes, | t b- sonsioul horene-p | | |
| | | | | | | | | | T,eoæ | entingev-t eoefiçadek | - C-M | - | - | MIN |
| | | | | | | | | | T,enenth | Bhenai | un səuəli S'o tp-əuə L'əuəyo | oul 1-20-00 | ig - | INN |
| | | | | | | | | un'eus Ug | T,er nagenning anninenan | nanonino nano nino ni | Denzek uperzek uperzek upi upi upi upi upi upi upi upi upi upi | CS-Dipension Constraints Carbazole 2/3-Methyl 2/3-Methyl 2/3-Methyl 2/3-Dipension 2/3- | 7 | AMAN |
| | | | | | | | un'səue | oenthrace | อกอาก์ไทธก | C2-Phe rene,T | /lphenanth | (rtemid-9, | e = | 1 K. A. |
| | | | | | | | | | นก รอบอวยุ | ansouade | anition of the | 19 19 19 19 19 19 19 19 19 19 19 19 19 1 | (d - 2 | |
| | | | | | | | | | unionuor | nu, sənər | nentrene, Prenes/Py | | Mumph. | |
| TIC: I | | | | | | | | | un'se | un'səu | anes/Pyrer | Phenarthe Fluoranthe | CS- | Mund |
| TIC: MS70057K.D\data.ms | | | | | | | | | | un (สอยอยู่) | edeuro douro | nu, SAT- nu, SAT- | | MAYA |
| 057K | | | | | | | | | | un'səuə | and the second strength of the second strengt | arendo 17.2 | 0 1 | man man |
| .D\da | | | | | | | | | | | un'se | Vaphthobe | co - | man - |
| ita.m | | | | | | | | | | | | | | men |
| 6 | | | | | | | | | | | SAT-(SOC) | (80ke/#062 | C44 | here |
| | | | | | | | | | | | u | u, SAT-(20 | C52(H | 2 |
| | | | | | | | | | | | 4 | nu, SAT-(Я T, ensqo | | |
| | | | | | | | | | | | T,enene | n(hane)(el.2.))c | Dimenia | 1 |
| | | | | | | | | | | | T,en | əlynəq(i,h,g | i)ozuəg | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

10.00 12.00 14.00 16.00 18.00 20.00 22.00 24.00 26.00 28.00 30.00 32.00 34.00 36.00 38.00 40.00 42.00 48.00 50.00 52.00 54.00 56.00 58.00 60.00

1

| Data File Name | ENV3081A.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|--|---------------------------------------|---------|---------|
| Data File Path | C:\GCMS7\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/17/2013 9:48 | Acenaphthene-d10 | 250.163 | Copy da |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | to Spre |
| Sample Name | Procedural Blank | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | ENV3 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | Procedu |
| Vial Number | 12 | | | 8/17 |
| Sample Multiplier | 0.06667 | | | PAH-2 |
| | C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C-C- | | | |

Sample Amount 0

_

opy data below o Spread Sheet

ENV3081A.D Procedural Blank 8/17/2013 PAH-2012.M 14.99925004

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---------------------|------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 4) | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 5) | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 6) | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 7) | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 8) | Naphthalene | 13.88 | 3463 | 0.0783 | 0.1019 |
| 9)+10) | C1-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 13) | C2-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 14) | C3-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 18) | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 17.69 | 1651 | 0.0435 | 0.0567 |
| 23) | Acenaphthylene | 0.00 | 0 | 0.0000 | 0.0000 |
| 24) | Acenaphthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 28) | C1-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 30) | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 41) | Phenanthrene | 24.82 | 2672 | 0.0437 | 0.0569 |
| 43)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 51) | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 52) | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 34) | Dibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| (C) (C) | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.875 | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 5.54.51 P | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2012/2020 | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| Self. 2.85 | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Chrysene/Triphenylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 275.50 | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.0757 | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(k,j)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.96.75 | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Perylene | 0.00 | ō | 0.0000 | 0.0000 |
| | Indeno(1,2,3-c,d)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 53267 | Dibenzo(a,h)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2003 | C2-Dibenzo(a,h)anthracenes | 0.00 | ō | 0.0000 | 0.0000 |
| 17 Sec. 25 | C3-Dibenzo(a,h)anthracenes | 0.00 | ő | 0.0000 | 0.0000 |
| | Benzo(g,h,i)perylene | 0.00 | 0 | 0.0000 | 0.0000 |
| 07) | | | | | |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 10) | 1-Methylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 36) | 2/3-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 37) | 1-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 43) | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 45) | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 46) | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 47) | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1 | Surrogate Standards | | 2) | | |
| 2) | Naphthalene-d8 | 13.82 | 564058 | 14.23 | 85.32 |
| | Acenaphthene-d10 | 19.67 | 327906 | 14.39 | 86.26 |
| | Phenanthrene-d10 | 24.75 | 626002 | 12.81 | 76.77 |
| | Chrysene-d12 | 33.81 | 875128 | 16.36 | 98.11 |
| | Perviene-d12 | 38.70 | 892012 | 14.36 | 86.12 |
| | 5(b)H-Cholane | 34.24 | 143864 | 13.79 | 82.71 |
| | Internal Standards | | | | |
| 11 | Fluorene-d10 | 21.45 | 392122 | 16.74 | |
| | Pyrene-d10 | 29.63 | 808915 | 16.71 | |
| | Benzo(a)pyrene-d12 | 38.39 | 878300 | 16.69 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081A.D Acq On : 17 Aug 2013 9:48 am Operator : YM Sample : Procedural Blank : Misc ALS Vial : 12 Sample Multiplier: 0.06667 Quant Time: Aug 22 11:54:46 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QION Response Conc Units Dev(Min) Compound Internal Standards1) Fluorene-d1021.455176392122m251.050.0031) Pyrene-d1029.635212808915m250.630.0073) Benzo(a)pyrene-d1238.386264878300m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136564058m14.230.0021) Acenaphthene-d1019.672164327906m14.390.0032) Phenanthrene-d1024.752188626002m12.810.0066) Chrysene-d1233.809240875128m16.36-0.0488) Perylene-d1238.697264892012m14.360.0090) 5 (b)H-Cholane34.235217143864m13.780.00

 90) 5(b)H-Cholane
 34.235
 217
 143864m
 13.78

 Target Compounds
 0
 0
 N.D. d

 3) cis/trans Decalins
 0.000
 0
 N.D. d

 4) C1-Decalins
 0.000
 0
 N.D. d

 5) C2-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 11
 2,6-Dimethylnaphthalene
 0.000
 0
 N.D. d

 12) 1,6,7-Trimethylnaphthalene
 0.000
 0
 N.D. d

 13) C2-Naphthalenes
 0.000
 0
 N.D. d

 14) C3-Naphthalenes
 0.000
 0
 N.D. d

 15) C4-Naphthalenes
 0.000
 0
 N.D. d

 16) Benzothiophenes
 0.000
 0
 N.D. d

 17) C1-Benzothiophenes
 0.000
 0
 N.D. d

 20) C4-Benzothiophenes
 0.000
 0
 N.D. d

 21) benzofuran
 0.000
 0
 N.D. d

 22) Biphenyl
 17.694
 154
 1651m
 0.04

 23) Acenaphthylene
 Qvalue

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081A.D Acq On : 17 Aug 2013 Operator : YM 9:48 am Sample : Procedural Blank Misc : ALS Vial : 12 Sample Multiplier: 0.06667 Quant Time: Aug 22 11:54:46 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration
 Compound
 R.T. QION Response
 Conc Units D

 44)
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 45)
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 46)
 4/9-Methylphenanthrene
 0.000
 0
 N.D. d

 47)
 1-Methylphenanthrene
 0.000
 0
 N.D. d

 48)
 3.6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49)
 Retene
 0.000
 0
 N.D. d

 50)
 C2-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 51)
 C3-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 52)
 C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 53)
 Naphthobenzothiophenes
 0.000
 0
 N.D. d

 54)
 C1-Asphthobenzothiophenes
 0.000
 0
 N.D. d

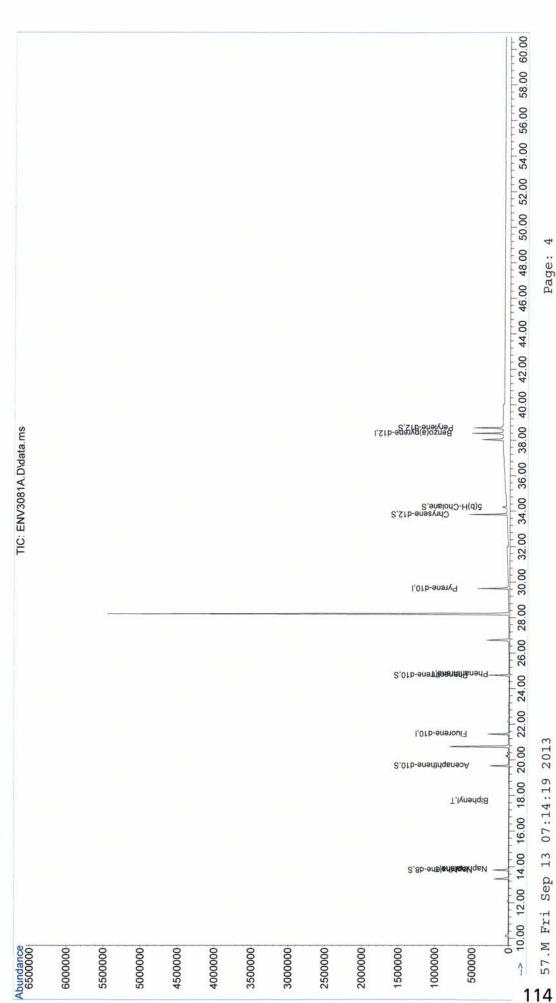
 52)
 C4-Pheynthobenzothiophenes
 0.000
 0
 N.D. d

 56)
 C3-Methylfluoranthene
 0.000
 0
 N.D. d

 61)
 <t Compound R.T. QIon Response Conc Units Dev(Min)

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081A.D Acq On : 17 Aug 2013 9:48 am Operator : YM Sample : Procedural Blank Misc : ALS Vial : 12 Sample Multiplier: 0.06667 Quant Time: Aug 22 11:54:46 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration (#) = qualifier out of range (m) = manual integration (+) = signals summed (QT Reviewed) Quantitation Report

Sample Multiplier: 0.06667 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration C:\msdchem\2\data\MS70057\ 9:48 am Quant Time: Aug 22 11:54:46 2013 Procedural Blank 17 Aug 2013 ENV3081A.D MX 12 QLast Update ... •• •• .. Data Path Data File Operator ALS Vial Acq On Sample Misc



| Data File Name | ENV3081B.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|-------------------|---------------------------------------|---------|
| Data File Path | C:\GCMS7\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 10:57 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SRM 1941b | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 13 | | |
| Sample Multiplier | 0.25 | | |

Sample Amount 0

Copy data below to Spread Sheet ENV3081B.D

ENV3081B.D SRM 1941b 8/17/2013 PAH-2012.M 4

| Sumple Fine and | 17 | | | | |
|--|------------------------------|-----------|--|---------------|---------------|
| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
| | | (minute) | (area) | | Concentration |
| 3) | cis/trans Decalin | 11.40 | 56913 | 27.7503 | 37.3526 |
| | C1-Decalins | 12.35 | 23717 | 11.5642 | 15.5657 |
| | C2-Decalins | 14.71 | 33044 | 16.1119 | 21.6870 |
| 2.2.2 | C3-Decalins | 17.30 | 44505 | 21.7002 | 29.2090 |
| | C4-Decalins | 17.58 | 63938 | 31.1755 | 41.9630 |
| | Naphthalene | 13.88 | 7628850 | 571.3400 | 769.0387 |
| | C1-Naphthalenes | 16.30 | 2174076 | 162.8209 | 219.1613 |
| | C2-Naphthalenes | 18.50 | 2025580 | 151.7000 | 204.1922 |
| | C3-Naphthalenes | 20.84 | 1550980 | 116.1565 | 156.3497 |
| 1978 | C4-Naphthalenes | 22.82 | 883725 | 66.1840 | 89.0854 |
| (Contra) | Benzothiophene | 14.05 | 250550 | 22.9978 | 30.9556 |
| 2653 | C1-Benzothiophenes | 16.39 | 237629 | 21.8118 | 29.3592 |
| 22077 | C2-Benzothiophenes | 17.95 | 68563 | 6.2933 | 8.4710 |
| 2020 | C3-Benzothiophenes | 20.31 | 150590 | 13.8225 | 18.6055 |
| 5.53 | C4-Benzothiophenes | 21.62 | 140013 | 12.8517 | 17.2987 |
| | Biphenyl | 17.69 | 552986 | 48.3373 | 65.0632 |
| 2574 | Acenaphthylene | 19.17 | 671916 | 51.5500 | 69.3877 |
| | Acenaphthene | 19.76 | 169764 | 22.8185 | 30.7142 |
| | Dibenzofuran | 20.37 | 767969 | 60.6723 | 81.6664 |
| 2.63 | Fluorene | 21.54 | 387697 | 38.7863 | 52.2073 |
| | C1-Fluorenes | 23.51 | 396257 | 39.6425 | 53.3599 |
| 10 C C C C C C C C C C C C C C C C C C C | C2-Fluorenes | 25.38 | 954245 | 95.4650 | 128.4984 |
| | C3-Fluorenes | 27.59 | 1299670 | 130.0218 | 175.0127 |
| | Carbazole | 25.58 | 181884 | 13.6519 | 18.3758 |
| | Anthracene | 24.99 | 2145260 | 132.1783 | 177.9154 |
| | Phenanthrene | 24.82 | 5250720 | 300.0200 | 403.8348 |
| | C1-Phenanthrenes/Anthracenes | 26.72 | 3392271 | 193.8304 | 260.9008 |
| | C2-Phenanthrenes/Anthracenes | 28.39 | 3313490 | 189.3283 | 254.8408 |
| (- S) | C3-Phenanthrenes/Anthracenes | 29.95 | 2626220 | 150.0585 | 201.9827 |
| | C4-Phenanthrenes/Anthracenes | 31.78 | 1706340 | 97.4978 | 131.2345 |
| 1. C. S. N. | Dibenzothiophene | 24.41 | 520630 | 35.9868 | 48.4391 |
| and a second | C1-Dibenzothiophenes | 26.20 | 736884 | 50.9346 | 68.5593 |
| | C2-Dibenzothiophenes | 27.63 | 1141870 | 78.9280 | 106.2392 |
| 12/3 | C3-Dibenzothiophenes | 28.80 | 1326520 | 91.6908 | 123.4182 |
| | C4-Dibenzothiophenes | 30.67 | 596660 | 41.2420 | 55.5128 |
| | Fluoranthene | 28.94 | 8085210 | 512.4150 | 689.7241 |
| 7.085 | Pyrene | 29.70 | 7959400 | 388.2350 | 522.5746 |
| | C1-Fluoranthenes/Pyrenes | 30.85 | 4715230 | 298.8350 | 402.2398 |
| | C2-Fluoranthenes/Pyrenes | 32.57 | 4972310 | 315.1300 | 424.1733 |
| S.S.A. | C3-Fluoranthenes/Pyrenes | 33.85 | 2233300 | 141.5393 | 190.5156 |
| | C4-Fluoranthenes/Pyrenes | 35.32 | 2007730 | 127.2435 | 171.2731 |
| 1.2235 | Naphthobenzothiophene | 32.96 | 2030660 | 112.3338 | 151.2042 |
| | C1-Naphthobenzothiophenes | 34.12 | 1742590 | 96.3983 | 129.7546 |
| | C2-Naphthobenzothiophenes | 35.83 | 1588840 | 87.8930 | 118.3063 |
| | C3-Naphthobenzothiophenes | 36.91 | 1157440 | 64.0283 | 86.1837 |
| | C4-Naphthobenzothiophenes | 38.19 | 495006 | 27.3833 | 36.8586 |
| 1.1.2.2.2.1 | Benz(a)anthracene | 33.77 | 4756480 | 255.5250 | 343.9434 |
| | Chrysene/Triphenylene | 33.89 | 5043310 | 319.9975 | 430.7251 |
| 5524 | C1-Chrysenes | 35.17 | 3497850 | 221.9388 | 298.7354 |
| 0.4576. | C2-Chrysenes | 36.60 | 2139930 | 135.7785 | 182.7614 |
| | C3-Chrysenes | 37.38 | 1375370 | 87.2673 | 117.4640 |
| | C4-Chrysenes | 39.43 | 808852 | 51.3218 | 69.0804 |
| | Benzo(b)fluoranthene | 37.34 | 7740260 | 383.3475 | 515.9958 |
| | Benzo(k,j)fluoranthene | 37.34 | 4923690 | 320.2125 | 431.0145 |
| | Benzo(a)fluoranthene | 37.69 | 1011010 | 65.7510 | 88.5026 |
| 1.137.54 | Benzo(e)pyrene | 38.31 | 4957180 | 266.4850 | 358.6958 |
| | Benzo(a)pyrene | 38.46 | 3718940 | 203.5738 | 274.0156 |
| 1. S. | Perylene | 38.77 | 4672740 | 251.1550 | 338.0613 |
| | Indeno(1,2,3-c,d)pyrene | 43.19 | 4986650 | 216.5690 | 291.5076 |
| | Dibenzo(a,h)anthracene | 43.23 | 1033040 | 55.9123 | 75.2594 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C2-Dibenzo(a,h)anthracenes | 0.00 | ŏ | 0.0000 | 0.0000 |
| 236 | C3-Dibenzo(a,h)anthracenes | 0.00 | ō | 0.0000 | 0.0000 |
| V235 | Benzo(g,h,i)perylene | 44.55 | 3960680 | 196.9233 | 265.0639 |
| 011 | | 100000000 | and a start of the | | |

| # | # Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 1505610 | 178.9435 | 240.8627 |
| 10) | 1-Methylnaphthalene | 16.47 | 668466 | 86.0038 | 115.7633 |
| 11) | 2,6-Dimethylnaphthalene | 18.25 | 591506 | 74.9028 | 100.8211 |
| 12) | 1,6,7-Trimethylnaphthalene | 21.07 | 166702 | 23.8359 | 32.0837 |
| 27) | 1-Methylfluorene | 23.51 | 143669 | 21.7882 | 29.3275 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 378547 | 32.0905 | 43.1947 |
| 36) | 2/3-Methyldibenzothiophene | 26.17 | 253625 | 21.5005 | 28.9402 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 104712 | 8.8767 | 11.9483 |
| 43) | 3-Methylphenanthrene | 26.48 | 839433 | 77.4240 | 104.2147 |
| 44) | 2-Methylphenanthrene | 26.59 | 844210 | 77.8645 | 104.8077 |
| 45) | 2-Methylanthracene | 26.73 | 539022 | 49.7160 | 66.9190 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 594319 | 54.8163 | 73.7841 |
| 47) | 1-Methylphenanthrene | 26.93 | 575287 | 53.0608 | 71.4212 |
| 48) | 3,6-Dimethylphenanthrene | 28.04 | 171045 | 18.3333 | 24.6771 |
| 49) | Retene | 30.71 | 87870 | 17.1076 | 23.0272 |
| 60) | 2-Methylfluoranthene | 30.47 | 661000 | 50.6725 | 68.2065 |
| 61) | Benzo(b)fluorene | 31.09 | 679549 | 61.6865 | 83.0317 |
| 74) | C29-Hopane | 40.76 | 1119110 | 207.6888 | 279.5545 |
| 75) | 18a-Oleanane | 41.82 | 283648 | 52.6405 | 70.8555 |
| 76) | C30-Hopane | 42.05 | 1493980 | 277.2575 | 373.1959 |
| 91) | C20-TAS | 33.30 | 192438 | 9.3888 | 12.6376 |
| 92) | C21-TAS | 34.39 | 69388 | 3.3854 | 4.5568 |
| 93) | C26(20S)-TAS | 38.54 | 38472 | 1.8770 | 2.5265 |
| 94) | C26(20R)/C27(20S)-TAS | 39.47 | 154613 | 7.5434 | 10.1536 |
| 95) | C28(20S)-TAS | 40.24 | 76113 | 3.7135 | 4.9984 |
| 96) | C27(20R)-TAS | 40.68 | 137735 | 6.7199 | 9.0452 |
| 97) | C28(20R)-TAS | 41.38 | 99610 | 4.8599 | 6.5415 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 544667 | 45.53 | 72.81 |
| 21) | Acenaphthene-d10 | 19.67 | 340862 | 49.56 | 79.25 |
| 32) | Phenanthrene-d10 | 24.75 | 650070 | 46.47 | 74.29 |
| 66) | Chrysene-d12 | 33.81 | 799796 | 52.23 | 83.56 |
| 88) | Perylene-d12 | 38.70 | 863474 | 50.38 | 80.59 |
| 90) | 5(b)H-Cholane | 34.24 | 156442 | 54.34 | 86.95 |
| neibð | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.46 | 443711 | 62.76 | |
| 31) | Pyrene-d10 | 29.63 | 868078 | 62.66 | |
| | Benzo(a)pyrene-d12 | 38.39 | 908512 | 62.58 | |

| | 2 | | nopor | | | |
|-----------|---|------------------|---|----------------------------|------------|-----------------------------------|
| Data | Path : C:\msdchem\2\data\MS | 570057\ | | | | |
| | File : ENV3081B.D | | | | | |
| | 0n : 17 Aug 2013 10:57 a | am | | | | |
| | ator : YM | | | | | |
| | .e : SRM 1941b | | | | | |
| Misc | | | | | | |
| ALS V | Vial : 13 Sample Multipli | er: 0.25 | 5 | | | |
| | | | | | | |
| | : Time: Aug 22 12:10:32 2013 | | | | | |
| | Method : C:\GCMS7\MS70057\ | | | | | |
| | Title : PAH Calibration T | | L3A | | | |
| QLast | Update : Sat Aug 17 22:39: | 35 2013 | | | | |
| Respo | onse via : Initial Calibrati | .on | | | | |
| | 121 | | | | | 2 |
| | Compound | R.T. | Qion | Response | Conc Units | Dev(Min) |
| T | | | | | | |
| Inte | ernal Standards | 01 455 | 170 | 442711- | 051 05 | 0 00 |
| (L 21) | Fluorene-d10 Pyrene-d10 | 21.455 | 1/6 | 443/11m | 251.05 | 0.00 |
| 31) | Benzo (a) pyrene-d12 | 29.035 | 212 | 8680780 | 250.63 | 0.00 |
| 13) | Benzo (a) pyrene-diz | 30.30/ | 264 | 9085120 | 250.32 | 0.00 |
| Suct | em Monitoring Compounds | | | | | |
| 2) | Naphthalene-d8 | 13,822 | 136 | 544667m | 45.53 | 0 00 |
| 21) | Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 | 19.672 | 164 | 340862m | 49.56 | 0.00 |
| 32) | Phenanthrene-d10 | 24 752 | 188 | 650070m | 46 47 | 0.00 |
| 66) | Phenanthrene-d10 Chrysene-d12 | 33 809 | 240 | 799796m | 52 23 | -0.04 |
| 88) | Perylene-d12 | 38 697 | 264 | 863474m | 50 38 | 0.00 |
| | 5(b)H-Cholane | | | | 54.34 | |
| 207 | | 51.250 | | 100112 | | 0.00 |
| Tarq | et Compounds | | | | | Qvalue |
| 3) | cis/trans Decalin | 11.399 | 138 | 56913m | 27.75 | 2 0.0000 532,000 00.0 |
| | C1-Decalins | 12.346 | 152 | 23717m | 11.56 | |
| | C2-Decalins | 14.714 | 166 | 33044m | 16.11 | |
| 6) | C2-Decalins C3-Decalins | 14.714 17.304 | 180 | 23717m 33044m 44505m | 21.70 | |
| 7) | C4-Decalins | 17.583 | 194 | 63938m | 31.18 | |
| 8) | Naphthalene | 13.878 | 128 | 7628845m | 571.34 | |
| 9) | C3-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene | 16.134 | 142 | 1505609m | 178.94 | |
| 10) | 1-Methylnaphthalene | 16.469 | 142 | 668466m | 86.00 | |
| LL) | 2,6-Dimethyinaphthaiene | 18.251 | 120 | 591506m | 74.90 | |
| | 1,6,7-Trimethylnaphtha | 21.065 | 170 | 166702m | 23.84 | |
| | C2-Naphthalenes | 18.502 | | 2025578m | | |
| | C3-Naphthalenes | | | 1550983m | | |
| | C4-Naphthalenes | 22.820 | | 883725m | 66.18 | |
| | Benzothiophene | 14.045 | | | | |
| | C1-Benzothiophenes | 16.385 | | 237629m | | |
| | C2-Benzothiophenes | 17.945 | | 68563m | | |
| | C3-Benzothiophenes | 20.313 | | 150590m | | |
| | C4-Benzothiophenes | 21.622 | | 140013m | | |
| | Biphenyl | 17.694 | | 552986m | 48.34 | |
| | Acenaphthylene | 19.171 | | 671916m | | |
| | Acenaphthene | 19.756 | | 169764m | | |
| | Dibenzofuran | 20.369 | | 767969m 387697m | 60.67 | |
| | Fluorene | 21.539 | | 143669m | 38.79 | |
| | 1-Methylfluorene | 23.506 | | | | |
| | C1-Fluorenes | 23.506 | | 396257m | | |
| | C2-Fluorenes | 25.376 | | 954245m | | |
| | C3-Fluorenes | 27.592 | | | | |
| | Carbazole Dibenzothiophene | 25.583 | | 181884m 520630m | | |
| | 4-Methyldibenzothiophene | 24.406 25.895 | | | | |
| | 2/3-Methyldibenzothiop | 25.895 | | 378547m 253625m | 21.50 | |
| | 1-Methyldibenzothiophene | 26.518 | | 104712m | | |
| | C2-Dibenzothiophenes | 27.626 | | 1141874m | | |
| | C3-Dibenzothiophenes | 28.804 | | 1326517m | | |
| | C4-Dibenzothiophenes | 30.674 | | | 41.24 | |
| | Phenanthrene | 24.822 | | | 300.02 | |
| | Anthracene | 24.995 | | | 132.18 | |
| | 3-Methylphenanthrene | 26.484 | 192 | 839433m | 77.42 | |
| | . ಕುಂಟು ಮತ್ತುದ ನಡ ಲಿ ಜನ್ ಕಾ ಟಿನ ನಾಡನಾಗದ ರುವ ನಡೆದೇ ಹೆಸಿದಿದೆ. | | 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - 1993 - | | -34 A - 14 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081B.D Acq On : 17 Aug 2013 10:57 am Operator : YM Sample : SRM 1941b : Misc ALS Vial : 13 Sample Multiplier: 0.25 Quant Time: Aug 22 12:10:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QION Response Conc Units Dev(Min) Compound 44)2-Methylphenanthrene26.588192844210m77.8645)2-Methylanthracene26.726192539022m49.7246)4/9-Methylphenanthrene26.865192594319m54.8247)1-Methylphenanthrene26.934192575287m53.0648)3,6-Dimethylphenanthrene28.042206171045m18.3349)Retene30.70823487870m17.1150)C2-Phenanthrenes/Anthr...28.3882063313494m189.3351)C3-Phenanthrenes/Anthr...29.9472202626218m150.0652)C4-Phenanthrenes/Anthr...31.7822341706338m97.5053)Naphthobenzothiophene32.9552342030655m112.3354)C1-Naphthobenzothiophenes36.9122761157436m64.0357)C4-Naphthobenzothiophenes38.193290495006m27.3858)Fluoranthene28.9422028085209m512.4159)Pyrene29.7042027959395m388.2460)2-Methylfluoranthene30.466216661000m50.6761)Benzo(b) fluorene31.089216679549m61.6962)C1-Fluoranthenes/Pyrenes30.8472164715229m298.8463)C2-Fluoranthenes/Pyrenes32.5672304972111m315.13 63) C2-Fluoranthenes/Pyrenes 32.567 230 4972311m 315.13 64) C3-Fluoranthenes/Pyrenes 33.848 244 2233301m 141.54 65)C4-Fluoranthenes/Pyrenes35.3222582007732m127.2467)Benz (a) anthracene33.7702284756481m255.5368)Chrysene/Triphenylene33.8862285043312m320.0069)C1-Chrysenes35.1672423497850m221.9470)C2-Chrysenes36.6022562139929m135.7871)C3-Chrysenes37.3782701375368m87.2772)C4-Chrysenes39.434284808852m51.3274)C29-Hopane40.755191111911m207.6975)18a-Oleanane41.824191283648m52.6476)C30-Hopane42.0461911493981m277.2677)Benzo (b) fluoranthene37.3392527740260m383.3578)Benzo (a) fluoranthene37.6882521011008m65.7580)Benzo (a) fluoranthene37.6882521011008m65.7581)Benzo (a, h) anthracene43.2262781033041m55.9184)C1-Dibenzo (a, h) anthrac...0.0000N.D. d85)C2-Dibenzo (a, h) anthrac...0.0000N.D. d86)C3-Dibenzo (a, h) anthrac...0.0000N.D. d87)Benzo (g, h, i) perylene44.5532763960676m196.92 65) C4-Fluoranthenes/Pyrenes 35.322 258 2007732m 127.24 87) Benzo(g,h,i)perylene44.5532763960676m196.9289) Perylene38.7752524672735m251.15 89) Perylene 91) C20-TAS 92) C21-TAS 33.304 231 192438m 9.39 91)C20-TAS33.304231192438m9.3992)C21-TAS34.39123169388m3.3993)C26(20S)-TAS38.54223138472m1.8894)C26(20R)/C27(20S)-TAS39.473231154613m7.5495)C28(20S)-TAS40.23923176113m3.7196)C27(20R)-TAS40.682231137735m6.7297)C28(20R)-TAS41.38223199610m4.86

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081B.D Acq On : 17 Aug 2013 10:57 am Operator : YM Sample : SRM 1941b Misc : ALS Vial : 13 Sample Multiplier: 0.25 Quant Time: Aug 22 12:10:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration (#) = qualifier out of range (m) = manual integration (+) = signals summed

| | CONC LLOG | TDADT ADG |
|---|---------------|-----------------|
| | EC | TX |
| | Donort | NCDUL |
| | Ortatitueinon | Xuallutuautuaut |
| 3 | ĉ | x |

| Data Path | | C:\msdchem\2\data\MS70057\ |
|-----------|----|----------------------------|
| Data File | •• | ENV3081B.D |
| Acq On | | 17 Aug 2013 10:57 am |
| Operator | •• | MX. |
| Sample | | SRM 1941b |
| Misc | | |
| ALS Vial | •• | 13 Sample Multiplier: 0.25 |
| ļ | | |

Quant Time: Aug 22 12:10:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| 750000 | 700000 | 650000 | 600000 | 550000 | 500000 | 4500000 | 4000000 | 350000 | 300000 | 250000 | 200000 | 1500000 | 100000 Decalin, | C1-Deca |
|--------|--------|--------|--------|--------|--------|---------|------------|------------|---------------------|---------------------------------------|--|---|--|----------|
| | | | | | | T,anale | srttrigeN | _ | | | - | s's i | Y YSYG SYN | 1 |
| | | | | | | | | | | | oleritden T,ens T,enslerit T,enslerit | | | |
| | | | | | | | | | | | ,T 5 ۳ | analytene personal pe | Acenaph andthaga deputber | ₩99868 |
| | | | | | | | | | | | | un'səua | Annand Annand Annand Annand Annand | Muhrul 2 |
| | | | | | | T, ənə | າປາດຄຸດອຸດ | I - | | T,ene T e | Anthraci | T anan | senetroute aninener aninener aninener | |
| | | _ | | | | | | | | | nu, sana opnene, nu opnene, nu op | id actin ho | 2013 15 4 102 | |
| | | | | | | T,ene,T | {а — | T, ene | u | n'səuəsi | nu, zana sintinAiza Tanany Nasitany | anthren ne d10, | C3-Phên | - MA |
| | | | | | | 1 | | - Juyzon | ur | yrenes, ur yrenes, ur Tenes, ur | ishttinA\as A\asanshtir Iqointozn | nthrene Fluorat Manual | CS CS CS CS | Multin |
| | | | | | | - | jųracene. | อมอเห็นอะ | Kappane | un'səu un's | entropher nertopher | zuəqou 응사위·IIII | FlugeN-SC | |
| | | | | | | | Tişenseitt | Jesoogij(d | l)ozna8 F,anaj¥g | un'saua | n Sothiophe Sothiophe Sothiophene Redonid | ouff(6)o | Benz | |
| | | | | | | | | | | | T, SAT-(| un'g un'gwg un'g S08)s80 | м (905) АТ-(205) (АН(905 (АТ-(Я05 | C280 |
| | | | | | | | | T,ene | -c'q)bλu | 17949aus | abtris (ri,s | T,9mg | 48H=853 | ANN MM |
| | | | | | | | | | T,e |)beuyleug | i,rl,p)ozna | эg | | WWWW |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | M |
| | | | | | | | | | | | | | | 2 |
| | | | | | | | | | | | | | | Ň |
| | | | | | | | | | | | | | | |

1

| Data File Name | ENV3081C.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|-------------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 12:05 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | MS (SO-DA-015 (0-0.5) MS/MSD) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 14 | 87 Te | |
| Sample Multiplier | 0.06662 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ENV3081C.D (SO-DA-015 (0-0.5) MS/MSD) 8/17/2013 PAH-2012.M 15.01050736

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|--|--|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 0.00 | 0 | | |
| | C4-Decalins | | | 0.0000 | 0.0000 |
| the second s | Naphthalene | 13.88 | 337156 | 7.0196 | 8.2530 |
| | C1-Naphthalenes | 16.30 | 395850 | 8.2416 | 9.6897 |
| 13) | C2-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 14) | C3-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 18) | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.010 | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | 집 이가가 집 아가님과 가지 않는 것 같은 것이 가지 않는 것 같아. | 0.00 | 0 | | |
| 12 http:// | Biphenyl | | | 0.0000 | 0.0000 |
| | Acenaphthylene | 19.17 | 226450 | 4.8299 | 5.6785 |
| 427.31 | Acenaphthene | 19.76 | 151933 | 5.6773 | 6.6748 |
| 2020 | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 21.54 | 231999 | 6.4523 | 7.5860 |
| 28) | C1-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| | Anthracene | 24.99 | 299334 | 5.3435 | 6.2824 |
| 2006 | | | | | |
| and the second | Phenanthrene | 24.82 | 844965 | 13.9881 | 16.4459 |
| | C1-Phenanthrenes/Anthracenes | 5.39 | 253002 | 4.1884 | 4.9243 |
| 50) | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 51) | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 52) | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 34) | Dibenzothiophene | 24.41 | 375228 | 7.5145 | 8.8348 |
| nan menerati 10 tiki | C1-Dibenzothiophenes | 8.63 | 266105 | 5.3291 | 6.2655 |
| | | | 0 | | |
| | C2-Dibenzothiophenes | 0.00 | | 0.0000 | 0.0000 |
| (2-5-5-5) | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2004 | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 58) | Fluoranthene | 28.94 | 1032170 | 18.9528 | 22.2828 |
| 59) | Pyrene | 29.70 | 1188240 | 16.7924 | 19.7428 |
| 62) | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 63) | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.2.2.2.2.2 | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 0.00 | õ | | |
| 100 A | Naphthobenzothiophene | | | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| Control of the | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 57) | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 67) | Benz(a)anthracene | 33.81 | 624127 | 9.7143 | 11.4212 |
| 68) | Chrysene/Triphenylene | 33.89 | 2948540 | 54.2040 | 63.7277 |
| | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| State 1977 | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Chrysenes | 0.00 | 0 | 0.0000 | |
| | | | | | 0.0000 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 37.34 | 2287040 | 33.5814 | 39.4817 |
| | Benzo(k,j)fluoranthene | 37.42 | 797943 | 15.3854 | 18.0887 |
| 79) | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 80) | Benzo(e)pyrene | 38.31 | 2807280 | 44.7417 | 52.6028 |
| | Benzo(a)pyrene | 38.50 | 456753 | 7.4127 | 8.7151 |
| | Perylene | 38.81 | 57592 | 0.9177 | 1.0790 |
| | Indeno(1,2,3-c,d)pyrene | 43.23 | 893565 | 11.5055 | 13.5270 |
| | | | | | |
| 5732742- | Dibenzo(a,h)anthracene | 43.30 | 456768 | 7.3295 | 8.6173 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | CD OT LL LL H | 0.00 | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-----------------|--------------------------------------|----------|-----------------|---------------|---------------|
| | × - | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 226226 | 7.4747 | 8.7880 |
| 10) | 1-Methylnaphthalene | 16.47 | 169624 | 6.0670 | 7.1329 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.89 | 266105 | 6.5358 | 7.6842 |
| 36) | 2/3-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 37) | 1-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 43) | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 47) | 1-Methylphenanthrene | 26.93 | 253002 | 6.7609 | 7.9488 |
| | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1.1.1.1.1 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| - 13 | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 485801 | 11.29 | 67.75 |
| 1000 | Acenaphthene-d10 | 19.67 | 347913 | 14.06 | 84.38 |
| | Phenanthrene-d10 | 24.75 | 684525 | 14.18 | 85.06 |
| | Chrysene-d12 | 33.85 | 860355 | 16.28 | 97.73 |
| | Pervlene-d12 | 38.74 | 53356 | 0.92 | 5.54 |
| | 5(b)H-Cholane | 34.24 | 192964 | 19.87 | 119.32 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 425322 | 16.72 | |
| 1.1.1.1.1.1 | Pyrene-d10 | 29.63 | 798420 | 16.70 | |
| | Benzo(a)pyrene-d12 | 38.43 | 816593 | 16.68 | |

| Data Path : C:\msdchem\2\data\Ms Data File : ENV3081C.D Acq On : 17 Aug 2013 12:05 p Operator : YM Sample : MS (SO-DA-015 (0-0.5 Misc : ALS Vial : 14 Sample Multipli Quant Time: Sep 05 15:40:40 2013 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39 Response via : Initial Calibrati | om 5) MS/MSI ier: 0.06 3 (AR70057. Table-201 35 2013 ion | M .3A | | | |
|---|---|--|---|---|---|
| Compound | R.T. | QIon | Response | Conc Uni | lts Dev(Min) |
| Internal Standards 1) Fluorene-d10 31) Pyrene-d10 73) Benzo(a)pyrene-d12 | | | | | |
| System Monitoring Compounds 2) Naphthalene-d8 21) Acenaphthene-d10 32) Phenanthrene-d10 66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane | 13.822 19.672 24.752 33.847 38.735 34.235 | 136 164 188 240 264 217 | 485801m 347913m 684525m 860355m 53356m 192964m | 11.29 14.06 14.18 16.28 0.92 19.87 | 0.00 0.00 0.00 0.00 0.04 0.00 |
| <pre>Target Compounds 3) cis/trans Decalin 4) C1-Decalins 5) C2-Decalins 6) C3-Decalins 7) C4-Decalins 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene 12) 1,6,7-Trimethylnaphtha 13) C2-Naphthalenes 14) C3-Naphthalenes 15) C4-Naphthalenes 16) Benzothiophene 17) C1-Benzothiophenes 18) C2-Benzothiophenes 19) C3-Benzothiophenes 19) C3-Benzothiophenes 20) C4-Benzothiophenes 21) Biphenyl 23) Acenaphthylene 24) Acenaphthene 25) Dibenzofuran 26) Fluorene 27) 1-Methylfluorene 28) C1-Fluorenes 30) C3-Fluorenes 30) C3-Fluorenes 31) Carbazole 34) Dibenzothiophene 35) 4-Methyldibenzothiophene 36) 2/3-Methyldibenzothiophene 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophene 31) 2-Dibenzothiophene 33) Carbazole 34) Dibenzothiophene 35) 4-Methyldibenzothiophene 36) 2/3-Methyldibenzothiophene 37) 1-Methyldibenzothiophene 38) C2-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 31) Phenanthrene 31) Amethylphenanthrene 32) Anthracene 33) 3-Methylphenanthrene 33) 3-Methylphenanthrene</pre> | 0.000 0.000 13.878 16.134 16.468 0.000 0.000 | 128 142 142 | 0 0 337156m 226226m 169624m 0 0 | 7.47 | d d d d d d d d d d d d d d d d d d d |

| Data Path : C:\msdchem\2\data\MS Data File : ENV3081C.D Acq On : 17 Aug 2013 12:05 p Operator : YM Sample : MS (SO-DA-015 (0-0.5 Misc : ALS Vial : 14 Sample Multipli Quant Time: Sep 05 15:40:40 2013 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | 2000 5) MS/MS ier: 0.00 3 (AR70057 Fable-20 535 2013 | 5662 .M | | |
|--|--|-------------------|--|--|
| Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
| 44) 2-Methylphenanthrene 45) 2-Methylanthracene 46) 4/9-Methylphenanthrene 47) 1-Methylphenanthrene 48) 3,6-Dimethylphenanthrene 49) Retene 50) C2-Phenanthrenes/Anthr 51) C3-Phenanthrenes/Anthr 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene 54) C1-Naphthobenzothiophenes 55) C2-Naphthobenzothiophenes 56) C3-Naphthobenzothiophenes | 0.000 0.000 26.934 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 192 | 0 0 253002m 0 0 0 0 0 | N.D. d N.D. d 6.76 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d |
| 57) C4-Naphthobenzothiophenes 58) Fluoranthene 59) Pyrene 60) 2-Methylfluoranthene 61) Benzo(b)fluorene 62) C1-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 64) C3-Fluoranthenes/Pyrenes | 0.000 28.942 29.704 0.000 0.000 0.000 0.000 | 202 202 | 0 1032170m 1188243m 0 0 0 | N.D. d 18.95 16.79 N.D. d N.D. d N.D. d N.D. d |
| 64) C3-Filtoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes 67) Benz(a) anthracene 68) Chrysene/Triphenylene 69) C1-Chrysenes 70) C2-Chrysenes 71) C3-Chrysenes 72) C4-Chrysenes 74) C29-Hopane 75) 18a-Oleanane 76) C30-Hopane 77) Benzo(b) fluoranthene | 33.809 33.886 0.000 0.000 0.000 0.000 0.000 0.000 0.000 37.339 | 228 228 252 | 624127m 2948542m 0 0 0 0 0 0 0 0 0 2287035m | 9.71 54.20 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d 33.58 |
| 78) Benzo(k,j)fluoranthene 79) Benzo(a)fluoranthene 80) Benzo(e)pyrene 81) Benzo(a)pyrene 82) Indeno(1,2,3-c,d)pyrene 83) Dibenzo(a,h)anthracene | 37.416 0.000 38.309 38.503 | 252 252 252 | 797943m 0 2807278m 456753m 893565m 456768m 0 0 | 15.39 N.D. d 44.74 7.41 11.51 7.33 N.D. d N.D. d N.D. d N.D. d |
| <pre>87) Benzo(g,h,i)perylene 89) Perylene 91) C20-TAS 92) C21-TAS 93) C26(20S)-TAS 94) C26(20R)/C27(20S)-TAS 95) C28(20S)-TAS 96) C27(20R)-TAS 97) C28(20R)-TAS</pre> | 44.626 38.813 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 276 252 | 872037m 57592m 0 0 0 0 0 0 0 0 0 | 12.85 0.92 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081C.D Acq On : 17 Aug 2013 12:05 pm Operator : YM Sample : MS (SO-DA-015 (0-0.5) MS/MSD) Misc : ALS Vial : 14 Sample Multiplier: 0.06662 Quant Time: Sep 05 15:40:40 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

| (QT Reviewed) |
|---------------|
| TQ) |
| Report |
| Quantitation |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081C.D Acq On : 17 Aug 2013 12:05 pm Operator : YM Sample : MS (SO-DA-015 (0-0.5) MS/MSD) Misc :

| - S-Meth Diparticity Accena |
|--|
| |
| deniv Soon |
| Paterseed8, Paters |
| 3, Shaaraaka, S , S , S , S , S , S , S , S , S , S |
| 3, Shaasaka, 5 T, analectingent T, analectingent T, analectingent T, analectingent T, analectingent T, analytic T, |
| 3,8haaaala,5 T,9halaala,5 T,9halaalaa,1 T,9halaalaalaa T,9halaalaalaa T,9halaanaalaa T,0halaanaalaanaalaa T,0halaanaalaanaalaa |
| 3,8haaaala,5 T,9naleruhdehi T,9naleruhdehi T,9naleruhdehi T,0haana |
| 3,8hatestad,5 TBradshindgehi |
| 3,8haasalaq T.analyddin T.analyddin T.analyddin T.analyddin U.OTb-Tianalyddin U.OTb-Tianalyddin C.OTb- |
| 3,8haasalaq T.analydin T.ana |
| 2, Bhateadad T. Analydrindgaffa T. Analydrindgaffa T. Analydrindgaffa T. Analydrindgaffa T. Analydrind T. Analydrindgaffa Stydaeaagtaffagfagfagfagfagfagfagfagfagfagfagfagfa |
| 2, Bhateadad T, enalydding T, enalydding T, enalyddin T, enalyddin |
| 3, Bhateaster T, Sinsberthrigerhyn T, Sinsberhrigerhyn T, Sakkermyngerhyn Rodieser Rodieserger d10,1 I, Sinsdennegrigerhyn Rodieserger d10,1 I, Sinsdrigerhynegrigerhyn T, Sinsdrigerhyngerhyn T, Sinsdrigerhyngerhyn T, Sinsdrigerhyngerhyngerhynger T, Sinsdrigerhyngerhyngerhynger T, Sinsdrigerhyngerhyngerhynger T, Sinsdrigerhyngerhyngerhyngerhynger T, Sinsdrigerhyngerhyngerhyngerhyngerhynger T, Sinsdrigerhynge |
| 2, Bhateadar T, ensigning Realizing Reali |
| 8,8haaaaiq T,ensistrihtepiku 7,2akbanngekkise 7,2akbanngekkise 1,01b 87,3haanapigjiggg 87,3haanapigjiggg 7,3haanapigjigggg 7,3haanapigjigggg 7,3haanapigjigggg 7,3haanapigjigggg 7,3haanapigjigggg 7,3haanapigjiggggg 7,3haanapigjiggggg 7,3haanapigjigggggggggggggggggggggggggggggggggg |
| 8,8haeaalad T,enalerdingehit 7,anistrangehide 7,anistrangehide Raditer |
| 2, Bhaneaidd T-graeiddhigendd Robeinangeridd Robein |
| 2, Sharendry T, enablishingendry T, enablishingen |
| 2. Bhaneadar T. Prosibilithrapping T. Sensitivity T. Sensit |
| 3. Bhaeariad T-prasicitifidadati T-prasicitifidadati T-prasicitifidadati T-prasicitifidadati T-prasicitifica |
| 2, Branard T-presiding approve Main approve Main approve T-answidter Main approve T-answidter Main approve T-answidter T-answi |
| 2. Shoreadd T. Panelddrydd C. Paneldollodd C. Carlon C. |
| 3.8haadad T.enalydri Makabaragesti Makabarag |
| 2. 20-second T. enskyth 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2 |
| 2.8haaraad T. Frashtinterad Makimanahiya Mak |
| 2. 8. hoerended T. P. Schollender 2. 7. analytike 2. 7. analytike 2. 7. analytike 2. 7. analytike 2. 7. analytike 2. 7. analytike 7. a |
| 7.8.hardender T. sensitivitation T. sensitiv |
| Poddance Poddance Poddance Poded Poden Poden |
| <pre>Construction 17 attrict 12 a</pre> |
| Time: Sep 05 15:40:40 2013 fettod : C:\GCNS7\NK77057\AR7057\AR7057 fettod : C:\GCNS7\NK77057\AR7057 fettod : C:\GCNS7\NK77057 ppdate : Sat Aug 17 22:39:35 2013 http://sec. http://se |
| Inter Sep Construction Inter Sep Construction </td |

Page: 4

57.M Fri Sep 13 07:14:55 2013

-

| Data File I | Name ENV3081D.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|--------------|-------------------------------------|---------------------------------------|---------|
| Data File | Path C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Ope | rator YM | Naphthalene-d8 | 250.125 |
| Date Acq | uired 8/17/2013 13:14 | Acenaphthene-d10 | 250.163 |
| Acq. Metho | d File PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample N | Name MSD (SO-DA-015 (0-0.5) MS/MSD) | Chrysene-d12 | 250.038 |
| Mis | c Info 0 | Perylene-d12 | 250.031 |
| Instrument M | lame GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Nu | mber 15 | | |
| Sample Mult | iplier 0.06658 | | |
| Sample Am | ount 0 | | |
| | | | |

Copy data below to Spread Sheet

ENV3081D.D) (SO-DA-015 (0-0.5) MS/MSD) 8/17/2013 PAH-2012.M 15.01952538

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|-----------|--|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 23 | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 334544 | 6.8695 | 7.5173 |
| | C1-Naphthalenes | 16.30 | 399186 | 8.1968 | 8.9699 |
| | C2-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthalenes | 0.00 | ō | 0.0000 | 0.0000 |
| 0.05 | Benzothiophene | 0.00 | õ | 0.0000 | 0.0000 |
| 0.00.00 | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 7.255 | C2-Benzothiophenes | 0.00 | õ | 0.0000 | 0.0000 |
| 2023 | C3-Benzothiophenes | 0.00 | õ | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | ō | 0.0000 | 0.0000 |
| 5.242 | Biphenyl | 0.00 | õ | 0.0000 | 0.0000 |
| | Acenaphthylene | 19.17 | 213556 | 4.4922 | 4.9159 |
| | Acenaphthene | 19.78 | 144444 | 5.3232 | 5.8253 |
| | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.23.24 | Fluorene | 21.54 | 243303 | 6.6737 | 7.3031 |
| | C1-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Fluorenes | 0.00 | õ | 0.0000 | 0.0000 |
| | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 57577 | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| - 7.7 M | Anthracene | 24.99 | 289334 | 5.3721 | 5.8787 |
| | Phenanthrene | 24.82 | 854008 | 14.7047 | 16.0915 |
| 5.E | | 5.39 | 242071 | | |
| | C1-Phenanthrenes/Anthracenes C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 4.1681 0.0000 | 4.5612 |
| | | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Phenanthrenes/Anthracenes | | 386262 | 8.0456 | 0.0000 |
| | Dibenzothiophene | 24.41 | | | 8.8044 |
| | C1-Dibenzothiophenes | 8.63 | 273174 | 5.6900 | 6.2267 |
| | C2-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluoranthene | 28.94 | 1050580 | 20.0641 | 21.9565 |
| | Pyrene | 29.70 | 1204980 | 17.7116 | 19.3821 |
| | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 5 (C) (C) | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 183331 | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 10000 | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.81 | 644218 | 10.4291 | 11.4127 |
| | Chrysene/Triphenylene | 33.93 | 2783190 | 53.2155 | 58.2344 |
| 22233 | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 70) | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 77) | Benzo(b)fluoranthene | 37.34 | 2096710 | 31.7680 | 34.7641 |
| | Benzo(k,j)fluoranthene | 37.42 | 750535 | 14.9326 | 16.3409 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 2414050 | 39.7008 | 43.4451 |
| | Benzo(a)pyrene | 38.50 | 399642 | 6.6925 | 7.3237 |
| | Perylene | 38.81 | 66571 | 1.0946 | 1.1979 |
| 82) | Indeno(1,2,3-c,d)pyrene | 43.23 | 890192 | 11.8273 | 12.9428 |
| (13.42 M) | Dibenzo(a,h)anthracene | 43.30 | 548623 | 9.0840 | 9.9408 |
| 84) | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 87) | Benzo(g,h,i)perylene | 44.63 | 894022 | 13.5985 | 14.8810 |
| | | | | | |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---------|--------------------------------------|-----------------------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 227655 | 7.4185 | 8.1181 |
| 10) | 1-Methylnaphthalene | 16.47 | 171531 | 6.0508 | 6.6215 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 273174 | 6.9784 | 7.6366 |
| 36) | 2/3-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 37) | 1-Methyldibenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 43) | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 1-Methylphenanthrene | 26.93 | 242071 | 6.7282 | 7.3627 |
| 1000 | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1 | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 211 | Surrogate Standards | 1.252.2 | | 12202000 | 1479573757575 |
| 21 | Naphthalene-d8 | 13.85 | 743172 | 17.03 | 102.27 |
| | Acenaphthene-d10 | 19.67 | 340317 | 13.57 | 81.45 |
| | Phenanthrene-d10 | 24.75 | 706662 | 15.22 | 91.38 |
| 1000 | Chrysene-d12 | 33.85 | 871398 | 17.15 | 103.01 |
| 1.00 | Perylene-d12 | 38.74 | 31121 | 0.56 | 3.34 |
| 1000 | 5(b)H-Cholane | 34.24 | 313979 | 33.37 | 200.45 |
| 501 | Internal Standards | and the second second | | | |
| 11 | Fluorene-d10 | 21.45 | 430992 | 16.71 | |
| 1000 | Pyrene-d10 | 29.63 | 767183 | 16.69 | |
| | Benzo(a)pyrene-d12 | 38.43 | 790895 | 16.67 | |

| Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081D.D Acq On : 17 Aug 2013 1:14 pm Operator : YM Sample : MSD (SO-DA-015 (0-0.5) MS/MSD) Misc : ALS Vial : 15 Sample Multiplier: 0.06658 Quant Time: Sep 08 16:13:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration | | | | | | |
|--|--|--|---|---|----------|--|
| Compound | R.T. | QIon | Response | Conc Units | Dev(Min) | |
| Internal Standards 1) Fluorene-d10 31) Pyrene-d10 73) Benzo(a)pyrene-d12 | | | | | | |
| <pre>66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane</pre> | 13.850 19.672 24.752 33.847 38.736 34.235 | 136 164 188 240 264 217 | 743172m 340317m 706662m 871398m 31121m 313979m | 17.03 13.57 15.22 17.15 0.56 33.37 | 0.00 | |
| <pre>Target Compounds 3) cis/trans Decalin 4) C1-Decalins 5) C2-Decalins 6) C3-Decalins 7) C4-Decalins 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene 12) 1,6,7-Trimethylnaphthalene 12) 1,6,7-Trimethylnaphthalene 12) 1,6,7-Trimethylnaphthalene 13) C2-Naphthalenes 14) C3-Naphthalenes 15) C4-Naphthalenes 16) Benzothiophene 17) C1-Benzothiophenes 18) C2-Benzothiophenes 19) C3-Benzothiophenes 19) C3-Benzothiophenes 20) C4-Benzothiophenes 20) C4-Benzothiophenes 21) Biphenyl 23) Acenaphthylene 24) Acenaphthene 25) Dibenzofuran 26) Fluorene 27) 1-Methylfluorene 28) C1-Fluorenes 30) C3-Fluorenes 30) C3-Fluorenes 31) Carbazole 34) Dibenzothiophene 35) 4-Methyldibenzothiophene 36) 2/3-Methyldibenzothiophene 39) C3-Dibenzothiophenes 30) C4-Dibenzothiophenes 31) Phenanthrene 33) 3-Methylphenanthrene</pre> | 16.134 16.469 | 128 142 142 | 0 0 334544m 227655m 171531m | N.D. d N.D. d N.D. d N.D. d 6.87 | Qvalue | |

| Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081D.D Acq On : 17 Aug 2013 1:14 pm Operator : YM Sample : MSD (SO-DA-015 (0-0.5) MS/MSD) Misc : ALS Vial : 15 Sample Multiplier: 0.06658 Quant Time: Sep 08 16:13:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 | | | | | | |
|---|--|------------------|------|----------------------|---------------------|--|
| Reppo | nse via : Initial Calibrati Compound | | QIon | Response | Conc Units Dev(Min) | |
| | 2 Methodabasethase | | | | | |
| | 2-Methylphenanthrene 2-Methylanthracene | 0.000 | | 0 | N.D. d N.D. d | |
| 46) | 4/9-Methylphenanthrene | 0.000 | | õ | N.D. d | |
| 47) | 1-Methylphenanthrene | 26.934 | 192 | | 6.73 | |
| 48) | 1-Methylphenanthrene 3,6-Dimethylphenanthrene | 0.000 | | 0 | N.D. d | |
| 49) | Retene | 0.000 | | 0 | N.D. d | |
| | C2-Phenanthrenes/Anthr | | | | N.D. d | |
| | C3-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d | |
| 52) | C4-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d | |
| | Naphthobenzothiophene | 0.000 | | | N.D. d | |
| | C1-Naphthobenzothiophenes | | | 0 | N.D. d | |
| | C2-Naphthobenzothiophenes | | | 0 | N.D. d | |
| | C3-Naphthobenzothiophenes | 0.000 | | 0 | N.D. d | |
| | C4-Naphthobenzothiophenes | | | 0 1050575m | N.D. d | |
| 10000 | Fluoranthene | 28.942 29.704 | | 1050575m 1204980m | 20.06 17.71 | |
| 59) | Pyrene | 0.000 | | 12049800 | N.D. d | |
| 61) | 2-Methylfluoranthene Benzo(b)fluorene | 0.000 | | o | N.D. d | |
| 2.50.000 | C1-Fluoranthenes/Pyrenes | | | 0 | N.D. d | |
| | C2-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d | |
| | C3-Fluoranthenes/Pyrenes | | | 0 | N.D. d | |
| 65) | C4-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d | |
| | | | | 644218m | | |
| 68) | Chrysene/Triphenylene | 33.925 | 228 | 2783187m | 53.22 | |
| | C1-Chrysenes | 0.000 | | 0 | N.D. d | |
| 70) | C2-Chrysenes | 0.000 | | 0 | N.D. d | |
| | C3-Chrysenes | 0.000 | | 0 | N.D. d | |
| | C4-Chrysenes | 0.000 | | 0 | N.D. d | |
| | C29-Hopane | 0.000 | | 0 | N.D. d | |
| | 18a-Oleanane | 0.000 | | 0 | N.D. d | |
| | C30-Hopane Benzo(b)fluoranthene | 0.000 37.339 | 252 | 2096709m | N.D. d 31.77 | |
| | Benzo(k,j)fluoranthene | 37.417 | 252 | 750535m | 14.93 | |
| | Benzo(a) fluoranthene | 0.000 | 252 | 000000 | N.D. d | |
| | Benzo(e)pyrene | 38.309 | 252 | 2414053m | 39.70 | |
| | Benzo(a)pyrene | 38.503 | 252 | 399642m | 6.69 | |
| | | 43.225 | 276 | 890192m | 11.83 | |
| | Dibenzo(a,h)anthracene | 43.299 | 278 | 548623m | 9.08 | |
| | C1-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d | |
| | C2-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d | |
| | C3-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d | |
| | Benzo(g,h,i)perylene | 44.627 | 276 | | 13.60 | |
| | Perylene | 38.813 | 252 | 66571m | 1.09 | |
| | C20-TAS | 0.000 | | 0 | N.D. d | |
| | C21-TAS | 0.000 | | 0 | N.D. d | |
| | C26 (20S) - TAS C26 (20R) / C27 (20S) - TAS | 0.000 | | 0 | N.D. d N.D. d | |
| | C28 (208) - TAS C28 (208) - TAS | 0.000 | | 0 | N.D. d | |
| | C27 (20R) - TAS | 0.000 | | 0 | N.D. d | |
| | C28 (20R) - TAS | 0.000 | | ő | N.D. d | |
| | | | | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081D.D Acq On : 17 Aug 2013 1:14 pm Operator : YM Sample : MSD (SO-DA-015 (0-0.5) MS/MSD) Misc : ALS Vial : 15 Sample Multiplier: 0.06658 Quant Time: Sep 08 16:13:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

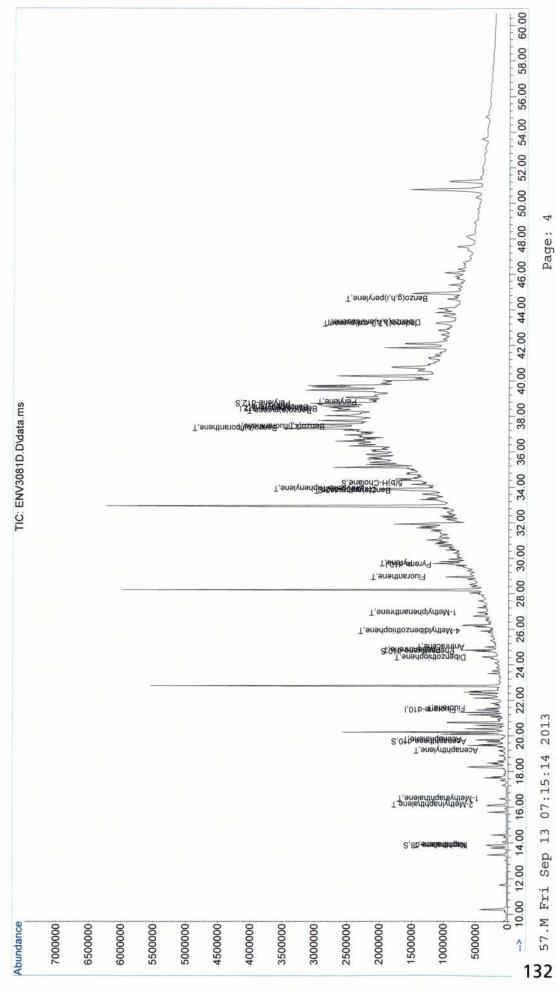
(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:15:13 2013

Quantitation Report (QT Reviewed)

Sample Multiplier: 0.06658 (SO-DA-015 (0-0.5) MS/MSD) C:\msdchem\2\data\MS70057\ 1:14 pm Sep 08 16:13:10 2013 17 Aug 2013 ENV3081D.D MSD MY 15 ••• Quant Time: •• .. Data Path Data File Misc ALS Vial Operator Acq On Sample

Quant Time: Sep 08 16:13:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration



| Data File Name | ENV3081E.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|-----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 14:22 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | Dupl. (SO-DA-014 (1.0-1.5)) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 16 | | |
| Sample Multiplier | 0.06631 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ENV3081E.D Dupl. (SO-DA-014 (1.0-1.5)) 8/17/2013 PAH-2012.M 15.08068165

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|---|------------------------------|----------------------|---------------------------|------------------|--------------------------------|
| 21 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | õ | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.50 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Decalins | | | | 0.8042 |
| | Naphthalene | 13.88 | 27586 | 0.6554 | |
| C52 - 45-45 | C1-Naphthalenes | 16.30 | 18286 | 0.4345 | 0.5331 |
| 176-2510 | C2-Naphthalenes | 18.59 | 31438 | 0.7470 | 0.9165 |
| | C3-Naphthalenes | 20.15 | 32974 | 0.7835 | 0.9613 |
| | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 2973 | 0.0724 | 0.0888 |
| 24) | Acenaphthene | 19.70 | 710 | 0.0303 | 0.0371 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.5.5.5.1 | Fluorene | 21.54 | 28578 | 0.9070 | 1.1129 |
| | C1-Fluorenes | 23.51 | 10112 | 0.3209 | 0.3938 |
| | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Carbazole | 0.00 | ō | 0.0000 | 0.0000 |
| | Anthracene | 24.99 | 2994 | 0.0583 | 0.0715 |
| | | | 128513 | 2.3189 | 2.8452 |
| | Phenanthrene | 24.82 | | | |
| | C1-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20.022 | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzothiophene | 24.41 | 9115 | 0.1990 | 0.2441 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 6789 | 0.1482 | 0.1818 |
| 38) | C2-Dibenzothiophenes | 27.97 | 9239 | 0.2017 | 0.2474 |
| 39) | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 40) | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 58) | Fluoranthene | 28.94 | 31936 | 0.6392 | 0.7842 |
| | Pyrene | 29.70 | 18164 | 0.2798 | 0.3433 |
| (10/53/20 L) | 1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | 22-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| C 38 | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Fluoranthenes/Pyrenes | 0.00 | õ | 0.0000 | 0.0000 |
| NDSS21 | Naphthobenzothiophene | 0.00 | õ | 0.0000 | 0.0000 |
| 10.0541 | | 0.00 | 0 | 0.0000 | |
| | C1-Naphthobenzothiophenes | | | | 0.0000 |
| 2,52,54 | 22-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | 24-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 12049 | 0.2044 | 0.2508 |
| | Chrysene/Triphenylene | 33.89 | 23093 | 0.4627 | 0.5677 |
| | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 70) (| C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 71) (| C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 72) (| C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 37.34 | 34899 | 0.5669 | 0.6956 |
| 1.0538 | Benzo(k,j)fluoranthene | 37.42 | 8735 | 0.1863 | 0.2286 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 17828 | 0.3144 | 0.3857 |
| | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1. C. | Perviene | 38.77 | 1855 | 0.0327 | 0.0401 |
| 2000/01/01 | | | | | |
| | ndeno(1,2,3-c,d)pyrene | 43.19 | 8318 | 0.1185 | 0.1454 |
| | Dibenzo(a,h)anthracene | 43.26 | 1518 | 0.0269 | 0.0331 |
| 15 CB | 1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| OC) / | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |
| | C3-Dibenzo(a,h)anthracenes | 0.00 44.55 | 0 4928 | 0.0000 0.0804 | 0.0000 0.0986 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-----------------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 12887 | 0.4859 | 0.5962 |
| 10) | 1-Methylnaphthalene | 16.47 | 5399 | 0.2204 | 0.2704 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 3272 | 0.0876 | 0.1075 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 2206 | 0.0591 | 0.0725 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 1311 | 0.0351 | 0.0431 |
| | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 45) | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1.1.1.1.1 | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 12121 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 12223 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 100.00 | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.1 | Surrogate Standards | 0.000 | 0.000 | | |
| 21 | Naphthalene-d8 | 13.82 | 489155 | 12.97 | 78.21 |
| | Acenaphthene-d10 | 19.67 | 263532 | 12.16 | 73.28 |
| | Phenanthrene-d10 | 24.75 | 598976 | 13.52 | 81.50 |
| 2010 | Chrysene-d12 | 33.81 | 709091 | 14.62 | 88.20 |
| | Perviene-d12 | 38.70 | 8372 | 0.16 | 0.97 |
| | 5(b)H-Cholane | 34.24 | 137446 | 15.66 | 94.46 |
| 501 | Internal Standards | 5.124 | | | |
| 11 | Fluorene-d10 | 21.45 | 370959 | 16.65 | |
| | Pyrene-d10 | 29.63 | 729099 | 16.62 | |
| | Benzo(a)pyrene-d12 | 38.39 | 734674 | 16.60 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081E.D Acq On : 17 Aug 2013 2:22 pm Operator : YM Sample : Dupl. (SO-DA-014 (1.0-1.5)) Misc : ALS Vial : 16 Sample Multiplier: 0.06631 Quant Time: Sep 08 15:24:00 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QION Response Conc Units Dev(Min) ______ Internal Standards1) Fluorene-d1021.455176370959m251.050.0031) Pyrene-d1029.635212729099m250.630.0073) Benzo(a)pyrene-d1238.386264734674m250.320.00 System Monitoring Compounds System Monitoring Compounds13.822136489155m12.970.002) Naphthalene-d813.822136489155m12.970.0021) Acenaphthene-d1019.672164263532m12.160.0032) Phenanthrene-d1024.752188598976m13.520.0066) Chrysene-d1233.809240709091m14.62-0.0488) Perylene-d1238.6972648372m0.160.0090) 5 (b) H-Cholane34.235217137446m15.660.00

 90)
 5 (b)H-Cholane
 34.235
 217
 137446m
 15.66

 Target Compounds
 0
 0
 N.D. d

 3)
 cis/trans Decalin
 0.000
 0
 N.D. d

 4)
 C1-Decalins
 0.000
 0
 N.D. d

 5)
 C2-Decalins
 0.000
 0
 N.D. d

 7)
 C4-Decalins
 0.000
 0
 N.D. d

 7)
 C4-Decalins
 0.000
 0
 N.D. d

 1)
 C4-Decalins
 0.000
 0
 N.D. d

 1)
 C4-Decalins
 0.000
 0
 N.D. d

 1)
 C4-Dimethylnaphthalene
 16.469
 142
 12837m
 0.49

 1)
 C4-Dimethylnaphthalene
 16.469
 142
 12837m
 0.49

 12)
 C4-Dimethylnaphthalene
 0.000
 0
 N.D. d
 0.22

 11)
 C4-Sapthalenes
 0.000
 0
 N.D. d
 0.75

 14)
 C3-Naphthalenes
 0.000
 0
 N.D. d

 16)
 Benzothiophenes
 0.000
 0
 N.D. d

 17) Qvalue

| | | C:\msdchem\2\data\MS70057\ ENV3081E.D |
|----------|---|--|
| | | 17 Aug 2013 2:22 pm |
| Operator | : | YM |
| Sample | : | Dupl. (SO-DA-014 (1.0-1.5)) |
| Misc | : | |
| ALS Vial | : | 16 Sample Multiplier: 0.06631 |

Quant Time: Sep 08 15:24:00 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
|-----|--|--------|-------|----------|---------------------|
| 44) | 2-Methylphenanthrene | 0.000 | | 0 | N.D. d |
| | 2-Methylanthracene | 0.000 | | 0 | N.D. d |
| | 4/9-Methylphenanthrene | | | 0 | N.D. d |
| | 1-Methylphenanthrene | 0.000 | | 0 | N.D. d |
| | 3,6-Dimethylphenanthrene | 0.000 | | õ | N.D. d |
| | Retene | 0.000 | | 0 | N.D. d |
| | C2-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d |
| | C3-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d |
| | C4-Phenanthrenes/Anthr | 0.000 | | õ | N.D. d |
| | Naphthobenzothiophene | 0.000 | | õ | N.D. d |
| | C1-Naphthobenzothiophenes | | | õ | N.D. d |
| | C2-Naphthobenzothiophenes | | | õ | N.D. d |
| | C3-Naphthobenzothiophenes | 0.000 | | õ | N.D. d |
| | C4-Naphthobenzothiophenes | 0.000 | | 0 | N.D. d |
| | Fluoranthene | 28.942 | 202 | 31936m | 0.64 |
| | Pyrene | 29.704 | | 18164m | 0.28 |
| | 2-Methylfluoranthene | 0.000 | 202 | 0 | N.D. d |
| | Benzo (b) fluorene | 0.000 | | 0 | |
| | C1-Fluoranthenes/Pyrenes | | | | N.D. d N.D. d |
| | | | | 0 | |
| | C2-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d |
| (F) | C3-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes | 0.000 | | | N.D. d |
| | | | 220 | 0 | N.D. d |
| | Benz (a) anthracene | 33.770 | | | 0.20 |
| | Chrysene/Triphenylene | 33.886 | 228 | | 0.46 |
| | Cl-Chrysenes | 0.000 | | 0 | N.D. d |
| | | | | 0 | N.D. d |
| | | 0.000 | | 0 | N.D. d |
| | C4-Chrysenes | 0.000 | | 0 | N.D. d |
| | C29-Hopane | 0.000 | | 0 | N.D. d |
| | 18a-Oleanane | 0.000 | | 0 | N.D. d |
| | C30-Hopane | 0.000 | 252 | 0 | N.D. d |
| 77) | Benzo (b) fluoranthene | 37.339 | | 34899m | 0.57 |
| | Benzo(k, j)fluoranthene | 37.417 | 252 | 8735m | 0.19 |
| | Benzo(a) fluoranthene | 0.000 | 050 | 0 | N.D. d |
| | Benzo(e)pyrene | 38.309 | 252 | 17828m | 0.31 |
| 8T) | Benzo(a)pyrene | 0.000 | 0.7.6 | 0 | N.D. d |
| 82) | Indeno(1,2,3-c,d)pyrene | | | 8318m | 0.12 |
| 83) | Dibenzo(a, h) anthracene | 43.262 | 278 | 1518m | 0.03 |
| | C1-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d |
| | C2-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d |
| | C3-Dibenzo(a,h)anthrac | 0.000 | 0.7.6 | 0 | N.D. d |
| | Benzo(g,h,i)perylene | 44.553 | 276 | 4928m | 0.08 |
| 89) | | 38.774 | 252 | 1855m | 0.03 |
| 70 | C20-TAS | 0.000 | | 0 | N.D. d |
| | C21-TAS | 0.000 | | 0 | N.D. d |
| | C26(205)-TAS | 0.000 | | 0 | N.D. d |
| | C26(20R)/C27(20S)-TAS | 0.000 | | 0 | N.D. d |
| | C28 (205) - TAS | 0.000 | | 0 | N.D. d |
| | C27 (20R) - TAS | 0.000 | | 0 | N.D. d |
| 97) | C28(20R)-TAS | 0.000 | | 0 | N.D. d |
| | | | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ENV3081E.D Acq On : 17 Aug 2013 2:22 pm Operator : YM Sample : Dupl. (SO-DA-014 (1.0-1.5)) Misc : ALS Vial : 16 Sample Multiplier: 0.06631 Quant Time: Sep 08 15:24:00 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:17:55 2013

Sample Multiplier: 0.06631 : Dupl. (SO-DA-014 (1.0-1.5)) : C:\msdchem\2\data\MS70057\ 2:22 pm 17 Aug 2013 ENV3081E.D MY : 16 ••• Data Path Data File Operator ALS Vial Acq On Sample Misc

Quant Time: Sep 08 15:24:00 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| 600000 | 550000 | 5000000 | 4500000 | 4000000 | 3500000 | 300000- | 2500000 | 2000000 | 1500000 | 100000 8,8b-9 me | 500000 |
|--------|--------|---------|---------|---------|---------|---------|---------|---------|-------------------------------|---|--|
| | | | | | | | | | ł | , ənəlsrinds , ənəlsrinds | |
| | | | | | | | | | S'0 | nu, sənəlan T, ənəlyr P-ən ə f əndar nu, sənəlan | Acenaphi Acenaphi Acenaphi Acenaphi |
| | | | | | | | | | | l,01b-energe | Hillorefile |
| | | | | | | | | | 2.01 | T.anandoin b-an ananan an | Dibenzoti Dibenzoti |
| | | | | | | | | | T,ənər nu,əhənq nu,ənər | lqointoznadi ontoznadibi dointoznadi dointoznadi | memory manual memory me |
| | 8 | | | | | | | | un's | | Fluoranti |
| | | | | | | | | | | l,01b-enerv | fenerver |
| | | | | | | | | | T.S.G. | Cholane, S. | H(9)g |
| | | | | | | | | | T ⊺ ¢9689 | MARADOM((()) (| zueg |
| | | | | | | | | | I,Sfb-enen | TO BUS SIDE ONE | Kied |
| | | | | | | | | | | | |
| | | | | | | | | | | አα(ከብຣ(គនៃ) ensived(i.n.g | |
| | | | | | | | | | 175.24 | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

_

| Data File Name | ARC1600.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|----------------------------|---------------------------------------|---------|--------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/17/2013 15:31 | Acenaphthene-d10 | 250.163 | Copy |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | to Sp |
| Sample Name | SED-DA-020 (0.5-1.0) | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | AR |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SED-DA |
| Vial Number | 17 | | | 8/: |
| Sample Multiplier | 0.06653 | | | PAH |
| Sample Amount | 0 | | | 15.0 |

Copy data below to Spread Sheet

ARC1600.D SED-DA-020 (0.5-1.0) 8/17/2013 PAH-2012.M 15.03081317

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|--|--|----------------------|---------------------------|-------------------|--------------------------------|
| 21 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 6.226 | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 107 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.22 | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 435302 | 10.1278 | 10.8530 |
| | | 16.30 | 450874 | 10.4901 | 11.2413 |
| | C1-Naphthalenes | | | | |
| | C2-Naphthalenes | 18.59 | 1157740 | 26.9363 | 28.8652 |
| | C3-Naphthalenes | 20.51 | 1189870 | 27.6838 | 29.6662 |
| | C4-Naphthalenes | 22.82 | 1456480 | 33.8867 | 36.3133 |
| A 24-54 | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 212010 | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 155634 | 3.7094 | 3.9751 |
| | Acenaphthene | 19.78 | 137825 | 5.7552 | 6.1673 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluorene | 21.54 | 469989 | 14.6070 | 15.6530 |
| 28) | C1-Fluorenes | 23.51 | 338018 | 10.5054 | 11.2577 |
| 29) | C2-Fluorenes | 24.99 | 1494590 | 46.4512 | 49.7775 |
| 30) | C3-Fluorenes | 26.52 | 1470030 | 45.6878 | 48.9595 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 24.99 | 385019 | 8.1868 | 8.7731 |
| 41) | Phenanthrene | 24.82 | 2183980 | 43.0658 | 46.1497 |
| | C1-Phenanthrenes/Anthracenes | 26.73 | 1996523 | 39.3693 | 42.1886 |
| and the second | C2-Phenanthrenes/Anthracenes | 28.39 | 4426250 | 87.2814 | 93.5315 |
| | C3-Phenanthrenes/Anthracenes | 29.95 | 6112870 | 120.5397 | 129.1715 |
| | C4-Phenanthrenes/Anthracenes | 31.78 | 5771880 | 113.8155 | 121.9658 |
| | Dibenzothiophene | 24.41 | 460174 | 10.9772 | 11.7633 |
| and the second | | | 1028875 | | |
| 10 I I I I I I I I I I I I I I I I I I I | C1-Dibenzothiophenes | 26.22 | | 24.5432 | 26.3007 |
| | C2-Dibenzothiophenes | 27.63 | 2824910 | 67.3862 | 72.2117 |
| | C3-Dibenzothiophenes | 29.12 | 5665870 | 135.1557 | 144.8341 |
| 2023-05 | C4-Dibenzothiophenes | 30.88 | 5360670 | 127.8753 | 137.0324 |
| 22.25 | Fluoranthene | 28.94 | 1417610 | 31.0056 | 33.2259 |
| | Pyrene | 29.70 | 1255170 | 21.1287 | 22.6417 |
| 500 P | C1-Fluoranthenes/Pyrenes | 31.54 | 3137440 | 68.6217 | 73.5357 |
| | C2-Fluoranthenes/Pyrenes | 32.61 | 6827260 | 149.3246 | 160.0176 |
| 64) | C3-Fluoranthenes/Pyrenes | 34.16 | 7286030 | 159.3586 | 170.7702 |
| 65) | C4-Fluoranthenes/Pyrenes | 35.79 | 8046630 | 175.9945 | 188.5973 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 54) | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 55) | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 56) | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 57) | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 67) | Benz(a)anthracene | 33.81 | 451693 | 8.3743 | 8.9739 |
| - CA1- | Chrysene/Triphenylene | 33.93 | 2396820 | 52.4835 | 56.2418 |
| 10000 | C1-Chrysenes | 35.63 | 15713800 | 344.0872 | 368.7270 |
| | C2-Chrysenes | 36.33 | 9332780 | 204.3609 | 218.9950 |
| | C3-Chrysenes | 37.57 | 6983810 | 152.9252 | 163.8761 |
| | C4-Chrysenes | 39.40 | 3387890 | 74.1849 | 79.4973 |
| | Benzo(b)fluoranthene | 37.38 | 2144660 | 40.8930 | 43.8213 |
| (CCC)51 | Benzo(k,j)fluoranthene | 37.46 | 439367 | 11.0010 | 11.7888 |
| 6406-57 | Benzo(a)fluoranthene | 0.00 | 435307 | 0.0000 | 0.0000 |
| | | 38.35 | 1723700 | 35.6741 | 38.2287 |
| | Benzo(e)pyrene | | | | |
| | Benzo(a)pyrene | 38.54 | 482044 | 10.1589 | 10.8863 |
| 1222 | Perylene | 38.85 | 25341100 | 524.3861 | 561.9371 |
| 07.100 | Indeno(1,2,3-c,d)pyrene | 43.34 | 948630 | 15.8614 | 16.9972 |
| | Dibenzo(a,h)anthracene | 43.41 | 324765 | 6.7673 | 7.2519 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |
| 86) | C3-Dibenzo(a,h)anthracenes Benzo(g,h,i)perylene | 0.00 44.85 | 0 1636630 | 0.0000 31.3280 | 0.0000 33.5714 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | 1911 (11) | | |
| 9) | 2-Methylnaphthalene | 16.13 | 323333 | 11.9383 | 12.7932 |
| 10) | 1-Methylnaphthalene | 16.47 | 127541 | 5.0977 | 5.4628 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 4-Methyldibenzothiophene | 25.89 | 431984 | 12.6380 | 13.5430 |
| | 2/3-Methyldibenzothiophene | 26.21 | 474420 | 13.8795 | 14.8734 |
| | 1-Methyldibenzothiophene | 26.55 | 122471 | 3.5830 | 3.8396 |
| | 3-Methylphenanthrene | 26.48 | 433299 | 13.7921 | 14.7798 |
| | 2-Methylphenanthrene | 26.59 | 576652 | 18.3552 | 19.6696 |
| | 2-Methylanthracene | 26.76 | 354232 | 11.2754 | 12.0829 |
| | 4/9-Methylphenanthrene | 26.86 | 365960 | 11.6487 | 12.4829 |
| 1000 | 1-Methylphenanthrene | 26.97 | 266380 | 8.4790 | 9.0862 |
| 2.12 | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1 | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1 | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 11111 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| - 1 | Surrogate Standards | | | | |
| 21 | Naphthalene-d8 | 13.82 | 578063 | 15.01 | 90.21 |
| | Acenaphthene-d10 | 19.67 | 321212 | 14.51 | 87.18 |
| | Phenanthrene-d10 | 24.75 | 629651 | 15.53 | 93.32 |
| | Chrysene-d12 | 33.85 | 704783 | 15.88 | 95.49 |
| | Perviene-d12 | 38.77 | 528511 | 11.87 | 71.36 |
| | 5(b)H-Cholane | 34.24 | 216997 | 29.02 | 174.47 |
| 201 | Internal Standards | 8.00 | | | |
| 1) | Fluorene-d10 | 21.45 | 380092 | 16.70 | |
| | Pyrene-d10 | 29.67 | 669393 | 16.67 | |
| | Benzo(a)pyrene-d12 | 38.46 | 627990 | 16.65 | |

| | 2 uuri | er cu cr cu | repor | | cevice, | | | | | | |
|--|---|-----------------------------------|------------|--------------------|----------------------|--------------|--|--|--|--|--|
| Data Path : C:\msdchem\2\data\MS70057\ | | | | | | | | | | | |
| | File : ARC1600.D Dn : 17 Aug 2013 3:31 p | om | | | | | | | | | |
| Opera | ator : YM | | | | | | | | | | |
| Samp1 Misc | .e : SED-DA-020 (0.5-1.0) : |) | | | | | | | | | |
| ALS V | vial : 17 Sample Multipl: | ier: 0.06 | 5653 | | | | | | | | |
| Quant Quant QLast | Time: Sep 05 22:32:32 2013 Method : C:\GCMS7\MS70057 Title : PAH Calibration T Update : Sat Aug 17 22:39 onse via : Initial Calibrati | AR70057. Table-201 :35 2013 | | | | | | | | | |
| | Compound | R.T. | QIon | Response | Conc Un | its Dev(Min) | | | | | |
| Inte | rnal Standards | | | | | | | | | | |
| 1) | Fluorene-d10 Pyrene-d10 | 21,455 | 176 | 380092m | 251.05 | 0.00 | | | | | |
| 31) | Pvrene-d10 | 29.669 | 212 | 669393m | 250.63 | 0.03 | | | | | |
| 73) | Benzo(a)pyrene-d12 | 38.464 | 264 | 627990m | 250.32 | 0.08 | | | | | |
| Swat | em Monitoring Compounds | | | | | | | | | | |
| 2) | Naphthalene-d8 Acenaphthene-d10 | 13.822 | 136 | 578063m | 15.01 | 0.00 | | | | | |
| 21) | Acenaphthene-d10 | 19.672 | 164 | 321212m | 14.51 | 0.00 | | | | | |
| 32) | Phenanthrene-d10 | 24.752 | 188 | 629651m | 15.53 | 0.00 | | | | | |
| 66) | Phenanthrene-d10 Chrysene-d12 Perylene-d12 | 33.847 | 240 | 704783m | 15.88 | 0.00 | | | | | |
| 88) | Perylene-d12 | 38.774 | 264 | 528511m | 11.87 | 0.08 | | | | | |
| 90) | 5(b)H-Cholane | 34.235 | 217 | 216997m | 29.02 | 0.00 | | | | | |
| Targ | et Compounds | | | | | Qvalue | | | | | |
| | cis/trans Decalin | 0.000 | | 0 | N.D. | d | | | | | |
| | C1-Decalins | 0.000 | | 0 | N.D. N.D. N.D. | d | | | | | |
| 5) | C2-Decalins C3-Decalins | 0.000 | | 0 | N.D. | d | | | | | |
| 6) | C3-Decalins | 0.000 | | 0 | N.D. N.D. | d | | | | | |
| () | Naphthalene | 12 070 | 120 | 425202m | N.D. | a | | | | | |
| 9) | 2-Methylnaphthalene | 16 134 | 142 | 433302m | 11 94 | | | | | | |
| 10) | 1-Methylnaphthalene | 16 468 | 142 | 127541m | 5 10 | | | | | | |
| 11) | C4-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphtha | 0.000 | | 0 | N.D. | d | | | | | |
| 12) | 1,6,7-Trimethylnaphtha | 0.000 | | 0 | N.D. | d | | | | | |
| 13) | C2-Naphthalenes | 18.586 | 156 | 1157744m | 26.94 | | | | | | |
| 14) | C3-Naphthalenes | 20.508 | 170 | 1189871m | 27.68 | | | | | | |
| | C4-Naphthalenes | 22.820 | 184 | 1456478m | 33.89 | | | | | | |
| | Benzothiophene | 0.000 | | 0 | N.D. | | | | | | |
| | C1-Benzothiophenes | 0.000 | | 0 | N.D. | | | | | | |
| | C2-Benzothiophenes | 0.000 | | 0 | N.D. | | | | | | |
| | C3-Benzothiophenes C4-Benzothiophenes | 0.000 | | 0 | N.D. | | | | | | |
| | Biphenyl | 0.000 | | 0 | N.D. N.D. | | | | | | |
| | Acenaphthylene | 19.171 | 152 | 155634m | 3.71 | u | | | | | |
| | Acenaphthene | 19.783 | 154 | 137825m | 5.76 | | | | | | |
| | Dibenzofuran | 0.000 | | 0 | N.D. | d | | | | | |
| 26) | Fluorene | 21.538 | 166 | 469989m | 14.61 | | | | | | |
| 27) | 1-Methylfluorene | 0.000 | | 0 | N.D. | d | | | | | |
| | C1-Fluorenes | 23.506 | | 338018m | 10.51 | | | | | | |
| | C2-Fluorenes | 24.995 | 194 | 1494594m | 46.45 | | | | | | |
| | C3-Fluorenes | 26.518 | 208 | 1470034m | 45.69 | | | | | | |
| | Carbazole | 0.000 | 104 | 0 | N.D. | d | | | | | |
| | Dibenzothiophene 4-Methyldibenzothiophene | 24.406 25.895 | 184 198 | 460174m 431984m | 10.98 | | | | | | |
| | 2/3-Methyldibenzothiop | 25.895 | 198 | 474420m | 12.64 13.88 | | | | | | |
| | 1-Methyldibenzothiophene | 26.207 | 198 | 122471m | 3.58 | | | | | | |
| | C2-Dibenzothiophenes | 27.626 | 212 | 2824908m | 67.39 | | | | | | |
| | C3-Dibenzothiophenes | 29.115 | 226 | 5665866m | 135.16 | | | | | | |
| | C4-Dibenzothiophenes | 30.881 | | 5360669m | 127.88 | | | | | | |
| | Phenanthrene | 24.821 | | | 43.07 | | | | | | |
| | Anthracene | 24.995 | | 385019m | 8.19 | | | | | | |
| 43) | 3-Methylphenanthrene | 26.484 | 192 | 433299m | 13.79 | | | | | | |
| | | | | | | | | | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1600.D Acq On : 17 Aug 2013 3:31 pm Operator : YM Sample : SED-DA-020 (0.5-1.0) Misc : ALS Vial : 17 Sample Multiplier: 0.06653 Quant Time: Sep 05 22:32:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) 44)2-Methylphenanthrene26.587192576652m18.3645)2-Methylanthracene26.761192354232m11.2846)4/9-Methylphenanthrene26.865192365960m11.6547)1-Methylphenanthrene26.968192266380m8.4848)3,6-Dimethylphenanthrene0.0000N.D. d49)Retene0.0000N.D. d

 40
 1-Methylphenanthrene
 26.963
 192
 266380m
 8.48

 43
 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49
 Retene
 0.000
 0
 N.D. d

 50
 C2-Phenanthrenes/Anthr...
 28.388
 206
 4426247m
 87.28

 51
 C3-Phenanthrenes/Anthr...
 29.946
 220
 6112869m
 120.54

 52
 C4-Phenanthrenes/Anthr...
 31.782
 234
 5771881m
 113.82

 53
 Naphthobenzothiophenes
 0.000
 0
 N.D. d

 54
 C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55
 C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 56
 Fluoranthene
 0.000
 0
 N.D. d

 57
 C4-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 58
 Fluoranthenes/Pyrenes
 31.539
 216
 3137442m
 68.62

 63
 C2-Fluoranthenes/Pyrenes
 32.66
 220
 242603m
 159.36

 65
 C4-Fluoranthenes/Pyrenes
 35.632
 242
 159.36

 86)
 C3-Dibenzo(a,h)anthrac...
 0.000
 0
 N.D. d

 87)
 Benzo(g,h,i)perylene
 44.848
 276
 1636630m
 31.33

 89)
 Perylene
 38.852
 252
 25341078m
 524.39

 91)
 C20-TAS
 0.000
 0
 N.D. d

 92)
 C21-TAS
 0.000
 0
 N.D. d

 93)
 C26(20S)-TAS
 0.000
 0
 N.D. d

 94)
 C26(20S)-TAS
 0.000
 0
 N.D. d

 95)
 C28(20S)-TAS
 0.000
 0
 N.D. d

 96)
 C27(20R)-TAS
 0.000
 0
 N.D. d

 97)
 C28(20R)-TAS
 0.000
 0
 N.D. d

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1600.D Acq On : 17 Aug 2013 3:31 pm Operator : YM Sample : SED-DA-020 (0.5-1.0) Misc : ALS Vial : 17 Sample Multiplier: 0.06653 Quant Time: Sep 05 22:32:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration (#) = qualifier out of range (m) = manual integration (+) = signals summed Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1600.D Acq On : 17 Aug 2013 3:31 pm Operator : YM Sample : SED-DA-020 (0.5-1.0) Misc : ALS Vial : 17 Sample Multiplier: 0.06653

Quant Time: Sep 05 22:32:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| 7.5e+07 | 7e+07 | 6.5e+07 | 6e+07 | 5.5e+07 | 5e+07 | 4.5e+07 | 4e+07 | 3.5e+07 | 3e+07 | 2.5e+07 | 2e+07 | 1.5e+07 | 1e+07 | 500000 | |
|------------------------|-------|---------|-------|---------|-------|---------|-------|---------|-------|---------|----------|-------------------------------------|--|-----------------------|--|
| | | | | | | | | | | | | s | ,8 ¢,enele | dth <mark>qe</mark> V | |
| | | | | | | | | | | | | Lana T,ana | erthqeniy Ierthqeniy | rtiəM-1 | |
| | | | | | | | | | | | | 1 | phthalene, phthylene, p , snarling | Acenap | 2 Y |
| | | | | | | | | | | | | un's | nphthalene 1,01t-, 96 , | | July Inc. |
| | | | | | | | | | | | | un'səue | elshthale nu,senero | | 1444 |
| | | | | | | | | | | | Τe | | nariqointo narialitation naria | | the second |
| | | | | | | | | | | | | | oznadibiyn Snadi | CS-DI | hund |
| | | | | | | | | | | | u | n'səuəyd | enantnenen Johnschieß Johnschieß Johnschinschen Bandhenschen | Engl Engl C2-PI | munuh |
| - | | | | | | | | | | | ur | n'səuəyde | bintoznadi Polifikanski | \$P\$3 | harpen |
| IC: ARC | | | | | | | | | | | | | noranthenu | CS-FI | Mulas WW washes and a second and when we are a second with the second se |
| 1600.D | | - | | | | | | | | un's | | S CHPWWR | 19101 13 20 | | WWW W |
| TIC: ARC1600.D\data.ms | | | | | | | | | | | Ŧ | Supply and | edso(e)ax All () Cµu\seue | 19 1 9 | AM. NWN |
| Ś | | | | | | | | | | 5 | T,ənəlyı | un's ⁹ d 1'2'45'80 | CµL\zeues CµL\zeues | C4- | - mul |
| | | | | | | | | | | | | | - | | مساليما |
| | | | | | | | | | | | غليل | 98A9AGKA | 9 46 (8,8)09 | CHARGEN | M MMM |
| | | | | | | | | | | | | T,ənəlyı | əd(i,n,p)o: | zuəg | MANK |
| | | | | | | | | | | | | | | ų ų | VUUL |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | | | _ |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

57.M Fri Sep 13 07:18:29 2013

Page: 4

| Data File Name | ARC1601.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 16:40 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SED-DA-020 (1.0-1.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 18 | | |
| Sample Multiplier | 0.06667 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ARC1601.D SED-DA-020 (1.0-1.5) 8/17/2013 PAH-2012.M 14.99925004

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--|------------------------------|----------|-----------------|---------------|---------------|
| 21 | sis (trans Deselin | (minute) | (area) | 0.0000 | Concentration |
| 2.7 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | | 0.0000 | 0.0000 |
| 622 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 233 | C4-Decalins | 13.88 | 248932 | 0.0000 | 0.0000 |
| | Naphthalene | | | 5.4627 | 5.7994 |
| | C1-Naphthalenes | 16.30 | 191093 | 4.1934 | 4.4520 |
| 2.5.19 | C2-Naphthalenes | 18.59 | 399494 | 8.7667 | 9.3071 |
| 10.3.5 | C3-Naphthalenes | 20.51 | 409321 | 8.9823 | 9.5360 |
| 0.333.0 | C4-Naphthalenes | 21.57 | 554447 | 12.1671 | 12.9171 |
| 23.47.1 | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1005 | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthylene | 19.17 | 40246 | 0.9047 | 0.9605 |
| | Acenaphthene | 19.78 | 39903 | 1.5716 | 1.6685 |
| | Dibenzofuran | 20.37 | 269802 | 6.2457 | 6.6307 |
| | Fluorene | 21.54 | 306970 | 8.9984 | 9.5532 |
| | C1-Fluorenes | 23.51 | 174842 | 5.1253 | 5.4413 |
| 2.222 | C2-Fluorenes | 25.55 | 488934 | 14.3325 | 15.2161 |
| | C3-Fluorenes | 27.59 | 363238 | 10.6479 | 11.3043 |
| | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| | Anthracene | 24.99 | 82842 | 1.7555 | 1.8638 |
| The second second states of the second s | Phenanthrene | 24.82 | 1700840 | 33.4249 | 35.4854 |
| | C1-Phenanthrenes/Anthracenes | 26.73 | 578251 | 11.3638 | 12.0643 |
| 2.9 S. 1 | C2-Phenanthrenes/Anthracenes | 28.22 | 707629 | 13.9063 | 14.7636 |
| | C3-Phenanthrenes/Anthracenes | 29.95 | 362803 | 7.1298 | 7.5694 |
| 1022200 | C4-Phenanthrenes/Anthracenes | 30.71 | 440665 | 8.6600 | 9.1938 |
| 34) | Dibenzothiophene | 24.41 | 108981 | 2.5908 | 2.7506 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 113333 | 2.6943 | 2.8604 |
| 38) | C2-Dibenzothiophenes | 27.63 | 215510 | 5.1234 | 5.4392 |
| | C3-Dibenzothiophenes | 29.12 | 297048 | 7.0618 | 7.4972 |
| 40) | C4-Dibenzothiophenes | 30.88 | 199917 | 4.7527 | 5.0457 |
| 58) | Fluoranthene | 28.94 | 500127 | 10.9015 | 11.5736 |
| 59) | Pyrene | 29.70 | 327446 | 5.4933 | 5.8319 |
| 62) | C1-Fluoranthenes/Pyrenes | 30.85 | 328737 | 7.1656 | 7.6074 |
| 63) | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 65) | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 54) | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 55) | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 56) | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 57) | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 109104 | 2.0159 | 2.1402 |
| 68) | Chrysene/Triphenylene | 33.93 | 303113 | 6.6147 | 7.0225 |
| 69) | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 37.34 | 529828 | 9.5882 | 10.1793 |
| | Benzo(k,j)fluoranthene | 37.38 | 108292 | 2.5734 | 2.7321 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 226456 | 4.4482 | 4.7225 |
| | Benzo(a)pyrene | 38.50 | 88108 | 1.7623 | 1.8710 |
| | Perviene | 38.81 | 16180300 | 317.7779 | 337.3678 |
| | Indeno(1,2,3-c,d)pyrene | 43.23 | 197753 | 3.1382 | 3.3316 |
| | Dibenzo(a,h)anthracene | 43.37 | 417701 | 8.2608 | 8.7701 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | | 0.0000 |
| | | | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,h)anthracenes | 0.00 | | 0.0000 2.8999 | 0.0000 |
| | Benzo(g,h,i)perylene | 44.63 | 159620 | | 3.0787 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-----|--------------------------------------|----------|-----------------|--------------------------|---------------|
| | | (minute) | (area) | 1916197909400371.1947953 | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 132967 | 4.6306 | 4.9161 |
| 10) | 1-Methylnaphthalene | 16.47 | 58126 | 2.1913 | 2.3264 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 43637 | 1.2723 | 1.3507 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 51898 | 1.5132 | 1.6064 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 17798 | 0.5189 | 0.5509 |
| 43) | 3-Methylphenanthrene | 26.48 | 130715 | 4.1466 | 4.4022 |
| 44) | 2-Methylphenanthrene | 26.59 | 153375 | 4.8654 | 5.1654 |
| 45) | 2-Methylanthracene | 26.76 | 126490 | 4.0126 | 4.2599 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 100382 | 3.1844 | 3.3807 |
| 47) | 1-Methylphenanthrene | 26.97 | 67289 | 2.1346 | 2.2662 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 91) | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 92) | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 93) | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 94) | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 95) | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 96) | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 97) | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 563647 | 13.81 | 82.79 |
| 21) | Acenaphthene-d10 | 19.67 | 335371 | 14.29 | 85.67 |
| 32) | Phenanthrene-d10 | 24.75 | 639068 | 15.71 | 94.19 |
| 66) | Chrysene-d12 | 33.81 | 583914 | 13.12 | 78.68 |
| 88) | Perylene-d12 | 38.74 | 482542 | 10.29 | 61.71 |
| 90) | 5(b)H-Cholane | 34.24 | 170394 | 21.63 | 129.76 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 403833 | 16.74 | |
| 31) | Pyrene-d10 | 29.67 | 673089 | 16.71 | |
| 73) | Benzo(a)pyrene-d12 | 38.43 | 663062 | 16.69 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1601.D Acq On : 17 Aug 2013 4:40 pm Operator : YM Sample : SED-DA-020 (1.0-1.5) Misc : ALS Vial : 18 Sample Multiplier: 0.06667 Quant Time: Sep 05 16:31:02 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) Internal Standards21.455176403833m251.050.0031) Pyrene-d1029.669212673089m250.630.0373) Benzo(a)pyrene-d1238.425264663062m250.320.04 System Monitoring Compounds 2) Naphthalene-d813.822136563647m13.810.0021) Acenaphthene-d1019.672164335371m14.290.0032) Phenanthrene-d1024.752188639068m15.710.0066) Chrysene-d1233.809240583914m13.12-0.0488) Perylene-d1238.736264482542m10.290.0490) 5(b)H-Cholane34.235217170394m21.630.00

 90) 5(b)H-Cholane
 34.235
 217
 170394m
 21.63

 Target Compounds
 0
 0
 N.D. d

 3) cis/trans Decalins
 0.000
 0
 N.D. d

 4) C1-Decalins
 0.000
 0
 N.D. d

 5) C2-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 10 1-Methylnaphthalene
 16.458
 142
 132967m
 4.63

 11 2,6-Dimethylnaphthalene
 16.468
 142
 132967m
 4.63

 12) 1,6,7-Trimethylnaphthal.
 0.000
 0
 N.D. d
 13

 13) C2-Naphthalenes
 18.586
 156
 399494m
 8.77

 14) C3-Naphthalenes
 21.566
 184
 54447m
 12.17

 16) Benzothiophene
 0.000
 0
 N.D. d

 17) C1-Benzothiophenes
 0.000
 0
 N.D. d

 19) C3-Benzothiophenes
 0.000
 0
 N.D. d

 20) C4-Benzothiophenes
 0.000
 0
 N.D. d

 21) benzofuran
 20.368
 Qvalue

| Data Acq C Opera Sampl Misc | Path : C:\msdchem\2\data\MS File : ARC1601.D On : 17 Aug 2013 4:40 p tor : YM .e : SED-DA-020 (1.0-1.5) Yial : 18 Sample Multipli | om | 667 | | | |
|---|---|--|--|--|--|--|
| Quant Quant QLast | Time: Sep 05 16:31:02 2013 Method : C:\GCMS7\MS70057\ Title : PAH Calibration T Update : Sat Aug 17 22:39: onse via : Initial Calibrati | AR70057. able-201 35 2013 | | | | |
| | Compound | | | | Conc Units | |
| 45) 46) 47) 48) 50) 51) 52) 52) 55) 55) 55) 55) 55) 55) 55) 55 | 2-Methylphenanthrene 2-Methylphenanthrene 4/9-Methylphenanthrene 1-Methylphenanthrene Retene C2-Phenanthrenes/Anthr C3-Phenanthrenes/Anthr C4-Phenanthrenes/Anthr Naphthobenzothiophene C1-Naphthobenzothiophenes C2-Naphthobenzothiophenes C3-Naphthobenzothiophenes C4-Naphthobenzothiophenes C4-Naphthobenzothiophenes Fluoranthene Pyrene 2-Methylfluoranthene Benzo(b)fluorene C1-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes C4-Chrysenes C2-Chrysenes C3-Chrysenes C4-Chrysenes C2-Chrysenes C3-Chrysenes C4-Chrysenes C2-Chrysenes C3-Chrysenes C4-Chrysenes C2-Hopane 18a-Oleanane C30-Hopane Benzo(b)fluoranthene Benzo(c)fluoranthene Benzo(a)fluoranthene Benzo(a)fluoranthene Benzo(a)pyrene | 26.588 26.761 26.865 26.968 0.000 0.000 28.215 29.946 30.708 0.000 0.000 0.000 0.000 0.000 28.942 29.704 0.000 0.000 30.847 0.000 0.000 30.847 0.000 30.770 | 192 192 192 206 220 234 202 202 202 216 | 153375m 126490m 100382m 67289m 0 707629m 362803m 440665m 0 0 0 500127m 327446m 0 0 500127m 327446m 0 0 328737m 0 0 0 328737m 0 0 0 0 500127m 327446m 0 0 500127m 327446m 0 0 500127m 327446m 0 0 500127m 327446m 0 0 0 529828m 108292m 0 226456m 88108m | 4.87 4.01 3.18 2.13 N.D. d 13.91 7.13 8.66 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d 10.90 5.49 N.D. d N.D. d | |
| 83) | Dibenzo(a,h)anthracene | 43.373 0.000 | 278 | | 8.26 N.D. d | |
| | | 0.000 | | 0 | N.D. d | |
| | C3-Dibenzo(a,h)anthrac Benzo(g,h,i)perylene | 0.000 44.627 | 276 | 0 159620m | N.D. d 2.90 | |
| | Perylene | 38.813 | | 16180302m | 317.78 | |
| | C20-TAS | 0.000 | | 0 | N.D. d | |
| | C21-TAS | 0.000 | | 0 | N.D. d | |
| | C26(20S)-TAS | 0.000 | | 0 | N.D. d | |
| | C26 (20R) /C27 (20S) -TAS | 0.000 | | 0 | N.D. d | |
| | C28(20S)-TAS | 0.000 | | 0 | N.D. d | |
| | C27 (20R) -TAS C28 (20R) -TAS | 0.000 | | 0 | N.D. d N.D. d | |
| | | | | | | |

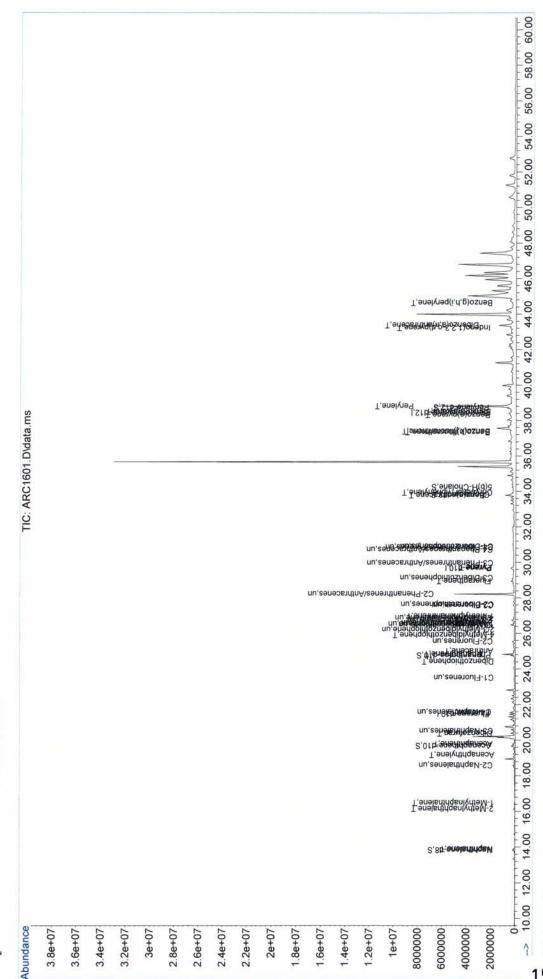
Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1601.D Acq On : 17 Aug 2013 4:40 pm Operator : YM Sample : SED-DA-020 (1.0-1.5) Misc : ALS Vial : 18 Sample Multiplier: 0.06667 Quant Time: Sep 05 16:31:02 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed



Sample Multiplier: 0.06667 C:\msdchem\2\data\MS70057\ 4:40 pm Sep 05 16:31:02 2013 SED-DA-020 (1.0-1.5) 17 Aug 2013 ARC1601.D MЖ 18 .. •• Time: •• ... Data Path Data File Operator ALS Vial Acq On Sample Quant Misc

Quant Time: Sep 05 16:31:02 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration



150

57.M Fri

07:18:49 2013

Sep 13

4

Page:

| Data File Name | ARC1618.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 17:48 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-012 (0-0.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 19 | | |
| Sample Multiplier | 0.06614 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ARC1618.D SO-DA-012 (0-0.5) 8/17/2013 PAH-2012.M 15.1194436

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--|--|---------------|-----------------|------------------|---------------|
| 21 | dia Anna Prosella | (minute) | (area) | 0.0000 | Concentration |
| 232 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 105 | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 22 | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 52 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 83762 | 2.1292 | 2.3531 |
| 9)+10) | C1-Naphthalenes | 16.30 | 65634 | 1.6684 | 1.8438 |
| 13) | C2-Naphthalenes | 18.59 | 102843 | 2.6142 | 2.8891 |
| 14) | C3-Naphthalenes | 20.51 | 79238 | 2.0142 | 2.2260 |
| 15) | C4-Naphthalenes | 21.57 | 148734 | 3.7807 | 4.1783 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 18) | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| Sec. Sec. | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 232 C | Acenaphthylene | 19.17 | 75094 | 1.9555 | 2.1611 |
| | Acenaphthene | 19.78 | 2342 | 0.1068 | 0.1181 |
| 92.434 | | | 0 | | |
| | Dibenzofuran | 0.00 21.54 | 73251 | 0.0000 | 0.0000 |
| 020124 | Fluorene | | | 2.4873 | 2.7489 |
| ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | C1-Fluorenes | 23.51 | 42940 | 1.4581 | 1.6114 |
| | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 24.99 | 152324 | 3.3747 | 3.7296 |
| 41) | Phenanthrene | 24.82 | 558980 | 11.4845 | 12.6923 |
| 3)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 26.72 | 298401 | 6.1308 | 6.7755 |
| 50) | C2-Phenanthrenes/Anthracenes | 28.22 | 455585 | 9.3602 | 10.3446 |
| 51) | C3-Phenanthrenes/Anthracenes | 29.95 | 524350 | 10.7729 | 11.9059 |
| 2.3527.0 | C4-Phenanthrenes/Anthracenes | 31.78 | 468134 | 9.6180 | 10.6295 |
| 8.007 | Dibenzothiophene | 24.41 | 41486 | 1.0311 | 1.1395 |
| | C1-Dibenzothiophenes | 26.21 | 56991 | 1.4165 | 1.5654 |
| | 승규가 지지 않는 것 같아요. 김 이가 가장 것을 수집하면서 집 | 27.97 | | | |
| | C2-Dibenzothiophenes | | 189995 | 4.7222 | 5.2188 |
| | C3-Dibenzothiophenes | 29.50 | 403159 | 10.0201 | 11.0739 |
| | C4-Dibenzothiophenes | 31.50 | 338327 | 8.4088 | 9.2931 |
| 58) | Fluoranthene | 28.94 | 631499 | 14.3909 | 15.9043 |
| 59) | Pyrene | 29.70 | 529238 | 9.2822 | 10.2584 |
| 62) | C1-Fluoranthenes/Pyrenes | 30.85 | 413491 | 9.4228 | 10.4138 |
| 63) | C2-Fluoranthenes/Pyrenes | 32.57 | 671692 | 15.3068 | 16.9165 |
| 64) | C3-Fluoranthenes/Pyrenes | 34.43 | 349731 | 7.9698 | 8.8080 |
| 65) | C4-Fluoranthenes/Pyrenes | 35.32 | 645053 | 14.6997 | 16.2457 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 14 SS 44 | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | o | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | | | | |
| | | 33.77 | 324179 | 6.2621 | 6.9206 |
| | Chrysene/Triphenylene | 33.89 | 677775 | 15.4633 | 17.0895 |
| 121.725 | C1-Chrysenes | 35.13 | 519913 | 11.8617 | 13.1091 |
| | C2-Chrysenes | 36.60 | 523455 | 11.9425 | 13.1984 |
| 10.0 | C3-Chrysenes | 38.00 | 407645 | 9.3003 | 10.2784 |
| | C4-Chrysenes | 39.43 | 249607 | 5.6947 | 6.2936 |
| 1 - 21 - 21 - 21 - 21 - 21 - 21 - 21 - | Benzo(b)fluoranthene | 37.34 | 1109500 | 22.8317 | 25.2328 |
| 78) | Benzo(k,j)fluoranthene | 37.42 | 395710 | 10.6931 | 11.8176 |
| 79) | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 80) | Benzo(e)pyrene | 38.31 | 619442 | 13.8361 | 15.2912 |
| C22810 | Benzo(a)pyrene | 38.50 | 184658 | 4.2000 | 4.6417 |
| | Perviene | 38.81 | 38528 | 0.8604 | 0.9509 |
| 10000 | Indeno(1,2,3-c,d)pyrene | 43.19 | 345193 | 6.2291 | 6.8842 |
| | Dibenzo(a,h)anthracene | 43.26 | 94782 | 2.1315 | 2.3557 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | | | |
| | | | 0 | 0.0000 | 0.0000 |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,h)anthracenes Benzo(g,h,i)perylene | 0.00 | 0 306836 | 0.0000 6.3388 | 0.0000 |
| V (122) | | 44.55 | | | 7.0055 |

| | Quai | ercacton | Repor | | CVICWEU) | |
|---------------|--|-----------|-------|-----------|--------------------------------------|-------------|
| Data | Path : C:\msdchem\2\data\M | 970057\ | | | | |
| | File : ARC1618.D | 5,005,1 | | | | |
| Acq C | On : 17 Aug 2013 5:48] ator : YM | pm | | | | |
| | Le : SO-DA-012 (0-0.5) | | | | | |
| Misc ALS V | : Vial : 19 Sample Multipl: | ier: 0.06 | 5614 | | | |
| | | | | | | |
| Quant | Time: Sep 05 22:30:50 201 Method : C:\GCMS7\MS70057 Title : PAH Calibration 7 | AR70057 | | | | |
| | Update : Sat Aug 17 22:39 | | | | | |
| | onse via : Initial Calibrat: | | | | | |
| | | | | | | |
| | Compound | R.T. | QIon | Response | Conc Uni | ts Dev(Min) |
| | | | | | | |
| Inte | rnal Standards Fluorene-d10 Pyrene-d10 | | | | | |
| (L | Fluorene-dlu | 21.455 | 176 | 345855m | 251.05 | 0.00 |
| 31) | Pyrene-d10 | 29.635 | 212 | 638702m | 250.63 | 0.00 |
| 73) | Benzo(a)pyrene-d12 | 38.386 | 264 | 578467m | 250.32 | 0.00 |
| Curat | om Monitoring Compounds | | | | | |
| SYSC | em Monitoring Compounds | 12 022 | 126 | 150110m | 10 04 | 0.00 |
| 21) | Naphthalene-d8 Acenaphthene-d10 | 19 672 | 164 | 452418III | 11 72 | 0.00 |
| 32) | Phenanthrene-d10 | 24 752 | 199 | 237737m | 1/ 07 | 0.00 |
| 66) | Phenanthrene-d10 Chrysene-d12 Perylene-d12 | 33 809 | 240 | 582394m | 13 68 | -0.04 |
| 88) | Pervlene-d12 | 38 697 | 264 | 4067m | 0 10 | 0.04 |
| 90) | 5(b)H-Cholane | 34.235 | 217 | 122026m | 17 61 | 0.00 |
| , | | | | 100000 | 17.01 | 0.00 |
| Targ | et Compounds | | | | N.D. N.D. N.D. N.D. N.D. | Qvalue |
| | cis/trans Decalin | 0.000 | | 0 | N.D. | d |
| | C1-Decalins | 0.000 | | 0 | N.D. | d |
| 5) | C2-Decalins C3-Decalins | 0.000 | | 0 | N.D. | d |
| 6) | C3-Decalins | 0.000 | | 0 | N.D. | a |
| 7) | C4-Decalins | 0.000 | 100 | 0 | N.D. | d |
| 8) | Naphthalene | 15.8/8 | 142 | 83762m | 2.13 | |
| 10) | 2-Methylnaphthalene | 16.154 | 142 | 46428III | 1.8/ | |
| 11) | 2 6-Dimethylnaphthalene | 10.400 | 142 | 19206 | 0.04 N D | a |
| 12) | C3-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphtha | 0.000 | | 0 | N.D. | d. |
| 13) | C2-Naphthalenes | 18.586 | 156 | 102843m | 2.61 | u. |
| 14) | C3-Naphthalenes | | | 79238m | | |
| 15) | C4-Naphthalenes | 21.566 | 184 | 148734m | 3.78 | |
| | Benzothiophene | 0.000 | | 0 | N.D. | d |
| | C1-Benzothiophenes | 0.000 | | 0 | N.D. (| |
| 18) | C2-Benzothiophenes | 0.000 | | 0 | N.D. (| d |
| | C3-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| | C4-Benzothiophenes | 0.000 | | 0 | N.D. (| d |
| | Biphenyl | 0.000 | | 0 | N.D. (| d |
| | Acenaphthylene | 19.171 | 152 | 75094m | 1.96 | |
| | Acenaphthene | 19.783 | 154 | 2342m | 0.11 | |
| | Dibenzofuran | 0.000 | | 0 | N.D. (| d |
| | Fluorene | 21.538 | 166 | 73251m | 2.49 | - |
| | 1-Methylfluorene | 0.000 | 100 | 0 | N.D. (| a |
| | C1-Fluorenes C2-Fluorenes | 23.506 | 180 | 42940m | 1.46 N.D. | 4 |
| | C3-Fluorenes | 0.000 | | 0 | N.D. 0 N.D. 0 | |
| | Carbazole | 0.000 | | 0 | N.D. 0 | |
| | Dibenzothiophene | 24.406 | 184 | 41486m | 1.03 | 4 |
| | 4-Methyldibenzothiophene | 25.895 | 198 | 24199m | 0.74 | |
| | 2/3-Methyldibenzothiop | 26.207 | 198 | 20803m | 0.63 | |
| | 1-Methyldibenzothiophene | 26.518 | 198 | 11989m | 0.37 | |
| | C2-Dibenzothiophenes | 27.973 | 212 | 189995m | 4.72 | |
| | C3-Dibenzothiophenes | 29.496 | 226 | 403159m | 10.02 | |
| | C4-Dibenzothiophenes | 31.505 | 240 | 338327m | 8.41 | |
| | Phenanthrene | 24.821 | 178 | 558980m | 11.48 | |
| | Anthracene | 24.995 | | 152324m | 3.37 | |
| 43) | 3-Methylphenanthrene | 26.484 | 192 | 48609m | 1.61 | |
| | | | | | | |

| Data Acq O Opera Sampl Misc | Path : C:\msdchem\2\data\MS File : ARC1618.D m : 17 Aug 2013 5:48 p tor : YM e : SO-DA-012 (0-0.5) : Tial : 19 Sample Multipli | m | 5614 | | | |
|---|---|--|--|--|---|---|
| Quant Quant QLast | Time: Sep 05 22:30:50 2013 Method : C:\GCMS7\MS70057\ Title : PAH Calibration T Update : Sat Aug 17 22:39: nse via : Initial Calibrati | AR70057. able-201 35 2013 | M .3A | | | |
| | Compound | | | | | its Dev(Min) |
| 47))) 52)) 55) 55) 55) 55) 55) 55) 55) 55) | 2-Methylphenanthrene 2-Methylphenanthrene 4/9-Methylphenanthrene 1-Methylphenanthrene Retene C2-Phenanthrenes/Anthr C3-Phenanthrenes/Anthr C4-Phenanthrenes/Anthr Naphthobenzothiophene C1-Naphthobenzothiophenes C2-Naphthobenzothiophenes C3-Naphthobenzothiophenes C4-Naphthobenzothiophenes C4-Naphthobenzothiophenes Fluoranthene Pyrene 2-Methylfluoranthene Benzo(b)fluorene C1-Fluoranthenes/Pyrenes C2-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C4-Fluoranthenes/Pyrenes Benz(a) anthracene Chrysene/Triphenylene C1-Chrysenes C2-Chrysenes C2-Chrysenes C2-Chrysenes C3-Chrysenes C4-Chrysenes C2-Chrysenes C3-Chrysenes C4-Chrysenes C2-Chrysenes C3-Chrysenes C3-Chrysenes C4-Chrysenes C3-Hopane Benzo(b)fluoranthene Benzo(a)fluoranthene Benzo(a)fluoranthene Benzo(a)pyrene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene C1-Dibenzo(a,h)anthrac | $\begin{array}{c} 26.587\\ 26.726\\ 26.865\\ 26.934\\ 0.000\\ 0.000\\ 28.215\\ 29.946\\ 31.782\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 30.847\\ 32.567\\ 34.429\\ 35.322\\ 33.770\\ 34.429\\ 35.322\\ 33.770\\ 33.886\\ 35.128\\ 36.602\\ 37.998\\ 39.434\\ 0.000\\ 0.000\\ 37.339\\ 37.417\\ 0.000\\ 38.309\\ 38.503\\ 43.189\\ 43.262\\ 0.000\\ \end{array}$ | 192 192 192 206 220 234 202 202 202 216 230 244 258 228 | 65640m 116995m 36608m 30549m 0 455585m 524350m 468134m 0 0 0 631499m 529238m 0 0 631499m 529238m 0 0 413491m 671692m 349731m 645053m 324179m 677775m 519913m 523455m 407645m 249607m 0 0 1109499m 395710m 0 619442m 184658m 345193m 94782m 0 | 2.18 3.88 1.21 1.01 N.D. 9.36 10.77 9.62 N.D. N.D. N.D. 14.39 9.28 N.D. 14.39 9.28 N.D. 9.42 15.31 7.97 14.70 6.26 15.46 11.86 11.94 9.30 5.69 N.D. N.D. N.D. N.D. 13.84 4.20 6.23 2.13 N.D. | d d d d d d d d d d d d d d d d d d d |
| 86) | C3-Dibenzo(a,h)anthrac | 0.000 | 076 | 0 0 | N.D. N.D. | |
| | Benzo(g,h,i)perylene Perylene | 44.553 38.813 | 276 252 | 306836m 38528m | 6.34 0.86 | |
| | C20-TAS | 0.000 | | 0 | N.D. | |
| | C21-TAS | 0.000 | | 0 | N.D. | |
| | C26(20S)-TAS | 0.000 | | 0 | N.D. | |
| | C26(20R)/C27(20S)-TAS | 0.000 | | 0 | N.D. | |
| | C28 (20S) - TAS | 0.000 | | 0 | N.D. N.D. | |
| | C27 (20R) -TAS C28 (20R) -TAS | 0.000 | | 0 | N.D. N.D. | |
| | | | | | | 575 10 0 0 0 0 0 0 0 0 0 0 0 0 |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1618.D Acq On : 17 Aug 2013 5:48 pm Operator : YM Sample : SO-DA-012 (0-0.5) Misc : ALS Vial : 19 Sample Multiplier: 0.06614 Quant Time: Sep 05 22:30:50 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:21:12 2013

(QT Reviewed) Quantitation Report

MMM 1mm T,enslyneq(i,h,g)ozne8 T. Trensverbranks for i a postanta di C un'sauas/uq)-+) Betherid of State 112's TIC: ARC1618.D\data.ms Т. этеккитеники (ряредна в C2-Chrysenes, un C41FfUX88888645)Pyrenes.un Book and the set of th C2-Fluoranthenes/Pyrenes,un C4-Dipenzofhiophenes.un C1-Fluoranthenes/Pyrenes,un C3-Phenanthrenes/Anthracenes,un T,enertheroul F J, senecentin Alzeneritinenerit-53 C2-Dibenzothiophenes.un T ənəriqointoznadibiyriləM-P ənəriqointoznadibiyriləM-P HəndrintoznadibiyriləM-P Həndrintoznadibiyri Hənəriənən artifiziylə və Məri Hənəriənən artifiziylə və Məri un Sample Multiplier: 0.06614 PAH Calibration Table-2013A C:\GCMS7\MS70057\AR70057.M T.enengointoznedio 2.011eaenniishaadd 24.00 : Sat Aug 17 22:39:35 2013 : Initial Calibration nu, seneroul 7-10 C:\msdchem\2\data\MS70057 md nlugebragerer and 22:30:50 2013 16.00 18.00 20.00 C3-Naphthalenes, un 5:48 -W T,enelyhtingeneck B,01b-energiaaneekie S,01b-energiaaneekie S,01b-energi SO-DA-012 (0-0.5) C2-Naphthalenes,un 17 Aug 2013 L, analishingsnivnamin T, analishing ARC1618.D 05 S,8b-analadatikaskisN Sep ••• .. ΜХ 19 12.00 Quant Method Response via QLast Update Quant Title Quant Time: ... ••• 10.00 Data Path Data File Operator ALS Vial 40 500000 Acq On Sample Abundance 5000000 5500000 4500000 4000000 3500000 3000000 2500000 2000000 1500000 1000000 Misc

60.00

58.00

8 56.0

54.00

52.00

50.00

46.00 48.00

44.00

38.00 40.00 42.00

36.00

34.00

32.00

30.00

28.00

26.00

22.00

07:21:13 2013

13 14.00

Sep

Fri

M. 72

1

4

Page:

1

| Data File Name | ARC1619.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|----------------------------|---------------------------------------|---------|--------------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/17/2013 20:05 | Acenaphthene-d10 | 250.163 | Copy data b |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | to Spread S |
| Sample Name | SO-DA-012 (0.5-1.0) | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | ARC1619 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SO-DA-012 (0 |
| Vial Number | 21 | | | 8/17/20 |
| Sample Multiplier | 0.06653 | | | PAH-2012 |
| Sample Amount | 0 | | | 15.03081 |

below Sheet

19.D 2 (0.5-1.0) 2013 012.M 15.03081317

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|--------------------|------------------------------|----------------------|---------------------------|------------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.330 | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 12.01 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| (a) (a) | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 87757 | 2.1339 | 2.4706 |
| | C1-Naphthalenes | 16.30 | 73671 | 1.7914 | 2.0740 |
| | C2-Naphthalenes | 18.59 | 115852 | 2.8171 | 3.2616 |
| | C3-Naphthalenes | 20.51 | 90770 | 2.2072 | 2.5554 |
| | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 19.17 | 25208 | 0.6279 | 0.7270 |
| | Acenaphthylene | 19.70 | 3545 | | |
| | Acenaphthene | 20.37 | 89731 | 0.1547 2.3017 | 0.1791 2.6649 |
| 5 Y S S S | Dibenzofuran | 20.37 | 96353 | | 3.6235 |
| 002557 | Fluorene | | | 3.1298 | |
| | C1-Fluorenes | 23.51 | 28539 | 0.9270 | 1.0733 |
| | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 6.000 C | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| | Anthracene | 24.99 | 36658 | 0.7564 | 0.8758 |
| 41) | Phenanthrene | 24.82 | 562259 | 10.7592 | 12.4567 |
| 3)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 26.72 | 237389 | 4.5426 | 5.2593 |
| 50) | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 51) | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 52) | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 34) | Dibenzothiophene | 24.41 | 47234 | 1.0934 | 1.2659 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 50790 | 1.1757 | 1.3612 |
| 38) | C2-Dibenzothiophenes | 27.63 | 60271 | 1.3952 | 1.6153 |
| 39) | C3-Dibenzothiophenes | 29.50 | 49492 | 1.1457 | 1.3264 |
| 40) | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluoranthene | 28.94 | 259866 | 5.5156 | 6.3858 |
| | Pyrene | 29.70 | 170502 | 2.7852 | 3.2246 |
| | C1-Fluoranthenes/Pyrenes | 30.85 | 85639 | 1.8177 | 2.1044 |
| SSC MARK | C2-Fluoranthenes/Pyrenes | 32.57 | 161947 | 3.4373 | 3.9796 |
| ST22 (22) (24) | C3-Fluoranthenes/Pyrenes | 33.61 | 74761 | 1.5868 | 1.8371 |
| | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.09700.0 | Naphthobenzothiophene | 0.00 | ō | 0.0000 | 0.0000 |
| 22-201 | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 107 C (207 | C2-Naphthobenzothiophenes | 0.00 | Ö | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 75269 | 1.3542 | 1.5678 |
| | Chrysene/Triphenylene | 33.89 | 188142 | 3.9979 | 4.6286 |
| | | 35.17 | 115895 | | |
| | C1-Chrysenes | | | 2.4627 | 2.8512 2.7729 |
| | C2-Chrysenes | 36.60 | 112711 | 2.3950 | |
| | C3-Chrysenes | 38.08 | 79197 | 1.6829 | 1.9484 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 37.34 | 274269 | 5.3232 | 6.1631 |
| Sec. 2017 | Benzo(k,j)fluoranthene | 37.42 | 73775 | 1.8803 | 2.1769 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 153580 | 3.2354 | 3.7459 |
| | Benzo(a)pyrene | 38.46 | 27219 | 0.5839 | 0.6760 |
| | Perylene | 38.77 | 9332 | 0.1966 | 0.2276 |
| | ndeno(1,2,3-c,d)pyrene | 43.19 | 89259 | 1.5192 | 1.7588 |
| | Dibenzo(a,h)anthracene | 43.26 | 23606 | 0.5007 | 0.5797 |
| 84) (| C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) (| C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 001 | | | | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-------|--------------------------------------|----------|-----------------|---------------|---------------|
| | 020 | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 52129 | 2.0115 | 2.3290 |
| 10) | 1-Methylnaphthalene | 16.47 | 21542 | 0.8999 | 1.0419 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.89 | 25519 | 0.7245 | 0.8388 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 17207 | 0.4885 | 0.5656 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 8064 | 0.2289 | 0.2651 |
| 43) | 3-Methylphenanthrene | 26.48 | 39421 | 1.2177 | 1.4098 |
| 44) | 2-Methylphenanthrene | 26.59 | 46361 | 1.4320 | 1.6580 |
| 45) | 2-Methylanthracene | 26.73 | 108886 | 3.3634 | 3.8940 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 19501 | 0.6024 | 0.6974 |
| 47) | 1-Methylphenanthrene | 26.93 | 23220 | 0.7172 | 0.8304 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 92) | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 93) | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| - 10 | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 470534 | 12.77 | 76.74 |
| | Acenaphthene-d10 | 19.67 | 249460 | 11.78 | 70.76 |
| | Phenanthrene-d10 | 24.75 | 600557 | 14.38 | 86.37 |
| 1.111 | Chrysene-d12 | 33.81 | 633779 | 13.86 | 83.33 |
| | Perviene-d12 | 38.70 | 1662 | 0.04 | 0.23 |
| 1200 | 5(b)H-Cholane | 34.24 | 136536 | 18.59 | 111.74 |
| 1 | Internal Standards | | and 5.50 | 57775 R | 111111111 |
| 1) | Fluorene-d10 | 21.45 | 363678 | 16.70 | |
| | Pyrene-d10 | 29.63 | 689801 | 16.67 | |
| | Benzo(a)pyrene-d12 | 38.39 | 616945 | 16.65 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1619.D Acq On : 17 Aug 2013 8:05 pm Operator : YM Sample : SO-DA-012 (0.5-1.0) Misc . ALS Vial : 21 Sample Multiplier: 0.06653 Quant Time: Sep 05 21:32:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QION Response Conc Units Dev(Min) Internal Standards1) Fluorene-d1021.455176363678m251.050.0031) Pyrene-d1029.635212689801m250.630.0073) Benzo(a)pyrene-d1238.386264616945m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136470534m12.770.0021) Acenaphthene-d1019.672164249460m11.780.0032) Phenanthrene-d1024.752188600557m14.380.0066) Chrysene-d1233.809240633779m13.86-0.0488) Perylene-d1238.6972641662m0.040.0090) 5 (b)H-Cholane34.235217136536m18.590.00

 90) 5 (b)H-Cholane
 34.235
 217
 136536m
 18.59

 Target Compounds
 0
 0
 N.D. d

 3) cis/trans Decalin
 0.000
 0
 N.D. d

 6) C2-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 9) 2-Methylnaphthalene
 16.134
 142
 52129m
 2.01

 101 1-Methylnaphthalene
 16.468
 142
 52129m
 2.01

 11 2,6-Dimethylnaphthalene
 16.468
 142
 52129m
 2.01

 12,6-Dimethylnaphthalene
 16.000
 0
 N.D. d

 13) C2-Naphthalenes
 20.508
 170
 90770m
 2.21

 14) C3-Naphthalenes
 0.000
 0
 N.D. d

 13) C2-Naphthalenes
 0.000
 0
 N.D. d

 16) Benzothiophene
 0.000
 0
 N.D. d

 17) C1-Benzothiophenes
 0.000
 0
 N.D. d

 19) C3-Benzothiophenes
 0.000
 0
 N.D. d

 20) C4-Benzothiophenes
 0.000
 0
 N.D. d

 21) Denzofuran
 20.368
 168
 Qvalue

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1619.D Acq On : 17 Aug 2013 8:05 pm Operator : YM Sample : SO-DA-012 (0.5-1.0) : Misc ALS Vial : 21 Sample Multiplier: 0.06653 Quant Time: Sep 05 21:32:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QION Response Conc Units Dev(Min) Compound

 44)
 2-Methylphenanthrene
 26.587
 192
 46361m
 1.43

 45)
 2-Methylanthracene
 26.726
 192
 108886m
 3.36

 46)
 4/9-Methylphenanthrene
 26.865
 192
 19501m
 0.60

 47)
 1-Methylphenanthrene
 26.934
 192
 23220m
 0.72

 48)
 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49)
 Retene
 0.000
 0
 N.D. d

 50)
 C2-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 51)
 C3-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 53)
 Naphthobenzothiophene
 0.000
 0
 N.D. d

 54)
 C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55)
 C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 57)
 C4-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 58)
 Fluoranthene
 28.942
 202
 259866m
 5.52

 59)
 Pyrene
 29.704
 202
 170502m
 2.79

 60)< ______

 62)
 C1-Fluoranthenes/Pyrenes
 30.847
 216
 85639m
 1.82

 63)
 C2-Fluoranthenes/Pyrenes
 32.567
 230
 161947m
 3.44

 64)
 C3-Fluoranthenes/Pyrenes
 33.615
 244
 74761m
 1.59

 65)
 C4-Fluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 67)
 Benz(a) anthracene
 33.770
 228
 75269m
 1.35

 68)
 Chrysene/Triphenylene
 33.886
 228
 188142m
 4.00

 69)
 C1-Chrysenes
 35.166
 242
 115895m
 2.46

 70)
 C2-Chrysenes
 36.076
 270
 79197m
 1.68

 72)
 C4-Chrysenes
 0.000
 0
 N.D. d

 73)
 Bacoleanane
 0.000
 0
 N.D. d

 76)
 C30-Hopane
 0.000
 0
 N.D. d

 77)
 Benzo(k,j)fluoranthene
 37.339
 252
 274269m
 5.32

 78)
 Benzo(a)fluoranthene
 37.417
 252
 73775m
 1.88

 79)
 Benzo(a, h) anthraccne
 43.262
 27219m</t 10 84 (94.176.82109) (4.1010) (4.100) (4.1010) (4.100) (4.100) (4.100) (4.100) (4.100) (4.100) (4.100)

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1619.D Acq On : 17 Aug 2013 8:05 pm Operator : YM Sample : SO-DA-012 (0.5-1.0) Misc : ALS Vial : 21 Sample Multiplier: 0.06653 Quant Time: Sep 05 21:32:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:21:31 2013

| Reviewed) |
|--------------|
| (QT |
| Report |
| Quantitation |

Sample Multiplier: 0.06653 Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1619.D 8:05 pm : SO-DA-012 (0.5-1.0) : 17 Aug 2013 : 21 . ΥМ Misc ALS Vial Operator Sample Acq On

Quant Time: Sep 05 21:32:32 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| Иариярыееете Солтариярыееете Солтариярия Солтариярия Солтариярия Солтариярия Солтариария Солтария Солтариария Солтариария Солтариария Солтариария Солтария Солтариария Солт |
|---|
| C2-Naphthalene Acenaphthylene C3th6th6th6th6th6th6th6th6th6th6th6th6th6t |
| Acensphitylene Acentration Administration Co |
| Coltraction of the contraction o |
| C1-Fluorenes,ur Dibenzothiophe Bingensofhin Chenzothiophe |
| Dibenzorhoznadi Dibenzorhozna |
| |
| uediplythem-ty |
| CS-Dibenzothion |
| Fluoranthene, |
| C1-Fluoranthen |
| C2-Fluoranthen |
| and the second s |
| C1-Chrysenes. |
| omit(d) partege 5 |
| |
| and the second and the second se |
| Benzo(g.h.i)pe |
| |
| |
| J |
| Y |
| |
| 0 |
| |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |

Page: 4

| Data File Name | ARC1620.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 21:14 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-012 (1.0-1.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 22 | | |
| Sample Multiplier | 0.06649 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ARC1620.D SO-DA-012 (1.0-1.5) 8/17/2013 PAH-2012.M 15.03985562

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|----------------------------|--|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 2273 | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 213 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 1915 | Naphthalene | 13.88 | 182213 | 4.4903 | 4.8806 |
| | | 16.30 | 139065 | 3.4270 | 3.7249 |
| | C1-Naphthalenes | | | | |
| | C2-Naphthalenes | 18.59 | 232991 | 5.7416 | 6.2407 |
| | C3-Naphthalenes | 20.15 | 333815 | 8.2261 | 8.9413 |
| 2920327 | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| S. 10.00 | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 46972 | 1.1858 | 1.2889 |
| 24) | Acenaphthene | 19.78 | 8741 | 0.3866 | 0.4202 |
| | Dibenzofuran | 20.37 | 157078 | 4.0834 | 4.4383 |
| | Fluorene | 21.54 | 158506 | 5.2178 | 5.6714 |
| 6. S. S. C. | C1-Fluorenes | 23.51 | 70532 | 2.3218 | 2.5237 |
| (2010-2010) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | 0 | | |
| | C3-Fluorenes | 0.00 | | 0.0000 | 0.0000 |
| | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 2253256 | Anthracene | 24.99 | 74464 | 1.5687 | 1.7051 |
| 41) | Phenanthrene | 24.82 | 899049 | 17.5641 | 19.0910 |
| 43)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 26.72 | 397725 | 7.7701 | 8.4456 |
| 50) | C2-Phenanthrenes/Anthracenes | 28.22 | 340595 | 6.6539 | 7.2324 |
| 51) | C3-Phenanthrenes/Anthracenes | 29.95 | 139652 | 2.7283 | 2.9655 |
| (2-93-23) | C4-Phenanthrenes/Anthracenes | 30.71 | 169679 | 3.3149 | 3.6031 |
| | Dibenzothiophene | 24.41 | 82018 | 1.9384 | 2.1069 |
| | C1-Dibenzothiophenes | 26.21 | 132762 | 3.1376 | 3.4104 |
| 전 것이 같은 것이 있는 것이 없는 것이 없다. | C2-Dibenzothiophenes | 27.63 | 143127 | 3.3826 | 3.6766 |
| 5219023W | 요즘 옷에 들어들어야 한 것을 알았는 다가 한 것을 수 있는 것이다. | 29.50 | 146940 | 3.4727 | 3.7746 |
| | C3-Dibenzothiophenes | | | | |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluoranthene | 28.94 | 523774 | 11.3497 | 12.3364 |
| 533 MA | Pyrene | 29.70 | 427468 | 7.1291 | 7.7488 |
| 62) | C1-Fluoranthenes/Pyrenes | 30.85 | 252884 | 5.4798 | 5.9562 |
| 63) | C2-Fluoranthenes/Pyrenes | 32.57 | 388519 | 8.4189 | 9.1508 |
| 64) | C3-Fluoranthenes/Pyrenes | 33.61 | 168864 | 3.6591 | 3.9772 |
| 65) | C4-Fluoranthenes/Pyrenes | 35.32 | 217398 | 4.7108 | 5.1204 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 33.77 | | | |
| | Benz(a)anthracene | | 130666 | 2.4001 | 2.6087 |
| | Chrysene/Triphenylene | 33.89 | 352170 | 7.6400 | 8.3042 |
| | C1-Chrysenes | 35.17 | 264862 | 5.7460 | 6.2455 |
| | C2-Chrysenes | 36.60 | 209689 | 4.5490 | 4.9445 |
| 71) | C3-Chrysenes | 38.81 | 131419 | 2.8510 | 3.0989 |
| 72) | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 77) | Benzo(b)fluoranthene | 37.34 | 464986 | 8.5333 | 9.2751 |
| 78) | Benzo(k,j)fluoranthene | 37.42 | 120222 | 2.8971 | 3.1490 |
| 10.000.00 | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 234012 | 4.6614 | 5.0666 |
| | Benzo(a)pyrene | 38.46 | 71186 | 1.4439 | 1.5694 |
| | Perylene | 38.77 | 127703 | 2.5434 | 2.7645 |
| | | | | | |
| | Indeno(1,2,3-c,d)pyrene | 43.19 | 126880 | 2.0418 | 2.2193 |
| | Dibenzo(a,h)anthracene | 43.26 | 33942 | 0.6807 | 0.7399 |
| 2018 a 2019 | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---------------------------------------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 94782 | 3.7067 | 4.0289 |
| 10) | 1-Methylnaphthalene | 16.47 | 44283 | 1.8747 | 2.0377 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.89 | 71846 | 2.0824 | 2.2635 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 41731 | 1.2096 | 1.3147 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 19185 | 0.5561 | 0.6044 |
| 43) | 3-Methylphenanthrene | 26.48 | 81664 | 2.5753 | 2.7992 |
| 44) | 2-Methylphenanthrene | 26.59 | 96902 | 3.0559 | 3.3215 |
| 45) | 2-Methylanthracene | 26.73 | 120638 | 3.8044 | 4.1351 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 46887 | 1.4786 | 1.6072 |
| 47) | 1-Methylphenanthrene | 26.93 | 51634 | 1.6283 | 1.7699 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 6002 | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.00 | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.10 | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 7. S. S. S. | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 22.05 | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 497559 | 13.68 | 82.29 |
| | Acenaphthene-d10 | 19.67 | 294853 | 14.11 | 84.81 |
| 0.2 1 1 1 | Phenanthrene-d10 | 24.75 | 626201 | 15.30 | 92.00 |
| 0.00 | Chrysene-d12 | 33.81 | 666816 | 14.89 | 89.56 |
| | Perylene-d12 | 38.70 | 31297 | 0.68 | 4.07 |
| | 5(b)H-Cholane | 34.24 | 145663 | 18.75 | 112.79 |
| -51 | Internal Standards | | 1.5000 | | 246.00 |
| 11 | Fluorene-d10 | 21.45 | 358642 | 16.69 | |
| - C.S. | Pyrene-d10 | 29.63 | 675248 | 16.66 | |
| · · · · · · · · · · · · · · · · · · · | Benzo(a)pyrene-d12 | 38.39 | 652091 | 16.64 | |

| Data Path : C:\msdchem\2\data\MS Data File : ARC1620.D Acq On : 17 Aug 2013 9:14 p Operator : YM Sample : SO-DA-012 (1.0-1.5) Misc : ALS Vial : 22 Sample Multipli Quant Time: Sep 05 21:33:16 2013 Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | om .er: 0.06 AR70057. Table-201 35 2013 | М | | | |
|--|---|--|------------------------|------------------------------|-------------|
| Compound | R.T. | QIon | Response | Conc Uni | ts Dev(Min) |
| Internal Standards 1) Fluorene-d10 31) Pyrene-d10 73) Benzo(a)pyrene-d12 | | | | | |
| System Monitoring Compounds 2) Naphthalene-d8 21) Acenaphthene-d10 32) Phenanthrene-d10 66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane | 38.697 | 264 | 31297m | 0.68 | |
| <pre>Target Compounds 3) cis/trans Decalin 4) C1-Decalins 5) C2-Decalins 6) C3-Decalins 7) C4-Decalins 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene 12) 1,6,7-Trimethylnaphtha 13) C2-Naphthalenes 14) C3-Naphthalenes 15) C4-Naphthalenes 16) Benzothiophene 17) C1-Benzothiophenes 18) C2-Benzothiophenes 19) C3-Benzothiophenes 19) C3-Benzothiophenes 20) C4-Benzothiophenes 21) Biphenyl 23) Acenaphthylene 24) Acenaphthene 25) Dibenzofuran 26) Fluorene 27) 1-Methylfluorene 28) C1-Fluorenes 30) C3-Fluorenes 30) C3-Fluorenes 31) Carbazole 34) Dibenzothiophene 35) 4-Methyldibenzothiophene 36) 2/3-Methyldibenzothiophene 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 30) C4-Dibenzothiophenes 31) Phenanthrene 42) Anthracene 43) 3-Methylphenanthrene</pre> | 0.000 0.000 0.000 13.878 16.134 16.468 0.000 0.000 18.586 | 128 142 142 156 170 152 154 168 166 180 184 198 198 198 212 226 | 0 0 0 182213m | 1.87 N.D. N.D. 5.74 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1620.D Acq On : 17 Aug 2013 9:14 pm Operator : YM Sample : SO-DA-012 (1.0-1.5) Misc . ALS Vial : 22 Sample Multiplier: 0.06649 Quant Time: Sep 05 21:33:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QION Response Conc Units Dev(Min) Compound

 44)
 2-Methylphenanthrene
 26.587
 192
 96902m
 3.06

 45)
 2-Methylanthracene
 26.726
 192
 120638m
 3.80

 46)
 4/9-Methylphenanthrene
 26.865
 192
 46887m
 1.48

 47)
 1-Methylphenanthrene
 26.934
 192
 51634m
 1.63

 48)
 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49)
 Retene
 0.000
 0
 N.D. d

 50)
 C2-Phenanthrenes/Anthr..
 28.215
 206
 340595m
 6.65

 51)
 C3-Phenanthrenes/Anthr..
 29.946
 220
 139652m
 2.73

 52)
 C4-Phenanthrenes/Anthr..
 30.708
 234
 169679m
 3.31

 53)
 Naphthobenzothiophene
 0.000
 0
 N.D. d

 54)
 C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55)
 C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 57)
 C4-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 58)
 Fluoranthene
 28.942
 202
 52 ______ 63) C2-Fluoranthenes/Pyrenes 32.567 230 388519m 8.42 64) C3-Fluoranthenes/Pyrenes 33.615 244 168864m 3.66

 64)
 C3-Fluoranthenes/Pyrenes
 33.615
 244
 168864m
 3.66

 65)
 C4-Fluoranthenes/Pyrenes
 35.322
 258
 217398m
 4.71

 67)
 Benz(a) anthracene
 33.770
 228
 130666m
 2.40

 68)
 Chrysene/Triphenylene
 33.886
 228
 352170m
 7.64

 69)
 C1-Chrysenes
 35.166
 242
 264862m
 5.75

 70)
 C2-Chrysenes
 36.602
 256
 209689m
 4.55

 71)
 C3-Chrysenes
 38.813
 270
 131419m
 2.85

 72)
 C4-Chrysenes
 0.000
 0
 N.D. d

 74)
 C29-Hopane
 0.000
 0
 N.D. d

 75)
 18a-Oleanane
 0.000
 0
 N.D. d

 76)
 Benzo(b) fluoranthene
 37.339
 252
 464986m
 8.53

 78)
 Benzo(a) fluoranthene
 37.417
 252
 120222m
 2.90

 79)
 Benzo(a) pyrene
 38.309
 252
 234012m
 4.66

 81)
 Benzo(a, h) anthracene
 43.262
 65) C4-Fluoranthenes/Pyrenes 35.322 258 217398m 4.71 89) Perylene 91) C20-TAS 92) C21-TAS

 89)
 Perylene
 38.774
 252
 127703m
 2.54

 91)
 C20-TAS
 0.000
 0
 N.D. d

 92)
 C21-TAS
 0.000
 0
 N.D. d

 93)
 C26(20S)-TAS
 0.000
 0
 N.D. d

 94)
 C26(20R)/C27(20S)-TAS
 0.000
 0
 N.D. d

 95)
 C28(20S)-TAS
 0.000
 0
 N.D. d

 96)
 C27(20R)-TAS
 0.000
 0
 N.D. d

 97)
 C28(20R)-TAS
 0.000
 0
 N.D. d

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1620.D Acq On : 17 Aug 2013 9:14 pm Operator : YM Sample : SO-DA-012 (1.0-1.5) Misc : ALS Vial : 22 Sample Multiplier: 0.06649 Quant Time: Sep 05 21:33:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

| Reviewed) |
|--------------|
| (QT |
| Report |
| Quantitation |

Sample Multiplier: 0.06649 Quant Time: Sep 05 21:33:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1620.D 9:14 pm : YM : SO-DA-012 (1.0-1.5) : 17 Aug 2013 : 22 Acq On Operator Sample Misc ALS Vial

| C1-Fluorenes,un Diberschinghene, T AnthreBene inswerendes, AnthreBene inswerendes, C2-Diberschinghenes, un C3-Phenenthrenes, un C3-Phenenthrenes, hitteres u |
|---|
| 1,01b-m/m/m/m/m/m/m/m/m/m/m/m/m/m/m/m/m/m/m/ |

Page: 4

| Data File Name | ARC1621.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 22:22 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-013 (0-0.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 23 | | |
| Sample Multiplier | 0.06645 | | |
| Sample Amount | 0 | | |

| Copy data below to Spread Sheet |
|------------------------------------|
| ARC1621.D |

SO-DA-013 (0-0.5) 8/17/2013 PAH-2012.M 15.04890895

| Sample Amount | 0 | | | | 15.04890895 |
|---|---|----------------------|---------------------------|---------------|--------------------------------|
| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
| 31 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.25 | | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | | 0 | | |
| 5.042 B | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 1. S. | C4-Decalins | 0.00 | | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 40687 | 1.0342 | 1.1923 |
| | C1-Naphthalenes | 16.30 | 35750 | 0.9087 | 1.0476 |
| 13) | C2-Naphthalenes | 18.59 | 66474 | 1.6896 | 1.9480 |
| 14) | C3-Naphthalenes | 20.15 | 82131 | 2.0876 | 2.4068 |
| 15) | C4-Naphthalenes | 22.82 | 54271 | 1.3794 | 1.5904 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | Ö | 0.0000 | 0.0000 |
| 1.200.00 | | 19.17 | 6972 | 0.1815 | 0.2093 |
| 5.555 | Acenaphthylene | | | | |
| | Acenaphthene | 19.70 | 1023 | 0.0467 | 0.0538 |
| 644355 | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | Fluorene | 21.54 | 44342 | 1.5056 | 1.7358 |
| | C1-Fluorenes | 23.51 | 22322 | 0.7579 | 0.8738 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 30) | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 24.99 | 9170 | 0.1981 | 0.2283 |
| 41) | Phenanthrene | 24.82 | 259852 | 5.2047 | 6.0005 |
| 그렇게 그렇게 날아야지는 것이 집에서 가지? | C1-Phenanthrenes/Anthracenes | 26.72 | 201748 | 4.0409 | 4.6588 |
| | C2-Phenanthrenes/Anthracenes | 28.22 | 358756 | 7.1857 | 8.2844 |
| | 이 가장 같은 것 같아요. 것 같아요. 것 같아요. 같아요. 것 같아요. 것 같아요. 것 같아요. 같아요. | | 284835 | 5.7051 | 6.5775 |
| | C3-Phenanthrenes/Anthracenes | 29.95 | | | |
| | C4-Phenanthrenes/Anthracenes | 31.78 | 238145 | 4.7699 | 5.4993 |
| | Dibenzothiophene | 24.41 | 24392 | 0.5910 | 0.6814 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 53869 | 1.3053 | 1.5048 |
| 38) | C2-Dibenzothiophenes | 27.97 | 158880 | 3.8497 | 4.4383 |
| 39) | C3-Dibenzothiophenes | 29.50 | 264089 | 6.3989 | 7.3773 |
| 40) | C4-Dibenzothiophenes | 31.50 | 203643 | 4.9343 | 5.6888 |
| 58) | Fluoranthene | 28.94 | 140034 | 3.1110 | 3.5867 |
| 59) | Pyrene | 29.70 | 138326 | 2.3652 | 2.7268 |
| 0.23533 | C1-Fluoranthenes/Pyrenes | 30.85 | 106701 | 2.3705 | 2.7330 |
| | C2-Fluoranthenes/Pyrenes | 32.57 | 168803 | 3.7502 | 4.3236 |
| | C3-Fluoranthenes/Pyrenes | 34.16 | 113758 | 2.5273 | 2.9137 |
| | C4-Fluoranthenes/Pyrenes | 35.32 | 157695 | 3.5034 | 4.0391 |
| | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 승규가 가지 않는 것 같은 것이 같은 것이 같은 것이 많은 것이 같은 것이 없다. 같은 것이 없는 것이 없는 것이 없는 것이 없는 것이 없는 것이 없는 것이 없다. 것이 없는 것이 없다. 것이 없는 것 않이 | | 0 | | |
| 1000 | C1-Naphthobenzothiophenes | 0.00 | | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.274.03 | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 52382 | 0.9864 | 1.1373 |
| 68) | Chrysene/Triphenylene | 33.89 | 123255 | 2.7414 | 3.1606 |
| 69) | C1-Chrysenes | 35.13 | 135327 | 3.0099 | 3.4702 |
| | C2-Chrysenes | 36.29 | 167441 | 3.7242 | 4.2937 |
| | C3-Chrysenes | 38.08 | 135488 | 3.0135 | 3.4743 |
| A. Contraction of the second s | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 013-533 | Benzo(b)fluoranthene | 37.34 | 178618 | 3.2318 | 3.7260 |
| | Benzo(k,j)fluoranthene | 37.42 | 50957 | 1.2107 | 1.3958 |
| | | | 0 | 0.0000 | 0.0000 |
| | Benzo(a)fluoranthene | 0.00 | | | |
| | Benzo(e)pyrene | 38.31 | 118062 | 2.3186 | 2.6732 |
| | Benzo(a)pyrene | 38.46 | 47701 | 0.9539 | 1.0998 |
| 2331 (A.Z.) | Perylene | 38.77 | 12381 | 0.2431 | 0.2803 |
| 82) | Indeno(1,2,3-c,d)pyrene | 43.19 | 68854 | 1.0925 | 1.2595 |
| 83) | Dibenzo(a,h)anthracene | 43.26 | 17481 | 0.3457 | 0.3985 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | ō | 0.0000 | 0.0000 |
| (1-11-11-11-11-11-11-11-11-11-11-11-11-1 | Benzo(g,h,i)perylene | 44.55 | 77397 | 1.4058 | 1.6208 |
| 8/) | Denzo(B,n,i)perviene | 44.35 | 11331 | 1.1000 | 1.0200 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|----------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 24859 | 1.0027 | 1.1561 |
| 10) | 1-Methylnaphthalene | 16.47 | 10891 | 0.4756 | 0.5483 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 22599 | 0.6716 | 0.7742 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 17389 | 0.5167 | 0.5958 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 13881 | 0.4125 | 0.4756 |
| 43) | 3-Methylphenanthrene | 26.48 | 26189 | 0.8467 | 0.9762 |
| 44) | 2-Methylphenanthrene | 26.59 | 33633 | 1.0874 | 1.2537 |
| 45) | 2-Methylanthracene | 26.73 | 104413 | 3.3759 | 3.8921 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 19032 | 0.6153 | 0.7094 |
| 47) | 1-Methylphenanthrene | 26.93 | 18481 | 0.5975 | 0.6889 |
| 0.007 | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | o | 0.0000 | 0.0000 |
| 100 | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| - | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | V 3297 | | | |
| 21 | Naphthalene-d8 | 13.82 | 451619 | 12.81 | 77.08 |
| | Acenaphthene-d10 | 19.67 | 267427 | 13.20 | 79.39 |
| | Phenanthrene-d10 | 24.75 | 575485 | 14.42 | 86.74 |
| | Chrysene-d12 | 33.81 | 631077 | 14.45 | 86.95 |
| | Pervlene-d12 | 38.70 | 16386 | 0.35 | 2.10 |
| | 5(b)H-Cholane | 34.24 | 132731 | 16.84 | 101.39 |
| 501 | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.46 | 347503 | 16.68 | |
| | Pyrene-d10 | 29.63 | 658221 | 16.65 | |
| | Benzo(a)pyrene-d12 | 38.39 | 660995 | 16.63 | |

| Data | Path : C:\msdchem\2\data\M | \$70057\ | | | | |
|-------|--|-------------------------|------|----------|----------------------|---------------|
| Data | File : ARC1621.D | | | | | |
| Opera | On : 17 Aug 2013 10:22 ator : YM | pm | | | | |
| Sampl | e : SO-DA-013 (0-0.5) : | | | | | |
| ALS V | : /ial : 23 Sample Multipl | ier: 0.00 | 5645 | | | |
| | | | | | | |
| | Time: Sep 05 21:34:04 201 | | | | | |
| | Method : C:\GCMS7\MS70057 | | | | | |
| | Title : PAH Calibration | | 13A | | | |
| QLast | Update : Sat Aug 17 22:39 | :35 2013 | | | | |
| Respo | onse via : Initial Calibrat | ion | | | | |
| | | | | | | |
| | Compound | R.T. | QIon | Response | Conc Un | its Dev(Min) |
| | | | | | | |
| Inte | rnal Standards | | | | | |
| 1) | Fluorene-d10 Pyrene-d10 | 21.455 | 176 | 347503m | 251.05 | 0.00 |
| 31) | Pyrene-d10 | 29.635 | 212 | 658221m | 250.63 | 0.00 |
| 73) | Benzo(a)pyrene-d12 | 38.386 | 264 | 660995m | 250.32 | 0.00 |
| | | | | | | |
| Syst | em Monitoring Compounds | | | | | |
| 2) | Naphthalene-d8 Acenaphthene-d10 | 13.822 | 136 | 451619m | 12.81 | 0.00 |
| 21) | Acenaphthene-d10 | 19.672 | 164 | 267427m | | 0.00 |
| 32) | Phenanthrene-d10 | 24.752 | 188 | 575485m | 14.42 | 0.00 |
| 66) | Phenanthrene-d10 Chrysene-d12 | 33.809 | 240 | 631077m | 14.45 | 0.00 -0.04 |
| 88) | Perylene-d12 | 38.697 | 264 | 16386m | 0.35 | 0 00 |
| | 5(b)H-Cholane | 34.235 | | | | |
| | 2.3 | | | | | 0.00 |
| Targ | et Compounds | | | | | Qvalue |
| | cis/trans Decalin | 0.000 | | 0 | N.D. | d |
| | C1-Decalins | 0.000 | | 0 | N.D. N.D. N.D. | d |
| 5) | C2-Decalins | 0.000 | | 0 | N.D. | d |
| 6) | C3-Decalins | 0.000 0.000 0.000 | | 0 | N.D. | d |
| 7) | C4-Decalins | 0.000 | | 0 | N.D. | d |
| 8) | Naphthalene | 13.878 | 128 | 40687m | 1.03 | 124 |
| 9) | C3-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene 2.6-Dimethylnaphthalene | 16.134 | 142 | 24859m | 1.00 | |
| 10) | 1-Methylnaphthalene | 16.469 | 142 | 10891m | 0.48 | |
| 11) | 2,6-Dimethylnaphthalene | 0.000 | | 0 | N.D. | d |
| 12) | 1,6,7-Trimethylnaphtha | 0.000 | | 0 | N.D. | |
| 13) | C2-Naphthalenes | 18.586 | 156 | 66474m | 1.69 | S |
| | C3-Naphthalenes | | | 82131m | | |
| | C4-Naphthalenes | 22.820 | 184 | 54271m | 1.38 | |
| | Benzothiophene | 0.000 | 101 | 0 | N.D. | 5 |
| | C1-Benzothiophenes | 0.000 | | õ | N.D. | |
| | | 0.000 | | õ | N.D. | |
| | | 0.000 | | 0 | N.D. | |
| | C4-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 22) | Biphenyl | 0.000 | | õ | N.D. | |
| | Acenaphthylene | 19.171 | 152 | 6972m | 0.18 | u |
| | Acenaphthene | 19.700 | | 1023m | 0.18 | |
| | Dibenzofuran | | 104 | | | 2 |
| | Fluorene | 0.000 | 100 | 0 | N.D. | a |
| | | 21.539 | 166 | | 1.51 | |
| | 1-Methylfluorene | 0.000 | 100 | 0 | N.D. | a |
| | C1-Fluorenes | 23.506 | 180 | 22322m | 0.76 | -1 |
| | C2-Fluorenes | 0.000 | | 0 | N.D. | |
| | C3-Fluorenes | 0.000 | | 0 | N.D. | |
| | Carbazole | 0.000 | 104 | 0 | N.D. | a |
| | Dibenzothiophene | 24.406 | | | | |
| | 4-Methyldibenzothiophene | 25.895 | | 22599m | 0.67 | |
| | 2/3-Methyldibenzothiop | | | 17389m | 0.52 | |
| | 1-Methyldibenzothiophene | 26.518 | 198 | 13881m | 0.41 | |
| | C2-Dibenzothiophenes | 27.973 | | 158880m | | |
| | C3-Dibenzothiophenes | 29.496 | | 264089m | | |
| | C4-Dibenzothiophenes | 31.505 | | 203643m | 4.93 | |
| | Phenanthrene | 24.822 | | 259852m | 5.20 | |
| | Anthracene | 24.995 | | 9170m | 0.20 | |
| 43) | 3-Methylphenanthrene | 26.484 | 192 | 26189m | 0.85 | |
| | | | | | | |

| Data Path : C:\msdchem\2\data\MS Data File : ARC1621.D Acq On : 17 Aug 2013 10:22 p Operator : YM Sample : SO-DA-013 (0-0.5) Misc : ALS Vial : 23 Sample Multipli | er: 0.00 | 5645 | | |
|---|--|--|---|--|
| Quant Time: Sep 05 21:34:04 2013 Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | AR70057 able-201 35 2013 | | | |
| Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
| <pre>44) 2-Methylphenanthrene 45) 2-Methylphenanthrene 46) 4/9-Methylphenanthrene 47) 1-Methylphenanthrene 48) 3,6-Dimethylphenanthrene 49) Retene 50) C2-Phenanthrenes/Anthr 51) C3-Phenanthrenes/Anthr 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene 54) C1-Naphthobenzothiophenes 55) C2-Naphthobenzothiophenes 56) C3-Naphthobenzothiophenes 57) C4-Naphthobenzothiophenes 58) Fluoranthene 59) Pyrene 60) 2-Methylfluoranthene 61) Benzo(b) fluorene 62) C1-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 64) C3-Fluoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes 66) C1-Chrysenes 70) C2-Chrysenes 71) C3-Chrysenes 71) C3-Chrysenes 72) C4-Chrysenes 73) 18a-Oleanane 74) C29-Hopane 75) 18a-Oleanane 76) C30-Hopane 77) Benzo(b) fluoranthene 78) Benzo(k,j) fluoranthene 79) Benzo(a) fluoranthene 79) Benzo(a) fluoranthene 79) Benzo(a) fluoranthene 80) Benzo(a) pyrene 81) Benzo(a) pyrene 82) Indeno(1,2,3-c,d) pyrene 83) Dibenzo(a,h) anthracene 84) C1-Dibenzo(a,h) anthrac</pre> | $\begin{array}{c} 26.865\\ 26.934\\ 0.000\\ 0.000\\ 28.215\\ 29.947\\ 31.782\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 30.847\\ 32.567\\ 34.158\\ 35.322\\ 33.770\\ 33.886\\ 35.128\\ 35.322\\ 33.770\\ 33.886\\ 35.128\\ 36.292\\ 38.076\\ 0.000$ | 192 192 206 220 234 202 202 202 216 230 244 258 228 242 256 270 252 252 252 252 | 18481m 0 0 358756m 284835m 238145m 238145m 0 0 140034m 138326m 138326m 138326m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 13758m 135327m 167441m 135488m 0 0 0 178618m 50957m 0 118062m 47701m 68854m 17481m 0 0 0 0 | 0.62 0.60 N.D. d N.D. d 7.19 5.71 4.77 N.D. d N.D. d N.D. d N.D. d N.D. d 3.11 2.37 N.D. d N.D. d 2.37 N.D. d N.D. d 2.37 3.75 2.53 3.50 0.99 |
| 91) C20-TAS 92) C21-TAS | 0.000 | 252 | 0 0 | N.D. d N.D. d |
| 93) C26(20S)-TAS 94) C26(20R)/C27(20S)-TAS | 0.000 | | 0 | N.D. d N.D. d |
| 95) C28(20S)-TAS | 0.000 | | 0 | N.D. d N.D. d |
| 96) C27(20R)-TAS 97) C28(20R)-TAS | 0.000 | | 0 | N.D. d |
| | | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1621.D Acq On : 17 Aug 2013 10:22 pm Operator : YM Sample : SO-DA-013 (0-0.5) Misc : ALS Vial : 23 Sample Multiplier: 0.06645 Quant Time: Sep 05 21:34:04 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:24:44 2013

Sample Multiplier: 0.06645 : PAH Calibration Table-2013A Quant Time: Sep 05 21:34:04 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1621.D 17 Aug 2013 10:22 pm YM SO-DA-013 (0-0.5) : 23 Quant Title •• •• ... Operator ALS Vial Acq On Sample Misc

| 6000000 | 5500000 | 500000 | 4500000 | 400000 | 350000 | 300000 | 250000 | 200000 | 150000 | 1000000 | 500000 | |
|------------------------|------------------|---------------|---------|--------|--------|--------|--------|--------|-------------------------------|--|-----------------------------|---|
| | | | | | | | | | | 2,8b-9 n 948 | Jakand a N | γγ |
| | | | | | | | | | | T.ənəlsririqi T.ənəlsririqi | snivrteM-S anivrteM-S | |
| | | | | | | | | | 3 | T,enely | C2-Naphth | |
| | | | | | | | | | S | nu,sənəlsı nu,sənəlsı | Acentephth C3-Naphth | |
| | | | | | | | | | | I,01b-ang | | |
| | | | | | | | | | | un'səu un'səuəley | C4-Naphi | |
| | | | | | | | | | S'O | T,enendo ophene.T ophene.d | Dibenzorhid DibenzorhinA | 4 |
| | | | | | | | | | un ənən T, ənən T, ənən | i dolulozuació audolulozuació peudolulozuació | | June |
| 1 300 | nes/Anthracer | and neverily. | 0 | | | | | | | , energians and a second s | | m |
| 1'00' | ISOP II NIL-VEOU | ອແຫມສມອບ | -70 | | | | | | | T,ener | Fluorant | - mark |
| | | | | | | | | un's | | sənərigiqiqiqi nA\zənənina nYP\zənərina | | |
| = | | | | | | | | un's | innacene: | anangointosr nA\zanannins | nang-\$3 | 3 |
| IIC: ARC1621.D\data.ms | | | | | | | | | | enthenes/Pyre | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
| 3C16 | | | | | | | | | | ALAS SALARIAN | | m |
| 21.D | | | | | | | | | un'səuə | senes, un senes, un | | - |
| Vdata | | | | | | | | | Т, в | b)))meneripuen seues'au | | ~ |
| sm | | | | | | | | | | eual (S'Z VO) | | Mhu |
| | | | | | | | | | | | | Y |
| | | | | | | | | | | | | 2 |
| | | | | | | | | | Τa | neousileneefer | t have a pitti | 2 |
| | | | | | | | | | | T, enelyned(i, r | | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |
| | | | | | | | | | | L'ousif es d'ét | 16)071107 | Y |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | } |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | 3 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

4 Page:

_

| Data File Name | ARC1622.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/17/2013 23:31 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-013 (0.5-1.0) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Pervlene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 24 | | |
| Sample Multiplier | 0.06662 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ARC1622.D SO-DA-013 (0.5-1.0) 8/17/2013 PAH-2012.M 15.01050736

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-------------------|------------------------------|----------|-----------------|---------------|---------------|
| 21 | i ha Dealla | (minute) | (area) | 0.0000 | Concentration |
| | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 2005 | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 2015 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 20359 | 0.5423 | 0.6676 |
| | C1-Naphthalenes | 16.30 | 12590 | 0.3354 | 0.4128 |
| | C2-Naphthalenes | 18.59 | 29425 | 0.7838 | 0.9648 |
| LE CLOBA | C3-Naphthalenes | 20.15 | 52994 | 1.4116 | 1.7376 |
| | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.12.2.2.X. | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 1548 | 0.0422 | 0.0520 |
| 24) | Acenaphthene | 19.78 | 1177 | 0.0563 | 0.0693 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 21.54 | 19680 | 0.7002 | 0.8620 |
| 28) | C1-Fluorenes | 23.51 | 5888 | 0.2095 | 0.2579 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 30) | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 24.99 | 1750 | 0.0381 | 0.0469 |
| 3.5332.3 | Phenanthrene | 24.82 | 90723 | 1.8328 | 2.2561 |
| 영화 그는 지도 가지가 같아요. | C1-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Phenanthrenes/Anthracenes | 0.00 | õ | 0.0000 | 0.0000 |
| 100000 | C4-Phenanthrenes/Anthracenes | 0.00 | õ | 0.0000 | 0.0000 |
| | Dibenzothiophene | 24.41 | 3355 | 0.0820 | 0.1009 |
| | C1-Dibenzothiophenes | 26.21 | 5000 | 0.1222 | 0.1504 |
| | C2-Dibenzothiophenes | 27.97 | 6235 | 0.1524 | 0.1876 |
| | | 29.63 | 8975 | 0.2193 | |
| | C3-Dibenzothiophenes | | | | 0.2700 |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| C-29(3) | Fluoranthene | 28.94 | 16742 | 0.3751 | 0.4618 |
| | Pyrene | 29.70 | 15570 | 0.2685 | 0.3305 |
| 275.75 PTS | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| in the second | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| SS 22.5 | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 232303 | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 6387 | 0.1213 | 0.1493 |
| | Chrysene/Triphenylene | 33.89 | 5572 | 0.1250 | 0.1539 |
| | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 71) | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 72) | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 77) | Benzo(b)fluoranthene | 37.34 | 11561 | 0.2272 | 0.2796 |
| 78) | Benzo(k,j)fluoranthene | 37.42 | 2623 | 0.0677 | 0.0833 |
| 79) | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 7695 | 0.1641 | 0.2020 |
| | Benzo(a)pyrene | 38.46 | 2321 | 0.0504 | 0.0621 |
| | Perylene | 38.77 | 1082 | 0.0231 | 0.0284 |
| 10000 | Indeno(1,2,3-c,d)pyrene | 43.19 | 4489 | 0.0773 | 0.0952 |
| | Dibenzo(a,h)anthracene | 43.26 | 1137 | 0.0244 | 0.0301 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2013 S. A. K | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(g,h,i)perylene | 44.55 | | | 0.1032 |
| | Bellyore D Liberviene | 44.55 | 4248 | 0.0838 | 0.1032 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|-------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9 | 2-Methylnaphthalene | 16.13 | 8671 | 0.3665 | 0.4512 |
| 10) | 1-Methylnaphthalene | 16.47 | 3919 | 0.1793 | 0.2208 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 1544 | 0.0463 | 0.0570 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 1966 | 0.0589 | 0.0725 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 1490 | 0.0447 | 0.0550 |
| 43) | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 45) | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 46) | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 47) | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 91) | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 92) | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 93) | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 94) | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 95) | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.000 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 97) | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 0000 | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 435683 | 12.95 | 77.73 |
| 21) | Acenaphthene-d10 | 19.67 | 251653 | 13.01 | 78.09 |
| | Phenanthrene-d10 | 24.75 | 535744 | 13.54 | 81.24 |
| 66) | Chrysene-d12 | 33.81 | 610699 | 14.10 | 84.65 |
| 100 | Perylene-d12 | 38.70 | 93385 | 2.16 | 12.98 |
| 0.00 | 5(b)H-Cholane | 34.24 | 116446 | 16.05 | 96.36 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 332451 | 16.72 | |
| | Pyrene-d10 | 29.63 | 654271 | 16.70 | |
| 1000 | Benzo(a)pyrene-d12 | 38.39 | 610205 | 16.68 | |

| QI REVIEWED) | (QT | Reviewed) |
|--------------|-----|-----------|
|--------------|-----|-----------|

| Data Path : C:\msdchem\2\data\M3 Data File : ARC1622.D Acq On : 17 Aug 2013 11:31 p Operator : YM Sample : SO-DA-013 (0.5-1.0) Misc : ALS Vial : 24 Sample Multipl: Quant Time: Sep 05 22:37:46 2012 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39 | pm ier: 0.06 3 \AR70057. Fable-201 | M | | | |
|---|---|--|--|--|-----------------------|
| Response via : Initial Calibrati | | 201394 | | 1981 (1991 1 997 | 1965 - 1870-197 - 187 |
| Compound | R.T. | | | Conc Units | |
| Internal Standards 1) Fluorene-d10 31) Pyrene-d10 73) Benzo(a)pyrene-d12 | 21.455 29.635 38.386 | 176 212 | 332451m 654271m | 251.05 250.63 | 0.00 |
| System Monitoring Compounds | | | | | |
| | 13.822 19.672 24.752 33.809 38.697 34.235 | 164 188 240 264 | 251653m 535744m 610699m 93385m | 2.16 | 0.00 0.00 -0.04 |
| Target Compounds | | | | | Qvalue |
| 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene 12) 1,6,7-Trimethylnaphthalene 12) 1,6,7-Trimethylnaphthalene 13) C2-Naphthalenes 14) C3-Naphthalenes 15) C4-Naphthalenes 16) Benzothiophene 17) C1-Benzothiophenes 18) C2-Benzothiophenes 19) C3-Benzothiophenes 20) C4-Benzothiophenes 20) C4-Benzothiophenes 20) C4-Benzothiophenes 20) C4-Benzothiophenes 20) C4-Benzothiophenes 21) Biphenyl 23) Acenaphthylene 24) Acenaphthene 25) Dibenzofuran 26) Fluorene 27) 1-Methylfluorene 28) C1-Fluorenes 30) C3-Fluorenes 30) C3-Fluorenes 33) Carbazole 34) Dibenzothiophene 35) 4-Methyldibenzothiophene 36) C2-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 40) C4-Dibenzothiophenes | 0.000 0.000 0.000 13.878 16.134 16.469 0.000 0.000 18.586 20.146 0.000 21.538 0.000 23.506 0.000 0.000 23.506 0.000 0.000 24.406 25.895 26.207 26.518 27.973 29.635 0.000 | 128 142 142 156 170 152 154 166 180 184 198 198 198 198 212 226 | 0 0 0 20359m 8671m 3919m 0 0 29425m 52994m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | N.D. d N.D. d N.D. d 0.54 0.37 0.18 N.D. d N.D. d | |
| 41) Phenanthrene 42) Anthracene 43) 3-Methylphenanthrene | 24.822 24.995 0.000 | 178 178 | 90723m 1750m 0 | 1.83 0.04 N.D. d | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1622.D Acq On : 17 Aug 2013 11:31 pm Operator : YM Sample : SO-DA-013 (0.5-1.0) Misc : ALS Vial : 24 Sample Multiplier: 0.06662 Quant Time: Sep 05 22:37:46 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
|---|--------|------|----------|---------------------|
| 44) 2-Methylphenanthrene | 0.000 | | 0 | N.D. d |
| 45) 2-Methylanthracene | 0.000 | | 0 | N.D. d |
| 46) 4/9-Methylphenanthrene | 0.000 | | 0 | N.D. d |
| 47) 1-Methylphenanthrene | | | 0 | N.D. d |
| 48) 3,6-Dimethylphenanthrene | 0.000 | | 0 | N.D. d |
| 49) Retene | 0.000 | | 0 | N.D. d |
| 50) C2-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d |
| 51) C3-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d |
| 52) C4-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d |
| 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene 54) C1-Naphthobenzothiophenes | 0.000 | | 0 | N.D. d |
| | | | 0 | N.D. d |
| 55) C2-Naphthobenzothiophenes | | | 0 | N.D. d |
| 56) C3-Naphthobenzothiophenes | | | 0 | N.D. d |
| | 0.000 | | 0 | N.D. d |
| 58) Fluoranthene | | | 16742m | 0.38 |
| 59) Pyrene | 29.704 | | 15570m | 0.27 |
| 60) 2-Methylfluoranthene61) Benzo(b)fluorene | 0.000 | | 0 | N.D. d |
| | 0.000 | | 0 | N.D. d |
| 62) C1-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d |
| 63) C2-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d |
| 63) C2-Fluoranthenes/Pyrenes 64) C3-Fluoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes 67) Benz(a)anthracene | 0.000 | | 0 | N.D. d |
| 65) C4-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d |
| 67) Benz (a) anthracene | 33.770 | 228 | 6387m | 0.12 |
| 68) Chrysene/Triphenylene | | | | 0.12 |
| 69) Cl-Chrysenes | 0.000 | | 0 | N.D. d |
| | | | 0 | N.D. d |
| 71) C3-Chrysenes | 0.000 | | 0 | N.D. d |
| 72) C4-Chrysenes 74) C29-Hopane | 0.000 | | 0 | N.D. d N.D. d |
| 75) 18a-Oleanane | 0.000 | | 0 | N.D. d |
| | 0.000 | | 0 | N.D. d |
| 77) Benzo(b)fluoranthene | | | | 0.23 |
| 78) Benzo(k i)fluoranthene | 37 417 | 252 | | 0.07 |
| 79) Benzo(a) fluoranthene | 0.000 | 252 | 0 | N.D. d |
| 79) Benzo(a) fluoranthene80) Benzo(e) pyrene | 38.309 | 252 | | |
| 81) Benzo(a)pyrene | 38.464 | 252 | 2321m | |
| 81) Benzo(a)pyrene 82) Indeno(1,2,3-c,d)pyrene 83) Dibenzo(a,h)anthracene | 43.189 | 276 | 4489m | 0.08 |
| 83) Dibenzo(a,h)anthracene | 43.262 | 278 | 1137m | 0.02 |
| 84) C1-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d |
| 85) C2-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d |
| 86) C3-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d |
| 87) Benzo(g,h,i)perylene | 44.553 | 276 | 4248m | 0.08 |
| 89) Perylene | 38.774 | 252 | 1082m | 0.02 |
| 91) C20-TAS | 0.000 | | 0 | N.D. d |
| 92) C21-TAS | 0.000 | | 0 | N.D. d |
| 93) C26(20S)-TAS | 0.000 | | 0 | N.D. d |
| 94) C26(20R)/C27(20S)-TAS | 0.000 | | 0 | N.D. d |
| 95) C28(20S)-TAS | 0.000 | | 0 | N.D. d |
| 96) C27(20R)-TAS | 0.000 | | 0 | N.D. d |
| 97) C28(20R)-TAS | 0.000 | | 0 | N.D. d |

 Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1622.D Acq On : 17 Aug 2013 11:31 pm Operator : YM Sample : SO-DA-013 (0.5-1.0) Misc : ALS Vial : 24 Sample Multiplier: 0.06662 Quant Time: Sep 05 22:37:46 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

| ~ |
|--------------|
| ewed. |
| Revi |
| TQ) |
| Report |
| Quantitation |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1622.D Acq On : 17 Aug 2013 11:31 pm Operator : YM Sample : SO-DA-013 (0.5-1.0) Misc : 24 Sample Multiplier: 0.06662

Quant Time: Sep 05 22:37:46 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| Abundance | 5500000 | 500000 | 4500000 | 400000 | 3500000 | 3000000 | 2500000- | 2000000 | 1500000 | 100000 | 200000 | 0 0 12.00 1 |
|------------------------|---------|--------|---------|--------|---------|---------|----------|---------|---------|--------------------------|--|-------------|
| | | | | | | | | | | | Anticipation of the second sec | 14.00 16.00 |
| | | | | | | | | | S | T,ene | CS-Naphthal Acenaphthyl CS-Naphthal CS-Naphtha | 18.00 20.00 |
| | | | | | | | | | | | | 22.00 |
| | | | | | | | | | | 1016-910 Deve-1 | C1-Fluorene: Dibenzothioc | 24.00 26 |
| | | | | | | | | | | | -Methyldibe 2/3-Methyldibe 1-Methyldibe | 26.00 28.00 |
| | | | | | | | | un | | Τ,6 | Fluoranthenel 9 T,energe | 30,00 |
| TIC: / | | | | | | | | | | | | 32.00 |
| TIC: ARC1622.D\data.ms | | | | | | | | | Ţ | Srbitter | Iou D-H(a)g | 34.00 30 |
| .D\data.m | | | | | | | | | | T ononnhar ae | | 36.00 38.00 |
| SI | | | | | | | | | 1,216 | -əuəı £Ğ ¦711 | | 00 40 00 |
| | | | | | | | | | Τ,6 | anaari(kraf | Dagensol(Shi | 42.00 |
| | | | | | | | | | | | (i,1,9)ozna8 | 44 00 46 00 |
| | | | | | | | | | | | | 00 48 00 |
| | | | | | | | | | | | | 50.00 |
| | | | | | | | | | | | | 52 00 54 00 |
| | | | | | | | | | | | | 00 25 00 |
| | | | | | | | | | | | | 58 00 60 00 |

57.M Fri Sep 13 07:25:24 2013

-

| Data File Name | ARC1623.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/18/2013 0:39 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-013 (1.0-1.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 25 | | |
| Sample Multiplier | 0.0664 | | |
| Sample Amount | 0 | | |
| | | | |

Copy data below to Spread Sheet

ARC1623.D SO-DA-013 (1.0-1.5) 8/18/2013 PAH-2012.M 15.06024096

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|-------------|------------------------------|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 7/ | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 1023 | | | 0 | | |
| 12.22 | C4-Decalins | 0.00 | and the set | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 35430 | 0.9521 | 1.1682 |
| | C1-Naphthalenes | 16.30 | 28905 | 0.7768 | 0.9530 |
| 13) | C2-Naphthalenes | 18.59 | 50609 | 1.3600 | 1.6686 |
| 14) | C3-Naphthalenes | 20.15 | 86327 | 2.3199 | 2.8463 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1220.22 | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 202632 | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | | 2937 | | |
| 10.00 C | Acenaphthylene | 19.17 | | 0.0809 | 0.0992 |
| | Acenaphthene | 19.70 | 831 | 0.0401 | 0.0492 |
| 1.515.27 | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 21.54 | 61812 | 2.2189 | 2.7224 |
| 28) | C1-Fluorenes | 23.51 | 15302 | 0.5493 | 0.6740 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.2.2.2 | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| | Anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Phenanthrene | 24.82 | 276195 | 5.6254 | 6.9018 |
| 0.00 | | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Phenanthrenes/Anthracenes | | | | |
| | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.250 | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 52) | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 34) | Dibenzothiophene | 24.41 | 6985 | 0.1721 | 0.2112 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 6171 | 0.1520 | 0.1865 |
| 38) | C2-Dibenzothiophenes | 27.97 | 7810 | 0.1924 | 0.2361 |
| | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.25 | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| - C. 20 | Fluoranthene | 28.94 | 32563 | 0.7356 | 0.9026 |
| | | 29.70 | 17218 | 0.2994 | 0.3673 |
| C.C.C.21 | Pyrene (D | | | | |
| 1.2.2.2.2 | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.5.1.2 | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 65) | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 54) | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.81 | 4974 | 0.0953 | 0.1169 |
| 521 P.454 | | | 4974 | | |
| | Chrysene/Triphenylene | 33.89 | | 0.1018 | 0.1248 |
| | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 220162 | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 77) | Benzo(b)fluoranthene | 37.34 | 8689 | 0.1650 | 0.2025 |
| 78) | Benzo(k,j)fluoranthene | 37.42 | 1988 | 0.0496 | 0.0608 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.552 (25) | Benzo(e)pyrene | 38.31 | 5803 | 0.1196 | 0.1468 |
| 53.5.6 | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |
| | Perylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Indeno(1,2,3-c,d)pyrene | 43.19 | 3102 | 0.0517 | 0.0634 |
| (0.13.10) - | Dibenzo(a,h)anthracene | 43.23 | 836 | 0.0174 | 0.0213 |
| 84) | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibelizo(a,ii/antinacenes | 0.00 | | | |
| 2.537 | C3-Dibenzo(a,h)anthracenes | 0.00 | õ | 0.0000 | 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--|-------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopane | 5 | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 20082 | 0.8564 | 1.0508 |
| 10) | 1-Methylnaphthalene | 16.47 | 8823 | 0.4073 | 0.4997 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 2527 | 0.0764 | 0.0937 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 1724 | 0.0521 | 0.0639 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 1920 | 0.0580 | 0.0712 |
| 43) | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 45) | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 46) | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.000 | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1. | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| - 10 S. M. | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 433380 | 13.00 | 78.27 |
| | Acenaphthene-d10 | 19.67 | 243780 | 12.72 | 76.57 |
| | Phenanthrene-d10 | 24.75 | 531400 | 13.54 | 81.51 |
| 0.000 | Chrysene-d12 | 33.81 | 595321 | 13.86 | 83.47 |
| - 0.001 C (2) | Perylene-d12 | 38.70 | 32135 | 0.72 | 4.33 |
| 1. | 5(b)H-Cholane | 34.24 | 114582 | 15.26 | 91.94 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.46 | 328427 | 16.67 | |
| | Pyrene-d10 | 29.63 | 646809 | 16.64 | |
| 100000 | Benzo(a)pyrene-d12 | 38.39 | 629279 | 16.62 | |

_

| | | L. | | | |
|---|------------------|------------|----------------|----------------------|--------------|
| Data Path : C:\msdchem\2\data\M | S70057\ | | | | |
| Data File : ARC1623.D Acq On : 18 Aug 2013 12:39 a | | | | | |
| Operator : YM | am | | | | |
| Operator : YM Sample : SO-DA-013 (1.0-1.5) Misc : | | | | | |
| ALS Vial : 25 Sample Multipl: | ier: 0.00 | 564 | | | |
| Quant Time: Sep 05 21:35:04 201 | | | | | |
| Quant Method : C:\GCMS7\MS70057 | | | | | |
| Quant Title : PAH Calibration ? QLast Update : Sat Aug 17 22:39 | | LJA | | | |
| Response via : Initial Calibrat: | | | | | |
| Response via . inicial calibrat. | 1011 | | | | |
| Compound | R.T. | QIon | Response | Conc Un | its Dev(Min) |
| | | | | | |
| Internal Standards | 01 455 | 100 | 200405 | 051 05 | |
| 1) Fluorene-dlu | 21.455 | 1/6 | 328427m | 251.05 | 0.00 |
| Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 29.035 | 212 | 640009m | 250.63 | 0.00 |
| /5/ Delizo(a)pyrelie-drz | 50.507 | 204 | 02927911 | 250.52 | 0.00 |
| System Monitoring Compounds | | | | | |
| Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 Chrysene-d12 | 13.822 | 136 | 433380m | 13.00 | 0.00 |
| 21) Acenaphthene-d10 | 19.672 | 164 | 243780m | 12.72 | 0.00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 531400m | 13.54 | 0.00 |
| 66) Chrysene-d12 | 33.809 | 240 | 595321m | 13.86 | -0.04 |
| 88) Perylene-d12 | 38.697 | 264 | 32135m | 0.72 | 0.00 |
| 90) 5(b)H-Cholane | 34.236 | 217 | 114582m | 15.26 | 0.00 |
| Target Compounds | | | | | Qvalue |
| 3) cis/trans Decalin | 0.000 | | 0 | N.D. | d |
| 4) Cl-Decalins | 0.000 | | 0 | N.D. N.D. N.D. | d |
| 5) C2-Decalins | 0.000 | | 0 | N.D. | d |
| 6) C3-Decalins | 0.000 | | 0 | N.D. | d |
| 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene | 0.000 | | 0 | N.D. | d |
| 8) Naphthalene | 13.878 | 128 | 35430m | 0.95 | |
| 9) 2-Methylnaphthalene | 16.134 | 142 | 20082m | 0.86 | |
| 11) 2 6-Dimethylnaphthalene | 10.409 | 142 | 00230 | 0.41 N D | 2 |
| 11) 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphtha 13) C2-Naphthalenes | 0.000 | | 0 | N.D. | d |
| 13) C2-Naphthalenes | 18.586 | 156 | 50609m | 1.36 | a |
| 14) C3-Naphthalenes | 20.146 | 170 | 86327m | 2.32 | |
| 15) C4-Naphthalenes | 0.000 | | 0 | N.D. | d |
| 16) Benzothiophene | 0.000 | | 0 | N.D. | d |
| 17) Cl-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 20) C4-Benzothiophenes 22) Biphenyl | 0.000 | | 0 | N.D. | |
| 23) Acenaphthylene | 0.000 19.171 | 152 | 2937m | N.D. 0.08 | u |
| 24) Acenaphthene | 19.700 | 154 | 831m | 0.03 | |
| 25) Dibenzofuran | 0.000 | | 0 | N.D. | d |
| 26) Fluorene | 21.539 | 166 | 61812m | 2.22 | |
| 27) 1-Methylfluorene | 0.000 | | 0 | N.D. | d |
| 28) C1-Fluorenes | 23.506 | 180 | 15302m | 0.55 | |
| 29) C2-Fluorenes | 0.000 | | 0 | N.D. | |
| 30) C3-Fluorenes | 0.000 | | 0 | N.D. | |
| 33) Carbazole | 0.000 | 104 | 0 | N.D. | d |
| 34) Dibenzothiophene | 24.406 | 184 | 6985m | 0.17 | |
| 35) 4-Methyldibenzothiophene36) 2/3-Methyldibenzothiop | 25.895 | 198 | 2527m | 0.08 | |
| 37) 1-Methyldibenzothiophene | 26.207 26.518 | 198 198 | 1724m 1920m | 0.05 | |
| 38) C2-Dibenzothiophenes | 27.973 | 212 | 7810m | 0.08 | |
| 39) C3-Dibenzothiophenes | 0.000 | 222 | 0 | N.D. | d |
| 40) C4-Dibenzothiophenes | 0.000 | | o | N.D. | |
| 41) Phenanthrene | 24.822 | 178 | 276195m | 5.63 | DED |
| 42) Anthracene | 0.000 | | 0 | N.D. | d |
| 43) 3-Methylphenanthrene | 0.000 | | 0 | N.D. | d |
| | | | | | |

Data Path : C:\msdchem\2\data\MS70057\

Data File : ARC1623.D Acq On : 18 Aug 2013 12:39 am Operator : YM Sample : SO-DA-013 (1.0-1.5) Misc : ALS Vial : 25 Sample Multiplier: 0.0664 Quant Time: Sep 05 21:35:04 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration
 Compound
 R.T. QIon Response Conc Units 1

 44) 2-Methylphenanthrene
 0.000
 0
 N.D. d

 45) 2-Methylphenanthrene
 0.000
 0
 N.D. d

 47) 1-Methylphenanthrene
 0.000
 0
 N.D. d

 48) 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49) Retene
 0.000
 0
 N.D. d

 50) C2-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 51) C3-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 52) C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 53) Naphthobenzothiophenes
 0.000
 0
 N.D. d

 54) C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55) C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 59) Pyrene
 28.942
 202
 32563m
 0.74

 50) C2-Pluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 61) Benzo(b)fluoranthene
 0.000
 0
 N.D. d

 62) C1-Pluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 R.T. QION Response Conc Units Dev(Min) Compound

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1623.D Acq On : 18 Aug 2013 12:39 am Operator : YM Sample : SO-DA-013 (1.0-1.5) Misc : ALS Vial : 25 Sample Multiplier: 0.0664 Quant Time: Sep 05 21:35:04 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1623.D Acq On : 18 Aug 2013 12:39 am Operator : YM Sample : SO-DA-013 (1.0-1.5) Misc : ALS Vial : 25 Sample Multiplier: 0.0664

Quant Time: Sep 05 21:35:04 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| Abundance 5500000 | 5000000 | 400000 | 350000 | 300000 | 250000 | 200000 | 150000 | 100000 | 50000 | 0 |
|------------------------|---------|--------|--------|--------|--------|--------|--------|--|------------------------------|--------------------------|
| | - | | | | | | | | - | 0+ |
| | | | | | | | | S,8b-ange | artitikanikan | $\mathcal{A}\mathcal{A}$ |
| | | | | | | | | L enelsrijno T, enelsnino | aenlyrtieM-S aenlyrtieM-I | |
| | | | | | | | | T.ene | C2-Naphthy Acenaphthy | |
| | | | | | | | c | nu,ឧទnata nu,ឧទnata 1,01b-ອກ | C3-Naphricip | White |
| | | | | | | | | | C1-Fluorene | Alter and a second |
| | | | | | | | | T,eneng Dhene,T Dhene,T | | - Contraction |
| | | | | | | | | nanqointozna nandointozna nandointozna | | |
| | | | | | | | | | Fluoranthen | |
| | | | | | | | | I'OLD-ƏL | Pyrene?Fre | |
| TIC: AR | | | | | | | Ter | n So Statematerie | | |
| TIC: ARC1623.D\data.ms | | | | | | | 1 of | ri ⊛iteitiveiteit Z,ens | ou D-H(d)g | |
| D\data.r | | | | | | | | j sponihosoo | | |
| su | | | | | | | 1,STb | -ənərydərər | Perylene- | - H |
| | | | | | | | | | | |
| | | | | | | | Τ, | gand)pycene | Didenz(3(3() | |
| | | | | | | | | T,ənəlynəq(| i,n,g)ozna8 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Page:

4

157.M Fri Sep 13 07:25:42 2013

| Data File Name | ARC1624.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/18/2013 1:48 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-014 (0-0.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 26 | | |
| Sample Multiplier | 0.06623 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ARC1624.D SO-DA-014 (0-0.5) 8/18/2013 PAH-2012.M 15.09889778

Compound Name **Ret Time** Target Response Concentration Su. Corrected Concentration (minute) (area) 0.0000 0.0000 3) cis/trans Decalin 0.00 0 0.0000 0.0000 4) C1-Decalins 0.00 0 5) C2-Decalins 0.00 0 0.0000 0.0000 0.00 0 0.0000 0.0000 6) C3-Decalins 7) C4-Decalins 0.00 0.0000 0.0000 0 92915 2.3870 2.8495 8) Naphthalene 13.88 9)+10) C1-Naphthalenes 16.30 70085 1.8005 2.1494 13) C2-Naphthalenes 18.59 131269 3.3724 4.0257 14) C3-Naphthalenes 20.37 106995 2.7487 3.2813 0.0000 0.0000 15) C4-Naphthalenes 0.00 0 0 0.0000 0.0000 16) Benzothiophene 0.00 17) C1-Benzothiophenes 0.00 0 0.0000 0.0000 18) C2-Benzothiophenes 0.00 0 0.0000 0.0000 0 0.0000 0.0000 19) C3-Benzothiophenes 0.00 20) C4-Benzothiophenes 0.00 0 0.0000 0.0000 52945 1,8951 1.5875 22) Biphenyl 17.69 23) Acenaphthylene 19.17 60376 1.5890 1.8968 24) Acenaphthene 19.78 5785 0.2667 0.3184 25) Dibenzofuran 0.00 0 0.0000 0.0000 21.54 77942 2.6748 3.1930 26) Fluorene 41281 28) C1-Fluorenes 23.51 1.4167 1.6911 0.0000 0.0000 29) C2-Fluorenes 0.00 0 30) C3-Fluorenes 0.00 0 0.0000 0.0000 0.00 0 0.0000 0.0000 33) Carbazole 42) Anthracene 24.99 93485 1.9850 2.3696 41) Phenanthrene 24.82 627669 12.3594 14.7540 43)+44)+45)+46)+47) C1-Phenanthrenes/Anthracenes 26.72 310994 6.1238 7.3102 50) C2-Phenanthrenes/Anthracenes 28.22 313748 6.1780 7.3750 51) C3-Phenanthrenes/Anthracenes 29.95 322486 6.3501 7.5804 52) C4-Phenanthrenes/Anthracenes 30.71 305422 6.0141 7.1793 34) Dibenzothiophene 24.41 44429 1.0583 1.2634 35)+36)+37) C1-Dibenzothiophenes 26.21 51693 1.2314 1.4699 66016 1.5725 1.8772 38) C2-Dibenzothiophenes 27.63 112628 2.6829 39) C3-Dibenzothiophenes 28.80 3.2026 40) C4-Dibenzothiophenes 0.00 0.0000 0.0000 0 686264 58) Fluoranthene 28.94 14.9885 17.8925 29.70 616057 10.3556 12.3620 59) Pyrene 62) C1-Fluoranthenes/Pyrenes 303242 30.85 6.6230 7.9062 63) C2-Fluoranthenes/Pyrenes 32.57 498592 10.8896 12.9994 64) C3-Fluoranthenes/Pyrenes 34.43 193697 4.2305 5.0501 65) C4-Fluoranthenes/Pyrenes 35.32 420047 9.1741 10.9516 53) Naphthobenzothiophene 0.00 0 0.0000 0.0000 54) C1-Naphthobenzothiophenes 0.00 0 0.0000 0.0000 0 0.0000 55) C2-Naphthobenzothiophenes 0.00 0.0000 56) C3-Naphthobenzothiophenes 0.00 0 0.0000 0.0000 57) C4-Naphthobenzothiophenes 0.00 0.0000 0.0000 0 33.77 287080 5.3148 6.3446 67) Benz(a)anthracene 33.89 604803 13.2246 15.7868 68) Chrysene/Triphenylene 69) C1-Chrysenes 35.13 329649 7.2081 8.6046 70) C2-Chrysenes 36.29 319349 6.9829 8.3358 71) C3-Chrysenes 38.08 295389 6.4590 7.7104 72) C4-Chrysenes 0.00 0.0000 0 0.0000 1113300 77) Benzo(b)fluoranthene 37.34 21.6039 25.7896 78) Benzo(k,j)fluoranthene 37.42 321635 8.1959 9.7838 79) Benzo(a)fluoranthene 0.00 0.0000 0.0000 0 80) Benzo(e)pyrene 38.31 611016 12.8699 15.3634 38.46 142500 3.0563 3.6485 81) Benzo(a)pyrene 25271 89) Pervlene 38 77 0.5322 0.6353 82) Indeno(1,2,3-c,d)pyrene 43.19 424523 7.2240 8.6236 43.26 106473 2.2580 2.6954 83) Dibenzo(a,h)anthracene 84) C1-Dibenzo(a,h)anthracenes 0.00 0 0.0000 0.0000 0 0.00 0.0000 85) C2-Dibenzo(a,h)anthracenes 0.0000 86) C3-Dibenzo(a,h)anthracenes 0.00 0 0.0000 0.0000 87) Benzo(g,h,i)perylene 44.55 349479 6.8082 8.1273

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 50003 | 2,0386 | 2.4336 |
| 10) | 1-Methylnaphthalene | 16.47 | 20082 | 0.8863 | 1.0580 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 23516 | 0.6870 | 0.8201 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 20431 | 0.5969 | 0.7125 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 7746 | 0.2263 | 0.2701 |
| 43) | 3-Methylphenanthrene | 26.48 | 57906 | 1.8406 | 2.1972 |
| 44) | 2-Methylphenanthrene | 26.59 | 77871 | 2.4752 | 2.9547 |
| 45) | 2-Methylanthracene | 26.73 | 108909 | 3.4617 | 4.1324 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 33087 | 1.0517 | 1.2554 |
| 47) | 1-Methylphenanthrene | 26.93 | 33221 | 1.0559 | 1.2605 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 6 | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1 | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(205)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1 | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 455472 | 13.06 | 78.84 |
| | Acenaphthene-d10 | 19.67 | 256585 | 12.80 | 77.24 |
| | Phenanthrene-d10 | 24.75 | 563480 | 13.88 | 83.77 |
| | Chrysene-d12 | 33.81 | 636791 | 14.33 | 86.54 |
| | Pervlene-d12 | 38.70 | 2810 | 0.06 | 0.39 |
| 1. | 5(b)H-Cholane | 34.24 | 131034 | 17.83 | 107.71 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.46 | 342674 | 16.63 | |
| | Pyrene-d10 | 29.63 | 667323 | 16.60 | |
| 1000 | Benzo(a)pyrene-d12 | 38.39 | 614271 | 16.58 | |

| Data Path : C:\msdchem\2\data\MS Data File : ARC1624.D Acq On : 18 Aug 2013 1:48 a Operator : YM Sample : SO-DA-014 (0-0.5) Misc : ALS Vial : 26 Sample Multipli Quant Time: Sep 05 21:37:16 2013 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | .er: 0.06 AR70057. able-201 35 2013 | М | | | |
|--|--|---|---|------------------------------|---|
| Compound | R.T. | QIon | Response | Conc Uni | ts Dev(Min) |
| Internal Standards 1) Fluorene-d10 31) Pyrene-d10 73) Benzo(a)pyrene-d12 | 21.455 29.635 38.387 | 176 212 | 342674m 667323m | 251.05 250.63 | 0.00 |
| <pre>66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane</pre> | 13.822 19.672 24.752 33.809 38.697 34.236 | 240 | 636791m | 12.80 13.88 14.33 | 0.00 |
| <pre>Target Compounds 3) cis/trans Decalin 4) C1-Decalins 5) C2-Decalins 6) C3-Decalins 7) C4-Decalins 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene 12) 1,6,7-Trimethylnaphtha 13) C2-Naphthalenes 14) C3-Naphthalenes 15) C4-Naphthalenes 16) Benzothiophene 17) C1-Benzothiophenes 18) C2-Benzothiophenes 19) C3-Benzothiophenes 20) C4-Benzothiophenes 20) C4-Benzothiophenes 21) Biphenyl 23) Acenaphthylene 24) Acenaphthene 25) Dibenzofuran 26) Fluorene 27) 1-Methylfluorene 28) C1-Fluorenes 29) C2-Fluorenes 30) C3-Fluorenes 31) Carbazole 34) Dibenzothiophene 35) 4-Methyldibenzothiophene 36) 2/3-Methyldibenzothiophene 39) C3-Dibenzothiophenes 30) C4-Dibenzothiophenes 31) Phenanthrene 42) Anthracene</pre> | 0.000 0.000 0.000 13.878 16.134 16.469 | 128 142 142 156 170 154 152 154 166 180 184 198 198 198 212 226 178 | 0 0 92915m 50003m 20082m 0 0 131269m | 0.89 N.D. N.D. 3.37 | d d d d d d d d d d d d d d d d d d d |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1624.D Acq On : 18 Aug 2013 1:48 am Operator : YM Sample : SO-DA-014 (0-0.5) Misc : ALS Vial : 26 Sample Multiplier: 0.06623 Quant Time: Sep 05 21:37:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

 44)
 2-Methylphenanthrene
 26.588
 192
 77871m
 2.48

 45)
 2-Methylanthracene
 26.726
 192
 108909m
 3.46

 46)
 4/9-Methylphenanthrene
 26.865
 192
 33087m
 1.05

 47)
 1-Methylphenanthrene
 26.934
 192
 33221m
 1.06

 48)
 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49)
 Retene
 0.000
 0
 N.D. d

 50)
 C2-Phenanthrenes/Anthr...
 28.215
 206
 313748m
 6.18

 51)
 C3-Phenanthrenes/Anthr...
 29.947
 220
 322486m
 6.35

 52)
 C4-Phenanthrenes/Anthr...
 20.708
 234
 305422m
 6.01

 52) C4-Phenanthrenes/Anthr... 30.708 234 305422m 6.01

 52)
 C4-Phenanthrenes/Anthr...
 30.708
 234
 305422m
 6.01

 53)
 Naphthobenzothiophene
 0.000
 0
 N.D. d

 54)
 C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55)
 C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 56)
 C3-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 57)
 C4-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 58)
 Fluoranthene
 28.942
 202
 686264m
 14.99

 59)
 Pyrene
 29.704
 202
 616057m
 10.36

 60)
 2-Methylfluoranthene
 0.000
 0
 N.D. d

 61)
 Benzo(b) fluorene
 0.000
 0
 N.D. d

 62)
 C1-Fluoranthenes/Pyrenes
 30.847
 216
 303242m
 6.62

 63)
 C2-Fluoranthenes/Pyrenes
 32.567
 230
 498592m
 10.89

 61)
 Benzo (b) fluorene
 0.000
 0
 N.D. d

 62)
 C1-Fluoranthenes/Pyrenes
 30.847
 216
 303242m
 6.62

 63)
 C2-Fluoranthenes/Pyrenes
 32.567
 230
 498592m
 10.89

 64)
 C3-Fluoranthenes/Pyrenes
 34.429
 244
 193697m
 4.23

 65)
 C4-Fluoranthenes/Pyrenes
 35.322
 258
 420047m
 9.17

 67)
 Benz (a) anthracene
 33.770
 228
 287080m
 5.31

 68)
 Chrysenes/Triphenylene
 38.86
 228
 604803m
 13.22

 70)
 C2-Chrysenes
 36.292
 256
 319349m
 6.98

 71)
 C3-Chrysenes
 0.000
 0
 N.D. d

 72)
 C4-Chrysenes
 0.000
 0
 N.D. d

 73)
 Bacleanane
 0.000
 0
 N.D. d

 74)
 C29-Hopane
 0.000
 0
 N.D. d

 75)
 Benzo (k, j) fluoranthene
 37.339
 252
 1113295m
 21.60

 78)
 Benzo (a) pyrene
 38.464
 252
 14250m</td

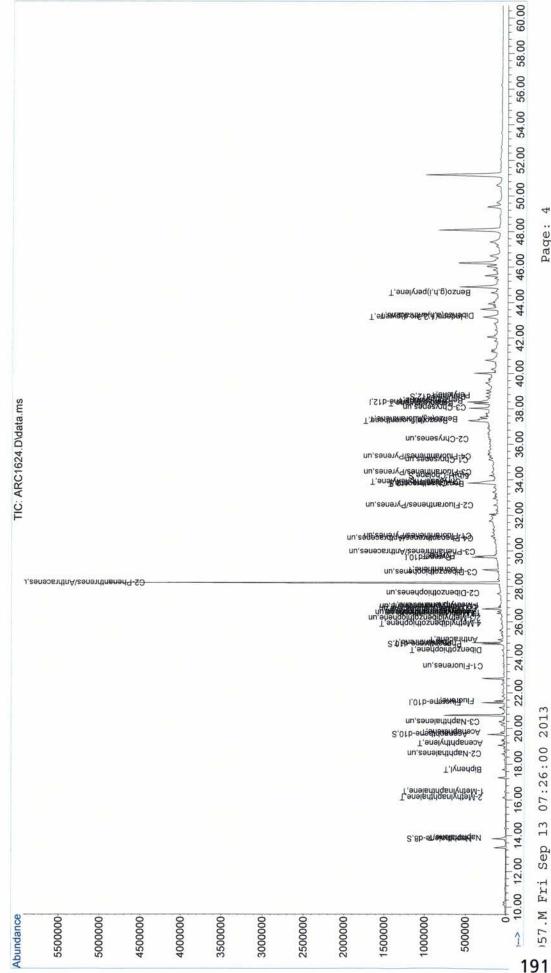
Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1624.D Acq On : 18 Aug 2013 1:48 am Operator : YM Sample : SO-DA-014 (0-0.5) Misc : ALS Vial : 26 Sample Multiplier: 0.06623 Quant Time: Sep 05 21:37:16 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:25:59 2013

Sample Multiplier: 0.06623 C:\msdchem\2\data\MS70057 am 1:4818 Aug 2013 1:4 YM SO-DA-014 (0-0.5) ARC1624.D 26 •• Data Path Data File Operator ALS Vial Acq On Sample Misc

Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A : Sat Aug 17 22:39:35 2013 : Initial Calibration 05 21:37:16 2013 Sep Response via QLast Update Time: Quant



4

Page:

Data File Name ARC1625.D Data File Path C:\msdchem\2\data\MS70057\ Operator YM Date Acquired 8/18/2013 2:56 Acq. Method File PAH-2012.M Sample Name SO-DA-014 (0.5-1.0) Misc Info 0 Instrument Name GCMSD Vial Number 27 Sample Multiplier 0.06662 Sample Amount 0

Surrogate/Internal Multiplier Factor: 1.00 AR-WKSU-2500-001: (ng/mL) Naphthalene-d8 250.125 Acenaphthene-d10 250.163 Phenanthrene-d10 250.194 Chrysene-d12 250.038 Perylene-d12 250.031 5(b)H-Cholane 250.000

Copy data below to Spread Sheet

ARC1625.D SO-DA-014 (0.5-1.0) 8/18/2013 PAH-2012.M 15.01050736

| Sample Amount | 0 | | | | 15.01050/36 |
|--|---|---|--------------------------|--------------------------------------|--------------------------------------|
| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
| | compound Name | (minute) | (area) | concentration | Concentration |
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 6) | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 7) | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 8) | Naphthalene | 13.88 | 54148 | 1.3851 | 1.6312 |
| 9)+10) | C1-Naphthalenes | 16.30 | 46025 | 1.1773 | 1.3865 |
| 13) | C2-Naphthalenes | 18.59 | 96983 | 2.4808 | 2.9217 |
| | C3-Naphthalenes | 20.51 | 84260 | 2.1553 | 2.5384 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 18) | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 17493 | 0.4584 | 0.5399 |
| 24) | Acenaphthene | 19.70 | 3719 | 0.1707 | 0.2011 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 21.54 | 143630 | 4.9078 | 5.7800 |
| 28) | C1-Fluorenes | 23.51 | 57281 | 1.9573 | 2.3051 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 30) | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.7-73 | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 24.99 | 26974 | 0.5671 | 0.6678 |
| 41) | Phenanthrene | 24.82 | 862090 | 16.8072 | 19.7941 |
| 43)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 26.72 | 280590 | 5.4703 | 6.4425 |
| 50) | C2-Phenanthrenes/Anthracenes | 28.22 | 290320 | 5.6600 | 6.6659 |
| 51) | C3-Phenanthrenes/Anthracenes | 29.67 | 291357 | 5.6802 | 6.6897 |
| 52) | C4-Phenanthrenes/Anthracenes | 31.78 | 215485 | 4.2011 | 4.9477 |
| | Dibenzothiophene | 24.41 | 39601 | 0.9340 | 1.0999 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 26104 | 0.6156 | 0.7251 |
| 38) | C2-Dibenzothiophenes | 27.63 | 37113 | 0.8753 | 1.0308 |
| 39) | C3-Dibenzothiophenes | 28.80 | 92283 | 2.1764 | 2.5632 |
| 40) | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 58) | Fluoranthene | 28.94 | 243128 | 5.2575 | 6.1918 |
| 59) | Pyrene | 29.70 | 141990 | 2.3631 | 2.7831 |
| 62) | C1-Fluoranthenes/Pyrenes | 30.85 | 102495 | 2.2164 | 2.6103 |
| 63) | C2-Fluoranthenes/Pyrenes | 32.57 | 211835 | 4.5808 | 5.3949 |
| 64) | C3-Fluoranthenes/Pyrenes | 34.24 | 108632 | 2.3491 | 2.7666 |
| 65) | C4-Fluoranthenes/Pyrenes | 35.32 | 252375 | 5.4574 | 6.4273 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 54) | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 55) | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 56) | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 57) | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 67) | Benz(a)anthracene | 33.77 | 77762 | 1.4254 | 1.6787 |
| 68) | Chrysene/Triphenylene | 33.89 | 153566 | 3.3246 | 3.9154 |
| 69) | C1-Chrysenes | 35.13 | 148978 | 3.2253 | 3.7985 |
| 70) | C2-Chrysenes | 36.29 | 171950 | 3.7226 | 4.3842 |
| 71) | C3-Chrysenes | 38.08 | 194138 | 4.2030 | 4.9499 |
| 72) | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 77) | Benzo(b)fluoranthene | 37.34 | 264516 | 4.7755 | 5.6242 |
| | Benzo(k,j)fluoranthene | 37.42 | 66397 | 1.5741 | 1.8538 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 80) | Benzo(e)pyrene | 38.31 | 159529 | 3.1262 | 3.6817 |
| | | 38.46 | 35443 | 0.7072 | 0.8329 |
| | Benzo(a)pyrene | | | | |
| 89) | Perylene | 38.77 | 10356 | 0.2029 | 0.2390 |
| 89) 82) | Perylene Indeno(1,2,3-c,d)pyrene | 38.77 43.19 | 92269 | 0.2029 1.4608 | 0.2390 1.7203 |
| 89) 82) 83) | Perylene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene | 38.77 43.19 43.26 | 92269 26026 | 1.4608 0.5135 | |
| 89) 82) 83) 84) | Perylene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene C1-Dibenzo(a,h)anthracenes | 38.77 43.19 43.26 0.00 | 92269 26026 0 | 1.4608 0.5135 0.0000 | 1.7203 0.6047 0.0000 |
| 89) 82) 83) 84) 85) | Perylene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene C1-Dibenzo(a,h)anthracenes C2-Dibenzo(a,h)anthracenes | 38.77 43.19 43.26 0.00 0.00 | 92269 26026 0 0 | 1.4608 0.5135 0.0000 0.0000 | 1.7203 0.6047 0.0000 0.0000 |
| 89) 82) 83) 84) 85) 86) | Perylene Indeno(1,2,3-c,d)pyrene Dibenzo(a,h)anthracene C1-Dibenzo(a,h)anthracenes | 38.77 43.19 43.26 0.00 | 92269 26026 0 | 1.4608 0.5135 0.0000 | 1.7203 0.6047 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 32668 | 1.3261 | 1.5618 |
| 10) | 1-Methylnaphthalene | 16.47 | 13357 | 0.5870 | 0.6913 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 11683 | 0.3379 | 0.3980 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 9335 | 0.2700 | 0.3180 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 5086 | 0.1471 | 0.1733 |
| 43) | 3-Methylphenanthrene | 26.48 | 48570 | 1.5285 | 1.8002 |
| 44) | 2-Methylphenanthrene | 26.59 | 59162 | 1.8618 | 2.1927 |
| 45) | 2-Methylanthracene | 26.73 | 109873 | 3.4577 | 4.0722 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 27770 | 0.8739 | 1.0292 |
| 47) | 1-Methylphenanthrene | 26.93 | 35215 | 1.1082 | 1.3052 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 91) | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 95) | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 C | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 97) | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 33.74 | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 487815 | 13.93 | 83.58 |
| 21) | Acenaphthene-d10 | 19.67 | 264990 | 13.16 | 78.96 |
| 1000 | Phenanthrene-d10 | 24.75 | 580264 | 14.15 | 84.91 |
| | Chrysene-d12 | 33.81 | 663150 | 14.78 | 88.71 |
| | Perviene-d12 | 38.70 | 2698 | 0.06 | 0.34 |
| 10.000 | 5(b)H-Cholane | 34.24 | 135573 | 17.17 | 103.07 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.46 | 346184 | 16.72 | |
| | Pyrene-d10 | 29.63 | 677971 | 16.70 | |
| 1000 | Benzo(a)pyrene-d12 | 38.39 | 664144 | 16.68 | |

| | Quan | er cucrom | nepor | (21 1 | ceviewed) | |
|---|---|------------|-------|----------|------------------|-------------|
| Data | Path : C:\msdchem\2\data\M | 1970057 | | | | |
| | File : ARC1625.D | 5700571 | | | | |
| | On : 18 Aug 2013 2:56 | am | | | | |
| Opera | ator : YM | | | | | |
| Samp | le : SO-DA-014 (0.5-1.0) : | | | | | |
| Misc | | | | | | |
| ALS V | Vial : 27 Sample Multipl | ier: 0.00 | 6662 | | | |
| | 527 | | | | | |
| | t Time: Sep 05 21:38:18 201 | | | | | |
| | t Method : C:\GCMS7\MS70057 | | | | | |
| | t Title : PAH Calibration | | 13A | | | |
| QLast | Update : Sat Aug 17 22:39 | :35 2013 | | | | |
| Respo | onse via : Initial Calibrat | ion | | | | |
| | Compound | D m | OTem | D | | |
| | Compound | R.1. | QION | Response | Cone Uni | ts Dev(Min) |
| Inte | ernal Standards | | | | | |
| 1) | Fluorene-d10 | 21 455 | 176 | 346184m | 251 05 | 0 00 |
| 31) | Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 29 635 | 212 | 677971m | 251.05 | 0.00 |
| 73) | Benzo (a) pyrene-d12 | 38 387 | 264 | 664144m | 250.03 | 0.00 |
| 131 | benze (u) pyrene urz | 50.507 | 204 | 0041440 | 230.52 | 0.00 |
| Svst | tem Monitoring Compounds | | | | | |
| 2) | Naphthalene-d8 | 13.822 | 136 | 487815m | 13.93 | 0 00 |
| 21) | Naphthalene-d8 Acenaphthene-d10 | 19.672 | 164 | 264990m | 13.16 | 0.00 |
| 32) | Phenanthrene-d10 | 24.752 | 188 | 580264m | 14.15 | 0.00 |
| 66) | Chrysene-d12 | 33.809 | 240 | 663150m | 14 78 | -0.04 |
| 88) | Phenanthrene-d10 Chrysene-d12 Perylene-d12 | 38.697 | 264 | 2698m | 0.06 | 0.00 |
| 90) | 5(b)H-Cholane | 34,235 | 217 | 135573m | 17 17 | 0.00 |
| | | | | | | 0.00 |
| Targ | get Compounds | | | | | Qvalue |
| | cis/trans Decalin | 0.000 | | 0 | N.D. d | f |
| | | 0.000 | | 0 | N.D. (| f. |
| 5) | C2 Docaling | 0 000 | | 0 | N.D. 0 N.D. 0 | d |
| 6) | C2-Decalins C3-Decalins | 0.000 | | 0 | N.D. d | |
| 7) | C4-Decalins | 0.000 | | 0 | N.D. 0 | f |
| 8) | Naphthalene | 13.878 | 128 | 54148m | 1.39 | |
| 9) | 2-Methylnaphthalene | 16.134 | 142 | 32668m | 1.33 | |
| 10) | 1-Methylnaphthalene | 16.469 | 142 | 13357m | 0.59 | |
| 11) | 2,6-Dimethylnaphthalene | 0.000 | | 0 | N.D. c | f |
| 12) | C3-Decalins C3-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphtha | 0.000 | | 0 | N.D. c | £ |
| 101 | ez hapitellarelleb | 10.000 | 100 | 20203m | 2.10 | |
| 14) | C3-Naphthalenes | 20.508 | 170 | 84260m | | |
| | C4-Naphthalenes | 0.000 | | 0 | N.D. c | 1 |
| | Benzothiophene | 0.000 | | 0 | N.D. c | E |
| | C1-Benzothiophenes | 0.000 | | 0 | N.D. c | 1 |
| | C2-Benzothiophenes | 0.000 | | 0 | N.D. c | |
| | C3-Benzothiophenes | 0.000 | | 0 | N.D. c | |
| | C4-Benzothiophenes | 0.000 | 1940 | 0 | N.D. c | |
| | Biphenyl | 0.000 | | 0 | N.D. c | 1 |
| | Acenaphthylene | 19.171 | | 17493m | 0.46 | |
| | Acenaphthene | 19.700 | 154 | 3719m | 0.17 | |
| | Dibenzofuran | 0.000 | | 0 | N.D. d | 1 |
| | Fluorene | 21.539 | 166 | 143630m | 4.91 | |
| | 1-Methylfluorene | 0.000 | 100 | 0 | N.D. d | 1 |
| | C1-Fluorenes | 23.506 | 180 | 57281m | 1.96 | |
| | C2-Fluorenes | 0.000 | | 0 | N.D. d | |
| | C3-Fluorenes | 0.000 | | 0 | N.D. d | |
| 200 C C C C C C C C C C C C C C C C C C | Carbazole | 0.000 | 1.0.1 | 0 | N.D. d | 1 |
| | Dibenzothiophene | 24.406 | | 39601m | 0.93 | |
| | 4-Methyldibenzothiophene | 25.895 | 198 | 11683m | 0.34 | |
| | 2/3-Methyldibenzothiop | 26.207 | | 9335m | 0.27 | |
| | 1-Methyldibenzothiophene | 26.518 | 198 | 5086m | 0.15 | |
| | C2-Dibenzothiophenes | 27.626 | 212 | 37113m | 0.88 | |
| | C3-Dibenzothiophenes | 28.804 | 226 | 92283m | 2.18 | |
| | C4-Dibenzothiophenes | 0.000 | 1.0.0 | 0 | N.D. d | 1 |
| | Phenanthrene | 24.822 | 178 | 862090m | 16.81 | |
| | Anthracene | 24.995 | 178 | 26974m | 0.57 | |
| 43) | 3-Methylphenanthrene | 26.484 | 192 | 48570m | 1.53 | |
| | | | | | | |

| Data Path : C:\msdchem\2\data\MS Data File : ARC1625.D Acq On : 18 Aug 2013 2:56 a Operator : YM Sample : SO-DA-014 (0.5-1.0) Misc : ALS Vial : 27 Sample Multipli | am .er: 0.00 | 5662 | | |
|--|---|--|---|--|
| Quant Time: Sep 05 21:38:18 2013 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | AR70057. able-201 35 2013 | | | |
| | | | | Conc Units Dev(Min) |
| <pre>44) 2-Methylphenanthrene 45) 2-Methylphenanthrene 46) 4/9-Methylphenanthrene 47) 1-Methylphenanthrene 48) 3,6-Dimethylphenanthrene 49) Retene 50) C2-Phenanthrenes/Anthr 51) C3-Phenanthrenes/Anthr 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene 54) C1-Naphthobenzothiophenes 55) C2-Naphthobenzothiophenes 56) C3-Naphthobenzothiophenes 57) C4-Naphthobenzothiophenes 57) C4-Naphthobenzothiophenes 58) Fluoranthene 59) Pyrene 60) 2-Methylfluoranthene 61) Benzo (b) fluorene 62) C1-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 64) C3-Fluoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes 66) C4-Fluoranthenes/Pyrenes 70) Benz (a) anthracene 68) Chrysene/Triphenylene 69) C1-Chrysenes 71) C3-Chrysenes 72) C4-Chrysenes 73) C2-Chrysenes 74) C29-Hopane 75) 18a-Oleanane 76) C30-Hopane 77) Benzo (b) fluoranthene 78) Benzo (k, j) fluoranthene 79) Benzo (a) fluoranthene 79) Benzo (a) fluoranthene 80) Benzo (a) pyrene 81) Benzo (a) pyrene 82) Indeno (1, 2, 3-c, d) pyrene 83) Dibenzo (a, h) anthracene 84) C1-Dibenzo (a, h) anthrac</pre> | $\begin{array}{c} 26.588\\ 26.726\\ 26.865\\ 26.934\\ 0.000\\ 0.000\\ 28.215\\ 29.669\\ 31.782\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 30.847\\ 32.567\\ 34.235\\ 35.322\\ 33.770\\ 34.235\\ 35.322\\ 33.770\\ 33.886\\ 35.128\\ 36.292\\ 38.076\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 0.000\\ 37.339\\ 37.417\\ 0.000\\ 38.309\\ 38.464\\ 43.189\\ 43.262\\ 0.000\\ \end{array}$ | 192 192 192 192 206 220 234 202 202 202 216 230 244 258 228 228 | 59162m 109873m 27770m 35215m 0 290320m 291357m 215485m 215485m 0 0 0 243128m 141990m 211835m 108632m 252375m 77762m 153566m 148978m 171950m 194138m 0 0 0 264516m 66397m 0 159529m 35443m 92269m 26026m 0 | 1.86 3.46 0.87 1.11 N.D. d N.D. d 5.66 5.68 4.20 N.D. d N.D. d N.D. d N.D. d N.D. d 5.26 2.36 N.D. d N.D. d 2.22 4.58 2.35 5.46 1.43 3.32 3.72 4.20 N.D. d N.D. d N.D. d N.D. d 1.43 3.72 4.20 N.D. d N.D. d N.D. d 1.43 1.57 N.D. d 3.13 0.71 1.46 0.51 N.D. d |
| 85) C2-Dibenzo(a,h)anthrac86) C3-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d N.D. d |
| 87) Benzo(g,h,i)perylene89) Perylene | 44.553 38.774 | 276 252 | 86520m 10356m | 1.57 0.20 |
| 91) C20-TAS | 0.000 | 202 | 0356 | N.D. d |
| 92) C21-TAS | 0.000 | | 0 | N.D. d |
| 93) C26(20S)-TAS 94) C26(20R)/C27(20S)-TAS | 0.000 | | 0 | N.D. d |
| 95) C28(20S)-TAS | 0.000 | | 0 | N.D. d N.D. d |
| 96) C27(20R)-TAS | 0.000 | | 0 | N.D. d |
| 97) C28(20R)-TAS | 0.000 | | 0 | N.D. d |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1625.D Acq On : 18 Aug 2013 2:56 am Operator : YM Sample : SO-DA-014 (0.5-1.0) Misc : ALS Vial : 27 Sample Multiplier: 0.06662 Quant Time: Sep 05 21:38:18 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration (#) = qualifier out of range (m) = manual integration (+) = signals summed (QT Reviewed) Quantitation Report

Sample Multiplier: 0.06662 C:\msdchem\2\data\MS70057\ ARC1625.D 2:56 am SO-DA-014 (0.5-1.0) 18 Aug 2013 YM : 27 Data Path Data File Operator ALS Vial Acq On Sample Misc

: PAH Calibration Table-2013A Quant Time: Sep 05 21:38:18 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Quant Title

| Intrenes/Pyrenes/un nu/zenes/Pyrenes/un C. At C. | C2-Dibenzed (a. C4-Dibenzed (a. C4-Phona C4-Phona C2-Fhuoran C2-Fh |
|--|---|
|--|---|

4 Page:

197

| Data File Name | ARC1626.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\1\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/18/2013 4:05 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-014 (1.0-1.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 28 | | |
| Sample Multiplier | 0.06623 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ARC1626.D SO-DA-014 (1.0-1.5) 8/18/2013 PAH-2012.M 15.09889778

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|------------|------------------------------|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 1035 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.827 | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.55 | Naphthalene | 13.88 | 24872 | 0.6303 | 0.9486 |
| | | 16.30 | 15519 | 0.3933 | |
| | C1-Naphthalenes | | | | 0.5919 |
| | C2-Naphthalenes | 18.59 | 23139 | 0.5863 | 0.8825 |
| | C3-Naphthalenes | 20.15 | 28651 | 0.7260 | 1.0927 |
| 0.825 | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1997 | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 2317 | 0.0601 | 0.0905 |
| 24) | Acenaphthene | 19.70 | 575 | 0.0262 | 0.0394 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 21.54 | 25403 | 0.8599 | 1.2942 |
| 28) | C1-Fluorenes | 23.51 | 8003 | 0.2709 | 0.4077 |
| 0.000 | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.023 | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 18 E A N | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 5-23 T | Anthracene | 24.99 | 2429 | 0.0501 | 0.0753 |
| | Phenanthrene | 24.82 | 113589 | 2.1707 | 3.2670 |
| | C1-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 0.00 | 0 | 0.0000 | 0.0000 |
| S4057 | C2-Phenanthrenes/Anthracenes | | 0 | | |
| | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 13.12.20 | C4-Phenanthrenes/Anthracenes | 0.00 | 511127 Mar | 0.0000 | 0.0000 |
| | Dibenzothiophene | 24.41 | 6910 | 0.1597 | 0.2404 |
| | C1-Dibenzothiophenes | 26.21 | 5111 | 0.1182 | 0.1778 |
| | C2-Dibenzothiophenes | 27.97 | 7253 | 0.1677 | 0.2524 |
| | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 40) | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 58) | Fluoranthene | 28.94 | 22487 | 0.4766 | 0.7174 |
| 59) | Pyrene | 29.70 | 9095 | 0.1484 | 0.2233 |
| 62) | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 63) | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 64) | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 65) | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 54) | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 932-0076 | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| - 0 | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 9713 | 0.1745 | 0.2627 |
| 0.451 1.3 | Chrysene/Triphenylene | 33.89 | 14900 | 0.3162 | 0.4759 |
| | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.555 B.50 | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | 0.0000 | |
| | C3-Chrysenes C4-Chrysenes | 0.00 | 0 | | 0.0000 |
| (2015/M/3) | | 37.34 | 23942 | 0.0000 | |
| | Benzo(b)fluoranthene | | | 0.4564 | 0.6869 |
| | Benzo(k,j)fluoranthene | 37.42 | 6365 | 0.1593 | 0.2398 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 11683 | 0.2417 | 0.3638 |
| | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Perylene | 38.77 | 1374 | 0.0284 | 0.0428 |
| | Indeno(1,2,3-c,d)pyrene | 43.19 | 6353 | 0.1062 | 0.1598 |
| | Dibenzo(a,h)anthracene | 43.23 | 1332 | 0.0277 | 0.0418 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--------|--------------------------------------|------------|-----------------|---|---------------|
| | | (minute) | (area) | 210100000000000000000000000000000000000 | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 10792 | 0.4340 | 0.6532 |
| 10) | 1-Methylnaphthalene | 16.47 | 4727 | 0.2058 | 0.3097 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 2375 | 0.0673 | 0.1013 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 1753 | 0.0497 | 0.0748 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 983 | 0.0279 | 0.0419 |
| 43) | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 45) | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 46) | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 47) | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 92) | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 100.00 | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | õ | 0.0000 | 0.0000 |
| | Surrogate Standards | 1000 | | | 0.0000 |
| 2) | Naphthalene-d8 | 13.82 | 464629 | 13.14 | 79.32 |
| | Acenaphthene-d10 | 19.67 | 231820 | 11.40 | 68.83 |
| | Phenanthrene-d10 | 24.75 | 460511 | 11.01 | 66.44 |
| | Chrysene-d12 | 33.81 | 664613 | 14.52 | 87.66 |
| | Perylene-d12 | 38.70 | 1134 | 0.03 | 0.15 |
| | 5(b)H-Cholane | 34.24 | 120091 | 16.05 | 96.96 |
| / | Internal Standards | 22.102.001 | | 20.00 | 50.50 |
| 1) | Fluorene-d10 | 21.46 | 347411 | 16.63 | |
| | Pyrene-d10 | 29.63 | 687610 | 16.60 | |
| | Benzo(a)pyrene-d12 | 38.39 | 625351 | 16.58 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1626.D Acq On : 18 Aug 2013 4:05 am Operator : YM Sample : SO-DA-014 (1.0-1.5) Misc : ALS Vial : 28 Sample Multiplier: 0.06623 Quant Time: Sep 08 15:31:56 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) Internal Standards21.455176347411m251.050.001) Fluorene-d1029.635212687610m250.630.0031) Pyrene-d1029.635212687610m250.630.0073) Benzo(a)pyrene-d1238.387264625351m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136464629m13.140.0021) Acenaphthene-d1019.672164231820m11.400.0032) Phenanthrene-d1024.752188460511m11.010.0066) Chrysene-d1233.809240664613m14.52-0.0488) Perylene-d1238.6972641134m0.030.0090) 5 (b) H-Cholane34.236217120091m16.050.00

 90) 5(b)H-Cholane
 34.236
 217
 120091m
 16.05

 Target Compounds
 0
 0
 N.D. d

 3) cis/trans Decalins
 0.000
 0
 N.D. d

 4) C1-Decalins
 0.000
 0
 N.D. d

 5) C2-Decalins
 0.000
 0
 N.D. d

 6) C3-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 9) 2-Methylnaphthalene
 16.459
 142
 4727m
 0.21

 11) 2,6-Dimethylnaphthalene
 16.469
 142
 4727m
 0.21

 11) 2,6-Dimethylnaphthalene
 0.000
 0
 N.D. d

 13) C2-Naphthalenes
 18.556
 156
 23139m
 0.59

 14) C3-Naphthalenes
 0.000
 0
 N.D. d

 15) C4-Naphthalenes
 0.000
 0
 N.D. d

 16) Benzothiophene
 0.000
 0
 N.D. d

 17) C1-Benzothiophenes
 0.000
 0
 N.D. d

 19) C3-Benzothiophenes
 0.000
 0
 N.D. d

 20) C4-Benzothiophenes
 0.000
 0
 N.D. d

 Qvalue

| | Path : C:\msdchem\2\data\MS | 570057\ | | | |
|-------------|--|-----------|----------|----------|---------------------|
| | File : ARC1626.D Dn : 18 Aug 2013 4:05 a | am | | | |
| | ator : YM le : SO-DA-014 (1.0-1.5) | | | | |
| Misc | : | | | | |
| ALS | Vial : 28 Sample Multipl: | ler: 0.00 | 0623 | | |
| Quant | Time: Sep 08 15:31:56 2013 | 3 | | | |
| | Method : C:\GCMS7\MS70057 Title : PAH Calibration 7 | | | | |
| | Update : Sat Aug 17 22:39: | | LJA | | |
| | onse via : Initial Calibrati | | | | |
| - | | | | | |
| | Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
| 44) | 2-Methylphenanthrene 2-Methylanthracene | 0.000 | | 0 | N.D. d |
| 45) | 2-Methylanthracene | 0.000 | | 0 | N.D. d |
| 46) | 4/9-Methylphenanthrene | 0.000 | | 0 | |
| 47) | 1-Methylphenanthrene | 0.000 | | 0 | |
| 48) | 4/9-Methylphenanthrene 1-Methylphenanthrene 3,6-Dimethylphenanthrene Retene | 0.000 | | 0 | N.D. d |
| 49) | Retene | 0.000 | | 0 | N.D. d |
| 50) | C2-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d |
| 52) | C3-Phenanthrenes/Anthr C4-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d N.D. d |
| 53) | Naphthobenzothiophene | 0.000 | | 0 | N.D. d |
| 54) | C1-Naphthobenzothiophenes | 0.000 | | õ | N.D. d |
| 55) | C2-Naphthobenzothiophenes | 0.000 | | 0 | N.D. d |
| 56) | C3-Naphthobenzothiophenes | 0.000 | | 0 | N.D. d |
| 57) | C4-Naphthobenzothiophenes | | | 0 | N.D. d |
| 12212233 | Fluoranthene | 28.942 | 202 | 22487m | |
| 59) | Pyrene | 29.704 | 202 | 9095m | 0.15 |
| 60) | 2-Methylfluoranthene Benzo(b)fluorene | 0.000 | | 0 | N.D. d |
| | | | | 0 | N.D. d |
| 63) | C1-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d |
| 64) | C2-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d N.D. d |
| 65) | C4-Fluoranthenes/Pyrenes Benz (a) anthracene | 0.000 | | 0 | N.D. d |
| 67) | Benz(a)anthracene | 33.770 | 228 | 9713m | 0.17 |
| 68) | Chrysene/Triphenylene | 33.886 | 228 | 14900m | 0.32 |
| 69) | C1-Chrysenes | 0.000 | | 0 | N.D. d |
| | | 0.000 | | 0 | N.D. d |
| | C3-Chrysenes | 0.000 | | 0 | N.D. d |
| | C4-Chrysenes | 0.000 | | 0 | N.D. d |
| | C29-Hopane 18a-Oleanane | 0.000 | | 0 | N.D. d N.D. d |
| | C30-Hopane | 0.000 | | 0 | N.D. d |
| | Benzo(b)fluoranthene | 37.339 | 252 | | 0.46 |
| | Benzo(k,j)fluoranthene | 37.417 | 252 | 6365m | 0.16 |
| | Benzo(a)fluoranthene | 0.000 | | 0 | N.D. d |
| | | 38.309 | 252 | 11683m | 0.24 |
| 81) | Benzo(a)pyrene | 0.000 | | 0 | N.D. d |
| 82) | Indeno(1,2,3-c,d)pyrene | 43.189 | | 6353m | 0.11 |
| | Dibenzo(a, h) anthracene | | 278 | 1332m | 0.03 |
| 94) | C1-Dibenzo(a, h) anthrac | 0.000 | | 0 | N.D. d |
| 86) | C2-Dibenzo(a,h)anthrac C3-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. d N.D. d |
| | Benzo(g,h,i)perylene | | 276 | | |
| | Perylene | 38.775 | 252 | | 0.03 |
| | C20-TAS | 0.000 | 1.778744 | 0 | N.D. d |
| 92) | C21-TAS | 0.000 | | 0 | N.D. d |
| | | 0.000 | | 0 | N.D. d |
| 94) | C26(20R)/C27(20S)-TAS | | | 0 | N.D. d |
| 95) | C28(20S) - TAS | 0.000 | | 0 | N.D. d |
| 96) | C28 (20S) -TAS C27 (20R) -TAS C28 (20R) -TAS | 0.000 | | 0 | N.D. d |
| 97) | C20(20K) - IAS | 0.000 | | 0 | N.D. d |
| - 1000 COR. | | | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1626.D Acq On : 18 Aug 2013 4:05 am Operator : YM Sample : SO-DA-014 (1.0-1.5) Misc : ALS Vial : 28 Sample Multiplier: 0.06623 Quant Time: Sep 08 15:31:56 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Sample Multiplier: 0.06623 C:\msdchem\2\data\MS70057\ ARC1626.D 4:05 am SO-DA-014 (1.0-1.5) 18 Aug 2013 MY : 28 .. •• •• Data Path Data File Operator ALS Vial Acq On Sample Misc

Quant Time: Sep 08 15:31:56 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| 550000 | 500000 | 4500000 | 400000 | 3500000 | 300000 | 250000- | 200000 | 1500000- | 1000000- | 500000 | 0 |
|--------|--------|---------|--------|---------|--------|---------|--------|-----------------------------|--|---|--------|
| | | | | | | | | | | | 1 |
| | | | | | | | | | S,8b-ertşian | runguni qen - | |
| | | | | | | | | | T,enelsrinde T,enelsrinde | enlyrtjeM-S enlyrtjeM-T | 100 97 |
| | | | | | | | | S | nu, sənəls T, ənəly 2,01b-ə rədrit ı | C2-Naphth Acenaphth Acenaphth | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | S | | | |
| | | | | | | | | nu,ənər nu,ənər nu,ən | nenqointozneo nqointozneo nenqointozneo nenqointozneo | diblydiaM-1 Jydraem-1 diblydiaM-2/2 | |
| | 2 | | | | | | | ur | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | 1 | C CTICORDON | na (o) ruad | |
| | | | | | | | | li | S, ensioner | u <u>ე-</u> H(g)g | |
| | | | | | | | | Ţ | T-acouttorsacti | Md\avaa | |
| | | | | | | | | | | | |
| | | | | | | | | | | | E |
| | | | | | | | | | | | |
| | | | | | | | | T,e | | | |
| | | | | | | | | | ı 'əuəıkıəd(ı' | u'6)ozuag | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | arts | nu senets Tener, 1.01b-ene nu .ee e.un c.un c.un c.un c.un c.un c.un c.un c | |

57.M Fri Sep 13 07:26:54 2013

_

| Data File Name | ARC1627.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|----------------------------|---------------------------------------|---------|--------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/18/2013 6:22 | Acenaphthene-d10 | 250.163 | Cop |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | to S |
| Sample Name | SO-DA-DUP-01-080113 | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | A |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SO-DA- |
| Vial Number | 30 | | | 8 |
| Sample Multiplier | 0.0664 | | | P |
| Sample Amount | 0 | | | 15 |
| | | | | |

Copy data below to Spread Sheet

ARC1627.D SO-DA-DUP-01-080113 8/18/2013 PAH-2012.M 15.06024096

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|--|---|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1 | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Decalins | | | | |
| 574 | Naphthalene | 13.88 | 99177 | 2.3663 | 2.8525 |
| | C1-Naphthalenes | 16.30 | 81906 | 1.9542 | 2.3558 |
| 13) | C2-Naphthalenes | 18.59 | 125901 | 3.0039 | 3.6211 |
| 14) | C3-Naphthalenes | 20.37 | 88554 | 2.1129 | 2.5470 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.000 | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | õ | 0.0000 | 0.0000 |
| | | 17.69 | 105473 | 2.9372 | |
| | Biphenyl | | | | 3.5407 |
| | Acenaphthylene | 19.17 | 91472 | 2.2358 | 2.6951 |
| | Acenaphthene | 19.78 | 4931 | 0.2112 | 0.2545 |
| 1000 | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluorene | 21.54 | 42423 | 1.3521 | 1.6299 |
| 28) | C1-Fluorenes | 23.51 | 37022 | 1.1800 | 1.4224 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 30) | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| | Anthracene | 24.99 | 158160 | 3.1155 | 3.7557 |
| | Phenanthrene | 24.82 | 508982 | 9.2980 | 11.2084 |
| Sec. 19 | | 26.72 | | | |
| | C1-Phenanthrenes/Anthracenes | | 354152 | 6.4696 | 7.7989 |
| | C2-Phenanthrenes/Anthracenes | 28.21 | 439291 | 8.0249 | 9.6737 |
| | C3-Phenanthrenes/Anthracenes | 29.95 | 521760 | 9.5315 | 11.4898 |
| | C4-Phenanthrenes/Anthracenes | 31.78 | 455429 | 8.3197 | 10.0291 |
| 34) | Dibenzothiophene | 24.41 | 51923 | 1.1474 | 1.3832 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 62232 | 1.3753 | 1.6578 |
| 38) | C2-Dibenzothiophenes | 27.63 | 98610 | 2.1792 | 2.6269 |
| | C3-Dibenzothiophenes | 28.80 | 281027 | 6.2104 | 7.4864 |
| | C4-Dibenzothiophenes | 31.50 | 207607 | 4.5879 | 5.5305 |
| | Fluoranthene | 28.94 | 984841 | 19.9551 | 24.0551 |
| 1/3.00.00 | Pyrene | 29.70 | 1126200 | 17.5627 | 21.1712 |
| 1. | the second se | 30.85 | 539117 | 10.9237 | |
| 2469-371 | C1-Fluoranthenes/Pyrenes | | | | 13.1682 |
| 22632 | C2-Fluoranthenes/Pyrenes | 32.57 | 728863 | 14.7684 | 17.8028 |
| (S21)22C | C3-Fluoranthenes/Pyrenes | 34.43 | 387663 | 7.8549 | 9.4688 |
| G815222 | C4-Fluoranthenes/Pyrenes | 35.32 | 523776 | 10.6128 | 12.7934 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 54) | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 55) | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 56) | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| - 1.5 h. S. I | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2014-2014 | Benz(a)anthracene | 33.77 | 595137 | 10.2217 | 12.3219 |
| 0.303,6770 | Chrysene/Triphenylene | 33.89 | 999517 | 20.2759 | 24.4419 |
| | C1-Chrysenes | 35.13 | 589115 | 11.9506 | 14.4060 |
| | | | | | |
| 2.42 B | C2-Chrysenes | 36.29 | 476233 | 9.6607 | 11.6457 |
| | C3-Chrysenes | 38.00 | 407155 | 8.2594 | 9.9564 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 37.34 | 1897410 | 37.8491 | 45.6258 |
| 78) | Benzo(k,j)fluoranthene | 37.42 | 514396 | 13.4743 | 16.2428 |
| 79) | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 80) | Benzo(e)pyrene | 38.31 | 1004270 | 21.7443 | 26.2120 |
| | Benzo(a)pyrene | 38.46 | 339958 | 7.4953 | 9.0353 |
| 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C 1 C | Perylene | 38.77 | 73757 | 1.5967 | 1.9248 |
| | Indeno(1,2,3-c,d)pyrene | 43.19 | 738875 | 12.9246 | 15.5802 |
| S. 192.20 | | | | | |
| | Dibenzo(a,h)anthracene | 43.26 | 182814 | 3.9853 | 4.8041 |
| 1223210 | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|----------|--------------------------------------|------------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 59061 | 2.2363 | 2.6958 |
| 10) | 1-Methylnaphthalene | 16.47 | 22845 | 0.9364 | 1.1288 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.89 | 30209 | 0.8187 | 0.9870 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 24217 | 0.6563 | 0.7912 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 7806 | 0.2116 | 0.2550 |
| 43) | 3-Methylphenanthrene | 26.48 | 67614 | 1.9938 | 2.4035 |
| 44) | 2-Methylphenanthrene | 26.59 | 89809 | 2.6483 | 3.1924 |
| 45) | 2-Methylanthracene | 26.73 | 123143 | 3.6313 | 4.3773 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 38692 | 1.1410 | 1.3754 |
| 47) | 1-Methylphenanthrene | 26.93 | 34894 | 1.0290 | 1.2404 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 92) | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 93) | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.1 | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.17 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | 10 TSNE 7. | | | |
| 21 | Naphthalene-d8 | 13.82 | 684225 | 18.22 | 109.71 |
| | Acenaphthene-d10 | 19.67 | 297336 | 13.77 | 82.92 |
| | Phenanthrene-d10 | 24.75 | 603017 | 13.78 | 82.96 |
| C | Chrysene-d12 | 33.81 | 701731 | 14.65 | 88.25 |
| | Pervlene-d12 | 38.70 | 7308 | 0.17 | 1.03 |
| S. S. M. | 5(b)H-Cholane | 34.24 | 136669 | 19.12 | 115.19 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 369916 | 16.67 | |
| | Pyrene-d10 | 29.63 | 721156 | 16.64 | |
| | Benzo(a)pyrene-d12 | 38.39 | 599100 | 16.62 | |

| 2 ······ | | nopor | · · · · · | erzenea, | |
|---|----------------------------------|-------|-------------|----------------------------|------------|
| Data Path : C:\msdchem\2\data\MS | 570057\ | | | | |
| Data File : ARC1627.D Acq On : 18 Aug 2013 6:22 a | | | | | |
| Operator : YM | | | | | |
| Sample : SO-DA-DUP-01-080113 Misc : | | | | | |
| ALS Vial : 30 Sample Multipli | | 564 | | | |
| Quant Time: Sep 05 21:40:08 2013 Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | AR70057. Cable-201 35 2013 | | | | |
| Compound | R.T. | QIon | Response | Conc Unit | s Dev(Min) |
| Internal Standards | | | | | |
| 1) Fluorene-d10 | 21 455 | 176 | 369916m | 251 05 | 0 00 |
| 31) Pyrene-d10 | 29.635 | 212 | 721156m | 250.63 | 0.00 |
| Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 38.386 | 264 | 599100m | 250.32 | 0.00 |
| | | | | | |
| System Monitoring Compounds 2) Naphthalene-d8 21) Acenaphthene-d10 32) Phenanthrene-d10 66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane | | | | | |
| 2) Naphthalene-d8 | 13.822 | 136 | 684225m | 18.22 | 0.00 |
| 21) Acenaphthene-d10 | 19.672 | 164 | 297336m | 13.77 | 0.00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 603017m | 13.78 | 0.00 |
| 66) Chrysene-d12 | 33.809 | 240 | 701731m | 14.65 | -0.04 |
| 88) Perylene-d12 | 38.697 | 264 | 7308m | 0.17 | 0.00 |
| 90) 5(b)H-Cholane | 34.235 | 217 | 136669m | 19.12 | 0.00 |
| Target Compounds | | | | | 0 |
| 3) cis/trans Decalin | 0.000 | | 0 | N.D. d | |
| 4) Cl-Decalins | 0.000 | | 0 | N.D. d N.D. d N.D. d | |
| 5) C2-Decalins | 0.000 | | 0 | N.D. d | |
| 6) C3-Decalins | 0.000 | | 0 | N.D. d | |
| 6) C3-Decalins 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene | 0.000 | | 0 | N.D. d | |
| 8) Naphthalene | 13.878 | 128 | 99177m | 2.37 | |
| 9) 2-Methylnaphthalene | 16.134 | 142 | 59061m | 2.24 | |
| 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene | 16.468 | 142 | 22845m | 0.94 | |
| 12) 2,6-Dimethyinaphthaiene | 0.000 | | 0 | N.D. d | |
| 1,6,7-Trimethylnaphtha C2-Naphthalenes | 18.586 | 156 | | N.D. d 3.00 | |
| 14) C3-Naphthalenes | 20.368 | | | | |
| 15) C4-Naphthalenes | 0.000 | 110 | 000001111 | N.D. d | |
| 16) Benzothiophene | 0.000 | | 0 | N.D. d | |
| 17) Cl-Benzothiophenes | 0.000 | | 0 | N.D. d | |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. d | |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. d | |
| 20) C4-Benzothiophenes | 0.000 | | 0 | N.D. d | |
| 22) Biphenyl | 17.694 | 154 | 105473m | 2.94 | |
| 23) Acenaphthylene | 19.171 | | 91472m | 2.24 | |
| 24) Acenaphthene | 19.783 | 154 | 4931m | 0.21 | |
| 25) Dibenzofuran | 0.000 | | 0 | N.D. d | |
| 26) Fluorene | 21.538 | 166 | 42423m | 1.35 | |
| 27) 1-Methylfluorene | 0.000 | 100 | 0 | N.D. d | |
| 28) C1-Fluorenes 29) C2-Fluorenes | 23.506 | 180 | 37022m 0 | 1.18 N.D.d | |
| 30) C3-Fluorenes | 0.000 | | 0 | N.D. d N.D. d | |
| 33) Carbazole | 0.000 | | 0 | N.D. d | |
| 34) Dibenzothiophene | 24.406 | 184 | | 1.15 | |
| 35) 4-Methyldibenzothiophene | 25.895 | | 30209m | 0.82 | |
| 36) 2/3-Methyldibenzothiop | 26.207 | | 24217m | 0.66 | |
| 37) 1-Methyldibenzothiophene | 26.518 | 198 | 7806m | 0.21 | |
| 38) C2-Dibenzothiophenes | 27.626 | | 98610m | 2.18 | |
| 39) C3-Dibenzothiophenes | 28.804 | | 281027m | 6.21 | |
| 40) C4-Dibenzothiophenes | 31.505 | 240 | 207607m | 4.59 | |
| 41) Phenanthrene | 24.821 | | | | |
| 42) Anthracene | 24.995 | | | 3.12 | |
| 43) 3-Methylphenanthrene | 26.484 | 192 | 67614m | 1.99 | |
| | | | | | |

| Acq On : 18 Aug 2013 6:22 am Operator : YM Sample : SO-DA-DUP-01-080113 Misc : ALS Vial : 30 Sample Multiplier: 0.0664 Quant Time: Sep 05 21:40:08 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration | |
|---|--------|
| Compound R.T. QIon Response Conc Units Dev | /(Min) |
| 44) 2-Methylphenanthrene 26.587 192 89809m 2.65 | |
| 45) 2-Methylanthracene 26.726 192 123143m 3.63 | |
| 46) 4/9-Methylphenanthrene 26.864 192 38692m 1.14 | |
| 47) 1-Methylphenanthrene 26.934 192 34894m 1.03 | |
| 47) 1-Methylphenanthrene 26.934 192 34894m 1.03 48) 3,6-Dimethylphenanthrene 0.000 0 N.D. d | |
| 49) Retene 0.000 0 N.D. d | |
| 50) C2-Phenanthrenes/Anthr 28.215 206 439291m 8.02 | |
| 51) C3-Phenanthrenes/Anthr 29.946 220 521760m 9.53 | |
| 52) C4-Phenanthrenes/Anthr 31.782 234 455429m 8.32 | |
| 53) Naphthobenzothiophene 0.000 0 N.D. d | |
| 54) C1-Naphthobenzothiophenes0.0000N.D. d55) C2-Naphthobenzothiophenes0.0000N.D. d56) C3-Naphthobenzothiophenes0.0000N.D. d | |
| 55) C2-Naphthobenzothiophenes0.0000N.D. d56) C3-Naphthobenzothiophenes0.0000N.D. d | |
| 56) C3-Naphthobenzothiophenes0.0000N.D. d57) C4-Naphthobenzothiophenes0.0000N.D. d | |
| 58) Fluoranthene 28.942 202 984841m 19.96 | |
| 59) Pyrene 29.704 202 1126204m 17.56 | |
| 60) 2-Methylfluoranthene 0.000 0 N.D. d | |
| 61) Benzo(b)fluorene 0.000 0 N.D. d | |
| 62) C1-Fluoranthenes/Pyrenes 30.847 216 539117m 10.92 | |
| 63) C2-Fluoranthenes/Pyrenes 32.567 230 728863m 14.77 | |
| 64) C3-Fluoranthenes/Pyrenes 34.429 244 387663m 7.85 | |
| 65) C4-Fluoranthenes/Pyrenes 35.322 258 523776m 10.61 | |
| 67) Benz(a) anthracene 33.770 228 595137m 10.22 | |
| 68) Chrysene/Triphenylene33.886228999517m20.2869) C1-Chrysenes35.128242589115m11.95 | |
| 69) Cl-Chrysenes35.128242589115m11.9570) C2-Chrysenes36.291256476233m9.66 | |
| 71) C3-Chrysenes 37.998 270 407155m 8.26 | |
| 72) C4-Chrysenes 0.000 0 N.D. d | |
| 74) C29-Hopane 0.000 0 N.D. d | |
| 75) 18a-Oleanane 0.000 0 N.D. d | |
| 76) C30-Hopane 0.000 0 N.D. d | |
| 77) Benzo(b)fluoranthene 37.339 252 1897408m 37.85 | |
| 78) Benzo(k,j)fluoranthene 37.416 252 514396m 13.47 | |
| 79) Benzo(a)fluoranthene0.0000N.D. d80) Benzo(e)pyrene38.3092521004267m21.74 | |
| 81) Benzo(a)pyrene 38.464 252 339958m 7.50 | |
| 82) Indeno(1,2,3-c,d)pyrene 43.188 276 738875m 12.92 | |
| 83) Dibenzo(a,h)anthracene 43.262 278 182814m 3.99 | |
| 84) C1-Dibenzo(a,h)anthrac 0.000 0 N.D. d | |
| 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d | |
| 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d | |
| 87) Benzo(g,h,i)perylene 44.553 276 687767m 13.77 | |
| 89) Perylene 38.774 252 73757m 1.60 | |
| 91) C20-TAS 0.000 0 N.D. d | |
| 92) C21-TAS 0.000 0 N.D. d | |
| 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 0.000 0 N.D. d | |
| 94) C26(20R)/C27(20S)-TAS 0.000 0 N.D. d 95) C28(20S)-TAS 0.000 0 N.D. d | |
| 96) C27(20R)-TAS 0.000 0 N.D. d | |
| 97) C28(20R) TAS 0.000 0 N.D. d | |
| | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1627.D Acq On : 18 Aug 2013 6:22 am Operator : YM Sample : SO-DA-DUP-01-080113 Misc : ALS Vial : 30 Sample Multiplier: 0.0664 Quant Time: Sep 05 21:40:08 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

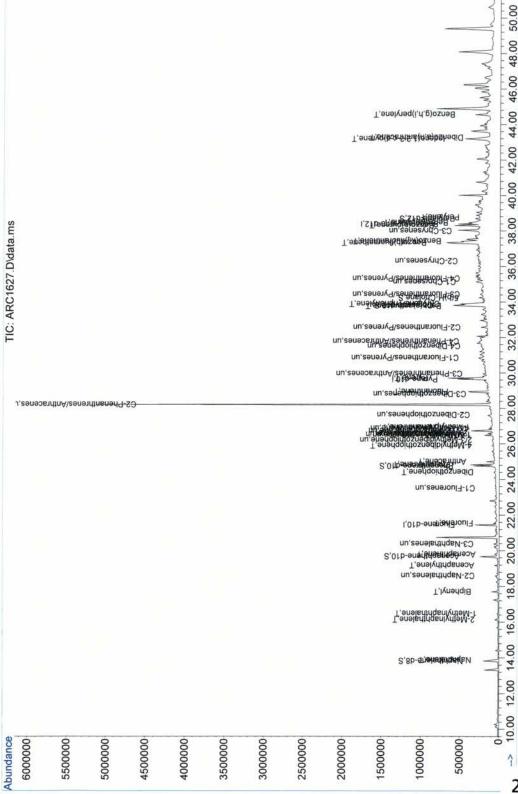
(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:27:11 2013

Quantitation Report (QT Reviewed)

Sample Multiplier: 0.0664 C:\msdchem\2\data\MS70057\ am SO-DA-DUP-01-080113 6:22 18 Aug 2013 ARC1627.D WX 30 ••• •• ... Data Path Data File Operator ALS Vial Acq On Sample Misc

Quant Time: Sep 05 21:40:08 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration



60.00

58.00

56.00

54.00

52.00

07:27:13 2013

Sep 13

57.M Fri

| Data File Name | ARC1628.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-----------------------|----------------------------|---------------------------------------|---------|-------------------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/18/2013 7:30 | Acenaphthene-d10 | 250.163 | Copy data below |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | to Spread Sheet |
| Sample Name | SO-DA-015 (0-0.5) | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | ARC1628.D |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SO-DA-015 (0-0.5) |
| Vial Number | 31 | | | 8/18/2013 |
| Sample Multiplier | 0.06662 | | | PAH-2012.M |
| Sample Amount | 0 | | | 15.01050736 |

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|---|------------------------------|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 140249 | 3.1707 | 4.3092 |
| | C1-Naphthalenes | 16.30 | 140156 | 3.1686 | 4.3063 |
| 125X797104265 | C2-Naphthalenes | 18.59 | 274266 | 6.2005 | 8.4269 |
| | C3-Naphthalenes | 21.45 | 252623 | 5.7112 | 7.7619 |
| 223 | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | õ | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthylene | 19.17 | 49555 | 1.1477 | 1.5598 |
| | Acenaphthene | 19.70 | 8732 | 0.3543 | 0.4815 |
| 6335 | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluorene | 21.54 | 92308 | 2.7877 | 3.7886 |
| | C1-Fluorenes | 23.51 | 70300 | 2.1230 | 2.8854 |
| | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 5.2 C | C3-Fluorenes | 0.00 | õ | 0.0000 | 0.0000 |
| - 100LA | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 1022 | Anthracene | 24.99 | 88230 | 1.7797 | 2.4187 |
| | Phenanthrene | 24.82 | 742808 | 13.8947 | 18.8839 |
| | | 26.72 | 358588 | 6.7076 | |
| the second s | C1-Phenanthrenes/Anthracenes | | 650815 | 12.1739 | 9.1161 |
| | C2-Phenanthrenes/Anthracenes | 28.22 | | | 16.5452 |
| | C3-Phenanthrenes/Anthracenes | 29.95 | 1145470 | 21.4268 | 29.1205 |
| | C4-Phenanthrenes/Anthracenes | 32.37 | 1474400 | 27.5797 | 37.4827 |
| 10.00 C C C C C C C C C C C C C C C C C C | Dibenzothiophene | 24.41 | 60772 | 1.3752 | 1.8690 |
| | C1-Dibenzothiophenes | 26.21 | 140936 | 3.1892 | 4.3343 |
| 1.1.1.1 | C2-Dibenzothiophenes | 27.97 | 344305 | 7.7911 | 10.5887 |
| 2012 | C3-Dibenzothiophenes | 29.50 | 716053 | 16.2032 | 22.0214 |
| | C4-Dibenzothiophenes | 31.50 | 712232 | 16.1168 | 21.9038 |
| 1.2.5 | Fluoranthene | 28.94 | 626244 | 12.9932 | 17.6587 |
| 16.522 | Pyrene | 29.70 | 576657 | 9.2082 | 12.5146 |
| 223 | C1-Fluoranthenes/Pyrenes | 31.19 | 470278 | 9.7573 | 13.2609 |
| NAMES OF THE OWNER OWNER OF THE OWNER OWN | C2-Fluoranthenes/Pyrenes | 32.57 | 944313 | 19.5925 | 26.6276 |
| | C3-Fluoranthenes/Pyrenes | 34.43 | 538498 | 11.1727 | 15.1845 |
| | C4-Fluoranthenes/Pyrenes | 35.32 | 1290670 | 26.7786 | 36.3940 |
| -27224 | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 281762 | 4.9554 | 6.7347 |
| 100 | Chrysene/Triphenylene | 33.93 | 610770 | 12.6868 | 17.2423 |
| | C1-Chrysenes | 35.13 | 797844 | 16.5727 | 22.5235 |
| 70) | C2-Chrysenes | 36.33 | 1014060 | 21.0640 | 28.6274 |
| | C3-Chrysenes | 38.00 | 971906 | 20.1883 | 27.4374 |
| 72) | C4-Chrysenes | 39.47 | 496594 | 10.3152 | 14.0190 |
| 0.030 | Benzo(b)fluoranthene | 37.34 | 1162770 | 23.1532 | 31.4669 |
| 78) | Benzo(k,j)fluoranthene | 37.42 | 343901 | 8.9922 | 12.2210 |
| 79) | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 38.31 | 765518 | 16.5453 | 22.4862 |
| 81) | Benzo(a)pyrene | 38.50 | 109649 | 2.4132 | 3.2797 |
| 89) | Perylene | 38.81 | 43190 | 0.9333 | 1.2685 |
| 82) | Indeno(1,2,3-c,d)pyrene | 43.19 | 371030 | 6.4786 | 8.8048 |
| 83) | Dibenzo(a,h)anthracene | 43.26 | 121459 | 2.6430 | 3.5921 |
| 84) | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 87) | Benzo(g,h,i)perylene | 44.55 | 389055 | 7.7772 | 10.5697 |
| 1777.V. | | | | | |

| 9) 10) 11) 12) 27) 35) | Individual Alkyl Isomers and Hopanes 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphthalene | (minute) 16.13 16.47 | (area) 98278 | 2 5260 | Concentration |
|---------------------------------------|---|----------------------------|-----------------|---------|---------------|
| 9) 10) 11) 12) 27) 35) | 2-Methylnaphthalene 1-Methylnaphthalene 2,6-Dimethylnaphthalene | 16.47 | | 2 5252 | |
| 10) 11) 12) 27) 35) | 1-Methylnaphthalene 2,6-Dimethylnaphthalene | 16.47 | | 3 53 60 | |
| 11) 12) 27) 35) | 2,6-Dimethylnaphthalene | | | 3.5260 | 4.7920 |
| 12) 27) 35) | | 0.00 | 41878 | 1.6265 | 2.2105 |
| 27) 35) | 1.6.7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1 | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 36) | 4-Methyldibenzothiophene | 25.89 | 41848 | 1.1614 | 1.5784 |
| | 2/3-Methyldibenzothiophene | 26.21 | 76797 | 2.1313 | 2.8966 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 22291 | 0.6186 | 0.8408 |
| | 3-Methylphenanthrene | 26.48 | 60588 | 1.8294 | 2.4863 |
| | 2-Methylphenanthrene | 26.59 | 85607 | 2.5849 | 3.5130 |
| 45) | 2-Methylanthracene | 26.73 | 119395 | 3.6051 | 4.8996 |
| | 4/9-Methylphenanthrene | 26.86 | 49226 | 1.4864 | 2.0201 |
| 1000 | 1-Methylphenanthrene | 26.93 | 43772 | 1.3217 | 1.7963 |
| | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1 | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.1.1.1.1.1 | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.50 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| S | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | 0.00 | | | 20.00000000 |
| | Naphthalene-d8 | 13.82 | 419018 | 10.57 | 63.45 |
| 1.1.1 | Acenaphthene-d10 | 19.67 | 262797 | 11.53 | 69.21 |
| 1000 | Phenanthrene-d10 | 24.75 | 524074 | 12.26 | 73.58 |
| 20.5 | Chrysene-d12 | 33.85 | 615834 | 13.17 | 79.04 |
| 200 | Perylene-d12 | 38.70 | 11051 | 0.26 | 1.56 |
| | 5(b)H-Cholane | 34.24 | 145357 | 20.30 | 121.88 |
| 10.00 | Internal Standards | 34.24 | 1-3331 | 20100 | 22,2,00 |
| | Fluorene-d10 | 21.45 | 391694 | 16.72 | |
| 0.00 | Pyrene-d10 | 29.63 | 706610 | 16.70 | |
| | Pyrene-d10 Benzo(a)pyrene-d12 | 38.39 | 602163 | 16.68 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1628.D Acq On : 18 Aug 2013 7:30 am Operator : YM Sample : SO-DA-015 (0-0.5) Misc : ALS Vial : 31 Sample Multiplier: 0.06662 Quant Time: Sep 08 16:16:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) Internal Standards21.455176391694m251.050.0031) Pyrene-d1029.635212706610m250.630.0073) Benzo(a)pyrene-d1238.386264602163m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136419018m10.570.0021) Acenaphthene-d1019.672164262797m11.530.0032) Phenanthrene-d1024.752188524074m12.260.0066) Chrysene-d1233.847240615834m13.170.0088) Perylene-d1238.69726411051m0.260.0090) 5 (b)H-Cholane34.235217145357m20.300.00

 90) 5 (b)H-Cholane
 34.235
 217
 145357m
 20.30

 Target Compounds
 0
 0
 N.D. d

 3) cis/trans Decalins
 0.000
 0
 N.D. d

 4) C1-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 8) Naphthalene
 16.34
 142
 98278m
 3.53

 101 -Methylnaphthalene
 16.468
 142
 14578m
 1.63

 11) 2,6-Dimethylnaphthalene
 0.000
 0
 N.D. d

 13) C2-Naphthalenes
 18.586
 156
 274266m
 6.20

 14) C3-Naphthalenes
 0.000
 0
 N.D. d

 13) C2-Naphthalenes
 0.000
 0
 N.D. d

 16) Benzothiophene
 0.000
 0
 N.D. d

 17) C1-Benzothiophenes
 0.000
 0
 N.D. d

 19) C3-Benzothiophenes
 0.000
 0
 N.D. d

 20) C4-Benzothiophenes
 0.000
 0
 N.D. d

 Ovalue

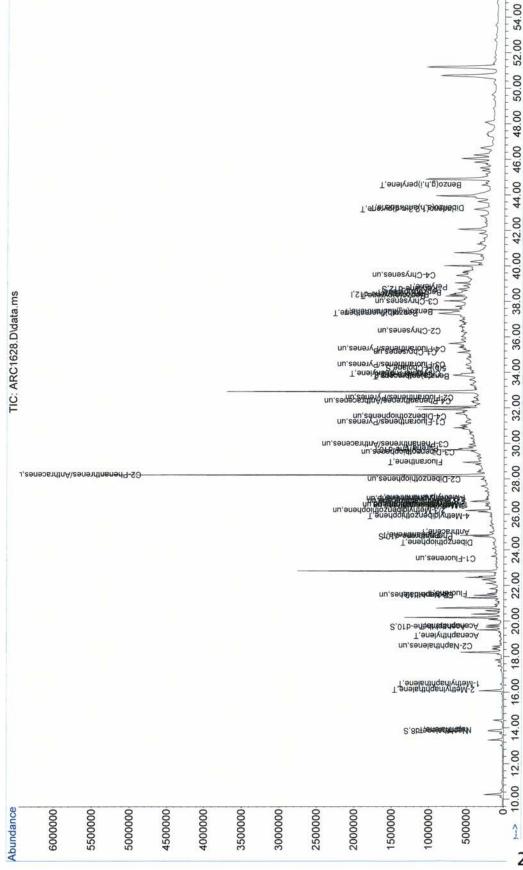
| Compound R.T. QION Response Conc Units Dev(Min) 441 2-Methylphenanthrene 26.587 192 85607m 2.58 451 2-Methylphenanthrene 26.726 192 119395m 3.61 464 4/9 49226m 1.49 3.61 471 1-Methylphenanthrene 26.934 192 43772m 1.32 483 3,6-Dimethylphenanthrene 0.000 0 N.D. d 59 C2-Phenanthrenes/Anthr 28.946 220 1145471m 21.43 51 C3-Naphthobenzothiophenes 0.000 0 N.D. d 0 51 C3-Naphthobenzothiophenes 0.000 0 N.D. d 0 52 C3-Naphthobenzothiophenes 0.000 0 N.D. d 0 0 N.D. d 53 C3-Haphthobenzothiophenes 31.193 216 470278m 9.76 221 66657m 9.21 60 C1-Fuoranthenes/Pyrenes 31.232 257 238 1290666m | Data Path : C:\msdchem\2\data\MS Data File : ARC1628.D Acq On : 18 Aug 2013 7:30 a Operator : YM Sample : SO-DA-015 (0-0.5) Misc : ALS Vial : 31 Sample Multipli Quant Time: Sep 08 16:16:10 2013 Quant Method : C:\GCMS7\MS70057\. Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibratio | m er: 0.06 AR70057. able-201 35 2013 | М | | |
|--|---|---|--|--|--|
| 45 2-Methylphenanthrene 26.726 192 119395m 3.6.1 46 4/9-Methylphenanthrene 26.934 192 43772m 1.32 48 3.6-Dimethylphenanthrene 0.000 0 N.D. d 49 Reteme 0.000 0 N.D. d 50 C2-Phenanthrenes/Anthr 29.946 220 1145471m 21.43 51 C3-Phenanthrenes/Anthr 29.946 220 1145471m 21.43 52 C4-Phenanthrenes/Anthr 29.946 220 1145471m 21.43 53 Naphthobenzothiophenes 0.000 0 N.D. d 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 28.942 202 52657m 9.21 61 Benzo(b)fluoranthene 0.000 0 N.D. d 62 C1-Fluoranthenes/Pyrenes 31.720 224 518498m 11.17 63 C2-Fluoranthenes/Pyrenes 35.222 258 <t< td=""><td>Compound</td><td>R.T.</td><td>QIon</td><td>Response</td><td>Conc Units Dev(Min)</td></t<> | Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
| 94)C26(20R)/C27(20S)-TAS0.0000N.D. d95)C28(20S)-TAS0.0000N.D. d96)C27(20R)-TAS0.0000N.D. d | <pre>44) 2-Methylphenanthrene 45) 2-Methylphenanthrene 46) 4/9-Methylphenanthrene 47) 1-Methylphenanthrene 48) 3,6-Dimethylphenanthrene 49) Retene 50) C2-Phenanthrenes/Anthr 51) C3-Phenanthrenes/Anthr 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene 54) C1-Naphthobenzothiophenes 55) C2-Naphthobenzothiophenes 56) C3-Naphthobenzothiophenes 57) C4-Naphthobenzothiophenes 58) Fluoranthene 59) Pyrene 60) 2-Methylfluoranthene 61) Benzo(b) fluorene 62) C1-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 64) C3-Fluoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes 66) C4-Fluoranthenes/Pyrenes 67) Benz(a) anthracene 68) Chrysene/Triphenylene 69) C1-Chrysenes 70) C2-Chrysenes 71) C3-Chrysenes 72) C4-Chrysenes 74) C29-Hopane 75) 18a-Oleanane 76) C30-Hopane 77) Benzo(b) fluoranthene 78) Benzo(k, j) fluoranthene 79) Benzo(a) fluoranthene 80 Benzo(k, j) fluoranthene 81 Benzo(a) pyrene 81 Benzo(a) pyrene 82 Indeno(1,2,3-c,d) pyrene 83 Dibenzo(a,h) anthrac 84) C1-Dibenzo(a,h) anthrac 85) C2-Dibenzo(a,h) anthrac 86) C3-Dibenzo(a,h) anthrac 87) Benzo(g,h,i) perylene 89) Perylene 91) C20-TAS 92) C21-TAS</pre> | 26.587 26.726 26.864 26.934 0.000 0.000 28.215 29.946 32.373 0.000 0.000 0.000 0.000 28.942 29.704 0.000 0.000 28.942 29.704 0.000 0.000 31.193 32.567 34.429 35.322 33.770 32.567 34.429 35.322 33.770 33.925 35.128 36.330 37.998 39.473 0.000 0.000 37.339 37.416 0.000 38.309 38.503 43.188 43.262 0.000 0.000 44.553 38.813 0.000 0.000 | 192 192 192 192 206 220 234 202 202 202 216 230 244 258 228 242 256 270 284 252 252 252 252 252 252 252 252 252 25 | 85607m 119395m 49226m 43772m 0 0 650815m 1145471m 1474404m 1474404m 1474404m 0 0 0 626244m 576657m 0 0 0 470278m 944313m 538498m 1290666m 281762m 610770m 797844m 1014063m 971906m 496594m 0 0 0 1162772m 343901m 0 765518m 109649m 371030m 121459m 0 0 0 0 0 0 0 0 0 0 0 0 0 | 2.58 3.61 1.49 1.32 N.D. d N.D. d 12.17 21.43 27.58 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d 12.99 9.21 N.D. d N.D. d 9.76 19.59 11.17 26.78 4.96 12.69 16.57 21.06 20.19 10.32 N.D. d N.D. d |
| | 94) C26(20R)/C27(20S)-TAS 95) C28(20S)-TAS 96) C27(20R)-TAS | 0.000 0.000 0.000 | | 0 0 0 | N.D. d N.D. d N.D. d |

| Data Path : C:\msdchem\2\data\MS Data File : ARC1628.D | 70057\ |
|---|---|
| Acq On : 18 Aug 2013 7:30 at | m |
| Operator : YM | |
| Sample : SO-DA-015 (0-0.5) | |
| Misc : | |
| ALS Vial : 31 Sample Multiplie | er: 0.06662 |
| bompro Harosper | |
| Quant Time: Sep 08 16:16:10 2013 | |
| Quant Method : C:\GCMS7\MS70057\A | AD70057 M |
| | |
| Quant Title : PAH Calibration Ta | |
| QLast Update : Sat Aug 17 22:39: | |
| Response via : Initial Calibratio | n |
| | |
| Compound | R.T. QION Response Conc Units Dev(Min) |
| | |
| (#) = qualifier out of range (m) |) = manual integration (+) = signals summed |
| ALLER SEALCHER CHERNEL CHERCE CONTROL END AND AND AND AND AND AND AND AND AND A | |

Quantitation Report (QT Reviewed)

Sample Multiplier: 0.06662 C:\msdchem\2\data\MS70057' am 7:30 SO-DA-015 (0-0.5) 18 Aug 2013 ARC1628.D MX 31 Path Data File Operator ALS Vial Acq On Sample Data Misc

Quant Time: Sep 08 16:16:10 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration



Page:

4

60.00

58.00

56.00

07:27:32 2013

Sep 13

157.M Fri

| Data File Name | ARC1629.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|----------------------------|---------------------------------------|---------|----|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/18/2013 8:39 | Acenaphthene-d10 | 250.163 | C |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | 1 |
| Sample Name | SO-DA-015 (0.5-1.0) | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SO |
| Vial Number | 32 | | | |
| Sample Multiplier | 0.06623 | | | |
| Sample Amount | 0 | | | |

Copy data below to Spread Sheet

ARC1629.D SO-DA-015 (0.5-1.0) 8/18/2013 PAH-2012.M 15.09889778

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|--|------------------------------|----------------------|---------------------------|------------------|--------------------------------|
| 31 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 12.5 c | C4-Decalins | 0.00 | 0 | | |
| | | 13.88 | | 0.0000 2.2152 | 0.0000 |
| | Naphthalene | | 93283 | | 2.7371 |
| | C1-Naphthalenes | 16.30 | 77518 | 1.8409 | 2.2745 |
| | C2-Naphthalenes | 18.59 | 138557 | 3.2904 | 4.0655 |
| | C3-Naphthalenes | 20.84 | 87637 | 2.0812 | 2.5714 |
| | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20030 | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthylene | 19.17 | 17631 | 0.4289 | 0.5300 |
| 63330 | Acenaphthene | 19.70 | 6462 | 0.2754 | 0.3403 |
| 282.211 282.211 | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluorene | 21.54 | 125231 | 3.9726 | 4.9085 |
| 28) | C1-Fluorenes | 23.51 | 46470 | 1.4741 | 1.8214 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 30) | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 24.99 | 24830 | 0.4776 | 0.5901 |
| 41) | Phenanthrene | 24.82 | 774217 | 13.8107 | 17.0643 |
| 43)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 26.72 | 287424 | 5.1272 | 6.3350 |
| | C2-Phenanthrenes/Anthracenes | 28.22 | 456794 | 8.1485 | 10.0681 |
| 2023/07/ | C3-Phenanthrenes/Anthracenes | 29.95 | 863541 | 15.4042 | 19.0331 |
| | C4-Phenanthrenes/Anthracenes | 31.78 | 892928 | 15.9284 | 19.6808 |
| | Dibenzothiophene | 24.41 | 43523 | 0.9392 | 1.1605 |
| | C1-Dibenzothiophenes | 26.21 | 118051 | 2.5475 | 3.1476 |
| | C2-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Dibenzothiophenes | 0.00 | 0 | | |
| | | | | 0.0000 | 0.0000 |
| C-2023 | Fluoranthene | 28.94 | 246837 | 4.8839 | 6.0344 |
| | Pyrene | 29.70 | 159706 | 2.4320 | 3.0049 |
| - C-903 | C1-Fluoranthenes/Pyrenes | 31.19 | 263504 | 5.2137 | 6.4419 |
| | C2-Fluoranthenes/Pyrenes | 32.57 | 506702 | 10.0256 | 12.3874 |
| | C3-Fluoranthenes/Pyrenes | 34.43 | 370160 | 7.3239 | 9.0493 |
| 15-CU285-1 | C4-Fluoranthenes/Pyrenes | 35.32 | 717528 | 14.1969 | 17.5415 |
| 50000 T | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 74331 | 1.2466 | 1.5403 |
| | Chrysene/Triphenylene | 33.89 | 248562 | 4.9237 | 6.0836 |
| | C1-Chrysenes | 35.13 | 512634 | 10.1546 | 12.5469 |
| | C2-Chrysenes | 36.29 | 642287 | 12.7229 | 15.7202 |
| 50 S. C. | C3-Chrysenes | 38.08 | 500052 | 9.9054 | 12.2390 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 37.34 | 343687 | 6.4721 | 7.9968 |
| | Benzo(k,j)fluoranthene | 37.42 | 83632 | 2.0681 | 2.5553 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 2012/2013 | Benzo(e)pyrene | 38.31 | 267460 | 5.4669 | 6.7548 |
| 202 A 222 | Benzo(a)pyrene | 38.46 | 60685 | 1.2631 | 1.5606 |
| 89) 1 | Perylene | 38.77 | 22641 | 0.4627 | 0.5717 |
| 82) 1 | Indeno(1,2,3-c,d)pyrene | 43.19 | 118572 | 1.9580 | 2.4193 |
| 83) 1 | Dibenzo(a,h)anthracene | 43.26 | 42567 | 0.8760 | 1.0824 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 84) (| | | | | |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) (| | 0.00 | 0 | 0.0000 0.0000 | 0.0000 |

| # Compound Name | | Ret Time | Target Response | Concentration | Su. Corrected |
|-----------------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 55686 | 2.0986 | 2.5930 |
| 10) | 1-Methylnaphthalene | 16.47 | 21832 | 0.8907 | 1.1005 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 27209 | 0.7201 | 0.8897 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 73622 | 1.9484 | 2.4075 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 17220 | 0.4557 | 0.5631 |
| 43) | 3-Methylphenanthrene | 26.48 | 46600 | 1.3418 | 1.6580 |
| 44) | 2-Methylphenanthrene | 26.59 | 59318 | 1.7081 | 2.1104 |
| 45) | 2-Methylanthracene | 26.73 | 113380 | 3.2648 | 4.0339 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 31084 | 0.8951 | 1.1059 |
| 47) | 1-Methylphenanthrene | 26.93 | 37042 | 1.0666 | 1.3179 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 100 | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.00 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 93) | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(205)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.00 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.00 | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 483701 | 12.82 | 77.39 |
| | Acenaphthene-d10 | 19.67 | 219959 | 10.14 | 61.21 |
| 2000 | Phenanthrene-d10 | 24.75 | 600941 | 13.41 | 80.93 |
| 10000 | Chrysene-d12 | 33.81 | 652301 | 13.30 | 80.31 |
| 202120 | Perylene-d12 | 38.70 | 8290 | 0.18 | 1.11 |
| | 5(b)H-Cholane | 34.24 | 119807 | 15.82 | 95.57 |
| 2.24 | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 370709 | 16.63 | |
| | Pyrene-d10 | 29.63 | 736628 | 16.60 | |
| 12012 | Benzo(a)pyrene-d12 | 38.39 | 632990 | 16.58 | |

| Data Path : C:\msdchem\2\data\M | S70057\ | | | | |
|---|-------------------------|------|--------------|--------------|---------------|
| Data File : ARC1629.D | | | | | |
| Acq On : 18 Aug 2013 8:39 a | am | | | | |
| Operator : YM | | | | | |
| Sample : SO-DA-015 (0.5-1.0) | | | | | |
| Misc : | | | | | |
| Misc : ALS Vial : 32 Sample Multipl: | ier: 0.00 | 5623 | | | |
| | | | | | |
| Quant Time: Sep 05 21:05:42 201 | | _ | | | |
| Quant Method : C:\GCMS7\MS70057 | | | | | |
| Quant Title : PAH Calibration 7 | | L3A | | | |
| QLast Update : Sat Aug 17 22:39 | :35 2013 | | | | |
| Response via : Initial Calibrat: | lon | | | | |
| Compound | ידי כו | OTon | Perponse | Cong Un | ita Dev (Min) |
| Compound | R.I. | QION | Response | cone on | ILS DEV(MIII) |
| Internal Standards | | | | | |
| 1) Fluorene-d10 | 21 455 | 176 | 370709m | 251 05 | 0.00 |
| Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 29 635 | 212 | 736628m | 250 63 | 0.00 |
| 73) Benzo(a)pyrene-d12 | 38.386 | 264 | 632990m | 250.32 | 0.00 |
| (o) Denie (d) pyrene dri | 50.500 | 201 | 00255011 | 200.02 | 0.00 |
| System Monitoring Compounds | | | | | |
| 2) Naphthalene-d8 | 13.822 | 136 | 483701m | 12.82 | 0.00 |
| 21) Acenaphthene-d10 | 19.672 | 164 | 219959m | 10.14 | 0 00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 600941m | 13.41 | 0.00 |
| 66) Chrysene-d12 | 33.809 | 240 | 652301m | 13.30 | -0.04 |
| 88) Perylene-d12 | 38.697 | 264 | 8290m | 0.18 | 0.00 |
| 32) Phenanthrene-d10 66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane | 34.235 | 217 | 119807m | 15.82 | 0.00 |
| | | | | | |
| Target Compounds | | | 2 0 | | Qvalue |
| 3) cis/trans Decalin | 0.000 | | 0 | N.D. N.D. | a |
| | 0.000 | | 0 | N.D. | a |
| 5) C2-Decalins | 0.000 0.000 0.000 | | 0 0 0 | N.D. | a |
| 6) C3-Decalins 7) C4-Decalins | 0.000 | | 0 | N.D. | d |
| 0) Namhthalana | 12 070 | 100 | 02202m | 2 22 | |
| 9) 2-Methylpaphthalene | 16 134 | 142 | 55686m | 2.22 | |
| a) Naphthalene b) 2-Methylnaphthalene c) 1-Methylnaphthalene c) 2,6-Dimethylnaphthalene c) 1,6,7-Trimethylnaphtha | 16.469 | 142 | 21832m | 0.89 | |
| 11) 2.6-Dimethylnaphthalene | 0.000 | | 0 | N.D. | d |
| 12) 1,6,7-Trimethylnaphtha | 0.000 | | 0 | N.D. | d |
| 13) C2-Naphthalenes | 18.586 | 156 | 138557m | 3.29 | |
| 14) C3-Naphthalenes | 20.842 | 170 | 87637m | 2.08 | |
| 15) C4-Naphthalenes | 0.000 | | 0 | N.D. | d |
| 16) Benzothiophene | 0.000 | | 0 | N.D. | d |
| 17) Cl-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 20) C4-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 22) Biphenyl | 0.000 | 150 | 0 | N.D. | d |
| 23) Acenaphthylene | 19.171 | 152 | 17631m | 0.43 | |
| 24) Acenaphthene | 19.700 | 154 | 6462m | 0.28 | 4 |
| 25) Dibenzofuran 26) Fluorene | 0.000 21.538 | 166 | 0 125231m | N.D. | a |
| 27) 1-Methylfluorene | 0.000 | TOO | 1252510 | 3.97 N.D. | 4 |
| 28) C1-Fluorenes | 23.506 | 180 | 46470m | 1.47 | u |
| 29) C2-Fluorenes | 0.000 | 100 | 4047011 | N.D. | Б |
| 30) C3-Fluorenes | 0.000 | | 0 | N.D. | |
| 33) Carbazole | 0.000 | | õ | N.D. | |
| 34) Dibenzothiophene | 24.406 | 184 | 43523m | 0.94 | |
| 35) 4-Methyldibenzothiophene | 25.895 | 198 | 27209m | 0.72 | |
| 36) 2/3-Methyldibenzothiop | 26.207 | 198 | 73622m | 1.95 | |
| 37) 1-Methyldibenzothiophene | 26.518 | 198 | 17220m | 0.46 | |
| 38) C2-Dibenzothiophenes | 0.000 | | 0 | N.D. | d |
| 39) C3-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 40) C4-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 41) Phenanthrene | 24.822 | 178 | 774217m | 13.81 | |
| 42) Anthracene | 24.995 | 178 | 24830m | 0.48 | |
| 43) 3-Methylphenanthrene | 26.484 | 192 | 46600m | 1.34 | |
| | | | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1629.D Acq On : 18 Aug 2013 8:39 am Operator : YM Sample : SO-DA-015 (0.5-1.0) Misc : ALS Vial : 32 Sample Multiplier: 0.06623 Quant Time: Sep 05 21:05:42 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QION Response Conc Units Dev(Min) Compound

 44)
 2-Methylphenanthrene
 26.588
 192
 59318m
 1.71

 45)
 2-Methylanthracene
 26.726
 192
 113380m
 3.26

 46)
 4/9-Methylphenanthrene
 26.865
 192
 31084m
 0.90

 47)
 1-Methylphenanthrene
 26.934
 192
 37042m
 1.07

 48)
 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49)
 Retene
 0.000
 0
 N.D. d

 50)
 C2-Phenanthrenes/Anthr..
 28.215
 206
 456794m
 8.15

 51)
 C3-Phenanthrenes/Anthr..
 31.782
 234
 892928m
 15.93

 53)
 Naphthobenzothiophene
 0.000
 0
 N.D. d

 54)
 C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55)
 C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 56)
 C3-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 57)
 C4-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 58)
 Fluoranthene
 28.942
 202
 246837m
 4 ______ 63) C2-Fluoranthenes/Pyrenes 32.567 230 506702m 10.03 64) C3-Fluoranthenes/Pyrenes 34.429 244 370160m 7.32

 64)
 C3-Fluoranthenes/Pyrenes
 34.429
 244
 370160m
 7.32

 65)
 C4-Fluoranthenes/Pyrenes
 35.322
 258
 717528m
 14.20

 67)
 Benz (a) anthracene
 33.770
 228
 74331m
 1.25

 68)
 Chrysene/Triphenylene
 33.886
 228
 248562m
 4.92

 69)
 C1-Chrysenes
 35.128
 242
 512634m
 10.15

 70)
 C2-Chrysenes
 36.292
 256
 642287m
 12.72

 71)
 C3-Chrysenes
 0.000
 0
 N.D. d

 72)
 C4-Chrysenes
 0.000
 0
 N.D. d

 741
 C39-Hopane
 0.000
 0
 N.D. d

 75)
 18a-Oleanane
 0.000
 0
 N.D. d

 76)
 Garzo (b) fluoranthene
 37.339
 252
 343687m
 6.47

 78)
 Benzo (k, j) fluoranthene
 37.417
 252
 83632m
 2.07

 79)
 Benzo (a) pyrene
 38.464
 252
 60685m
 1.26

 82)
 Indeno (1,2,3-c, d) pyrene
 43.189
 276
 65) C4-Fluoranthenes/Pyrenes 35.322 258 717528m 14.20

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1629.D Acq On : 18 Aug 2013 8:39 am Operator : YM Sample : SO-DA-015 (0.5-1.0) Misc : ALS Vial : 32 Sample Multiplier: 0.06623 Quant Time: Sep 05 21:05:42 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

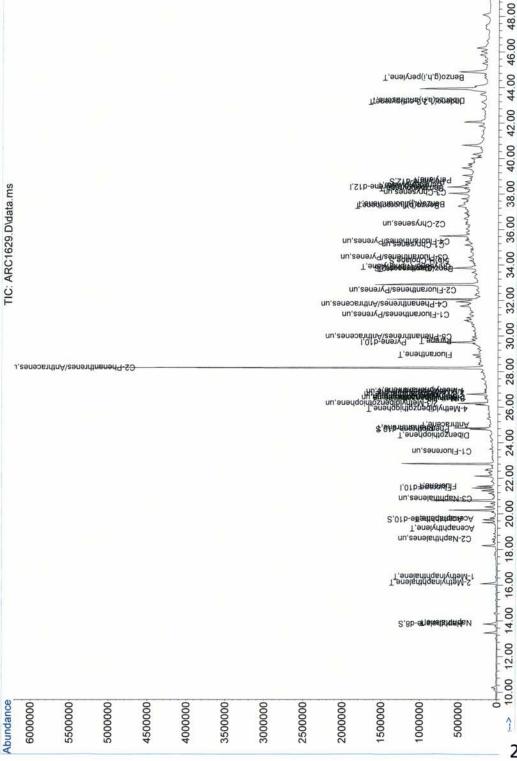
(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:27:50 2013

(QT Reviewed) Quantitation Report

Sample Multiplier: 0.06623 C:\msdchem\2\data\MS70057 8:39 am SO-DA-015 (0.5-1.0) 18 Aug 2013 YM ARC1629.D 32 •• Path Data File Operator ALS Vial Acq On Sample Data Misc

0 05 21:05:42 2013 C:\GCMS7\MS70057\AR70057.M PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Sep Method : •• Time: Title Quant Quant Quant



4 Page:

60.00

58.00

56.00

54.00

52.00

50.00

T,enslyneq(i,n,g)ozne8

07:27:51 2013

Sep 13

Fri

157.M

-

| Data File Name | ARC1630.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/18/2013 9:47 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SO-DA-015 (1.0-1.5) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 33 | | |
| Sample Multiplier | 0.06631 | | |
| Sample Amount | 0 | | |
| | | | |

Copy data below to Spread Sheet

ARC1630.D SO-DA-015 (1.0-1.5) 8/18/2013 PAH-2012.M 15.08068165

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---|------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| 20 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| 122 | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 5) | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 6) | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 7) | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 8) | Naphthalene | 13.88 | 70212 | 1.7359 | 2.2956 |
| 9)+10) | C1-Naphthalenes | 16.30 | 47478 | 1.1739 | 1.5523 |
| 13) | C2-Naphthalenes | 18.59 | 76862 | 1.9004 | 2.5131 |
| 14) | C3-Naphthalenes | 20.84 | 61635 | 1.5239 | 2.0152 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 18) | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 8597 | 0.2177 | 0.2880 |
| 24) | Acenaphthene | 19.70 | 2018 | 0.0895 | 0.1184 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 21.54 | 49946 | 1.6496 | 2.1814 |
| 28) | C1-Fluorenes | 23.51 | 21519 | 0.7107 | 0.9399 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 8333 | Anthracene | 24.99 | 13477 | 0.2639 | 0.3490 |
| | Phenanthrene | 24.82 | 288061 | 5.2309 | 6.9175 |
| | C1-Phenanthrenes/Anthracenes | 26.72 | 202041 | 3.6689 | 4.8518 |
| | C2-Phenanthrenes/Anthracenes | 28.22 | 325339 | 5.9079 | 7.8127 |
| 10.25 | C3-Phenanthrenes/Anthracenes | 29.95 | 293585 | 5.3313 | 7.0502 |
| 2000 | C4-Phenanthrenes/Anthracenes | 31.78 | 332183 | 6.0322 | 7.9771 |
| | Dibenzothiophene | 24.41 | 29504 | 0.6481 | 0.8571 |
| | C1-Dibenzothiophenes | 26.21 | 42183 | 0.9267 | 1.2254 |
| And the second se | C2-Dibenzothiophenes | 27.97 | 96174 | 2.1127 | 2.7939 |
| 2.3676 | | 28.80 | 209725 | 4.6071 | 6.0925 |
| | C3-Dibenzothiophenes | | 0 | | |
| | C4-Dibenzothiophenes | 0.00 | 118237 | 0.0000 | 0.0000 |
| | Fluoranthene | 28.91 | | 2.3815 | 3.1493 |
| | Pyrene | 29.70 | 87783 98280 | 1.3608 | 1.7995 |
| 12327 | C1-Fluoranthenes/Pyrenes | 31.19 | 98280 | 1.9795 | 2.6178 |
| | C2-Fluoranthenes/Pyrenes | 0.00 | | 0.0000 | 0.0000 |
| 12012/ | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 15 D C 1 | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.626 | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.77 | 43897 | 0.7495 | 0.9911 |
| | Chrysene/Triphenylene | 33.89 | 125510 | 2.5309 | 3.3469 |
| | C1-Chrysenes | 35.13 | 247082 | 4.9824 | 6.5888 |
| | C2-Chrysenes | 36.29 | 230869 | 4.6555 | 6.1565 |
| | C3-Chrysenes | 38.08 | 198181 | 3.9963 | 5.2848 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1/2623 | Benzo(b)fluoranthene | 37.30 | 173618 | 2.9639 | 3.9195 |
| | Benzo(k,j)fluoranthene | 37.42 | 30660 | 0.6873 | 0.9089 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 80) | Benzo(e)pyrene | 38.31 | 102899 | 1.9067 | 2.5215 |
| 81) | Benzo(a)pyrene | 38.46 | 15700 | 0.2962 | 0.3917 |
| 89) | Perylene | 38.77 | 13144 | 0.2435 | 0.3220 |
| 82) | Indeno(1,2,3-c,d)pyrene | 43.19 | 51535 | 0.7715 | 1.0202 |
| 83) | Dibenzo(a,h)anthracene | 43.23 | 17542 | 0.3273 | 0.4328 |
| 84) | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,n/antinacenes | 0.00 | | | 0.0000 |

| # Compound Name | | Ret Time | Target Response | Concentration | Su. Corrected | | |
|-----------------|--------------------------------------|----------|-----------------|---------------|---------------|--|--|
| | | (minute) | (area) | | Concentration | | |
| | Individual Alkyl Isomers and Hopanes | | | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 33235 | 1.3040 | 1.7245 | | |
| 10) | 1-Methylnaphthalene | 16.47 | 14243 | 0.6050 | 0.8000 | | |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 | | |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 | | |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 | | |
| 35) | 4-Methyldibenzothiophene | 25.90 | 18695 | 0.5037 | 0.6661 | | |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 14797 | 0.3987 | 0.5272 | | |
| 37) | 1-Methyldibenzothiophene | 26.52 | 8691 | 0.2341 | 0.3096 | | |
| 43) | 3-Methylphenanthrene | 26.48 | 26926 | 0.7893 | 1.0438 | | |
| 44) | 2-Methylphenanthrene | 26.59 | 33298 | 0.9761 | 1.2907 | | |
| | 2-Methylanthracene | 26.73 | 108282 | 3.1740 | 4.1974 | | |
| | 4/9-Methylphenanthrene | 26.86 | 16054 | 0.4706 | 0.6223 | | |
| | 1-Methylphenanthrene | 26.93 | 17481 | 0.5124 | 0.6776 | | |
| | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | Retene | 0.00 | 0 | 0.0000 | 0.0000 | | |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C28(205)-TAS | 0.00 | 0 | 0.0000 | 0.0000 | | |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 | | |
| 10.00 | C28(20R)-TAS | 0.00 | ō | 0.0000 | 0.0000 | | |
| 5.1 | Surrogate Standards | 217.9763 | | 1560.0000 | 454555510 | | |
| 21 | Naphthalene-d8 | 13.82 | 491583 | 13.57 | 81.79 | | |
| | Acenaphthene-d10 | 19.67 | 245605 | 11.79 | 71.07 | | |
| | Phenanthrene-d10 | 24.75 | 552227 | 12.55 | 75.62 | | |
| 100.0 | Chrysene-d12 | 33.81 | 726604 | 15.08 | 90.96 | | |
| | Pervlene-d12 | 38.70 | 1357 | 0.03 | 0.16 | | |
| | 5(b)H-Cholane | 34.24 | 126045 | 15.09 | 91.04 | | |
| 50) | Internal Standards | | | | | | |
| 11 | Fluorene-d10 | 21.46 | 356494 | 16.65 | | | |
| | Pyrene-d10 | 29.63 | 724489 | 16.62 | | | |
| 1000 | Benzo(a)pyrene-d12 | 38.39 | 699093 | 16.60 | | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1630.D Acq On : 18 Aug 2013 9:47 am Operator : YM Sample : SO-DA-015 (1.0-1.5) Misc : ALS Vial : 33 Sample Multiplier: 0.06631 Quant Time: Sep 05 21:41:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QIon Response Conc Units Dev(Min) Compound _____ Internal Standards21.455176356494m251.050.0031) Pyrene-d1029.635212724489m250.630.0073) Benzo(a)pyrene-d1238.387264699093m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136491583m13.570.0021) Acenaphthene-d1019.672164245605m11.790.0032) Phenanthrene-d1024.752188552227m12.550.0066) Chrysene-d1233.809240726604m15.08-0.0488) Perylene-d1238.6972641357m0.030.0090) 5 (b) H-Cholane34.235217126045m15.090.00

 90)
 5 (b)H-Cholane
 34.235
 217
 126045m
 15.09

 Target Compounds
 0
 0
 N.D. d

 3)
 cis/trans Decalin
 0.000
 0
 N.D. d

 4)
 C1-Decalins
 0.000
 0
 N.D. d

 5)
 C2-Decalins
 0.000
 0
 N.D. d

 6)
 C3-Decalins
 0.000
 0
 N.D. d

 7)
 C4-Decalins
 0.000
 0
 N.D. d

 1
 Maphthalene
 16.134
 142
 3235m
 1.30

 01
 1-Methylnaphthalene
 16.469
 142
 14243m
 0.60

 11)
 2,6-Dimethylnaphthal...
 0.000
 0
 N.D. d

 13)
 C2-Naphthalenes
 18.586
 156
 76862m
 1.90

 14)
 C3-Naphthalenes
 0.000
 0
 N.D. d

 16)
 Benzothiophenes
 0.000
 0
 N.D. d

 17)
 C1-Benzothiophenes
 0.000
 0
 N.D. d

 19)
 C3-Benzothiophenes
 0.000
 0
 N.D. d

 20)
 <td Qvalue

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1630.D Acq On : 18 Aug 2013 9:47 am Operator : YM Sample : SO-DA-015 (1.0-1.5) : Misc ALS Vial : 33 Sample Multiplier: 0.06631 Quant Time: Sep 05 21:41:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration
 Compound
 R.T. QION
 Response
 Conc Units

 44)
 2-Methylphenanthrene
 26.588
 192
 33298m
 0.98

 45)
 2-Methylphenanthrene
 26.726
 192
 10822m
 3.17

 46)
 4/9-Methylphenanthrene
 26.865
 192
 16054m
 0.47

 41)
 1-Methylphenanthrene
 26.841
 192
 17481m
 0.51

 43)
 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 51)
 C2-Phenanthrenes/Anthr...
 29.947
 220
 293585m
 5.33

 52)
 C4-Phenanthrenes/Anthr...
 21.782
 231213m
 6.03

 51)
 C3-Raphthobenzothiophenes
 0.000
 0
 N.D. d

 52)
 C4-Phenanthrenes/Anthr...
 31.79
 243
 312187
 2.33

 53)
 Naphthobenzothiophenes
 0.000
 0
 N.D. d
 35

 51)
 C2-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 52)
 Pyrene
 28.908
 202
 18237m
 R.T. QION Response Conc Units Dev(Min) Compound _____ a ut channeles conte langue. All contentes and contentes a

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1630.D Acq On : 18 Aug 2013 9:47 am Operator : YM Sample : SO-DA-015 (1.0-1.5) Misc : ALS Vial : 33 Sample Multiplier: 0.06631 Quant Time: Sep 05 21:41:28 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:30:17 2013



T,enslyneq(i,h,g)ozne8 T,eneogithms(rifs)denetin I'ZLP-euertes States 202-5-5 TIC: ARC1630.D\data.ms T, an and the reuting (C) Approximate un'səuəs/uy)-70 nu, senes (nd)-10 S, analogical S, and a state of the state of C4-Phenanthrenes/Anthracenes,un C1-Fluoranthenes/Pyrenes,un Cyrene Fyrenes/Anthracenes.un nu, zenenqqidhanaqia J, seneskhriftnehes/Anthracenes, L c2-Dibenzothiophenes.un T.snendointocnedibythem. n.snendointocnedibythem. T.snendointocnedibythem. T.s. n.snendointocnedibythem. T.s. n.snendointocned Sample Multiplier: 0.06631 PAH Calibration Table-2013A C:\GCMS7\MS70057\AR70057.M Dibergenting and the second se : Sat Aug 17 22:39:35 2013 : Initial Calibration C:\msdchem\2\data\MS70057\ C1-Fluorenes, un am 1.01b-snpigneduli 21:41:28 2013 C3-Naphthalenes, un YM SO-DA-015 (1.0-1.5) 9:47 C-Naphthalenes,un T,sientrylenes Ace**heghtept**ered 2,010,5 18 Aug 2013 Lenelshingphinaphinalene, T ARC1630.D 05 2,8b-9794646466W Sep 33 •• ••• Method Response via Update Title •• Time: Data Path Data File Misc ALS Vial Operator Acq On Sample Abundance 5500000 5000000 4500000 4000000 3500000 3000000 2500000 2000000 1500000 1000000 Quant Quant QLast Quant

07:30:18 2013 Sep 13 Fri 57.M

Page:

4

60.00

58.00

56.00

54.00

52.00

50.00

46.00 48.00

42.00 44.00

40.00

38.00

36.00

34.00

32.00

30.00

28.00

26.00

24.00

22.00

20.00

16.00 18.00

14.00

12.00

10.00

î

227

ò

500000

| Data File Name | ARC1641.D | Surrogate/Internal Multiplier Factor: | 1.00 |
|-------------------|----------------------------|---------------------------------------|---------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) |
| Operator | YM | Naphthalene-d8 | 250.125 |
| Date Acquired | 8/18/2013 10:56 | Acenaphthene-d10 | 250.163 |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 |
| Sample Name | SED-DA-012 (0.5-1.0) | Chrysene-d12 | 250.038 |
| Misc Info | 0 | Perylene-d12 | 250.031 |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 |
| Vial Number | 34 | | |
| Sample Multiplier | 0.06649 | | |
| Sample Amount | 0 | | |

Copy data below to Spread Sheet

ARC1641.D SED-DA-012 (0.5-1.0) 8/18/2013 PAH-2012.M 15.03985562

| # | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|--------------------|------------------------------|----------------------|---------------------------|---------------|--------------------------------|
| | cis/trans Decalin | 0.00 | (area) 0 | 0.0000 | 0.0000 |
| 104 | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 10 | | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.51.25 | C2-Decalins | | 0 | | |
| 11.74 | C3-Decalins | 0.00 | | 0.0000 | 0.0000 |
| 0.03 | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 45484 | 1.1819 | 1.6203 |
| | C1-Naphthalenes | 16.30 | 35159 | 0.9136 | 1.2525 |
| 13) | C2-Naphthalenes | 18.25 | 34339 | 0.8923 | 1.2232 |
| 14) | C3-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 18) | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 17.69 | 10557 | 0.3202 | 0.4389 |
| | Acenaphthylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| S799366 | Fluorene | 21.54 | 43998 | 1.5272 | 2.0937 |
| 575376 | | 23.51 | 10987 | 0.3814 | 0.5228 |
| =1.5 | C1-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| (S-9-50) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.000 | C3-Fluorenes | | | | |
| 10000 | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| | Anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 41) | Phenanthrene | 24.82 | 204845 | 3.8118 | 5.2255 |
| 3)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 50) | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 51) | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 52) | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 34) | Dibenzothiophene | 24.41 | 13170 | 0.2965 | 0.4064 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 11955 | 0.2691 | 0.3689 |
| | C2-Dibenzothiophenes | 27.97 | 10444 | 0.2351 | 0.3223 |
| 5.5690 | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluoranthene | 28.91 | 24307 | 0.5017 | 0.6878 |
| 0.000 | | 29.70 | 2408 | 0.0383 | 0.0524 |
| 2-3-2-2-3- | Pyrene (D | | | | |
| 2012/06 | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 15.752 | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 5-01/Mc | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 53) | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 54) | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 55) | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 56) | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 57) | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 101.07.07 | Benz(a)anthracene | 33.81 | 3424 | 0.0599 | 0.0821 |
| 5433537 | Chrysene/Triphenylene | 33.89 | 2986 | 0.0617 | 0.0846 |
| | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | õ | 0.0000 | 0.0000 |
| 0.643574 | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| (2013) | | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Chrysenes | | | | |
| | Benzo(b)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| C-543 | Benzo(k,j)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 81) | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 89) | Perylene | 38.77 | 2339 | 0.0462 | 0.0634 |
| 555543 | Indeno(1,2,3-c,d)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzo(a,h)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |
| 861 | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |

| # Compound Name | | Ret Time | Target Response | Concentration | Su. Corrected |
|-----------------|--------------------------------------|--|-----------------|------------------------------|-----------------|
| | | (minute) | (area) | 2011/01/2011/01/2011/01/2011 | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 26395 | 1.0885 | 1.4922 |
| 10) | 1-Methylnaphthalene | 16.47 | 8764 | 0.3912 | 0.5363 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 6162 | 0.1701 | 0.2332 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 3815 | 0.1053 | 0.1444 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 1978 | 0.0546 | 0.0749 |
| | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.0 | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.00 | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1997 | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1 | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 21 | Surrogate Standards | | 2733 | 0.7050707A | ~ 2 소리 전 전 (프 1 |
| 21 | Naphthalene-d8 | 13.82 | 454048 | 13.17 | 79.18 |
| | Acenaphthene-d10 | 19.67 | 105938 | 5.34 | 32.13 |
| | Phenanthrene-d10 | 24.75 | 521260 | 12.13 | 72.95 |
| | Chrysene-d12 | 33.81 | 691138 | 14.70 | 88.42 |
| | Pervlene-d12 | 38.70 | 584 | 0.01 | 0.08 |
| 100 | 5(b)H-Cholane | 34.24 | 116169 | 14.84 | 89.26 |
| 501 | Internal Standards | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 220200 | | |
| 13 | Fluorene-d10 | 21.46 | 340116 | 16.69 | |
| | Pyrene-d10 | 29.63 | 708926 | 16.66 | |
| | Benzo(a)pyrene-d12 | 38.39 | 657110 | 16.64 | |

| Data Acq O Opera Sampl Misc ALS V Quant Quant Quant Quant | Path : C:\msdchem\2\data\MS File : ARC1641.D on : 18 Aug 2013 10:56 a tor : YM e : SED-DA-012 (0.5-1.0) : Tial : 34 Sample Multipli Time: Sep 05 21:42:22 2013 Method : C:\GCMS7\MS70057 Title : PAH Calibration T Update : Sat Aug 17 22:39 nse via : Initial Calibrati | am ier: 0.06 AR70057. Table-201 :35 2013 | M | | | |
|--|---|--|---------|-------------|----------------------|--------------|
| _ | Compound | | QIon | Response | Conc Un | its Dev(Min) |
| | | | | | | |
| Inte | rnal Standards | 01 455 | 170 | 240116 | 251 05 | 0.00 |
| 1) 21) | Fluorene-dlu Pyrepe-dlu | 21.455 | 212 | 708926m | 251.05 | 0.00 |
| 73) | Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 38.387 | 264 | 657110m | 250.32 | 0.00 |
| , , , | Louis (a) Flicus are | | 0770303 | | | Contra. |
| Syst | em Monitoring Compounds | | | | | |
| 2) | Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 | 13.822 | 136 | 454048m | 13.17 | 0.00 |
| 21) | Acenaphthene-d10 | 19.672 | 164 | 105938m | 5.34 | 0.00 |
| 32) | Acenaphthene-d10 Phenanthrene-d10 Chrysene-d12 Perylene-d12 5 (b) H-Cholane | 24.752 | 188 | 521260m | 12.13 | 0.00 |
| 66) | Chrysene-dl2 | 33.809 | 240 | 691138M | 14.70 | -0.04 |
| 90) | 5(b)H-Cholane | 34 235 | 217 | 116169m | 14 84 | 0.00 |
| 207 | 5(b) in chorane | 51.255 | 227 | 1101050 | 11101 | 0.00 |
| Targ | et Compounds | | | | | Qvalue |
| 3) | cis/trans Decalin C1-Decalins C2-Decalins | 0.000 | | 0 | N.D. N.D. N.D. | d |
| 4) | C1-Decalins | 0.000 | | 0 | N.D. | d |
| 5) | C2-Decalins | 0.000 | | 0 | N.D. | a |
| 6) | C3-Decaling | 0.000 | | 0 | N.D. | d |
| 8) | Naphthalene | 13 878 | 128 | 45484m | 1.18 | u |
| 9) | C3-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene | 16.134 | 142 | 26395m | 1.09 | |
| 10) | 1-Methylnaphthalene | 16.469 | 142 | 8764m | 0.39 | |
| 11) | 2,6-Dimethylnaphthalene | 0.000 | | 0 | N.D. N.D. | d |
| 12) | 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphtha | 0.000 | | 0 | N.D. | d |
| 13) | C2-Naphthalenes | 18.251 | 156 | 34339m | | 121 |
| | C3-Naphthalenes | 0.000 | | | N.D. | |
| | C4-Naphthalenes | 0.000 | | 0 | N.D. | |
| | Benzothiophene Cl-Benzothiophenes | 0.000 | | 0 | N.D. N.D. | |
| | C2-Benzothiophenes | 0.000 | | 0 | N.D. | |
| | C3-Benzothiophenes | 0.000 | | õ | N.D. | |
| | C4-Benzothiophenes | 0.000 | | 0 | N.D. | |
| | Biphenyl | 17.694 | 154 | 10557m | 0.32 | |
| | Acenaphthylene | 0.000 | | 0 | N.D. | |
| | Acenaphthene | 0.000 | | 0 | N.D. | |
| | Dibenzofuran | 0.000 | 100 | 0 | N.D. | a |
| | Fluorene | 21.539 0.000 | 166 | 43998m 0 | 1.53 N.D. | 5 |
| | 1-Methylfluorene C1-Fluorenes | 23.506 | 180 | 10987m | 0.38 | u |
| | C2-Fluorenes | 0.000 | 100 | 0 | N.D. | d |
| | C3-Fluorenes | 0.000 | | 0 | N.D. | |
| | Carbazole | 0.000 | | 0 | N.D. | |
| 34) | Dibenzothiophene | 24.406 | 184 | 13170m | 0.30 | |
| | 4-Methyldibenzothiophene | 25.895 | | 6162m | 0.17 | |
| | 2/3-Methyldibenzothiop | 26.207 | | 3815m | 0.11 | |
| | 1-Methyldibenzothiophene | 26.518 | | 1978m | 0.05 | |
| | C2-Dibenzothiophenes | 27.973 | 212 | 10444m | 0.24 | d |
| | C3-Dibenzothiophenes | 0.000 | | 0 | N.D. N.D. | |
| | C4-Dibenzothiophenes Phenanthrene | 0.000 24.822 | 178 | 204845m | 3.81 | u |
| | Anthracene | 0.000 | 1,0 | 20404511 | N.D. | d |
| | 3-Methylphenanthrene | 0.000 | | 0 | N.D. | |
| | 2 2 | | | | | |

| Data Path : C:\msdchem\2\data\MS Data File : ARC1641.D Acq On : 18 Aug 2013 10:56 a Operator : YM Sample : SED-DA-012 (0.5-1.0) Misc : ALS Vial : 34 Sample Multipli Quant Time: Sep 05 21:42:22 2013 Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | .er: 0.06 AR70057. able-201 35 2013 | . M | | |
|---|--|--------------------------|---|--|
| Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
| <pre>44) 2-Methylphenanthrene 45) 2-Methylphenanthrene 46) 4/9-Methylphenanthrene 47) 1-Methylphenanthrene 48) 3,6-Dimethylphenanthrene 49) Retene 50) C2-Phenanthrenes/Anthr 51) C3-Phenanthrenes/Anthr 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene 54) C1-Naphthobenzothiophenes 55) C2-Naphthobenzothiophenes 56) C3-Naphthobenzothiophenes 57) C4-Naphthobenzothiophenes 58) Fluoranthene 59) Pyrene 60) 2-Methylfluoranthene 61) Benzo (b) fluorene 62) C1-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 64) C3-Fluoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes 66) C4-Fluoranthenes/Pyrenes 67) Benz (a) anthracene 68) Chrysene/Triphenylene 69) C1-Chrysenes 71) C3-Chrysenes 72) C4-Chrysenes 73) C2-Chrysenes 74) C29-Hopane 75) 18a-Oleanane 76) C30-Hopane 77) Benzo (b) fluoranthene 78) Benzo (k, j) fluoranthene 79) Benzo (a) fluoranthene 79) Benzo (a) fluoranthene 80) Benzo (a) pyrene 81) Benzo (a) pyrene 82) Indeno (1, 2, 3-c, d) pyrene 83) Dibenzo (a, h) anthrac 85) C2-Dibenzo (a, h) anthrac 86) C3-Dibenzo (a, h) anthrac 87) Benzo (a, h) anthrac</pre> | 0.000 0 | 202 202 228 228 | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | N.D. d N.D. d |
| <pre>89) Perylene 91) C20-TAS 92) C21-TAS 93) C26(20S)-TAS 94) C26(20R)/C27(20S)-TAS 95) C28(20S)-TAS 96) C27(20R)-TAS 97) C28(20R)-TAS</pre> | 38.774 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 252 | 2339m 0 0 0 0 0 0 0 0 | 0.05 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1641.D Acq On : 18 Aug 2013 10:56 am Operator : YM Sample : SED-DA-012 (0.5-1.0) Misc : ALS Vial : 34 Sample Multiplier: 0.06649 Quant Time: Sep 05 21:42:22 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

| Reviewed) | |
|--------------|--|
| (QT | |
| Report | |
| Quantitation | |

| | | | sm. | | | | | | | | 1,215- | -Sig)bλιευθ | e-enelyie | | | |
|---|--|---|------------------------|--------|--------|--------|--------|--------|--------|--------|--------------------------|---|--|---------------|-------|---|
| 1 | | | 641.D\data | | | | | | | | | | | A CONSCIONE | 30.00 | |
| | | | TIC: ARC1641.D\data.ms | | | | | | | | T,en e | n Central Central Central | | 32 00 34 00 | 32.00 | |
| 2 | | | | | | | | | | | | | Pyrene, Pyre | 0008 | 20.00 | |
| | | | | | | | | | | | u | | C2-Dibenzoi | | 0.00 | |
| - | 49 | Å | | | | | | | | | nu,əhə nu,əhə nu,ə | uəudoiujozu udoiujozuəc uəudoiujozu | adiblyrti9M-P Iblyrti9M-C\S adiblyrti9M-1 | | ~ | |
| | . 06649 | 67.M 13 | | | | | | | | | S | T,enene,T Mene,T | ointoznadiO Heneriara | | | |
| | 0.57\ 5: 0. | .3 \\AR70057.M Table-2013A :35 2013 :ion | | | | | | | | | | un's | C1-Fluorene | 22 00 24 | | |
| | MS7(am 0) | 113 57\AH 1 Tak 19:35 | | | | | | | | | | 1,01b-9i | TPINOFEMER | | | - |
| | data\MS 10:56 | 21:42:22 2013 CMS7\MS70057\AR Calibration Tab Aug 17 22:39:35 ial Calibration | | | | | | | | | | | Acenaphth | | | |
| | <pre>\2\dat 3 10 (0.5- (0.5- e Mult</pre> | 42:2 7\MS ibra 17 Cal | | | | | | | | | | | T,Iynəriqi8 Edifiqayi T,Iyneri | 18.00 | ~ | |
| | dchem\2\data\MS700 41.D g 2013 10:56 am A-012 (0.5-1.0) Sample Multiplier: | | | | | | | | | | | T ənəlsrifr T ənəlsrifr | qeniynteM-S qeniynteM-F | 16.00 | | |
| | h : C:\ms e : ARC16 : 18 Au : YM : SED-D : 34 | ne: Sep thod : tle : date : via : | | | | | | | | | | 2,8b-ənə | ตเข้เช่α⊭ ζι⊾N | 0 12 00 14 00 | Sel | |
| | Data Path Data File Acq on Operator Sample Misc ALS Vial | | 550000 | 500000 | 450000 | 400000 | 350000 | 300000 | 250000 | 200000 | 150000 | 100000 | 50000 | -10- | | |
| | Data P Data F Acq On Operat Sample Misc ALS Vi | Quant Quant Quant QLast Respor | Abundance 550000 | 500 | 450 | 400 | 350 | 300 | 250 | 200 | 150 | 100 | 50 | | 233 | |
| | | aman 1. 1990 (1997) (1997) | | | | | | | | | | | | | 200 | 1 |

| Data File Name | ARC1642.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|---|---|---------------------------------------|--------------------|-----------------------------------|
| Data File Path | C:\GCMS7\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/18/2013 12:04 | Acenaphthene-d10 | 250.163 | Copy data below |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | to Spread Sheet |
| Sample Name | SED-DA-012 (1.0-1.5) | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | ARC1642.D |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SED-DA-012 (1.0-1.5) |
| Vial Number | 35 | | | 8/18/2013 |
| Sample Multiplier | 0.06658 | | | PAH-2012.M |
| Sample Amount | 0 | | | 15.01952538 |
| Sample Name Misc Info Instrument Name Vial Number Sample Multiplier | SED-DA-012 (1.0-1.5) 0 GCMSD 35 0.06658 | Chrysene-d12 Perylene-d12 | 250.038 250.031 | ARC1 SED-DA-0 8/18 PAH-2 |

| 138 | |
|-----|----------------------|
| 031 | ARC1642.D |
| 000 | SED-DA-012 (1.0-1.5) |
| | 8/18/2013 |
| | PAH-2012.M |
| | 15.01952538 |
| | |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---|------------------------------|----------|-----------------|------------------|---------------|
| 21 | ala (tanan Quantin | (minute) | (area) | 0.0000 | Concentration |
| 1000 | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 200 | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Decalins Naphthalene | 13.88 | 44292 | 1.1901 | 1.6140 |
| 5.0 | | | | | |
| | C1-Naphthalenes | 16.30 | 50140 66890 | 1.3472 1.7972 | 1.8271 |
| 19.511 | C2-Naphthalenes | 18.25 | | | 2.4375 |
| | C3-Naphthalenes | 20.15 | 47363 | 1.2726 | 1.7259 |
| | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 6355 | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | | 0.0000 | 0.0000 |
| 0.00 | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluorene | 21.54 | 52965 | 1.9010 | 2.5782 |
| 1000 | C1-Fluorenes | 23.51 | 20731 | 0.7441 | 1.0091 |
| 5.67 M | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2020 | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.274 | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 41) | Phenanthrene | 24.82 | 275445 | 5.3781 | 7.2939 |
| 43)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 26.72 | 157181 | 3.0690 | 4.1622 |
| 50) | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 51) | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 52) | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 34) | Dibenzothiophene | 24.41 | 18387 | 0.4343 | 0.5890 |
| 35)+36)+37) | C1-Dibenzothiophenes | 26.21 | 17949 | 0.4240 | 0.5750 |
| | C2-Dibenzothiophenes | 27.38 | 14553 | 0.3437 | 0.4662 |
| 0.275 | C3-Dibenzothiophenes | 28.49 | 9857 | 0.2328 | 0.3158 |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.02.00 | Fluoranthene | 28.91 | 31175 | 0.6751 | 0.9157 |
| | Pyrene | 29.70 | 3370 | 0.0562 | 0.0762 |
| | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.04945 | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.1.2.4.2. | Naphthobenzothiophene | 0.00 | õ | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2011 States | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.81 | 3568 | 0.0655 | 0.0888 |
| | Chrysene/Triphenylene | 33.89 | 2281 | 0.0495 | 0.0671 |
| | | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.5.975.5. | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Chrysenes | | | | 0.0000 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | |
| | Benzo(b)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(k,j)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1. 1. 2. 1. P. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.7 Sec. | Perylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Indeno(1,2,3-c,d)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzo(a,h)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 84) | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 85) | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 86) | C3-Dibenzo(a,injantinacenes | 0.00 | 0 | 0.0000 | 0.0000 |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|--------|--------------------------------------|---|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | 5 | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 36597 | 1.5605 | 2.1164 |
| 10) | 1-Methylnaphthalene | 16.47 | 13543 | 0.6251 | 0.8478 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.89 | 8312 | 0.2408 | 0.3266 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 5280 | 0.1530 | 0.2074 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 4357 | 0.1262 | 0.1712 |
| 43) | 3-Methylphenanthrene | 26.48 | 15529 | 0.4894 | 0.6638 |
| 44) | 2-Methylphenanthrene | 26.59 | 18176 | 0.5729 | 0.7769 |
| 45) | 2-Methylanthracene | 26.73 | 100983 | 3.1827 | 4.3165 |
| 46) | 4/9-Methylphenanthrene | 26.86 | 9640 | 0.3038 | 0.4121 |
| 47) | 1-Methylphenanthrene | 26.93 | 12853 | 0.4051 | 0.5494 |
| 1000 | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 100.00 | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 438760 | 13.16 | 79.01 |
| | Acenaphthene-d10 | 19.67 | 136866 | 7.14 | 42.86 |
| | Phenanthrene-d10 | 24.75 | 502830 | 12.28 | 73.73 |
| 1000 | Chrysene-d12 | 33.81 | 664004 | 14.82 | 89.01 |
| 1000 | Pervlene-d12 | 38.70 | 782 | 0.02 | 0.11 |
| 1000 | 5(b)H-Cholane | 34.24 | 107745 | 14.59 | 87.64 |
| | Internal Standards | 1. March 1. | | | |
| 1) | Fluorene-d10 | 21.45 | 329379 | 16.71 | |
| 10.00 | Pyrene-d10 | 29.63 | 676551 | 16.69 | |
| | Benzo(a)pyrene-d12 | 38.39 | 620743 | 16.67 | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1642.D Acq On : 18 Aug 2013 12:04 pm Operator : YM Sample : SED-DA-012 (1.0-1.5) Misc : ALS Vial : 35 Sample Multiplier: 0.06658 Quant Time: Sep 05 21:31:06 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) Internal Standards21.455176329379m251.050.0031) Pyrene-d1029.635212676551m250.630.0073) Benzo(a)pyrene-d1238.386264620743m250.320.00 System Monitoring Compounds 2) Naphthalene-d813.822136438760m13.160.0021) Acenaphthene-d1019.672164136866m7.140.0032) Phenanthrene-d1024.752188502830m12.280.0066) Chrysene-d1233.809240664004m14.82-0.0488) Perylene-d1238.697264782m0.020.0090) 5 (b) H-Cholane34.235217107745m14.590.00

 90) 5(b)H-Cholane
 34.235
 217
 107745m
 14.59

 Target Compounds
 0
 0
 N.D. d

 3) cis/trans Decalins
 0.000
 0
 N.D. d

 4) C1-Decalins
 0.000
 0
 N.D. d

 5) C2-Decalins
 0.000
 0
 N.D. d

 6) C3-Decalins
 0.000
 0
 N.D. d

 7) C4-Decalins
 0.000
 0
 N.D. d

 9) 2-Methylnaphthalene
 16.134
 142
 36597m
 1.56

 101 -Methylnaphthalene
 16.468
 142
 13543m
 0.63

 11) 2, 6-Dimethylnaphthal.ene
 0.000
 0
 N.D. d

 13) C2-Naphthalenes
 18.251
 156
 66890m
 1.80

 14) C3-Naphthalenes
 0.000
 0
 N.D. d

 16) Benzothiophene
 0.000
 0
 N.D. d

 17) C1-Benzothiophenes
 0.000
 0
 N.D. d

 10) C4-Benzothiophenes
 0.000
 0
 N.D. d

 20) C4-Benzothiophenes
 0.000
 0
 N.D. d

 21) benzofuran
 0.000
 0
 N.D. d

 Target Compounds Ovalue

| Data Path : C:\msdchem\2\data\MS Data File : ARC1642.D Acq On : 18 Aug 2013 12:04 p Operator : YM Sample : SED-DA-012 (1.0-1.5) Misc : ALS Vial : 35 Sample Multipli Quant Time: Sep 05 21:31:06 2013 Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:39: Response via : Initial Calibrati | m er: 0.06 AR70057. able-201 35 2013 | . M | | |
|---|--|-------------------|---|--|
| Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
| 44) 2-Methylphenanthrene 45) 2-Methylanthracene 46) 4/9-Methylphenanthrene 47) 1-Methylphenanthrene 48) 3,6-Dimethylphenanthrene 49) Retene 50) C2-Phenanthrenes/Anthr 51) C3-Phenanthrenes/Anthr 52) C4-Phenanthrenes/Anthr 53) Naphthobenzothiophene 54) C1-Naphthobenzothiophenes 55) C2-Naphthobenzothiophenes 56) C3-Naphthobenzothiophenes 57) C4-Naphthobenzothiophenes | 26.726 26.864 26.934 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 192 192 192 | 100983m 9640m 12853m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | 3.18 0.30 0.41 N.D. d N.D. d |
| 58) Fluoranthene 59) Pyrene 60) 2-Methylfluoranthene 61) Benzo(b)fluorene 62) C1-Fluoranthenes/Pyrenes 63) C2-Fluoranthenes/Pyrenes 64) C3-Fluoranthenes/Pyrenes 65) C4-Fluoranthenes/Pyrenes | 0.000 0.000 0.000 0.000 | 202 | 3370m 0 0 0 0 0 | 0.06 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d |
| 65) C4-Fluoranthenes/Pyrenes 67) Benz(a) anthracene 68) Chrysene/Triphenylene 69) C1-Chrysenes 70) C2-Chrysenes 71) C3-Chrysenes 72) C4-Chrysenes 74) C29-Hopane 75) 18a-Oleanane 76) C30-Hopane 77) Benzo(b) fluoranthene 78) Benzo(k,j) fluoranthene | 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 | 228 | 3568m 2281m 0 0 0 0 0 0 0 0 0 0 | 0.07 0.05 N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d N.D. d |
| 79) Benzo(a) fluoranthene 80) Benzo(e) pyrene | 0.000 0.000 0.000 0.000 0.000 0.000 | | | N.D. d N.D. d |
| 94) C28(20R)/C27(20S)-TAS 95) C28(20S)-TAS 96) C27(20R)-TAS 97) C28(20R)-TAS | 0.000 0.000 0.000 | | 0 | N.D. d N.D. d N.D. d N.D. d |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1642.D Acq On : 18 Aug 2013 12:04 pm Operator : YM Sample : SED-DA-012 (1.0-1.5) Misc : ALS Vial : 35 Sample Multiplier: 0.06658 Quant Time: Sep 05 21:31:06 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

| Reviewed) |
|-----------|
| TQ) |
| Report |
| ltation |
| Quanti |

| analertind analertind nu, sanali nu, sanali nu, sanali nu, sanali nu, sanali nu, sa nu, sa nan nu, sa nu, s | 2,8b-eff T,enelsfit T,enelsfit nu,zen nu,zen 1,orb-en nu,zen nu,zenelogo nu,zenelogo nu,zenelogo nu,zenelogo nu,zenelogo nu,zenelogo nu,zenelogo nu,zenelogo z,entervezi nu,zenelogo z,entervezi nu,zenelogo z,entervezi z,ent | Aby00006 TIC: ARC1642. D\data.ms | <pre>Quant Time: Sep 05 21:31:06 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration</pre> | | 29(a)pyrene-d12,1 | L C A C A C A C A C A C A C A C A C A C | | 0 C 0 W 0 ∑ W 0 ∑ W 0 ∑ W 0 0 0 0 N 0 N | e-dro,i me-dro,i me.er. 0. 3 3 3 3 3 3 5 2 0 1 0 5 7 0 5 1 2 10 1 1 2 1 1 1 2 2 1 1 2 2 1 1 1 1 | nenes.un nenes.un | 2\dat Mult Mult Ms70 Ms70 Calik Calik Calik | hem/2 . D mple mple fial 221:33 fial 6 . 2013 fial 6 . 2013 fial 6 . 2013 fial 6 . 2013 fial 6 . 0 . 0 . 0 . 0 . 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | h : C:\ e : ARC : YM : SED : 35 : 35 : 35 : 35 thod : thod : via : via : | |
|---|--|--|--|--|-------------------|--|---|--|--|--------------------------|--|---|---|--------------------------------|
| and | | 2.8b-arrive P.anaBarrive n.anaBarrive 2.01b-ana 0.01b-ana 0.01b-Barrive 2.01b-Barrive 1.01b-ana n.ana n.ana 1.01b-ana 1.0 | 2.8b-erray T.enelerrity T.enelerrity and and and and and and and and | | Perylene-d | iou2-H(a)s Haanasynta | C3-Dibenzot Fluoranthene Pyrene, Pyre | adibly diam. 5/5 | Eludibrege | Acenaphth BritideN-EO | C2-Naphtha | qaniyriam-r qaniyriam-r | asr ániann q eN | 50000 |
| un's un's buddy S'01 S' I | | 5000000 4600000 3500000 3500000 3500000 360000 360000 360000 360000 360000 360000 3700000 3700000 360000 3700000 3700000 3700000 3700000 3700000 3700000 3700000 3700000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 370000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 370000000 37000000 37000000 37000000 37000000 37000000 37000000 370000000 37000000 37000000 37000000 37000000 37000000 37000000 3700000 3700000 3700000 37000000 37000000 3700000 3700000 3700000 3700000 3700000 3700000 3700000 3700000 3700000 3700000 3700000 37000000 3700000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 37000000 3700000000 | | | 1,211 | T,en | | ne,un Att | | | | | | 150000 |
| T S.or nu.anano Anana nu.a nu.a nu.a nu.a T.an a ter tu a tu a tu a tu a tu a tu a tu a tu | nu a fi | | | | | | | | | | | | | 200000 |
| الم در در در در در ماری در در در در در در در در در در در در در | nu eun ff | | | | | | | | | | | | | 250000 |
| الم الم الم الم الم الم الم الم الم الم | لیاس ایل ۱٫۹ | | | | | | | | | | | | | |
| ן ג. מושרים העורד ג. ד.פתמקוני ד.פתמקוני ד.פתמקוני ד.פתמקוני | لیس ایل ۱٫۹ | | | | | | | | | | | | | 3000000 |
| ן ג. ג. ג. ג. ג. ג. ג. ג. ג. | لی می آبا ۲,ه | | | | | | | | | | | | | 3500000 |
| ן גיח גיח גיח גיח גיח גיח גיח גיח גיח | ۳۳ ۲. ۲. | 500000 | | | | | | | | | | | | 400000 |
| ן נייי גייי מעדיי גייי גייי גייי גייי גייי גייי גייי | لی می آبا ۱. | 500000 | | | | | | | | | | | | 4500000 |
| ן י ג י י י ג י י ג י ג י ג י ג י ג י ג | ۳. ۳. | | | | | | | | | | | | | 500000 |
| Time: Sep 05 21:31:06 2013 Method : C:\GCWS7\MS70057.M Title : PAH Calibration Table-2013A Update : Sat Aug 17 22:39:35 2013 Ise via : Initial Calibration 0 0 0 0 0 0 0 0 0 0 0 0 0 | Time: Sep 05 21:31:06 2013 Method : C:\GCMS7\MS70057\AR70057.M Title : PAH Calibration Table-2013A Update : Sat Aug 17 22:39:35 2013 use via : Initial Calibration 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | Time: Sep 05 21:31:06 201 Method : C:\GCMS7\MS70057 Title : PAH Calibration Update : Sat Aug 17 22:39 ise via : Initial Calibrat | | | | | | 06658 | | ipl | Mult | nple | . 35 | Misc ALS Vial |
| <pre>c : couperous (1.0-1.2) i.al : 35 Sample Multiplier: 0.06658 Time: Sep 05 21:31:06 2013 Method : C:\GCMS7\MS70057\AR70057\AR70057.M Title : PAH Calibration Table-2013A Update : Sat Aug 17 22:39:35 2013 See via : Initial Calibration 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</pre> | <pre>c : control (1.0-1.5) i.al : 35 Sample Multiplier: 0.06658 Time: Sep 05 21:31:06 2013 Method : C:\dcms7\Ms70057\AR70057\AR70057.M Title : PAH Calibration Table-2013A Update : Sat Aug 17 22:39:35 2013 See via : Initial Calibration 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</pre> | al : 35 Sample Multiplier: Time: Sep 05 21:31:06 2013 Method : C:\GCMS7\MS70057\AR70 Title : PAH Calibration Table Update : Sat Aug 17 22:39:35 2 Ise via : Initial Calibration | : 35 Sample Multiplier: | | | | | | E. | 04 1 | 12: | 2013 | ຍ | Jata Fil Acq On Dperator |
| Time: Sep 05 21:31:04 pm SED-DA-012 (1.0-1.5) SED-DA-012 (1.0-1.5) SED-DA-012 (1.0-1.5) SED-DA-012 (1.0-1.5) SED-DA-012 (1.0-1.5) SED-DA-012 (1.0-1.5) SECONTYMS70057.M Time: Sep 05 21:31:06 2013 Nethod : C:\GGW37NR570057.M Title : Set 0.0 17 22:39:35 2013 NUPdate : Sat Aug 17 22:39:35 2013 Nupdate : Sat A | Time: Sep 05 21:31:04 pm Sec : SED-DA-012 (1.0-1.5) Sec : SED-DA-012 (1.0-1.5) Sec : SED-DA-012 (1.0-1.5) Sec : SED-DA-012 (1.0-1.5) Anthod : C:\GCMS7\MS70057\MS70057.M Time: Sep 05 21:31:06 2013 Method : C:\GCMS7\MS70057.M Title : PAH Calibration Table-2013A Update : Sat Aug 17 22:32 2013 Sec via : Initial Calibration 0 0 0 0 0 0 0 0 0 0 0 0 0 | <pre>rection of the second matrix for a contract of the second matrix matrix for a contract of the second matrix for a contract of the sec</pre> | File : ARC1642.D tor : 18 Aug 2013 12:04 pm tor : YM e : SED-DA-012 (1.0-1.5) ial : 35 Sample Multiplier: | | | | | | 100671 | M/e- | +ep/0 | c/mer | | Jata Dat |

Tissues, Sediments and Water PAH Report (use Phenanthrene-d10 as surrogate correction)

| Data File Name | ARC1643.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|----------------------------|---------------------------------------|---------|---------------------|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | YM | Naphthalene-d8 | 250.125 | |
| Date Acquired | 8/18/2013 13:13 | Acenaphthene-d10 | 250.163 | Copy data below |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | to Spread Sheet |
| Sample Name | SED-DA-013 (1.0-1.5) | Chrysene-d12 | 250.038 | |
| Misc Info | 0 | Perylene-d12 | 250.031 | ARC1643.D |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SED-DA-013 (1.0-1.5 |
| Vial Number | 36 | | | 8/18/2013 |
| Sample Multiplier | 0.06636 | | | PAH-2012.M |
| Sample Amount | 0 | | | 15.06931887 |

1643.D 13 (1.0-1.5) 3/2013

PAH-2012.M 15.06931887

| | Compound Name | Ret Time (minute) | Target Response (area) | Concentration | Su. Corrected Concentration |
|---|--|----------------------|---------------------------|---------------|--------------------------------|
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | õ | 0.0000 | 0.0000 |
| 255 | C2-Decalins | 0.00 | õ | 0.0000 | 0.0000 |
| 203 | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthalene | 13.88 | 33851 | 0.8372 | 1.1702 |
| | C1-Naphthalenes | 16.30 | 40506 | 1.0018 | 1.4002 |
| | C2-Naphthalenes | 18.59 | 106187 | 2.6261 | 3.6707 |
| | C3-Naphthalenes | 20.15 | 129407 | 3.2004 | 4.4733 |
| | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.440 | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 1985 | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.0.37 | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 19) | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 20) | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22) | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| 23) | Acenaphthylene | 19.17 | 2044 | 0.0518 | 0.0724 |
| 24) | Acenaphthene | 19.70 | 1008 | 0.0447 | 0.0625 |
| 25) | Dibenzofuran | 0.00 | 0 | 0.0000 | 0.0000 |
| 26) | Fluorene | 21.54 | 54996 | 1.8169 | 2.5395 |
| 28) | C1-Fluorenes | 23.51 | 19212 | 0.6347 | 0.8871 |
| 29) | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 30) | C3-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 33) | Carbazole | 0.00 | 0 | 0.0000 | 0.0000 |
| 42) | Anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 41) | Phenanthrene | 24.82 | 258279 | 4.5911 | 6.4172 |
| 43)+44)+45)+46)+47) | C1-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 50) | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 51) | C3-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 22/24 | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzothiophene | 24.41 | 15610 | 0.3357 | 0.4692 |
| | C1-Dibenzothiophenes | 26.21 | 14436 | 0.3104 | 0.4339 |
| 0-01 | C2-Dibenzothiophenes | 27.97 | 12391 | 0.2664 | 0.3724 |
| | C3-Dibenzothiophenes | 28.80 | 11392 | 0.2450 | 0.3424 |
| | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Fluoranthene | 28.91 | 31506 | 0.6212 | 0.8683 |
| | Pyrene | 29.70 | 7155 | 0.1086 | 0.1518 |
| 2,2017 | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 5.22 MA | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 0.0000 |
| 1993 | C4-Naphthobenzothiophenes | 33.81 | 4399 | 0.0735 | 0.1028 |
| | Benz(a)anthracene Chrysene/Triphenylene | 33.89 | 2654 | 0.0524 | 0.0732 |
| S. S. S. | C1-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| (1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1- | Benzo(k,j)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(e)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(a)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Perylene | 38.77 | 8622 | 0.1684 | 0.2354 |
| | Indeno(1,2,3-c,d)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzo(a,h)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Dibenzo(a,h)anthracenes | 0.00 | õ | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(g,h,i)perylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|---------------|--------------------------------------|----------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | 5 | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 26572 | 1.0429 | 1.4577 |
| 10) | 1-Methylnaphthalene | 16.47 | 13934 | 0.5920 | 0.8275 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 6975 | 0.1839 | 0.2571 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 4218 | 0.1112 | 0.1555 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 3243 | 0.0855 | 0.1195 |
| 43) | 3-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 44) | 2-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 45) | 2-Methylanthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| 46) | 4/9-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 47) | 1-Methylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 48) | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| 49) | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| 60) | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 61) | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 74) | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 75) | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| 76) | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 91) | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 92) | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 93) | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 94) | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 95) | C28(205)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 96) | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 97) | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.0116 | Surrogate Standards | | | | |
| 2) | Naphthalene-d8 | 13.82 | 458147 | 12.65 | 76.19 |
| 21) | Acenaphthene-d10 | 19.67 | 271453 | 13.03 | 78.51 |
| 32) | Phenanthrene-d10 | 24.75 | 534138 | 11.88 | 71.54 |
| 66) | Chrysene-d12 | 33.81 | 717338 | 14.57 | 87.83 |
| | Perylene-d12 | 38.70 | 142992 | 3.03 | 18.27 |
| | 5(b)H-Cholane | 34.24 | 118110 | 14.91 | 89.85 |
| | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 356666 | 16.66 | |
| 1000 | Pyrene-d10 | 29.63 | 740680 | 16.63 | |
| - 10 Per 2010 | Benzo(a)pyrene-d12 | 38.39 | 663704 | 16.61 | |

| Compound R.T. QION Response Conc Units Dev(Min) Internal Standards 1) Fluorene-d10 21.455 176 356666m 251.05 0.00 31) Pyrene-d10 22.635 212 74660m 250.63 0.00 73) Benzo(a)pyrene-d12 38.386 264 663704m 250.32 0.00 System Monitoring Compounds 2) Nachnahltene-d8 13.622 136 458147m 12.65 0.00 2) Nachnahltene-d8 13.822 136 458147m 12.65 0.00 30 Displthalene-d8 13.825 240 717338m 14.85 0.00 90 5(D)H-Cholane 34.637 24 142992m 3.03 0.00 90 5(D)H-Cholane 34.637 24 142992m 3.03 0.00 90 5(D)H-Cholane 34.637 24 142992m 3.03 0.00 90 5(D)H-Cholane 34.637 24 142992m 3.00 | Data Acq O Opera Sampl Misc ALS V Quant Quant Quant QLast | Path : C:\msdchem\2\data\M File : ARC1643.D n : 18 Aug 2013 1:13 tor : YM e : SED-DA-013 (1.0-1.5 : ial : 36 Sample Multipl Time: Sep 05 21:49:14 201 Method : C:\GCMS7\MS70057 Title : PAH Calibration Update : Sat Aug 17 22:39 nse via : Initial Calibrat | pm) ier: 0.00 3 \AR70057 Table-20 :35 2013 | . M | | | |
|---|--|---|---|-------|----------|------------|------------|
| Internal standards 1) Fluorene-d10 21.455 176 356666m 251.05 0.00 31) Fyrene-d10 29.635 212 740680m 250.63 0.00 73) Benzo(a)pyrene-d12 38.366 264 663704m 250.32 0.00 System Monitoring Compounds 2 18.822 136 458147m 12.65 0.00 21) Acenaphthene-d10 24.752 188 54138m 11.88 0.00 32) Phenanthrene-d12 38.809 240 717338m 14.57 -0.04 88) Perylene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 7arget Compounds Qvalue Qvalue 0.00 0 N.D. d 0.00 0 N.D. d 3) cis/trans Decalin 0.000 0 N.D. d 0.00 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 0.59 111 2.6-Dimethylnaphthalene 16.134 142 26572m 1.04 101 1.4 | | Compound | R.T. | QIon | Response | Conc Units | s Dev(Min) |
| 1) Fluoren-d10 21.455 176 356666m 251.05 0.00 3) Pyrene-d10 25.35 21.2 740680m 250.32 0.00 73) Benzo(a)pyrene-d12 38.386 264 663704m 250.32 0.00 2) Naphthalene-d10 15.672 164 271453m 11.03 0.00 21) Accmaphthene-d10 24.752 188 534138m 11.88 0.00 66) Chrysene-d12 38.697 264 142992m 3.03 0.00 90 5 (b)H-Cholane 34.235 217 118110m 14.91 0.00 70 C4-Decalins 0.000 0 N.D. d 0.00 0 N.D. d 71 C4-Decalins 0.000 0 N.D. d 0.00 0 N.D. d 71 C4-Decalins 0.000 0 N.D. d 0.00 0 N.D. d 72 C4-Decalins 0.000 0 N.D. d 0.00 0 N.D. d 72 C4-Decalins 0.000 0 N.D. d 0.00 0 N.D. d 73 C4-Decalins 0.000 0 N.D. | | | | | | | |
| System Monitoring Compounds 13.822 136 458147m 12.65 0.00 21) Acenaphthene-d10 19.672 164 271453m 13.03 0.00 32) Phenanthrene-d10 24.752 188 534138m 11.88 0.00 66) Chrysene-d12 33.809 240 717338m 14.57 -0.04 88) Perylene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 7arget Compounds Qvalue Qvalue Qvalue Qvalue Qvalue 3) cis/trans Decalins 0.000 0 N.D. d N.D. d 0.00 6) C2-Decalins 0.000 0 N.D. d N.D. d 0.59 110 1.4methylnaphthalene 16.134 122 26572m 1.04 10 1.4methylnaphthalene 0.000 0 N.D. d 0.59 111 2.6-Dimethylnaphthalene 0.000 0 N.D. d 0.55 <tr< td=""><td>Inte</td><td>rnal Standards</td><td></td><td></td><td></td><td></td><td></td></tr<> | Inte | rnal Standards | | | | | |
| System Monitoring Compounds 13.822 136 458147m 12.65 0.00 21) Acenaphthene-d10 19.672 164 271453m 13.03 0.00 32) Phenanthrene-d10 24.752 188 534138m 11.88 0.00 66) Chrysene-d12 33.809 240 717338m 14.57 -0.04 88) Perylene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 7arget Compounds Qvalue Qvalue Qvalue Qvalue Qvalue 3) cis/trans Decalins 0.000 0 N.D. d N.D. d 0.00 6) C2-Decalins 0.000 0 N.D. d N.D. d 0.59 110 1.4methylnaphthalene 16.134 122 26572m 1.04 10 1.4methylnaphthalene 0.000 0 N.D. d 0.59 111 2.6-Dimethylnaphthalene 0.000 0 N.D. d 0.55 <tr< td=""><td>1)</td><td>Fluorene-d10</td><td>21.455</td><td>176</td><td>356666m</td><td>251.05</td><td>0.00</td></tr<> | 1) | Fluorene-d10 | 21.455 | 176 | 356666m | 251.05 | 0.00 |
| System Monitoring Compounds 13.822 136 458147m 12.65 0.00 21) Acenaphthene-d10 19.672 164 271453m 13.03 0.00 32) Phenanthrene-d10 24.752 188 534138m 11.88 0.00 66) Chrysene-d12 33.809 240 717338m 14.57 -0.04 88) Perylene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 7arget Compounds Qvalue Qvalue Qvalue Qvalue Qvalue 3) cis/trans Decalins 0.000 0 N.D. d N.D. d 0.00 6) C2-Decalins 0.000 0 N.D. d N.D. d 0.59 110 1.4methylnaphthalene 16.134 122 26572m 1.04 10 1.4methylnaphthalene 0.000 0 N.D. d 0.59 111 2.6-Dimethylnaphthalene 0.000 0 N.D. d 0.55 <tr< td=""><td>31)</td><td>Pyrene-d10</td><td>29.635</td><td>212</td><td>740680m</td><td>250.63</td><td>0.00</td></tr<> | 31) | Pyrene-d10 | 29.635 | 212 | 740680m | 250.63 | 0.00 |
| 2) Naphthalene-dd 13.822 136 458147m 12.65 0.00 21) Acenaphthene-d10 24.752 188 534138m 11.88 0.00 32) Phenanthrene-d12 33.809 240 717338m 14.57 -0.04 88) Perylene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 3) cis/trans Decalin 0.000 0 N.D. d 0.00 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 0.59 0.50 0.59 7) C4-Decalins 0.000 0 N.D. d 0.59 0.59 0.59 11) 2,6-Dimethylnaphthalene 16.134 142 26572m 1.04 0.59 12) 1,6,7-Trimethylnaphthalene 0.646 142 13934m 0.59 0.50 12) 2,6-Dimethylnaphthalenes 0.000 0 N.D. d 0.59 0.51 12, 2,6-Dimethylnaphthalenes 0.000 0 | 73) | Benzo(a)pyrene-d12 | 38.386 | 264 | 663704m | 250.32 | 0.00 |
| 2) Naphthalene-dd 13.822 136 458147m 12.65 0.00 21) Acenaphthene-d10 24.752 188 534138m 11.88 0.00 32) Phenanthrene-d12 33.809 240 717338m 14.57 -0.04 88) Perylene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 3) cis/trans Decalin 0.000 0 N.D. d 0.00 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 0.59 0.50 0.59 7) C4-Decalins 0.000 0 N.D. d 0.59 0.59 0.59 11) 2,6-Dimethylnaphthalene 16.134 142 26572m 1.04 0.59 12) 1,6,7-Trimethylnaphthalene 0.646 142 13934m 0.59 0.50 12) 2,6-Dimethylnaphthalenes 0.000 0 N.D. d 0.59 0.59 0.50 12) 2,6-Dimethylnaphthalene 0.000 <t< td=""><td>Great</td><td>- Manitaning Compounds</td><td></td><td></td><td></td><td></td><td></td></t<> | Great | - Manitaning Compounds | | | | | |
| 32) Phenanthrene-d10 24.752 188 534138m 14.57 -0.04 66) Chrysene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 7arget Compounds Qvalue Qvalue Qvalue Qvalue 3) cis/trans Decalins 0.000 0 N.D. d N.D. d 4) C1-Decalins 0.000 0 N.D. d N.D. d N.D. d 6) C3-Decalins 0.000 0 N.D. d N.D. d N.D. d 7) C4-Decalins 0.000 0 N.D. d N.D. d N.D. d 10 1-Methylnaphthalene 16.134 142 25572m 1.04 11 11 2.6-Dimethylnaphthalene 0.000 0 N.D. d 13 14 12.26.63 14 C3-Naphthalenes 0.000 0 N.D. d 12 1.6 1.6 1.6 1.6 1.6 1.7 1.2407m 3.20 1.6 | Syst | Naphthalene-de | 13 800 | 136 | 458147m | 12 65 | 0 00 |
| 32) Phenanthrene-d10 24.752 188 534138m 14.57 -0.04 66) Chrysene-d12 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 7arget Compounds Qvalue Qvalue Qvalue 0.00 0 N.D. d 3) cis/trans Decalins 0.000 0 N.D. d 0.00 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 0.00 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 0.59 | 21) | Aconaphthene_d10 | 19 672 | 164 | 271453m | 13 03 | 0.00 |
| 66) Chrysene-dl2 33.809 240 717338m 14.57 -0.04 88) Perylene-dl2 38.697 264 142992m 3.03 0.00 90) 5(b)H-Cholane 34.235 217 118110m 14.91 0.00 3) cis/trans Decalins 0.000 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 5) C2-Decalins 0.000 0 N.D. d 6) C3-Decalins 0.000 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 8) Naphthalene 16.134 142 26572m 1.04 10) 1-Methylnaphthalene 16.468 142 13934m 0.59 11) 2,6-Dimethylnaphthalene 0.000 0 N.D. d 12) 1,6,7-Trimethylnaphthalene 10.6187m 2.63 14) C3-Naphthalenes 18.586 156 106187m 2.63 12) 1,6,7-Trimethylnaphthalene 0.000 0 N.D. d 17 | 32) | Phenanthrene-d10 | 24 752 | 188 | 534138m | 11 88 | 0.00 |
| Target Compounds Qvalue 3) cis/trans Decalin 0.000 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 5) C2-Decalins 0.000 0 N.D. d 6) C3-Decalins 0.000 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 8) Naphthalene 13.878 128 33851m 0.84 9) 2-Methylnaphthalene 16.134 142 26572m 1.04 10) 1-Methylnaphthalene 16.468 142 13934m 0.59 11) 2.6-Dimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 0.000 0 N.D. d 13 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d <t< td=""><td>66)</td><td>Chrysene-d12</td><td>33,809</td><td>240</td><td>717338m</td><td>14.57</td><td>-0.04</td></t<> | 66) | Chrysene-d12 | 33,809 | 240 | 717338m | 14.57 | -0.04 |
| Target Compounds Qvalue 3) cis/trans Decalin 0.000 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 5) C2-Decalins 0.000 0 N.D. d 6) C3-Decalins 0.000 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 8) Naphthalene 13.878 128 33851m 0.84 9) 2-Methylnaphthalene 16.134 142 26572m 1.04 10) 1-Methylnaphthalene 16.468 142 13934m 0.59 11) 2.6-Dimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 0.000 0 N.D. d 13 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d <t< td=""><td>88)</td><td>Pervlene-d12</td><td>38.697</td><td>264</td><td>142992m</td><td>3.03</td><td>0.00</td></t<> | 88) | Pervlene-d12 | 38.697 | 264 | 142992m | 3.03 | 0.00 |
| Target Compounds Qvalue 3) cis/trans Decalin 0.000 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 5) C2-Decalins 0.000 0 N.D. d 6) C3-Decalins 0.000 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 8) Naphthalene 13.878 128 33851m 0.84 9) 2-Methylnaphthalene 16.134 142 26572m 1.04 10) 1-Methylnaphthalene 16.468 142 13934m 0.59 11) 2.6-Dimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 0.000 0 N.D. d 13 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d <t< td=""><td>90)</td><td>5(b)H-Cholane</td><td>34.235</td><td>217</td><td>118110m</td><td>14.91</td><td>0.00</td></t<> | 90) | 5(b)H-Cholane | 34.235 | 217 | 118110m | 14.91 | 0.00 |
| 3) cis/trans Decalin 0.000 0 N.D. d 4) C1-Decalins 0.000 0 N.D. d 5) C2-Decalins 0.000 0 N.D. d 6) C3-Decalins 0.000 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 8) Naphthalene 13.878 128 33851m 0.84 9) 2-Methylnaphthalene 16.468 142 2572m 1.04 10) 1-Methylnaphthalene 16.468 142 13934m 0.59 11) 2,6-Dimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 20.000 0 N.D. d 14) C3-Naphthalenes 0.000 0 N.D. d 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 20) | 0.303 | | | | | | |
| 5) C2-Decalins 0.000 0 N.D. d 6) C3-Decalins 0.000 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 8) Naphthalene 13.878 128 33851m 0.84 9) 2-Methylnaphthalene 16.134 142 26572m 1.04 10) 1-Methylnaphthalene 16.468 142 13934m 0.59 11) 2,6-Dimethylnaphthalene 0.000 0 N.D. d 12) 1,6,7-Trimethylnaphthal 0.000 0 N.D. d 13) C2-Naphthalenes 20.146 170 129407m 3.20 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) G3-Benzothiophenes 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d <td>Targ</td> <td>et Compounds</td> <td></td> <td></td> <td></td> <td></td> <td>Qvalue</td> | Targ | et Compounds | | | | | Qvalue |
| 5) C2-Decalins 0.000 0 N.D. d 6) C3-Decalins 0.000 0 N.D. d 7) C4-Decalins 0.000 0 N.D. d 8) Naphthalene 13.878 128 33851m 0.84 9) 2-Methylnaphthalene 16.134 142 26572m 1.04 10) 1-Methylnaphthalene 16.468 142 13934m 0.59 11) 2,6-Dimethylnaphthalene 0.000 0 N.D. d 12) 1,6,7-Trimethylnaphthal 0.000 0 N.D. d 13) C2-Naphthalenes 20.146 170 129407m 3.20 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) G3-Benzothiophenes 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d <td>3)</td> <td>cis/trans Decalin</td> <td>0.000</td> <td></td> <td>0</td> <td>N.D. d</td> <td></td> | 3) | cis/trans Decalin | 0.000 | | 0 | N.D. d | |
| 9) 2-Methylnaphthalene 16.134 142 13934m 0.59 10) 1.6,7-Trimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 20.146 170 129407m 3.20 15) C4-Naphthalenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.171 152 2044m 0.05 22) Dibenzofuran 0.000 0 N.D. d 23) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.00 | | C1-Decalins | 0.000 | | 0 | N.D. d | |
| 9) 2-Methylnaphthalene 16.134 142 13934m 0.59 10) 1.6,7-Trimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 20.146 170 129407m 3.20 15) C4-Naphthalenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.171 152 2044m 0.05 22) Dibenzofuran 0.000 0 N.D. d 23) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.00 | 5) | C2-Decalins | 0.000 | | 0 | N.D. d | |
| 9) 2-Methylnaphthalene 16.134 142 13934m 0.59 10) 1.6,7-Trimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 20.146 170 129407m 3.20 15) C4-Naphthalenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.171 152 2044m 0.05 22) Dibenzofuran 0.000 0 N.D. d 23) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.00 | 6) | C3-Decalins | 0.000 | | 0 | N.D. d | |
| 9) 2-Methylnaphthalene 16.134 142 13934m 0.59 10) 1.6,7-Trimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 20.146 170 129407m 3.20 15) C4-Naphthalenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.171 152 2044m 0.05 22) Dibenzofuran 0.000 0 N.D. d 23) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.00 | 7) | C4-Decalins | 0.000 | | 0 | N.D. d | |
| 9) 2-Methylnaphthalene 16.134 142 13934m 0.59 10) 1.6,7-Trimethylnaphthalene 0.000 0 N.D. d 13) C2-Naphthalenes 18.586 156 106187m 2.63 14) C3-Naphthalenes 20.146 170 129407m 3.20 15) C4-Naphthalenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.171 152 2044m 0.05 22) Dibenzofuran 0.000 0 N.D. d 23) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.00 | 8) | Naphthalene | 13.878 | 128 | 33851m | 0.84 | |
| 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophene 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Biphenyl 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 33) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene< | 9) | 2-Methylnaphthalene | 16.134 | 142 | 26572m | 1.04 | |
| 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophene 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Biphenyl 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 33) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene< | 10) | 1-Methylnaphthalene | 16.468 | 142 | 13934m | 0.59 | |
| 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophene 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) C3-Benzothiophenes 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 32) Acenthy | | 2,6-Dimetnyinaphthalene | 0.000 | | 0 | N.D. d | |
| 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophene 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) C3-Benzothiophenes 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 32) Acenthy | 12) | 1,6,7-frimethyinaphtha | 19 596 | 156 | 106197m | N.D. U | |
| 15) C4-Naphthalenes 0.000 0 N.D. d 16) Benzothiophene 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Biphenyl 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 33) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene< | 14) | C2-Naphthalenes | 20 146 | 170 | 129407m | 3 20 | |
| 16) Benzothiophene 0.000 0 N.D. d 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Biphenyl 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 28) C1-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 32) Carbazole < | 15) | C4-Naphthalenes | 0 000 | 110 | 12940711 | ND d | |
| 17) C1-Benzothiophenes 0.000 0 N.D. d 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Biphenyl 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 28) C2-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 32) 4-Methyldibenzothiophene 25.895 198 6975m 0.18 36) | | | | | | | |
| 18) C2-Benzothiophenes 0.000 0 N.D. d 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 21) Biphenyl 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthylene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 28) C1-Fluorenes 23.506 180 19212m 0.63 29) C2-Fluorenes 0.000 0 N.D. d 30) C3rbazole 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene 25.895 198 6975m 0.18 3 | | | | | | | |
| 19) C3-Benzothiophenes 0.000 0 N.D. d 20) C4-Benzothiophenes 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 28) C1-Fluorenes 23.506 180 19212m 0.63 29) C2-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 32) 4-Methyldibenzothiophene 25.895 198 6975m 0.18 36) 2/3-Methyldibenzothiophene 26.207 198 4218m 0.11 37) 1-Methyldibenzothiophenes 27.973 21 | | | | | | | |
| 20) C4-Benzothiophenes 0.000 0 N.D. d 22) Biphenyl 0.000 0 N.D. d 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 28) C1-Fluorenes 23.506 180 19212m 0.63 29) C2-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 32) Carbazole 0.000 0 N.D. d 33) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene 25.895 198 6975m 0.18 36) 2/3-Methyldibenzothiophene 26.207 198 4218m 0.11 <td></td> <td></td> <td></td> <td></td> <td>0</td> <td></td> <td></td> | | | | | 0 | | |
| 23) Acenaphthylene 19.171 152 2044m 0.05 24) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 28) C1-Fluorenes 23.506 180 19212m 0.63 29) C2-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 324) Dibenzothiophene 24.406 184 15610m 0.34 35) 4-Methyldibenzothiophene 25.895 198 6975m 0.18 36) 2/3-Methyldibenzothiophene 26.518 198 3243m 0.09 38) C2-Dibenzothiophenes 27.973 212 12391m 0.27 39) C3-Dibenzothiophenes 28.804 226 11392m 0.24 40 | | | 0.000 | | 0 | N.D. d | |
| 24) Acenaphthene 19.700 154 1008m 0.04 25) Dibenzofuran 0.000 0 N.D. d 26) Fluorene 21.538 166 54996m 1.82 27) 1-Methylfluorene 0.000 0 N.D. d 28) C1-Fluorenes 23.506 180 19212m 0.63 29) C2-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 31) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene 24.406 184 15610m 0.34 35) 4-Methyldibenzothiophene 25.895 198 6975m 0.18 36) 2/3-Methyldibenzothiophene 26.207 198 4218m 0.11 37) 1-Methyldibenzothiophene 26.518 198 3243m 0.09 38) C2-Dibenzothiophenes 27.973 212 12391m 0.27 39) C3-Dibenzothiophenes 28.804 226 11392m 0.24 40) C4-Dibenzothiophenes 0.000 0 N.D. d 41) Phenanthrene 24.822 178 258279m <td></td> <td></td> <td>0.000</td> <td></td> <td></td> <td></td> <td></td> | | | 0.000 | | | | |
| 25)Dibenzofuran0.0000N.D. d26)Fluorene21.53816654996m1.8227)1-Methylfluorene0.0000N.D. d28)C1-Fluorenes23.50618019212m0.6329)C2-Fluorenes0.0000N.D. d30)C3-Fluorenes0.0000N.D. d33)Carbazole0.0000N.D. d34)Dibenzothiophene24.40618415610m0.3435)4-Methyldibenzothiophene25.8951986975m0.1836)2/3-Methyldibenzothiophene26.2071984218m0.1137)1-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 26)Fluorene21.53816654996m1.8227)1-Methylfluorene0.0000N.D. d28)C1-Fluorenes23.50618019212m0.6329)C2-Fluorenes0.0000N.D. d30)C3-Fluorenes0.0000N.D. d33)Carbazole0.0000N.D. d34)Dibenzothiophene24.40618415610m0.3435)4-Methyldibenzothiophene25.8951986975m0.1836)2/3-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | 154 | | | |
| 27)1-Methylfluorene0.0000N.D. d28)C1-Fluorenes23.50618019212m0.6329)C2-Fluorenes0.0000N.D. d30)C3-Fluorenes0.0000N.D. d31)Carbazole0.0000N.D. d34)Dibenzothiophene24.40618415610m0.3435)4-Methyldibenzothiophene25.8951986975m0.1836)2/3-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | 5 8 2 | | | |
| 28) C1-Fluorenes 23.506 180 19212m 0.63 29) C2-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 33) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene 24.406 184 15610m 0.34 35) 4-Methyldibenzothiophene 25.895 198 6975m 0.18 36) 2/3-Methyldibenzothiophene 26.207 198 4218m 0.11 37) 1-Methyldibenzothiophene 26.518 198 3243m 0.09 38) C2-Dibenzothiophenes 27.973 212 12391m 0.27 39) C3-Dibenzothiophenes 28.804 226 11392m 0.24 40) C4-Dibenzothiophenes 0.000 0 N.D. d 41) Phenanthrene 24.822 178 258279m 4.59 42) Anthracene 0.000 0 N.D. d | | | | 166 | | | |
| 29) C2-Fluorenes 0.000 0 N.D. d 30) C3-Fluorenes 0.000 0 N.D. d 33) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene 24.406 184 15610m 0.34 35) 4-Methyldibenzothiophene 25.895 198 6975m 0.18 36) 2/3-Methyldibenzothiophene 26.207 198 4218m 0.11 37) 1-Methyldibenzothiophene 26.518 198 3243m 0.09 38) C2-Dibenzothiophenes 27.973 212 12391m 0.27 39) C3-Dibenzothiophenes 28.804 226 11392m 0.24 40) C4-Dibenzothiophenes 0.000 0 N.D. d 41) Phenanthrene 24.822 178 258279m 4.59 42) Anthracene 0.000 0 N.D. d | | | | 100 | | | |
| 30) C3-Fluorenes 0.000 0 N.D. d 33) Carbazole 0.000 0 N.D. d 34) Dibenzothiophene 24.406 184 15610m 0.34 35) 4-Methyldibenzothiophene 25.895 198 6975m 0.18 36) 2/3-Methyldibenzothiophene 26.207 198 4218m 0.11 37) 1-Methyldibenzothiophene 26.518 198 3243m 0.09 38) C2-Dibenzothiophenes 27.973 212 12391m 0.27 39) C3-Dibenzothiophenes 28.804 226 11392m 0.24 40) C4-Dibenzothiophenes 0.000 0 N.D. d 41) Phenanthrene 24.822 178 258279m 4.59 42) Anthracene 0.000 0 N.D. d | | | | 180 | | | |
| 33)Carbazole0.0000N.D. d34)Dibenzothiophene24.40618415610m0.3435)4-Methyldibenzothiophene25.8951986975m0.1836)2/3-Methyldibenzothiophene26.2071984218m0.1137)1-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 34)Dibenzothiophene24.40618415610m0.3435)4-Methyldibenzothiophene25.8951986975m0.1836)2/3-Methyldibenzothiop26.2071984218m0.1137)1-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 35)4-Methyldibenzothiophene25.8951986975m0.1836)2/3-Methyldibenzothiop26.2071984218m0.1137)1-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | 184 | | | |
| 36)2/3-Methyldibenzothiop26.2071984218m0.1137)1-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 37)1-Methyldibenzothiophene26.5181983243m0.0938)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 38)C2-Dibenzothiophenes27.97321212391m0.2739)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 39)C3-Dibenzothiophenes28.80422611392m0.2440)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 40)C4-Dibenzothiophenes0.0000N.D. d41)Phenanthrene24.822178258279m4.5942)Anthracene0.0000N.D. d | | | | | | | |
| 41) Phenanthrene24.822178258279m4.5942) Anthracene0.0000N.D. d | | | | | 0 | | |
| | | | 24.822 | 178 | 258279m | 4.59 | |
| 43) 3-Methylphenanthrene 0.000 0 N.D. d | | | | | | | |
| | 43) | 3-Methylphenanthrene | 0.000 | | 0 | N.D. d | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1643.D Acq On : 18 Aug 2013 1:13 pm Operator : YM Sample : SED-DA-013 (1.0-1.5) Misc : ALS Vial : 36 Sample Multiplier: 0.06636 Quant Time: Sep 05 21:49:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration
 Compound
 R.T. QION Response Conc Units De

 44)
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 45)
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 45)
 2-Methylphenanthrene
 0.000
 0
 N.D. d

 46)
 4/9-Methylphenanthrene
 0.000
 0
 N.D. d

 47)
 1-Methylphenanthrene
 0.000
 0
 N.D. d

 48)
 3,6-Dimethylphenanthrene
 0.000
 0
 N.D. d

 49)
 Retene
 0.000
 0
 N.D. d

 51)
 C2-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 52)
 C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 53)
 Naphthobenzothiophenes
 0.000
 0
 N.D. d

 54)
 C1-Naphthobenzothiophenes
 0.000
 0
 N.D. d

 55)
 Plucranthenes/Pyrenes
 0.000
 0
 N.D. d

 62)
 C4-Hyblfluoranthene
 0.000
 0
 N.D. d

 63)
 C2-Fluoranthenes/Pyrenes</ Compound R.T. QIon Response Conc Units Dev(Min) _ ____

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1643.D Acq On : 18 Aug 2013 1:13 pm Operator : YM Sample : SED-DA-013 (1.0-1.5) Misc : ALS Vial : 36 Sample Multiplier: 0.06636 Quant Time: Sep 05 21:49:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min)

(#) = qualifier out of range (m) = manual integration (+) = signals summed

AR70057.M Fri Sep 13 07:31:36 2013

I,Stb-enerv(s)pyrene-2,Stbread TIC: ARC1643.D\data.ms (QT Reviewed) I,01b-enerv9T,enerv9 nu, zənəriqqidi Ashiroda C2-Dibenzothiophenes.un Quantitation Report Sample Multiplier: 0.06636 PAH Calibration Table-2013A Quant Time: Sep 05 21:49:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M : Sat Aug 17 22:39:35 2013 : Initial Calibration C:\msdchem\2\data\MS70057\ C1-Fluorenes,un md 1,01b-9n996676ul7 (1.0-1.5)1:13Acenaphthylene.T Acenaphthylene.a10.S C3-Naphthalenes.un C2-Naphthalenes,un 18 Aug 2013 SED-DA-013 Lanalshingsniynsem-r T,analshingsniynsem-r ARC1643.D 2,8b-9094619164644466V 36 WX •• QLast Update Response via •• ••• ., Title Data Path Data File Operator ALS Vial Acq On 3500000 Sample Abundance 500000 5500000 5000000 4500000 4000000 3000000 2500000 2000000 1500000 1000000 Quant Misc

07:31:38 2013)57.M Fri Sep 13 245

Page:

4

56.00 58.00 60.00

54.00

52.00

34.00 36.00 38.00 40.00 42.00 44.00 46.00 48.00 50.00

32.00

30.00

28.00

26.00

24.00

22.00

16.00 18.00 20.00

10.00 12.00 14.00

^__

10

N N

F

Tissues, Sediments and Water PAH Report (use Phenanthrene-d10 as surrogate correction)

-

| Data File Name | ARC1644.D | Surrogate/Internal Multiplier Factor: | 1.00 | |
|-------------------|---|---------------------------------------|---------|----|
| Data File Path | C:\msdchem\2\data\MS70057\ | AR-WKSU-2500-001: | (ng/mL) | |
| Operator | (a) Solution of the second state of the sec | Naphthalene-d8 | 250.125 | |
| | 8/18/2013 14:22 | Acenaphthene-d10 | 250.163 | |
| Acq. Method File | PAH-2012.M | Phenanthrene-d10 | 250.194 | |
| | SED-DA-013 (1.0-1.5) | Chrysene-d12 | 250.038 | |
| Misc Info | 승규는 그는 것이 가지 않는 것이 좀 가지 않는 것이 같은 것이 같은 것이 같은 것이 같이 | Perylene-d12 | 250.031 | |
| Instrument Name | GCMSD | 5(b)H-Cholane | 250.000 | SE |
| Vial Number | 37 | | | |
| Sample Multiplier | 0.06645 | | | |
| Sample Amount | 0 | | | |
| | | | | |

Copy data below to Spread Sheet

ARC1644.D SED-DA-013 (1.0-1.5) 8/18/2013 PAH-2012.M 15.04890895

| Sample Amount | 0 | | | | |
|--|------------------------------|---------------|-----------------|------------------|------------------|
| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
| | compound nume | (minute) | (area) | | Concentration |
| 3) | cis/trans Decalin | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 6) | C3-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 7) | C4-Decalins | 0.00 | 0 | 0.0000 | 0.0000 |
| 8) | Naphthalene | 13.88 | 34825 | 0.8928 | 1.2260 |
| 9)+10) | C1-Naphthalenes | 16.30 | 48427 | 1.2416 | 1.7049 |
| 13) | C2-Naphthalenes | 18.25 | 96319 | 2.4694 | 3.3909 |
| 14) | C3-Naphthalenes | 20.15 | 57997 | 1.4869 | 2.0418 |
| 15) | C4-Naphthalenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 16) | Benzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| 17) | C1-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Benzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.89261 | Biphenyl | 0.00 | 0 | 0.0000 | 0.0000 |
| | Acenaphthylene | 19.17 | 1506 | 0.0396 | 0.0543 |
| | Acenaphthene | 19.70 | 3897 | 0.1793 | 0.2462 |
| 1.1 | Dibenzofuran | 0.00 | 0 118374 | 0.0000 | 0.0000 5.5669 |
| | Fluorene | 21.54 | 38204 | 4.0540 1.3084 | 1.7966 |
| | C1-Fluorenes | 23.51 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Fluorenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Fluorenes Carbazole | 0.00 | ő | 0.0000 | 0.0000 |
| | Anthracene | 0.00 | ő | 0.0000 | 0.0000 |
| 0.77 | Phenanthrene | 24.82 | 588890 | 10.8540 | 14.9046 |
| Contraction and a second se | C1-Phenanthrenes/Anthracenes | 26.72 | 206599 | 3.8079 | 5.2290 |
| | C2-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Phenanthrenes/Anthracenes | 0.00 | õ | 0.0000 | 0.0000 |
| | C4-Phenanthrenes/Anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzothiophene | 24.41 | 20280 | 0.4522 | 0.6209 |
| and the second | C1-Dibenzothiophenes | 26.21 | 16544 | 0.3689 | 0.5065 |
| | C2-Dibenzothiophenes | 27.38 | 19440 | 0.4334 | 0.5952 |
| 1.513 | C3-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 15.55 | C4-Dibenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 5323 A | Fluoranthene | 28.91 | 65995 | 1.3492 | 1.8527 |
| 59) | Pyrene | 29.70 | 2217 | 0.0349 | 0.0479 |
| 62) | C1-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 63) | C2-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 64) | C3-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 65) | C4-Fluoranthenes/Pyrenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Naphthobenzothiophene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C2-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C4-Naphthobenzothiophenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benz(a)anthracene | 33.81 | 2651 | 0.0459 | 0.0631 |
| | Chrysene/Triphenylene | 33.89 0.00 | 1134 0 | 0.0232 0.0000 | 0.0319 0.0000 |
| | C1-Chrysenes | | 0 | 0.0000 | 0.0000 |
| | C2-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1/22023 | C3-Chrysenes C4-Chrysenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluoranthene | 0.00 | õ | 0.0000 | 0.0000 |
| | Benzo(k,j)fluoranthene | 0.00 | õ | 0.0000 | 0.0000 |
| | Benzo(a)fluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.11 (2.11) | Benzo(e)pyrene | 0.00 | ő | 0.0000 | 0.0000 |
| | Benzo(a)pyrene | 0.00 | õ | 0.0000 | 0.0000 |
| 10.51 | Perylene | 0.00 | õ | 0.0000 | 0.0000 |
| 1.2.2.2.2.2 | Indeno(1,2,3-c,d)pyrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Dibenzo(a,h)anthracene | 0.00 | 0 | 0.0000 | 0.0000 |
| | C1-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| 1.257 | C2-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | C3-Dibenzo(a,h)anthracenes | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(g,h,i)perylene | 0.00 | 0 | 0.0000 | 0.0000 |
| | | | | | |

| # | Compound Name | Ret Time | Target Response | Concentration | Su. Corrected |
|----------|--------------------------------------|------------|-----------------|---------------|---------------|
| | | (minute) | (area) | | Concentration |
| | Individual Alkyl Isomers and Hopanes | | | | |
| 9) | 2-Methylnaphthalene | 16.13 | 34625 | 1.4087 | 1.9345 |
| 10) | 1-Methylnaphthalene | 16.47 | 13802 | 0.6079 | 0.8347 |
| 11) | 2,6-Dimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 12) | 1,6,7-Trimethylnaphthalene | 0.00 | 0 | 0.0000 | 0.0000 |
| 27) | 1-Methylfluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 35) | 4-Methyldibenzothiophene | 25.90 | 9939 | 0.2718 | 0.3732 |
| 36) | 2/3-Methyldibenzothiophene | 26.21 | 4586 | 0.1254 | 0.1722 |
| 37) | 1-Methyldibenzothiophene | 26.52 | 2019 | 0.0552 | 0.0758 |
| 43) | 3-Methylphenanthrene | 26.48 | 30681 | 0.9128 | 1.2535 |
| 44) | 2-Methylphenanthrene | 26.59 | 34817 | 1.0359 | 1.4225 |
| 1.005 | 2-Methylanthracene | 26.73 | 103206 | 3.0706 | 4.2165 |
| 2015/F | 4/9-Methylphenanthrene | 26.86 | 18398 | 0.5474 | 0.7517 |
| 122312 | 1-Methylphenanthrene | 26.93 | 19497 | 0.5801 | 0.7966 |
| 10 State | 3,6-Dimethylphenanthrene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Retene | 0.00 | 0 | 0.0000 | 0.0000 |
| | 2-Methylfluoranthene | 0.00 | 0 | 0.0000 | 0.0000 |
| | Benzo(b)fluorene | 0.00 | 0 | 0.0000 | 0.0000 |
| 100.00 | C29-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 1000 | 18a-Oleanane | 0.00 | 0 | 0.0000 | 0.0000 |
| | C30-Hopane | 0.00 | 0 | 0.0000 | 0.0000 |
| 0.07 | C20-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | C21-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10.000 | C26(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 2.00 | C26(20R)/C27(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 10007 | C28(20S)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 2028 | C27(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| 2,02,05 | C28(20R)-TAS | 0.00 | 0 | 0.0000 | 0.0000 |
| | Surrogate Standards | 1701-710 V | | | |
| 21 | Naphthalene-d8 | 13.82 | 465873 | 13.33 | 80.20 |
| | Acenaphthene-d10 | 19.67 | 166852 | 8.30 | 49.96 |
| 10000 | Phenanthrene-d10 | 24.75 | 525064 | 12.11 | 72.82 |
| | Chrysene-d12 | 33.81 | 695772 | 14.66 | 88.21 |
| | Pervlene-d12 | 38.70 | 733 | 0.02 | 0.10 |
| | 5(b)H-Cholane | 34.24 | 111709 | 14.94 | 89.95 |
| 55) | Internal Standards | | | | |
| 1) | Fluorene-d10 | 21.45 | 344521 | 16.68 | |
| | Pyrene-d10 | 29.63 | 715299 | 16.65 | |
| | Benzo(a)pyrene-d12 | 38.39 | 627035 | 16.63 | |

| Data File : ARC Acq On : 18 Operator : YM Sample : SED Misc : ALS Vial : 37 Quant Time: Sep Quant Method : Quant Title : QLast Update : | msdchem\2\data\MS 1644.D Aug 2013 2:22 p D-DA-013 (1.0-1.5) Sample Multipli 05 21:57:14 2013 C:\GCMS7\MS70057 PAH Calibration T Sat Aug 17 22:39: Initial Calibrati | om Ler: 0.06 AR70057. Table-201 35 2013 | М | | | | |
|--|--|---|-------------|-----------------|--------------|-----------|------|
| Compoun | d | R.T. | QIon | Response | Conc Un | its Dev(N | 4in) |
| | | | | | | | |
| Internal Stand | ards d10 | 21 455 | 176 | 344521m | 251 05 | | 0.00 |
| 31) Pvrene-d1 | 0 | 29.635 | 212 | 715299m | 250.63 | | 0.00 |
| 73) Benzo(a)p | d10 0 yrene-d12 | 38.386 | 264 | 627035m | 250.32 | | 0.00 |
| | | | | | | | |
| System Monitor 2) Naphthale | ing Compounds ne-d8 ene-d10 ene-d10 d12 d12 lane | 13.822 | 136 | 465873m | 13.33 | (| 0.00 |
| 21) Acenaphth | ene-d10 | 19.672 | 164 | 166852m | 8.30 | (| 0.00 |
| 32) Phenanthr | ene-d10 | 24.752 | 188 | 525064m | 12.11 | (| 0.00 |
| 66) Chrysene- | d12 | 33.809 | 240 | 695772m | 14.66 | - (| 0.04 |
| 88) Perylene- | dl2 Jane | 38.697 | 264 | 733m 111709m | 14 94 | (| 0.00 |
| 50) 5(D)H-CHO | Talle | 54.255 | 211 | 111/05/11 | 11.71 | | |
| Target compound | | | | | | Qva. | lue |
| | Decalin | 0.000 0.000 0.000 | | 0 | N.D. N.D. | d | |
| 4) C1-Decali 5) C2-Decali | ns | 0.000 | | 0 | N.D. N.D. | д Д | |
| 6) C3-Decali | ns | 0.000 | | õ | N.D. | d | |
| 7) C4-Decali | ns ns | 0.000 | | 0 | N.D. | d | |
| 8) Naphthale | ne | 13.878 | 128 | 34825m | 0.89 | | |
| 9) 2-Methyln | aphthalene | 16.134 | 142 | 34625m | 1.41 | | |
| 10) 1-Methylm | aphthalene | 0 000 | 142 | 1380211 | | d | |
| 12) 1,6,7-Tri | hylnaphthalene methylnaphtha | 0.000 | | 0 | N.D. N.D. | d | |
| 13) C2-Naphth | | 18.251 | 156 | 96319m | 2.47 | | |
| 14) C3-Naphth | alenes | 20.146 | 170 | 57997m | 1.49 | | |
| 15) C4-Naphth | | 0.000 | | 0 | N.D. | | |
| 16) Benzothio 17) Cl-Benzot | | 0.000 | | 0 | N.D. N.D. | | |
| 18) C2-Benzot | | 0.000 | | õ | N.D. | | |
| 19) C3-Benzot | | 0.000 | | 0 | N.D. | | |
| 20) C4-Benzot | hiophenes | 0.000 | | 0 | N.D. | | |
| 22) Biphenyl | | 0.000 | 150 | 0 | N.D. | d | |
| 23) Acenaphth 24) Acenaphth | | 19.171 19.700 | 152 154 | 1506m 3897m | 0.04 0.18 | | |
| 25) Dibenzofu | | 0.000 | 101 | 0 | N.D. | d | |
| 26) Fluorene | | 21.538 | 166 | 118374m | 4.05 | | |
| 27) 1-Methylf | | 0.000 | | 0 | N.D. | d | |
| 28) C1-Fluore 29) C2-Fluore | | 23.506 | 180 | 38204m | 1.31 N D | 4 | |
| 30) C3-Fluore | | 0.000 | | 0 | N.D. N.D. | | |
| 33) Carbazole | | 0.000 | | 0 | N.D. | | |
| 34) Dibenzoth | | 24.406 | 184 | 20280m | 0.45 | | |
| | ibenzothiophene | 25.895 | 198 | 9939m | 0.27 | | |
| | ldibenzothiop ibenzothiophene | 26.207 26.518 | 198 198 | 4586m 2019m | 0.13 0.06 | | |
| 38) C2-Dibenz | | 27.384 | 212 | 19440m | 0.43 | | |
| 39) C3-Dibenz | | 0.000 | ्या संस्थित | 0 | N.D. | d | |
| 40) C4-Dibenz | othiophenes | 0.000 | | 0 | N.D. | | |
| 41) Phenanthr | | 24.822 | 178 | 588890m | 10.85 | -7 | |
| 42) Anthracen 43) 3-Methylp | | 0.000 26.484 | 192 | 0 30681m | N.D. 0.91 | a | |
| TO, 2-Meenyip | nonument ene | 20.101 | 174 | 2000111 | 0.91 | | |

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1644.D Acq On : 18 Aug 2013 2:22 pm Operator : YM Sample : SED-DA-013 (1.0-1.5) Misc 31 ALS Vial : 37 Sample Multiplier: 0.06645 Quant Time: Sep 05 21:57:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration
 Compound
 R.T. QION Response Conc Units

 44) 2-Methylphenanthrene
 26.588
 192
 34817m
 1.04

 44) 2-Methylphenanthrene
 26.726
 192
 103206m
 3.07

 46) 4/9-Methylphenanthrene
 26.865
 192
 19398m
 0.55

 47) 1-Methylphenanthrene
 26.934
 192
 19497m
 0.58

 48) 3,6-Dimethylphenanthrenes/Anthr...
 0.000
 0
 N.D. d

 50
 C2-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 51
 C3-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 52
 C4-Phenanthrenes/Anthr...
 0.000
 0
 N.D. d

 53
 Naphthobenzothiophenes
 0.000
 0
 N.D. d

 54
 C1-Maphthobenzothiophenes
 0.000
 0
 N.D. d

 59
 Pyrene
 29.704
 202
 2217m
 0.03

 61
 Benzo(b)fluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 62
 C1-Fluoranthenes/Pyrenes
 0.000
 0
 N.D. d

 R.T. QION Response Conc Units Dev(Min) Compound

Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1644.D Acq On : 18 Aug 2013 2:22 pm Operator : YM Sample : SED-DA-013 (1.0-1.5) Misc : ALS Vial : 37 Sample Multiplier: 0.06645 Quant Time: Sep 05 21:57:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration (#) = qualifier out of range (m) = manual integration (+) = signals summed

| - |
|--------|
| - |
| lewed |
| Φ |
| 2 |
| in |
| U. |
| H- |
| 5 |
| in |
| 2 |
| щ |
| EQ. |
| EH. |
| N |
| \sim |
| \sim |
| Report |
| C |
| 2 |
| 0 |
| 1 |
| L |
| m |
| cation |
| |
| - |
| μ |
| đ |
| a l |
| 12 |
| Juan |
| |

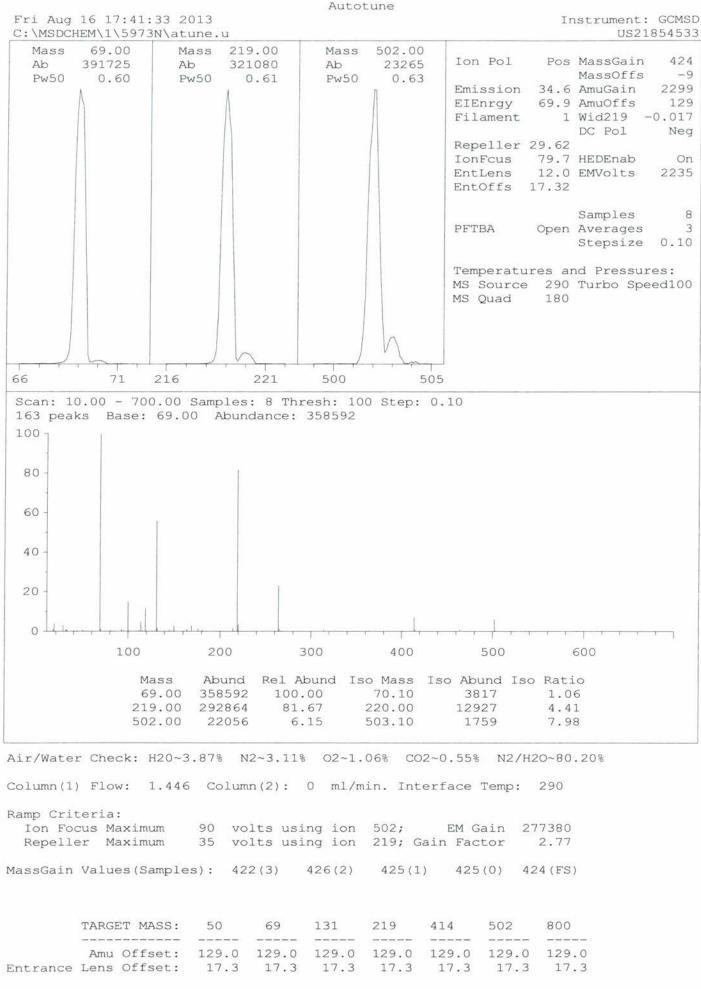
Sample Multiplier: 0.06645 Quant Time: Sep 05 21:57:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Data Path : C:\msdchem\2\data\MS70057\ Data File : ARC1644.D 2:22 pm SED-DA-013 (1.0-1.5) 18 Aug 2013 ΜХ : 37 .. Operator ALS Vial Acq On Sample Misc

| | | Piberyolenes.un Diberyoliophenes.un Diberyoliophenes.un C2-Fluorentiophenes.un C2-Diberzothiophenes.un Fusionergenergenenes.un Fluorantinene.T Pyrene,TPyrene-d10,1 Benyfene-d12,3)pyrene-d12,1 Benyfene-d12,3)pyrene-d12,1 |
|--|--|--|
| | | FElleteneeneerta - Felleteneerta - Acenaphtinalenee, T - Acenaphtinalenes, un - C2-Naphthalenes, un |

Polycyclic Aromatic Hydrocarbon Initial Calibration Data and Initial Calibration Verification Data

PAH ICAL AR 70057.M

GC/MS 7 (PAH-2012)



MS Foary 254

| Me Ti La | Method Path : C:\GCMS7\MS70057\ Method File : AR70057.M Title : PAH Calibration Table-2013A Last Update : Sat Aug 17 22:39:35 2013 Response Via : Initial Calibration | | | | | | | | | |
|----------------|---|--|--------|-------|-------|---------|-------|---------|--------|----------------|
| Ca 1 6 | =M | ation Files S70057B.D 2 =MS' S70057G.D | 70057C | .D 3 | =MS7(| 0057D.1 | D 4 | =MS70 | 057E.D | 5 =MS70057F.D |
| | | Compound | 1 | 2 | 3 | 4 | 5 | 6 | Avg | %RSD |
| 1) | т | Fluorene-d10 | | | | TSTI | 7 | | | |
| 2) | S | Naphthalene-d8 | 2.026 | 1.682 | 1.564 | 1.610 | 1.626 | 1.645 | 1.692 | 9.95 |
| | Т | cis/trans Decalin | 0.304 | 0.297 | 0.282 | 0.285 | 0.288 | 0.284 | 0.290 | 3.00 |
| | un | C1-Decalins C2-Decalins C3-Decalins | 0.304 | 0.297 | 0.282 | 0.285 | 0.288 | 0.284 | 0.290 | 3.00 |
| 5) | un | C2-Decalins | 0.304 | 0.297 | 0.282 | 0.285 | 0.288 | 0.284 | 0.290 | 3.00 |
| 6) | un | C3-Decalins | 0.304 | 0.297 | 0.282 | 0.285 | 0.288 | 0.284 | 0.290 | 3.00 |
| | un | C4-Decalins | 0.304 | 0.297 | 0.282 | 0.285 | 0.288 | 0.284 | 0.290 | 3.00 |
| 8) | т | Naphthalene 2-Methylnaphth | 2.262 | 1.877 | 1.753 | 1.798 | 1.814 | 1.829 | 1.889 | 9.91 |
| 9) | т | 2-Methylnaphth | 1.420 | 1.181 | 1.098 | 1.131 | 1.149 | 1.162 | 1.190 | 9.76 |
| | | 1-Methylnaphth | | | | | | | | |
| | Т | 2,6-Dimethylna | 1.320 | 1.101 | 1.030 | 1.069 | 1.079 | 1.103 | 1.117 | 9.21 |
| 12) | | 1,6,7-Trimethy | | | | | | | | |
| 13) | un | C2-Naphthalenes C3-Naphthalenes | 2.262 | 1.877 | 1.753 | 1.798 | 1.814 | 1.829 | 1.889 | 9.91 |
| 14) | un | C3-Naphthalenes C4-Naphthalenes | 2.262 | 1.8// | 1.753 | 1.798 | 1.814 | 1.829 | 1.889 | 9.91 9.91 |
| 15) | un T | C4-Naphthalenes | 2.202 | 1.8// | 1 424 | 1.798 | 1 /02 | 1 / 929 | 1 541 | 9.77 |
| 17) | 1 11m | Benzothiophene Cl-Benzothioph | 1 842 | 1 529 | 1 434 | 1 467 | 1 483 | 1 492 | 1 541 | 9.77 |
| 18) | | C2-Benzothioph | | | | | | | | |
| 19) | | C3-Benzothioph | | | | | | | | |
| 20) | | C4-Benzothioph | | | | | | | | |
| 21) | | Acenaphthene-d10 | | | | | | | | |
| 22) | | Biphenyl | 1.916 | 1.610 | 1.500 | 1.549 | 1.554 | 1.580 | 1.618 | 9.28 |
| 23) | | Biphenyl Acenaphthylene | 2.132 | 1.768 | 1.660 | 1.744 | 1.814 | 1.945 | 1.844 | 9.18 |
| 24) | Т | Acenaphthene | 1.250 | 1.032 | 0.970 | 1.007 | 1.026 | 1.030 | 1.052 | 9.46 |
| 25) | т | Dibenzofuran Fluorene | 2.087 | 1.769 | 1.666 | 1.716 | 1.723 | 1.782 | 1.790 | 8.42 |
| 26) | Т | Fluorene | 1.654 | 1.389 | 1.304 | 1.363 | 1.375 | 1.399 | 1.414 | 8.63 |
| 27) | | 1-Methylfluorene | | | | | | | | |
| 28) | | C1-Fluorenes | | | | | | | 1.414 | |
| 29) | | C2-Fluorenes | 1.654 | | 1.304 | | | | | 8.63 |
| 30) | un | C3-Fluorenes | 1.654 | 1.389 | 1.304 | 1.363 | 1.375 | 1.399 | 1.414 | 8.63 |
| 31) | I | Pyrene-d10 | | | | | | | | |
| 32) | S | Phenanthrene-d10 | | | | | | | | |
| 33) | | | | | | | | | 0.962 | |
| 34) | | Dibenzothiophene | | | | | | | | |
| 35) | | 4-Methyldibenz | | | | | | | | 6.66 |
| 36) | | 2/3-Methyldibe | | | | | | | | 6.66 |
| 37) | | 1-Methyldibenz C2-Dibenzothio | | | | | | | | 6.66 |
| 38) | | C3-Dibenzothio | | | | | | | | 11.67 11.67 |
| 39) 40) | | C4-Dibenzothio | | | | | | | | 11.67 |
| 41) | | Phenanthrene | | | | | | | | 7.54 |
| 42) | | Anthracene | 1.285 | 1.139 | 1.063 | 1.145 | 1.205 | 1.192 | 1.171 | |
| 43) | | 3-Methylphenan | 0.881 | 0.776 | 0.722 | 0.766 | 0.788 | 0.762 | 0.783 | 6.80 |
| 44) | | 2-Methylphenan | | | | | | | | |
| 45) | | 2-Methylanthra | | | | | | | | 6.80 |
| 46) | | 4/9-Methylphen | | | | | | | | 6.80 |
| 47) | | 1-Methylphenan | 0.881 | 0.776 | 0.722 | 0.766 | 0.788 | 0.762 | 0.783 | 6.80 |
| 48) | | 3,6-Dimethylph | | | | | | | | 10.88 |
| 49) | | Retene | | | | | | | | 10.77 |
| 50) | | C2-Phenanthren | | | | | | | | 7.54 |
| 51) | | C3-Phenanthren | | | | | | | | 7.54 |
| 52) | | C4-Phenanthren | | | | | | | | |
| 53) | Т | Naphthobenzoth | 1.535 | 1.314 | 1.210 | 1.283 | 1.296 | 1.190 | 1.305 | 9.45 |

| | | Path : C:\GCMS7\M | S70057 | \ | | | | | | |
|-------|--------|--|--------|-------|-------|-------|-------|-------|-------|-------|
| | | File : AR70057.M | | | | | | | | |
| | tle | : PAH Calibrat | | | | | | | | |
| | | C1-Naphthobenz | | | | | | | | 9.45 |
| | | C2-Naphthobenz | | | | | | | | 9.45 |
| | un | C3-Naphthobenz | | | | | | | | 9.45 |
| - N. | un | C4-Naphthobenz | | | | | | | | 9.45 |
| 58) | | Fluoranthene | 1.366 | 1.126 | 1.032 | 1.072 | 1.093 | 1.144 | 1.139 | 10.36 |
| 59) | т | Pyrene 2-Methylfluora | 1.817 | 1.528 | 1.390 | 1.439 | 1.469 | 1.235 | 1.480 | 13.02 |
| | | | | | | | | | | 11.07 |
| 61) | | Benzo(b)fluorene | | | | | | | | 12.27 |
| 62) | un | Cl-Fluoranthen | | | | | | | | 10.36 |
| 63) | un | C2-Fluoranthen | 1.366 | 1.126 | 1.032 | 1.072 | 1.093 | 1.144 | 1.139 | 10.36 |
| 64) | un | C3-Fluoranthen | | | | | | | | 10.36 |
| 65) | un | C4-Fluoranthen | 1.366 | 1.126 | 1.032 | 1.072 | 1.093 | 1.144 | 1.139 | 10.36 |
| 66) | S | Chrysene-d12 | 1.309 | 1.136 | 1.052 | 1.115 | 1.087 | 0.932 | 1.105 | 11.14 |
| 67) | | Benz(a)anthracene | 1.607 | 1.358 | 1.261 | 1.329 | 1.310 | 1.197 | 1.344 | 10.48 |
| 68) | т | Chrysene/Triph | 1.347 | 1.153 | 1.064 | 1.093 | 1.106 | 1.062 | 1.138 | 9.49 |
| 69) | un | C1-Chrysenes | 1.347 | 1.153 | 1.064 | 1.093 | 1.106 | 1.062 | 1.138 | 9.49 |
| 70) | un | Chrysene/Triph Cl-Chrysenes C2-Chrysenes | 1.347 | 1.153 | 1.064 | 1.093 | 1.106 | 1.062 | 1.138 | 9.49 |
| 71) | un | C3-Chrysenes C4-Chrysenes | 1.347 | 1.153 | 1.064 | 1.093 | 1.106 | 1.062 | 1.138 | 9.49 |
| 72) | un | C4-Chrysenes | 1.347 | 1.153 | 1.064 | 1.093 | 1.106 | 1.062 | 1.138 | 9.49 |
| | | | | | | | | | | |
| 73) | I | Benzo(a)pyrene-dl2 | 2 | | | ISTI |) | | | |
| 74) | | C29-Hopane | | | | | | | | |
| 75) | | 18a-Oleanane | 0.358 | 0.395 | 0.350 | 0.378 | 0.363 | 0.383 | 0.371 | 4.54 |
| 76) | Т | C30-Hopane | 0.358 | 0.395 | 0.350 | 0.378 | 0.363 | 0.383 | 0.371 | 4.54 |
| | т | C30-Hopane Benzo(b)fluora | 1.609 | 1.441 | 1.275 | 1.342 | 1.351 | 1.326 | 1.391 | 8.61 |
| 78) | | Benzo(k,j)fluo | | | | | | | | |
| 10000 | | Benzo(a)fluora | | | | | | | | 13.35 |
| 80) | Т | Benzo (e) pyrene | 1.519 | 1.300 | 1.147 | 1.165 | 1.191 | 1.366 | 1.281 | 11.25 |
| 81) | Т | Benzo(e)pyrene Benzo(a)pyrene | 1.488 | 1.284 | 1.144 | 1.153 | 1.198 | 1.283 | 1.258 | 10.15 |
| 82) | | Indeno(1,2,3-c | | | | | | | | 10.19 |
| 83) | | Dibenzo(a, h) an | | | | | | | | 10.40 |
| 84) | | Cl-Dibenzo(a,h | | | | | | | | 10.40 |
| 85) | | C2-Dibenzo(a,h | | | | | | | | 10.40 |
| 86) | | C3-Dibenzo(a,h | | | | | | | | 10.40 |
| 87) | | Benzo(g,h,i)pe | | | | | | | | 11.20 |
| | | | | | | | | | | 13.16 |
| 89) | D T | Perylene-d12 Perylene | 1 502 | 1 206 | 1 167 | 1 170 | 1 205 | 1 220 | 1 202 | 9.94 |
| 90) | C | Perylene 5(b)H-Cholane | 0 251 | 0.206 | 0 176 | 0 170 | 1.205 | 1.329 | 1.202 | |
| | | C20-TAS | | | | | | | | 14.38 |
| 91) | | | | 1.445 | | | | | | 11.45 |
| 92) | 200223 | | | | | | | | | 11.45 |
| 93) | | | | 1.445 | | | | | | 11.45 |
| | | C26(20R)/C27(2 | | | | | | | | 11.45 |
| 95) | | | | 1.445 | | | | | | 11.45 |
| 96) | un | C27 (20R) - TAS | 1.703 | 1.445 | 1.268 | 1.286 | 1.325 | 1.444 | 1.412 | 11.45 |
| | | C28(20R)-TAS | | | | | | | | 11.45 |
| | | | | | | | | | | |

(#) = Out of Range

Data Path : C:\GCMS7\MS70057\ Data File : MS70057B.D Acq On : 16 Aug 2013 10:23 pm Operator : YM Sample : AR-WKC1-020-030 Misc : ALS Vial : 2 Sample Multiplier: 1 Quant Time: Aug 17 19:41:36 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 19:24:04 2013 Response via : Initial Calibration Compound R.T. QION Response Conc Units Dev(Min) ______ Internal Standards 1) Fluorene-dl021.455176441596m251.0531) Pyrene-dl029.635212832419m250.6373) Benzo(a)pyrene-dl238.387264992147m250.32 0.00 0.00 0.00 System Monitoring Compounds 2) Naphthalene-d813.82213671327m24.260.0021) Acenaphthene-d1019.67216441558m24.470.0032) Phenanthrene-d1024.75218880804m24.220.0066) Chrysene-d1233.80924086976m23.82-0.0488) Perylene-d1238.697264117525m25.700.0090) 5 (b) H-Cholane34.23621719876m25.690.00

 90)
 5 (b) H-Cholane
 34.236
 217
 19876m
 25.69

 Target Compounds
 3
 cis/trans Decalin
 11.176
 138
 10580m
 30.38

 4)
 C1-Decalins
 0.000
 0
 N.D. d

 5)
 C2-Decalins
 0.000
 0
 N.D. d

 6)
 C3-Decalins
 0.000
 0
 N.D. d

 7)
 C4-Decalins
 0.000
 0
 N.D. d

 9)
 2-Methylnaphthalene
 16.134
 142
 50012m
 23.97

 101
 H-Methylnaphthalene
 18.224
 156
 46438m
 23.64

 12)
 1,6,7-Trimethylnaphthal...
 21.093
 170
 41409m
 23.88

 31)
 C2-Naphthalenes
 0.000
 0
 N.D. d

 16)
 C4-Naphthalenes
 0.000
 0
 N.D. d

 17)
 C1-Benzothiophene
 14.045
 134
 64402m
 23.90

 17)
 C1-Benzothiophenes
 0.000
 0
 N.D. d

 18)
 C2-Benzothiophenes
 0.000
 0
 N.D. d

 20)
 Edenzoth Target Compounds Qvalue

| Data Path : C:\GCMS7\MS70057\ Data File : MS70057B.D Acq On : 16 Aug 2013 10:23 Operator : YM Sample : AR-WKC1-020-030 Misc : ALS Vial : 2 Sample Multipl: Quant Time: Aug 17 19:41:36 20: Quant Method : C:\GCMS7\MS7005 Quant Title : PAH Calibration QLast Update : Sat Aug 17 19:24 | ier: 1 13 7\AR70057 Table-203 | | | | |
|---|---|------|-------------------|--------------------|-----|
| Response via : Initial Calibrat Compound | | OIon | Response | Conc Units Dev(Mir | 1) |
| | | | | | . – |
| 43) 3-Methylphenanthrene | | | 0 | N.D. d | |
| 44) 2-Methylphenanthrene | 0.000 | | 0 | N.D. d | |
| 45) 2-Methylanthracene46) 4/9-Methylphenanthrene | 0.000 | | 0 | N.D. d | |
| 46) 4/9-Methylphenanthrene | 0.000 | | 0 | N.D. d | |
| 47) 1-Methylphenanthrene | | | | | |
| 48) 3,6-Dimethylphenanthrene | 28.042 | 206 | 53917m | 24.24 | |
| 49) Retene | 30.708 | 234 | 26302m | 21.50 | |
| 50) C2-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. d | |
| 51) C3-Phenanthrenes/Anthr | | | 0 | N.D. d | |
| 52) C4-Phenanthrenes/Anthr | | | 0 | N.D. d | |
| 53) Naphthobenzothiophene | 32.955 | 234 | | 23.86 | |
| 54) Cl-Naphthobenzothiophenes | s 0.000 | | 0 | N.D. d | |
| 55) C2-Naphthobenzothiophenes | | | 0 | N.D. d | |
| 56) C3-Naphthobenzothiophenes | | | 0 | N.D. d | |
| 57) C4-Naphthobenzothiophenes | | | 0 | N.D. d | |
| 58) Fluoranthene | 28.942 | 202 | 90812m 120692m | 24.09 | |
| 59) Pyrene | | | | | |
| 60) 2-Methylfluoranthene | | | | | |
| 61) Benzo(b)fluorene | | | 63790m | | |
| 62) C1-Fluoranthenes/Pyrenes63) C2-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d N.D. d | |
| 64) C3-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d | |
| 65) C4-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d | |
| 67) Benz(a)anthracene | 33 770 | 228 | | | |
| | 33.886 | 228 | 106512m 88943m | 24.44 | |
| 68) Chrysene/Triphenylene 69) Cl-Chrysenes | 0.000 | | | N.D. d | |
| 70) C2-Chrysenes | 0.000 | | 0 | N.D. d | |
| 71) C3-Chrysenes | 0.000 | | 0 | N.D. d | |
| 72) C4-Chrysenes | 0.000 | | 0 | N.D. d | |
| 74) C29-Hopane | 0.000 | | 0 | N.D. d | |
| 75) 18a-Oleanane | 0.000 | | 0 | N.D. d | |
| 76) C30-Hopane | 42.783 | 191 | 28355m | 17.91 | |
| 77) Benzo(b)fluoranthene | 37.339 | 252 | 127824m | 28.60 | |
| 78) Benzo(k,j)fluoranthene | 37.417 | 252 | 101812m | 24.59 | |
| 79) Benzo(a)fluoranthene | 0.000 | | 0 | N.D. d | |
| 80) Benzo(e)pyrene | 38.309 | 252 | 119931m | 24.03 | |
| 81) Benzo(a)pyrene | 38.464 | 252 | 117686m | | |
| 82) Indeno(1,2,3-c,d)pyrene | 43.189 | | 145853m | 23.31 | |
| 83) Dibenzo(a,h)anthracene | | 278 | 118563m | 23.59 | |
| 84) Cl-Dibenzo(a,h)anthrac | | | 0 | N.D. d | |
| 85) C2-Dibenzo(a,h)anthrac | | | 0 | N.D. d | |
| 86) C3-Dibenzo(a,h)anthrac | | 076 | 0 | N.D. d | |
| 87) Benzo(g,h,i)perylene | 44.553 | 276 | 131608m | 24.11 | |
| 89) Perylene | 38.775 | 252 | 119231m | 23.35 ND d | |
| 91) C20-TAS 92) C21-TAS | 0.000 | | 0 | N.D. d | |
| 93) C26(20S)-TAS | 0.000 | | 0 | N.D. d | |
| 94) C26(20R)/C27(20S)-TAS | 0.000 39.434 | 231 | 134983m | N.D. d 24.13 | |
| 95) C28(208)-TAS | 0.000 | 231 | 134983111 | N.D. d | |
| 96) C27 (20R) - TAS | 0.000 | | 0 | N.D. d | |
| 97) C28(20R) - TAS | 0.000 | | 0 | N.D. d | |
| A second state of the second state and the second state of the second state o second state of the second state os the second state of the second state of the second state of the second state of the second state o | 1999 - 1997 - | | 10 A | | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057B.D Acq On : 16 Aug 2013 10:23 pm Operator : YM Sample : AR-WKC1-020-030 Misc : ALS Vial : 2 Sample Multiplier: 1 Quant Time: Aug 17 19:41:36 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 19:24:04 2013 Response via : Initial Calibration (#) = qualifier out of range (m) = manual integration (+) = signals summed



60.00 58.00 56.00 54.00 52.00 50.00 42.00 44.00 46.00 48.00 T,enslyneq(i,h,g)ozneB T.ensertathas(A.a.)&Yanamanan TTananarathas(A.a.)&Yanamanan 40.00 C26(20R)/C27(20S)-TAS,T S'ZLB-ALIANOXIBE 38.00 TIC: MS70057B.D\data.ms Benzo(a)pyrene-d12,1 T, and Astradult (194) 844 agree a 36.00 34.00 T. Chrolane, Cholane, C. T, enerto thiophene, T 32.00 T,enentherenthene,T Relence Benzo(b)fluorene,T 28.00 30.00 Pyrene, T Pyrene-d10,1 Fluoranthene,T T, enerthnenertqlyrtemid-8,5 T,enenthrenengly/them-t 24.00 26.00 T,enegointoznadiblynene,T 4-Methyldibenzothiophene,T PAH Calibration Table-2013A T.enengointoznedio C:\GCMS7\MS70057\AR70057.M : Sat Aug 17 19:24:04 2013 : Initial Calibration T.Aethylfluorene,T 16.00 18.00 20.00 22.00 Ч Sample Multiplier: T,enelentingentynteminT-7,8,1 T,enerene,T Fluorene-d10,1 mq Time: Aug 17 19:41:36 2013 T,nshitoznadiQ 10:23 T.enelynthqeneck 2.01b,aranhtarresk C:\GCMS7\MS70057 AR-WKC1-020-030 16 Aug 2013 YM Lenelshingsnivnem-1, MS70057B.D 14.00 STORE STATES Quant Method : .. 12.00 N QLast Update Response via Title T,nilecell enert/eic 10.00 Data Path Data File Operator ALS Vial 600000 500000 350000 300000 200000 150000 100000 50000 Ó 550000 400000 250000 Abundance 450000 Sample 650000 Acq On Quant Quant Ŷ Misc 260

Page:

4

2013 06:42:00 90 Sep 37.M Fri

-

| Data Acq C Opera Sampl Misc ALS V | Path : C:\GCMS7\MS70057\ File : MS70057C.D On : 16 Aug 2013 11:31 p ator : YM .e : AR-WKC2-100-030 Yial : 3 Sample Multiplie | er: l | | | | |
|--|---|---------------------------------|------------|--------------|------------------|------------|
| Quant Quant QLast | Time: Aug 17 22:15:53 2013 Method : C:\GCMS7\MS70057 Title : PAH Calibration T Update : Sat Aug 17 19:41 onse via : Initial Calibrati | AR70057 Table-202 44 2013 | | | | |
| | Compound | R.T. | QIon | Response | Conc Unit | s Dev(Min) |
| | | | | | | |
| Inte | rnal Standards | 01 455 | 186 | 125050- | 051 05 | |
| 21) | Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 21.455 | 1/6 | 435952m | 251.05 | 0.00 |
| 73) | Benzo (a) pyrepe-d12 | 29.035 | 212 | 006544III | 250.03 | 0.00 |
| 131 | Belizo (a) pyrelie-diz | 20.201 | 204 | 9000190 | 250.52 | 0.00 |
| Svst | em Monitoring Compounds | | | | | |
| | Naphthalene-d8 | 13.822 | 136 | 292203m | 100.05 | 0.00 |
| 21) | Acenaphthene-d10 | 19.672 | 164 | 167752m | 99.68 | 0.00 |
| | Phenanthrene-d10 | | | | | |
| 66) | Chrysene-d12 | 33.809 | 240 | 365778m | 103.29 | 0.00 |
| 88) | Chrysene-d12 Perylene-d12 | 38.697 | 264 | 437266m | 103.09 | 0.00 |
| 90) | 5(b)H-Cholane | 34.236 | 217 | 74495m | 105.16 | 0.00 |
| | | | | | | |
| | et Compounds | 11 176 | 120 | 51089m | 140 70 | Qvalue |
| 4) | cis/trans Decalin Cl-Decalins | 0.000 | 120 | | N.D. d | |
| 5) | C2-Decaling | 0 000 | | 0 | N D d | |
| 6) | C3-Decalins | 0.000 | | 0 | N.D. d | |
| 7) | C4-Decalins | 0.000 | | 0 | N.D.d | |
| 8) | C2-Decalins C4-Decalins Naphthalene 2-Methylnaphthalene | 13.878 | 128 | 325887m | 99.25 | |
| 9) | 2-Methylnaphthalene | 16.134 | 142 | 205300m | 99.51 | |
| 10) | 1-Methylnaphthalene | 16.469 | 142 | 189364m | 99.62 | |
| 11) | 2,6-Dimethylnaphthalene | 18.224 | 156 | 191129m | 98.39 | |
| 12) | 1-Methylnaphthalene 2,6-Dimethylnaphthalene 1,6,7-Trimethylnaphtha | 21.065 | 170 | 166985m | 97.18 | |
| 13) | C2-Naphthalenes | 0.000 | | 0 | N.D. d | |
| | C3-Naphthalenes | 0.000 | | 0 | N.D. d | |
| | C4-Naphthalenes | 0.000 | | 0 | N.D. | |
| | Benzothiophene | 14.045 | 134 | 263985m | 98.83 | |
| | Cl-Benzothiophenes | 0.000 | | 0 | N.D. d | |
| | C2-Benzothiophenes | 0.000 | | 0 | N.D. d | |
| | C3-Benzothiophenes C4-Benzothiophenes | 0.000 | | 0 | N.D. d N.D. d | |
| | Biphenyl | 17.694 | 154 | 277043m | 98.56 | |
| | Acenaphthylene | 19.171 | 152 | 304527m | 95.01 | |
| | Acenaphthene | 19.784 | 154 | 179492m | 98.20 | |
| | Dibenzofuran | 20.369 | 168 | 305652m | 98.54 | |
| | Fluorene | 21.539 | 166 | 241683m | 98.72 | |
| | 1-Methylfluorene | 23.506 | 180 | 158079m | 97.31 | |
| 28) | | 0.000 | | 0 | N.D. d | |
| 29) | C2-Fluorenes | 0.000 | | 0 | N.D. d | |
| | C3-Fluorenes | 0.000 | | 0 | N.D. | |
| 33) | Carbazole | 25.583 | 167 | 301630m | 97.20 | |
| 34) | Dibenzothiophene | 24.406 | 184 | 333254m | 99.55 | |
| 35) | 이 이 것 같은 것 같은 것 같은 것 같은 📥 이 것 같은 것 | 25.895 | 198 | 271380m | 99.19 | |
| | 2/3-Methyldibenzothiop | 0.000 | | 0 | N.D. | |
| 37) | | 0.000 | | 0 | N.D. d | |
| | C2-Dibenzothiophenes | 0.000 | | 0 | N.D. d | |
| | C3-Dibenzothiophenes | 0.000 | | 0 | N.D. d | |
| | C4-Dibenzothiophenes Phenanthrene | 0.000 | 170 | 0 401307m | N.D. d | |
| | Anthracene | 24.822 | 178 178 | 401307m | 99.99 | |
| 42) | MICHTACCHE | 24.995 | T/0 | 367787m | 98.34 | |

| Quant Time: Aug 17 22:15:3 2013 Quant Title : PAH Calibration Table-2013A Quant Method : C: (GCMSY)MS70057.M7 Quant Title : PAH Calibration Table-2013A Compound R.T. Qion Response Conc Units Dev(Min) 433 3-Methylphenanthrene 0.000 0 N.D. d 441 2-Methylphenanthrene 0.000 0 N.D. d 451 2-Methylphenanthrene 0.000 0 N.D. d 461 4/9 -Methylphenanthrene 26.934 192 247123m 98.53 481 3.6-Dimethylphenanthrene 26.422 206 215774m 100.05 491 Retme 30.708 234 10435m 86.53 501 <c2-phenanthrenes anthr<="" td=""> 0.000 0 N.D. d 101.72 51<c2-naphthobenzothiophene< td=""> 0.000 0 N.D. d 103.83 51<c2-naphthobenzothiophene< td=""> 0.000 0 N.D. d 103.83 602 2-Methylphenanthrene 28.942 202 362788m 99.36 51<c2-naphthobenzothiophene< td=""> 0.000<th>Data Path : C:\GCMS7\MS70057\ Data File : MS70057C.D Acq On : 16 Aug 2013 11:31 p Operator : YM Sample : AR-WKC2-100-030 Misc : ALS Vial : 3 Sample Multiplie</th><th>er: 1</th><th></th><th></th><th></th></c2-naphthobenzothiophene<></c2-naphthobenzothiophene<></c2-naphthobenzothiophene<></c2-phenanthrenes> | Data Path : C:\GCMS7\MS70057\ Data File : MS70057C.D Acq On : 16 Aug 2013 11:31 p Operator : YM Sample : AR-WKC2-100-030 Misc : ALS Vial : 3 Sample Multiplie | er: 1 | | | |
|--|---|---------------------------------|-------|---------|--------|
| 43) 3-Methylphenanthrene 0.000 0 N.D. d 44) 2-Methylphenanthrene 0.000 0 N.D. d 45) 2-Methylphenanthrene 0.000 0 N.D. d 45) 2-Methylphenanthrene 26.934 192 247123m 58.53 47) 1-Methylphenanthrene 28.042 206 215774m 100.05 49) Retene 30.708 234 104935m 88.53 50 C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52 C4-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Naphthobenzothiophenes 0.000 0 N.D. d 52 C4-Naphthobenzothiophenes 0.000 0 N.D. d 51 C3-Naphthobenzothiophenes 0.000 0 N.D. d 52 C4-Photanthenes/Pyrenes 0.000 0 N.D. d 52 C1-Fluoranthenes/Pyrenes | Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 19:41: | AR70057 Cable-201 44 2013 | | | |
| 43) 3-Methylphenanthrene 0.000 0 N.D. d 44) 2-Methylphenanthrene 0.000 0 N.D. d 45) 2-Methylphenanthrene 26.374 192 247123m 98.53 46) 3,6-Dimethylphenanthrene 28.377 100.05 55 48) 3,6-Dimethylphenanthrene 28.42 206 215774m 100.05 41) 1-Methylphenanthrenes/Anthr 0.000 0 N.D. d 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) Pyrene 29.704 202 362788m 99.36 56) Pyrene 29.704 202 362849m 102.56 57) Pyrene 0.000 0 N.D. d 502 C1-Fluoranthenes/Py | | | | | |
| 44) 2-Methylphenanthrene 0.000 0 N.D. d 45) 2-Methylphenanthrene 0.000 0 N.D. d 47) 1-Methylphenanthrene 26.934 192 247123m 98.53 48) 3, 6-Dimethylphenanthrene 28.042 206 215774m 100.05 49) Retene 30.708 234 104935m 88.53 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Naphthobenzothiophenes 0.000 0 N.D. d 51) C3-Naphthobenzothiophenes 0.000 0 N.D. d 52) Pyrene 29.704 202 362788m 99.36 51) Pyrene 29.704 202 362788m 99.36 52) Pyrene 29.704 202 362788m 90.36 52) | | | | | |
| 45 2-Methylphenanthrene 0.000 0 N.D. d 46 4/9-Methylphenanthrene 26.934 192 247123m 98.53 48 3,6-Dimethylphenanthrene 28.042 206 215774m 100.05 49 Retene 30.708 224 104935m 88.53 50 C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52 C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53 Naphthobenzothiophenes 0.000 0 N.D. d 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 29.704 202 491803m 103.83 60 2-Methylfluoranthene 30.466 216 300580m 99.90 61 Benzo(b/fluorene 31.089 216 30556 62 | | | | | |
| 47) 1-Methylphenanthrene 26.934 192 247123m 98.53 48) 3,6 -Dimethylphenanthrene 28.042 206 215774m 100.05 49) Retene 30.708 234 104935m 88.53 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Mapthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C2-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.42 202 362788m 99.36 59) Pyrene 29.704 202 491803m 103.83 60 C-Hethylphens 0.000 0 N.D. d 61 C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 62 | 45) 2-Methylanthracene | 0.000 | | | |
| 48) 3,6-Dimethylphenanthrene 28.042 206 215774m 100.05 49) Retene 30.708 234 104935m 88.53 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 54) C1-Maphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Maphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 362788m 99.36 61) Benzo (b) fluoranthene 30.466 216 300580m 99.90 61) Benzo (b) fluoranthenes/Pyrenes 0.000 0 N.D. d 62) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d | 46) 4/9-Methylphenanthrene | 0.000 | | | |
| 49) Retene 30.708 234 104935m 88.53 50 C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52 C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53 Naphthobenzothiophenes 32.955 234 425580m 101.72 54 C1-Naphthobenzothiophenes 0.000 0 N.D. d 55 C2-Naphthobenzothiophenes 0.000 0 N.D. d 57 Pyrene 29.704 202 362788m 99.36 59 Pyrene 29.704 202 491803m 103.83 60 Amethyliovanthenes 0.000 0 N.D. d 61 Benzo(b)fluoranthenes 0.000 0 N.D. d 63 C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64 C3-Pluoranthenes/Pyrenes 0.000 0 N.D. d 65 C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 76 Benzo(a)anthracene 33 | 47) 1-Methylphenanthrene | 26.934 | 192 | 247123m | 98.53 |
| 50 C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52 C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53 Naphthobenzothiophenes 0.000 0 N.D. d 55 C2-Naphthobenzothiophenes 0.000 0 N.D. d 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 28.942 202 362788m 99.36 59 Pyrene 29.704 202 451803m 103.83 60 2-Methylfluoranthene 31.089 216 252108m 99.90 61 Benzo(bfluorene 31.089 216 252108m 99.76 62 C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63 C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 7 Benzo(bfluoranthene 33.70 228 368831m 103.58 69 <t< td=""><td>48) 3,6-Dimethylphenanthrene</td><td>28.042</td><td>206</td><td>215774m</td><td>100.05</td></t<> | 48) 3,6-Dimethylphenanthrene | 28.042 | 206 | 215774m | 100.05 |
| 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 362788m 99.36 61) Benzo(b) fluorene 31.089 216 252108m 98.76 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz(a) anthracene 33.770 228 436249m 102.56 68) Chrysenes 0.000 0 N.D. d 70 C2-Chrysenes < | 49) Retene | 30.708 | 234 | | |
| 52 C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53 Naphthobenzothiophenes 0.000 0 N.D. d 54 C1-Naphthobenzothiophenes 0.000 0 N.D. d 55 C2-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 28.942 202 362788m 99.36 59 Pyrene 29.704 224 491803m 103.83 60 2-Methylfluoranthene 30.466 216 300580m 99.36 61 Benzo(b)fluorene 31.089 216 252108m 98.76 62 C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63 C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64 C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67 Benz(a) anthracene 33.770 228 362831m 103.58 69 C1-Chrysenes 0.000 0 N.D. d 71 C3-Chrysen | 50) C2-Phenanthrenes/Anthr | 0.000 | | | |
| 53) Naphthobenzothiophenes 32.955 234 425580m 101.72 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 362788m 99.36 59) Pyrene 29.704 202 491803m 103.83 60 2-Methylfluoranthene 30.466 216 300580m 99.90 61) Benzo(b) fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benzo(a) anthracene 33.770 228 436249m 102.56 68) C1-Chrysenes 0.000 0 N.D. d 102.56 69) C1-Chrysenes 0.000 0 N.D. d | | | | | |
| 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 362788m 99.36 59) Pyrene 29.704 202 491803m 103.83 60) 2-Methylfluoranthene 30.466 216 300580m 98.96 61) Benzo(b/fluorant 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 436249m 102.56 68) Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 71) C3-Chopane 42.783 | | | | | |
| 55 C2-Naphthobenzothiophenes 0.000 0 N.D. d 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 28.942 202 362788m 99.36 59 Pyrene 29.704 202 491803m 103.83 60 2-Methylfluoranthene 30.466 216 252108m 99.90 61 Benzo(b)fluorene 31.089 216 252108m 98.76 62 C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63 C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64 C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65 C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 70 C2-Chrysenes 0.000 0 N.D. d 71 C3-Chrysenes 0.000 0 N.D. d 72 C4-Chrysenes 0.000 0 N.D. d 73 Beazo(k,j)fluoranthene 37.300 | | | | | |
| 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 28.942 202 362788m 99.36 59 Pyrene 29.704 202 491803m 103.83 60 2-Methylfluoranthene 30.466 216 300580m 99.0 61 Benzo(b)fluorene 31.089 216 252108m 98.76 62 C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63 C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64 C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz(a) anthracene 33.770 228 436249m 102.56 68 Chrysenes 0.000 0 N.D. d 70 C2-Chrysenes 0.000 0 N.D. d 71 C3-Chrysenes 0.000 0 N.D. d 72 C4-Chrysenes 0.000 0 N.D. d 73 18a-Oleanane 0.000 | 55) C2-Naphthobenzothiophenes | 0.000 | | | |
| 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 362788m 99.36 59) Pyrene 29.704 202 491803m 103.83 60) 2-Methylfluoranthene 30.466 216 300580m 99.90 61) Benzo(b)fluorene 31.089 216 252108m 98.76 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 436249m 102.56 68) Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Ba20leanane 0.000 0 N.D. d 74) C29-Hopane 37.300 <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | |
| 58) Fluoranthene 28.942 202 362788m 99.36 59) Pyrene 29.704 202 491803m 103.83 60) 2-Methylfluoranthene 30.466 216 300580m 99.90 61) Benzo(b) fluorene 31.089 216 252108m 98.76 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz(a) anthracene 33.770 228 436249m 102.56 68) Chrysene/Triphenylene 33.886 228 368831m 103.58 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 73) Ba-Oleanane 0.000 0 N.D. d 74) C29-Hopane 191 142973m 108.38 77) Benzo(a) fluoranthene 37.300 252 522975m 121.43 78) Benzo(a) fluoranthene 37.00 0 N.D. d | | | | | |
| 60) 2-Methylfluoranthene 30.466 216 300580m 99.90 61) Benzo(b)fluorene 31.089 216 25108m 98.76 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz(a) anthracene 33.770 228 436249m 102.56 68) Chrysene/Triphenylene 33.886 228 368831m 103.58 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Benzo(k,j)fluoranthene 37.417 252 376672m 95.17 79) Benzo(a)fluoranthene 30.000 0 N.D. d 77) Benzo(a)pyrene 38.464 252 468972m 102.40 81) | | | | 362788m | 99.36 |
| 61) Benzo(b) fluorene 31.089 216 252108m 98.76 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 436249m 102.56 68) Chrysene/Triphenylene 33.886 228 368831m 103.58 69) C1-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Bacoleanane 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 77) Benzo(k) fluoranthene 37.300 252 522975m 121.43 78) Benzo(k) fluoranthene 37.417 252 366972m 102.60 81) Benzo(a) pyrene <td>59) Pyrene</td> <td>29.704</td> <td>202</td> <td>491803m</td> <td>103.83</td> | 59) Pyrene | 29.704 | 202 | 491803m | 103.83 |
| 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz(a) anthracene 33.770 228 368831m 103.58 68) Chrysenes/Triphenylene 33.886 228 368831m 103.58 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Ba-oleanane 0.000 0 N.D. d 74) C29-Hopane 37.300 252 522975m 121.43 78) Benzo(k) fluoranthene 37.417 252 468972m | | | | | |
| 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 436249m 102.56 68) Chrysene/Triphenylene 33.886 228 36881m 103.58 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) G30-Hopane 42.783 191 142973m 108.38 77) Benzo(k,j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 37.417 252 468972m 102.40 80) Benzo(a, h) anthracene 43.262 278 46250m 101.20 83) Dibenzo(a, h) anthrace | | 31.089 | 216 | | 98.76 |
| 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 436249m 102.56 68) Chrysene/Triphenylene 33.886 228 36881m 103.58 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) G30-Hopane 42.783 191 142973m 108.38 77) Benzo(k,j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 37.417 252 468972m 102.40 80) Benzo(a, h) anthracene 43.262 278 46250m 101.20 83) Dibenzo(a, h) anthrace | 62) Cl-Fluoranthenes/Pyrenes | 0.000 | | | N.D. d |
| 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 436249m 102.56 68) Chrysene/Triphenylene 33.886 228 368831m 103.58 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo (b fluoranthene 37.300 252 32675m 12.43 78) Benzo (a) fluoranthene 37.417 252 376672m 95.17 79) Benzo (a) fluoranthene 36.309 252 468972m 102.60 81) Benzo (a, h) anthracc 0.000 0 N.D. d 82) Dibenzo (a, h) anthracc | 63) C2-Fluoranthenes/Pyrenes | 0.000 | | | N.D. U |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo(b) fluoranthene 37.300 252 522975m 121.43 78) Benzo(k, j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 0.000 0 N.D. d 80) Benzo(a) fluoranthene 38.309 252 468972m 102.60 81) Benzo(a) pyrene 38.464 252 464220m 102.41 82) Indeno(1,2,3-c,d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C2 | 65) C4-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo(b) fluoranthene 37.300 252 522975m 121.43 78) Benzo(k, j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 0.000 0 N.D. d 80) Benzo(a) fluoranthene 38.309 252 468972m 102.60 81) Benzo(a) pyrene 38.464 252 464220m 102.41 82) Indeno(1,2,3-c,d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C2 | 67) Benz(a)anthracene | 33 770 | 228 | 436249m | 102 56 |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo(b) fluoranthene 37.300 252 522975m 121.43 78) Benzo(k, j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 0.000 0 N.D. d 80) Benzo(a) fluoranthene 38.309 252 468972m 102.60 81) Benzo(a) pyrene 38.464 252 464220m 102.41 82) Indeno(1,2,3-c,d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C2 | 68) Chrysene/Triphenylene | 33.886 | 228 | 368831m | 103.58 |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo(b) fluoranthene 37.300 252 522975m 121.43 78) Benzo(k, j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 0.000 0 N.D. d 80) Benzo(a) fluoranthene 38.309 252 468972m 102.60 81) Benzo(a) pyrene 38.464 252 464220m 102.41 82) Indeno(1,2,3-c,d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C2 | 69) Cl-Chrysenes | 0.000 | | 0 | N.D. d |
| 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo (b) fluoranthene 37.300 252 52975m 121.43 78) Benzo (k, j) fluoranthene 0.000 0 N.D. d 80) Benzo (a) fluoranthene 0.000 0 N.D. d 81) Benzo (a) pyrene 38.309 252 468972m 102.60 81) Benzo (a) pyrene 38.464 252 464220m 102.41 82) Indeno(1, 2, 3-c, d) pyrene 43.189 276 579669m 101.20 83) Dibenzo (a, h) anthracc 0.000 0 N.D. d 85) C2-Dibenzo (a, h) anthracc 0.000 0 N.D. d 86) C3-Dibenzo (a, h) anthrac 0.000 0 N.D. d 87) Benzo (g, h, i)perylene 48.553 276 507986m 101.32 < | 70) C2-Chrysenes | 0.000 | | 0 | N.D. d |
| 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo(b) fluoranthene 37.300 252 522975m 121.43 78) Benzo(k,j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 0.000 0 N.D. d 80) Benzo(a) pyrene 38.309 252 468972m 102.60 81) Benzo(a) pyrene 38.464 252 464220m 102.41 82) Inden(1, 2, 3-c, d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a, h) anthracene 43.262 278 462250m 100.26 84) C1-Dibenzo(a, h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a, h) anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a, h) anthrac 0.000 0 N.D. d 87) Benzo(g, h, i) perylene 44.553 276 5079 | | 0.000 | | 0 | N.D. d |
| 75)18a-Oleanane0.0000N.D. d76)C30-Hopane42.783191142973m108.3877)Benzo(b) fluoranthene37.300252522975m121.4378)Benzo(k,j) fluoranthene37.417252376672m95.1779)Benzo(a) fluoranthene0.0000N.D. d80)Benzo(a) pyrene38.309252468972m102.6081)Benzo(a) pyrene38.464252464220m102.4182)Indeno(1,2,3-c,d) pyrene43.189276579669m101.2083)Dibenzo(a,h) anthracene43.262278462250m100.2684)C1-Dibenzo(a,h) anthrac0.0000N.D. d85)C2-Dibenzo(a,h) anthrac0.0000N.D. d86)C3-Dibenzo(a,h) anthrac0.0000N.D. d87)Benzo(g,h,i) perylene44.553276507986m101.3289)Perylene38.774252473547m101.9791)C20-TAS0.0000N.D. d92)C21-TAS0.0000N.D. d93)C26(20S) -TAS0.0000N.D. d94)C26(20R)/C27(20S) -TAS39.434231523281m102.6095)C28(20S) -TAS0.0000N.D. d96)C27(20R) -TAS0.0000N.D. d | | | | | |
| 76) C30-Hopane 42.783 191 142973m 108.38 77) Benzo(b) fluoranthene 37.300 252 522975m 121.43 78) Benzo(k,j) fluoranthene 37.417 252 376672m 95.17 79) Benzo(a) fluoranthene 0.000 0 N.D. d 80) Benzo(e) pyrene 38.309 252 468972m 102.60 81) Benzo(a) pyrene 38.464 252 464220m 102.41 82) Indeno(1,2,3-c,d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h) anthracene 43.262 278 462250m 100.26 84) C1-Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h) anthrac 0.000 0 N.D. d 87) Benzo(g, h, i) perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 </td <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | |
| 77) Benzo (b) fluoranthene 37.300 252 522975m 121.43 78) Benzo (k, j) fluoranthene 37.417 252 376672m 95.17 79) Benzo (a) fluoranthene 0.000 0 N.D. d 80) Benzo (a) fluoranthene 0.000 0 N.D. d 81) Benzo (a) pyrene 38.309 252 468972m 102.60 81) Benzo (a) pyrene 38.464 252 464220m 102.41 82) Indeno (1, 2, 3 - c, d) pyrene 43.189 276 579669m 101.20 83) Dibenzo (a, h) anthracene 43.262 278 462250m 100.26 84) C1-Dibenzo (a, h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo (a, h) anthrac 0.000 0 N.D. d 86) C3-Dibenzo (a, h) anthrac 0.000 0 N.D. d 87) Benzo (g, h, i) perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS | - 2월 11일 및 - 영국 12월 12일 - 2월 1 | | 1.01 | | |
| 78)Benzo (k, j) fluoranthene 37.417 252 $376672m$ 95.17 79)Benzo (a) fluoranthene 0.000 0 N.D. d80)Benzo (e) pyrene 38.309 252 $468972m$ 102.60 81)Benzo (a) pyrene 38.464 252 $464220m$ 102.41 82)Indeno (1, 2, 3-c, d) pyrene 43.189 276 $579669m$ 101.20 83)Dibenzo (a, h) anthracene 43.262 278 $462250m$ 100.26 84)C1-Dibenzo (a, h) anthrac 0.000 0 N.D. d85)C2-Dibenzo (a, h) anthrac 0.000 0 N.D. d86)C3-Dibenzo (a, h) anthrac 0.000 0 N.D. d87)Benzo (g, h, i) perylene 44.553 276 $507986m$ 101.32 89)Perylene 38.774 252 $473547m$ 101.97 91)C20-TAS 0.000 0 N.D. d93)C26 ($20S$) -TAS 0.000 0 N.D. d94)C26 ($20R$)/C27 ($20S$) -TAS 39.434 231 $523281m$ 102.60 95)C28 ($20S$) -TAS 0.000 0 N.D. d96)C27 ($20R$) -TAS 0.000 0 N.D. d | | | | | |
| 79)Benzo (a) fluoranthene0.0000N.D. d80)Benzo (e) pyrene38.309252468972m102.6081)Benzo (a) pyrene38.464252464220m102.4182)Indeno (1, 2, 3-c, d) pyrene43.189276579669m101.2083)Dibenzo (a, h) anthracene43.262278462250m100.2684)C1-Dibenzo (a, h) anthrac0.0000N.D. d85)C2-Dibenzo (a, h) anthrac0.0000N.D. d86)C3-Dibenzo (a, h) anthrac0.0000N.D. d87)Benzo (g, h, i) perylene44.553276507986m101.3289)Perylene38.774252473547m101.9791)C20-TAS0.0000N.D. d92)C21-TAS0.0000N.D. d93)C26 (20S) -TAS0.0000N.D. d94)C26 (20R)/C27 (20S) -TAS39.434231523281m102.6095)C28 (20S) -TAS0.0000N.D. d96)C27 (20R) -TAS0.0000N.D. d | | | | | |
| 80) Benzo(e)pyrene 38.309 252 468972m 102.60 81) Benzo(a)pyrene 38.464 252 464220m 102.41 82) Indeno(1,2,3-c,d)pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h)anthracene 43.262 278 462250m 100.26 84) C1-Dibenzo(a,h)anthracene 0.000 0 N.D. d 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S) -TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S) -TAS 39.434 231 523281m 102.60 95) C28(20S) -TAS 0.000 0 N.D. d <td< td=""><td></td><td></td><td>252</td><td></td><td></td></td<> | | | 252 | | |
| 81) Benzo(a) pyrene 38.464 252 464220m 102.41 82) Indeno(1,2,3-c,d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h) anthracene 43.262 278 462250m 100.26 84) C1-Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h) anthrac 0.000 0 N.D. d 87) Benzo(g,h,i) perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 523281m 102.60 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | 252 | | |
| 82) Indeno(1,2,3-c,d) pyrene 43.189 276 579669m 101.20 83) Dibenzo(a,h) anthracene 43.262 278 462250m 100.26 84) C1-Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h) anthrac 0.000 0 N.D. d 87) Benzo(g,h,i) perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 523281m 102.60 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | | |
| 84) C1-Dibenzo(a,h)anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 523281m 102.60 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | 43.189 | 276 | 579669m | |
| 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 523281m 102.60 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | 43.262 | 278 | 462250m | 100.26 |
| 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 523281m 102.60 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | 0 | |
| 87) Benzo(g,h,i)perylene 44.553 276 507986m 101.32 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 523281m 102.60 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | Sec. | |
| 89) Perylene 38.774 252 473547m 101.97 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 523281m 102.60 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | 0.0.0 | | |
| 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26 (20S) - TAS 0.000 0 N.D. d 94) C26 (20R) / C27 (20S) - TAS 39.434 231 523281m 102.60 95) C28 (20S) - TAS 0.000 0 N.D. d 96) C27 (20R) - TAS 0.000 0 N.D. d | | | | | |
| 92)C21-TAS0.0000N.D. d93)C26(20S)-TAS0.0000N.D. d94)C26(20R)/C27(20S)-TAS39.434231523281m102.6095)C28(20S)-TAS0.0000N.D. d96)C27(20R)-TAS0.0000N.D. d | | | 252 | | |
| 93)C26(20S)-TAS0.0000N.D. d94)C26(20R)/C27(20S)-TAS39.434231523281m102.6095)C28(20S)-TAS0.0000N.D. d96)C27(20R)-TAS0.0000N.D. d | | | | | |
| 94)C26(20R)/C27(20S)-TAS39.434231523281m102.6095)C28(20S)-TAS0.0000N.D. d96)C27(20R)-TAS0.0000N.D. d | | | | | |
| 95) C28(20S)-TAS0.0000N.D. d96) C27(20R)-TAS0.0000N.D. d | | | 231 | | |
| 96) C27(20R)-TAS 0.000 0 N.D. d | | | | | |
| | | | | | |
| | 97) C28(20R)-TAS | 0.000 | | 0 | N.D. d |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057C.D Acq On : 16 Aug 2013 11:31 pm Operator : YM Sample : AR-WKC2-100-030 Misc : ALS Vial : 3 Sample Multiplier: 1 Quant Time: Aug 17 22:15:53 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 19:41:44 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) ------(#) = qualifier out of range (m) = manual integration (+) = signals summed

42.00 40.00 C26(20R)/C27(20S)-TAS,T 2,21b-ensitiene-d12,5 38.00 TIC: MS70057C.D\data.ms Benzo(a)pyrene-d12,1 T, anartnardw**h(f;x))64**ngenthene, T 36.00 34.00 2(b)H-Choiane,S Chrysene/TripheRgne/gne/greene/T T,enehotioznedorthqsN 32.00 T,enentherenthyththetherenthe 30.00 Pyrene-d10,1 Fluoranthene,T 28.00 T, enerthylphenanthrenei D-8, 5 T.enerdtnandhylphenanthrene.T 24.00 26.00 T,enertophenzothiophene,T T, slozedie. : PAH Calibration Table-2013A T, enertorition T, enertoritios de T, enertoritio de T, enertoritios de T, enertori C:\GCMS7\MS70057\AR70057.M : Sat Aug 17 19:41:44 2013 : Initial Calibration T.9n9nouflity/filuorene,T 22.00 Ч Sample Multiplier: T,eneithtqtanlythamitT-7,8,1 T,eneithtqtanlythamitT-7,8,1 Fluorene-d10,1 md 20.00 Aug 17 22:15:53 2013 L'instantoznadiu 11:31 T.eneltythdeneoA 2.0f.breaddidiasopeA C:\GCMS7\MS70057\ 16.00 18.00 AR-WKC2-100-030 T.enelsht/qsnlyhtemiQ-8.2 T,Iynardia 16 Aug 2013 T, enelshingsnivne M-S T, enelshingsnivne M-1 MS70057C.D 14.00 90 Park and the stand Sep Quant Method : MY 12.00 m QLast Update Response via Time: Title Fri T,nilsoeD enert/sio 10.00 Data Path Data File Operator ALS Vial 57.M Abundance 450000 350000 300000 250000 200000 50000 Ó Acq On 500000 150000 600000 550000 100000 Sample 400000 Quant Quant Ą Misc 264

T,enelyneq(i,h,g)ozne8

C30-Hopane,T

T. Brasse watche pressor brander in

60.00

58.00

56.00

54.00

52.00

50.00

46.00 48.00

44.00

.

2013

06:42:06

| Data Path : C:\GCMS7\MS70057\ Data File : MS70057D.D Acq On : 17 Aug 2013 12:40 a Operator : YM Sample : AR-WKC3-250-030 Misc : ALS Vial : 4 Sample Multiplie | er: 1 | | | | |
|---|--|----------------------------|--------------|-------------------|--------------|
| Quant Time: Aug 17 22:21:56 2013 Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:16: Response via : Initial Calibrati | AR70057. able-201 03 2013 | | | | |
| Compound | R.T. | QIon | Response | Conc Un | its Dev(Min) |
| Internal Standards | | | | | |
| 1) Fluorene-d10 | 21.455 | 176 | 444103m | 251.05 | 0.00 |
| 31) Pyrene-d10 | 29.635 | 212 | 828017m | 250.63 | 0.00 |
| Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 38.386 | 264 | 947909m | 250.32 | 0.00 |
| System Monitoring Compounds | | | | | |
| 2) Naphthalene-d8 | 13.822 | 136 | 691986m | 231.89 | 0.00 |
| 21) Acenaphthene-d10 | 19.672 | 164 | 394173m | 229.48 | 0.00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 762314m | 229.78 | 0.00 |
| 66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane | 33.809 | 240 | 868723m | 238.54 | 0.00 |
| 88) Perylene-d12 | 38.697 | 264 | 1006221m | 224.43 | 0.00 |
| 90) 5(b)H-Cholane | 34.235 | 217 | 166831m | 222.48 | 0.00 |
| Target Compounds | | | | | Qvalue |
| cis/trans Decalin C1-Decalins | 11.176 | 138 | 123476m | 309.17 | 2 |
| 4) Cl-Decalins | 0.000 | | 0 | N.D. | d |
| 5) C2-Decalins | 0.000 | | 0 | N.D. | d |
| 6) C3-Decalins7) C4-Decalins8) Naphthalene | 0.000 | | 0 | N.D. | a |
| 7) C4-Decalins | 12 070 | 120 | 775462m | N.D. | a |
| 9) 2-Methylnaphthalene | 16 134 | 142 | 486082m | 231.70 | |
| 10) 1-Methylnaphthalene | 16 469 | 142 | 451415m | 232 57 | |
| 11) 2 6-Dimethylnaphthalene | 18.224 | 156 | 455612m | 230.37 | |
| 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene 12) 1,6,7-Trimethylnaphtha | 21.065 | 170 | 403005m | 230.17 | |
| 13) C2-Naphthalenes | 0.000 | | 0 | N.D. | d |
| 14) C3-Naphthalenes | 0.000 | | 0 | N.D. | |
| 15) C4-Naphthalenes | 0.000 | | 0 | N.D. | |
| 16) Benzothiophene | 14.045 | 134 | 630448m | 231.37 | |
| 17) Cl-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 20) C4-Benzothiophenes | 0.000 | 154 | 0 657225m | N.D. 229.37 | a |
| 22) Biphenyl 23) Acenaphthylene | 17.694 19.171 | 154 | 728366m | 222.84 | |
| 24) Acenaphthene | 19.784 | | 429631m | 230.53 | |
| 25) Dibenzofuran | 20.369 | | 733074m | 231.77 | |
| 26) Fluorene | 21.538 | 166 | 577771m | 231.36 | |
| 27) 1-Methylfluorene | 23.506 | 180 | 383399m | 231.77 | |
| 28) Cl-Fluorenes | 0.000 | | 0 | N.D. | d |
| 29) C2-Fluorenes | 0.000 | | 0 | N.D. | d |
| 30) C3-Fluorenes | 0.000 | 244444 | 0 | N.D. | d |
| 33) Carbazole | 25.583 | 167 | 703083m | 221.04 | |
| 34) Dibenzothiophene | 24.406 | 184 | 774573m | 225.15 | |
| 35) 4-Methyldibenzothiophene | 25.895 | 198 | 667905m | 237.49 | 2 |
| 36) 2/3-Methyldibenzothiop | 0.000 | | 0 | N.D. | |
| 37) 1-Methyldibenzothiophene | 0.000 | | 0 | N.D. | |
| 38) C2-Dibenzothiophenes39) C3-Dibenzothiophenes | 0.000 | | 0 | N.D. N.D. | |
| 40) C4-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 41) Phenanthrene | 24.822 | 178 | 971606m | 234.69 | |
| 42) Anthracene | 24.995 | 178 | 880284m | 228.15 | |
| ಾನ ನಡೆ 🍋 - ಬರುವರಾದ ನಡೆ ನಡೆದ ನಡೆದ ನಡೆದು ಬಿಡಿದಿದ್ದರೆ. ಬ | 2014 (B) | 1999 (1997) 1999 (1997) | | - TATA (NALESCO) | |

| Quant Time: Aug 17 22:21:56 02013 Quant Method: C:(SCMSY)MS70057\AR70057.M Quant Title: PAH Calibration Table-2013A Quant Method: C:(SCMSY)MS70057\AR70057.M Quant Method: C:(SCMSY)MS70057\AR70057.M Quant Method: C:(SCMSY)MS70057\AR70057.M Compound R.T. Qion Response Conc Units Dev(Min) 433 3-Methylphenanthrene 0.000 0 N.D. d 441 2-Methylphenanthrene 0.000 0 N.D. d 445 2-Methylphenanthrene 26.934 192 589954m 228.67 481 3,6-Dimethylphenanthrene 28.042 206 501768m 223.67 491 Retne 30.700 234 2486 2467 501 <c2-phenanthrenes anthr<="" td=""> 0.000 0 N.D. d 51 51<c2-naphthobenzothiophene< td=""> 30.000 0 N.D. d 51 51<c2-naphthobenzothiophene< td=""> 30.000 0 N.D. d 51 51<c2-naphthobenzothiophene< td=""> 30.0466 216 702745m 226.98 52 C1-Naphthobenzothiophene 30.0</c2-naphthobenzothiophene<></c2-naphthobenzothiophene<></c2-naphthobenzothiophene<></c2-phenanthrenes> | Data Path : C:\GCMS7\MS70057\ Data File : MS70057D.D Acq On : 17 Aug 2013 12:40 a Operator : YM Sample : AR-WKC3-250-030 Misc : ALS Vial : 4 Sample Multiplie | er: 1 | | | | |
|---|---|---------------------------------|------|----------|---------------|--------------|
| 43) 3-Methylphenanthrene 0.000 0 N.D. d 44) 2-Methylphenanthrene 0.000 0 N.D. d 45) 2-Methylphenanthrene 0.000 0 N.D. d 47) 1-Methylphenanthrene 26.934 192 589954m 228.67 47) 1-Methylphenanthrene 28.042 206 501765m 226.24 49) Retene 30.708 234 244582m 200.62 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52 C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53 Naphthobenzothiophenes 0.000 0 N.D. d 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 59 Pyrene 29.742 202 853132m 227.34 61 Denzo(b)fluoranthene 30.466 216 702745m 226.98 62 C1- | Quant Method : C:\GCMS7\MS70057\ Quant Title : PAH Calibration T QLast Update : Sat Aug 17 22:16: | AR70057 Cable-201 03 2013 | | | | |
| 43) 3-Methylphenanthrene 0.000 0 N.D. d 44) 2-Methylphenanthrene 0.000 0 N.D. d 45) 2-Methylphenanthrene 26.934 192 589954m 228.67 46) 3,6-Dimethylphenanthrene 28.942 206 501768m 226.24 47) 1-Methylphenanthrenes/Anthr 0.000 0 N.D. d 48) 3,6-Dimethylphenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C4-Naphthobenzothiophenes 0.000 0 N.D. d 56) Pyrene 29.704 202 1148274m 23.69 61) Benzo(b)fluoranthenes 0.000 0 N.D. d 62) | Compound | R.T. | QIon | Response | Conc Un: | its Dev(Min) |
| 44) 2-Methylphenanthrene 0.000 0 N.D. d 45) 2-Methylphenanthrene 0.000 0 N.D. d 47) 1-Methylphenanthrene 26.934 192 589954m 228.67 48) 3,6-Dimethylphenanthrene 28.042 206 501765m 228.67 49) Retene 30.708 234 244582m 200.62 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 227.34 59) Pyrene 29.704 202 148274m 226.98 61) | | | | | | |
| 45 2-Methylphenanthrene 0.000 0 N.D. d 46 4/9-Methylphenanthrene 28.042 206 501768m 228.67 48 3,6-Dimethylphenanthrene 28.042 206 501768m 226.24 49 Retene 30.708 234 244552m 200.62 50 C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 51 C3-Phenanthrenes/Anthr 0.000 0 N.D. d 53 Naphthobenzothiophenes 0.000 0 N.D. d 54 C1-Naphthobenzothiophenes 0.000 0 N.D. d 55 C2-Naphthobenzothiophenes 0.000 0 N.D. d 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthenes 202 184274m 235.69 61 Benzo(b/fluorene 31.689 216 5445960 62 C1-Fluoranthenes/Pyrenes | 44) 2-Methylphenanthrene | 0.000 | | | | |
| 47) 1-Methylphenanthrene 26,324 192 589954m 228.67 48) Retene 30.708 234 244582m 200.62 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 56) C2-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 27.34 59) Pyrene 29.704 202 144274m 235.69 61) Benzo(b)fluoranthenes/Pyrenes 0.000 0 N.D. d 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluo | 45) 2-Methylanthracene | 0.000 | | 0 | | |
| 47) 1-Methylphenanthrene 26,324 192 589954m 228.67 48) Retene 30.708 234 244582m 200.62 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 56) C2-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 27.34 59) Pyrene 29.704 202 144274m 235.69 61) Benzo(b)fluoranthenes/Pyrenes 0.000 0 N.D. d 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluo | 46) 4/9-Methylphenanthrene | 0.000 | | 0 | N.D. | |
| 49) Retene 30.708 234 244582m 200.62 50) C2-Phenanthrenes/Anthr 0.000 0 N.D. d 51) C3-Phenanthrenes/Anthr 0.000 0 N.D. d 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C2-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 29.704 202 1148274m 235.69 61) Benzo(b)fluorene 31.089 216 5845956m 222.93 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 71 C3-Chrysenes | 47) 1-Methylphenanthrene | 26.934 | 192 | 589954m | 228.67 | |
| 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 227.34 59) Fyrene 29.704 202 1148274m 235.69 60) 2-Methylfluoranthenes/Pyrenes 0.000 0 N.D. d 61) Benzo(b)fluorant 0.000 0 N.D. d 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benzo(a) anthracene 33.770 228 1039240m 236.77 68) C1-Chrysenes | 48) 3,6-Dimethylphenanthrene | 28.042 | 206 | 501768m | 226.24 | |
| 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 227.34 59) Fyrene 29.704 202 1148274m 235.69 60) 2-Methylfluoranthenes/Pyrenes 0.000 0 N.D. d 61) Benzo(b)fluorant 0.000 0 N.D. d 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benzo(a) anthracene 33.770 228 1039240m 236.77 68) C1-Chrysenes | 49) Retene | 30.708 | 234 | 244582m | 200.62 | |
| 52) C4-Phenanthrenes/Anthr 0.000 0 N.D. d 53) Naphthobenzothiophenes 0.000 0 N.D. d 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 227.34 59) Fyrene 29.704 202 1148274m 235.69 60) 2-Methylfluoranthenes/Pyrenes 0.000 0 N.D. d 61) Benzo(b)fluorant 0.000 0 N.D. d 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benzo(a) anthracene 33.770 228 1039240m 236.77 68) C1-Chrysenes | 50) C2-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. | |
| 53) Naphthobenzothiophenes 32.955 234 1005648m 233.68 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 227.34 59) Pyrene 29.704 202 1148274m 235.69 61) Benzo(b)fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Bacoleanane 0.000 | 51) C3-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. | |
| 54) C1-Naphthobenzothiophenes 0.000 0 N.D. d 55) C2-Naphthobenzothiophenes 0.000 0 N.D. d 56) C3-Naphthobenzothiophenes 0.000 0 N.D. d 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 227.34 59) Pyrene 29.704 202 1148274m 235.69 61) Benzo(b/fluoranthenes/Pyrenes 0.000 0 N.D. d 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benzo(b/fluorene 33.770 228 1039240m 236.64 69) C1-Chrysenes 0.000 0 N.D. d 70 C2-Chrysenes 0.000 0 N.D. d 71 C3-Chrysenes 0.000 0 N.D. d 72 C4-Chrysenes 0.000 0 N.D. d 73 Denzo(k)fluoranthene 77.471 252 <td>52) C4-Phenanthrenes/Anthr</td> <td>0.000</td> <td>224</td> <td></td> <td></td> <td>d</td> | 52) C4-Phenanthrenes/Anthr | 0.000 | 224 | | | d |
| 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 28.942 202 853132m 227.34 59 Pyrene 29.704 202 1148274m 235.69 60 2-Methylfluoranthene 30.466 216 70274m 226.98 61 Benzo(b)fluorene 31.089 216 584596m 222.93 62 C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63 C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64 C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67 Benz(a)anthracene 33.770 228 1039240m 236.64 69 C1-Chrysenes 0.000 0 N.D. d 70 C2-Chrysenes 0.000 0 N.D. d 71 C3-Chrysenes 0.000 0 N.D. d 72 C4-Chrysenes 0.000 0 N.D. d 73 Benzo(k,j)fluoranthene 77.41 | 53) Naphthobenzothiophene | 32.955 | 234 | | | a |
| 56 C3-Naphthobenzothiophenes 0.000 0 N.D. d 57 C4-Naphthobenzothiophenes 0.000 0 N.D. d 58 Fluoranthene 28.942 202 853132m 227.34 59 Pyrene 29.704 202 1148274m 235.69 60 2-Methylfluoranthene 30.466 216 70274m 226.98 61 Benzo(b)fluorene 31.089 216 584596m 222.93 62 C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63 C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64 C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67 Benz(a)anthracene 33.770 228 1039240m 236.64 69 C1-Chrysenes 0.000 0 N.D. d 70 C2-Chrysenes 0.000 0 N.D. d 71 C3-Chrysenes 0.000 0 N.D. d 72 C4-Chrysenes 0.000 0 N.D. d 73 Benzo(k,j)fluoranthene 77.41 | 55) C2-Naphthobenzothiophenes | 0.000 | | | | |
| 57) C4-Naphthobenzothiophenes 0.000 0 N.D. d 58) Fluoranthene 28.942 202 853132m 227.34 59) Pyrene 29.704 202 1148274m 235.69 60) 2-Methylfluoranthene 30.466 216 702745m 226.98 61) Benzo(b) fluorene 31.089 216 584596m 222.93 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 1039240m 236.77 68) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Bacoleanane 0.000 0 N.D. d 74) C29-Hopane 37.300 | 56) C3-Naphthobenzothiophenes | 0.000 | | | | |
| 58) Fluoranthene 28.942 202 853132m 227.34 59) Pyrene 29.704 202 1148274m 235.69 60) 2-Methylfluoranthene 30.466 216 702745m 226.98 61) Benzo(b) fluorene 31.089 216 584596m 222.93 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz(a) anthracene 33.770 228 1039240m 236.77 68) Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72 C4-Chrysenes 0.000 0 N.D. d 73) Baa-Oleanane 0.000 0 N.D. d 74) C30-Hopane 42.783 191 33166m 239.71 77 Benzo(k) fluoranthene | | | | | | |
| 59) Pyrene 29.704 202 1148274m 235.69 60) 2-Methylfluoranthene 30.466 216 702745m 222.93 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 873316m 236.64 69) C1-Chrysenes 0.000 0 N.D. d 700 C2-Chrysenes 0.000 0 N.D. d 711 C3-Chrysenes 0.000 0 N.D. d 720 C4-Chrysenes 0.000 0 N.D. d 731 Ba-Oleanane 0.000 0 N.D. d 741 C29-Hopane 42.783 191 33166m 239.71 77 Benzo (a) fluoranthene 37.400 252 1209668m 25.77 78 Benzo (a) fluoranthene 37 | 58) Fluoranthene | 28.942 | 202 | 853132m | 227.34 | |
| 60) 2-Methylfluoranthene 30.466 216 702745m 226.98 61) Benzo (b) fluorene 31.089 216 584596m 222.93 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 1039240m 236.77 68) Chrysene/Triphenylene 33.886 228 873316m 236.64 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 33166m 239.71 77 Benzo (k) fluoranthene 37. | 59) Pyrene | 29.704 | 202 | 1148274m | 235.69 | |
| 62) C1-Fluoranthenes/Pyrenes 0.000 0 N.D. d 63) C2-Fluoranthenes/Pyrenes 0.000 0 N.D. d 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz(a) anthracene 33.770 228 1039240m 236.77 68) Chrysene/Triphenylene 38.86 228 873316m 236.64 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) Benzo(k)fluoranthene 37.300 252 1209668m 253.77 78) Benzo(a)fluoranthene 37.417 252 891357m 214.93 79) Benzo(a)pyrene 38.464 252 108131m 223.63 81) Benzo(a,h) anthrac< | 60) 2-Methylfluoranthene | 30.466 | 216 | 702745m | 226.98 | |
| 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 1039240m 236.77 68) Chrysene/Triphenylene 33.886 228 873316m 236.64 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 331666m 239.71 77 Benzo(k) jl fluoranthene 37.417 252 891357m 214.93 79) Benzo(a) pyrene 38.309 252 108131m 223.63 81) Benzo(a, h) anthracc 0.000 0 N.D. 82) Indeno(1,2,3-c,d) pyrene 43 | 61) Benzo(b)fluorene | 31.089 | 216 | 584596m | 222.93 | |
| 64) C3-Fluoranthenes/Pyrenes 0.000 0 N.D. d 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 1039240m 236.77 68) Chrysene/Triphenylene 33.886 228 873316m 236.64 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 331666m 239.71 77 Benzo(k) jl fluoranthene 37.417 252 891357m 214.93 79) Benzo(a) pyrene 38.309 252 108131m 223.63 81) Benzo(a, h) anthracc 0.000 0 N.D. 82) Indeno(1,2,3-c,d) pyrene 43 | 62) Cl-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. | |
| 65) C4-Fluoranthenes/Pyrenes 0.000 0 N.D. d 67) Benz (a) anthracene 33.770 228 1039240m 236.77 68) Chrysene/Triphenylene 33.886 228 873316m 236.64 69) C1-Chrysenes 0.000 0 N.D. d 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 331666m 239.71 77) Benzo (b fluoranthene 37.300 252 1209668m 23.77 78) Benzo (a) fluoranthene 37.300 252 1081331m 23.63 81) Benzo (a) fluoranthene 37.417 252 1081331m 23.63 82) Indeno (1, 2, 3-c, d) pyrene 43.262 278 1068381m 219.96 <t< td=""><td>63) C2-Fluoranthenes/Pyrenes</td><td>0.000</td><td></td><td>0</td><td>N.D.</td><td></td></t<> | 63) C2-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. | |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Ba-Oleanane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 33166m 239.71 77) Benzo (b) fluoranthene 37.417 252 891357m 214.93 79) Benzo (a) fluoranthene 0.000 0 N.D. 80) Benzo (a) pyrene 38.464 252 1081331m 223.63 81) Benzo (a, h) anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo (a, h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo (a, h) anthrac 0.000 0 N.D. d 87) Benzo (g, h, i) perylene 38.774 252 | 64) C3-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. | |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Ba-Oleanane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 33166m 239.71 77) Benzo (b) fluoranthene 37.417 252 891357m 214.93 79) Benzo (a) fluoranthene 0.000 0 N.D. 80) Benzo (a) pyrene 38.464 252 1081331m 223.63 81) Benzo (a, h) anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo (a, h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo (a, h) anthrac 0.000 0 N.D. d 87) Benzo (g, h, i) perylene 38.774 252 | 65) C4-Fluoranthenes/Pyrenes | 0.000 | 220 | 1020240m | N.D. | a |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Ba-Oleanane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 33166m 239.71 77) Benzo (b) fluoranthene 37.417 252 891357m 214.93 79) Benzo (a) fluoranthene 0.000 0 N.D. 80) Benzo (a) pyrene 38.464 252 1081331m 223.63 81) Benzo (a, h) anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo (a, h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo (a, h) anthrac 0.000 0 N.D. d 87) Benzo (g, h, i) perylene 38.774 252 | 68) Chrysene/Trinhenylene | 33.770 | 228 | 1039240m | 236.77 | |
| 70) C2-Chrysenes 0.000 0 N.D. d 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 73) Ba-Oleanane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 33166m 239.71 77) Benzo (b) fluoranthene 37.417 252 891357m 214.93 79) Benzo (a) fluoranthene 0.000 0 N.D. 80) Benzo (a) pyrene 38.464 252 1081331m 223.63 81) Benzo (a, h) anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo (a, h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo (a, h) anthrac 0.000 0 N.D. d 87) Benzo (g, h, i) perylene 38.774 252 | 69) C1-Chrysenes | 0 000 | 220 | 0/33100 | 230.04 N D | d |
| 71) C3-Chrysenes 0.000 0 N.D. d 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 331666m 239.71 77) Benzo(b) fluoranthene 37.300 252 1209668m 253.77 78) Benzo(a) fluoranthene 37.417 252 891357m 214.93 79) Benzo(a) fluoranthene 0.000 0 N.D. 80) Benzo(a) pyrene 38.309 252 1081331m 223.63 81) Benzo(a) pyrene 38.464 252 108080m 225.83 82) Indeno(1, 2, 3-c, d) pyrene 43.189 276 1324764m 219.36 83) Dibenzo(a, h) anthracc 0.000 0 N.D. d 85) C2-Dibenzo(a, h) anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a, h) anthrac 0.000 0 N.D. d 87) <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> | | | | | | |
| 72) C4-Chrysenes 0.000 0 N.D. d 74) C29-Hopane 0.000 0 N.D. d 75) 18a-Oleanane 0.000 0 N.D. d 76) C30-Hopane 42.783 191 331666m 239.71 77) Benzo(b) fluoranthene 37.300 252 1209668m 253.77 78) Benzo(a) fluoranthene 0.000 0 N.D. 80) Benzo(a) fluoranthene 0.000 0 N.D. 81) Benzo(a) fluoranthene 0.000 0 N.D. 82) Indeno(1,2,3-c,d) pyrene 38.309 252 1081331m 223.63 81) Benzo(a,h) anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo(a,h) anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h) anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 48.553 276 1171764m 221.99 | | | | | | |
| 75) $18a-01$ -anane 0.000 0 N.D. d76) $C30$ -Hopane 42.783 191 $331666m$ 239.71 77) $Benzo(b)$ fluoranthene 37.300 252 $1209668m$ 253.77 78) $Benzo(k, j)$ fluoranthene 37.417 252 $891357m$ 214.93 79) $Benzo(a)$ fluoranthene 0.000 0 N.D.80) $Benzo(a)$ fluoranthene 0.000 0 N.D.81) $Benzo(a)$ fluoranthene 38.309 252 $1081331m$ 223.63 81) $Benzo(a)$ fluoranthene 38.464 252 $1080809m$ 225.83 82)Indeno(1, 2, 3 - c, d) pyrene 43.189 276 $1324764m$ 219.36 83)Dibenzo(a, h) anthracene 43.262 278 $1068381m$ 219.96 84)C1-Dibenzo(a, h) anthrac 0.000 0 N.D. d85)C2-Dibenzo(a, h) anthrac 0.000 0 N.D. d86)C3-Dibenzo(a, h) anthrac 0.000 0 N.D. d87)Benzo(g, h, i) perylene 44.553 276 $1171764m$ 221.99 89)Perylene 38.774 252 $1106264m$ 226.26 91)C20-TAS 0.000 0 N.D. d92)C21-TAS 0.000 0 N.D. d93)C26(20S) -TAS 0.000 0 N.D. d94)C26(20R)/C27(20S) -TAS 39.434 231 $1200488m$ 223.66 95)C28(20S) -TAS 0.0 | | | | 0 | | |
| 76)C30-Hopane42.783191331666m239.7177)Benzo (b) fluoranthene37.3002521209668m253.7778)Benzo (k, j) fluoranthene37.417252891357m214.9379)Benzo (a) fluoranthene0.0000N.D.80)Benzo (e) pyrene38.3092521081331m223.6381)Benzo (a) pyrene38.4642521080809m225.8382)Indeno (1, 2, 3-c, d) pyrene43.1892761324764m219.3683)Dibenzo (a, h) anthracene43.2622781068381m219.9684)C1-Dibenzo (a, h) anthrac0.0000N.D.d86)C2-Dibenzo (a, h) anthrac0.0000N.D.d87)Benzo (g, h, i) perylene44.5532761171764m221.9989)Perylene38.7742521106264m226.2691)C20-TAS0.0000N.D.d92)C21-TAS0.0000N.D.d93)C26 (20S) -TAS0.0000N.D.d94)C26 (20R)/C27 (20S) -TAS39.4342311200488m223.6695)C28 (20S) -TAS0.0000N.D.d96)C27 (20R) -TAS0.0000N.D.d | 74) C29-Hopane | 0.000 | | 0 | N.D. | d |
| 77)Benzo (b) fluoranthene37.3002521209668m253.7778)Benzo (k, j) fluoranthene37.417252891357m214.9379)Benzo (a) fluoranthene0.0000N.D.80)Benzo (e) pyrene38.3092521081331m223.6381)Benzo (a) pyrene38.4642521080809m225.8382)Indeno (1, 2, 3 - c, d) pyrene43.1892761324764m219.3683)Dibenzo (a, h) anthracene43.2622781068381m219.9684)C1-Dibenzo (a, h) anthrac0.0000N.D.d85)C2-Dibenzo (a, h) anthrac0.0000N.D.d86)C3-Dibenzo (a, h) anthrac0.0000N.D.d87)Benzo (g, h, i) perylene44.5532761171764m221.9989)Perylene38.7742521106264m226.2691)C20-TAS0.0000N.D.d93)C26 (20S) -TAS0.0000N.D.d94)C26 (20R)/C27 (20S) -TAS39.4342311200488m223.6695)C28 (20S) -TAS0.0000N.D.d96)C27 (20R) -TAS0.0000N.D.d | | | | | | d |
| 78) Benzo(k,j)fluoranthene 37.417 252 891357m 214.93 79) Benzo(a) fluoranthene 0.000 0 N.D. 80) Benzo(e) pyrene 38.309 252 1081331m 223.63 81) Benzo(a) pyrene 38.464 252 1080809m 225.83 82) Indeno(1,2,3-c,d) pyrene 43.189 276 1324764m 219.36 83) Dibenzo(a,h) anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo(a,h) anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo(a,h) anthracene 0.000 0 N.D. d 85) C2-Dibenzo(a,h) anthracene 0.000 0 N.D. d 86) C3-Dibenzo(a,h) anthracene 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 1171764m 221.99 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<> | | | | | | |
| 79)Benzo (a) fluoranthene0.0000N.D.80)Benzo (e) pyrene38.3092521081331m223.6381)Benzo (a) pyrene38.4642521080809m225.8382)Indeno (1, 2, 3-c, d) pyrene43.1892761324764m219.3683)Dibenzo (a, h) anthracene43.2622781068381m219.9684)C1-Dibenzo (a, h) anthrac0.0000N.D.d85)C2-Dibenzo (a, h) anthrac0.0000N.D.d86)C3-Dibenzo (a, h) anthrac0.0000N.D.d87)Benzo (g, h, i) perylene44.5532761171764m221.9989)Perylene38.7742521106264m226.2691)C20-TAS0.0000N.D.d92)C21-TAS0.0000N.D.d93)C26 (20S) -TAS0.0000N.D.d94)C26 (20R) / C27 (20S) -TAS39.4342311200488m223.6695)C28 (20S) -TAS0.0000N.D.d96)C27 (20R) -TAS0.0000N.D.d | | | | | | |
| 80)Benzo(e)pyrene38.3092521081331m223.6381)Benzo(a)pyrene38.4642521080809m225.8382)Indeno(1,2,3-c,d)pyrene43.1892761324764m219.3683)Dibenzo(a,h)anthracene43.2622781068381m219.9684)C1-Dibenzo(a,h)anthrac0.0000N.D. d85)C2-Dibenzo(a,h)anthrac0.0000N.D. d86)C3-Dibenzo(a,h)anthrac0.0000N.D. d87)Benzo(g,h,i)perylene44.5532761171764m89)Perylene38.7742521106264m226.2691)C20-TAS0.0000N.D. d92)C21-TAS0.0000N.D. d93)C26(20S)-TAS0.0000N.D. d94)C26(20R)/C27(20S)-TAS39.4342311200488m223.6695)C28(20S)-TAS0.0000N.D. d96)C27(20R)-TAS0.0000N.D. d | | | 252 | | | |
| 81) Benzo(a)pyrene 38.464 252 1080809m 225.83 82) Indeno(1,2,3-c,d)pyrene 43.189 276 1324764m 219.36 83) Dibenzo(a,h)anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo(a,h)anthracene 0.000 0 N.D. d 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 1171764m 221.99 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | 252 | | | |
| 82) Indeno(1,2,3-c,d)pyrene 43.189 276 1324764m 219.36 83) Dibenzo(a,h)anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo(a,h)anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 1171764m 221.99 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | | | |
| 83) Dibenzo(a,h)anthracene 43.262 278 1068381m 219.96 84) C1-Dibenzo(a,h)anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 1171764m 221.99 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | 다 김 화태님이는 것을 것 것을 많은 것을 것을 만들어야 한 것을 많이 다. 그는 것은 것은 것을 다 나라. | | | | | |
| 84) C1-Dibenzo(a,h)anthrac 0.000 0 N.D. d 85) C2-Dibenzo(a,h)anthrac 0.000 0 N.D. d 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 1171764m 221.99 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | | | |
| 86) C3-Dibenzo(a,h)anthrac 0.000 0 N.D. d 87) Benzo(g,h,i)perylene 44.553 276 1171764m 221.99 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | 0 | N.D. | d |
| 87) Benzo(g,h,i)perylene 44.553 276 1171764m 221.99 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | 0.000 | | 0 | N.D. | d |
| 89) Perylene 38.774 252 1106264m 226.26 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | | | d |
| 91) C20-TAS 0.000 0 N.D. d 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | | | | |
| 92) C21-TAS 0.000 0 N.D. d 93) C26(20S)-TAS 0.000 0 N.D. d 94) C26(20R)/C27(20S)-TAS 39.434 231 1200488m 223.66 95) C28(20S)-TAS 0.000 0 N.D. d 96) C27(20R)-TAS 0.000 0 N.D. d | | | 252 | | | |
| 93)C26(20S)-TAS0.0000N.D. d94)C26(20R)/C27(20S)-TAS39.4342311200488m223.6695)C28(20S)-TAS0.0000N.D. d96)C27(20R)-TAS0.0000N.D. d | | | | | | |
| 94)C26(20R)/C27(20S)-TAS39.4342311200488m223.6695)C28(20S)-TAS0.0000N.D. d96)C27(20R)-TAS0.0000N.D. d | | | | | | |
| 95) C28(20S)-TAS0.0000N.D. d96) C27(20R)-TAS0.0000N.D. d | | | 231 | | | u |
| 96) C27(20R)-TAS 0.000 0 N.D. d | | | 231 | | | d |
| | | | | | | |
| | | | | 0 | | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057D.D Acq On : 17 Aug 2013 12:40 am Operator : YM Sample : AR-WKC3-250-030 Misc : ALS Vial : 4 Sample Multiplier: 1 Quant Time: Aug 17 22:21:56 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:16:03 2013 Response via : Initial Calibration (#) = qualifier out of range (m) = manual integration (+) = signals summed

: 4 Sample Multiplier: 1 : 17 Aug 2013 12:40 am : YM Data Path : C:\GCMS7\MS70057\ Data File : MS70057D.D : AR-WKC3-250-030 Operator Sample ALS Vial Acq On Misc

Quant Time: Aug 17 22:21:56 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:16:03 2013 Response via : Initial Calibration

| | | | T,enele | зивндрне | L'SKSHQ S | <u>Aloznaŭ</u> | | | T,nile: | trans Dec | - cis/ | |
|-----|---|--------------|---------------------------------------|------------------|------------------------|----------------|----------|-----------|---------|-----------|--------|-------|
| | | T,ənəlsrt | thganlydfe I , analenfr | iqeniydt 9M-S | 9M-1 | | | | | | | |
| | T,lynənqiB T,ənəlsatirqısırlyntəmiD-8,2 | | | | | | | | | | | |
| | | SOL | neithylen Senerthylen Dibenzofu | H39374 | | | | | | | | יזחרר |
| T,9 | ,9n9lsht/dsnlythimi7-7,8,1 T,9n9roul7 | | 1,01b-ens | -Fluore | | | | | | | _ | |
| | T,ənəroufityrtiəM-f | | | | | | | | | | | |
| | T,5n99324969994 T,9n9n9n001105n9diblyddan T,9n9n9n001105n9diblyddan | S'01p-et | eusuthrer ene, T | | Dibenz |) — | | _ | | | | n-n |
| | T,anandon accuración (ruant) T,anandrine | uəqqivdiya | 9M-1 | | | | | | | | | |
| | | | | T,enenh | tnsnanddr T,anartfn | | | | | | | MLM |
| | - Pyrene,T hene,T | ı Altinorant | l,01b-ane | | oufi(d)osr oufi | U | | | | | | 2 |
| | | | anesti. | 1,9115 | יבס(מ)ספו | aq | | | | | 5 | |
| | T.9@926btbrefetate | henytene. | | Chry | | - | S,9 | nslord)-H | (q)9 | | | |
| | | | | | | | | | | | 1 | |
| | T,ənərtinsioufi(j,i)o: | | | zuəß | | | | | | | | |
| | 1,216-6-0-2012,010,010,020,010,010,010,010,010,010 | 5 C | Ben | | | | | | | | | |
| | | | | | | | | | | | | |
| | T,9-7530999444(| N.35.90 Sole | Monabel — | | | | T,ensqot | C30-H | _ | | | |
| | Т,9 | nəlynəq(i,r | 1,e)ozna8 | - | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

58.00 60.00

.7

| Data Acq C Opera Sampl Misc ALS V Quant Quant Quant | <pre>Path : C:\GCMS7\MS70057\ File : MS70057E.D on : 17 Aug 2013 1:48 a tor : YM e : AR-WKC4-500-030 : Tial : 5 Sample Multiplie Time: Aug 17 22:26:51 2013 Method : C:\GCMS7\MS70057\ Title : PAH Calibration T Undete: Sat Wer 17 22:22</pre> | er: 1 AR70057. Table-201 | | | | |
|---|---|--------------------------------|------------|----------------------|------------------|-------------|
| | Update : Sat Aug 17 22:22: nse via : Initial Calibrati | | | | | |
| | Compound | R.T. | QIon | Response | Conc Unit | ts Dev(Min) |
| Inte | rnal Standards Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | | | | | |
| | em Monitoring Compounds | | | | | |
| 2) | Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 | 13.822 | 136 | 1428409m | 476.99 | 0.00 |
| 32) | Phenanthrene-d10 | 24.752 | 188 | 1561631m | 463.37 | 0.00 |
| 66) | Chrysene-d12 | 33.809 | 240 | 1869491m | 505.62 | 0.00 |
| 88) | Perylene-d12 5(b)H-Cholane | 38.697 | 264 | 2102664m | 461.72 | 0.00 |
| 901 | 5 (b) n-chorane | 34.235 | 21/ | 342368m | 449.20 | 0.00 |
| | et Compounds | | | | | Qvalue |
| 3) | cis/trans Decalin Cl-Decalins | 11.176 | 138 | 249578m | 581.16 | 4 |
| | C2-Decalins | 0.000 | | 0 | N.D. C | 3 |
| 6) | C3-Decalins | 0.000 | | 0 0 0 | N.D. 0 | Î |
| 7) | C4-Decalins Naphthalene 2-Methylnaphthalene | 0.000 | | 0 | N.D. d | 1 |
| 8) | Naphthalene | 13.878 | 128 | 1593929m | 475.27 | |
| 9) | 2-Methylnaphthalene 1-Methylnaphthalene | 16.134 | 142 | 1003525m 928003m | 475.53 | |
| 11) | 2,6-Dimethylnaphthalene | 18.223 | | | | |
| 12) | 1,6,7-Trimethylnaphtha | 21.065 | 170 | 836678m | 476.83 | |
| 13) | C2-Naphthalenes | | | 0 | N.D. d | |
| 14) | | 0.000 | | | N.D. d | 1 |
| | C4-Naphthalenes Benzothiophene | 0.000 | 124 | 0 1292460m | N.D. | |
| | Cl-Benzothiophenes | 14.045 | 134 | 1292460111 | 472.93 N.D. d | 1 |
| | C2-Benzothiophenes | 0.000 | | õ | N.D. d | |
| | C3-Benzothiophenes | 0.000 | | 0 | N.D. d | 1 |
| | C4-Benzothiophenes | 0.000 | 154 | 0 | N.D. d | 1 |
| | Biphenyl Acenaphthylene | 17.694 19.171 | 154 152 | 1361466m 1534136m | 474.41 468.67 | |
| | Acenaphthene | 19.783 | | 894517m | 478.82 | |
| | Dibenzofuran | 20.368 | | 1513877m | 477.22 | |
| | Fluorene | 21.538 | 166 | 1210676m | 483.23 | |
| | 1-Methylfluorene | 23.506 | 180 | 800088m | 482.60 | 1 |
| | C1-Fluorenes C2-Fluorenes | 0.000 | | 0 | N.D. d N.D. d | |
| | C3-Fluorenes | 0.000 | | õ | N.D. d | |
| 1. H. C. H. H. H. | Carbazole | 25.583 | 167 | 1439289m | 446.66 | |
| | Dibenzothiophene | 24.406 | | 1583741m | 453.58 | |
| | 4-Methyldibenzothiophene 2/3-Methyldibenzothiop | 25.895 | 198 | 1405986m 0 | 492.33 N.D. d | 1 |
| | 1-Methyldibenzothiophene | 0.000 | | 0 | N.D. d | |
| 38) | C2-Dibenzothiophenes | 0.000 | | 0 | N.D. d | |
| | C3-Dibenzothiophenes | 0.000 | | 0 | N.D. d | |
| | C4-Dibenzothiophenes Phenanthrene | 0.000 24.821 | 178 | 0 2031585m | N.D. d 482.60 | L |
| | Anthracene | 24.995 | 178 | 1925184m | 492.43 | |

| Data Acq C Opera Sampl Misc ALS V | Path : C:\GCMS7\MS70057\ File : MS70057E.D On : 17 Aug 2013 1:48 a tor : YM .e : AR-WKC4-500-030 : Yial : 5 Sample Multiplie | er: 1 | | | | |
|--|--|--------------------------------|------|---------------|----------------|--------------|
| Quant Quant QLast | Method : C:\GCMS7\MS70057\ Title : PAH Calibration T Update : Sat Aug 17 22:22: nse via : Initial Calibrati | AR70057 able-201 02 2013 | | | | |
| | Compound | | | Response | | its Dev(Min) |
| 43) | 3-Methylphenanthrene | 0.000 | | 0 | N.D. | |
| | 2-Methylphenanthrene | 0.000 | | 0 | N.D. | |
| 45) | 2-Methylanthracene | 0.000 | | 0 | N.D. | |
| 46) | 4/9-Methylphenanthrene | 0.000 | | 0 | N.D. | |
| | | 26.934 | | 1268961m | 484.42 | |
| 48) | 3,6-Dimethylphenanthrene | | | | 465.89 | |
| | Retene | | | 514040m | | |
| 50) | C2-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. | d |
| | | 0.000 | | 0 | N.D. | d |
| | C4-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. | |
| | Naphthobenzothiophene | | | | | |
| | C1-Naphthobenzothiophenes | | | 0 | N.D. | |
| | C2-Naphthobenzothiophenes | | | 0 | N.D. | |
| | C3-Naphthobenzothiophenes | | | 0 | N.D. | 52.5 |
| | C4-Naphthobenzothiophenes | | 0.00 | 0 | N.D. | a |
| | Fluoranthene | 28.942 | | | | |
| | Pyrene | 29.704 | | | | |
| | 2-Methylfluoranthene Benzo(b)fluorene | 30.466 | | | | |
| | C1-Fluoranthenes/Pyrenes | | 210 | 1215389m 0 | 456.86 N.D. | 4 |
| | C2-Fluoranthenes/Pyrenes | | | 0 | N.D. | |
| | C3-Fluoranthenes/Pyrenes | 0.000 | | õ | N.D. | |
| | C4-Fluoranthenes/Pyrenes | | | õ | N.D. | |
| 67) | Benz(a)anthracene | 33.770 | 228 | 2222154m | | vies. |
| | | 33.886 | 228 | | | |
| | C1-Chrysenes | 0.000 | | | N.D. | d |
| | C2-Chrysenes | 0.000 | | 0 | N.D. | |
| | C3-Chrysenes | 0.000 | | 0 | N.D. | d |
| | C4-Chrysenes | 0.000 | | 0 | N.D. | |
| | C29-Hopane | 0.000 | | 0 | N.D. | |
| | 18a-Oleanane | 0.000 | | 0 | N.D. | d |
| | C30-Hopane | 42.783 | 191 | 725847m | 515.97 | |
| | Benzo(b)fluoranthene | 37.300 | 252 | 2584480m | 522.94 | |
| | Benzo(k,j)fluoranthene | 37.416 | 252 | 1792350m | 427.98 | |
| | Benzo(a)fluoranthene Benzo(e)pyrene | 0.000 38.309 | 252 | 0 2229498m | N.D. 453.08 | |
| | Benzo(a)pyrene | 38.464 | 252 | 2211288m | | |
| | Indeno(1,2,3-c,d)pyrene | 43.188 | 276 | | 453.40 | |
| | Dibenzo(a, h) anthracene | 43.262 | 278 | 2241576m | 455.42 | |
| | | 0.000 | 2.0 | 0 | N.D. | d |
| | C2-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. | |
| | C3-Dibenzo(a,h)anthrac | 0.000 | | 0 | N.D. | |
| | Benzo(g,h,i)perylene | 44.553 | 276 | 2444435m | 456.70 | |
| | Perylene | 38.774 | 252 | 2268257m | 457.15 | |
| | C20-TAS | 0.000 | | 0 | N.D. | d |
| 92) | C21-TAS | 0.000 | | 0 | N.D. | d |
| | C26(20S)-TAS | 0.000 | | 0 | N.D. | d |
| | C26(20R)/C27(20S)-TAS | 39.434 | 231 | 2471898m | 453.68 | |
| | C28(20S) - TAS | 0.000 | | 0 | N.D. | |
| | C27(20R)-TAS | 0.000 | | 0 | N.D. | |
| 97) | C28(20R)-TAS | 0.000 | | 0 | N.D. | a |

C:\GCMS7\MS70057\

...

56.00 54.00 52.00 50.00 48.00 46.00 T,ensityeq(i,h,e)ozne8 44.00 T, BRESSYRIAGER SASARA C30-Hopane,T 42.00 40.00 C26(20R)/C27(205)-TAS,T Perylene-d12,S T, anafyal B)%g(g)psna, at b-ananyq(s)osnad 38.00 TIC: MS70057E.D\data.ms T.enertinerouli(())939686860000(d)ozna8 36.00 34.00 5(b)H-Cholane,S Chrysene/Triphenylene,T T.98926649766292498 T, energo into znedo ntrage N 32.00 T,enetene,T T,eneroult(d)ozneB 30.00 T, anartheroutliveta M-S Pyrene,T 1'01P-Fluoranthene,T 28.00 T, enerthylphenanthrene, T, enerthylphenanthrene, T, enerthylphenanthrene, T, energy (1996) T, enerthylphenanthrene, T 26.00 T,enertophioznadiblydtem.4-T, elozedhe.) PAH Calibration Table-2013A T, anaJangnanang Dibenzothiophene.T, snehtqointoznadio 24.00 C:\GCMS7\MS70057\AR70057.M 2013 T.enerouthythem-t 22.00 Ч Sat Aug 17 22:22:02 Initial Calibration Sample Multiplier: Fluorene,T Fluorene-d10,1 1:48 am T,enels/thqsnly/teminT-7,8,f 20.00 Quant Time: Aug 17 22:26:51 2013 2013 T,nshutoznadiQ T,enelydtidgenec 2,01¢-anedtidgenec A 16.00 18.00 06:42:18 AR-WKC4-500-030 T, enelshtidsniytismiQ-8.2 T,Iynenqia 17 Aug 2013 YM MS70057E.D T,eneledingeniydiaen-S T,eneledingeniydiaen-T 14.00 90 T, enelshing all energy and the standard and the transferred to the standard and the standa Sep .. Method : .. •• 10.00 12.00 S QLast Update Response via Title ... ••• 57.M Fri T,nilecell anert/aic Data Path Data File Operator ALS Vial 0 Abundance 1500000 800000 700000 600000 500000 400000 300000 000006 Acq On Sample 1400000 1200000 200000 100000 1300000 1100000 1000000 Quant Quant Misc Ą 272 14

4 Page:

60.00

58.00

| Data Path : C:\GCMS7\MS70057\ Data File : MS70057F.D Acq On : 17 Aug 2013 2:57 a Operator : YM Sample : AR-WKC5-1000-030 Misc : ALS Vial : 6 Sample Multiplie | er: l | | | | |
|---|------------------------------------|------|----------------------|--------------|--------------|
| Quant Time: Aug 17 22:32:14 201 Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration 7 QLast Update : Sat Aug 17 22:26 Response via : Initial Calibrat | \AR70057. Fable-201 :58 2013 | | | | |
| Compound | R.T. | QIon | Response | Conc Un | its Dev(Min) |
| Internal Standards | | | | | |
| | 21.455 | 176 | 444641m | 251.05 | 0.00 |
| 31) Pyrene-d10 | 29.635 | 212 | 837570m | 250.63 | 0.00 |
| Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 38.387 | 264 | 950583m | 250.32 | 0.00 |
| System Monitoring Compounds | | | | | |
| | 13.822 | 136 | 2880666m | 961.94 | 0.00 |
| Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 Chrysene-d12 | 19.672 | 164 | 2880666m 1646056m | 955.98 | 0.00 |
| 32) Phenanthrene-d10 | 24.752 | 188 | 3156753m | 938.19 | 0.00 |
| 66) Chrysene-d12 | 33.809 | 240 | 3631693m | 984.68 | 0.00 |
| 88) Perylene-dl2 | 38.697 | 264 | 4251926m | 945.15 | 0.00 |
| 90) 5(b)H-Cholane | 34.235 | 217 | 680224m | 901.51 | 0.00 |
| Target Compounds | | | | | Qvalue |
| 3) cis/trans Decalin | 11.176 | 138 | 504142m | 1102.72 | |
| 4) Cl-Decalins | 0.000 | | 0 | N.D. | d |
| 5) C2-Decalins | 0.000 | | 0 0 0 | N.D. | d |
| 6) C3-Decalins | 0.000 | | 0 | N.D. | d |
| 7) C4-Decalins | 0.000 | | 0 | N.D. | d |
| 7) C4-Decalins8) Naphthalene9) 2-Methylnaphthalene | 13.878 | 128 | 3212660m | 959.90 | |
| 9) 2-Methylnaphthalene | 16.134 | 142 | 2037111m | 966.38 | |
| 10) 1-Methylnaphthalene | 16.469 | 142 | 1866053m | 958.34 | |
| 11) 2,6-Dimethylnaphthalene | 18.224 | 156 | 1910811m | 965.59 | |
| 1,6,7-Trimethylnaphtha C2-Naphthalenes | | 170 | | | 3 |
| | 0.000 | | 0 | N.D. | |
| 15) C4-Naphthalenes | 0.000 | | 0 | N.D. | u |
| 16) Benzothiophene | 14.045 | 134 | | 956.41 | |
| 17) Cl-Benzothiophenes | 0.000 | 101 | 0 | N.D. | d |
| 18) C2-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 19) C3-Benzothiophenes | 0.000 | | 0 | N.D. | |
| 20) C4-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| 22) Biphenyl | 17.694 | 154 | 2728094m | 951.79 | |
| 23) Acenaphthylene | 19.171 | 152 | | 975.14 | |
| 24) Acenaphthene | 19.756 | 154 | | 975.82 | |
| 25) Dibenzofuran | 20.369 | 168 | 3036968m | 957.75 | |
| 26) Fluorene | 21.539 | 166 | 2440905m | 975.11 | |
| 27) 1-Methylfluorene | 23.506 | 180 | 1641580m | 991.18 | 2 |
| 28) C1-Fluorenes 29) C2-Fluorenes | 0.000 | | 0 | N.D. | |
| 30) C3-Fluorenes | 0.000 | | 0 | N.D. N.D. | |
| 33) Carbazole | 25.583 | 167 | | 922.28 | a |
| 34) Dibenzothiophene | 24.406 | 184 | | 920.12 | |
| 35) 4-Methyldibenzothiophene | 25.895 | 198 | | | |
| 36) 2/3-Methyldibenzothiop | 0.000 | | 0 | N.D. | d |
| 37) 1-Methyldibenzothiophene | 0.000 | | 0 | N.D. | |
| 38) C2-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 39) C3-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 40) C4-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| 41) Phenanthrene | 24.822 | 178 | 4110232m | 977.24 | |
| 42) Anthracene | 24.995 | 178 | 4038223m | 1034.77 | |

| Data Acq (Opera Samp] Misc ALS V Quant Quant Quant Quant | Path : C:\GCMS7\MS70057\ File : MS70057F.D On : 17 Aug 2013 2:57 a ator : YM le : AR-WKC5-1000-030 : Yial : 6 Sample Multiplie Time: Aug 17 22:32:14 2013 Method : C:\GCMS7\MS70057\ Title : PAH Calibration T : Update : Sat Aug 17 22:26: onse via : Initial Calibrati | er: 1 AR70057. Cable-201 58 2013 | | | | |
|--|---|---|------|----------------------|----------------|--------------|
| | Compound | R.T. | QIon | Response | Conc Un | its Dev(Min) |
| 43) | 3-Methylphenanthrene | 0.000 | | 0 | N.D. | d |
| | 2-Methylphenanthrene | | | 0 | N.D. | |
| 45) | 2-Methylanthracene | 0.000 | | 0 | N.D. | |
| 46) | 4/9-Methylphenanthrene 1-Methylphenanthrene | 0.000 | | 0 | N.D. | d |
| 47) | 1-Methylphenanthrene | 26.934 | 192 | 2604624m | 996.98 | |
| | 3,6-Dimethylphenanthrene | | | | | |
| | Retene | 30.708 | 234 | 1065614m | | 500 C |
| 50) | C2-Phenanthrenes/Anthr C3-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. | |
| 51) | C3-Phenanthrenes/Anthr | 0.000 | | 0 | N.D. | d |
| | Naphthobenzothiophene | | | 0 4359391m | N.D. | |
| | C1-Naphthobenzothiophenes | | 234 | 43583810 | N.D. | 2 |
| 55) | C2-Naphthobenzothiophenes | 0.000 | | 0 | N.D. | |
| 56) | C3-Naphthobenzothiophenes | 0.000 | | 0 | N.D. | |
| | C4-Naphthobenzothiophenes | | | 0 | N.D. | |
| | Fluoranthene | | 202 | 3657812m | | |
| | Pyrene | 29.704 | 202 | 4909881m | 995.27 | |
| | 2-Methylfluoranthene | 30.466 | 216 | 3034797m | 966.99 | |
| 61) | Benzo(b)fluorene | 31.089 | 216 | | | |
| 62) | C1-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. | |
| 63) | C2-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes | 0.000 | | 0 | | |
| 64) (F) | C3-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. | |
| | C4-Fluoranthenes/Pyrenes Benz(a)anthracene | | | | N.D. | d |
| | Chrysene/Triphenylene | 33.886 | 228 | 4368346m 3675324m | | |
| 69) | C1-Chrysenes | 0.000 | | 3675324III 0 | 974.16 N.D. | 2 |
| 70) | C2-Chrysenes | 0.000 | | 0 | N.D. | |
| | C3-Chrysenes | 0.000 | | õ | N.D. | |
| | C4-Chrysenes | 0.000 | | 0 | N.D. | |
| 74) | C29-Hopane | 0.000 | | 0 | N.D. | |
| | 18a-Oleanane | 0.000 | | 0 | N.D. | d |
| | C30-Hopane | 42.783 | 191 | 1379635m | | |
| | Benzo(b)fluoranthene | 37.300 | 252 | 5139476m | | |
| | Benzo(k,j)fluoranthene | 37.417 | 252 | 3682951m | 910.35 | |
| | Benzo(a)fluoranthene Benzo(e)pyrene | 0.000 | 252 | 0 | N.D. | a |
| | Benzo (a) pyrene | 38.309 38.464 | 252 | 4504797m 4540323m | | |
| | Indeno(1,2,3-c,d)pyrene | 43.189 | | 5624156m | | |
| | Dibenzo(a, h) anthracene | 43.262 | 278 | 4575945m | | |
| | | 0.000 | | 0 | N.D. | d |
| | | 0.000 | | 0 | N.D. | |
| | | 0.000 | | 0 | N.D. | |
| | Benzo(g,h,i)perylene | 44.553 | 276 | 4910658m | | |
| 89) | Perylene | 38.774 | 252 | 4580166m | 936.90 | |
| | C20-TAS | 0.000 | | 0 | N.D. | |
| | C21-TAS | 0.000 | | 0 | N.D. | |
| | C26(20S)-TAS | 0.000 | | 0 | N.D. | d |
| | C26(20R)/C27(20S)-TAS | 39.434 | 231 | 5030931m | 935.04 | ă. |
| | C28 (20S) - TAS | 0.000 | | 0 | N.D. | |
| | C27 (20R) - TAS C28 (20R) - TAS | 0.000 | | 0 | N.D. N.D. | |
| 211 | CEO (EUX) IND | 0.000 | | 0 | W.D. | u |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057F.D Acq On : 17 Aug 2013 2:57 am Operator : YM Sample : AR-WKC5-1000-030 Misc : ALS Vial : 6 Sample Multiplier: 1 Quant Time: Aug 17 22:32:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:26:58 2013 Response via : Initial Calibration R.T. QIon Response Conc Units Dev(Min) Compound (#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : C:\GCMS7\MS70057\ Data File : MS70057F.D Acq On : 17 Aug 2013 2:57 am Operator : YM Sample : AR-WKC5-1000-030 Misc : ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 17 22:32:14 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:26:58 2013 Response via : Initial Calibration

| Coordination of the construction of the constructine of the constructine of the constructine of the construct | | | | | | | | | | | | | T,nil6 | | | |
|--|--------|-----------------|----------------------|---------|-------------------|----------------|-----------|------------------|-------------------|---------|----------|-----------|--------------------------------|------------------|---|-----------|
| T.konskriftgenight Stewightgenight T.anskriftgenightgen | | | | | | | | | | 88. | | | | | | |
| Coordination of the construction of the constructine of the constructine of the constructine of the construct | | | | 2,6-Dir | - | | 1121000 | | | | | | | | | |
| Riseannique (Vienni, 1.00) Function of the model T. (Argendiation of the model of the mode | | | | | | r.sAsAla | denedat | Acenap | - | | | | | | | |
| T.anouffly(rife).f T.anouffly(rife).f T.anouffly(rife).f T.anouffly(rife).f T.anouffly(rife).f E T.anouffly(rife).f T.anoufflerend(rife).f F T.anoufflerend(rife).f F F T.anoufflerend(rife).f F F T.anoufflerend(rife).f F F T.anoufflerend(rife).f F F F.anoufflerend(rife).f F | ∋n∋len | trigenlyitien | ninT-7,8,1 T,ener | Fluor | | | | | | | | 1.011 | notene-c | 1 3 - | | |
| Carbazole, T Carbazole, T Carbazole, T T.AnendihytheM-4 T.Anendihytenk, T T.AnendihytheM-4 T.Anendihytenk, T T.AnendihytheM-4 T.AnendihytheMent T T.AnendihytheMent T T.AnendihytheMent T Pyrene-d10,1 Torranthreno,1 Maphibrohythement T Pyrene-d10,1 Pyrene-d10,1 Torranthreno,1 Maphibrohythement T Pyrene-d10,1 Pyrene-d10,1 Torranthreno,1 Benzo(b)fluorenti,1 Strandhementionentit | | | | | S | 01b-ene | T,9 | dəqdoiqt | Dipenzo | | | | | | - | |
| 1.4640ytphanahthrene,1 7.4040ytphanahthrene,1 7.4040ytphanahthrene,1 1.4040ytphanahthrene,1 1.4040ytphanahthrene,1 1.4040ytphanahthrene,1 1.4040ytphanahthrene,1 1.4040ytphanahthrene,1 1.4040ytphanahthrene,1 1.4040ytphana,10,1 1.4040ytphana,10,1 1.4040ytphana,10,1 1.4040ytphana,10,1 1.4040ytene,11 1.4040ytene,11 1.4040ytene,11 1.4040ytene,11 | T,er | | | | | laur c | | | | _ | | | | | | |
| Pyteme-d10,1 Pyteme-d10,1 Fundaminene,1 Pyteme,1 Fundaminene,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Pyteme,1 Penylene,1 Pyteme,1 Penylene,1 Pyteme,1 Penylene,1 Pyteme,1 Penylene,1 Pyteme,1 Penylene,1 Pytemp,1 Penylene,1 Penylene,1 Penylene,1 Pytemp,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 Penylene,1 | | | T,enendhre | euəydı | (dî9M- | ı – | | + | | , e mid | 00 | | | | | |
| T.eneridoirtiosmedortindek T.eneridoirtiosmedortindek T.eneridoirtiosmedortindek T.eneridoirtiosmedortindek T.eneridoirtiosmeterind T.eneridoirtiosmeterind T.eneridoirtiosmeterind T.eneridoirtiosmeterind Eeneridoir | | | 7 000 | | | | | 1'9119" | | | | 101 | - ououng | , | | |
| T.eneniqointobanedoningbane.5 Naphtihobanedoniscenedoningbane.5 T.eneiquitorandoningbane.5 ChryseneriTinghangraphic F.eneiquitorandoningbane.5 Eeneigle/Bangle/ | | | ('aua | | nerther | ioniji(vi)e | 2-W | T,ene T,enero | təA huli(d)ozr | 98 | | June 1 | 0-auau/ | | | |
| S(b)H-Cholane,S Cinysement ruptionnyteme.T S(b)H-Cholane,S Cinysement ruptionnyteme.T Benzo(a)pyreme-d12,1 Benzo(b)fluoranthreme,tick/Science/th/Science/ | | | | | | | | 522555273 | 0102020-00 | | | | | | | E |
| C30-Hopane,T C30-Hopane,T C30-Hopane,T Benzo(g,h,I)perylene,T | | T,ən ə 2 | | | | | qn∏\ene | Chryse | | | | 5 | | | | |
| СЗ6(20R)/C27(20S)-TAS.T СЗ6(20R)/C27(20S)-TAS.T СС30-Норапе.T Велго(g,h,i)регу/вае, бас, бас, бас, бас, бас, бас, бас, бас | | | | | | | | | | | | S'AURIO | 1)- H(u ₎ , | | | |
| C30-Hopane,T C30-Hopane,T C30-Hopane,T Benzo(g,h,I)perylene,T | | | | Tan | edtn610 | מואייים אווייי | Færærdin | (p)(Inora | Benzo | | | | | | | |
| | | | S,Stb-ene | | | | | | | ť | C1b-ener | ukd(e)ozu | 188 | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | Г | ଚ ନ୍ଟର ଖ୍ୟ | KARARE CHE | for have | apul — | | | | T,ensqo | С30-Н9 | | | |
| | | | | | | T,ənəly | nəq(i,h,g |)ozuəg | | | | | | | | |
| | | | | | | | | | | | | | | | | 1 I I I I |
| | | | | | | | | | | | | | | | | E |
| | | | | | | | | | | | | | | | | 1.1 |

-

| Data Acq O Opera Sampl Misc ALS V Quant Quant Quant | <pre>Path : C:\GCMS7\MS70057\ File : MS70057G.D n : 17 Aug 2013 4:05 a tor : YM e : AR-WKC6-5000-030 : ial : 7 Sample Multiplie Time: Aug 17 22:39:04 2013 Method : C:\GCMS7\MS70057\ Title : PAH Calibration T Update : Sat Aug 17 22:32:</pre> | er: 1 AR70057 Cable-203 | | | | |
|---|--|-------------------------------|------|-----------------------|-----------------|--------------|
| | nse via : Initial Calibrati | on | | | | |
| | Compound | R.T. | QIon | Response | Conc Un: | its Dev(Min) |
| Inte | rnal Standards | | | | | |
| 1) | Fluorene-d10 Pyrene-d10 Benzo(a)pyrene-d12 | 21.455 | 176 | 430800m | 251.05 | 0.00 |
| 31) | Pyrene-d10 | 29.635 | 212 | 809304m | 250.63 | 0.00 |
| 73) | Benzo(a)pyrene-d12 | 38.386 | 264 | 879759m | 250.32 | 0.00 |
| Syste | em Monitoring Compounds | | | | | |
| 2) | Naphthalene-d8 Acenaphthene-d10 Phenanthrene-d10 Chrysene-d12 | 13.822 | 136 | 14122463m | 4864.94 | 0.00 |
| 21) | Acenaphthene-d10 | 19.672 | 164 | 8164923m | 4893.36 | 0.00 |
| 32) | Phenanthrene-d10 | 24.752 | 188 | 16522806m | 5074.75 | 0.00 |
| 66) | Chrysene-d12 | 33.847 | 240 | 15055790m | 4221.71 | 0.04 |
| | Perylene-d12 | | | | | |
| 90) | 5(b)H-Cholane | 34.235 | 217 | 3512263m | 5032.77 | 0.00 |
| | et Compounds | | | | | Qvalue |
| 3) | cis/trans Decalin | 11.176 | 138 | 2412395m | | |
| | C1-Decalins | 0.000 | | 0 0 0 | N.D. | d |
| | C2-Decalins | 0.000 | | 0 | N.D. | d |
| 6) | C3-Decalins | 0.000 | | 0 | N.D. | d |
| 7) | C4-Decalins Naphthalene 2-Methylnaphthalene 1-Methylnaphthalene | 0.000 | 100 | 0 | N.D. | d |
| 8) | Naphthalene | 13.878 | 128 | 15689203m | 4841.78 | |
| 10) | 2-Methylnaphthalene | 16.134 | 142 | 99/8191m | 4000.55 | |
| 11) | 2,6-Dimethylnaphthalene | 18 223 | 156 | 9095110m | 4022.03 | |
| | 1,6,7-Trimethylnaphtha | | | 8346515m | | |
| | | 0.000 | | | N.D. | d |
| | | 0.000 | | | N.D. | |
| | C4-Naphthalenes | 0.000 | | 0 | N.D. | |
| 16) | Benzothiophene | 14.045 | 134 | 12723175m | 4812.52 | |
| 17) | Cl-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| | C2-Benzothiophenes | 0.000 | | 0 | N.D. | |
| | C3-Benzothiophenes | 0.000 | | 0 | N.D. | 525 C |
| | C4-Benzothiophenes | 0.000 | | 0 | N.D. | d |
| | Biphenyl | 17.694 | | 13436961m | | |
| | Acenaphthylene Acenaphthene | 19.171 19.783 | | 16550514m 8857387m | | |
| | Dibenzofuran | 20.368 | | 15210334m | | |
| | Fluorene | 21.538 | | 12025206m | | |
| 2 C.C.C.C. | 1-Methylfluorene | 23.506 | 180 | 8053645m | | |
| | C1-Fluorenes | 0.000 | | 0 | N.D. | d |
| 29) | C2-Fluorenes | 0.000 | | 0 | N.D. | d |
| 30) | C3-Fluorenes | 0.000 | | 0 | N.D. | d |
| | Carbazole | 25.583 | | 16673669m | | |
| | Dibenzothiophene | 24.406 | | 16856586m | | |
| | 4-Methyldibenzothiophene | 25.895 | 198 | 13401991m | | - |
| | 2/3-Methyldibenzothiop | 0.000 | | 0 | N.D. | |
| | 1-Methyldibenzothiophene | 0.000 | | 0 | N.D. | |
| | C2-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| | C3-Dibenzothiophenes | 0.000 | | 0 | N.D. | |
| | C4-Dibenzothiophenes Phenanthrene | 0.000 24.822 | 179 | 19490608m | N.D. 4786 18 | u |
| | Anthracene | 24.822 | | 19306493m | | |
| / | | | | | | |

| Data File : MS Acq On : 17 Operator : YM Sample : AF Misc : ALS Vial : 7 Quant Time: Au | <pre>7 Aug 2013 4:05 a 1 8-WKC6-5000-030 Sample Multiplie ug 17 22:39:04 2013</pre> | er: 1 3 | | | | | |
|---|---|----------------------|-----|------------------------|--------------|-----|----------|
| Quant Title : QLast Update : | C:\GCMS7\MS70057 PAH Calibration T Sat Aug 17 22:32: Initial Calibrati | Table-201 22 2013 | | | | | |
| Compou | nd | | | Response | | | Dev(Min) |
| 43) 3-Methyl | phenanthrene | 0.000 | | 0 | | | |
| 44) 2-Methyl | phenanthrene | 0.000 | | 0 | N.D. | d | |
| 45) 2-Methyl | anthracene | 0.000 | | 0 | N.D. | d | |
| 46) 4/9-Meth | ylphenanthrene phenanthrene | 0.000 | 100 | 0 | N.D. | d | |
| 47) I-Metnyi | thylphenanthrene | 26.934 | 192 | 12166014m | 4817.06 | | |
| 49) Retene | chyiphenanchiene | 20.042 | 200 | 5550343m | 4641 08 | | |
| | nthrenes/Anthr | 0.000 | 234 | 0 | | d | |
| 51) C3-Phena | nthrenes/Anthr nthrenes/Anthr | 0.000 | 5 | õ | N.D. | | |
| 52) C4-Phena | nthrenes/Anthr | 0.000 | | 0 | N.D. | | |
| 53) Naphthob | enzothiophene | 32.955 | 234 | 19325231m | | | |
| 54) Cl-Napht | hobenzothiophenes | 0.000 | | 0 | N.D. | d | |
| 55) C2-Napht | hobenzothiophenes | 0.000 | | 0 | N.D. | | |
| | hobenzothiophenes | | | 0 | N.D. | 1.1 | |
| 57) C4-Napht 58) Fluorant | hobenzothiophenes | | | | N.D. | α | |
| 59) Pyrene | lielle | | | 18484317m 19939288m | | | |
| 60) 2-Methyl | fluoranthene | 30 466 | 216 | 15750455m | 5187 49 | | |
| 61) Benzo(b) | fluorene | 31.089 | 216 | 14217110m | 5542.69 | | |
| | anthenes/Pyrenes | | | 0 | N.D. | d | |
| 63) C2-Fluor | anthenes/Pyrenes anthenes/Pyrenes | 0.000 | | 0 | N.D. | | |
| 64) C3-Fluor | anthenes/Pyrenes | 0.000 | | 0 | N.D. | d | |
| | anthenes/Pyrenes | 0.000 | | 0 | N.D. | d | |
| 67) Benz(a)a | nthracene | | | 19293151m | | | |
| 68) Chrysene | | 33.925 | | 17043788m | | a | |
| 69) Cl-Chrys 70) C2-Chrys | enes | 0.000 | | 0 | N.D. N.D. | | |
| 71) C3-Chrys | | 0.000 | | 0 | N.D. | | |
| 72) C4-Chrys | | 0.000 | | õ | N.D. | | |
| 74) C29-Hopa | | 0.000 | | 0 | N.D. | | |
| 75) 18a-Olea | nane | 0.000 | | 0 | N.D. | | |
| 76) C30-Hopa | | 42.783 | 191 | 6732772m | | | |
| | fluoranthene | 37.339 | | 23352730m | | | |
| | j)fluoranthene | 37.417 | 252 | 20400802m | | 2 | |
| 79) Benzo(a) 80) Benzo(e) | | 0.000 38.309 | 252 | 0 23913134m | N.D. | a | |
| 81) Benzo(a) | | 38.503 | | 22503383m | | | |
| | ,2,3-c,d)pyrene | 43.189 | | 27920333m | | | |
| | a,h)anthracene | 43.262 | | 22760394m | | | |
| 84) Cl-Diben | zo(a,h)anthrac | 0.000 | | 0 | N.D. | d | |
| | zo(a,h)anthrac | 0.000 | | 0 | N.D. | d | |
| | zo(a,h)anthrac | 0.000 | | 0 | N.D. | d | |
| 87) Benzo(g, | | 44.553 | | 24106283m | | | |
| 89) Perylene | | 38.813 | 252 | 23376513m | | 2 | |
| 91) C20-TAS 92) C21-TAS | | 0.000 | | 0 | N.D. | | |
| 93) C21-1AS | -TAS | 0.000 | | 0 | N.D. N.D. | | |
| | /C27(20S)-TAS | 39.434 | 231 | 25376893m | | C. | |
| 95) C28(20S) | | 0.000 | | 0 | N.D. | d | |
| 96) C27(20R) | | 0.000 | | 0 | N.D. | | |
| 97) C28(20R) | -TAS | 0.000 | | 0 | N.D. | | |
| | | | | | | | |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057G.D Acq On : 17 Aug 2013 4:05 am Operator : YM Sample : AR-WKC6-5000-030 Misc : ALS Vial : 7 Sample Multiplier: 1 Quant Time: Aug 17 22:39:04 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:32:22 2013 Response via : Initial Calibration Compound R.T. QIon Response Conc Units Dev(Min) (#) = qualifier out of range (m) = manual integration (+) = signals summed

Data Path : C:\GCMS7\MS70057\ Data File : MS70057G.D Acq On : 17 Aug 2013 4:05 am Operator : YM Sample : AR-WKC6-5000-030 Misc : ALWKC6-5000-030 Misc : 7 Sample Multiplier: 1

Quant Time: Aug 17 22:39:04 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:32:22 2013 Response via : Initial Calibration

| | | – 1. | ənəlyəq(i,rl,g) | ozuə8 | | | | | |
|-------------------|--|--|---|-----------------------|-----------------|---------|-----------|---------------|-----|
| | T,enecenet/ns(d,e | | | | | | | | |
| | | | | | | T,9 | neqoH-05: |) | |
| | 1,2A1-(202) | C26(20R)/C27 | | | | | | | |
| 2 | | (e)ozne8 ,S1b-enelyne9 ,C1b-enelyne9 | T,enylene,T | e)ozua8 | | | 1,Stb-ene | u/d(e)ozuəg | P |
| | T.enertherouft(i,i)fluoranthene.T | | p)Iluoranthene |)ozueg – – | | | | | = |
|) | | | | | | | | | |
| | | | | | | 2,9n6lo | чጋ-н(q)э | | - |
| | | nobenzothiophen nobenzothiophen | | ansafafaban | esting | 0 | 10 11(4/3 | | |
| | | | | | | | | | E |
| | T,enertine | s-Methylfluora T,er | Retene,T enzo(b)fluorer | B | | | | | |
| | T,enery P | | 1/01 | | | | | Pyrene-d10,1 | 4 |
| | | | | Fluoranthens | | | | | A-A |
| | T,enenthre | anəriqiyritəM-t | | | | | | | |
| | T,enertqoirttoznediblyrtteM-4 | | Carbazole,T | | _ | | | | = |
| | | ne,1 01b-enenthrene | hqointoznadi(| o — | - | | | | Ē |
| | T.ari andganangal. | - | | | | | | | - |
| | T,ənəronifiyrtiəM-r —— Т. .भ_іздэврядд². | | | | | | | | |
| | T,ənəroufitytitəM-t —— | | | | | | | | F |
| ſ,9n | | | . | | | | ľ | 016-eneroul3 | |
| [,ən | iəlsrfirqsniyrtisminT-7,8,1 — Fuorene,T T,ənəronfityrtism-1 | 2,0†j b/h9/j T,nsntioznedi | дағаза А Д | | | | ľ | 016-enerod1 | |
| ſ,ən | 2.6-Dimethydsniydjane.T .sne.T - 1,6,7-Trimethylnaphthalet Fluorene.T T-Methylfluorene.T | T,nsnitoznedi | | | | | ľ | 01b-eneroul3 | |
| [,ən | T, en: – t, 6, 7, Trimerthylnaphylaalen – Tienenen T, Methylfluorenen – T, Methylfluorenen | - S.Of <u>tanga</u> T.nsnitoznadi | ИДВЛЭЭ ДА | | | | ľ | Eluorene-d10 | |
| ſ,ən | 2.6-Dimethydsniydjane.T .sne.T - 1,6,7-Trimethylnaphthalet Fluorene.T T-Methylfluorene.T | - S.Of <u>tanga</u> T.nsnitoznadi | | 46thyinap | | | ľ | Fluorene d10 | |
| ſ,ən | 2.6-Dimethydsniydjane.T .sne.T - 1,6,7-Trimethylnaphthalet Fluorene.T T-Methylfluorene.T | T,er Jayari Vitndenec 2,0†t gagg 2,0†ta gga 7,nenutoznedi | ИДВЛЭЭ ДА | | | | ľ | Eluorene d'10 | |
| [,ən | 2.6-Dimethydsniydjane.T .sne.T - 1,6,7-Trimethylnaphthalet Fluorene.T T-Methylfluorene.T | T,er Jayari Vitndenec 2,0†t gagg 2,0†ta gga 7,nenutoznedi | nelegtrigeniviti T,enelentri riff@reeaA | | | | | | |
| Γ, ο π | 2.6-Dimethydsniydjane.T .sne.T - 1,6,7-Trimethylnaphthalet Fluorene.T T-Methylfluorene.T | T,er Jayari Vitndenec 2,0†t gagg 2,0†ta gga 7,nenutoznedi | nelegtrigeniviti T,enelentri riff@reeaA | | | | | Eluorene d10 | |
| [,9n | 2.6-Dimethydsniydjane.T .sne.T - 1,6,7-Trimethylnaphthalet Fluorene.T T-Methylfluorene.T | T,əns T,ər T,ər Z,of bafaga 2,of bafaga T,nsnitoznədi | nelegtrigeniviti T,enelentri riff@reeaA | | sting <u>ev</u> | 4000000 | | | 0 |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057I.D Acq On : 17 Aug 2013 6:22 am Operator : YM Sample : AR-WKICV-250-004 Misc : ALS Vial : 9 Sample Multiplier: 1

Quant Time: Aug 17 22:48:01 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min Max. RRF Dev : 25% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev A | rea% 1 | Dev(min) |
|----|----|----------------------------|-------|-------|--------|--------|----------|
| 1 | I | Fluorene-d10 | 1.000 | 1.000 | 0.0 | 109 | 0.00 |
| 2 | S | Naphthalene-d8 | 1.692 | 1.546 | 8.6 | 108 | 0.00 |
| 3 | т | cis/trans Decalin | 0.290 | 0.321 | -10.7 | 124 | 0.00 |
| 4 | un | C1-Decalins | 0.290 | 0.000 | 100.0# | 0# | -12.32# |
| 5 | un | C2-Decalins | 0.290 | 0.000 | 100.0# | 0# | -13.52# |
| 6 | un | C3-Decalins | 0.290 | 0.000 | 100.0# | 0# | -15.88# |
| 7 | un | C4-Decalins | 0.290 | 0.000 | 100.0# | 0# | -18.33# |
| 8 | Т | Naphthalene | 1.889 | 2.096 | -11.0 | 131 | 0.00 |
| 9 | Т | 2-Methylnaphthalene | 1.190 | 1.360 | -14.3 | 135 | 0.00 |
| 10 | т | 1-Methylnaphthalene | 1.099 | 1.252 | -13.9 | 134 | 0.00 |
| 11 | т | 2,6-Dimethylnaphthalene | 1.117 | 1.240 | -11.0 | 131 | 0.00 |
| 12 | т | 1,6,7-Trimethylnaphthalene | 0.989 | 1.152 | -16.5 | 138 | 0.00 |
| 13 | un | C2-Naphthalenes | 1.889 | 0.000 | 100.0# | 0# | -18.89# |
| 14 | un | C3-Naphthalenes | 1.889 | 0.000 | 100.0# | 0# | -20.37# |
| 15 | un | C4-Naphthalenes | 1.889 | 0.000 | 100.0# | 0# | -22.26# |
| 16 | Т | Benzothiophene | 1.541 | 1.729 | -12.2 | 132 | 0.00 |
| 17 | un | C1-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -15.49# |
| 18 | un | C2-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -17.92# |
| 19 | un | C3-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -20.31# |
| 20 | un | C4-Benzothiophenes | 1.541 | 0.000 | 100.0# | 0# | -22.23# |
| 21 | S | Acenaphthene-d10 | 0.973 | 0.873 | 10.3 | 107 | 0.00 |
| 22 | т | Biphenyl | 1.618 | 1.808 | -11.7 | 132 | 0.00 |
| 23 | т | Acenaphthylene | 1.844 | 2.008 | -8.9 | 132 | 0.00 |
| 24 | Т | Acenaphthene | 1.052 | 1.203 | -14.4 | 136 | -0.03 |
| 25 | т | Dibenzofuran | 1.790 | 2.018 | -12.7 | 132 | 0.00 |
| 26 | т | Fluorene | 1.414 | 1.592 | -12.6 | 133 | 0.00 |
| 27 | т | 1-Methylfluorene | 0.933 | 0.000 | 100.0# | 0# | -23.51# |
| 28 | un | C1-Fluorenes | 1.414 | 0.000 | 100.0# | 0# | -23.51# |
| 29 | un | C2-Fluorenes | 1.414 | 0.000 | 100.0# | 0# | -24.79# |
| 30 | un | C3-Fluorenes | 1.414 | 0.000 | 100.0# | 0# | -27.59# |
| 31 | I | Pyrene-d10 | 1.000 | 1.000 | 0.0 | 114 | 0.00 |
| 32 | S | Phenanthrene-d10 | 1.010 | 0.834 | 17.4 | 103 | 0.00 |
| 33 | т | Carbazole | 0.962 | 0.943 | 2.0 | 125 | 0.00 |
| 34 | т | Dibenzothiophene | 1.044 | 1.088 | -4.2 | 130 | 0.00 |
| 35 | т | 4-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -25.89# |
| 36 | un | 2/3-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.21# |
| 37 | un | 1-Methyldibenzothiophene | 0.851 | 0.000 | 100.0# | 0# | -26.52# |
| 38 | un | C2-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -27.83# |
| 39 | un | C3-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -28.49# |
| 40 | un | C4-Dibenzothiophenes | 1.044 | 0.000 | 100.0# | 0# | -31.09# |
| 41 | Т | Phenanthrene | 1.263 | 1.366 | -8.2 | 131 | 0.00 |
| 42 | Т | Anthracene | 1.171 | 1.263 | -7.9 | 135 | 0.00 |
| 43 | un | 3-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | -26.93# |
| 44 | un | 2-Methylphenanthrene | 0.783 | 0.000 | 100.0# | | -26.93# |
| 45 | un | 2-Methylanthracene | 0.783 | 0.000 | 100.0# | 0# | -26.73# |
| 46 | un | 4/9-Methylphenanthrene | 0.783 | 0.000 | 100.0# | 0# | -26.93# |

| Data Path | : | C:\GCMS7\MS70057\ |
|-----------|---|------------------------|
| Data File | : | MS70057I.D |
| Acq On | : | 17 Aug 2013 6:22 am |
| Operator | : | YM |
| Sample | : | AR-WKICV-250-004 |
| Misc | : | |
| ALS Vial | : | 9 Sample Multiplier: 1 |
| | | 175 NR |

Quant Time: Aug 17 22:48:01 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min Max. RRF Dev : 25% Max. Rel. Area : 200%

| | | Compound | AvgRF | CCRF | %Dev A | rea% 1 | Dev(min) |
|----|-------|-----------------------------|-------|-------|--------|--------|----------|
| 47 | Т | 1-Methylphenanthrene | 0.783 | 0.900 | -14.9 | 141 | 0.00 |
| 48 | | 3,6-Dimethylphenanthrene | 0.673 | 0.000 | 100.0# | | -28.04# |
| 49 | | Retene | 0.371 | 0.000 | 100.0# | | -30.71# |
| | un | C2-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -28.56# |
| | un | C3-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -29.43# |
| 52 | un | C4-Phenanthrenes/Anthracene | 1.263 | 0.000 | 100.0# | | -32.06# |
| 53 | т | Naphthobenzothiophene | 1.305 | 0.000 | 100.0# | | -32.96# |
| 54 | un | C1-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | 0# | |
| 55 | un | C2-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | | -36.02# |
| 56 | un | C3-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | | -37.42# |
| 57 | un | C4-Naphthobenzothiophenes | 1.305 | 0.000 | 100.0# | | -37.92# |
| 58 | т | Fluoranthene | 1.139 | 1.244 | -9.2 | 137 | -0.03 |
| 59 | т | Pyrene | 1.480 | 1.628 | -10.0 | 133 | 0.00 |
| 60 | т | 2-Methylfluoranthene | 0.942 | 0.000 | 100.0# | 0# | -30.47# |
| 61 | Т | Benzo(b)fluorene | 0.795 | 0.000 | 100.0# | | -31.09# |
| 62 | un | C1-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | | -30.71# |
| 63 | un | C2-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | | -32.18# |
| 64 | un | C3-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | | -34.00# |
| 65 | un | C4-Fluoranthenes/Pyrenes | 1.139 | 0.000 | 100.0# | | -35.09# |
| 66 | S | Chrysene-d12 | 1.105 | 1.114 | -0.8 | 120 | -0.04 |
| 67 | Т | Benz(a)anthracene | 1.344 | 1.597 | -18.8 | 144 | 0.00 |
| 68 | Т | Chrysene/Triphenylene | 1.138 | 1.350 | -18.6 | 144 | -0.04 |
| 69 | un | C1-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -35.83# |
| 70 | un | C2-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -36.99# |
| 71 | un | C3-Chrysenes | 1.138 | 0.000 | 100.0# | 0# | -38.11# |
| 72 | un | C4-Chrysenes | 1.138 | 0.000 | 100.0# | | -39.74# |
| 73 | | Benzo(a)pyrene-d12 | 1.000 | 1.000 | 0.0 | 110 | 0.00 |
| | un | C29-Hopane | 0.371 | 0.000 | 100.0# | | -40.28# |
| | un | 18a-Oleanane | 0.371 | 0.000 | 100.0# | 0# | -42.34# |
| | Т | C30-Hopane | 0.371 | 0.000 | 100.0# | 0# | -42.78# |
| 77 | Т | Benzo(b)fluoranthene | 1.391 | 1.428 | -2.7 | 124 | -0.04 |
| 78 | Т | Benzo(k,j)fluoranthene | 1.059 | 0.913 | 13.8 | 107 | 0.00 |
| | un | Benzo(a)fluoranthene | 1.059 | 0.000 | 100.0# | 0# | -37.34# |
| 80 | т | Benzo(e)pyrene | 1.281 | 1.360 | -6.2 | 131 | 0.00 |
| 81 | | Benzo(a)pyrene | 1.258 | 1.367 | -8.7 | 132 | -0.04 |
| 82 | Т | Indeno(1,2,3-c,d)pyrene | 1.586 | 1.787 | -12.7 | 139 | -0.04 |
| 83 | Т | Dibenzo(a,h)anthracene | 1.273 | 1.458 | -14.5 | 141 | -0.04 |
| | un | Cl-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -48.31# |
| 85 | un | C2-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -50.30# |
| | un | C3-Dibenzo(a,h)anthracenes | 1.273 | 0.000 | 100.0# | 0# | -51.23# |
| 87 | | Benzo(g,h,i)perylene | 1.385 | 1.527 | -10.3 | 135 | -0.04 |
| 88 | | Perylene-d12 | 1.181 | 1.004 | 15.0 | 104 | 0.00 |
| 89 | | Perylene | 1.282 | 1.456 | -13.6 | 138 | -0.04 |
| 90 | | 5(b)H-Cholane | 0.198 | 0.162 | 18.2 | 101 | 0.00 |
| | un | C20-TAS | 1.412 | 0.000 | 100.0# | 0# | |
| 92 | un | C21-TAS | 1.412 | 0.000 | 100.0# | 0# | -34.24# |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057I.D : 17 Aug 2013 6:22 am Acq On Operator : YM Sample : AR-WKICV-250-004 Misc : ALS Vial : 9 Sample Multiplier: 1 Quant Time: Aug 17 22:48:01 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min Max. RRF Dev : 25% Max. Rel. Area : 200% Compound AvgRF CCRF %Dev Area% Dev(min)

 93 un
 C26(20S) - TAS
 1.412
 0.000
 100.0#
 0# -38.70#

 94 T
 C26(20R)/C27(20S) - TAS
 1.412
 0.000
 100.0#
 0# -39.43#

 95 un
 C28(20S) - TAS
 1.412
 0.000
 100.0#
 0# -40.24#

 96 un
 C27(20R) - TAS
 1.412
 0.000
 100.0#
 0# -41.09#

 97 un
 C28(20R) - TAS
 1.412
 0.000
 100.0#
 0# -41.42#

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

| Data Path : C:\GCMS7\MS70057\ Data File : MS70057I.D Acq On : 17 Aug 2013 6:22 Operator : YM Sample : AR-WKICV-250-004 Misc : ALS Vial : 9 Sample Multipl: Quant Time: Aug 17 22:48:01 20: Quant Method : C:\GCMS7\MS70057 Quant Title : PAH Calibration QLast Update : Sat Aug 17 22:33 Response via : Initial Calibrat | ier: 1 13 7\AR70057. Table-201 9:35 2013 | | | | |
|---|--|--|--|---|---|
| Compound | R.T. | QIon | Response | Conc Un: | its Dev(Min) |
| Internal Standards 1) Fluorene-d10 31) Pyrene-d10 73) Benzo(a)pyrene-d12 | | | | | |
| System Monitoring Compounds 2) Naphthalene-d8 21) Acenaphthene-d10 32) Phenanthrene-d10 66) Chrysene-d12 88) Perylene-d12 90) 5(b)H-Cholane | 33.809 | 164 188 240 264 | 421897m 782603m 1044517m 1049103m | 224.46 206.60 251.91 212.57 | -0.04 |
| 7) C4-Decalins 8) Naphthalene 9) 2-Methylnaphthalene 10) 1-Methylnaphthalene 11) 2,6-Dimethylnaphthalene 12) 1,6,7-Trimethylnaphtha 13) C2-Naphthalenes 14) C3-Naphthalenes 15) C4-Naphthalenes | 0.000 0.000 0.000 13.878 16.134 16.469 18.224 21.065 0.000 0.000 0.000 | 128 142 142 156 170 | 0 1012553m 657652m 604346m 598729m 556422m 0 0 0 | N.D. N.D. N.D. 277.48 286.01 284.51 277.43 291.12 N.D. N.D. N.D. N.D. | d d |
| 16) Benzothiophene 17) C1-Benzothiophenes 18) C2-Benzothiophenes 19) C3-Benzothiophenes 20) C4-Benzothiophenes 21) Biphenyl 23) Acenaphthylene 24) Acenaphthene 25) Dibenzofuran 26) Fluorene 27) 1-Methylfluorene 28) C1-Fluorenes 29) C2-Fluorenes 30) C3-Fluorenes 33) Carbazole 34) Dibenzothiophene 35) 4-Methyldibenzothiophene 36) 2/3-Methyldibenzothiophene 37) 1-Methyldibenzothiophene 38) C2-Dibenzothiophenes 39) C3-Dibenzothiophenes 39) C3-Dibenzothiophenes 31) Phenanthrene 32) Anthracene | $14.045 \\ 0.000 \\ 0.000 \\ 0.000 \\ 17.694 \\ 19.171 \\ 19.756 \\ 20.369 \\ 21.539 \\ 0.000 \\ 0.000 \\ 0.000 \\ 0.000 \\ 25.583 \\ 24.406 \\ 0.000 \\ 0.00$ | 134 154 152 154 168 166 167 184 | 830107m 0 0 0 865433m 961956m 582461m 970029m 770625m 0 0 0 0 0 876427m 1005834m 0 0 0 0 0 0 0 0 0 0 0 0 0 | 278.81 N.D. N.D. 276.81 270.05 286.47 280.42 282.10 N.D. N.D. N.D. 242.94 256.76 N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D | d d d d d d d d d d d d d d d d d d d |

| Data Acq C Opera Sampl Misc ALS V Quant Quant Quant Quant | Path : C:\GCMS7\MS70057\ File : MS70057I.D On : 17 Aug 2013 6:22 a ator : YM .e : AR-WKICV-250-004 : Yial : 9 Sample Multiplie Time: Aug 17 22:48:01 2013 Method : C:\GCMS7\MS70057\ Title : PAH Calibration T : Update : Sat Aug 17 22:39: onse via : Initial Calibrati | er: 1 AR70057. Cable-201 35 2013 | | | |
|--|--|---|-------------------|--|--|
| | Compound | R.T. | QIon | Response | Conc Units Dev(Min) |
| 44) 45) 46) 47) 48) 49) 50) 51) 52) 53) 53) 55) 55) 56) 57) 58) 56) 59) 61) 62) 63) 64) | 3-Methylphenanthrene 2-Methylphenanthrene 2-Methylphenanthrene 4/9-Methylphenanthrene 1-Methylphenanthrene 8.6-Dimethylphenanthrene Retene C2-Phenanthrenes/Anthr C3-Phenanthrenes/Anthr C4-Phenanthrenes/Anthr Naphthobenzothiophene C1-Naphthobenzothiophenes C2-Naphthobenzothiophenes C3-Naphthobenzothiophenes C3-Naphthobenzothiophenes C4-Naphthobenzothiophenes Fluoranthene Pyrene 2-Methylfluoranthene Benzo(b)fluorene C1-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes C3-Fluoranthenes/Pyrenes | 0.000 0.000 0.000 26.934 0.000 | 192 202 202 | 0 0 0 834760m 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | N.D. d N.D. d N.D. d N.D. d 284.34 N.D. d N.D. d |
| 65) | C4-Fluoranthenes/Pyrenes | 0.000 | | 0 | N.D. d |
| 68) | | 33.886 | 228 | 1495128m 1258413m 0 | |
| | C2-Chrysenes C3-Chrysenes | 0.000 | | 0 | N.D. d |
| | C4-Chrysenes | 0.000 | | 0 | N.D. d N.D. d |
| 74) | C29-Hopane | 0.000 | | 0 | N.D. d |
| | 18a-Oleanane C30-Hopane | 0.000 | | 0 | N.D. d N.D. d |
| | Benzo(b)fluoranthene | 37.300 | 252 | 1494795m | 257.11 |
| | Benzo(k,j)fluoranthene | 37.417 | 252 | 950589m | 214.71 |
| | Benzo(a)fluoranthene | 0.000 | 050 | 0 | N.D. d |
| | Benzo(e)pyrene Benzo(a)pyrene | 38.309 38.464 | 252 252 | 1415490m 1426066m | 264.27 271.11 |
| | Indeno(1,2,3-c,d) pyrene | 43.152 | 276 | 1835877m | 276.91 |
| | Dibenzo(a,h)anthracene | 43.226 | 278 | 1509451m | 283.74 |
| | | 0.000 | | 0 | N.D. d |
| | | 0.000 | | 0 | N.D. d |
| | C3-Dibenzo(a,h)anthrac | 0.000 | 276 | 0 | N.D. d |
| | Benzo(g,h,i)perylene Perylene | 44.516 38.774 | 276 252 | 1581626m 1523456m | 273.11 284.38 |
| | C20-TAS | 0.000 | 252 | 0 | N.D. d |
| | C21-TAS | 0.000 | | 0 | N.D. d |
| | C26(20S)-TAS | 0.000 | | 0 | N.D. d |
| | C26(20R)/C27(20S)-TAS | 0.000 | | 0 | N.D. d |
| | C28(20S)-TAS C27(20R)-TAS | 0.000 | | 0 | N.D. d N.D. d |
| | C28 (20R) - TAS | 0.000 | | 0 | N.D. d |

Data Path : C:\GCMS7\MS70057\ Data File : MS70057I.D Acq On : 17 Aug 2013 6:22 am Operator : YM Sample : AR-WKICV-250-004 Misc 3 ALS Vial : 9 Sample Multiplier: 1 Quant Time: Aug 17 22:48:01 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration R.T. QIon Response Conc Units Dev(Min) Compound (#) = qualifier out of range (m) = manual integration (+) = signals summed

(QT Reviewed) Quantitation Report

: 9 Sample Multiplier: 1 6:22 am Data Path : C:\GCMS7\MS70057\ : 17 Aug 2013 6:2 : YM : AR-WKICV-250-004 Data File : MS700571.D ALS Vial Operator Acq On Sample Misc

Quant Time: Aug 17 22:48:01 2013 Quant Method : C:\GCMS7\MS70057\AR70057.M Quant Title : PAH Calibration Table-2013A QLast Update : Sat Aug 17 22:39:35 2013 Response via : Initial Calibration

| | 800000 | 700000 | 60000 | 50000 | 400000 | 300000 | 200000 | cis/trans Dec | | 0.00 |
|------------|--------------------------------------|-------------|---|-----------------------------|--|------------------|--------------|---------------|----|-------------------------|
| | | | T,9nele | sdinger (anad | <mark>영방조개함</mark> 록uyd | e <mark>N</mark> | 11.144 | | | 12.00 14.00 |
| | | Ľ | inaphthalene î, ana | ydi9M-S Ydi9M-S | W-1 | | | | | 16.00 |
| | T,lynəriqi8 T,ənəlsritiqsniyritən | -9'2 | | | | | | | | 18.00 |
| | | T,ened | analyddiadau Idgenacy NeiufoznadiC | S'01p-auau | Acenapht | | | | | 20.00 |
| yeqtydeuly | - 1,6,7-Trimeth T,enerene,T | | | | -Fluorene- | | | | | 0 22.00 |
| | | | | T anadooid | losnadi() | | | | | 0 24.00 |
| | Trishagenana | ld | | T anahqoirt 2,01b anahdi | T, eloseda T, elos da T, elos da | | | | | 0 26.00 |
| | T,ənərdmenədql | (dt9M-f | | | | | | | | 0 28.00 |
| | T,ener, | (a | l,01b-en | | Fluoranthe | | | | | 0 30.00 |
| 2 | | | | | | | | | 5 | 0 32.00 |
| | T,ene 2636494(narg | Сhrysener | | | | | 2,9nalohO-H(| | | 34.00 |
| | | | | | | | | | | 34.00 36.00 |
| | | | 97098 | rn98 — — Benzo(e)pyrei | | | | | Ĵ | 0 38.00 |
| <i>•</i> | 100 | a-dia Milat | Pelved | | | | 3 | | ſ | 38.00 40.00 42.00 44.00 |
| | | | | | | | | | | 42.00 |
| | T,enecene,T | | m erg(b, o.c,í) greigeg(i d | | | | | |] | 44.00 |
| | | | ,ənəlynəq(i,rl, | 6)07020 | | | | | | |
| | | | | | | | | | | 46.00 48.00 |
| | | | | | | | | | | 50.00 |
| | | | | | | | | | | 52.00 |
| | | | | | | | | | | 54.00 |
| | | | | | | | | | i. | 56.00 |
| | | | | | | | | | | 0 58.00 |

N

PAH Mass Discrimination Ratio

B&B Laboratories Project J13034 Report 13-3100

Arcadis - Mayflower AR Polycyclic Aromatic Hydrocarbon Data Mass Discrimination Sheet

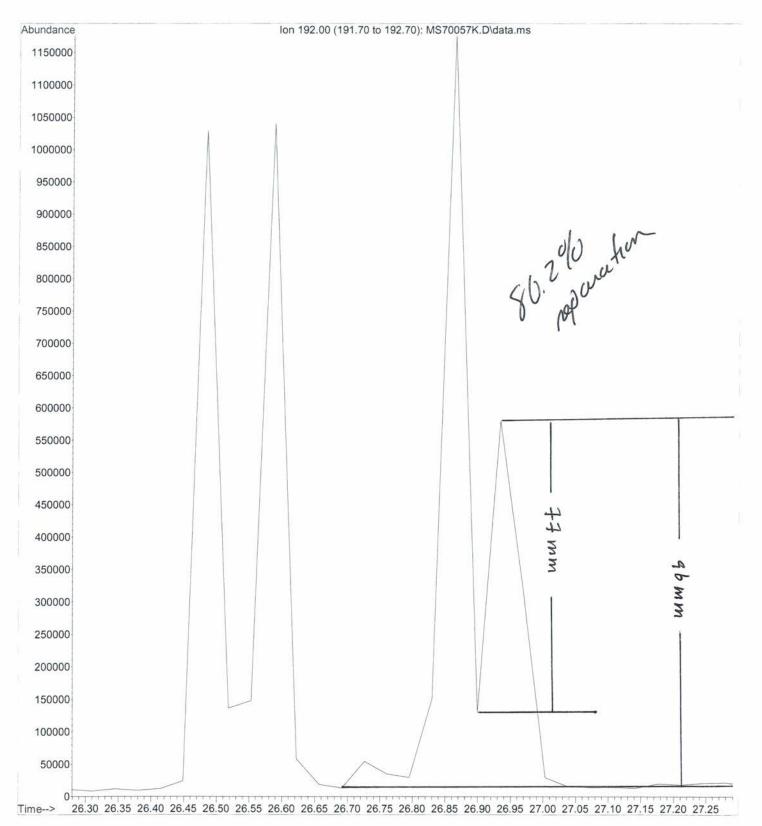
| | - |
|----------------|--------------|
| | |
| 24.1 23.2 1.04 | |
| 101 100 1.01 | |
| 222 235 0.95 | |
| 457 483 0.95 | |
| 930 977 0.95 | |
| 4941 4786 1.03 | |
| 273 268 1.02 | |
| 253 249 1.02 | |
| 168 228 0.74 | |
| | |
| 168 216 0.77 | |
| | 165 208 0.79 |

Qualifiers (Q): Ratio of Benzo(g,h,i) perylene to Phenanthrene needs to be ≥ 0.70

PAH Internal Standard Area Data

| Report 13-3100 | The Area of the Internal Standards in the Associated Calibration Standard | | | | | | | | | |
|--|--|--|-------------------------------------|----------------|--|-----------------------------------|----------------|--|---|----------------|
| File Name | Sample Name | Interna Flu | Internal Standard 1 Fluorene-d10 | d 1 | Inter | Internal Standard 2 Pyrene-d10 | Ird 2 | Inter Benz | Internal Standard 3 Benzo(a)pyrene-d12 | ard 3 9-d12 |
| | | Response (Area) | 50% (Area) | 200% (Area) | Response (Area) | 50% (Area) | 200% (Area) | Response (Area) | 50% (Area) | 200% (Area) |
| MS70057D.D MS700571.D | AR-WKC3-250-030 AR-WKICV-250-004 | 444103 485044 | 222052 | 888206 | 828017 940240 | 414009 | 1656034 | 947909 1046370 | 473955 | 1895818 |
| MS70057J.D ENV3081A.D | AR-WKCC-250-038 Procedural Blank | | 201144 | 804576 | 711768 808915 | 355884 | 1423536 | 764621 878300 | 382311 | 1529242 |
| ENV30816.D ENV3081C.D ENV3081D.D ENV3081E.D ARC1600.D | SKM 1941b MS (SO-DA-015 (0-0.5) MS/MSD) MSD (SO-DA-015 (0-0.5) MS/MSD) Dupl. (SO-DA-014 (1.0-1.5)) SED-DA-020 (0.5-1.0) | 443/11 425322 430992 370959 380092 | | | 868078 798420 767183 729099 669393 | | | 908512 816593 790895 734674 627990 | | |
| ARC1601.D ARC1618.D | SED-DA-020 (1.0-1.5) SO-DA-012 (0-0.5) | 403833 345855 | | | 673089 638702 | | | 663062 578467 | | |
| MS70057L.D ARC1619.D ARC1620.D ARC1621.D | AR-WKCC-250-038 SO-DA-012 (0.5-1.0) SO-DA-012 (1.0-1.5) SO-DA-013 (0-0.5) | 373875 363678 358642 347503 | 186938 | 747750 | 705293 689801 675248 658221 | 352647 | 1410586 | 665968 616945 652091 | 332984 | 1331936 |
| ARC1622.D ARC1622.D ARC1623.D ARC1624.D ARC1625.D ARC1626.D | SO-DA-013 (0.5-1.0) SO-DA-013 (0.5-1.0) SO-DA-014 (0-0.5) SO-DA-014 (0.5-1.0) SO-DA-014 (1.0-1.5) | 332451 328427 342674 346184 347411 | | | 654271 654271 646809 667323 677971 687610 | | | 610205 610205 629279 614271 664144 625351 | | |
| MS70057M.D ARC1627.D ARC1628.D ARC1629.D ARC1629.D ARC1630.D ARC1641.D ARC1642.D ARC1642.D ARC1643.D | AR-WKCC-250-038 SO-DA-DUP-01-080113 SO-DA-015 (0-0.5) SO-DA-015 (0.5-1.0) SO-DA-015 (1.0-1.5) SED-DA-012 (0.5-1.0) SED-DA-012 (1.0-1.5) SED-DA-013 (1.0-1.5) | | 210831 | 843322 | 852816 721156 721156 72156610 736628 724489 708926 676551 740680 | 426408 | 1705632 | 750512 599100 602163 632990 699093 657110 657110 663704 | 375256 | 1501024 |
| ARC1644.D MS70057N.D | SED-DA-013 (1.0-1.5) AR-WKCC-250-038 | 344521 393787 | 196894 | 787574 | 715299 784238 | 392119 | 1568476 | 627035 669077 | 334539 | 1338154 |

SRM-2779 Reference Oil Aliphatic and PAH Resolution Checks File :C:\GCMS7\MS70057\MS70057K.D
Operator : YM
Acquired : 17 Aug 2013 8:39 am using AcqMethod PAH-2012.M
Instrument : GCMSD
Sample Name: AR-SRM2779-WK4.0-002
Misc Info :
Vial Number: 11



Supporting Documents

Shipping, Sample Receiving, and Project Initiation Documents

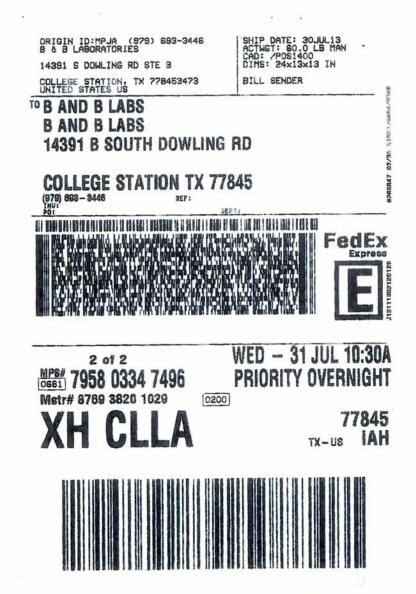
B&B LABORATORIES RECEIVING/INTEGRITY REPORT

| Job: J13034 Date Received: 7/31/13 SDG#: 13073101 |
|--|
| sender: Arcadis- May flower AR |
| 1. Number of Shipping Containers: 2 Avcadis - Daviel Mays |
| Comments: 10f2, lavge blue cooler |
| 2. Airbill Present? (Yes)No Shipping Company: Fed Ex |
| Airbill Number: 7958 0334 7496 Pon |
| 3. Custody Seals on Container? No Ves Intact Not Intact On top of duct take |
| 4. Chain of Custody Records? Comments No Yes Paperwork in Cooler 2 |
| 5. General Sample Conditions: Frozen Cool Unrefrigerated Temperature/Comments: Dry Ice Blue Ice Ice L. 6°C/ temp blank 2.9°C The |
| 6. List of Broken Containers: |
| None |
| |
| |
| 7. Number of Samples Expected: <u>2 Codevs</u> Number of Samples Received: |
| 8. Problems/Discrepancies: |
| None 19 seds 2 waters |
| 9. Resolutions: |
| NIA |
| 10. Checked in by: <u>AMANOLA BUW</u> Date: <u>7/31/13</u> |

Parde cooren

Solg 1307-3101 Cooler 10F2 wet ice To no coc 6.6°c/temp blank 2.9°c

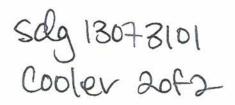




| B&B LABORATORIES RECEIVING/INTEGRITY REPOR | B&B | B LABORATORIES RE | CEIVING/INTEGRITY | REPORT |
|---|-----|-------------------|--------------------------|--------|
|---|-----|-------------------|--------------------------|--------|

| Job: J13034 Date Received: 7/31/13 SDG#: 13073101 |
|---|
| Sender: <u>Avcadis- Mayflower AK</u> 1. Number of Shipping Containers: 2 Avcadis-Daniel Mays |
| |
| Comments: 20f2 large blue cooler |
| 2. Airbill Present? Yes No Shipping Company: Fed EX Airbill Number: Comments: |
| 8769 3820 1029 PON |
| 3. Custody Seals on Container? No (Ves) Intact Not Intact OU top of duct tape |
| 4. Chain of Custody Records? Comments No very us very usked signature |
| 5. General Sample Conditions: Frozen Cool Unrefrigerated Dry Ice Blue Ice Ce The Hank 3.6°C (The Hank 3.6°C |
| 6. List of Broken Containers: |
| TUDILE |
| |
| 7. Number of Samples Expected: 2 COOLEVS Number of Samples Received: |
| 8. Problems/Discrepancies: Cooler 2: |
| None 19 seds 2 waters |
| 9. Resolutions: |
| NIA |
| 10. Checked in by: allanda Burter Date: 7/31/13 |





4.9°C/temp blank 3.6°C



| | Express NEW Package B769 3820 1029 | | 0200 📷 | | FedEx Retrieval Copy |
|---|--|---------|--|---------------|--|
| 1 | From Date 7-30-2013 Sonder's FedEx 198592746 | 4 | Express Package Service In- | | Packages up to 150 Um. In postages your Walks, and the own field's Execute Sought Int Actual |
| | Sender's Quin al Mays Phone 411 - 1917 | 06 | Noxt Business Day FactEx First Overnight Sector and Based in the Sector and Sector and Sector and Based Sector and Sector and Sector and Sector and Sector | 49 | 2 or 2 Business Days NEW Factors 2Day A.M |
| | Company ARC AD I | 01/ | FodEx Pricetty Overnegit: Near buildings realizes T-index shares at an indexembra Microbio and an UT-201201-2012 | 03 | FordEx ZDay Second Instances of Decision Processing Statements of the decision of decision of the second statements |
| | Address ROI Corporate Letter UP Ste 206 | 05 | s celevant FundEx Startufand Dverzreigen frank teaman affertream | 20 | Servery a selected FotEs Exprosy Server Server instance and Intervent Intervent 2011 Available |
| 2 | Cav Raleigh State NC ZIP 27607 Your Internal Billing Reference J13024 | 5 | Packaging "Overland view time one FodEx Envirope" 02 FodEx Pak | 03 | I Fude- 04 Fude 01 Otim |
| - | To Recipients B+B Laborator on The Phone 979 693-346 | 6 03 | Special Handling and Delivery S SATURDAY DELIVERY | ignati | ere Options |
| | Company B+B Labs | 7 | Package may be bet withing 10 Some may a supervise to desire a | an Ann dealle | nterno anticipationerse |
| | Address 4391 B South Visiting Kit Of Michael and South Visiting Kit Of Michael and South Michael And S | 7 | Does this shipment contain dangarous go One has much to charked 210 04 Yes yes are seen to charked Yes are strong to be and the sharked Yes are strong to be an are are strong to be an are strong to be are strong to be an | - | Chargen & Like same |
| | Address 31 Indiversal address of the continuous of your strategy address 31 Indiversal address of the continuous of your strategy address 31 Indiversal address of the continuous of your strategy address 31 Indiversal address of the continuous of the strategy address 31 Indiversal address of the continuous of the strategy address 31 Indiversal address address 31 Indivers | 1 7 | Poyment Bill to | | Gargo Alected Doly wild Card No. Select. 10:0 Aust. 10:0 |
| | 8769 3820 1029 | | And the second s | 会社の | Party 4 Credit Cant 5 CastyCheck Doct Cast Are - |

| 15 260 David | 03, 130) Ramirez | | | | Ctory VI Lionsic afaine | | phone (979) 693-3446 fax (979) | fax (979) 693-6389 http | http://www.ldi-bi.com | | and a local second |
|--|---------------------|--------------|--------------------------------|-----------------|-------------------------|-----------------------|--------------------------------|-------------------------|-----------------------|--------------------|--------------------|
| D: BDD860 Itact: J NOM Signature: Davi | 30) Marcz | | | | | | | Analyses | ses | | |
| B&B Contact: 9 WW Now | Man | | May Planer Pipeline Anider | teline S | Truider | t | 3100 WS 01.20 | Cin | | Other Instructions | s |
| | 4 | 5 | mi Dalla | rthe | | | 8 10 | 1 | 11 | | |
| Sample ID Sam | Sample Date | Sample Time | e Sample Matrix | Preservative | | Containers vne No. | AN SHA | | | Comments | |
| 5/20-04-029 (0-0.5) 7-29-13 | 8-13 | 1030 | Sed | None | 00 | 12 | XX | | Full DAL | 1) ist | |
| 501-04-029(0,5-10) 7-9 | 1-29-13 | 1035 | Sed | NONE | 7 | jour | X | - | HAG H | List | |
| 5ED-M-029(1.0-1.5) 7-5 | 7-29-13 | apal | Sed | None | 402 | int 1 | X | | 44 PAH | List | |
| 501-14-029(1.5-2.0) 7-5 | E1-82-13 | 1645 | Sed | None | 402 | jour 1 | X | | 7 440 44 | 1st extract | + hold |
| 551-04-029(2030) 71 | 129-13 | 1050 | Sed | None | 402 | ar 1 | X | + | AND FU | 1st estind | -thill |
| R | 5-80-1 | 011 | wherev | None | +1r A | Amber 2 | XX | 1 | FULPA | オンナ | 124751 - |
| 58D-124-030(0-0.5) 7-79. | S-bc | 0701 | Sel | None | 3 | 802 pur 1 | XX | 1 | Full PA | 414 | |
| L (0') | -29-13 | 1122 | Sed | None | 20 11 | 02 jav | X | T. | Htd th | List | |
| 5ED-DA-0300.0-1.5)7-2 | 1-24-13 | 130 | Sed | None | 402 | jav 1 | X | - | T ANA hh | 本 | |
| 550-04-028(0-05)7-6 | 51-20-13 | 1300 | Sed | None | 802 | or 1 | XX | - | Full Pr | H List | |
| | | | | To | Total # of Containers | ainers | | | | | |
| Relinquished By | H | Company Name | H | Date | Time | | Received By | | Company Name | Date | Time |
| Printed Name. Dayligh C May > Saula | dill | 42401 | 5 7- | 30-13 1 | 700 | nited Name | rhix | | | 7-30-13 | 1700 |
| Signature. | | | _ | - | ŝ | Signature: | | | | | |
| Printed Name | | | | | Pr | inted Name | duca b | 1 euclide | Bill lalo | 5 134/13 | 3.00 |
| Signature | | | | | 0 | Signature: | ionda | Buril | | | |
| Matrix | | ŭ | Sample Containor, Vol/material | Vol/matenal | | | | | | | |
| T=Tissue G=Gas S=SoutSodiment Ws=Waste | | 104 | GaGlass Papelast | C=Core B=Ban | 22 | | | | | | |

300

| | P9 34 | | ĸ | | 12 4 23, 17 7 | 19 15 |
|--|---|---|---|----------|--------------------|----------|
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | Home Office 14: | OF CUST Road College Station TX 7784 | ODY RECORD ¹⁵ phone (979) 693-346 fax (979) 693-6 | | -bi.com | ooks) |
| ontact: J'VUT Curritre 2 er Signature: LINUT Curritre 2 Sample ID sample Das Banja Tim Sample Town on the sample Part of the | APLADIS BCOBECO3. BUI MUNHANEY | Pipelive Two | dent (200 | Analyses | Other Instructions | |
| Sample ID Sample Data Sample Banoti Time Sample Addition Contribution Contres Contribution Contribution< | &B Contact: NUGN KOWNIVEZ ampler Signature: Dampe Mays Brill M | ly. | 3 Poru - | #.(4) | | |
| (1) 24-03(0.05) 7-30-13 85 Sed Mone 4 or 3 or 1 2 HU PAH hA (1) 24-03(0.5-1.0) 7-30-13 8-35 Sed Mone 4 or 3 or 1 2 14 PAH hA (1) -0.15) 7-30-13 8-15 Sed Mone 4 or 3 or 1 2 14 PAH hA (1) -0.15) 7-30-13 8-15 Sed Mone 4 or 3 or 1 2 14 PAH 15 (1) -0.15) 7-30-13 8-55 Sed Mone 4 or 3 or 1 2 14 PAH 15 extracter (1) -0.16(2.0-32) 7-50-13 8-55 Sed Mone 4 or 3 or 1 2 14 PAH 15 (1) -0.16(1.0-55) 7-50-13 9-55 Mone 4 or 3 or 1 2 14 PAH 15 (1) -0.16(1.0-55) 7-50-13 9-55 Mone 4 or 3 or 1 2 14 PAH 15 (1) -0.16(1.0-55) 7-50-13 9-55 Mone 4 or 3 or 1 2 14 PAH 15 (1) -0.16(1.0-55) 26 Mone 4 or 3 or 1 2 14 PAH 15 (2) -0.15(1.0-15) | Sample Date Sample Time | Preservative | tainers No. | 0.2 | Comments | |
| OPA-COULOS-10) 23-15 53-16 Mone 402 jan 2 W PARE List OPA-COULOS 23-15 841 52 MU DARE 2 W PARE List OPA-COULOS 23-15 841 52 MONE 402 jan 2 W PARE List OPA-COULOS 23-15 845 520 MONE 402 jan 2 W PARE List OPA-COULOS 23-50-15 855 520 MONE 4102 jan 2 PU PARE List OPA-COULOS 23-15 250 MONE 4102 jan 2 PU PARE List OPA-COULOS 23-13 455 520 Mone 402 jan 2 PU PARE List OPA-COULOS 23-13 1015 22 W PARE List 2 PU PARE List OPA-COULOS 23-13 1015 20 Mone Post 2 PU PU PU OPA-COULOS 23-14 PU 2 PU PU PU PU PU OPA<-COULOS | Si S | Pa | iar | 2 | Full PAH List | |
| Mr-016(10-15) P.A. B.C. Sed Nove H 0.2 Cut Z HH 141 Extract + PA-024(15-2.0) 855 Sed Nove H 0.1 2 HH Put Extract + PA-024(15-2.0) 855 Sed Nove H 0.2 2 HH Put Extract + PA-014(15-2.0) 855 Sed Nove H 0.2 2 HH Put Extract + PA-015(0.05) 750-13 745 Sed Nove H 0.2 2 HH Put Extract + PA-015(0.05) 750-13 745 Sed Nove H 0.2 2 HH Put Extract + PA-015(0.05) 730-13 455 Sed Nove H 0.2 2 HH Put Extract + PA-015(0.15) 730-13 455 Sed Nove H 0.2 2 HH Put LA PA-015(0.05) 7413 101 B 0.2 101 2 HH Put LA PA-015(0.15) 730-13 455 Sed Nove 4 2 HH Put LA PA-012(0.15) 730-13 1015 Sed Nove 4 2 HH Put LA PA-024(0-05) 7410< | 17-30-03 835 5 | Nave 40 | Z Jar X | 2 | W PAH List | |
| Mr-0240-201-201-201-201-201 201-044 22-04 Mr 124 extract + Dr-0240-201-201-201-201-201-201 255 264 Nove 22-14 P44 124 124 Dr-0250-51-031-201-301-301-301-301-301-301 22-2 144 124 125 Dr-0250-51-031-301-301-301-301-301-301-301-301 22-2 144 124 125 Dr-0250-51-031-301-301-301-301-301-301-301-301-30 | 1 - M-D 840 | None #07 | Ljar X | 2 | 44 PAK LIST | |
| PA-01(30-3,4) P-0-01(30-3,4) P-0-01(30-3,4) P-01(10-15) | 01-30-10 070 | Nove 40 | | 4 0 | . 7 | hold |
| DA-015(0-05) 745 Sel Mont E c2 bar X Z Full Put LX DA-025(0-15) 30-13 455 50 Mone 402 corr 2 141 Nt 135 DA-025(0-15) 30-13 455 50 Mone 402 corr 2 141 Nt 135 DA-025(0-15) 30-13 455 50 Mone 102 corr 2 141 141 PDA-025(0-0.5) 30-13 1015 50 Mone 102 corr 2 141 144 PDA-024(0-055) 30-13 1015 50 Mone 102 corr 2 141 144 PDA-024(0-055) 30-13 1015 50 Mone 102 corr 2 141 144 PDA-024(0-055) 30-13 101 102 2 141 144 15 PDA-024(0-055) 30-13 101 102 100 100 100 101 Reinquisted By Company Name Date 1me Received By Company Name 175 17 Inc Mone 100 pate 1me Received By Company Name 175 17 I | 7-30-13 855 | 7 | D' | | 1 -1 | hold |
| -DA-0250.54.07-30-13 950 5ed Nune 4 a. fur 1 X 2 14 24 44 43 -DA-0250.51-30-13 955 5ed Nune 4 a. for 2 14 24 44 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 24 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 24 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 44 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 44 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 44 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 44 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 44 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 44 43 -DA-0240-0557-30-13 1015 5ed Nune 4 a. for 2 14 44 43 -DA-0240-0557-30-13 1015 5ed Nune 7 44 43 -DA-0240-0557-30-13 1015 70 -DA-0240-0557-30-13 1015 70 -DA-0240-0577-30-13 1000-0577-000-000-000-000-000-000-000-000 | 17-30-13 945 5 | 90 | b . | 2 | (1 PAH 1.5+ | NIOTA |
| THE-025(1.0-15)7-30-13 (455 52.4 Mare 41.02 201 1 2 14 14 134 P-DA-024(0-05)7-30-13 1015 52.4 Mare 40.2 201 144 135 Total # of Containers 10 Relinquished By Company Name Date Time Received By Company Name Date Time Name Mark 138-13 17 no. DMMM Mark Abulh APCADS 7-36-13 1700 Printed Name Received By Company Name Date Time Printed Name Name Pate Time Received By Company Name 2010 178 Relinquished By Company Name Pate Time Received By Company Name Date Time Printed Name Name Pate Time Received By Company Name Pate Time Printed Name Name Pate Time Received By Company Name Pate Time Printed Name Name Pate Time Printed Name Name Pate Time Printed Name Pate Pate Pate Pate Pate Pate Pate Pat | 20-30-13 950 | + | | 2 | たいまれま | |
| P-DA-0240-0577-30-13 1615 Sed Advie 18 02.04 XX 2 Full PAH L34 Total # of Containers 10 Relinquished By Company Name Date Time Received By Company Name Date T mic Dudie May Avid Red S 73-13 1700 Printed Name. Follow Company Name Date T Signature Signature Signat | 7-30-13 455 | Nave 440. | z'on 1 X. | 2 | H TH LY | |
| Total # of Containers Relinquished By Company Name Date Time Relinquished By Company Name Date Time Mode Mode Mode Property Name Date Time Relinquished By Company Name Date Time Received By Company Name Date Ti Inc. Mode Mode Provided Name Provided Name Provided Name Provided Name Provided Name Inc. Mode Mode Mode Provided Name Provided Name Provided Name Provided Name Inc. Mode Mode Provided Name Provided Name Provided Name Provided Name Provided Name Inc. Mode Provided Name Provided Name Provided Name Provided Name Provided Name Inc. Mode Provided Name Provided Name Provided Name Provided Name Provided Name Inc. Mode Provided Name Provided Name Provided Name Provided Name Provided Name Inc. Mode Provided Name Provided Name Provided Name Provided Name Inc. Mode Provided Name Provided Name Provided Name < | 7-31-3 1015 | P | Z'ÀT XX | 2 | - KI #2 13 | |
| Relinquished By Company Name Date Time Received By Company Name Date T mmc MMK MMK MMK MMK MMK MMK MMK MMK MMK | | Total # of Col | | | | |
| me Durket Marke Warke Welter Proventier Faller Faller 1736-17 17 signature Printed Name Fuller Frederic Frederic 1736-17 17 signature Automatic Status 1981/18 18. Signature Julian Automatic Status 181/18 18. | 4 | H | Received By | Ů | - | Time |
| Signature. Signatu | 4 | P | te | | 1 CT-16-1 | 200 |
| Printed Name: AUDILLO SAUSAU & A/31/13 181 | nature: | | Signature. | | | |
| Signature: 1112 LOS | led Name | | Auguria 8 | euster r | 1 31/13 7/13 1 | 1.15 |
| | nature | | AULUANDA. | ALON | | |

Mainc. T=Trissue G=Gas S=SolfSediment Ws=Waste R=Rinsaale HW=Hazardhus Waste P=Produci W=Water

Sample Container: Vol/material G=Glass C=Core P=Plastic B=Bag

| Client: APCADD Project ID: BCD86C03, DO A B&B Contact: JUGM Raminez Sampler Signature: DUME NOWD | | | phone (979) 693-3446 fax | tax (9/9) 693-6369 http://www.tdi-bi.com | | | ŝunn la |
|---|--------------------|-----------------------------|--------------------------|--|----------------|--------------------|---------|
| | Mary Flower Pif | May Hower Pipeline Invidend | - ACMA | Analyses Analyses Analyses Analyses | | Other Instructions | |
| Sample ID Sample Date Sa | Sample Time Matrix | Preservative Con | Containers | 1731 | | Comments | |
| 51-15-70-00410-1-20-13C | 1020 501 | Nove 4 00 | .3 | 4 | WY PAH | - List | |
| 560-14-0241.0-1.5) 7-30-13 | 025 500 | Nove Hozdan | X | 2 | 44 244 | L'St | |
| 580-DH-024(152.0) 7-34-13 | 030 Sed | Mare Norlow | X | 2 | THAL M | st, extract that | P |
| 560-04-04(20-3.0)7-30-73 | 1035 Sed | Nave Hypor | X | 2 | W PHH Lise | t extract that | 10 |
| 5ED-DA 220(6-0.5) 7-30-13 | las sol | Nave \$ 02. | iar XX | 2 | Full P4H | -USF | |
| 521-14-220(0,5-1.0) 7-30-03 | 1105 501 | Nove Hozsi | ian IX | 2 | Atd the | 1.54 | |
| 5E0-24-020(10-1,5) 7-30-01 | 110 22 011 | Noneut 12 | iar I Z | 2 | Htd ht | A.T. | |
| 5=0-04-BG 20700-0.57-30-B | 1345 Sed | NoverBuzz | ian I XA | 2 | Full PA | H LIX | |
| 5ED-DA-DUP-020748 7-34-12 | Sed | Nove 8 02. | iar X | 2 | Full P44 | 1 134 | |
| | - | Total # of Containers | ners & | | | | |
| Relinquished By Co | Company Name | Date Time | Received By | 1 By | Company Name | Date Time | 8 |
| Pringer Name Daying New Strate M | PLAND 7- | -31-13 1700 Press | Printed Name Fully | | | 221 EHRELL | 6 |
| Printed Namo | | Prin | Tinted Name Auction | a freust | ter Bill later | \$ 3/31/13 13: | Q. |
| Stanature | | Sign | Signature | G Runsh | - | | |

303

Sample Contanor: Volmatenal G=Glass C=Core P=Plastic B=Bag

> G≖Gas Ws∍Waste HW=Hazardous Waste W≃Water

T=Tissue S=Sol/Sedment R=Runseate P=Product

Malex:

B&B Laboratories

Environmental Sample Inventory

| # 607 | | CLIENT NAME | FILENAME | CLIENT ID | CUL. UAIE | | cickieu | | COMMENIS | 200 200 | # 10000 | :Ka mac | CORLANDER | a LIDICL # |
|-------|--------|------------------------|----------|---------------------------|-------------|---------------|------------------------|-------|-----------------------------|----------|----------|----------------------|--------------------------|---------------|
| 64251 | 113034 | Arcadis - Mayflower AR | ARC1566 | SED-DA-029 (0-0.5) | 07/29/13 | 07/31/13 P | PAH, TPH, AU | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mays | Boz clear glass iar | B0086003.1302 |
| 64252 | J13034 | Arcadis - Maylower AR | ARC1567 | SED-DA-029 (0.5-1.0) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | | B0086003.1302 |
| 64253 | 113034 | Arcadis - Mayflower AR | ARC1568 | SED-DA-029 (1.0-1.5) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 1 | B0086003.1302 |
| 64254 | 113034 | Arcadis - Mayflower AR | ARC1569 | SED-DA-029 (1.5-2.0) | 07/29/13 | 07/31/13 P | PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 1T | B0086003.1302 |
| 64255 | J13034 | Arcadis - Mayflower AR | ARC1570 | SED-DA-029 (2.0-3.0) | E1/62/10 | 07/31/13 P | PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64256 | J13034 | Arcadis - Mayflower AR | ARC1571 | SED-DA-030 (0-0.5) | 07/29/13 | 07/31/13 P | PAH, TPH, ALI | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 8oz clear glass jar | B0086003.1302 |
| 64257 | 113034 | Arcadis - Mayflower AR | ARC1572 | SED-DA-030 (0.5-1.0) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass lar | B0086003.1302 |
| 64258 | 113034 | Arcadis - Mayflower AR | ARC1573 | SED-DA-030 (1.0-1.5) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64259 | J13034 | Arcadis - Maylower AR | ARC1574 | SED-DA-028 (0-0.5) | 07/29/13 | 07/31/13 P | PAH, TPH, ALI | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 8oz clear ulass jar | B0086003.1302 |
| 64260 | 113034 | Arcadis - Maylower AR | ARC1575 | SED-DA-028 (0-0.5) MS/MSD | 07/29/13 | 07/31/13 P | PAH, TPH, ALI | SED | 1 of 2 | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 8oz clear glass jar | B0086003 1302 |
| 64281 | 113034 | Arcadis - Mayflower AR | ARC1576 | SED-DA-028 (0-0.5) MS/MSD | 07/29/13 | 07/31/13 H | ного | SED | 2 of 2 | 13073101 | Cooler 1 | Arcadis: Daniel Mays | Boz clear glass jar | B0086003.1302 |
| 64262 | 113034 | Arcadis - Mayflower AR | ARC1577 | SED-DA-028 (0.5-1.0) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass lar | B0086003.1302 |
| 64263 | 113034 | Arcadis - Mayllower AR | ARC1578 | SED-DA-028 (1.0-1.5) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear plass iar | B0086003.1302 |
| 64264 | J13034 | Arcadis - Maylower AR | ARC1579 | SED-DA-027 (0-0.5) | 07/29/13 | 07/31/13 P | PAH, TPH, ALI | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mays | Boz clear plass jar | B0086003.1302 |
| 64265 | 113034 | Arcadis - Maylower AR | ARC1580 | SED-DA-027 (0.5-1.0) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear plass jar | B0066003.1302 |
| 64266 | 113034 | Arcadis - Maylower AR | ARC1581 | SED-DA-027 (1.0-1.5) | 07/29/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooter 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0085003.1302 |
| 64267 | J13034 | Arcadis - Mayflower AR | ARC1582 | SED-DA-027 (1.5-2.0) | 07/29/13 | 07/31/13 PAH | AH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass lar | B0086003.1302 |
| _ | | Arcadis - Maylower AR | ARC1583 | SED-DA-027 (2.0-3.0) | 07/29/13 | 07/31/13 P | PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0066003.1302 |
| 64269 | J13034 | Arcadis - Mayflower AR | ARC1584 | SED-DA-027 (3.0-3.6) | 07/29/13 | 07/31/13 P | PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0066003.1302 |
| 64270 | J13034 | Arcadis - Mayflower AR | ARC1585 | SED-DA-026 (0-0.5) | 07/30/13 | 07/31/13 P | PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | - | Boz clear glass jar | B0086003.1302 |
| 64271 | | Arcadis - Mayflower AR | ARC1586 | SED-DA-026 (0.5-1.0) | 07/30/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0066003.1302 |
| 64272 | J13034 | Arcadis - Mayflower AR | ARC1587 | SED-DA-026 (1.0-1.5) | 07/30/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: | 4oz clear glass jar | B0066003.1302 |
| 64273 | | Arcadis - Mayflower AR | ARC1588 | SED-DA-026 (1.5-2.0) | 07/30/13 | 07/31/13 PAH | HH | SED | extract & hold, 44 analytes | 13073101 | Cooler 2 | Arcadis: | 4oz clear glass jar | B0086003.1302 |
| 64274 | | Arcadis - Mayflower AR | ARC1589 | SED-DA-026 (2.0-3.0) | 07/30/13 | | PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 2 | Arcadis: Danlel Mays | 4oz clear glass jar | B0086003.1302 |
| | - | Arcadis - Mayflower AR | ARC1590 | SED-DA-026 (3.0-3.4) | 07/30/13 | | PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 2 | - | 4oz clear glass jar | B0066003.1302 |
| | | Arcadis - Mayflower AR | ARC1591 | SED-DA-025 (0-0.5) | 07/30/13 | | PAH, TPH, ALI | SED | | 13073101 | Cooter 2 | Arcadis: Daniel Mays | 8oz clear glass jar | B0066003.1302 |
| 64277 | | | ARC1592 | SED-DA-025 (0.5-1.0) | 07/30/13 | | PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64278 | 1 | Arcadis - Mayflower AR | ARC1593 | SED-DA-025 (1.0-1.5) | 07/30/13 | | PAH | SED | 44 analytes | 13073101 | Cooler 2 | - | 4oz clear glass jar | B0066003.1302 |
| 64279 | | Arcadis - Mayflower AR | ARC1594 | SED-DA-024 (0-0.5) | 07/30/13 | | PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: | Boz clear glass jar | B0086003.1302 |
| 64280 | J13034 | Arcadis - Mayflower AR | ARC1595 | SED-DA-024 (0.5-1.0) | 07/30/13 | | PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | 80086003.1302 |
| 64281 | 113034 | Arcadis - Meyllower AR | ARC1596 | SED-DA-024 (1.0-1.5) | 07/30/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Danlei Mays | 4oz clear glass jar | 80086003.1302 |
| 64282 | J13034 | Arcadis - Mayllower AR | ARC1697 | SED-DA-024 (1.5-2.0) | 07/30/13 | 07/31/13 PAH | AH | SED | extract & hold, 44 analytes | 13073101 | Cooler 2 | Arcadis: Danlet Mays | 4oz clear glass jar | 80086003.1302 |
| | J13034 | Arcadis - Mayllower AR | ARC1598 | SED-DA-024 (2.0-3.0) | 07/30/13 | 07/31/13 P | PAH | SED | extract & hold, 44 analyles | 13073101 | Conter 2 | Arcadis: Danlel Mays | 4oz clear glass jar | 80086003.1302 |
| | | Arcadis - Mayflower AR | ARC1599 | SED-DA-020 (0-0.5) | E1/0E/10 | 07/31/13 P | PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: Danlel Mays | Boz clear glass jar | B0086003,1302 |
| 64285 | | Arcadis - Maylower AR | ARC1600 | SED-DA-020 (0.5-1.0) | 07/30/13 | 07/31/13 P | PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | 80086003.1302 |
| 64286 | | Arcadis - Maylower AR | ARC1601 | SED-DA-020 (1.0-1.5) | 07/30/13 | 07/31/13 PAH | AH | SED | 44 analytes | 13073101 | Conter 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64287 | J13034 | Arcadis - Mayflower AR | ARC1602 | SED-DA-BG-007 (0-0.5) | 07/30/13 | 07/31/13 F | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: Daniel Mays | Boz clear glass jar | B0086003.1302 |
| 64288 | J13034 | Arcadis - Maylower AR | ARC1603 | SED-DA-DUP-02-073013 | 07/30/13 | 07/31/13 F | 07/31/13 PAH, TPH, AU | SED | | 13073101 | Cooler 2 | Arcadis: Daniel Mays | Boz clear glass jar | B0066003.1302 |
| 64289 | 113034 | Arcadis - Mayflower AR | ARC1604 | SED-DA-EB-02-072913 | 07/29/13 | 07/31/13 F | 07/31/13 PAH. TPH. ALI | WATER | 1 of 2 | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 1L amber glass BR bottle | B0086003.1302 |
| 64290 | 113034 | Arcadis - Mayflower AR | ARC1605 | SED-DA-EB-02-072913 | 07/29/13 | 07/31/13 HOLD | OLD | WATER | 2 of 2 | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 1L amber glass BR bottle | B0066003.1302 |
| 64291 | | Arcadis - Mayflower AR | ARC1606 | SED-DA-EB-03-073013 | 07/30/13 | 07/31/13 F | 07/31/13 PAH, TPH, ALI | WATER | 1 of 2 | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 1L amber glass BR bottle | B0086003.1302 |
| C0C43 | | Arrandie Mandhume AD | POOL OCT | | Con Con Con | 「「「「「」」」」 | | | | | | | | |

7/31/2013 1:47 PM

Page 1 of 1

| Job #: 313034 SDG: 13073101 Client: Avcadis-Mayflowev Initiation Date: $7/31/13$ AR | Number of Samples: 16 Matrix: Sectiments as 7/31/13 Due Date: 42 45 days: 10/14/13 Comments: PAH: 44 analytes Veceived 7/31/13 |
|---|---|
| Analyses | |
| PAHs D OCs/PCBs | Aliphatics/TPH EOM |
| Dry Wt. Dy Kipid | тос/тіс 🗆 |
| Short Columns Long Columns | · · |
| Requested QA/QC (per batch of Client S | Samples) |
| Blank BSRM/LCS | Blank Spike |
| Blank Spike Duplicate | Matrix Spike |
| 56556 | Duplicate |
| Surrogate(s):A (A | Volume(s): |
| Internal Standard(s): | Volume(s): |
| Final Extract Volume (ml): | Final Solvent: |
| Comments: | 12414s shout List only |
| | |
| Sample Custodian Signature: | 31/10 Date: 7/31/13 |
| Laboratory Manager Signature: | Date: <u>7-/31/13</u> |
| Sample Initiaiton - general Rev 1.doc | cc: COC Book Extraction Lab |

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

B&B Laboratories

Environmentai Sample Inventory

| O | CLIENT NAME | FILENAME | FILENAME CLIENT ID | COL. DATE | RECVD Analysis | MATRIX | COMMENTS | B&B SDG | Cooler # | Cooler # Sent by: | Container | a Project # |
|------|------------------------|-----------|----------------------|-----------|----------------|--------|-------------|----------|----------|----------------------|---------------------|---------------|
| 3 | Arcadis - Mayflower AR | ARC1567 | SED-DA-029 (0.5-1.0) | 07/29/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| ø | Arcadis - Mayflower AR | | SED-DA-029 (1.0-1.5) | 07/29/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | Aoz clear glass jar | B0086003.1302 |
| 5 | Arcadis - Mayflower AR | ARC1572 | SED-DA-030 (0.5-1.0) | 07/29/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0066003.1302 |
| 5 | Arcadis - Mayflower AR | ARC1573 | SED-DA-030 (1.0-1.5) | 07/28/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 2 | Arcadis - Mayflower AR | ARC1577 | SED-DA-028 (0.5-1.0) | 07/29/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| ۰e | Arcadis - Mayflower AR | ARC1578 | SED-DA-028 (1.0-1.5) | 07/29/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| | Arcadis - Mayflower AR | ARC1580 | SED-DA-027 (0.5-1.0) | 07/29/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| | Arcadis - Mayflower AR | - | SED-DA-027 (1.0-1.5) | 07/28/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| | Arcadis - Mayflower AR | ARC1586 | 0) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 1 E. | Arcadis - Mayflower AR | | SED-DA-026 (1.0-1.5) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 1.6 | Arcadis - Mayflower AR | RC1592 | SED-DA-025 (0.5-1.0) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 1.60 | Arcadis - Mayflower AR | - | SED-DA-025 (1.0-1.5) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass lar | B0086003.1302 |
| 1.5 | Arcadis - Mayflower AR | | SED-DA-024 (0.5-1.0) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| | Arcadis - Mayflower AR | t ARC1596 | SED-DA-024 (1.0-1.5) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| | Arcadis - Mayflower AR | ARC1600 | SED-DA-020 (0.5-1.0) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| . F | Arcadis - Mayflower AR | ARC1601 | SED-DA-020 (1.0-1.5) | 07/30/13 | 07/31/13 PAH | SED | 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |

12

Page 1 of 1

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

| Job #: 513034 | |
|---|--|
| SDG: 13073101 | Matrix: Water |
| Client: Avcadis - Mayflow | |
| Initiation Date: 7/31/13 | comments: <u>collected</u> 7/29-7/30 |
| | comments: <u>Collected</u> 7/29-7/30 extract by 8/04-8/05 received 7/31/13 |
| Analyses | |
| | |
| PAHS OCS/PCB | |
| Dry Wt. %Lipid | |
| Short Columns Long Column | umns |
| Requested QA/QC (per batch of | Client Samples) |
| Biank SRM/LCS | Blank Spike |
| Blank Spike Duplicate | □ Matrix Spike |
| Matrix Spike Duplicate | - |
| | |
| SEE BACK F | OR SPECIFIC STANDARDS TO USE |
| Surrogate(s):7411_4_ | Volume(s): |
| Spike Standard(s): | (/ Volume(s): |
| Internal Standard(s): | (Volume(s): |
| Final Extract Volume (ml): | Final Solvent: |
| Comments: | |
| Contraction of the second se | |
| | |
| | |
| | |
| | |
| Sample Custodian Signature: | Uda Bulutte Date: 7/31/13 |
| (intro | Uda Bulutte Date: 7/31/13 Date: 7/31/13 |

| - |
|------|
| |
| |
| 8 |
| 2 |
| 10 |
| * |
| 0 |
| 岩 |
| |
| - |
| 60 |
| |
| - 60 |
| œ |
| |
| |

Environmental Sample Inventory

| B0086003.1302 B0086003.1302 |
|--|
| Container 1L amber glass BR bottle 1L amber glass BR bottle |
| ooler # Sent by: ooler 1 Arcadis: Daniel Mays ooler 2 Arcadis: Daniel Mays |
| B&B SDG Co 13073101 Cc 13073101 Cc |
| M. DATE RECVD Analysis MATRIX COMMENTS 7/29/13 07/31/13 PAH, TPH, ALL WATER 1 of 2 7/30/13 07/31/13 PAH, TPH, ALL WATER 1 of 2 |
| FILENAME CLIENTID COL. ARC1604 SED-DA-EB-02-072913 077 ARC1606 SED-DA-EB-03-073013 077 |
| Log # Job # CLIENT NAME 64299 J13034 Arcadis - Mayflower AR 64291 J13034 Arcadis - Mayflower AR |
| Log # 64289 64291 |

10

308

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

| Job #: J13034 | Number of Samples: |
|--|-------------------------|
| SDG: 3073101 | Matrix: Sediments |
| client: Avcadis - Mayflower A | |
| Initiation Date: $\frac{7/31/13}{2}$ | Comments: PAH, TPH, ALI |
| | received 7/31/13 |
| | Vecencea 7/31/13 |
| Analyses | |
| -D PAHs OCs/PCBs | |
| Dry Wt. Kipid | State Same |
| Short Columns Long Columns | |
| Requested QA/QC (per batch of Client | : Samples) |
| Blank SRM/LCS 19411 | Blank Spike |
| Blank Spike Duplicate | Matrix Spike |
| Matrix Spike Duplicate | Duplicate |
| SUP BACK DAD SECON | IC STANDARDS TO USE |
| Surrogate(s): A-HA-H | |
| Spike Standard(s): <u> </u> | Volume(s): |
| Internal Standard(s): | Volume(s): |
| Final Extract Volume (ml): | Final Solvent: DC.M |
| Comments: Inst ARC | 1575 as Ms/45D |
| Sample Custodian Signature: 000000 | Bullistudate: 7/31/13 |
| Laboratory Manager Signature: | Date: |
| Sample Initiation - general iter iteou | Extraction Lab |

B&B Laboratories

Environmental Sample Inventory

| | Job # | Job # CLIENT NAME | FILENAME CLIENT I | CLIENT ID | COL. DAYE | RECVD Analysis | MATRIX | COMMENTS | B&B SDG | Cooler # | Sent by: | Container | h Project # |
|-------|--------|------------------------|-------------------|---------------------------|-----------|------------------------|--------|----------|----------|----------|----------------------|---------------------|---------------|
| - | J13034 | Arcadis - Mayflower AR | RC1566 | SED-DA-029 (0-0.5) | 07/29/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 8oz clear glass jar | B0086003.1302 |
| 9 | J13034 | Arcadis - Mayflower AR | RC1571 | SED-DA-030 (0-0.5) | 07/29/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mays | Boz clear glass jar | B0086003.1302 |
| 6 | J13034 | Arcadis - Mayflower AR | RC1574 | SED-DA-028 (0-0.5) | 07/29/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mavs | Boz clear class lar | B0086003 1302 |
| 64260 | J13034 | Arcadis - Mayflower AR | RC1575 | SED-DA-028 (0-0.5) MS/MSD | 07/29/13 | 07/31/13 PAH, TPH, ALI | SED | 1 of 2 | 13073101 | Cooler 1 | | Boz clear class lar | B0086003 1302 |
| 64264 | J13034 | Arcadis - Mayflower AR | RC1579 | SED-DA-027 (0-0.5) | 07/29/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 1 | Arcadis: Daniel Mays | Boz clear class iar | B0086003 1302 |
| 64270 | J13034 | Arcadis - Mayflower AR | - | SED-DA-026 (0-0.5) | 07/30/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: Daniel Mays | Boz clear plass lar | B0086003 1302 |
| 64276 | J13034 | Arcadis - Mayflower AR | RC1591 | SED-DA-025 (0-0.5) | 07/30/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: I | 8oz clear olass lar | B0086003.1302 |
| 64279 | J13034 | Arcadis - Mayflower AR | _ | SED-DA-024 (0-0.5) | 07/30/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 8oz clear glass iar | B0086003 1302 |
| 64284 | J13034 | Arcadis - Mayflower AR | RC1599 | SED-DA-020 (0-0.5) | 07/30/13 | 07/31/13 PAH. TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 8oz clear glass jar | 80086003.1302 |
| ~ | J13034 | Arcadis - Mayflower AR | RC1602 | SED-DA-BG-007 (0-0.5) | 07/30/13 | 07/31/13 PAH, TPH, ALI | SED | | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 8oz clear glass jar | B0086003.1302 |
| - | J13034 | Arcadis - Mayflower AR | RC1603 | SED-DA-DUP-02-073013 | 07/30/13 | 07/31/13 PAH. TPH. ALI | SED | | 13073101 | Cooler 2 | Arcadis' Daniel Mays | Roz clear place lar | RUNARUNA 1200 |

\=

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

| Job #: J13034 | Number of Samples:O |
|--|---|
| SDG: 13073101 | Matrix: sediments |
| client: Arcadis- Mayflower AR | Due Date: 45 days: 10/14/13 |
| Initiation Date: 7/81/13 | Comments: EXTRACT & HOLD |
| | received 7/31/13 |
| Analyses | |
| | Aliphatics/TPH EOM |
| 0 | |
| biy wa | |
| Requested QA/QC (per batch of Client | Samples) |
| Blank DSRM/LCS1941 | |
| Blank Spike Duplicate | Matrix Spike |
| Matrix Spike Duplicate | Duplicate |
| | |
| SEE BACK FOR SPECIFI | C STANDARDS TO USE |
| Surrogate(s): | - A |
| 0 | Volume(s): |
| Surrogate(s): | Volume(s): Volume(s): |
| Surrogate(s): Path, A-C/ Spike Standard(s): Path, A-C/ | Volume(s): Volume(s): |
| Surrogate(s): | Volume(s): Open Volume(s): Integral Volume(s): Integral Final Solvent: Integral |
| Surrogate(s): | Volume(s): Open Volume(s): Integral Volume(s): Integral Final Solvent: Integral |
| Surrogate(s): $PaH, A-CI$ Spike Standard(s): PAH, ACI Internal Standard(s): PAH, ACI Final Extract Volume (ml): $Iaci$ | Volume(s): Volume(s): Volume(s): |
| Surrogate(s): $PaH, A-CI$ Spike Standard(s): PAH, ACI Internal Standard(s): PAH, ACI Final Extract Volume (ml): $Iaci$ | Volume(s): |
| Surrogate(s):A.L | Volume(s): 0322 Volume(s): 0022 Volume(s): 0022 Final Solvent: 0072 |
| Surrogate(s):A.L | $\underline{\qquad Volume(s): \underline{\qquad Ogul}}$ $\underline{\qquad Volume(s): \underline{\qquad Ocu}}$ $\underline{\qquad Volume(s): \underline{\qquad Ocu}}$ $\underline{\qquad Final Solvent: \underline{\qquad PCT}}$ $\underline{\qquad Final Solvent: \underline{\qquad PCT}}$ |

B&B Laboratories

Environmental Sample Inventory

| # 6 | # qof | CLIENT NAME | | FILENAME | FILENAME CLIENT ID | COL. DATE | RECVD Analysis | MATRIX | COMMENTS | B&B SDG | Cooler # | Cooler # Sent by: | Container | a Project# |
|-------|--------|------------------------|---------|----------|----------------------|-----------|----------------|--------|-----------------------------|----------|----------|----------------------|---------------------|--------------|
| 54 | J13034 | Arcadis - Maytlower AR | OWET AR | ARC1569 | SED-DA-029 (1.5-2.0) | 07/29/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.130 |
| 55 | J13034 | Arcadis - Mayflower AR | ower AR | ARC1570 | SED-DA-029 (2.0-3.0) | 07/29/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.130 |
| 64267 | J13034 | Arcadis - Mayflower AR | OWEL AR | ARC1582 | SED-DA-027 (1.5-2.0) | 07/29/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.130 |
| 64268 | J13034 | Arcadis - Mayflower AR | OWEL AR | ARC1583 | SED-DA-027 (2.0-3.0) | 07/29/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.130 |
| 34269 | J13034 | Arcadis - Mayllower AR | OWER AR | ARC1584 | SED-DA-027 (3.0-3.6) | 07/29/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear class lar | B0086003.130 |
| 64273 | J13034 | Arcadis - Mayflower AR | ower AR | ARC1588 | SED-DA-026 (1.5-2.0) | 07/30/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear class jar | B0086003.130 |
| 54274 | J13034 | Arcadis - Mayfower AR | Ower AR | ARC1589 | SED-DA-026 (2.0-3.0) | 07/30/13 | 07/31/13 PAH | SED | extract & hold. 44 analytes | 13073101 | Cooler 2 | Arcadis: [| | B0086003.130 |
| 75 | J13034 | Arcadis - Mayflower AR | OWER AR | ARC1590 | SED-DA-026 (3.0-3.4) | 07/30/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 2 | Arcadis: C | 4oz clear olass lar | B0086003.130 |
| 64282 | J13034 | Arcadis - Mayflower AR | ower AR | ARC1597 | SED-DA-024 (1.5-2.0) | 07/30/13 | 07/31/13 PAH | SED | extract & hold, 44 analytes | 13073101 | Cooler 2 | - | 4oz clear glass jar | B0086003.130 |
| 83 | J13034 | Arcadis - Mavilower AR | ower AR | ARC1598 | SED-DA-024 (2.0-3.0) | 07/30/13 | 07/31/13 PAH | SED | extract & hold 44 analytes | 13073101 | Contar 3 | Arcadie: Danial Maye | Any clear clace lar | RUNARON3 130 |

10-

7/31/2013 1:44 PM

amanda brewster

| From: | amanda brewster <amandabrewster@tdi-bi.com></amandabrewster@tdi-bi.com> |
|--------------|---|
| Sent: | Wednesday, July 31, 2013 4:39 PM |
| То: | 'Mays, Daniel'; Parmelee, Rhiannon (Rhiannon.Parmelee@arcadis-us.com); |
| | 'Jennifer.Chandler@arcadis-us.com'; 'Dennis.Capria@arcadis-us.com'; Mott, Lyndi |
| | (Lyndi.Mott@arcadis-us.com) |
| Cc: | Juan Ramirez (juanramirez@tdi-bi.com); Donell Frank; 'tommcdonald@tdi-bi.com' |
| | (tommcdonald@tdi-bi.com) |
| Subject: | RE: B+B Shipment 7-30-2013 |
| Attachments: | COC 7-31-13.pdf |

Hi Daniel,

We received your samples today in good condition. The internal temperature of Cooler 1 was 6.6°C and the temperature blank was 2.9°C. The internal temperature of Cooler 2 was 4.9°C and the temperature blank was 3.6°C. A PDF of the COC is attached for your records.

Regards, Amanda

From: Mays, Daniel [mailto:Daniel.Mays@arcadis-us.com] Sent: Tuesday, July 30, 2013 5:11 PM To: amandabrewster@TDI-BI.com Subject: B+B Shipment 7-30-2013

Good evening Amanda,

2 coolers were shipped to B+B today, tracking number 876938201029 and 795803347496.

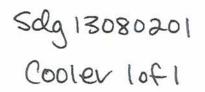
Regards,

Danny Mays | Environmental Specialist, E.I. | daniel.mays@arcadis-us.com ARCADIS U.S., Inc. | 801 Corporate Center Drive, Suite 300 | Raleigh, North Carolina 27607 T: 919-415-2281 | M: 919-812-1417 | F: 919-854-5448 Professional Affiliate/ARCADIS G&M of North Carolina, Inc. Please consider the environment before printing this email.



NOTICE: This e-mail and any files transmitted with it are the property of ARCADIS U.S., Inc. and its affiliates. All rights, including without limitation copyright, are reserved. The proprietary information contained in this e-mail message, and any files transmitted with it, is intended for the use of the recipient(s) named above. If the reader of this e-mail is not the intended recipient, you are hereby notified that you have received this e-mail in error and that any review, distribution or copying of this e-mail or any files transmitted with it is strictly prohibited. If you have received this e-mail in error, please notify the sender immediately and delete the original message and any files transmitted. The unauthorized use of this e-mail or any files transmitted with it is prohibited and disclaimed by ARCADIS U.S., Inc. and its affiliates. Nothing herein is intended to constitute the offering or performance of services where otherwise restricted by law.

| Job: J13034 Date Received: 8/02/13 SDG#: 13080201 |
|--|
| sender: Avcadis- Mayflower AR |
| 1. Number of Shipping Containers: 1 Avcadis-Dawiel Mays |
| Comments: large blue cooler - arrived leaking water |
| 2. Airbill Present? Kes No Shipping Company: Fed EX |
| Airbill Number: 8022 2781 5950 PON |
| 3. Custody Seals on Container? No (res) Not Intact Ou top of duct tape |
| 4. Chain of Custody Records? Comments No des ho relinguished signature |
| 5. General Sample Conditions: Frozen Cool Unrefrigerated Dry Ice Blue Ice (Ice) Temperature/Comments: 8.1°C/Feup blauk 4.6°C (T6) |
| 6. List of Broken Containers: |
| |
| None |
| |
| 7. Number of Samples Expected: 1000 W Number of Samples Received: 15 Sed S |
| 8. Problems/Discrepancies: |
| None |
| 9. Resolutions: |
| NIA |
| 10. Checked in by: auala Burble, Date: \$/02/13 |





thermometer 6 wetice

| CUSTODY SE Laboratories 2425 New Holland Pike, Lancaster, PA 1750 | DATE: 2013 EAL SIGNATURE: 440 June 01-5994 (717) 656-2300 |
|---|---|
| Freeder NEW Package US Airbill Freeder BD22 2781 5950 1 From Date Sender's Phone Sender's Phone Company Phone | Constraints of the second |
| Address | |
| Name Frome Company Address Address Dept/FoorSuide/Room Mathematical Section address Relia File Contract Address Dept/FoorSuide/Room Address Dept/FoorSuide/Room Address Dept/FoorSuide/Room City State City State | Kit methode for Forder Subject Docember Forder Super AM, or Forder Express Saver No Signature Required Portograms bis for the docember of the Super AM, or Forder Super Saver No Signature Required Direct Signature Someons at Regulation Direct Signature May any address the same at the docember of the same and the same at the same a |

B&B& B&B (Provension) P. M. Home Office 14

CHAIN OF CUSTODY RECORD

Home Office 14391B South Dowling Road College Station TX 77845 phone (979) 693-3446 fax (979) 693-6389 http://www.tdi-bi.com

| 9 | Sol |
|------|-----|
| ちーろ | |
| 2014 | H |
| | |

Sdo 130Rc201

| client: ARCADIS | | | | | | | Analyses | |
|---|-------------|--------------|--------|--------------------|-----------------------|-------------|--------------------|---|
| Project 1D: B00 86 003, 130) May Plave | 3, [30] / | Hay Alower | Pipel | - Pipeline Timidar | ident- | MISOL20 | Other Instructions | |
| B&B Contact: Jum (Camilye2) Sampler Signature: Damie N | mie Ma | VS JAM | Why | X | | the state | | |
| Samula ID | Comolo Dato | Comula Time | Sample | | Containers | | | T |
| | outple pare | | Matrix | Preservative | Type No. | A | / / Comments | |
| 150-DA-01260-05) 8-1-13 | 8-1-13 | 950 | ie | NOW | 4 cz jar 1 | X | 151 AVQ 111 | |
| 50-D4-012(0.5-1.0) 8-1-13 | 8-1-13 | | 501 | Nove | 4 oz iar i | | the the | |
| 20-04-012(10-1.5) 8-1-13 | 8-1-13 | 000 | Soil | NONE | 4 of ian 1 | X | 111 241 124 | |
| 50-DA-013(0-0.5) | 8-1-13 | 100 | 195 | Abne | 4 nz iar 1 | | til the th | |
| 50-DA-013(D5-10) 8-1-13 | 8-1-13 | 1105 | Soi. | Nove | 4 02 Jan 1 | | ナジーまった | |
| 50-74-013(1.0-1.5) | 8-1-13 | 1110 | Sai | None | 1 02 Jan 1 | | ないたるを | |
| 50-DA-014(0-0.5) | 8-1-13 | 200 | R | Nove | 4 02 ar | X | to to to | |
| -50-DA-014(0.5-1.0) | 8-1-13 | 1205 | Soi | Nove | 4 oriar 1 | X | 121 120 10 | |
| -1-1-2 (5-1-0-1/1.0-1-5) 8-1-1 | 8-1-13 | 1210 | Sei | None | 1 102 Jar 1 | X | A PA LY | |
| 50-DA-DUP-01-080115 | 8-1-13 | | in | Nove | Hoz jar 1 | | the path ist | |
| | | | | Total # | Total # of Containers | | | |
| Relinquished By | - | Company Name | - | Date Tir | Time | Received Bu | | |

200 Time 1-1-8 Date **Company Name** 14 LP/10x ties Nam Signature: 1700 8413 Damie Mays Mandain APCARO15 nied Name ignature: Signature.

Matrix. T=Trasue G=Gas T=Trasue G=Gas R=Provoate HW=Hazardous Waste P=Product W=Wate

Sample Containor. Vol(material G=Glass C=Core P=Plastic B=Bag

| Role R. Rome Off. Relinquished B. Rome Off. Relinquished B. Rome Off. Reveloced D. 1361 Reveloced D. 136 | Composition of the state of the | N Dowling R | DF CUSTC College Station TX 77845 Preservative Try Nove 4 or Nove 4 or Nove 4 or Total # of Cont | Station TX 77845 phone (9) Station TX 77845 phone (9) we threatiness attive threatiness attive threatiness attive to the phone (9) attive threatiness attive threatintess attive threatiness attive threatintess attive threat | DV REC phone (979) 693-3446 phone (979) 693-3446 http://www.mainers phone (970) 493-3446 http://www.mainers phone (970) 493-3446 http://www.mainers phone (970) 493-3446 http://www.mainers phone (970) 493-3446 http://www.mainers phone (970) 493-346 http://www.mainers phone (97 | 6386 | http://www.tdi-bi.com Analyses UUU DALL UUU DALL UUU DALL Company Name | | |
|--|--|-------------|--|--|--|----------|---|----------------------|--|
| Signature | ALLA | 4015 8-1 | 15 1200 | 6 Printeg Nar Signature: | -ede | 2 | | 8-1-13 1700 | |
| Proteine Matrice Scottane | | | | Protes Nat | me Auru | unda A R | uster 846 | Labor Stipping II to | |

G=Gas Ws=Waste HW=Hazardous Wasto W=Water

Matrix: T=Tissue S=Scit/Sedanseit R=Rinseato P=Product

Sample Container: Vol/matenal G=Gtass C=Core P=Plastic B=Bag

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

+

| Job #: J13034 SDG: 13080201 Client: AV Cadis-MayflowerAk | Number of Samples: 14 Matrix: Soils Due Date: 45 days: 10/16/13 |
|--|---|
| Initiation Date: 8/02/13 | Comments: PAH: 44 aualytes |
| | received s/02/13 |
| Analyses | |
| PAHs OCs/PCBs | Aliphatics/TPH EOM |
| Dry Wt. 🗆 %Lipid | |
| Short Columns Long Columns | |
| Requested QA/QC (per batch of Clier | nt Samples) |
| Blank BSRM/LCS/94/ | |
| Blank Spike Duplicate | Matrix Spike |
| Matrix Spike Duplicate | |
| Mailix Spike Dupheate | Dupicate |
| | |
| SEE BACK FOR SPECI | FIC STANDARDS TO USE |
| Surrogate(s): | |
| | Volume(s): |
| Surrogate(s): | Volume(s): Volume(s): Volume(s): Final Solvent: $DC.7$ D-DA - 015 (C.7.5) 4 5/4 50 |
| Surrogate(s): | Volume(s): |
| Surrogate(s):A | Volume(s): Volume(s): Final Solvent: DA -015 (C. T.S) 4 5/200 MRC/631 (C. T.S) 4 5/200 MRC/631 (C. T.S) 4 5/200 Short MH List |
| Surrogate(s):A | Volume(s): Volume(s): Final Solvent: DA -015 (C. 7.5) 4 5/200 Mic / 631 (C. A.S/250 Short MH List |

B&B Laboratories

Environmental Sample Inventory

| * | # 905 | JOD # CLIENT NAME | FILENAME CLIENT ID | | COL. DATE | RECVD | Analysis MATRI | X COMMENTS | B&B SDG | Cooler # | Sent hy: | Containor | Declark # |
|-------|--------|-------------------------------|--------------------|-----------------------------|-----------|--------------|----------------|---------------------|----------|----------|-----------------------|---------------------|----------------|
| 03 | J13034 | Arcadis - Mayflower AR | ARC1618 | ARC1618 SO-DA-012 (0-0.5) | 08/01/13 | 08/02/13 | - | 44 analytes | 13080201 | 1.0 | Arradic Danial Mave | Any close class lor | DODEODO 1000 |
| Z | J13034 | Arcadis - Mayflower AR | ARC1619 | ARC1619 SO-DA-012 (0.5-1.0) | 08/01/13 | 08/02/13 | | 44 analytes | 13080201 | Conter 1 | Arradie Daniel Maur | Any close glass lar | B00000000 1000 |
| 22 | J13034 | Arcadis - Mayflower AR | ARC1620 | SO-DA-012 (1.0-1.5) | 08/01/13 | 08/02/13 PAH | | 44 analytes | 13080201 | Coolar 1 | Arradie Daniel Mave | Any clear class jar | B0086009 4500 |
| 9 | J13034 | Arcadis - Mayflower AR | ARC1621 | | 08/01/13 | 08/02/13 | - | 44 analytes | 13080201 | Cooler 1 | Daniel | And clear clear int | DUU000003 1302 |
| 64307 | J13034 | Arcadis - Mayflower AR | ARC1622 | SO-DA-013 (0.5-1.0) | 08/01/13 | 0 | - | 44 | 13080201 | Cooler 1 | Arcadie: Danial Mave | | BODBEOD9 1302 |
| 64308 | J13034 | Arcadis - Mayflower AR | ARC1623 | SO-DA-013 (1.0-1.5) | 08/01/13 | 08/02/13 | Soll | 44 | 13080201 | Cooler 1 | Danial | Any clear place int | D0060000 1302 |
| 64309 | J13034 | Arcadis - Mayllower AR | ARC1624 | SO-DA-014 (0-0.5) | 08/01/13 | 08/02/13 | | | 13080201 | Cooler 1 | | | D0060003.1302 |
| 64310 | J13034 | Arcadis - Mayflower AR | ARC1625 | SO-DA-014 (0.5-1.0) | 08/01/13 | 08/02/13 | - | 44 | 13080201 | Contar 1 | Arradie Danial Mays | | B0066003 1302 |
| 64311 | J13034 | Arcadis - Mayflower AR | ARC1626 | SO-DA-014 (1.0-1.5) | 08/01/13 | 08/02/13 | - | 44 analytes | 13080201 | Contar 1 | | | B0000000 1000 |
| 64312 | J13034 | Arcadis - Maytlower AR | ARC1627 | 13 | 08/01/13 | 08/02/13 | | | 13080201 | Conter + | Arradie: Dariel Maus | | B0069003,1302 |
| 64313 | J13034 | Arcadis - Mayflower AR | ARC1628 | SO-DA-015 (0-0.5) | 08/01/13 | 08/02/13 | | 44 | 13080201 | Contar 1 | Danial | And clear glass jar | D0000003.1302 |
| 64314 | J13034 | Arcadis - Mayflower AR | ARC1629 | SO-DA-015 (0.5-1.0) | 08/01/13 | 08/02/13 | 6 | 44 | 13080201 | Cooler 1 | Arcartis: Daniel Mave | | BOORDOW 1302 |
| 64315 | J13034 | Arcadis - Mayflower AR | ARC1630 | SO-DA-015 (1.0-1.6) | 08/01/13 | 08/02/13 | | 44 analytes | 13080201 | Conter 1 | | | D0000000 1302 |
| 9 | J13034 | J13034 Arcadis - Mayflower AR | ARC1631 | SP-DA-015 (0-0.5) MS/MSD | 08/01/13 | 08/02/13 PAH | I SOIL | 44 analytes. 1 of 2 | - | Cooler 1 | | 402 clear place iar | BU080003, 1302 |

Page 1 of 1

B&B Laboratories

Environmental Sample Inventory

| - | # 905 | JOD # CLIENI NAME | NAME | FILENAME | FILENAME CLIENI ID | COL. DATE | RECVD Analysis | alysis | MATRIX | COMMENTS | B&B SDG | 3 Cooler# | # Sent by: | Container | a Project # |
|-------|--------|-------------------|------------------------|----------|--------------------------|-----------|----------------|--------|--------|---------------------|----------|-----------|----------------------|---------------------------|------------------|
| - | J13034 | Arcadts - | Arcadis - Mayflower AR | ARC1618 | SO-DA-012 (0-0.5) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 13080201 | | Arcadis: Daniel Mave | Any clear class iar | BURGEONS 1200 |
| - | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1619 | SO-DA-012 (0.5-1.0) | 08/01/13 | 08/02/13 PA | H | SOIL | 44 analytes | 1308020 | - | Arcadis: Daniel Mavs | 407 clear clear class jar | BODBENNE 120 |
| 64305 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1620 | SO-DA-012 (1.0-1.5) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analyles | 1308020 | - | Arcadis: Daniel Mavs | Any clear clace tar | RUNBOUT 120 |
| 64306 | J13034 | Arcadis - | Arcadis - Mayllower AR | ARC1621 | SO-DA-013 (0-0.5) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 1308020 | - | Arcadis | 407 Clear class iar | RUNKANT 130 |
| 64307 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1622 | SO-DA-013 (0.5-1.0) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 1308020 | - | 1 | Any clear place iar | BURBOUS 130 |
| 64308 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1623 | SO-DA-013 (1.0-1.5) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 13080201 | - | Arradis' Daniel Mave | Any clear place iar | BUNBENNA 120 |
| 64309 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1624 | SO-DA-014 (0-0.5) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 13080201 | | Arcadis: Daniel Mave | And clear nises isr | BUDBRUDS 130 |
| 64310 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1625 | SO-DA-014 (0.5-1.0) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 13080201 | - | | Any clear clack inc | BURBEURS 120 |
| 64311 | J13034 | Arcadis - | Arcadis - Mayllower AR | ARC1626 | SO-DA-014 (1.0-1.5) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 13080201 | | | Any clear clear inter int | BURBENNS 120 |
| 64312 | J13034 | Arcadis - | Arcadis - Mayllower AR | ARC1627 | SO-DA-DUP-01-080113 | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 13080201 | - | Arcadis: Danial Mave | Any clear place lar | BURBERRS 130 |
| 64313 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1628 | SO-DA-015 (0-0.5) | 08/01/13 | 08/02/13 PAH | I | SOIL | 44 analytes | 13080201 | | Arradie Danial Mave | And clear class jar | |
| 64314 | J13034 | Arcadis - | Arcadis - Mayllower AR | ARC1629 | SO-DA-015 (0.5-1.0) | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analytes | 1308020 | | Arradie Danial Mave | Any clear class jar | DODECOUS, 130 |
| 64315 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1630 | SO-DA-015 (1.0-1.5) | 08/01/13 | 08/02/13 PA | H | SOIL | 44 analytes | 1308020 | - | Arcadic Daniel Mave | Any clear clear place for | DUDBOUGSUUS. 130 |
| 64316 | J13034 | Arcadis - | Arcadis - Mayflower AR | ARC1631 | SP-DA-015 (0-0.5) MS/MSD | 08/01/13 | 08/02/13 PA | I | SOIL | 44 analyles. 1 of 2 | | 1 | Arcadie: Daniel Mave | Any riser rises in | DUNBEND3 130 |
| 64317 | J13034 | _ | Arcadis - Mayflower AR | ARC1632 | SP-DA-015 (0-0.5) MS/MSD | 08/01/13 | 08/02/13 HOLD | LD 1 | SOIL | 2 | - | 1 | Arcadis: Daniel Mays | 407 clear place jar | BODBBOD3 130 |

amanda brewster

| From: | amanda brewster <amandabrewster@tdi-bi.com></amandabrewster@tdi-bi.com> |
|--------------|---|
| Sent: | Friday, August 02, 2013 11:46 AM |
| To: | 'Mays, Daniel'; Parmelee, Rhiannon (Rhiannon.Parmelee@arcadis-us.com); |
| | 'Jennifer.Chandler@arcadis-us.com'; 'Dennis.Capria@arcadis-us.com'; Mott, Lyndi |
| | (Lyndi.Mott@arcadis-us.com) |
| Cc: | Juan Ramirez (juanramirez@tdi-bi.com); Donell Frank; 'tommcdonald@tdi-bi.com' |
| | (tommcdonald@tdi-bi.com) |
| Subject: | Samples Received 8/02/13 |
| Attachments: | COC 8-02-13.pdf |

Hi Daniel,

We received your cooler this morning in good condition. The internal temperature of the cooler was 8.1°C and the temperature blank was 4.6°C. A PDF of the COC is attached for your records.

Regards, Amanda

From: Mays, Daniel [mailto:Daniel.Mays@arcadis-us.com] Sent: Thursday, August 01, 2013 9:17 PM To: amanda brewster Subject: B+B Cooler Shipment 8-1-2013

Good Evening Amanda,

Sent one cooler to B & B Thursday, 8-1-2013. Tracking # 802227815950.

Regards,

Danny Mays | Environmental Specialist, E.I. | <u>daniel mays@arcadis-us.com</u> ARCADIS U.S., Inc. | 801 Corporate Center Drive, Suite 300 | Raleigh, North Carolina 27607 T: 919-415-2281 | M: 919-812-1417 | F: 919-854-5448 Professional Affiliate/ARCADIS G&M of North Carolina, Inc. Please consider the anvironment before printing this email.



NOTICE: This e-mail and any files transmitted with it are the property of ARCADIS U.S., Inc. and its affiliates. All rights, including without limitation copyright, are reserved. The proprietary information contained in this e-mail message, and any files transmitted with it, is intended for the use of the recipient(s) named above. If the reader of this e-mail is not the intended recipient, you are hereby notified that you have received this e-mail in error and that any review, distribution or copying of this e-mail or any files transmitted with it is strictly prohibited. If you have received this e-mail in error, please notify the sender immediately and delete the original message and any files transmitted. The unauthorized use of this e-mail or any files transmitted with it is prohibited and disclaimed by ARCADIS U.S., Inc. and its affiliates. Nothing herein is intended to constitute the offering or performance of services where otherwise restricted by law.

| Job: <u>J13034</u> Date Received: <u>8/06/13</u> SDG#: 13080601 |
|---|
| Sender: <u>Avcadis - Mayflower</u> AR 1. Number of Shipping Containers: <u>3</u> Avcadis: Daviel Mays |
| |
| Comments: 10f3, large blue cooler |
| 2. Airbill Present? (Yes)No Shipping Company: Fed EX |
| Airbill Number: 7958 0588 0377 Comments: PON |
| 3. Custody Seals on Container? No Yes Intag Not Intact Comments: outop of duct tape |
| 4. Chain of Custody Records? Comments No Yes IN COOLEV 2 |
| 5. General Sample Conditions: Frozen Cool Unrefrigerated Dry Ice Blue Ice Ice Temperature/Comments: 5.0°C / Tempe blank 1.6°C (T4) |
| 6. List of Broken Containers: |
| None |
| |
| |
| 7. Number of Samples Expected: <u>3 COOLERS</u> Number of Samples Received: |
| 8. Problems/Discrepancies: Cooler 1: Veceived Sample: 802 jav 21 seds |
| received sample: sozjav Lal seds SED-OA-DUP-04-080313 |
| SED-04-04-080313 |
| 9. Resolutions: for PAH, TPH, TEH ! NOT ON COC |
| notified Lyndi Mott/Daniel Mays via email 8/06/13 |
| 10. Checked in by: allanda BULW) the Date: _8/06/13 |

large cooler

Sdg 13080601 Cooler 10f3 Ice type: Cooler temp: Temp blank: yes 5.0/1.6 Thermometer: 4 Custody Seal:



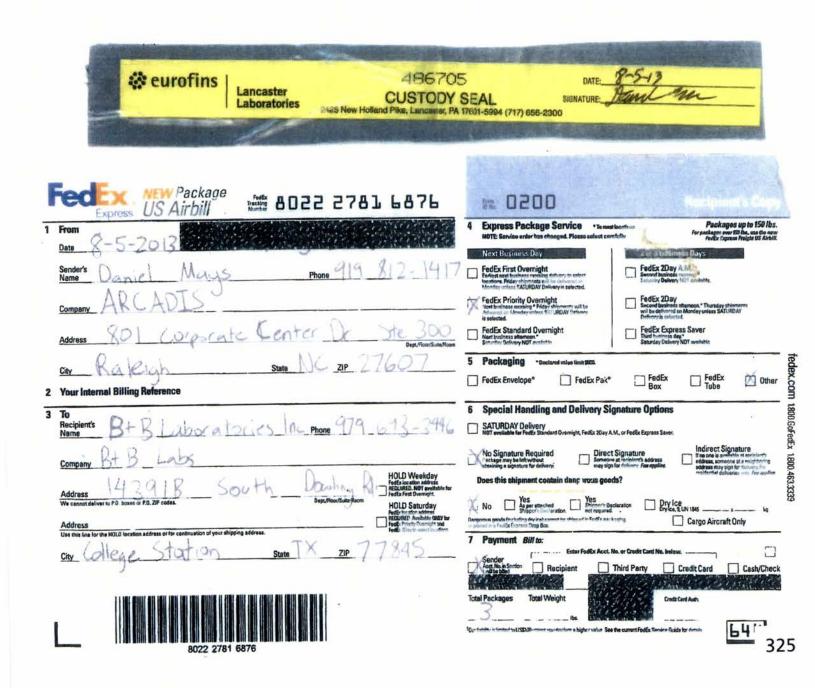


| Job: J13034 Date Received: 8/06/13 SDG#: 13080601 | | | | | | | |
|--|--|--|--|--|--|--|--|
| sender: Avcadis- May flower AR | | | | | | | |
| 1. Number of Shipping Containers: 3 Avcadis - Daviel Mays | | | | | | | |
| Comments: 20f3, large blue cooler | | | | | | | |
| 2. Airbill Present? (Yes)No Shipping Company: Fed EX | | | | | | | |
| Airbill Number: 8022 2781 6876 Comments: PON | | | | | | | |
| 3. Custody Seals on Container? No res Intact Not Intact Comments: Ou top of duct tape | | | | | | | |
| 4. Chain of Custody Records? Comments No res All COCS in Cooler 2 | | | | | | | |
| 5. General Sample Conditions: Frozen 600 Unrefrigerated Dry Ice Blue Ice | | | | | | | |
| 6. List of Broken Containers: | | | | | | | |
| None | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 7. Number of Samples Expected: 3 COOLEVS Number of Samples Received: | | | | | | | |
| 8. Problems/Discrepancies: | | | | | | | |
| None 20 seds | | | | | | | |
| 9. Resolutions: | | | | | | | |
| NIA | | | | | | | |
| 10. Checked in by: AUUAUCA BUULLU Date: 8/06/13 | | | | | | | |

Sdg 13080601 Cooler 20f3

land cooler

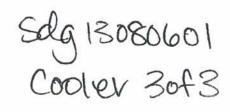
Ice type: Cooler temp Temp blank: yes 1.2 Thermometer: 4 Custody Seal:



Job: J13034 Date Received: 8/06/13 SDG#: 13080601 Sender: Avcaolis- May Flower AR Avcadis: Daniel Mays 1. Number of Shipping Containers: 3 Comments: 3 of 3, large blue cooler Fed Ex 2. Airbill Present? (Yes)No Shipping Company: Airbill Number: Comments: PON 1958 0588 0366 comments: ou top of duct tape 3. Custody Seals on Container? No (Yes) Intact) Not Intact 4 Chain of Custody Records? Comments No Yes 5. General Sample Conditions: (Coo) Frozen Unrefrigerated Temperature/Comments: 0.0°c/temp blank 1.1°c (T4 Blue Ice /Ice Dry Ice 6. List of Broken Containers: 7. Number of Samples Expected: 3Coolers Number of Samples Received: Coolev 3: 8. Problems/Discrepancies: SED-DA-009 (0.5-1.0) is this SED-DA-009 (0.5-1.0) is this alseds for PAH 44 analytes? not indicated 2 waters 9. Resolutions: ON COC asked Lyndi/Daniel for clarification via 10. Checked in by: auaucha Buunst. Date: 8/06/13 OMAIL 8/06/13

avoy coder

Ice type: Wet Ice Cooler temp: O.B Temp bleak: yes 1.1 Thermometer: 4 Castody scal:





| ~ | s, Inc |
|---|--------|
| | atorie |
| R | abor |
| M | &B |

CHAIN OF CUSTODY RECORD



Home Office 14391B South Dowling Road College Station TX 77845 phone (979) 693-3446 fax (979) 693-6389 http://www.tdi-bi.com

| Analyses | Other Instructions | / | a (coler 20f3) | Comments | 3 W DALL 3- | 3 44 244 1 24 | 3 40412 | 3.3 WH PAK List | 3 44 ptt 131 | 3 44 04 131 | 3 W PAR L34 | 3 44 PAHLIST | 3 4 4 PULLET | 3 44 put Lat | |
|-----------------|---------------------------------------|---------------------------|------------------------|--------------------------------|------------------|--------------------|-------------------|-------------------|-----------------|--------------------|--------------------|----------------------------|---------------------|----------------------|-----------------------|
| | May River Pipe line the the cloud 13/ | | 8 pars | Preservative Containers | - 2 | Mone ut uz jun 1 X | Nove 4 ozen 1 X | More 4 oz sur OFX | Nave Hozian 1 X | None Hor an 1 X | None 4 or in X | Nove 462 Just 1 X | Nove Horian) X | None if or at 1. X | Total # of Containers |
| | 23.301/ | | miel Nuys Juniel and | Sample Date Sample Time Matrix | ~ ~ | 1 8-2-13 815 | 1 2 2-03 470 Sail | 142-2-13 210 Soil | 0265-7-8 | 8-7-9 9 | 5) & -2-B 930 Soi | | - | 500 61-2-9 | |
| Client: ARCADIS | Project ID: BOOK603.30 | B&B Contact: JUAN RAMINEZ | Sampler Signature: 200 | Sample ID | 50-DA-011(0-0.5) | 20-17-011(0.5-1.0) | 21-14-0111.0-15 | | 150-010-02 | 01-101-010(0:2-1.0 | 20- N-010(10-15) 4 | EL-2-8 E12080-20-101-11-0- | 120-11-00-10-11-12/ | 120-124-009(0.5-1.0/ | |

| me Jonethun Homekell ARCADTS 8/5/13 16/5 Printed Name Au ALT 4 5 signature U Me | Relinquished By | Company Name | Date | Time | | | | |
|---|-----------------|--------------|--------|------|------------------------------------|--------------|--------|------|
| ne Jonethun Honetell ARCAD5 8/5/13 16/5 prined Name Autuela Brewster 18/8 (curs 8/8/6/13 2010 1 2 2 2 2 16/5 prined Name Autuela Brewster 18/8 (curs 8/8/13) Me me me me | | • | Albo | aun | Received By | Company Name | Date | Time |
| me Janethun Homertelle AKCADTS 8/5/13 16/15 Printed Name Austrelie Evernester 18:86 (abs. 8/16/13 15.) 2010 1 2 3970 10 2 39700 10 2010 10 10 10 10 10 10 10 10 10 10 10 10 | I | | | | | | | |
| Martin Andre Autor Andre Autor New Stabils IS | | AVIANTA | 8/1/12 | 1110 | Annall Prover | 3:0011 | | - |
| MAC + + + Signature WWWC BULWH | Hansing L | 「ちいい」 | 2100 | 1013 | Printed Name +11 LUCULAR DV +UV +0 | S C C S S | 8/4/12 | 2 |
| | 111 | | | - | | | 01000 | |
| | Signature - | | 1 | 2 | | | | |
| PE PE | Annual Kin | 2 | 7 | - | Signature 1111/11/1 22/11/14 | | | |
| | / / | | | | North North American | | | |
| 90 | | | | | | | | |
| | Printed Name | | | | | | | |
| | | | | | Printed Name: | | | |
| | | | | | | | | |
| | Signature | | | | | | | |
| | | | | | Signature: | | | |
| | | | | | | | | |

Matrox. T=Tssue S=Sol/Sedment R=Rmsake P=Product W=Water W=Water

Sample Container: Vol/material G=Glass C=Core P=Plashc B=Bag

| | | s, Inc. |
|---|---|---------|
| H | | tories |
| Q | 5 | abora |
| 2 | | &B L |
| - | | B8 |

CHAIN OF CUSTODY RECORD



| | B&B Laboratories, Inc. | Home | Home Office 14391B South Dowling Road | outh Dowling | | College Station TX 77845 | 45 phone (979) 693-3446 | 6 fax (979) 693-6389 | | http://www.tdi-bi.com | | Brooks | all all the |
|----|----------------------------|-------------|---------------------------------------|--------------|------------------|--------------------------|-------------------------|----------------------|----------|-----------------------|--------------------|-----------|-------------|
| | Client: ARCADS | | | | 1 | | | | Analyses | s | | | 1.1 |
| | Project ID: BO086003. 130 | 130 | MayPlane | er P | r Pipeline Thuis | Midant | | 510 W | | | Other Instructions | tions | |
| | B&B Contact: 5 UPM (COMINZ | anninez | 1.1.1 | | | | | 87 | | 4 - + | 0 * 0 | | |
| | Sampler Signature: Dumic | Neyrs | Bull | (m) | 1 | | | now 1 8 m | - 10 | Pool 1 | N é | 20601 (2) | |
| | Sample ID | Sample Date | ate Sample Time | Sample | | Preservative | tainers | A LA | 100 | | | 005 | |
| د | 50-DA-09(1.0-1.5) | 8-2-5 | 3 1010 | 201 | + | 1 | Type No. / | | 1 | 111 0 11 | Comments | | |
| > | 50-04-008(0-0.5) | 8-2-13 | | R | Al I | 7 | 21 06 and 1 | | nr | 41 1/4# | XX | | |
| 7 | S0-DA-008(05-1.D) | 4-2-8 | 3 1035 | Sai | No 10 | We that | L'ide | | 2 00 | the th | AN AN | | _ |
| 7 | 50-DA-008(1.0-1.5) | 1-2-8 | 3 1040 | Sbi | N | at the | いずし | | m | the m | 1.4 | | |
| 2 | 50-DA-0070-0.5) | 722 | 3 00 | S | W. | metho | L I MAI II | | m | 1 #18 m | 22 | | |
| 1 | 50-DA-00205-1.0) | 2-2 | 3 105 | Sail | No | ouch oz | 2 1 401 2 | | 3 | ゴ | 1 M | | |
| 2 | 20-DA-0071.0-15) | 8-2-1 | 3 110 | Soil | No | we that | oz zur 1 20 | | S | 1 the hh | 134 | | |
| ζ | 20-DA-18-01-08/140-02 | 8-2-13 | 3 300 | Way | er No | ovett | Amber OF | | 3.3 | 1 the th | 1st | | |
| 7 | SED-DA-009(0-0.5) | 8-5 | 3 45 | Sed | Ner | Ne 123, | Soziar 1 S | XX | - | FullPart | List | | |
| 7_ | 12121-14-004(U.S-1.0) | 1-2-2 | 3 1420 | 260 | No | overto | V Mai Zo | | 3 | - | | | |
| | | | | | | Total # of Containers | ntainers | | | | | | |
| | Relinquished By | | Company Name | er B | Date | Time | Rec | Received By | | Company Name | Date | Timo | - |
| | | | | | | | | | t | Alima fundinan | | BUNI | |

| Relinquished By | Company Namo | Dete 1 | | | | | |
|-----------------------------------|-----------------|--------|-------|--|--------------|-----------|--------|
| | alling Amplinoo | nate | IIIIe | Received By | Company Name | Date | Time |
| I II II | 10 | - | | | | | - |
| Printed Name Jone then Flens tell | 4KC4013 | 0/5/13 | 1615 | 1615 Printed Name ALUQUACE RV PLANK+DU | Ar B WX | 8/01-112 | 10. 20 |
| 1 1 | - | | - | Allenand han the | e an c in | Ci ina la | 3 |
| Signature / | + | 1 | | 0110 V 0110 | | | |
| 1-1-1 | | 2 | > | Signature Juliu Ulu Signature | | | |
| | | | | | | | |
| Printed Name | | | | | | | |
| | | | | Printed Name: | | | |
| Stonative | | | | | | | |
| Bunnific | | | | Signature. | | | |
| | | | | | | | |
| | | | | | | | |

| | Gas ⊨aWaste r=Mazardous Wasie Water |
|---------|---|
| | ent Ws=W Ws=W |
| Malrix. | T = Tissue S=Soil/Sedim R=Rinsealo P=Product |

Sample Container, Volrmatorial G=Glass C=Core P=Ptastic B±Bag

B&B (A B)

CHAIN OF CUSTODY RECORD



Home Office 14391B South Dowling Road College Station TX 77845 phone (979) 693-3446 fax (979) 693-6389 http://www.tdi-bi.com

| | Other Instructions | 1 Sta 12580601 | (00184 204 3(3) | Comments | +5-7 #Ydhh | | | | Fall List | Full list | 1 | | 生」した | | |
|----------------|--|-------------------------|--------------------------|-------------------------|------------------|---------------------|---------------------|-----------------------|--------------------------|-------------------|----------------------|----------------------|--------------------|----------------------|-----------------------|
| Analyses | / | # | 121 | 000 | m | - | 2 | 2 | 1.4 | - | 2 | 2 | | 2 | |
| | NINS / | 08/28 | pom . | | X | X I | | | × | × | | | X | X | |
| | 7 | | | Containers Voe No | | * | - | | 2 | | _ | N | | | Total # of Containers |
| | cident | | | Cont | 20 Has | 802 | 20% | 402 | 802 | 802 | 1402 | 20/2 | 208 | 702 | of Containe |
| | Procline Incident | | h | Preservative | Nove | - | | , | | | - | | | 7 | Total # |
| | | _ | all | Sample Matrix | Sed | - | | | _ | _ | | _ | | > | |
| | Mayflow | | Think | Sample Date Sample Time | 1475 | 245 | 750 | 755 | 745 | 900 | 965 | 910 | 1030 | 1035 | |
| | 3.1301 | Zanninez | May5 | Sample Date | 8-2-13 | 8-3-13 745 | - | | 034 | | | | | \rightarrow | |
| Client: APCADD | Project 10: DOO SLOO3, 1301 May Flower | B&B Contact: WM RUMINEZ | Sampler Signature: Downe | Sample ID | 5ED-DA-00(10-15) | SED - DA-008/0-0.1) | SED-DA-OUS CO. K-L. | SED- DA-008 (1.0-1.5) | SED-DA-008 (0-0.5) MIGHU | SED-DA-007(0.0 46 | 560-01-007 (0.5-1.0) | SED-04-007 (1.0-1.5) | SED-DA-006 (0.005) | SED-DA-006 (0.5-1.0) | |

| Relinquished By | Company Name | Date | Time | Received By | Company Name | Date | Time |
|------------------------------------|--------------|--------|------|------------------------------------|----------------|------------|-------|
| | | | | | autor fundance | 2000 | Atlin |
| Printed Name Land Hand Thank to 14 | ARCANTS | 5/2/13 | 1110 | Ann 6 . 0. 5. 5. | 0.0 | color line | |
| The second and a second second | 1+41-11-4 | 111 | 10/2 | Punied Name TURELACE DV ENCLASSION | 200 | 6/00/9 | 200 |
| 1 th | | 1 | | | | | |
| Signature // | して | > | 1 | Signature AURILIA Signature | | | |
| | | | | | | | |
| Printed Name | | | | | | | |
| | | | | Photod Name: | | | |
| | | | | | | | |
| Signature | | | | Signature: | | | |
| | | | | | | | |

| alnx. | | Sample Container. | or. Vol/material | |
|--|--|-----------------------|------------------|---|
| T = Tissue S = Soil/Sediment R = Runseate P = Product | G≂Gas Ws≠Waste HW+Hazardous Waste W≃Water | G=Glass P - Plashc | C=Core B=Bag | 1 |

| - | |
|---|-------|
| ~ | Inc. |
| | ories |
| 2 | orat |
| ~ | 8 Lab |
| Щ | B& |

CHAIN OF CUSTODY RECORD



Home Office 14391B South Dowling Road College Station TX 77845 phone (979) 693-3446 fax (979) 693-6389 http://www.tdi-bi.com

| Client: ARCADIS | 10 | | | | | | | Analyses | | 1 |
|------------------------------------|-------------|-------------------------|------------------|--------------------|-----------------------|---|--------|----------|--------------------|---|
| Project ID: 1300 86 00 3, 1301 May | 3.130 | Ol Mayt | lever F | Have Pychar Inchen | Tubent | | 15 | | Other Instructions | |
| B&B Contact: Juch No | Romice Z | | | | | | 127 02 | #// | Sda 13080601 | |
| Sampler Signature: Danie (| stow 10 | 5 | 1 | | | | 1 2 Y | 12/ | Cooler 2 of 3 (4) | - |
| Sample ID | Sample Date | Sample Date Sample Time | Sample Matrix | Preservative | Containers Type | N | LEH | 200 | Comments | - |
| SED-DA- 606 (10 13) 8/ 3/13 | 8/2/13 | 1040 | Sed | None 4 | 402100 | - | | 6 | HAY PAH List | - |
| SED DA-005 (0 US) | - | 1130 | + | 2 | 5.5 | - | × | - | Full List | - |
| SED-DA-005 (05-1.0) | | 135 | _ | 3 | 20/1- | | | 2 | 44 PAHL & F | - |
| VED-DA-COS(10-1.5) | | 1140 | _ | 3 | 102 | | | 2 | 44 PALL 1 | - |
| SED-DA-OUD (0-Ors) | | 011-1 | _ | 2 | Soz | | × | - | Full Int | - |
| 15ED DA-010 (0.5-10) | | 1415 | | 2 | 1/00 | | | Ч | 2/1/ PAH 1 . + | - |
| SED-DA-CID (10-1.5) | | 1420 | | 3 | 20% | | | 2 | LIN PAH List | - |
| SED DA-OIL (0-0.5) | | 1500 | | 3 | Soz | | × | 3 | Full List | - |
| 12E0-04-011 (0.5-1.0) | | 1505 | | 2 | 20 20 | | | 2 | 44 PAN Lich | - |
| SED-DA-01 (10-1.5) | 11 | 1510 | 7 | 7 | 402 | 7 | | 2 | + | - |
| | | | | Total # 0 | Total # of Containers | 0 | | | | - |

| Printed Name ALULUCIA BY EWISTER BIR (also \$106/13 15 Signature ALULUCIA BY EWISTER BIR (also \$106/13 15 Printed Name: Signature: | Relinquished By | Company Name | Date | Time | Received Ru | | | |
|--|-----------------------------------|--------------|--------|------|---------------------------|--------------|--------|------|
| Juncthan Flamerfeit ARCADES SYS/13 1615 Printed Name AUQUOLA SYEWSTER R.G. alos 8/04/13 15 2 2 2 2 2 2 2 3gravine AUQUOLA SYEWSTER R.G. alos 8/04/13 15 Printed Name Printed Name | | | | | for maximum | company name | Date | Time |
| MAR A Signature Automatical Properties and Signature Automatical Properties and Signature Signature Signature Signature: | Printed Nume Jana than Elanarh-14 | ARCADES | EIS113 | - | ALDINA RV211540. | 2:0 /-1- | che ha | 1.00 |
| 1 + + + + | | | | 1 | Printed Name Printed Name | Solo Cito | 8/0P/2 | 2 |
| | Signature: | > | + | + | Semantin AULOUC SILLING | | | |
| | | | | | to many warmen a | 1 | | |
| | | | | | | | | |
| | Lingo Name | | | | Printed Name: | | | |
| | | | | | | | | |
| 2 ana far | Signature | | | | Constitute | | | |
| | | | | | argumente. | | | |

G∞Gas Ws≖Waste HW≃Hazardous Waste W≃Water T=Tissue S=Soi/Sediment R=Rinseato P=Product Matrix:

Sample Container: Vol/material G=Glass C=Core P=Plastic B=Bag

B&B & B

CHAIN OF CUSTODY RECORD Home Office 14391B South Dowling Road College Station TX 77845 phone (979) 653-3446 tax (979) 653-6389 http://www.tdi-bi.com

TD

| | Client: ARCADIS | | | | | | | | Analyses | | |
|------|--|---|-------------------------|------------------|--------------|-----------------------|-----------|-------------|----------|---|----------|
| | Project 10: 600 8600 3 . 1301 May 6/ 400 | . 1301 | May Elano | · Pipeline | ne Incident | tut | | 510 | / / / | Other Instructions | |
| | B&B Contact: Jun Ramice T | 2 | | Ì | | 114 | | 160 | # | | |
| | Sampler Signature: Doniel May S | Mays | | | | | | 0 to 1 3 | 13/10 | Cooler 2043 (5) | 0 |
| | Sample ID | Sample Date | Sample Date Sample Time | Sample Matrix | Preservative | Containers Tvne | | <u>म्रम</u> | 0) | Comments | T |
| 7 | 4 SED-DA-ER-05-080-13 6/3/13 | 5 6/3/13 | 1630 | 5 | Nero | 3 LAG | R E | × > | 2,2 | BELL OF | — |
| | SEP 04 78-05-68011) | 8/3/13 | 1640 | 3 | Het | 100 | 5 | | | The second se | T |
| | SED DA- 612 (0.01) | | 8/4/13 930 | SED | Hore 4 | 208 | × | X | 2 | 1 151 151 | T |
| 7, | LED DA - 612 (6-05) ms/10 | 1 deu | 930 | - | | 8.02 | B | × | 2.2 | 1 | T |
| 2 | SED-DA-012 (0.5-1.0) | | 935 | | | 4.02 | (X)- | | - | WY PAHE 1 . 1 | - |
| 2 | 550-04-013 (1.0-1.5) | | 940 | | 3 | 2"4 | × - | | - | UH PAN LIST | T |
| 7 | SED-DA-013 (0.0.5) | | 1015 | | , | 208 | - | × | 2 | Full List | T |
| 2 | 5=0-0A-013(0.5-1+) | | 1020 | | 3 | 20/1 | - | | - | LIU PAH Lich | T- |
| | SED-DA-013 (1.0.1.3) | | 1025 | | 3 | 102 | - | | - | 14 PAN Lich | T |
| 1.00 | SED - DA-DG-wolle-es) | ~ (so | 950 | + | 7 | 208 | | | 1 | Full List | 1 |
| | | | | | Total # | Total # of Containers | = | | | | 7 |
| | | | | | | | | | | | |

S.00 Time NIN Date 00 ý Sala Company Name 1 a 1 JUMUICA SALL Huaucla BVEWS Received By mnted Name rinted Name Signature Signature. 1615 Time 7 8/12/9 Date ARCAPIS Company Name 7 cacthan Flenrikild **Relinquished By** ameN bot nled Nam Signature

Matrix Sample Contaner: Volimatonal 1 Te Tissue G=Gas S=Suisediment Vaixate G=Gas G=Gas G=Gas G=Gas G=Gas C=Core P=Protect HW=Hazerdous Waste P=Product W=Water W=Water P=Product

| | Inc. |
|---|--------|
| m | ories. |
| 2 | orato |
| ~ | i Lab |
| m | B&B |

CHAIN OF CUSTODY RECORD

Home Office 14391B South Dowling Road College Station TX 77845 phone (979) 693-3446 fax (979) 693-6389 http://www.tdi-bi.com

Oks)

| Client: ARCANTS | | | | | | | | Analyses | Se | | |
|-------------------------------------|---------------|-------------------------|------------------|-------------------|-----------------------|------------|-------------|----------|---------------------------------------|--------------------|--------|
| Project ID: BOOBLOOS 1301 May 61 ac | 1. 1301 1 | hay luci | | Pipeline Incident | L. | | w1.5 | 50 | | Other Instructions | |
| B&B Contact: Jun Runice Z | 2 > Junite Z | | | | | | 01 | | ~ | 29 13080601 | |
| Sampler Signature: Daniel Mays | 1 Mays | | | | | | " La | 121 | _ | coler 2013 | 2 |
| Sample ID | Sample Date | Sample Date Sample Time | Sample Matrix | Preservative | Containers Type | ers No. | ALLS HAD | 00 | | Comments | |
| 5-14-86-00510-45/ 1/13 | 8/1/13 | 355 | 5.d | None | Sor | - | XX | - | T 11 1 1.1 | | |
| 1/1/13 100-06 066(0.03) 8/4/13 | 51/4/13 | 930 | Sed | × | 805 | - | XX | - | C14 1181 | | |
| SED DA-OH (O O S) | 8/5/13 | 945 | X | - | -80Z | - | X | 2 | Fill | | |
| SED-DA-OIT (U.S.1.) | - | 950 | | | 1/02 | | × | - | DALL HELL | 11.1 | |
| 15ED-DA-015 (0.05) | | 1130 | | , | 1000 | | XX | N | | | |
| SED - DA-OIS (0.5-10) | | 1135 | | 7 | 20/2 | | × | - | LIN DAIL | | T |
| VSED-DH-OIS (1.0-1.5) | | 1140 | | 7 | 402 | | × | - | Hel Cal | PALL LAST | |
| SED DA-OLE CC OS) OIL | 0110 | 1230 | | 3 | 1802 | | ×× | 2 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | T AIST | |
| SED-DA-016 (0.5-10) | \rightarrow | 1235 | \rightarrow | + | 402 | > | X | - | | PAH I L | |
| | | | | | | | | | | | Γ |
| | | | | Total # | Total # of Containers | 0 | | | | | |
| Relinquished By | | Company Name | - | Date Time | ue l | × | Received By | | Company Name | Date | Time |
| | | 1 | | | | | | | annual fundation | 2002 | Allill |

| Primed Name buch an Floncifelt | ARCADIS | 8/5/13 | 1615 | Printed Name A WI QUE BUEUNCTEN | R.B. Calx | 8/16/12 15:00 | 17:00 |
|--------------------------------|---------|---------------|------|---------------------------------|-----------|---------------|-------|
| Signature And | 7 | \rightarrow | 4 | signature Aulduce Bruwy. | | | |
| Printed Name | | | | | | | |
| | | | | Linuo vane: | | | |
| Signature | | | | Signature: | | | |
| | | | | | | | |

1

G=Gas Ws=Waste HW=Hazardous Waste W=Water Matrix T = Tissue S = Soil/Sedment R =Rinseate P=Product

Sample Container: Vol/material G=Glass C=Core P=Plastic B=Bag

C=Core B=Bag

| | Inc. |
|---|--------|
| m | ories, |
| 3 | aborat |
| A | B&B L |

Home Office 14391B South Dowling Road College Station TX 77845 phone (979) 693-3446 fax (979) 693-6389 http://www.ldi-bi.com CHAIN OF CUSTODY RECORD

| Other Instructions | Comments | Full Lat | d | | | | | | |
|---|-------------------------|---------------------------|---------------------------|---|---|--|--|--|-----------------------|
| Analyses | 1007 | 2 | - | | | | | | |
| STOR PEW & | | XX | X | | | | | | - |
| tra | Containers Ype No. | | 1 2 | - | | | | | ners 2 |
| Incid | | 208 | 402 | | _ | | | | Total # of Containers |
| P. poline Incident | Preservative | None | Ŧ | | | | | | T otal |
| | Sample Matrix | Sed | Sed | | | | | | |
| May (le | Sample Date Sample Time | 1245 | 1250 | | | | | | |
| 03.1301 Ma | Sample Date | 8/5/13 | 8/2/13 | | | | | | |
| Client: ARCADIS Project ID: BCOS6003 1301 May flewing B&B Contact: Jue Renire Z Sampler Signature: Davie 1 May S | Sample ID | SED-DA-017 (0-0.5) 8/5/13 | SED-DA-OUT (05-12) 5/5/13 | | | | | | |

| Signature Left | 11 | \neq | 1 | signature Jullandia Bullinta | | |
|----------------|-------------|--------------------------------|---|------------------------------|---|--|
| Printed Name | | | | Printed Name: | | |
| Signature | | | | | | |
| | | | | bignature: | _ | |
| Matrix. | Sample Cont | Sample Container: Vol/material | | | | |
| | | | 1 | | | |

5.00 Time

8/01

A

Aurubia Evenister

ed Nar

111 Time

&/5/13

ARCADIS

Flometell

MAGN

Date

Company Name

Relinquished By

Received By

Date

Company Name BCalx

| | Vaste |
|--------|--|
| | G≃Gas Ws=Waste HWs-Mazardous Waste W≃Water |
| Matnx: | T = Tissue S = Soil/Sediment R = Rinseate P = Product |

C=Core B=Bag

G=Gtass P=Plastic

| Aumber of Samples: 2 Matrix: Watevs Due Date: <u>45 days</u> : <u>9/19</u> Comments: <u>PAH, TPH, AU</u> Collected s/02-8/03 <u>extvact</u> by <u>s/08/13</u> Aliphatics(TPH = ER TOC/TIC mples) Blank Spike Duplicate CANDARDS TO USE |
|---|
| Due Date: <u>45 days</u> : <u>9/19</u> Comments: <u>PAH, TPH, AU</u> Collected <u>8/02-8/03</u> <u>extvact</u> <u>by <u>8/08/13</u> Aliphatics(TPH <u>=</u> EQ TOC/TIC <u>_</u> mples) Blank Spike <u>Duplicate</u> Duplicate</u> |
| Due Date: <u>45 days</u> : <u>9/19</u> Comments: <u>PAH, TPH, AU</u> Collected <u>8/02-8/03</u> <u>extvact</u> <u>by <u>8/08/13</u> Aliphatics(TPH <u>=</u> EQ TOC/TIC <u>_</u> mples) Blank Spike <u>Duplicate</u> Duplicate</u> |
| Comments: <u>PAH, TPH, AU</u> Collected \$/02-8/03 <u>extvact by \$/08/13</u> Aliphatics(TPH = E TOC/TIC |
| TOC/TIC |
| TOC/TIC |
| mples) Blank Spike Matrix Spike Duplicate |
| mples) Blank Spike Matrix Spike Duplicate |
| Blank Spike Matrix Spike Duplicate |
| Blank Spike Matrix Spike Duplicate |
| Matrix Spike Duplicate |
| Duplicate |
| |
| TANDARDS TO USE |
| Volume(s): |
| Volume(s):/02 |
| Volume(s): |
| Final Solvent:Ch |
| |
| |
| |
| |
| • |
| telusta Date: 8/06/1 |
| Date: 8/6/13 |
| |

| Project # B0086003.1302 B0086003.1302 |
|---|
| Container a 1L amber glass BR bottle 1L amber glass BR bottle |
| S B&B SDG Cooler # Sent by: I 13080601 Cooler 2 Arcadis: Daniel Mays 1 13080601 Cooler 3 Arcadis: Daniel Mays 1 |
| IN |
| MATRIX J WATER J WATER |
| COL. DATE RECVD Analysis 08/03/13 08/06/13 PAH, TPH, AI 08/02/13 08/06/13 PAH, TPH, AI |
| CLIENT ID SED-DA-EB-05-080313 SO-DA-EB-01-080213 |
| wer AR ARC1695 wer AR ARC1695 |
| bb # CLIENT NAME 3034 Arcadis - Mayflo 3034 Arcadis - Mayflo |
| Log # Jo 64380 J13 64382 J13 |

Page 1 of 1

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

| | Number of Samples: 40 Matrix: <u>soil/sediment</u> Due Date: <u>45 days</u> : <u>9/19/13</u> Comments: <u>PAH</u> : <u>44 analytes</u> yeceived <u>8/06/13</u> |
|--|--|
| Analyses | Alinhatics (TPH) D FOM |
| 100 | |
| Dry Wt. Chipid Short Columns Long Columns | |
| Requested QA/QC (per batch of Client S | Samples) |
| Blank - SRM/LCS / 94/6 | Blank Spike |
| Blank Spike Duplicate | Matrix Spike |
| Matrix Spike Duplicate | Duplicate |
| SEE BACK FOR SPECIFIC Surrogate(s): PAH A() Spike Standard(s): PAH | Volume(s):/0.1 |
| Internal Standard(s): PAH, AU | Volume(s): 1001 |
| Final Extract Volume (ml): | Final Solvent: |
| Comments: AAA 5 | fort hist |
| Sample Custodian Signature: Laboratory Manager Signature: Sample Initiaiton - general Rev 1.doc Rev 1 | BALWILL Date: 8/06/13 Date: 8/0/13 cc: COC Book Extraction Lab |

337

&B Laboratories

Environmental Sample Inventory

| r # 607 | Т | CLIENI NAME | FILENAME | CLIENT ID | COL. DATE | RECVD Analysis | MATRIX | COMMENTS | B&B SDG | Cooler # | Cooler # Sent by: | Container | a Project # |
|----------|----------|------------------------|----------|--------------------------|-----------|----------------|--------|-----------------------------------|----------|----------|-------------------------------|---------------------|---------------|
| 2 | | Arcadis - Mayflower AR | ARC1641 | SED-DA-012 (0.5-1.0) | 08/04/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 4oz clear olass iar | B0086003 1302 |
| 1 | J13034 A | Arcadis - Mayflower AR | ARC1642 | SED-DA-012 (1.0-1.5) | 08/04/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 4oz clear olass iar | B0086003 1302 |
| 7 | | Arcadis - Mayflower AR | ARC1643 | SED-DA-013 (0.5-1.0) | 08/04/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 4oz clear plass iar | B0086003 1302 |
| | 113034 A | Arcadis - Mayflower AR | ARC1644 | SED-DA-013 (1.0-1.5) | 08/04/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mays | 4oz clear plass lar | B0086003 1302 |
| | - | Arcadis - Mayflower AR | ARC1648 | SED-DA-014 (0.5-1.0) | 08/05/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 407 clear olass iar | RUNRENDA 1302 |
| _ | J13034 A | Arcadis - Mayflower AR | ARC1649 | SED-DA-015 (0.5-1.0) | 08/05/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 407 clear place lar | RUNRENNA 1302 |
| 1 | 113034 A | Arcadis - Maylower AR | ARC1650 | SED-DA-015 (1.0-1.5) | 08/05/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 407 clear place lar | ROORGODA 1302 |
| 64336 J1 | J13034 A | Arcadis - Mayflower AR | ARC1651 | SED-DA-016 (0.5-1.0) | 08/05/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 407 clear place iar | RUNRENNA 1302 |
| | J13034 A | Arcadis - Mayflower AR | ARC1652 | SED-DA-017 (0.5-1.0) | 08/05/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 407 clear class iar | ROORGODA 1302 |
| 64339 J1 | 113034 A | Arcadis - Mayflower AR | ARC1654 | SED-DA-008 (0.5-1.0) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mave | 407 riser nisce isr | RUNRANTA 1202 |
| | 13034 A | Arcadis - Mayllower AR | ARC1655 | SED-DA-008 (1.0-1.5) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mays | 407 clear clacs jar | BUNRANNA 1302 |
| 64341 J1 | 113034 A | Arcadis - Mayflower AR | ARC1656 | SED-DA-007 (0.5-1.0) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Coolar 2 | Arcartis: Daniel Mave | Any clear clace iar | BAABBAAR 1302 |
| 64342 J1 | J13034 A | Arcadis - Mayflower AR | ARC1657 | SED-DA-007 (1.0-1.5) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mave | Any clear clace far | BOORGOOS 1302 |
| 64343 J1 | J13034 A | Arcadis - Mayflower AR | ARC1658 | SED-DA-006 (0.5-1.0) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mays | 407 clear clace iar | RUREUNA 1302 |
| | | Arcadis - Mayllower AR | ARC1659 | SED-DA-006 (1.0-1.5) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mavs | 407 clear place lar | BOORGOO3 1302 |
| - | | Arcadis - Mayllower AR | ARC1660 | SED-DA-005 (0.5-1.0) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mavs | 4oz clear olass iar | B0086003 1302 |
| | | Arcadis - Mayflower AR | ARC1661 | SED-DA-005 (1.0-1.5) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mavs | 4oz clear olass lar | B0086003 1302 |
| | | Arcadis - Mayflower AR | ARC1662 | SED-DA-010 (0.5-1.0) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear olass iar | B0086003.1302 |
| | | Arcadis - Mayflower AR | ARC1663 | SED-DA-010 (1.0-1.5) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass iar | B0086003.1302 |
| 1 | | Arcadis - Mayflower AR | ARC1664 | SED-DA-011 (0.5-1.0) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 1 | | Arcadis - Mayflower AR | ARC1665 | SED-DA-011 (1.0-1.5) | 08/03/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Cooler 2 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64359 J1 | 1 | Arcadis - Mayflower AR | ARC1674 | SO-DA-011 (0-0.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 2 | | Arcadis - Mayflower AR | ARC1675 | SO-DA-011 (0.5-1.0) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 2 | 1 | Arcadis - Mayllower AR | ARC1676 | SO-DA-011 (1.0-1.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64362 J1 | 1 | Arcadis - Mayflower AR | ARC1677 | SO-DA-011 (0-0.5) MS/MSD | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes, 1 of 2 | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0066003.1302 |
| 1 | 1 | Arcadis - Mayflower AR | ARC1679 | SO-DA-010 (0-0.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 2 | 1 | Arcadis - Mayflower AR | ARC1680 | SO-DA-010 (0.5-1.0) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 5 | Ť | Arcadis - Mayflower AR | ARC1681 | SO-DA-010 (1.0-1.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| | | Arcadis - Mayflower AR | ARC1682 | SO-DA-DUP-02-080213 | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 2 | Ì | Arcadis - Mayflower AR | ARC1683 | SO-DA-009 (0-0.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 2 | 1 | Arcadis - Mayllower AR | ARC1684 | SO-DA-009 (0.5-1.0) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 2 | T | Arcadis - Mayflower AR | ARC1685 | SO-DA-009 (1.0-1.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 5 | - | Arcadis - Mayllower AR | ARC1686 | SO-DA-008 (0-0.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 1 | 1 | Arcadis - Mayflower AR | ARC1687 | SO-DA-008 (0.5-1.0) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64373 J1 | 1 | Arcadis - Mayflower AR | ARC1688 | SO-DA-008 (1.0-1.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 5 | 1 | Arcadis - Mayflower AR | ARC1689 | SO-DA-007 (0-0.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 5 | 1 | Arcadis - Mayflower AR | ARC1690 | SO-DA-007 (0.5-1.0) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 5 | ., | Arcadis - Mayflower AR | ARC1691 | SO-DA-007 (1.0-1.5) | 08/02/13 | 08/06/13 PAH | SOIL | 44 analytes | 13080601 | Cooler 3 | Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| | 1 | Arcadis - Mayflower AR | ARC1692 | SED-DA-009 (0.5-1.0) | 08/02/13 | 08/06/13 PAH | SED | 44 analytes? not indicated on COC | 13080601 | Cooler 3 | Cooler 3 Arcadis: Daniel Mays | 4oz clear glass jar | B0086003.1302 |
| 64378 J1 | J13034 A | Arcadis - Mavilower AR | ARC1693 | SED-DA-009 (1.0-1.5) | 08/02/13 | 08/06/13 PAH | SED | 44 analytes | 13080601 | Coolor 2 | Areadie- Danial Maue | Any clear class int | 1001 0000000 |

40

anvir-mst1_new.xlsx

Page 1 of 1

B&B LABORATORIES SAMPLE INITIATION FORM-ENV

| Job #: 513034 | Number of Samples: 19 |
|--|--|
| SDG: 13080601 | Matrix: sediments |
| Client: Avcadis-MayflowerAR | Due Date: 45 days: 9/19/13 |
| Initiation Date: 8/06/13 | Comments: PAH, TPH, ALI |
| | received \$/06/13 |
| | received grouns |
| Analyses | |
| | Aliphatice TPH EOM |
| Dig we. | □ _{TOC/TIC} □ |
| Short Columns Long Columns | |
| Requested QA/QC (per batch of Client | Samples) |
| Blank BRM/LCS/SY1/ | Blank Spike |
| □ Blank Spike Duplicate | Matrix Spike |
| Matrix Spike Duplicate | Duplicate |
| | |
| Surrogate(s):A-C | |
| Spike Standard(s): <u>PAH</u> AC/ | Volume(e): |
| · · · · · · · · · · · · · · · · · · · | |
| Internal Standard(s): | |
| | |
| Internal Standard(s):AHA(1 Final Extract Volume (ml):/. ∂ | Volume(s): IOU Final Solvent: DCM |
| Internal Standard(s):AHACI | Volume(s): <u>IOU</u> <u>Final Solvent:</u> <u>DCM</u> <u>ARC1635</u> <u>ASD/45</u> <u>RC1667</u> |

339

&B Laboratories

Environmental Sample Inventory

| Log # | # dor | JOD # CLIENI NAME | FILENAME | FILENAME CLIENT ID | COL. DATE | RECVD Analysis | MATRIX | IATRIX COMMENTS | B&B SDG | Cooler # Sent by: | Sent by: | Container | Broinct # |
|-------|--------|------------------------|----------|---------------------------|-----------|------------------------|--------|--|----------|-------------------|----------------------|---------------------|----------------|
| 7 | J13034 | Arcadis - Mayflower AR | ARC1633 | SED-DA-009 (0-0.5) | 08/02/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 8nz clear class iar | BUNRENNA 1200 |
| 2 | 1 | Arcadis - Mayflower AR | ARC1634 | SED-DA-008 (0-0.5) | 08/03/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | Rnz clear place iar | RUNRANNA 1202 |
| 7 | 113034 | Arcadis - Mayflower AR | ARC1635 | SED-DA-008 (0-0.5) MS/MSD | 08/03/13 | 08/06/13 PAH. TPH. ALI | SED | 1 of 2 | 13080601 | Cooler 1 | Arcadis: Daniel Mave | Roy clear class jar | BOOBCOO3 1302 |
| 7 | 113034 | Arcadis - Mayflower AR | ARC1637 | SED-DA-007 (0-0.5) | 08/03/13 | 08/06/13 PAH. TPH. ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mays | Roz claar claee iar | BOOBEOOD 1202 |
| 7 | J13034 | Arcadis - Mayflower AR | ARC1638 | SED-DA-006 (0-0.5) | 08/03/13 | 08/06/13 PAH. TPH. ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mays | Roz clear place lar | BOORBOOM 1202 |
| 7 | 113034 | Arcadis - Mayflower AR | ARC1639 | SED-DA-005 (0-0.5) | 08/03/13 | 08/06/13 PAH. TPH. ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mays | Roz clear class jar | BUDBEDDA 1202 |
| - | J13034 | Arcadis - Mayflower AR | ARC1640 | SED-DA-010 (0-0.5) | 08/03/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mays | 802 clear class iar | BURREND3 1302 |
| 2 | J13034 | Arcadis - Mayflower AR | ARC1645 | SED-DA-BG-004 (0-0.5) | 08/04/13 | 08/06/13 PAH, TPH, ALI | SED | A REAL PROPERTY AND A REAL PROPERTY A REAL PROPERTY AND A REAL PROPERTY AND A REAL PRO | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 807 clear class iar | RUNREONA 1302 |
| 2 | | Arcadis - Mayflower AR | ARC1646 | SED-DA-BG-005 (0-0.5) | 08/04/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 8oz clear dass iar | B0086003 1302 |
| 7 | | Arcadis - Mayflower AR | ARC1647 | SED-DA-BG-006 (0-0.5) | 08/04/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 8oz clear olass iar | BOOR6003 1302 |
| 7 | J13034 | Arcadis - Mayflower AR | ARC1653 | SED-DA-DUP-04-080313 | 08/03/13 | 08/06/13 PAH, TPH, ALI | SED | not listed on COC | 13080601 | Cooler 1 | Arcadis: Daniel Mavs | 8oz clear olass iar | BOORGOO3 1302 |
| 7 | J13034 | Arcadis - Mayflower AR | ARC1666 | SED-DA-012 (0-0.5) | 08/04/13 | 08/06/13 PAH. TPH. ALI | SED | and the second se | 13080601 | Cooler 2 | | Roy clear place iar | BOORBOONS 1202 |
| 7 | J13034 | Arcadis - Mayflower AR | ARC1667 | SED-DA-012 (0-0.5) MS/MSD | 08/04/13 | 08/06/13 PAH. TPH. ALI | SED | 1 of 2 | 13080601 | Cooler 2 | | Roz clear clace lar | BOORGOOG 1202 |
| 7 | J13034 | Arcadis - Mayflower AR | ARC1669 | SED-DA-013 (0-0.5) | 08/04/13 | 08/06/13 PAH. TPH. ALI | SED | | 13080601 | Cooler 2 | | Rnz clear clace lar | BOORGOO3 1302 |
| 2 | | Arcadis - Mayflower AR | ARC1670 | SED-DA-014 (0-0.5) | 08/05/13 | 08/06/13 PAH. TPH. ALI | SED | | 13080601 | Cooler 2 | **** | Roy clear class iar | BOORGODA 1202 |
| 7 | 113034 | Arcadis - Mayflower AR | ARC1671 | SED-DA-015 (0-0.5) | 08/05/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 2 | + | 807 clear place iar | R0086003 1302 |
| - | | Arcadis - Mayflower AR | ARC1672 | SED-DA-016 (0-0.5) | 08/05/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 2 | | 807 clear place lar | BUNRENNA 1202 |
| - | | Arcadis - Mayflower AR | ARC1673 | SED-DA-017 (0-0.5) | 08/05/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 2 | | 807 clear class lar | RUNRANNA 1302 |
| | J13034 | Arcadis - Mayflower AR | ARC1694 | SED-DA-011 (0-0.5) | 08/03/13 | 08/06/13 PAH, TPH, ALI | SED | | 13080601 | Cooler 3 | | 8oz clear dlass iar | BOOR6003 1302 |

6

Page 1 of 1

B&B Laboratories

Environmental Sample Inventory

| Broiact # | B00B6003 1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | 80086003.1302 | B0086003.1302 | BUUGGUU3, 13UZ | B0060003.1302 | BUUBBUU3.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B00B6003.1302 | B0086003.1302 | BUUBBUUS. 1302 | B0086003 1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0085003.1302 | B0000003.1302 | RUNGGOUD, 1302 | B0086003 1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | BUUBBUUS, 1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0096003.1302 | B0086003 1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003 1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003 1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 B0086003.1302 | B0086003.1302 | B0086003.1302 | B0086003.1302 B0086003.1302 | BUUGOUUS, 1346 |
|------------------|------------------------|------------------------|---------------------------|-----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--|---------------------------|---------------------------|--|------------------------|--|------------------------|------------------------|--|--|--------------------------|------------------------|--|------------------------|------------------------|------------------------|------------------------|----------------------------|--|------------------------|------------------------|--|--|------------------------|--|--|---|
| Container | Boz clear glass iar | 8oz clear glass jar | Boz clear glass jar | Boz clear glass jar | Boz clear glass jar | Boz clear glass jar | Boz clear glass Jar | 402 clear glass jar | Aux clear class jar | 402 CIBAL GLASS JAF | 4oz clear glass jar | 4oz clear glass jar | Boz clear glass jar | Boz clear glass jar | Boz clear glass jar | 4oz clear glass jar | 402 clear glass Jar | 402 clear glass jar 402 clear glass iar | 4oz clear glass jar | 8oz clear glass jar | 4oz clear glass jar | 402 clear glass Jar | 402 clear glass jar | 402 clear place lar | 407 clear class jar | 402 clear plass lar | 4oz clear glass jar | 402 Clear glass jar Roz clear place iar | Boz clear glass jar | 8oz clear glass jar | Boz clear glass jar | Boz clear glass jar | ooz clear glass jar Boz clear olass jar | Boz clear glass jar | 4oz clear glass jar | 4oz clear glass jar | 402 Clear glass jar | 4oz clear glass jar | 4oz clear glass jar | 4oz clear glass jar | 402 clear glass jar | 4oz clear glass jai | 4oz clear glass jar | 4oz clear glass jar | 4oz clear glass jar | 4oz clear olass jar 4oz clear olass iar | 4oz clear glass jar | 4oz clear glass jar | 4oz clear glass jar | 402 Clear glass jar 407 clear class jar | Boz clear glass jar | 1L amber glass BR bottle | 1L amber glass BR bottle | IL amber glass BK pome |
| # Sent by: | 1 Arcadis: Daniel Mays | 1 Arcadis: Daniel Mays | -1. | - | | Arcadis: | 1 Arcadis: Daniel Mays | 1 Arradie | 1 Arradie | Anodia- | Arcadis. | 1 Arcadis | 1 Arcadis | 1 Arcadis. | 1. | Arcadis: Daniel Mays | 1 Arradie | 1 Arcadis. | - | 1 Arcadis. | 2 Arcadis: | Z Arcadis | 2 Arcadis Daniel Mays | 10 | 2 Arcadis | Arcadis: | 1 | 2 Arcadis: Daniel Mays | N | NIC | 2 Arcadis Daniel Mays | 10 | 2 Arcadis. | N | 2 Arcadis: | 2 Arcadis: Daniel Mays | Arcadis: | Arcadis: | 00 | 3 Arcadis: Daniel Mays 3 Arcadis: Daniel Mays | + | 3 Arcadis: | 3 Arcadis: | 3 Arcadis: Daniel Mays | Arcadis: | 3 Arcadis: | 0 | 3 Arcadis: | 3 Arcadis: Daniel Mays | Arcadis: | Arcadis: | 3 Arcadis: Daniel Mays | 3 Arcadis: Daniel Mays | 3 Arcadis: Daniel Mays | 2 Arcadis: Daniel Mays | 2 Arcadis, Daniel Mays 3 Arcadis, Daniel Mays | o Knut initian remany o |
| B&B SDG - Cooler | 3080601 Cooler | 080601 Cooler | | - | 3080601 Cooler | Ŧ | 3080601 Cooler | | 3080601 Conter | 1 | - | - | | - | SUBUBUT COOLET | ananani Cooler 1 | + | - | 3080601 Cooler | _ | | | 3080601 Cooler | + | - | - | - | 3080601 Cooler | 0 | 3080601 Cooler | 3080601 Cooler | - | | - | 3080601 Cooler | 3080601 Cooler 2 | 1 | | | 3080601 Cooler 3 | | - | 3080601 Cooler | 3080601 Cooler | | - | | 3080601 Cooler | - | - | - | 13080601 Cooler | +- | - | | 3080601 Cooler | + |
| B | 130 | 130 | 13 | 130 | 13 | 10 | 130 | 120 | 131 | | 100 | | | 13 | 13 | 121 | 130 | 130 | 13(| COC 13 | 13 | 0 | 13 | 130 | 13(| 130 | 130 | 13(| 130 | 13(| 130 | 130 | 13(| 13(| 13(| 13 | 13(| 130 | 13(| of 2 130 | 130 | 130 | 13(| 130 | 130 | 130 | 130 | 13(| 130 | 130 | 130 | not indicated on COC 130 | 1 | 130 | 130 | 13 | |
| COMMENTS | | | 1 01 2 | 2 01 2 | | | | 44 analytes | 44 analytes | 44 analytes | 44 analytes | 44 dildiyica | | | 44 anslutoc | | 44 analytes | 44 analytes | 44 analytes | e1 | 44 analytes | AA analytes | 44 analytes | 44 analytes | | 44 analytes | 44 analytes | 44 analytes | | 44 analytes | and initial | 1 of 2 | 2 of 2 | | | | | 44 analytes | 44 analytes | 44 analytes 1 | 2 of 2 | 44 analyles | 44 analytes | 44 analytes | 44 analytes | 44 analytes | 44 analytes | 44 analytes 44 analytes | 44 analytes | 44 analytes | 44 analytes | 44 analytes | analytes | | 1012 | 1 of 2 | |
| MATRIX | SED | SED | SEU | SED | SED SE | | SED | SED | SED | SED | SED S | SED OF | out out | | SED | SED | SFD | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED | SED SED | SED | SED | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | SED | SED | WATER | WATER | |
| RECVD Analysis | 08/06/13 PAH, TPH, ALI | PAH, TPH, | | DB/DE/13 HOLD | DRIDE/13 PAH, IPH, ALI | | 08/06/13 PAH. TPH. ALI | PAH | | | DRIDE/13 DAH | | DAU TOU | HVL HVL | PAH | 08/06/13 PAH | | | PAH | | DB/DD/13 PAH | - | 08/06/13 PAH | DRIDG/13 PAH | 08/06/13 PAH. TPH. ALI | 1 | НОГД | PAH, TPH, | DRIDGH3 PAH, IPH, ALI | PAH. | PAH, TPH, | | 08/06/13 PAH | | | | 08/06/13 PAH | - | 08/06/13 PAH | | | 08/06/13 PAH | | | 08/06/13 PAH | 08/06/13 PAH | 08/06/13 PAH | | 08/06/13 PAH, TPH, ALI | 08/06/13 PAH. TPH. ALI | |
| COL. DATE | 08/02/13 | 08/03/13 | 51/50/00 | 08/03/13 | 08/03/13 | 08/03/13 | 08/03/13 | 08/04/13 | 08/04/13 | 08/04/13 | 08/04/13 | ORIDA113 | ORIDA113 | DRIDA113 | 08/05/13 | 08/05/13 | 08/05/13 | 08/05/13 | 08/05/13 | 08/03/13 | 08/03/13 | ORIDA/13 | 08/03/13 | 08/03/13 | 08/03/13 | 08/03/13 | 08/03/13 | 08/03/13 | 08/03/13 | 08/03/13 | 08/04/13 | 08/04/13 | 08/04/13 | 08/04/13 | 08/05/13 | 08/05/13 | 08/05/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/02/13 | 08/03/13 | 08/03/13 | 08/02/13 | |
| CLIENT ID | SED-DA-009 (0-0.5) | SED-DA-008 (0-0.5) | SED-DA-008 (0-0.3) MS/MSU | SED. DA. 007 (0.0.5) MS/MSU | SED-DA-006 (0-0.5) | SED-DA-005 (0-0.5) | SED-DA-010 (0-0.5) | SED-DA-012 (0.5-1.0) | SED-DA-012 (1.0-1.5) | SED-DA-013 (0.5-1.0) | SED-DA-013 (1 0-1 5) | SED-DA-RG-004 (0-0 5) | SED-DA-BG-005 (0.0 5) | SED-DA-BG-006 (0-0 5) | SED-DA-014 (0.5-1 0) | SED-DA-015 (0.5-1.0) | SED-DA-015 (1.0-1.5) | SED-DA-016 (0.5-1 0) | SED-DA-017 (0.5-1.0) | SED-DA-DUP-04-080313 | SED-DA-008 (0.3-1.0) | SED-DA-007 (0 5-1 0) | SED-DA-007 (1.0-1.5) | SED-DA-006 (0.5-1.0) | SED-DA-006 (1.0-1.5) | SED-DA-005 (0.5-1.0) | SED-DA-005 (1.0-1.5) | SED-DA-010 (0.5-1.0) | SED-DA-010 (1.0-1.5) | SED-DA-011 (1 0-1 5) | SED-DA-012 (0-0.5) | SED-DA-012 (0-0.5) MS/MSD | SED-DA-012 (0-0.5) MS/MSD | SED-DA-013 (0-0.5) | SED-DA-015 (0-0.5) | SED-DA-016 (0-0.5) | SED-DA-017 (0-0.5) | SO-DA-011 (0-0.5) | SO-DA-011 (0.5-1.0) SO-DA-011 (1.0-1.5) | SO-DA-011 (0-0.5) MS/MSD | SO-DA-011 (0-0.5) MS/MSD | SO-DA-010 (0-0.5) | SO-DA-010 (0.5-1.0) | SO-DA-DUP-02-080213 | SO-DA-009 (0-0.5) | SO-DA-009 (0.5-1.0) | SO-DA-009 (1.0-1.5) | SO-DA-008 (0.5-1.0) | SO-DA-008 (1.0-1.5) | SO-DA-007 (0-0.5) | SO-DA-007 (0.5-1.0) | SED-DA-00/ (1.0-1.5) SED-DA-009 (0.5-1 0) | SED-DA-009 (1.0-1.5) | SED-DA-011 (0-0.5) | SED-DA-EB-05-080313 SFD-DA-FR-05-080313 | SO-DA-EB-01-080213 | |
| FILENAME | ARC1633 | ARC1634 | ARC1636 | APC 1637 | ARC1638 | ARC1639 | ARC1640 | ARC1641 | ARC1642 | ARC1643 | ARC1644 | ARC1645 | ARC1646 | ARC1647 | ARC1648 | ARC1649 | ARC1650 | ARC1651 | ARC1652 | ARC1653 | ARC1655 | ARC1656 | ARC1657 | ARC1658 | ARC1659 | ARC1660 | ARC1661 | ARC1662 | ARC1663 | ARC1665 | ARC1666 | ARC1667 | ARC1668 | ARC1669 | ARC1671 | ARC1672 | ARC1673 | ARC1674 | ARC1676 | ARC1677 | ARC1678 | ARC1679 | ARCIERI | ARC1682 | ARC1683 | ARC1684 | ARC1685 | ARC1687 | ARC1688 | ARC1689 | ARC1690 | ARC1697 | ARC1693 | ARC1694 | ARC1695 ARC1696 | ARC1697 | |
| CLIENT NAME | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mavfower AR | Arcadic - Marticuer AD | Arcadis - Mavflower AR | Arcadis - Mavilower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mavilower AR | Arcadis - Mavilower AR | Arcadis - Mavilower AR | Arcadis - Mavflower AR | Arcadis - Mavilower AR | Arcadis - Mavflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayllower AR | Arcadis - Mavilower AR | Arcadis - Mavilower AR | Arcadis - Mayflower AR | Arcadis - Mayllower AR | Arcadis - Mavflower AR | | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR Arcadis - Mayflower AR | Arcadis - Mavflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Maytiower AR Arcadis - Mavflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AK Arcadis - Mavflower AR | Arcadis - Mayflower AR | Arcadis - Mavflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayllower AR | Arcadis - Maytiower AR Arcadis - Mavflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR | Arcadis - Mayflower AR Arcadis - Mayflower AR | Arcadis - Mayflower AR | the second |
| Job # | J13034 | 113034 | 113034 | 113034 | J13034 | J13034 | 113034 | J13034 | 113034 | J13034 | J13034 | J13034 | J13034 | 113034 | 113034 | J13034 | J13034 | J13034 | J13034 | J13034 | J13034 | J13034 | 113034 | J13034 | J13034 | J13034 | J13034 | J13034 | J13034 | J13034 | 113034 | 113034 | J13034 | J13034 | J13034 | J13034 | |
| # 607 | 64318 | 64319 | 64321 | 60200 | 64323 | 64324 | 64325 | 64326 | 64327 | 64328 | 64329 | 64330 | 64331 | 64332 | 64333 | 64334 | 64335 | 64336 | 64337 | 64330 | 64340 | 64341 | 64342 | 64343 | 64344 | 64345 | 64346 | 64347 | 64340 | 64350 | 64351 | 64352 | 64353 | 64355 | 64356 | 64357 | 64358 | 64359 | 64361 | 64362 | 64363 | 64364 | 64366 | 64367 | 64368 | 64369 | 64370 | 64372 | 64373 | 64374 | 6/249 | 64377 | 64378 | 64379 | 64381 | 64382 | 00000 |

8/6/2013 3:22 PM

Page 1 of 1

amanda brewster

| From: | amanda brewster <amandabrewster@tdi-bi.com></amandabrewster@tdi-bi.com> |
|--------------|--|
| Sent: | Tuesday, August 06, 2013 3:21 PM |
| To: | 'Mays, Daniel'; Parmelee, Rhiannon (Rhiannon.Parmelee@arcadis-us.com); |
| | 'Jennifer.Chandler@arcadis-us.com'; 'Dennis.Capria@arcadis-us.com'; Mott, Lyndi (Lyndi.Mott@arcadis-us.com) |
| Cc: | Juan Ramirez (juanramirez@tdi-bi.com); Donell Frank; 'tommcdonald@tdi-bi.com' (tommcdonald@tdi-bi.com) |
| Subject: | Samples received 8/06/13 - a few guestions |
| Attachments: | COC 8-06-13.pdf |

Hi Daniel,

We received your samples this morning in good condition.

Cooler 1 arrived at an internal temperature of 5.0°C and the temperature blank was 1.6°C. Cooler 2 arrived at an internal temperature of 0.2°C and the temperature blank was 1.2°C. Cooler 3 arrived at an internal temperature of 0.0°C and the temperature blank was 1.1°C. A PDF of the COCs are attached for your records.

There were a few discrepancies I was hoping you could help clarify:

We received an 8oz jar of sediment labeled: SED-DA-DUP-04-080313 for PAH, TPH (TEH), but this sample was not listed on the COC. Is this sample intended for analysis by our laboratory?

The COC lists sediment sample: SED-DA-009 (0.5-1.0), 4oz jar but does not indicate what analysis you would like for the sample. Should this be for the "44 PAH list" like the rest of the 4oz jars?

Please let me know how you would like to proceed.

Regards, Amanda

From: Mays, Daniel [mailto:Daniel.Mays@arcadis-us.com] Sent: Tuesday, August 06, 2013 4:56 AM To: amanda brewster Subject: XOM-Mayflower Cooler Tracking #'s

Good Morning Amanda,

The tracking number for 3 coolers shipped from Mayflower yesterday 8-5-2013 was 8022 2781 6876.

Regards,

Danny Mays | Environmental Specialist, E.I. | <u>daniel.mays@arcadis-us.com</u> ARCADIS U.S., Inc. | 801 Corporate Center Drive, Suite 300 | Raleigh, North Carolina 27607 T: 919-415-2281 | M: 919-812-1417 | F: 919-854-5448 Professional Affiliate/ARCADIS G&M of North Carolina, Inc. Please consider the environment before printing this email



NOTICE: This e-mail and any files transmitted with it are the property of ARCADIS U.S., Inc. and its affiliates. All rights, including without limitation copyright, are reserved. The proprietary information contained in this e-mail message, and any files transmitted with it, is intended for the use of the recipient(s) named above. If the reader of this e-mail is not the intended recipient, you are hereby notified that you have received this e-mail in error and that any review, distribution or copying of this e-mail or any files transmitted with it is strictly prohibited. If you have received this e-mail in error, please notify the sender immediately and delete the original message and any files transmitted. The unauthorized use of this e-mail or any files transmitted with it is prohibited and disclaimed by ARCADIS U.S., Inc. and its affiliates. Nothing herein is intended to constitute the offering or performance of services where otherwise restricted by law.

Laboratory Bench Sheet Logs

| Spike: 100 Jul PAH: <u>AR - JUVS/K - 100 - 006</u> Pest/PCB: Aliphatic: <u>AL-WK5(k -100 - 006</u> Other: | Turbo Vap II Bath T (C): Pressure (>20psi): Check Water Level: Turbo Vap Date: | Internal Chain of Custody | Extraction Prep | 8 | Initials: CL | Ext | 8/13/13 8-14-73 | Initials: | Concentration | Date: 14-13 Date: 14-17 | Initials: Initials: | Short Columns | Bate: 14-13 Date: | Initials. | ENV 3081 |
|---|--|---------------------------|---------------------------|-------------------------|----------------------------------|--------------------------------------|---------------------------------|------------------------------|----------------------|-------------------------|---------------------|-------------------------|-------------------|--------------------------------|----------|
| Surrogate: OU ut S PAH: <u>Ap- WKS V - 2500 -002</u> P Pest/PCB: | GC Int Std: 100 µL PAH: AR-WHS - 2500-002 Pest/PCB: | Extraction Comments | | | | | | | | | | | | | |
| Lipids Y /(N) Dry Wt. (A) N Copper (A) N EOM (A) N Columns (A) N Long / (5hort) | 8/13/13 8/13/13 8/13/13 8/15/13 8/15/13 | Dry Wt. (g) |) | 4.00 | 15.01 | 15.02 | \$ 15.08 | 15.03 | - 15,00 | 15.12 | _ | H15.04 | 15.05 | 15,01 | |
| | 8/13/13 8/13/13 8/13/13 8/13/13 8/13/13 | Dry Wt. % | ١ | 107.101 | R0.17 | R0.17 | 83.48 | 27.63 | 60.42 | 88.49 | 21.12 | 82.04 | 82.81 | 84.93 | |
| 13080601 | Surrogate: Spike: Internal: | Wet Wt. (g or L) | , | 4.10 | 21.81 | +1.81 | 18.06 | 54.39 | 24.83 | 11.09 | 17.24 | 18.33 | L1.81 | L9.L1 | |
| spG# [3073 Wflower AR PESTS DOB avalytes | Final Solvent: DC/W Final Volume: 1 3100 Sris ONLy - add both PAH/ALI Standard (Short-list) | Client ID | ENV3081A Procedural Blank | 2 ENV308/ B SPAN 1941 b | ENV3081 C Mathix Spike (ARCIUSI) | ENV3081 D Matrix Spike Dup (APC/USI) | ENV3081E Duplicate (Apecilezce) | APCILOU SED-DA-020 (0.5-1.0) | SED-DA-020 (1.0-1.5) | SO-DA-012 (0-0.S) | SO-DA-012 (0.5-1.0) | SO - DA - 012 (1.0-1.5) | SO-DA-013 (0-0.5) | 12 APC/672 SO-DA-013 (0.5-1.0) | |
| MATRIX OTHER WATER MATER TISSUE | General Comments: General Comments: P. e. port 13-3100 P. A. D. D. M. J. D. M. J. J. D. M. J. J. J. D. M. J. J. D. M. J. J. J. D. M. J. | Sample Name | 1 ENV3081A | ² EMV308/ E | 3 ENV3081 (| 4 EW 3081 F | | _ | 7 ARCIGOI | 8 ARCIG18 | 9 APC1619 | 10 APC/1620 | 11 APC1621 | 12 APC1622 | |

a Ala

B&B LABORATORIES ENVIRONMENTAL EXTRACTION LOG

ENVIROLOG Rev 2 Env. Extraction Log

Page 1 of 2

| | Internal Chain of Custody | Concentration Short Columns | Bate: Date: Date: BAT. | Er. | Columns | Date: | Initials Initials | Concentration | Date: Date: | Initials: | Columns SA2 | | Initials. | Concentration | Date: Date: | Initials: Initials: | Transfer for HPLC | Date: | Initials. Initials | 냄 | Date: Date: Initials | ost-HPLC 0 | Date: Date: | Initials: Initials: | Final Extract Transfer | Date 15/13 Initials: CK |
|-----------------------------------|---------------------------|--------------------------------|------------------------|---------------------|---------------------|----------------------|---------------------|--------------------|--------------------|---------------------|----------------------------------|-------------------------|---------------------------------|---------------|---------------------------|---------------------|-----------------------|--------------|--------------------|---------------------|----------------------|------------|-----------------------|---------------------|------------------------|-------------------------|
| | Extraction Comments | | | | | | Original for MS/MSD | 7 | | | | | | | Lot Numbers | DCM: 52314 | Hexane: | Hydromatrix: | Water: DIO4S-B | silica: BCBH 19613V | Alumina: TG14B2EMJ | pentane: | Copper: 11SDSC) - A./ | Hudrochloric Acid: | | SPE Columns: |
| L EXTRA | Dry Wt. (g) | 15.06 | 15.10 | 12.01 | 15.10 | 15.06 | 12.01 | 15.10 | 15.08 | 15.04 | 15.02 | 15.07 | (5.05 | | ther | | | |] | | 10 | 2 | | Γ | 1 | J |
| DNMENTA | Dry Wt. % | 85.26 | 81.62 | 81.15 | - | 80.45 | 84.25 | 84.38 | 82.20 | 24.07 | 83.33 | 84.38 | 82.83 | | paration/O | Columns | | | | QC Review | | 7 | 0 | Conied to Ealdere | In Londeis | (I3 G |
| RIES ENVIRONMENTAL EXTRACTION LOG | Wet Wt. (g or L) | 17.66 | 18.50 | 18.50 | 18,09 | 18.72 | 17.82 | 17.90 | 18.34 | 17.89 | 18.02 | N7.86 | 18.17 | | Clean-up/Separation/Other | S | | | | QC | | 51 XI V | - 10 | Conied | naidoo | 8/15/13 |
| B&B LABORATOF | Client ID | 13 (1.0-1.5) | So -DA-014 (0-0.5) | SO-DA-014 (0.5-1.0) | SO-DA-014(1.0-1.5) | 50- DA-DUP-01-080113 | 50-DA-015 (0-0.5) | SO-DA-015 (aS-1.0) | So-DA-DIS(1.0-1.5) | SED-DA-012(0.5-1.0) | -012(1.0-1.5) | SED - DA - 013 (0.54.0) | -013 (1.61.5) | (| Lipid/EOM Page | | FOM 10 21 | | | HPLC Storage | k | | | | | |
| | Sample Name | 13 APC1623 SO-DA-013 | 14 APC1624 SO -DA-1 | 15 APCINZS SO-DA- (| 16 APC1626 SO-DA- (| 17 APCI627 SO-DA-L | 18 APCI628 SO-DA-1 | 19 APC1629 SU-DA-1 | | 21 APCIG41 SED-DA- | 22 AP-CI642 SED-DA-012 (1.0-1.5) | 23 APCI643 SED-DA | 24 APC 1644 SED-DA-013 (1.61.5) | | Dry Weight Page | | DRY 1505, 1355, 1355, | 1357 | | Sample Storage | # <00 | J13034-2 | | | | |

ENVIROLOG Rev 2 Env. Extraction Log

ENV 3081 Page 2 of 2

| | | | | | Comments | | | | | | | | | | | | | | | | |
|---------------------|------------------------------|----------------------------|---------------|--------------|-------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|------------------|----------------------|-----------------------|----------------------|---------------------|---------------------|----------------------|---------------------|---------------------|---------------------|
| | | Date/Init: | 816/13 CVC | | (%) Ury Weight | ST.TS | 1812 | 12.41 | 78.41, | 55210 | [0]0 [] | 10.30 | | 20.00 | 22.64 | 491.94 | 1 20 | 108.1010 | 71.21 | 27 12 | 60.42 |
| nments: | | Beaker + Dry Smpl (g) | | L Bal. Cal. | 2 | 2,34 | 2.78 | 2:35 | 2.82 | 2.27 | 2,08 | 1.50 | 2117 | 1.79 | 1.87 | 2.09 | 2175 | 2.83 | (.5.) | 1.74 | 2-17 |
| General comments: | | Beaker + D | £. | Dai. Cal. | ۲ | 2,34 | 2.80 | 3.35 | 2.83 | 12.21 | 3.09 | 1.59 | 2.17 | 1. 79 | 1.82 | 2.09 | 2.76 | 2.84 | 1.52 | 1.74 | Q. (8 |
| 10 | | Bal. Cal. | × | Besker + Mot | Smpl (g) | 3.10 | 3.36 | 2.75 | 3.24 | 3.02 | 2.45 | 2.36 | 2.88 | 2.87 | 2.89 | 2.89 | 3.34 | 3.51 | 233 | 284 | 2.74 |
| spg # . 13073101 | Wer AR | Date/Init: | 8/2/13 | Reaker Mt | (6) | 1.30 | 1.30 | 1.30 | 1.29 | 1.34 | 1.34 | 1.31 | 1.30 | 1.30 | 1.28 | 130 | 1.28 | 1.34 | 1.30 | 1.32 | 1.30 |
| Job #: J13034 SDG # | client. Arcadis-Mayflower AR | Lab Mananger Date: Init | 16/13 | | Client ID | SED-DA-029 (0.5-1.0) | SED-DA-029(1.0-1.5) | SED-DA-030 (W.S-1,0) | SED-DA-030(J.0-(.5) | SED-DA-028 (U.S-1.0) | SED-DA-028(1.0-1.5) | (0.1-2) (0.5-10) | SED-DA-027 (1.0-1.5) | SED-DA-D210 (0.5-1.0) | SED-DA-0284(1.0-1.5) | SED-DA-025(0.5-1.0) | SED-DA-025(1.0-1.5) | SED-DA-024 (0,5-1,0) | SED-DA-024(1.0-1.5) | SED-DA-020(0.5-1.0) | SED-DA-020(1.0-1.5) |
| MATRIX | X SEDIMENT | | Type | Samla Mana | | APCISC | 2 APCISI08 | 3 APCIS72 | | 5 APCI517 | 6 APCI578 | 7 APCI580 | ⁸ APCI581 | 9 APCISSLO | 10 APC1587 | 11 APCI592 | 12 APCUS93 | 13 APCISAS | 14 APCUSOLO | 15 APCI600 | 16 ARC1601 |

םמם באםטתאוטתובט % טעו עיבוטוו בטפטטו

ſ

T

DRYWT LOG V0

DRY 1353 Page 1 of 2

| | | | | Beaker + D Date/Init: \$ \$ r\$#A | y Smpl (g) Date/Init: 8 (6/13 HA | Date/Init: 8/b/13 0/C | | |
|----------------|--|------------------|--------------------------|---|---|-----------------------------|---|-----|
| Sample Name | Client ID | Beaker Wt (g) | Beaker + Wet Smpl (g) | ~ | 2 | (%) Dry Weight | Comments | |
| 17 ARC/60/Dup | Duplucat | 1.29 | 7-80 | 3.17 | 8.17 | 58.28 | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| % Dry Weight = | % Dry Weight = [Beaker + Dry SMPL (g)] - [Beaker Weight (g)] × 100 |] × 100 | RP | D = [Original % | Dry Weight Valu | e - Duplicate % | RPD = [Original % Dry Weight Value - Duplicate % Dry Weight Value] x 100 | |
| | [Beaker + Wet SMPL (g)] - [Beaker Weight (g)] | | | [Original % Dr | y Weight Value | + Duplicate % Dr | [Original % Dry Weight Value + Duplicate % Dry Weight Value] x 0.5 | |
| | | | | The Relative Pe | rcent Difference | (RPD) between (| The Relative Percent Difference (RPD) between duplicates must be $\leq 25\%.$ | |
| | | | | | Date / Init. | | RPD | |
| | | | | 8/10/ | 8/6/13 CK | m | 3.603.1. | |
| | | | | Sample | Sample # AP2C1 (20) | 100 | | |
| | | | | Duplicate # | e# AUC | ARCIGOI Dup | đ | |
| | | | | | | | DRY 1353 | 353 |
| | ŕ | | | | | | Page 2 of 2 | |

B&B LABORATORIES % DRY WEIGHT LOGBOOK

DRYWT LOG VO

| Mananger Manan Mananger Mananger Mananger Mananger Manang | sbg #: 130&02.01 General comments: flowler AP Beaker + Dry Smpl (g) Date/Init: Bal. Cal. Bate/Init: Bale/Init: 8/b/13 CK Bal. Cal. Bale/Init: Bale. Cal. Date/Init: Bale. Cal. Date/Init: Bale. Cal. Date/Init: Bale. Cal. Date/Init: | Beaker Wt Beaker + Wet 1 2 (%) Dry Comments (g) Smpl (g) 1 2 Weight Comments | 1.32 2.71 2.55 2.55 88,49 | 131 2.40 2.27 2.26 |) 1.33 3.00 2.70 | 132 2.60 2.38 2.38 82.81 |) 1.32 2.78 2.56 2.56 | 1.33 2.89 2.66 2.66 | 0.000 | 1.31 2.53 2.30 2.30 | 5) 1.29 2.44 2.25 2.25 83.48 | 1.28 2.61 2.34 | 1.30 2.57 2.38 2.37 84.25 |) 1.30 2.90 2.64 2.65 84.38 | 1.33 2.51 2.31 2.30 82.20 | 1.31 2.52 2.30 2 | 132 749 |
|---|---|--|---------------------------|-----------------------|------------------|--------------------------|-----------------------|-----------------------|---------------------|-----------------------|------------------------------|--------------------|---------------------------|-----------------------------|---------------------------|------------------|---------------|
| J J J J J J J J J J J J J J J J J J J | 201 Bal. cal. 3 CK | | 11.2 | 2.40 | 3.00 | 2.60 | 2.78 | 2.89 | 2.66 | 1 2.53 | 2.44 2 | 2.61 | 2.51 | 2.90 | 2.51 | 2.52 | 133 7.49 2.30 |
| | J13034 Arcachis- Mauf Lab Mananger Init: Init: | | SO-DA-012 (0-0,5) 1 | S0-DA-012 (0.5-1.0) 1 | \sim | | | S0-DA-013 (1.0-1.5) 1 | SO-DA-014(0-0.5) 11 | SU-DA-014 (0.5-1.0) 1 | | SU-DA-DUP-01-08013 | SO-DA-015 (0-0.5) 11 | S0- DA-015 (0.5-1.0) | SO-DA-015(1.0-1.5) 1 | SP-DA-015 (0.5) | Durdicate a |

DRYWT LOG VO

DRY 1355 Page 1 of 2

349

| Date/Init: | (%) Dry Weight Comments | | | | | | | | | RPD = [Original % Dry Weight Value - Duplicate % Dry Weight Value] × 100 | [Original % Drv Weight Value + Duplicate % Drv Weight Value 1 × 0.5 |
|--|---|----|--------|----|----|----|----|----|----|---|---|
| Beaker + Dry Smpl (g) Date/Init: Date/Init: Date/Init: Date/Init: Date/Init: Bal. Cal. Bal. Cal. | Beaker Wt Beaker + Wet (g) Smpl (g) 1 2 | 1 | NI CIN | | | | | | | | IOriginal % Drv Weight Value + Dr |
| | Client ID | | | | | | | | | % Dry Weight = [Beaker + Dry SMPL (g)] - [Beaker Weight (g)] × 100 | [Beaker + Wet SMPL (g)] - [Beaker Weight (g)] |
| | Sample Name | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | % Dry Weight = | |

B&B LABORATORIES % DRY WEIGHT LOGBOOK

The Relative Percent Difference (RPD) between duplicates must be $\leq 25\%$

RPD

Date / Init.

2.137

8/12/13/14

APCI631 DUP

Duplicate #

Sample # APC/ 63)

350

<u>م</u>

| | | | Comments | | | | | | | | | | | | 2.7% | | | | |
|---------------------------------------|---|---|--------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|------------------------|----------------------|----------------------|--|---------------------|----------------------|----------------------|----------------------|
| B&B LABORATORIES % DRY WEIGHT LOGBOOK | | Date/Init: 8(13)13 C/C | (%) Dry Weight | 84.07 | 83.33 | 84.38 | 82.83 | 83.33 | rol.old | J1.0L | 64.66 | 15.35 | R6.07 | 85.S3 | 01.10 | 81.09 | 86.39 | 85.09 | 83.20 |
| | mments: | Dry Smpl (g) Date/Init: 8/12/13 0/ | 2 | 2.26 | 2.26 | 2.38 | 2.96 | 2.So | 2.40 | 3.04 | 2.160 | 2.37 | 2.35 | 2.66 | 2.45 | 2.95 | 2.57 | 12.2 | 3.39 |
| | General comments: | Beaker + Date/Init: 8/9/(3 8/9. Cal. | 7 | 2.26 | 2.25 | 2.40 | 86.2 | 2.50 | 2.39 | 3.04 | 2.14 | 2.37 | 235 | 2.65 | 2.44 | 2.95 | 2.57 | 2.27 | 3.40 |
| | 109 | K Bal. Cal. | Beaker + Wet Smpl (g) | 2.44 | 2.45 | 2.58 | 7.30 | 44.2 | 2.56 | 3.78 | 2.63 | 2.72 | 7.52 | 18.2 | Ser is | 3.33 | 2.77 | 2-44 | 3.81 |
| | SDG#: 13080601 Flower AR | Date/Init: D 8/8/15 C55 | Beaker Wt (g) | 16.7 | 1.31 | 1.30 | 1.32 | 1.30 | 82.1 | 1.30 | 0.30 | 1.30 | 1.30 | 1.30 | 1.30 | 1.32 | 1.30 | Cź 1 | 1-31 |
| B&B LABORA | Job #: J13034 SDG #: 13 Client Arcadus - Mayflower | Date: Lab Mananger Init: $8/(9/3)$ | Client ID | SED-DA-012 (0.5-1.0) | SED-DA-012 (1.6-1.5) | SED-DA-013 (0.5-1.0) | SED-DA-D13 (1:0-1:5) | SED- DA-014 (0.5-1.0) | SED-DA-DIS (0.5-1.0) | SED-DA-015 (1.0-1.5) | SED-DA-016 (0.5-1.0) | SED- DA- 017 (0.5-1.0) | SED-DA-008 (0.5-1.0) | SED-DA-008 (1.0-1.5) | (01-5.0) LOO-DO-DO-DO-DO-DO-DO-DO-DO-DO-DO-DO-DO-D | SED-DA-007(1.0-1.5) | SED-DA-006 (0.5-1.0) | SED-DA-006 CI.0-1.5) | SED-DA-005 (0.5-1.0) |
| 1 | MATRIX OTHER SEDIMENT | TISSUE | Sample Name | 1 APCILOUI | | - | _ | | _ | APCILOSO | | 9 APCILOSZ | TO APCILOSY | 11 APCILOSS | | | | 15 APCILOSY | 16 AP CIGGO |

DRYWT LOG VO

DRY 1357 Page 1 of 2

| | | | | Beaker + Dry Smpl (g) Date/Init: 8 9 13 8 9 9 9 | y Smpl (g) Date/Init: 8 (3) (3) 8 (3) (3) 9 (3) 9 (3) | | | |
|----------------|--|------------------|--------------------------|---|--|-------------------|--|-------|
| Sample Name | Client ID | Beaker Wt (g) | Beaker + Wet Smpl (g) | ۲ | 2 | (%) Dry Weight | Comments | lts |
| 17 APCI661 | SED-DA-005 (1.0-1.5) | 1.28 | 2.73 | 2.49 | 2.48 | 91.28 | | |
| APC1662 | SED-DA-010 (0.5-1.0) | 1.31 | 2.91 | 2.57 | 2.57 | 78.75 | | |
| APC/10103 | SED-DA-016 (1.0-1.5) | 1.31 | 2.67 | 2.39 | 2.37 | 77.94 | | |
| ARCIGOUT | SED-DA-011 (0.5-1.0) | 1.30 | 12.2 | 2.31 | 2.29 | 28.18 | | |
| YARE ILLY DW | 21 Drave roug Duplicate | 1.31 | 2.86 | 2.60 | 2.59 | 82.58 | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| % Dry Weight - | % Dry Weight = [Beaker + Dry SMPL (g)] - [Beaker Weight (g)] × 100 |)] × 100 | RPI | 0 = [Original % | Dry Weight Valı | ue - Duplicate % | RPD = [Original % Dry Weight Value - Duplicate % Dry Weight Value] × | × 100 |
| | [Beaker + Wet SMPL (g)] - [Beaker Weight (g)] | 1 | | [Original % Dr | y Weight Value | + Duplicate % D | [Original % Dry Weight Value + Duplicate % Dry Weight Value] x 0.5 | |
| | | | | The Relative Pe | rcent Difference | (RPD) between | The Relative Percent Difference (RPD) between duplicates must be $\leq 25\%$ | .9 |
| | | | | | Date / Init. | | RPD | |
| | | | | 8/13 | 13/13 CK | 0 | 0.928-1. | |
| | | | | Sample | Sample # AP CILOLOY | FLOOT | | |
| | | | | Duplicate # | | APCULLENT DUP | dr | |
| | | | | | | | | |

B&B LABORATORIES % DRY WEIGHT LOGBOOK

DRYWT LOG V0

DRY 1357 Page 2 of 2

¥

B&B LABORATORIES EOM LOGBOUK

EOM 1021 Comments 1.6699 3336 EOM µg/g (Dry Wt. Basis) 3605 946 3000 1050 258 128 22 et 24 -21 2996 EOM µg/g (Wet Wt. Basis) 24.229 25.898 1.40 89 2674 212 1025 22.813 24.3151.502 2405 228 8/14/13 CK 173 20 SB 8 Ξ Wt. of 100 µl EOM Wt. (mg) 22.826 22.890 0.064 23.028 23.501 0.473 24-214 24246 0.032 24-147 25-953 1.806 22.914 23.044 0.130 24.097/24.203 0.106 22.55422.694 0.140 23.99024.002 0.012 24.351 24.351 0.000 24.063 24.074 0.011 Bal. Cal. V Date/Int: General comments: Filter & Sample Wt (mg) 8-14-13 Initial Filter Wt (mg) Date/Int: spg # 13073101, 13080201, From DRY Pg: Dpy 1353, 1355, 1357 Final Extract Vol (mL) 13080601 m m M M m \sim M 3 m Transferred by Date/Int: 8/14/13 0/C From ENV Pg: ENV308/ M 27.63 15.12 88,49 Dry Wt. (%) 10.28 40.21 EN30818 Duplicat (APC/626) 15.08 83.48 15,00 60.42 15.03 87.16 an. rel 12 APCI (22 SO-DA-03 (0.5-1.0) 15.01 84.93 20.17 ENV3081D Matrix Spite Dup ("1631) 15.02 80.17 18.28 ١ client Arcaelus - Maryflower AP 15.03 Smpl Wt.Vol IS, OS (g/L) Wet Wt. Dry Wt.) 4.00 ENJ3081C Mathix Spille (PPC/631) 15.01 " | AP-C1619 | SU-DA-012 (0.5-1.0) 7 APL(1601 SED-DA-020(1.0-1.5) 10 APC(1020 SO-DA-012 (1.0 -1.5) 6 APCULOCO SED-DA-020 (0.5-1.0) ENV3081A Procedural Blank "APC1621 SO-DA-013 (0-0.5) 8 APCI618 SO-DA-012 (0-0.5) Lab Manager Client ID Job#. J13034 ENV3081B SPM 19416 8 112 11/2 Date/Int: Sample Name SEDIMENT MATRIX WATER OTHER

EOM Rev 2 EOM Logbook

Page 1 of 2

| _ | | | | | | | | | | | | | | | | |
|---|---|------------------------------|-----------------------------|---------------|------------|-----------------------------------|-------------------------------|------------------------------------|------------------------------|----------------------------------|-----------------------------|----------------------------------|--|--|--|---------------|
| | Comments | | | | 83.48 | | | | | | | | | | The Relative Percent Difference (RPD) between duplicates must be ≤ 25%. Date/Int: | |
| | EOM µg/g (Dry Wt. Basis) | 24 | 252 | 126 | 24 | 339 | 430 | 240 | 105 | ما | 12 | 22 | 2003 | | (RPD) between dup RPD 8.563 | 260 |
| | EOM µg/g (Wet Wt. Basis) | 20 | 206 | 102 | 20 | 272 | 362 | 203 | 87 | 13 | 10 | 18 | 1659 | x 100% | ircent Difference | APCILOZLO |
| | Wt. of 100 µl EOM Wt. (mg) | 0.012 | 0.127 | 0.063 | 210.0 | 0/10 | 0,215 | 0.121 | 0.053 | 0.008 | 0.006 | 0.011 | 1.005 | (EOM ₁ - EOM ₂) (EOM ₁ + EOM ₂) × 0.5 | The Relative Pe Date/Int: | Sample: |
| | Filter & Sample Wt (mg) | Zoh.HZ | | | | 22.882 | | 25.019 | 22,71022,763 0.053 | 22.731 22.734 0.008 | 23.260 23.266 0.00le | 22.121 22.132 0.011 | 22.985-23.990 1.005 | | | |
| | Initial Filter Wt (mg) | 24.790 24.402 | 23.294 23.421 | 115.46 34.311 | 24.40H | 22.712 22.882 0.170 | 23.164 23.379 | 24.898 25.019 | 22,710 | 22.731 | 23.260 | 121.22 | 22.985 | %RPD= | Wt. of 100 μl Lipid Wt. (mg) | 0 |
| | Final Extract Vol (mL) | 3 | ξ | 3 | ξ | m | 3 | 3 | 3 | \sim | m | 3 | \sim | | Wt. Lipid | 0.000 |
| | Dry Wt. (%) | 85.26 | 81.62 | 81.15 | 81:38 | 80,45 | 84.25 | 84.38 | 82.20 | R4.07 | 83.33 | 84.38 | 82.83 | | Filter & Sample Wt (mg) | 24.478 24-478 |
| | Smpl Wt./Vol (g/L) Wet Wt. Dry Wt. | 15.06 | 15.10 | 15.01 | 15.10 | 15,06 | 12.01 | 15.10 | 15.08 | 15,04 | 15.02 | 15.07 | 15,05 | × 1000 | Initial Filter Wt (mg) | 24.470 |
| | Client ID | APC/1623 SO-DA-013 (1.0-1.5) | " APCI624 SO-DA-014 (0-0.5) | | | 71 APECILOZ J SO-DA-DUP-01-080113 | 18 APC/1628 50-DA-DIS (0-0.5) | 19 APC1629 SO - DA - 015 (0.5-1.0) | APCILIZO SO-DA-015 (1.0-1.5) | 21 APC(1641 SED-DA-DIZ (0.5-1.0) | APC1642 SED-DA-012(1.0-1.5) | 23 APCILO43 SED-DA-DI3 (0.5-1.0) | 24 APC(1644 SED-DA-U13 (1.0-1.5) 15.05 | (EOM Wt. (mg)) (Final Extract Vol. (ml)) (Smpl WtVol. (g/L)) (0.10 ml) | | Solvent Blank |
| | Sample Name | 13 APC/1623 | 14 APCI624 | 15 APCILO25 | 16 APC1626 | 17 APCC1627 | 18 ARC1628 | 19 APC1629 | 20 APC/630 | 21 APCILOTI | 22 Apc1642 | 23 APC/1643 | 24 APCILOUH | EOM | | |

B&B LABORATORIES EOM LOGBOOK

4

EOM Rev 2 EOM Logbook

EOM 1021 Page 2 of 2

ENN 3081E

Duplicate:

23,693 33.717 10.024

EOM-WELC-10-004

EOM Standard

Last Page