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COMMENTS ON THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT FOR THE NORTH PENN AREA SIX SUPERFUND SITE (JOHN EVANS' SONS, INC. SITE)

August 31, 1995

Prepared for:

John Evans' Sons, Inc.
Spring Avenue
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Prepared by:

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300 Stevens Drive, Suite 200
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COMMENTS ON THE REMEDIAL INVESTIGATION/FEASIBILITY STUDY REPORT FOR THE NORTH PENN AREA SIX SUPERFUND SITE (JOHN EVANS' SONS, INC. SITE)

1.0 Introduction

John Evans' Sons, Inc. has retained McLaren/Hart Environmental Engineering Corporation (McLaren/Hart) to review the *Remedial Investigation Feasibility Study Report for the North Penn Area 6 Site, Source Control Operable Unit, Lansdale, Pennsylvania* dated December, 1994 (RI/FS Report). The RI/FS Report was reviewed with attention to the investigation and remedial alternative evaluation for the John Evans' Sons, Inc. site (John Evans Site) only. This review also included revised pages of the RI/FS Report dated February 17, 1995 regarding hazardous classification of soils, and correspondence between McLaren/Hart and USEPA Region III (see Exhibit 1). Based on this review McLaren/Hart, on behalf of John Evans' Sons, Inc., offers comments in the following areas:

1) MULTIMED modeling methodology and findings;

2) Risk Assessment methodology and findings;

3) RCRA classification of site soils; and

4) Conclusions and recommendations regarding remediation at the John Evans Site.

2.0 MULTIMED Modeling Methodology and Findings

The MULTIMED model presented in Section 4.0 of the RI/FS Report concludes that trichloroethene (TCE) concentrations higher than 84 micrograms per kilogram (ug/kg) in soils at the John Evans Site will adversely impact groundwater quality at the downgradient property boundary. This concentration is higher than the range of 2 to 20 ug/kg computed by USEPA in its recent Soil Screening Guidance (USEPA, 1994), but is substantially lower than the soil-to-groundwater pathway concentration of 2,000 ug/kg computed by the Pennsylvania Department of Environmental Protection (PADEP) using the CREST model and published in its Land Recycling Program Technical Guidance Manual (July, 1995) as a Statewide Human Health Standard for Soils.

The difference between the MULTIMED result and the USEPA Soil Screening Level is primarily attributable to the areal extent of affected soil assumed in each model. USEPA's model assumes a 30 acre site uniformly impacted to its property lines, with the point of compliance at the property line. MULTIMED, on the other hand, assumes an affected area of 167 square meters, or 0.035 acres, with two meters between the edge of the affected soil and the point of compliance at the property line.

The discrepancy between the PADEP cleanup level and those determined by the USEPA results almost entirely from the fact that organic contaminants become entrained into the matrix of the

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soil over time and become less susceptible to leaching. PADEP's CREST model accounts for this factor, but the USEPA models do not. Had USEPA utilized a model that accounts for the entrainment of contaminants into the soils over time, the resulting soil cleanup goal would be orders of magnitude higher than that calculated using MULTIMED.

2.1 Evaluation of MULTIMED Procedures and Input Data

McLaren/Hart reviewed the procedures and input parameters used by USEPA in developing the MULTIMED model for the John Evans Site. We identified several input parameters for which USEPA made assumptions that were not based on field data, and which, upon acquisition of that field data by John Evans' Sons, Inc., were determined to be inaccurate. These parameters are (a) the starting leachate concentration, (b) the interval between the impacted soils and the water table and (c) delineation of the area of impacted soils.

2.1.1 Starting Leachate Concentration. The MULTIMED model calculates that a soil TCE concentration of 84 ug/kg would produce a leachate concentration of 440 ug/l based on a soil-water partitioning coefficient of 0.191 l/kg. Based on a saturated zone dilution factor of 88, this leachate concentration is then calculated to produce a groundwater concentration of 5 ug/l at the property line, which is USEPA's maximum acceptable groundwater concentration. McLaren/Hart agrees with USEPA's computation of the saturated zone dilution factor of 88, but we do not agree with the soil/water partitioning coefficient of 0.191 l/kg. Research has shown that non-equilibrium (i.e. time-variant) soil-water partitioning coefficients more accurately reflect the real-world phenomenon that organic contaminants become entrained into the matrix of the soil over time and become less susceptible to leaching. This phenomenon is accounted for in other formulae, such as that utilized by the CREST model, and is more appropriate for use at the John Evans Site, especially given the age of the alleged release, which is estimated to be over 23 years.

2.1.2 Interval between source soils and water table. USEPA assumed that the unsaturated zone between the base of the contaminated soil and the water table has a thickness of 33 feet and is comprised entirely of bedrock that has no organic carbon content. Our review of the RI/FS Report indicates that the actual thickness of the unsaturated zone may be as great as 70 feet, and that some of this distance may be comprised of uncontaminated soil. The presence of such uncontaminated soil would serve to attenuate leachate concentrations between the affected soils and the underlying water table.

2.1.3 Delineation of the area of impacted soils. MULTIMED uses the "patch source" concept that characterizes the source area as a rectangular patch of soil that is contaminated throughout the thickness of the soil profile. USEPA has assumed for the purposes of the MULTIMED model that the source of TCE at the John Evans Site is a patch of soil measuring 167 m^2 in area that extends to within 2 meters of the downgradient property line. The source area at the John Evans Site is in fact smaller and farther from the property line than was assumed in MULTIMED. From analysis of the RI/FS Report, the size of the source area is approximately 116 square meters, and the distance between the downgradient edge of the soil source area and the property boundary is approximately six meters. The use of both of these factors would result in an increase in the Dilution and Attenuation Factor (DAF), which in turn would result in an increase in the soil cleanup goal calculated by MULTIMED.

2.2 Field Verification of Input Data

As described in Exhibit 2, John Evans' Sons, Inc. retained McLaren/Hart to collect supplemental field data to further evaluate the appropriateness of input parameters utilized by USEPA in the MULTIMED model regarding the starting leachate concentration of 440 ug/l described above in Section 2.1.1, and the interval of clean soil beneath the source area described above in Section 2.1.2.

2.2.1 Starting leachate concentration. The data from a soil sample obtained from the 7 to 9 foot depth, in the location of highest TCE concentration found by USEPA, show a TCE concentration of 670 ug/kg and a leachate concentration, using the Synthetic Precipitation Leaching Procedure, USEPA Method 1312 (SPLP), of less than 5 ug/l. The data from a sample obtained from the 5 to 7 foot depth, the depth at which USEPA data indicates a TCE concentration of as high as 1,900 ug/kg, shows a SPLP leachate concentration of 64 ug/l. (McLaren/Hart was unable to determine the TCE concentration of the 5 to 7 foot sample due to discrepancies in laboratory procedures).

These site specific data show that the MULTIMED calculation of leachate concentration does not reflect reality at the John Evans Site and, importantly, the data are entirely consistent with the non-equilibrium, time variant partitioning coefficients described above that are used in models such as CREST. Based on this data: (a) a TCE soil concentration of 670 ug/kg and resulting leachate concentration of 5 ug/l will produce a groundwater concentration of roughly 0.06 ug/l at the property boundary; and (b) an (assumed) TCE soil concentration of 1,900 ug/kg and a measured leachate concentration of 64 ug/l will produce a groundwater concentration of roughly 0.73 ug/l at the property boundary.

Both of these property line concentrations are well below the USEPA maximum allowable level of 5 ug/l. Based on this data and an allowable groundwater concentration of 5 ug/l at the property boundary, calculation of a soil clean-up level results in a range of approximately 13,000 ug/kg to 59,000 ug/kg.

2.2.2 Interval of clean soil beneath source area. The data also indicate that approximately five and a half feet of clean soil exists between the base of the affected source area and the top of the bedrock. This interval of clean soil beneath the source area serves to attenuate the leachate concentrations, and would result in a reduction in leachate concentration in the MULTIMED model by a factor of approximately 0.6, and a corresponding increase in the soil cleanup goal by a factor of approximately 1.7. This factor should not be ignored, but it is much less significant than the site-specific leachate concentration results described above.

2.2.3 Area of Impacted Soils. In addition to the above, the site specific factors described in Section 2.1.3 of these comments regarding the size of the source area and the distance to the property line would serve to further attenuate the leachate concentration and increase the soil clean-up goal. We estimate that the leachate concentration would be attenuated by a factor of approximately 0.67, with a corresponding increase in the soil cleanup goal by a factor of approximately 1.5 over that computed by MULTIMED. Again, this factor is not of major significance but should not be dismissed.

2.3 General Discussion and Recommendations - MULTIMED

The MULTIMED model and USEPA's input parameters incorporated data that was based on assumptions that were not site specific and did not take into account the entrainment mechanism of organics in soil. (It is important to note that PADEP has published a Statewide Human Health Standard for Soils of 2,000 ug/kg for TCE, based on a model that takes this entrainment mechanism into account, and that this level is above the maximum concentration measured by USEPA at the John Evans Site). McLaren/Hart's supplemental investigation and acquisition of data from the John Evans Site indicates that the parameters input to the MULTIMED model do not reflect actual site conditions and, consequently, the result is a clean-up goal that is orders of magnitude too low. Use of this supplemental data results in a clean-up level that indicates that TCE concentrations in the soils at the John Evans Site do not pose a threat to groundwater quality.

3.0 Risk Assessment Methodology and Findings

The risk assessment presented in Section 6.0 of the RI/FS Report concludes that, under a hypothetical residential land use scenario, soils at the John Evans Site do not present an unacceptable carcinogenic risk to human health. However, the risk assessment concludes that the cumulative non-carcinogenic risks posed by certain metals under this land use scenario would be above acceptable criteria.

3.1 Soil Quality Data

Regarding the surface soil sampling database (0 - 6 inches), USEPA utilized only two samples (SS-01 and SS-02) in the risk assessment to estimate risks posed to hypothetical future residents living on-site. Two samples do not constitute an adequate sampling database upon which to base site risks. USEPA has rejected private-party risk assessments due to insufficient data for sites with databases far more robust than this one. The primary issue of concern here is that these two locations might represent hot spots, thereby biasing risks upward. If this is the case, additional soil data would be expected to reduce the site-wide concentrations, thereby bringing the overall risk estimates to within acceptable levels.

The risk assessment indicates that a Monte Carlo analysis (MCA) was used to determine complete ranges of exposure distributions and risks, and that soil concentrations were input as distributions (i.e. a range of concentrations from lowest to highest). MCA is useful in validating a point estimate risk assessment when the input data have a high degree of potential or actual variability. If the input data have little or no variability, as is the case at the John Evans Site, MCA has little utility and can in fact be misleading, as it will appear to show a high level of confidence in the point estimate risk levels. For the John Evans Site, two surface soil data points constituted USEPA's distribution of input surface soil values. However, two values cannot mathematically support a distribution and, as anticipated, the MCA results support USEPA's conservative estimate of risk.

USEPA's response to our risk assessment question No. 3 regarding the use of only two soil samples was to dismiss the importance of the risk assessment as a driver for site remediation in light of the results of the MULTIMED model, rather than to address the question. The

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MULTIMED model indicates that impact to groundwater drives the remediation. However, based on the presentation in Section 2.0 of these comments, the results of the MULTIMED model should be revised. Consequently, the risk assessment results become significant and the potential remediation of metals becomes an issue. Also, in the RI/FS Report certain remedial alternatives were considered to be inappropriate for the John Evans Site because they do not address metals. Such procedures might be appropriate if metals were no longer a concern based on a complete risk assessment.

For these reasons, McLaren/Hart maintains that the risk assessment for the John Evans Site was based on an inadequate database that cannot form the basis for any conclusions about site risks. Due to the apparent significance of the risk assessment, contrary to USEPA's conclusion, a new risk assessment should be performed using a more robust soil database.

3.2 Exposure Assumptions

McLaren/Hart's review of the risk assessment identified three primary factors that result in the calculated risk being greater than the most likely *and* high end risks. These are 1) the use of conservative probability distribution functions (PDFs) and/or the use of point estimate values in lieu of PDFs, 2) the use of multiple high end exposure values, and 3) the use of a hypothetical residential land use scenario.

3.2.1 Conservative Probability Distribution Factors. For most exposure input assumptions, the risk assessment apparently used conservative PDFs suggested by USEPA Region III guidance as default values. However, in some instances, such as soil ingestion and exposure duration, high end point estimate values were used in lieu of distributions. Precedent has been established in USEPA guidance documents that alternative PDFs may be used if they have been published in the peer-reviewed scientific literature. For key exposure parameters used in this risk assessment, such as soil ingestion and exposure duration, PDFs *have* been published in the peer reviewed literature (Finley et al., 1994). This suggests that USEPA's risk calculations likely exaggerate true risk at the John Evans Site. It is recommended that USEPA's risk calculations be revised based on appropriate published PDFs.

3.2.2 Multiple high end exposure values. The risk assessment utilizes multiple high end exposure values and produces a correspondingly high calculated risk. This is not consistent with recent EPA guidance concerning risk characterization. Specifically, the risk assessment does not follow the recommendations of the *Guidance on Risk Characterization for Risk Managers and Risk Assessors* (EPA, 1992a), the *Guidelines for Exposure Assessment* (EPA, 1992b) and the *EPA Risk Characterization Policy and Guidance* (EPA, 1995). One of the central principles of these three guidelines is that risk estimates must be presented for the central tendency and high end exposures. In addition, these documents clearly state that the high end exposure is not meant to be either a bounding estimate or a worst case scenario:

> Bounding estimates and worst case scenarios should not be termed high end risk estimates...High end estimates focus on estimates of the exposure or dose in the actual populations. "Bounding estimates", on the other hand, purposely overestimate the exposure or dose in an actual population for the purpose of

developing a statement that the risk is "not greater than...". A "worst case scenario" refers to a combination of events and conditions such that, taken together, produces the highest conceivable risk (EPA, 1992a, p. 23).

The guidance documents provide information on how the high end exposure may be estimated, including the use of Monte Carlo analysis. In the absence of a Monte Carlo analysis, the guidance documents state that the high end exposure should be estimated by "identifying the most sensitive variables and using high end values for a subset of these variables, leaving others at their central values" (emphasis added; EPA, 1995, p. 15). The guidance further notes that, "Maximizing all variables will in virtually all cases results in an estimate that is above the actual values seen in the population" (EPA, 1995, p. 15).

In light of this, McLaren/Hart considers the results of the risk assessment in the RI/FS Report to be a "worst case scenario" or a "bounding estimate", and therefore not suitable for determining the need for remediation. If EPA decides that remediation will be driven by the results of the risk assessment, EPA's risk estimates should be recalculated using central values for exposure input variables.

3.2.3 Residential Land Use Scenario. It is also established in precedent and policy that higher soil concentrations are acceptable at sites that are restricted to industrial land use. McLaren/Hart asked USEPA about this in our risk assessment question No. 7. Again, USEPA did not respond, but rather stated that this is a moot-point because the impact to groundwater, as predicted by MULTIMED, is driving the cleanup. As discussed above under Section 3.1, this point is not moot since MULTIMED results are overly conservative and impacts to groundwater are insignificant (see Section 2.0 above). That being the case, USEPA could take the position based on the risk assessment that cleanup at the John Evans Site should proceed due to excess risk under a hypothetical residential use scenario. However, such would probably not be required under an industrial use scenario.

3.3 General Discussion and Recommendations - Risk Assessment

USEPA's baseline risk assessment has been developed with an unacceptably small amount of site-specific information, especially with respect to surface soil sampling data and exposures. It has been McLaren/Hart's experience that limited sampling information and use of default exposure factors, as applied here, typically leads to an overestimation of site risks. Because media cleanup levels are directly related to the results of the baseline risk assessment, it follows that an overly conservative analysis will result in lower-than-necessary media cleanup levels, and higher-than-necessary cleanup costs.

While USEPA is downplaying the significance of the risk assessment as a driver for remediation, it is, for example, pointing to metals in soils as a factor that limits the remedial alternatives that can be considered at the John Evans Site. Based on the analysis in Section 2.0 of these comments, the impact to groundwater is not a driver for remediation, so the validity of the risk assessment must be reconsidered. In view of the limited data, together with the use of default and multiple high end exposures and a residential use scenario, the risk assessment should be revisited relative to the John Evans Site.

4.0 Hazardous Characteristics of Soils

In its revisions to the RI/FS Report, USEPA indicates that "sufficient information exists to classify soils at John Evans' Sons... as RCRA listed wastes (F002); therefore, these soils will be disposed of only at RCRA Subtitle C landfill(s)." This classification results in a significant increase in costs associated with soil disposal.

A soil is classified as an F002 waste only if it contains certain spent halogenated solvents (TCE, tetrachloroethene (PCE) and others) or blends of solvents containing, before use, 10 percent or more of such halogenated solvents. McLaren/Hart has not seen the "sufficient information" that USEPA refers to as supporting the determination that this classification applies to soils at the John Evans Site. If information is not in fact sufficient to prove that the chemicals were "spent" at the time they came into contact with the soils, the F002 listing is not appropriate.

Without a hazardous waste listing, the only way the soils can be classified as hazardous is if they have hazardous characteristics. The RI/FS Report indicates that hazardous characteristics testing has not yet been performed at the John Evans Site. However, based on the concentrations of constituents in soils as presented in the RI/FS Report, it is not anticipated that RCRA characteristics and TCLP testing would show these soils to be hazardous.

In addition, in view of the ages of the alleged releases at the John Evans Site and the other sites that were part of the RI/FS, it is unreasonable, as a practical matter, to handle soil with virtually identical levels of the same contaminants differently due to an excessively narrow reading of the hazardous waste regulations. The consequences of such would be to increase the cost of the remediation without any corresponding benefit to human health or the environment.

5.0 Conclusions and Recommendations regarding remediation at the John Evans Site

Based on the above comments regarding the MULTIMED model, it is apparent that the potential impact to groundwater by site soils has been overestimated by at least two orders of magnitude due to the use of an extremely conservative soil/water partitioning coefficient that does not account for the time-variable uptake of organic compounds into the soil matrix. A more appropriate soil/water partitioning coefficient, such as that used in the CREST model, would have predicted no groundwater impacts from site soils. Indeed, site-specific soil analytical results obtained independently by John Evans' Sons, Inc. show actual leachate concentrations from soils in the source area to be far below the acceptable leachate concentration calculated by USEPA using MULTIMED. In addition, site-specific information indicates the presence of at least four feet of unsaturated soil below the contamination, a source area size of only 116 square meters and a distance of six meters from the contamination to the property line. The use of these factors in the MULTIMED model would result in a further increase in the final cleanup goal. Based on this information, it is recommended that no further action be taken regarding site investigations or remediation relative to potential impacts to groundwater posed by site soils.

Based on the above comments regarding the risk assessment, it is apparent that the risks as calculated in the RI/FS Report are extremely conservative and are based on an inadequate data set. Actual risks under a residential exposure scenario may be found to be acceptable if a more robust data set and/or site-specific exposures are utilized. In addition, risks determined under

a non-residential (industrial) scenario would be in keeping with current and planned future uses of the John Evans Site. It is recommended that a more rigorous risk assessment be performed and, if risks are acceptable, no further action be taken regarding site investigation or remediation relative to exposure with site soils.

Based on the above comments regarding the classification of site soils as a listed F002 waste, it is concluded that insufficient information exists to give site soils this classification. In the absence of such information, site soil would need to exhibit hazardous characteristics to be classified as hazardous. However, based on the concentrations as presented in the RI/FS Report, it is not anticipated that testing would show these soils to be hazardous. Unless data is generated that demonstrates the contrary, it is recommended that site soils be classified as non-hazardous.

6.0 References Cited

EPA. 1992a. Memorandum from F.H. Habicht, Deputy Administrator, U.S. Environmental Protection Agency, Washington, D.C. to Assistant Administrators and Regional Administrators. Re: Guidance on Risk Characterization for Risk Managers and Risk Assessors. U.S. Environmental Protection Agency, Washington, DC. February 26, 1992.

EPA. 1992b. Final Guidelines for Exposure Assessment; Notice. U.S. Environmental Protection Agency, 57 Federal Register 104:22888-22938, Washington, DC. May 29, 1992.

EPA. 1995. Memo to Assistant Administrators, Associate Administrators, Regional Administrators, General Counsel, and Inspector General from C.M. Browner, Re: EPA Risk Characterization Program. U.S. Environmental Protection Agency, Washington, DC. March 21, 1995.

Finley, B, D. Proctor, P. Scott, N. Harrington, D. Paustenbach, and P. Price. 1994. Recommended Distributions for Exposure Factors Frequently Used in Health Risk Assessment. *Risk Analysis*. Vol. 14, No. 4. P. 533 - 553.

Exhibit 1

Questions From McLaren/Hart to USEPA, April 20, 1995
and
Response from USEPA to McLaren/Hart, May 11, 1995

AR301433

MEMORANDUM

To: Greg Ham, U.S. Environmental Protection Agency

From: Tom Rodriguez, McLaren/Hart Environmental Engineering Corporation

Date: April 20, 1995

Subject: North Penn Area Six RI/FS Report
John Evans' Sons, Inc. Property
Questions Regarding MULTIMED Model and Risk Assessment

As you suggested, we have prepared the following specific questions regarding the Risk Assessment and the MULTIMED model for the John Evans' Sons, Inc. Site.

Questions regarding MULTIMED Model

1. Black & Veatch (B&V) documented that a literature value for infiltration was used as an input for the MULTIMED model, in substitution of an infiltration rate explicitly computed by the model. Is this literature-based value an event-averaged infiltration rate which accounts for seasonal potential evapotranspiration rates?

2. The basis and rationale behind selecting a leachate concentration of 1 mg/l is not clear. According to our calculations, the batch reactor 'sub-model' utilized by B&V should suggest that the maximum on-site leachate concentration is no greater than 0.68 mg/l. Can you provide the rationale for the 1 mg/l leachate concentration?

3. Although it is a conservative assumption that the entire soil thickness is contaminated, the fact remains that 40 to 70 feet of unsaturated bedrock exists between the contaminated soil and the water table. Were the unsaturated zone flow and transport modules of MULTIMED utilized to simulate percolation through this zone?

4. For MULTIMED, B&V used a spill area of 167 square meters, and documented that this represented the area of delineated contamination. It would be helpful if the site coordinates of this contaminated region were given. This would aid in our evaluation of the assumption that the groundwater compliance point is two meters from the source boundary.

5. In addition to these questions, the values used by B&V for the following parameters need to be determined in order for us to complete our evaluation of the modeling performed by B&V. The parameters noted by an (*), may not have been used by B&V, since it is still in question if B&V performed unsaturated flow and transport modeling.

a.* Air entry pressure head into the unsaturated zone.

b.* Residual saturation of the unsaturated bedrock.

c.* Van Genuchten coefficients for the unsaturated bedrock

d. Temperature and pH of the saturated bedrock

e. Solid and dissolved phase decay coefficients for the saturated bedrock. Was the parameter termed 'source decay' used in lieu of these two parameters? We are assuming that the parameter termed 'biodegradation' is the effective first-order decay rate used by MULTIMED.

f. The dispersivity coefficients. Were the coefficients used by B&V for the saturated flow modeling determined by assuming a receptor 2 meters away, or determined using a probabilistic approach?

Questions Regarding Risk Assessment

1. Region III's Technical Guidance Manual on the Use of Monte Carlo Simulations in Risk Assessments (EPA903-F-94-001, February, 1994) suggests that Monte Carlo Simulations are an effective way of producing multiple risk descriptors, as espoused by the Exposure Assessment Guidelines of 1992. The Region III Guidance also explicitly states that "The Region will continue to require single-point risk estimates, prepared under current national guidance, in conjunction with optional Monte Carlo simulations. Moreover, a parallel point estimate analysis would provide a useful "check on the Monte Carlo analysis itself. Were point estimate risk calculations performed in parallel with the Monte Carlo option for the John Evans site? If so, can these calculations be made available to John Evans? If calculations were not performed, does EPA intend to do this at a later date or omit this step from the risk assessment?

2. The RA states that a Monte Carlo analysis was performed in order to "...reflect the uncertainty associated with any estimate of exposure concentrations. However, for key exposure parameters, such as soil ingestion and exposure duration (for which published probability distribution functions exist), point estimate values were utilized in lieu of distributions. Consequently, the resultant risk distributions may not be representative of the true distribution of risks associated with these parameters (again, a parallel point estimate analysis may show a limited variation between the Monte Carlo analysis results and the conservative point estimate evaluation). Does EPA intend to perform Monte Carlo analysis using distributions for all critical exposure values, including soil ingestion and exposure duration?

3. Regarding the surface soil sampling database (0 - 6 inches), it appears that only two samples were collected which the risk assessment relies upon in the determination of risks for a hypothetical residential receptor. While it is recognized that the majority of the site is paved, two near-surface samples hardly represent an adequate number to establish site-wide exposure concentrations. If this site were actually used for residential purposes in the future (which is highly improbable), it is conceivable that some or most of the pavement would be removed.

Please explain the reason for using only two surface soil samples in the residential risk calculations. Can John Evans collect additional data and submit the results to EPA for incorporation into the RA?

4. Can you please provide the individual subsurface soil concentrations used in developing the hypothetical future construction worker soil exposure concentration distribution?

5. Can you please provide all input data used for the @Risk Monte Carlo runs (including the individual parameter values used to generate the various distributions)?

6. The basis and interpretation of Figure 6-3D (Hazard Quotient for the Future Child Resident) is not provided in the document or supporting appendices. Can you please provide an explanation and interpretation of that figure?

7. EPA Region III has developed risk-based media screening concentrations for two use conditions - residential and industrial. This implies that nonresidential land uses are allowed in the analysis of site risks providing that a PRP is willing to limit (through a deed restriction) future use of its property. Can the use of deed restrictions be factored into the evaluation of suitable remedial measures for the site?

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

May 11, 1995

Mr. Thomas E. Rodriguez, P.G.
Principal Hydrogeologist
McLaren Hart Environmental Engineering Corporation
300 Stevens Drive, Suite 200
Philadelphia, PA 19113

Dear Mr. Rodriquez:

Enclosed are responses to the questions you had asked regarding the modeling and risk assessment for the North Penn Area 6 NPL Site as presented in the Remedial Investigation/ Feasibility Study report. These responses were prepared by Black & Veatch Waste Science, Inc., EPA's contractor who prepared the RI/FS report.

If you have any questions on this matter, please call me at (215) 597-4750.

Sincerely,

Gregory Ham
Remedial Project Manager

Enclosure

BLACK & VEATCH Waste Science, Inc.

The Curtis Center, Suite 705, 601 Walnut Street, Philadelphia, Pennsylvania 19106-3307, (215) 928-0700, Fax: (215) 928-1780

EPA Region III
North Penn Area 6 Site OU 1

B&V Project 21910.010
B&V File C.3
May 8, 1995

Mr. Gregory Ham
Remedial Project Manager
US Environmental Protection Agency
Region III
841 Chestnut Building
Philadelphia, PA 19107

Subject: Response to RI/FS Report Comments

Dear Mr. Ham:

BLACK & VEATCH Waste Science, Inc. (BVWS) has reviewed McLaren/Hart Environmental Engineering Corporation's comments on the final Remedial Investigation/Feasibility Study Report for the North Penn Area 6 Site, Source Control Operable Unit. Attached are BVWS's responses to the comments. Please note that the original comments have been abbreviated.

Please call me at 928-2224 if you have any questions.

Very truly yours,

BLACK & VEATCH Waste Science, Inc.

Lusheng Yan

Lusheng Yan
Project Manager

Attachment

Mr. Gregory Ham

B&V Project 21910.010
May 8, 1995

Responses to Comments
RI/FS Report, North Penn Area 6 Site
(John Evans and Sons Portion)

MODEL QUESTIONS

1. Is the infiltration rate used in the MULTIMED modeling an event-averaged value which accounts for evapotranspiration?

A: The infiltration rate used in the model is based the stream base flow in the Lansdale area. The value has accounted for evapotranspiration. (Page 2-11).

2. The rational for use of 1 mg/l as the contaminant concentration in the leachate.

A. The use of 1 mg/l as the contaminant concentration in the leachate was for the convenience of calculation, and does not indicate the actual value. Because we are concerned with only the dilution factor of contaminants in the leachate once mixed with groundwater, Equations 4.8 and 4.9 eliminate the need for an actual contaminant concentration in the leachate.

3. Whether the unsaturated bedrock has been included in the modeling?

A. Yes. The unsaturated zone included two layers. Layer 1 is the soil of 0 - 2.13 meters (7 feet thick). Layer 2 is the unsaturated bedrock which is assumed to be about 2.13 - 10 meters (33 feet thick)

4. Did the model use site coordinates to describe the contaminated area?

A. The model approximated the contaminated area by a square enclosing the most contaminated locations. There were no coordinates required by the model.

5. Additional parameters.

A. a Air entry pressure head is assumed to be 0.

b. Residual water content of the unsaturated bedrock is assumed to be 0.

c. The Brooks and Corey Equation was used, not Van Genuchten's. The model assumed a conservative scenario under which the contaminated soil is saturated with infiltrating water. This is to ensure that infiltration fully reacts with the contaminated soil. This is also consistent with assumptions in the batch reactor model used to calculate contaminant partitioning between aqueous and solid phases. Because of this, Brooks and Corey exponent of 0 was applied.

d. Temperature and pH were not required because hydrolysis was not considered.

e. The model considered only the first order biological degradation in the aqueous phase. The source decay is a different concept which describes the attenuation of contaminants in the source area attributable to leaching by infiltration. As shown by the derivations in Section 4.3.2, it has an expression similar to the first order decay model.

d. The dispersivity was calculated by the model for a lateral distance of 2 meters.

RISK ASSESSMENT QUESTIONS

1. Can Monte Carlo risk assessment replace RME (reasonable maximum exposure) risk assessment?

A. The risk assessment for North Penn Area 6 Site is consistent with the EPA Region III policy. The risk assessment provided in Section 6 contains RME risk values as the primary measure and Monte Carlo risk values only to measure the variability of risks (Page 6-19 and Table 6-11).

2. Are probability distributions for other parameters used for the risk assessment?

A. The Monte Carlo model for this risk assessment considered the variabilities of contaminant concentrations and other parameters that can be found in the EPA Region III guidance. The values of these parameters are listed in pages 6-20 through 6-22.

3. Why residential risk assessment was performed for a property that is known to be mostly industrial? Why only two surface soil samples were used for risk assessment? Can additional samples be collected and the results incorporated into the risk assessment?

A. The purpose of the residential risk assessment is to evaluate the potential health risks to future residents if the property is converted for residential use. It does not have much to do with the likelihood of the property being occupied by residents. Only two surface soil samples were used for the risk assessment because of the limited areas available for sampling at the property.

Additional samples probably will not be necessary. When the risk assessment was conducted, the nature and characteristics of the property were recognized. Consequently, the remedial decision did not heavily rely on the risk assessment using the two surface soil samples.

4. Where are the individual subsurface soils samples?

A. - All data tables are provided in Appendices B and C.

5. Where is the input data used for the @Risk runs?

A. The three parameters that were presented as probability distributions included body weight, exposure time, and population age. They are listed in Pages 6-20 through 6-22 and graphically presented as Figures E-1 through E-3 in Appendix E.

6. How should Figure 6-3D be interpreted.

A. Figure 6-3D most likely does not reflect the true probability distribution of non-cancer risk to residential children, even though the order of magnitude should generally be correct. This is primarily due to the fact that the number of contaminants and exposure pathways contributing the risk are reduced to two (cadmium and nickel, ingestion and dermal contact).

7. Can deed restriction be factored into remedial alternative so that the (risk-based) remedial measures account for the commercial and industrial nature of the property?

A. The remedial action proposed for this property is to remove the volatile contaminants based on the protection of groundwater. These volatile contaminants actually pose human health risks at levels much lower than other contaminants as reflected in the risk values. Deed restriction only limit the risk associated exposure to the contaminated soil, but does not protect the groundwater from being contaminated.

Exhibit 2

Report of Field Verification of MULTIMED Input Parameters

AR301442

Field Verification of VOC Concentrations and Leachability at John Evans' Sons, Inc. Lansdale, Pennsylvania

August 25, 1995

Prepared for:

John Evans' Sons, Inc.
Spring Avenue
Lansdale, PA 19446

Prepared by:

McLaren/Hart Environmental Engineering Corp.
300 Stevens Drive, Suite 200
Philadelphia, PA 19113

1.0 Introduction

On July 19, 1995 McLaren/Hart implemented a soil sampling program at the John Evans' Sons, Inc. property (the John Evans Site) designed to verify the concentrations, vertical extent and leachability of volatile organic compounds (VOCs), particularly trichloroethene (TCE) in the "source area" as identified by the U.S. Environmental Protection Agency (USEPA) Region III in its *Remedial Investigation Feasibility Study Report for the North Penn Area 6 Site, Source Control Operable Unit, Lansdale, Pennsylvania* dated December, 1994 (RI/FS Report). The field sampling procedures, findings, conclusions and recommendations are presented below.

2.0 Sampling Procedures

On July 19, 1995 McLaren/Hart drilled one soil boring in the location previously sampled by the EPA and documented as SB-09. Subsurface sampling was conducted using hollow-stem augers in conjunction with split-spoon sampling devices. Split spoon samples were collected continuously over the length of the boring. Soil samples were taken in two foot intervals beginning at 3 feet. Sample recovery to 9 feet was 100 percent, and dropped significantly at 10.5 feet.

Samples were recovered to a depth of 11.5 feet, and spoon refusal occurred at 12.5 feet. Auger Refusal occurred at 16.2 feet, which was determined to be competent bedrock. A total of six samples were obtained. Samples were analyzed for volatile organic compounds (VOCs) using USEPA Method 8260, and/or the Synthetic Precipitation Leaching Procedure (SPLP) using EPA Method 1312.

The utensils used during the sampling procedure were decontaminated after obtaining each sample using the following regimen:

- Liquinox/Potable Water Wash
- De-ionized Water Rinse
- Methanol Wash
- Total air dry
- De-ionized Water Rinse
- Total air dry

Samples were collected in laboratory-provided sample containers and stored in coolers maintained at approximately 4°C with ice pending shipment to the laboratory. The soil samples collected during this investigation were analyzed by Raytheon Environmental Laboratories in Boothwyn, Pennsylvania.

3.0 Findings

Analytical results are summarized in Attachment 1, and a soil boring log is provided in Attachment 2. A complete laboratory report is provided in Attachment 3.

As shown on the Summary of Analytical Results, analytical results for TCE via EPA method 8260 ranged from non-detect to 670 micrograms per kilogram (ug/kg), with the lowest

AR301444

concentrations occurring above five feet and below 10.5 feet and the highest concentrations occurring at a depth of approximately 7 feet below ground surface. This roughly corresponds to USEPA's data, which show approximately 1,400 to 1,900 ug/kg of TCE at approximately 7 feet below grade. Discrepancies in the analytical data may be attributable to sampling conditions, handling and analytical methods, and/or localized soil heterogeneities.

Analytical results for the Synthetic Precipitation Leaching Procedure (SPLP) via method 1312 show results of non-detect for the 7-9 foot sample that had a soil TCE concentration of 670 mg/kg, and a result of 64 ug/l from a sample collected from the 5-7 foot interval where USEPA identified up to 1,900 ug/kg TCE in soil.

The sampling program identified the top of competent bedrock to exist at a depth of approximately 16 feet below ground surface, as indicated on the attached soil boring log. Analytical data show a marked decrease in VOC concentrations below 10.5 feet, leaving approximately 5.5 feet of relatively clean soil between the zone of highest concentrations and the top of bedrock.

4.0 Conclusions and Recommendations

It is concluded based on the analytical data that the highest concentrations of VOCs exist at a depth of approximately 7 feet in the area of the soil boring. This is consistent with USEPA's conclusions regarding the interval of highest concentrations. However, the soil boring results indicate the top of competent bedrock exist roughly 5.5 feet below the base of the contaminated soils.

The MULTIMED model in the RI/FS report calculated that TCE concentration in the leachate can be as high as 440 ug/l at the water table without adversely impacting groundwater quality in at the property line. This is based on a groundwater concentration of 5 ug/l (the Maximum Contaminant Level for TCE) in groundwater at the property line and a saturated zone dilution factor of 88 (88 x 5 ug/l = 440 ug/l). The relatively clean soil thickness of 5.5 feet as identified in the soil boring samples would allow for leachate attenuation by a factor of approximately 0.6 which, when applied to a leachate concentration of 440 ug/l of TCE at the depth of the water table, would yield an acceptable leachate concentration of roughly 735 ug/l in the source area.

The SPLP analyses conducted during this sampling program demonstrate that the leachate from soils in the source area of the John Evans Site has TCE concentrations that are orders of magnitude less that the theoretical allowable maximum of 440 ug/l computed by USEPA using MULTIMED.

In view of this site specific information, McLaren/Hart recommends that John Evans' Sons, Inc. submit the results of this field verification program to USEPA during the public comment period for the RI/FS report and Proposed Plan.

AR301445

Attachment 1

Summary of Analytical Results

SUMMARY OF ANALYTICAL RESULTS
JOHN EVANS' SONS - LANSDALE, PA
JULY 19, 1995

Sample ID	SB-1	SB-2	EPA SB09	SB -X	SB-3	EPA SB-9	SB-4	SB-5
Sample Depth (in feet)	3 - 5	5 - 7	5 - 7	5 - 7	7 - 9	7 - 9	9 - 10.5	10.5 - 11.5
Date Sampled	7/19/95	7/19/95	8/19/93	7/19/95	7/19/95	8/19/93	7/19/95	7/19/95
Lab ID	90008	90009	-	90013	90010 90754	-	90011	90012
Volatile Organic Compounds - 8260 (ug/kg)								
Acetone	42 J	ND	ND	NA	ND	ND	ND	ND
2 - Butanone	ND	ND	ND	NA	ND	ND	ND	6 J
cis-1,2-Dichloromethane	ND	20 J	ND	NA	270	ND	250	33
Methylene Chloride	12 J	16 J	ND	NA	25 J	ND	25 J	15 J
Tetrachloroethane	83	280	ND	NA	1000	ND	1600 E	110
Trichloroethene	ND	40	1900	NA	670	1400 B	540	48
Volatile Organic Compounds - 1312 SPLP (ug/l)								
2 - Butanone	NA	NA	NA	3 J	ND	NA	NA	NA
Chlorobenzene	NA	NA	NA	4J	ND	NA	NA	NA
Tetrachloroethane	NA	NA	NA	87	ND	NA	NA	NA
Trichloroethene	NA	NA	NA	64	ND	NA	NA	NA

Notes:
B - Analyte was found in blank as well as sample
E- Analyte concentration exceeded instrument calibration range
J - Estimated Value
NA - Not Analyzed
ND - Not Detected

AR301447

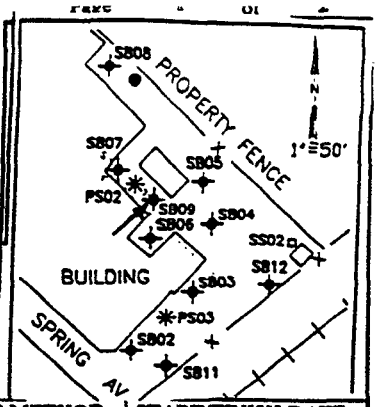
H:\geo\rs\johnev\JOHNEV.XLS

Attachment 2

Soil Boring Log

McLaren Hart

TEST BORING LOG



BORING/WELL NO.	SB-A
PROJECT NO./NAME	130803224.001.001/JOHN EVANS' SONS
LOCATION	SPRING AVE., LANSDALE, PA
DRILLING CONTRACTOR/DRILLER	ADVANCED DRILLING/SCOTT ABERELLA
MCLAREN/HART GEOLOGIST/OFFICE	RUSSELL SACKS/Philadelphia Office
DRILLING EQUIPMENT/METHOD	/HOLLOW STEM AUGER
SIZE/TYPE OF BIT	10"/STANDARD
SAMPLING METHOD	Continuous SS
START/FINISH DATE	7/19/95-7/19/95
WELL INSTALLED?	YES ☐ NO ☒
CASING MAT./DIA.	
SCREEN: TYPE / MAT. / LENGTH / DIA. / SLOT SIZE	
ELEVATION OF: (FT. ABOVE M.S.L.)	GROUND SURFACE / TOP OF WELL CASING / TOP & BOTTOM SCREEN / GW SURFACE / DATE
REMARKS:	An OVM was used to screen soils for the presence of organic vapors.

Depth ft	Sample #	Recovery (ft)	Pene. Resist. Blows/6"	Unified Classif.	LOG OF TEST BORING: DESCRIPTION	REMARKS	PID (ppm)	Well Const.	Graphic Log
	NA				ASPHALT (1.0)		NA		
	SB1 1-3	2.0	13, 7, 8, 8		RED TO BROWN CLAYEY SILT. (5.0)		3.2		
	SB2 3-5	2.0	15, 19, 13, 20				3.0		
5	SB3 5-7	2.0	9, 9, 16, 23		BROWN CLAYEY SILT.		12		
	SB4 7-9	2.0	16, 24, 19, 29				12		
	SB5 9-11	1.6	70, 23, 70				8.0		

0 … 5 … 10

Continued

AR301449

BORING/WELL NO.
SB-A

McLaren Hart

Depth ft	Sample #	Recovery (ft)	Pene. Resist. Blows/6"	Unified Classif.	LOG OF TEST BORING (continued) DESCRIPTION	REMARKS	PID (ppm)	Well Const.	Graphic Log
			50/.1						
		0	64				NA		
			100 /.3		12.5				
		0			GRADED TO WEATHERED BEDROCK.		NA		
15					15.8				
		0			WEATHERED BEDROCK. AUGER REFUSAL AT 16.2. 16.2				
20									

10 15 20 25

Attachment 3

Analytical Laboratory Data

RAYTHEON ENGINEERS & CONSTRUCTORS
RAYTHEON ENVIRONMENTAL SERVICES LABORATORY

301 Chelsea Parkway
Boothwyn, Pa. 19061
(610) 497-8000

Report For:

McLaren/Hart (John Evan's Sons)
Mr. Russell Sacks
300 Steven's Dr.,Suite 200
Lester PA 19113

Job Number

7570067

Summary Number

23513

August 15, 1995

Reviewed by
Project Manager Dane Tanner

NJ ID# 77343	EPA ID# PA00078	PA ID# 23-272
CA ID# 1924	CO ID# PA00078	CT ID# PH0687
RI ID# A70	DE ID# PA00078	WV ID# 9915(C)
NC ID# 292	MA ID# M-PA078	SC ID# 89007
TN ID# 2927		NY ID# 11345

Raytheon Engineers
& Constructors, Inc.
Environmental Laboratory

301 Chelsea Parkway
Boothwyn PA 19061

610 497 8000
FAX 610 497 8005

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Raytheon
Engineers & Constructors

August 15, 1995

McLaren/Hart (John Evan's Sons)
Mr. Russell Sacks
300 Steven's Dr.,Suite 200
Lester, PA 19113

Subject: RE&C Contract No. 7570067
Laboratory Analysis

Dear Mr. Sacks,

Attached is the analytical report for samples submitted to us on 07/19/1995. Inorganic sample results are reported on an as received basis unless otherwise noted. All organic sample results are reported on a dry weight basis unless otherwise noted.

All analyses are performed within method required holding times unless noted in a non-conformance report which, if necessary, is located following the method description summary. In addition, any conditions which may aid in the interpretation of the data are noted on this form.

If there are questions regarding this report, please contact me.

Very truly yours,

Joe C. Watt
Director

AR301453

Raytheon
Engineers & Constructors

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Raytheon [illegible]ineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 23513

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analyst
90008	John Evan's SB-1(3-5	G18	Acetone	42 J	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Benzene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Bromodichloromethane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Bromoform	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Bromomethane	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	2-Butanone	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Carbon Disulfide	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Carbon Tetrachloride	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Chlorobenzene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Chloroethane	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Chloroform	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Chloromethane	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Dibromochloromethane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	1,2-Dichloroethane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	1,1-Dichloroethane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	cis-1,2-Dichloroethene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	trans-1,2-Dichloroethene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	1,1-Dichloroethene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	1,2-Dichloropropane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	trans-1,3-Dichloropropene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	cis-1,3-Dichloropropene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Ethylbenzene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	2-Hexanone	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	4-Methyl-2-Pentanone	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Methylene Chloride	12 J	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Styrene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	1,1,2,2-Tetrachloroethane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Tetrachloroethene	83	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Toluene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	1,1,1-Trichloroethane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	1,1,2-Trichloroethane	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Trichloroethene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	Vinyl Chloride	ND	62	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	o-Xylene	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5	G18	m&p-Xylenes	ND	31	ug/kg	07/19/1995	07/25/1995	07/25/1995	GMC
90008	John Evan's SB-1(3-5)	S06	WATER BY EVAP	18.8		% as received	07/19/1995	07/20/1995	07/20/1995	MCH

Raytheon Engineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 23513

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analyst
90009	John Evan's SB-2(5-7	G18	Acetone	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Benzene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Bromodichloromethane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Bromoform	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Bromomethane	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	2-Butanone	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Carbon Disulfide	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Carbon Tetrachloride	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Chlorobenzene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Chloroethane	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Chloroform	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Chloromethane	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Dibromochloromethane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	1,1-Dichloroethane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	1,2-Dichloroethane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	1,1-Dichloroethene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	cis-1,2-Dichloroethene	20 J	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	trans-1,2-Dichloroethene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	1,2-Dichloropropane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	trans-1,3-Dichloropropene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	cis-1,3-Dichloropropene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Ethylbenzene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	2-Hexanone	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	4-Methyl-2-Pentanone	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Methylene Chloride	16 J	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Styrene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	1,1,2,2-Tetrachloroethane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Tetrachloroethene	280	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Toluene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	1,1,2-Trichloroethane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	1,1,1-Trichloroethane	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Trichloroethene	40	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	Vinyl Chloride	ND	60	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	o-Xylene	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7	G18	m&p-Xylenes	ND	30	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90009	John Evan's SB-2(5-7)	S06	WATER BY EVAP	16.7		% as received	07/19/1995	07/20/1995	07/20/1995	MCH
90010	John Evan's SB-3(7-9	G18	Acetone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Benzene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC

AR301456

Raytheon E[illegible]neers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 23513

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analyst
90010	John Evan's SB-3(7-9	G18	Bromodichloromethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Bromoform	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Bromomethane	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	2-Butanone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Carbon Disulfide	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Carbon Tetrachloride	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Chlorobenzene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Chloroethane	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Chloroform	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Chloromethane	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Dibromochloromethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	1,1-Dichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	1,2-Dichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	trans-1,2-Dichloroethene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	cis-1,2-Dichloroethene	270	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	1,1-Dichloroethene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	1,2-Dichloropropane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	trans-1,3-Dichloropropene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	cis-1,3-Dichloropropene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Ethylbenzene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	2-Hexanone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	4-Methyl-2-Pentanone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Methylene Chloride	25 J	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Styrene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	1,1,2,2-Tetrachloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Tetrachloroethene	1000	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Toluene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	1,1,2-Trichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	1,1,1-Trichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Trichloroethene	670	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	Vinyl Chloride	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	o-Xylene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9	G18	m&p-Xylenes	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90010	John Evan's SB-3(7-9)	S06	WATER BY EVAP	21.0		% as received	07/19/1995	07/20/1995	07/20/1995	MCH
90011	John Evan's SB-4(9-1	G18	Acetone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Benzene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Bromodichloromethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Bromoform	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC

Raytheon Engineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 23513

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analyst
90011	John Evan's SB-4(9-1	G18	Bromomethane	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	2-Butanone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Carbon Disulfide	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Carbon Tetrachloride	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Chlorobenzene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Chloroethane	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Chloroform	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Chloromethane	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Dibromochloromethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	1,1-Dichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	1,2-Dichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	1,1-Dichloroethene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	trans-1,2-Dichloroethene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	cis-1,2-Dichloroethene	250	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	1,2-Dichloropropane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	cis-1,3-Dichloropropene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	trans-1,3-Dichloropropene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Ethylbenzene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	2-Hexanone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	4-Methyl-2-Pentanone	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Methylene Chloride	25 J	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Styrene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	1,1,2,2-Tetrachloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Tetrachloroethene	1500 D	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Toluene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	1,1,2-Trichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	1,1,1-Trichloroethane	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Trichloroethene	540	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	Vinyl Chloride	ND	63	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	o-Xylene	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-1	G18	m&p-Xylenes	ND	32	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90011	John Evan's SB-4(9-10.5	S06	WATER BY EVAP	21.1		% as received	07/19/1995	07/20/1995	07/20/1995	MCH
90012	John Evan's SB-5(10.	G18	Acetone	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Benzene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Bromodichloromethane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Bromoform	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Bromomethane	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	2-Butanone	6 J	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC

Raytheon Engineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 23513

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analyst
90012	John Evan's SB-5(10.	G18	Carbon Disulfide	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Carbon Tetrachloride	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Chlorobenzene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Chloroethane	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Chloroform	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Chloromethane	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Dibromochloromethane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	1,1-Dichloroethane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	1,2-Dichloroethane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	cis-1,2-Dichloroethene	33	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	trans-1,2-Dichloroethene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	1,1-Dichloroethene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	1,2-Dichloropropane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	trans-1,3-Dichloropropene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	cis-1,3-Dichloropropene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Ethylbenzene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	2-Hexanone	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	4-Methyl-2-Pentanone	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Methylene Chloride	15 J	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Styrene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	1,1,2,2-Tetrachloroethane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Tetrachloroethene	110	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Toluene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	1,1,2-Trichloroethane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	1,1,1-Trichloroethane	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Trichloroethene	48	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	Vinyl Chloride	ND	56	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	o-Xylene	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.	G18	m&p-Xylenes	ND	28	ug/kg	07/19/1995	07/24/1995	07/24/1995	GMC
90012	John Evan's SB-5(10.5-1	S06	WATER BY EVAP	11.2		% as received	07/19/1995	07/20/1995	07/20/1995	MCH
90013	John Evan's SB-X(5-7)	1312	SPLP Leachate			Complete	07/19/1995	07/19/1995	07/20/1995	JVH
90014	SPLP/#90013	G18T	Benzene	3 J	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	2-Butanone	ND	10	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	Carbon Tetrachloride	ND	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	Chlorobenzene	4 J	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	Chloroform	ND	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	1,4-Dichlorobenzene	ND	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC

Raytheon Engineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 23513

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analyst
90014	SPLP/#90013	G18T	1,2-Dichloroethane	ND	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	1,1-Dichloroethene	ND	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	Tetrachloroethene	87	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	Trichloroethene	64	5	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC
90014	SPLP/#90013	G18T	Vinyl Chloride	ND	10	ug/L	07/20/1995	07/24/1995	07/24/1995	GMC

AR301460

Approved by: [signature]

Report Prep: K. E. Wolfe

757004.7

CHAIN OF CUSTODY DOCUMENTATION

SHIP TO:
Raytheon Engineers & Constructors
301 CHELSEA PARKWAY
BOOTHWYN, PA 19061
(215) 497-8000
(FAX -8005)

CLIENT: McLAREN / HART
PROJECT DESCRIPTION: JOHN EVANS' SONS
SEND REPORT TO: RUSSELL SACKS SEND INVOICE TO: RUSSELL SACKS
DATA NEEDED BY: 7/26/95 (5 DAYS) REPORT NEEDED BY: ASAP

LABORATORY JOB NO.: 130803224
SAMPLERS: RUSS SACKS
PHONE: 610-521-8505 FAX: 610-521-8577
REPORT TYPE: TIER I ___ TIER II ✓ STANDARD ___ QC ___ OTHER ___

FOR LAB USE ONLY:
P.O. NO.:
DUE DATE: 7/26/95
COOLER SEAL N/A
YES ..... NO .....
BROKEN ... INTACT ...
COOLER TEMP.: deg. F

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ANALYSIS REQUIRED: SOLID VOLATILES (TCE & PCE MUST BE REPORTED); 1312 SPLP (TCE & PCE MUST BE REPORTED); VOA - TCE & PCE

* TCE & PCE MUST BE REPORTED IN ANALYTE LIST

~~* CHECK BOX BELOW IF TCE & PCE ARE ~~

QUOTE NO.:
SUMMARY NO.: 23513

SAMPLE DATA						CONTAINER DATA								LABORATORY NO.
ID.	DATE	TIME	MATRIX	GRAB	COMP	TYPE	NO.	PRESERVATIVE	pH					
SB-1 (3-5)	7/14	830	SOIL			4oz JAR	1	—	—	X				90008
SB-2 (5-7)		845								X				90009
SB-3 (7-9)		900								X				90010
SB-4 (9-10.5)		915								X				90011
SB-5 (10.5-11.5)		930								X				90012
SB-X (5-7)		845								[redacted]	X			90013
SPLP #90013	7/20/95		LEACH			40 ML	2	—				X		90014

RELINQUISHED BY
NAME: Russell Sacks DATE: 7/17/95
OF: M/H TIME: 1556
NAME: DATE:
OF: TIME:
NAME: DATE:
OF: TIME:

RECEIVED BY
NAME: Richard [illegible] DATE: 7/19/95
OF: REC TIME: 1556
NAME: DATE:
OF: TIME:
NAME: DATE:
OF: TIME:

METHOD OF SHIPMENT
AIRBILL NO.:

AR301461

(110)

RAYTHEON ENGINEERS
ENVIRONMENTAL LABORATORY

Methods Used for Summary# 23513:

Code	Description
1312	SPLP Leachate/SW-846 Method 1312
G18	GC/MS VOA (TCL List)/SW-846 Method 8260
G18T	Volatiles in TCLP leachate-ZHE/40CFR261 3/90 etal;SW846 8260
S06	Water by evaporation/ EPA-600 Mtd 160.3

Raytheon
Engineers & Constructors

F-32-1

REPORT OF NONCONFORMANCES AND COMMENTS

This Form is used for reporting any nonconformances (anything unusual) encountered in the performance of the analysis. Also recorded are any comments about the nature of the sample that might aid in the interpretation of the data.

Laboratory Sample Number: 90008 thu 90014

Summary Number: 23513

Date: 08/16/95

Analyst:

Analysis:

Comments (including nonconformances):

NONE FOUND

Raytheon
Engineers & Constructors

Date: 7/20/95
Fraction: VOA
Instrument: B
Tune File: [illegible]
Sequence File: [illegible]
Method File: [illegible]
Analyst: [illegible]
Supervisor:

Standard	Conc	Lot No.

Sample ID	Data File	Inj Vol	ALS #	Dilution	Injection time	Comments
[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	1			
[illegible]	[illegible]	[illegible]	2			
[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	4			
[illegible]	[illegible]	[illegible]	5			
[illegible]	[illegible]	[illegible]	3			
[illegible]	[illegible]	[illegible]	4			
[illegible]	[illegible]	[illegible]	5			
[illegible]	[illegible]	[illegible]	6			
[illegible]	[illegible]	[illegible]	7			

GC/MS Laboratory Chronicle

Raytheon
Engineers & Constructors

Date: 7/24/95
Fraction: VOA
Instrument: B
Tune File: BFB624
Sequence File: V00734
Method File: CLPVOB
Analyst: JMC
Supervisor:

Standard	Conc	Lot No.

Sample ID	Data File	Inj Vol	ALS #	Dilution	Injection time	Comments
25ng/ul BFB	B4469.D	2ul	—			
50ug/L HSL	B4470.D	5ul	1			
methodblank	B4471.D	5ul	3			
89888	B4472.D	5g	4			
89685C	B4473.D	5ul	5			
89686C	B4474.D	5ul	6			
89687C	B4475.D	5ul	7			
89688	B4476.D	5ul	8			
90008	B4477.D	0.04g	9			rerunlg
90009	B4478.D	1g	10			
90010	B4479.D	1g	11			
90011	B4480.D	1g	12			
90012	B4481.D	1g	13			
89888MS	B4482.D	5g	14			
89888MSD	B4483.D	5g	15			
90014	B4484.D	5ml	16			

AR301465

GC/MS Laboratory Chronicle

Raytheon
Engineers & Constructors

Date: 7/25/95
Fraction: VOA
Instrument: B
Tune File: BFB102V
Sequence File: V00725
Method File: CLPVOB
Analyst: [illegible]
Supervisor:

Standard	Conc	Lot No.

Sample ID	Data File	Inj Vol	ALS #	Dilution	Injection time	Comments
25ng/ul BFB	B4485.D	2ul	—			
50ug/l HSL	B4486.D	5ml	1			
Methodblank	B4487.D	5ml	3			
90008	B4488.D	1g	4			
89974	B4489.D	5ml	4			
89973	B4490.D	5ml	5			
89881B	B4491.D	5g	6			
89882B	B4492.D	5g	7			
89883B	B4493.D	5g	8			rerun
89884B	B4494.D	5g	9			
89885B	B4495.D	5g	10			rerun
89885B MS	B4496.D	5g	11			
89885B MSD	B4497.D	5g	12			
89886	B4498.D	5ml	13			
90066	B4499.D	5ml	14			
89880B	B4500.D	5ml	15			
89887B	B4501.D	5ml	16			

GC/MS Laboratory Chronicle

Raytheon
Engineers & Constructors

Date: 7/28/95
Fraction: VOA
Instrument: B
Tune File: BFB624
Sequence File: V00728
Method File: CLP00B/8260
Analyst: [illegible]
Supervisor:

Standard	Conc	Lot No.

Sample ID	Data File	Inj Vol	ALS #	Dilution	Injection time	Comments
25ng/ueBCB	B4540.D	2ue	–			
50ug/L HSL	B4541.D	5ml	1			
methodblank	B4542.D	5ml	3			
90011	B4543.D	0.04g	4			
90458	B4544.D	0.04g	5			
90457	B4545.D	0.004g	6			
90459	B4546.D	0.01g	7			
90456	B4547.D	0.002g	8			
50ug/L 8260	B4548.D	5ml	9			
methodblank	B4549.D	5ml	10			
90295	B4550.D	5g	11			
90505	B4551.D	5g	13			
90506	B4552.D	5ml	~~13~~ 14			

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name : RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4441.D BFB Injection Date: 7/20/95

Instrument ID: A BFB Injection Time: 1003

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	29.2
75	30.0 - 66.0% of mass 95	57.0
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.7
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	62.5
175	4.0 - 9.0% of mass 174	5.3 (8.5)1
176	93.0 - 101.0% of mass 174	60.5 (96.8)1
177	5.0 - 9.0% of mass 176	4.6 (7.6)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD020	20STD	B4447.D	7/20/95	1547
02	VSTD050	50STD	B4448.D	7/20/95	1623
03	VSTD100	100STD	B4449.D	7/20/95	1700
04	VSTD150	150STD	B4450.D	7/20/95	1737
05	VSTD200	200STD	B4451.D	7/20/95	1815
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

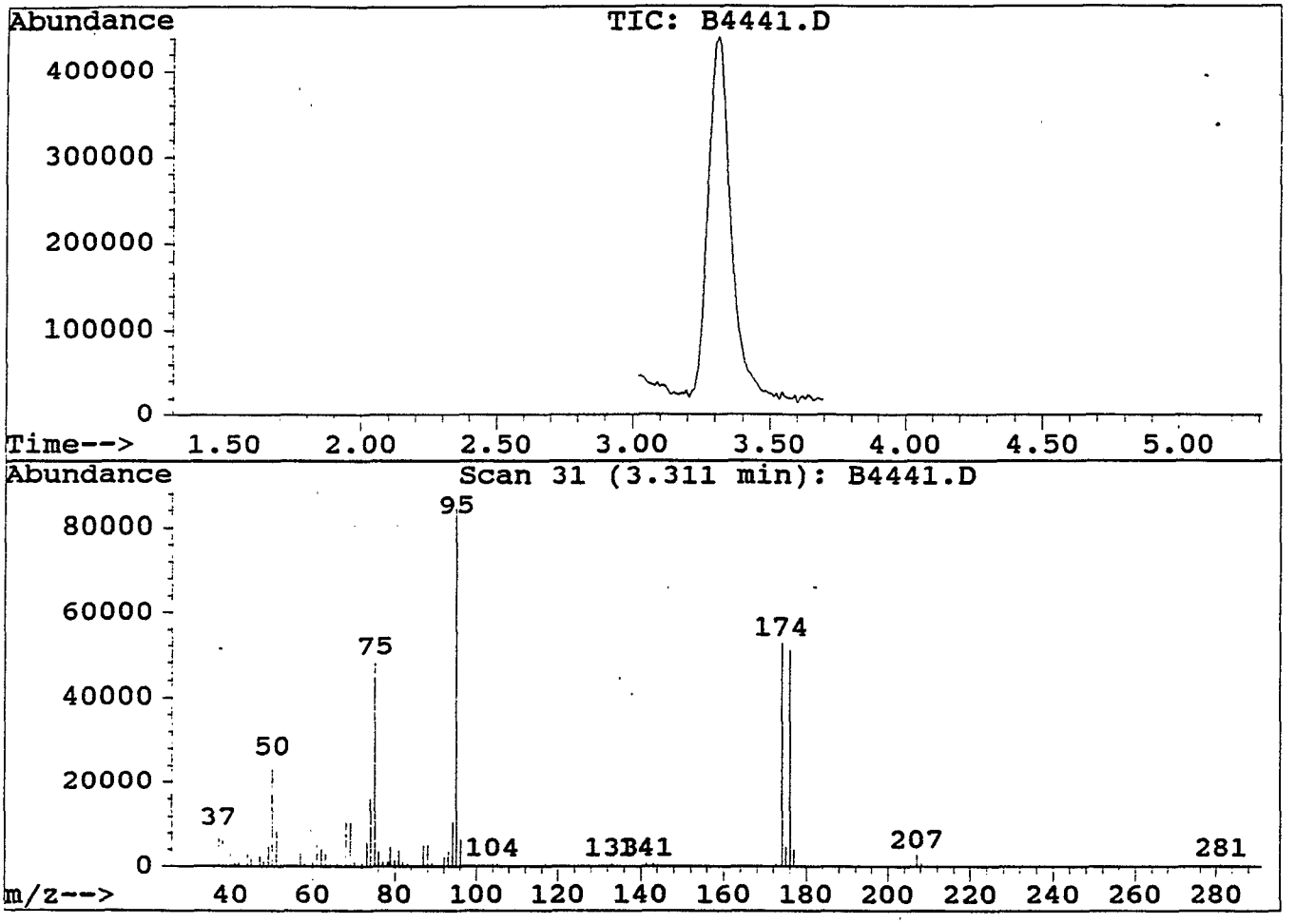
FORM V VOA 3/90

BFB

Data File : C:\HPCHEM\1\DATA\B4441.D
Acq On : 20 Jul 95 10:03 am
Sample : 25NG/UL BFB 2UL
Misc : 1001

Vial: 8
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :



Peak Apex is scan: 31

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	29.2	24624	PASS
75	95	30	60	57.0	48016	PASS
95	95	100	100	100.0	84264	PASS
96	95	5	9	7.7	6461	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	62.5	52664	PASS
175	174	5	9	8.5	4491	PASS
176	174	95	101	96.8	50976	PASS
177	176	5	9	7.6	3850	PASS

B4441.D BFB624.M Thu Jul 20 10:12:49 1995 HPDOS4

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name : RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4469.D BFB Injection Date: 7/24/95

Instrument ID: A BFB Injection Time: 1042

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	27.7
75	30.0 - 66.0% of mass 95	56.2
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	57.0
175	4.0 - 9.0% of mass 174	4.3 (7.5)1
176	93.0 - 101.0% of mass 174	55.0 (96.5)1
177	5.0 - 9.0% of mass 176	3.8 (7.0)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

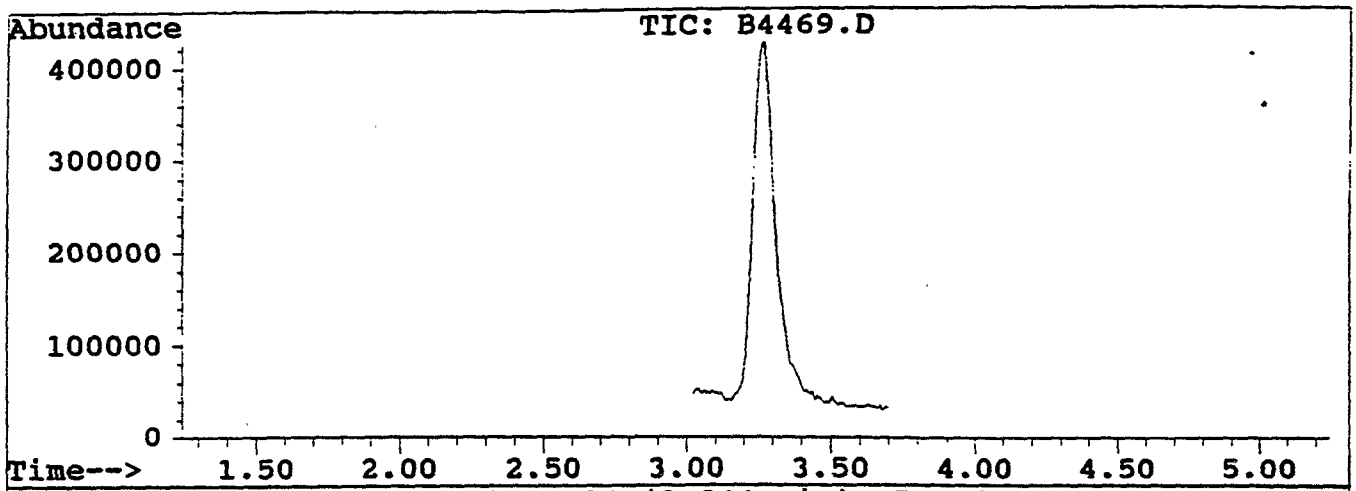
	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	50STD	B4470.D	7/24/95	1247
02	VBLK01	BLANK	B4471.D	7/24/95	1405
03	/89888	BH4	B4472.D	7/24/95	1442
04	/89685C	MW-9	B4473.D	7/24/95	1520
05	/89686C	MW-3	B4474.D	7/24/95	1557
06	/89687C	FB	B4475.D	7/24/95	1635
07	/89688	TB	B4476.D	7/24/95	1713
08	/90008	SB-1	B4477.D	7/24/95	1751
09	/90009	SB-2	B4478.D	7/24/95	1828
10	/90010	SB-3	B4479.D	7/24/95	1905
11	/90011	SB-4	B4480.D	7/24/95	1940
12	/90012	SB-5	B4481.D	7/24/95	2019
13	/89888MS	BH4MS	B4482.D	7/24/95	2057
14	/89888MSD	BH4MSD	B4483.D	7/24/95	2136
15	/90014	S90013	B4484.D	7/24/95	2215
16					
17					
18					
19					
20					
21					
22					

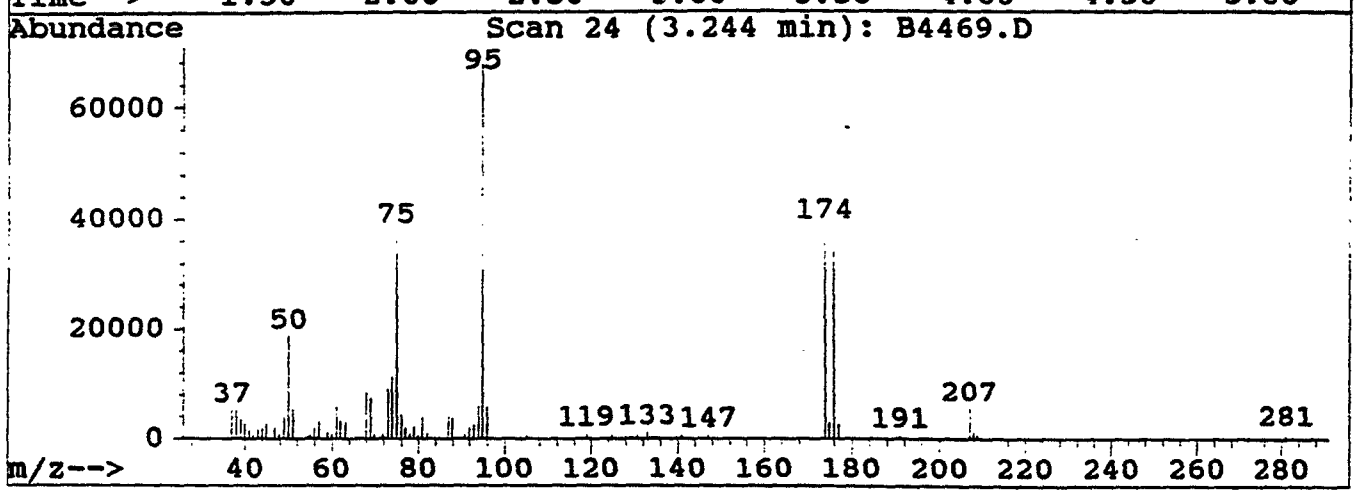
BFB

Data File : C:\HPCHEM\1\DATA\B4469.D
Acq On : 24 Jul 95 10:42 am
Sample : 25NG/UL BFB 2UL
Misc : 1040

Vial: 23
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :





Peak Apex is scan: 24

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	27.7	18728	PASS
75	95	30	60	56.2	37992	PASS
95	95	100	100	100.0	67624	PASS
96	95	5	9	8.6	5790	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	57.0	38512	PASS
175	174	5	9	7.5	2899	PASS
176	174	95	101	96.5	37168	PASS
177	176	5	9	7.0	2594	PASS

B4469.D BFB624.M Mon Jul 24 10:47:32 1995 HPDOS4

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name : RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4485.D BFB Injection Date: 7/25/95

Instrument ID: A BFB Injection Time: 0953

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	23.4
75	30.0 - 66.0% of mass 95	50.3
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.6
173	Less than 2.0% of mass 174	1.0 (1.5)1
174	50.0 - 120.0% of mass 95	68.7
175	4.0 - 9.0% of mass 174	4.4 (6.3)1
176	93.0 - 101.0% of mass 174	66.5 (96.8)1
177	5.0 - 9.0% of mass 176	4.1 (6.1)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

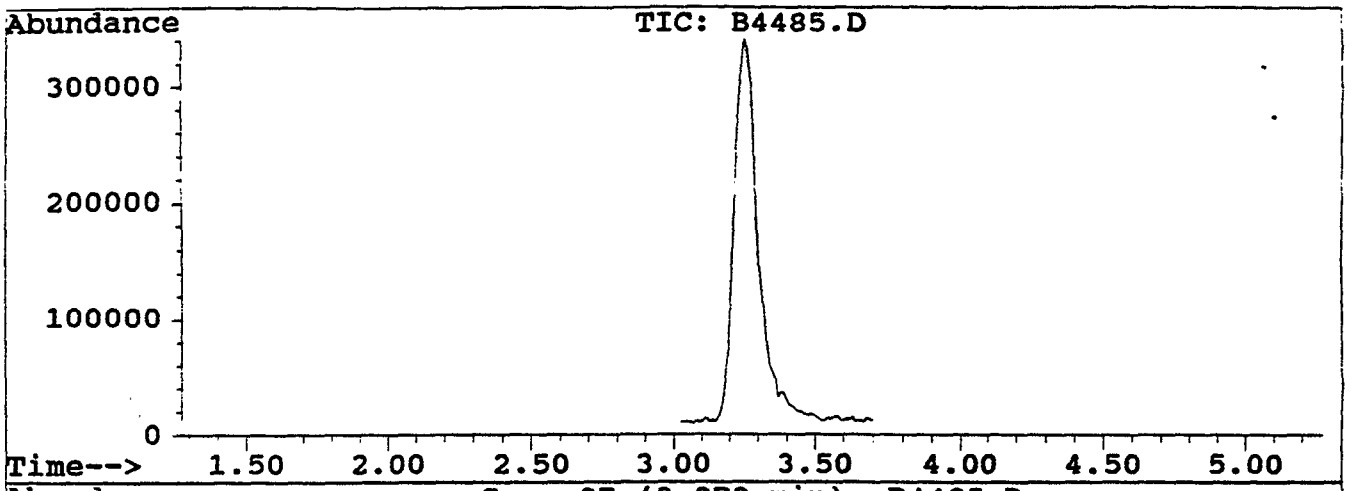
	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	50STD	B4486.D	7/25/95	1013
02	VBLK01	BLANK	B4487.D	7/25/95	1127
03	/90008	SB-1	B4488.D	7/25/95	1204
04	/89974	TRIP	B4489.D	7/25/95	1405
05	/89973	MW1-01	B4490.D	7/25/95	1445
06	/89881B	T17	B4491.D	7/25/95	1522
07	/89882B	T89979	B4492.D	7/25/95	1600
08	/89883B	T19	B4493.D	7/25/95	1637
09	/89884B	T89981	B4494.D	7/25/95	1714
10	/89886	TB	B4498.D	7/25/95	1942
11	/90066	SPLPBLK	B4499.D	7/25/95	2016
12	/89880B	FB	B4500.D	7/25/95	2056
13	/89887D	TCLPBLK	B4501.D	7/25/95	2136
14					
15					
16					
17					
18					
19					
20					
21					
22					

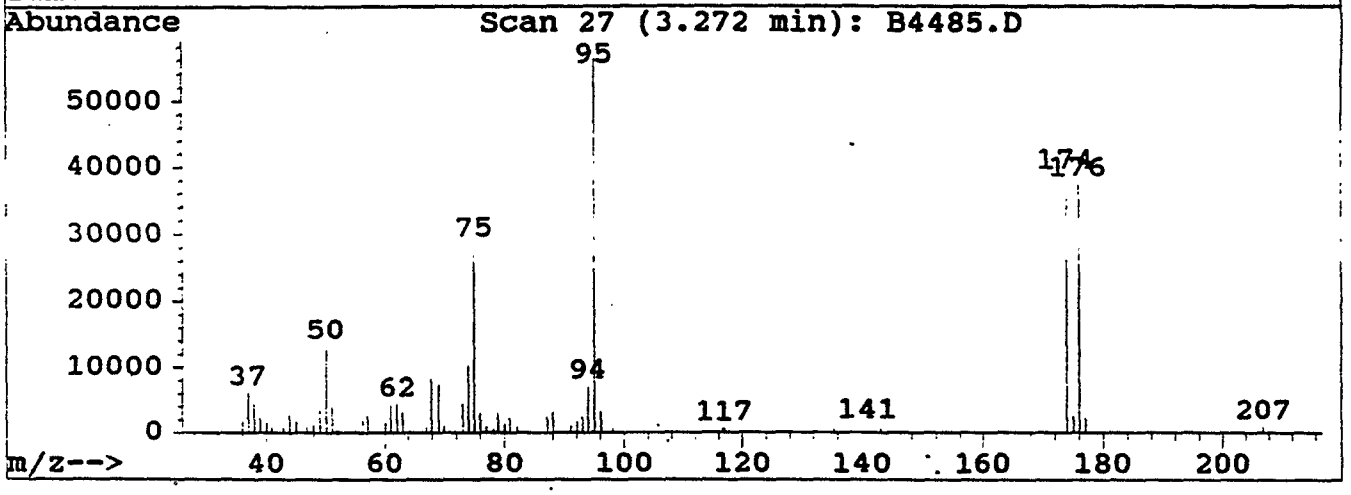
BFB

Data File : C:\HPCHEM\1\DATA\B4485.D
Acq On : 25 Jul 95 9:53 am
Sample : 25NG/UL BFB 2UL
Misc : 0953

Vial: 22
Operator: GWEN
Inst : 5970
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :





Peak Apex is scan: 27

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	23.4	13180	PASS
75	95	30	60	50.3	28376	PASS
95	95	100	100	100.0	56368	PASS
96	95	5	9	5.6	3146	PASS
173	174	0	2	1.5	568	PASS
174	95	50	100	68.7	38720	PASS
175	174	5	9	6.3	2453	PASS
176	174	95	101	96.8	37480	PASS
177	176	5	9	6.1	2299	PASS

B4485.D BFB624.M Tue Jul 25 09:58:03 1995 HPDOS4

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name : RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4540.D BFB Injection Date: 7/28/95

Instrument ID: B BFB Injection Time: 1300

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	30.4
75	30.0 - 66.0% of mass 95	58.4
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	67.0
175	4.0 - 9.0% of mass 174	5.4 (8.0)1
176	93.0 - 101.0% of mass 174	65.2 (97.3)1
177	5.0 - 9.0% of mass 176	4.4 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

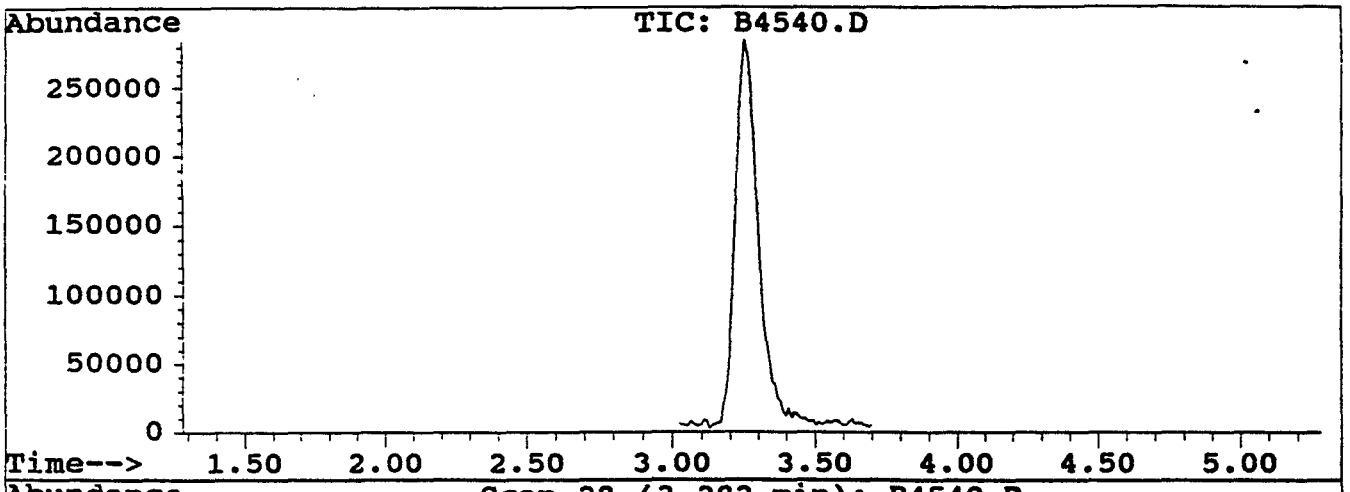
	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VBLK01	BLANK	B4542.D	7/28/95	1436
02	/90011	SB-4	B4543.D	7/28/95	1513
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

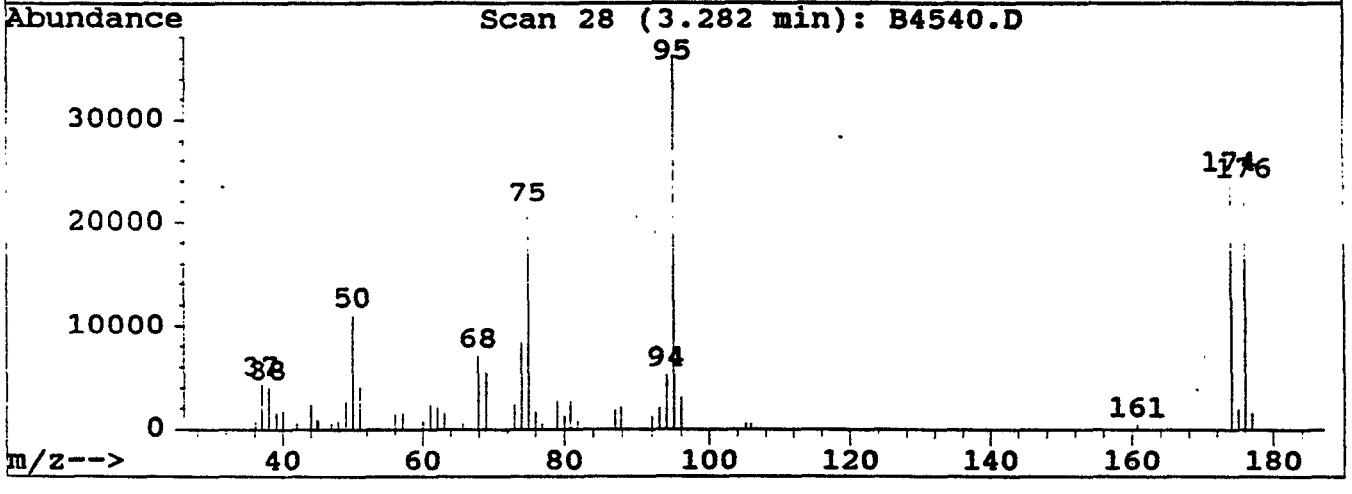
BFB

Data File : C:\HPCHEM\1\DATA\B4540.D
Acq On : 28 Jul 95 1:00 pm
Sample : 25NG/UL BFB 2UL
Misc : 1245

Vial: 1
Operator: GWEN
Inst : 5970
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :





Peak Apex is scan: 28

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	30.4	11016	PASS
75	95	30	60	58.4	21184	PASS
95	95	100	100	100.0	36272	PASS
96	95	5	9	8.6	3118	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	67.0	24288	PASS
175	174	5	9	8.0	1943	PASS
176	174	95	101	97.3	23632	PASS
177	176	5	9	6.7	1588	PASS

B4540.D BFB624.M Fri Jul 28 13:05:16 1995 HPDOS4

Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 90008
MATRIX : SOIL
CLIENT ID : John Evan's SB-1(3-5)
Sample wt/vol : 1G
% Moisture : 18.8

ANALYSIS DATE : 07/25/1995
RECVD DATE : 07/19/1995
ID FILE : g18.id
DATA FILE : b4488

Compound		Result (ug/kg)	Detection Limit (ug/kg)
7[illegible]-87-3	Chloromethane	ND	62
74-83-9	Bromomethane	ND	62
75-01-4	Vinyl Chloride	ND	62
7[illegible]-00-3	Chloroethane	ND	62
7[illegible]-09-2	Methylene Chloride	12 J	31
67-64-1	Acetone	42 J	62
75-15-0	Carbon Disulfide	ND	62
7[illegible]-35-4	1,1-Dichloroethene	ND	31
75-34-3	1,1-Dichloroethane	ND	31
156-59-2	cis-1,2-Dichloroethene	ND	31
1[illegible]6-60-5	trans-1,2-Dichloroethene	ND	31
6[illegible]-66-3	Chloroform	ND	31
107-02-2	1,2-Dichloroethane	ND	31
78-93-3	2-Butanone	ND	62
7[illegible]-55-6	1,1,1-Trichloroethane	ND	31
5[illegible]-23-5	Carbon Tetrachloride	ND	31
75[illegible]7-4	Bromodichloromethane	ND	31
7[illegible]7-5	1,2-Dichloropropane	ND	31
1[illegible]061-01-5	cis-1,3-Dichloropropene	ND	31
79-01-6	Trichloroethene	ND	31
124-48-1	Dibromochloromethane	ND	31
7[illegible]-00-5	1,1,2-Trichloroethane	ND	31
7[illegible]-43-2	Benzene	ND	31
10061-02-6	trans-1,3-Dichloropropene	ND	31
75-25-2	Bromoform	ND	31
1[illegible]3-10-1	4-Methyl-2-Pentanone	ND	62
5[illegible]1-78-6	2-Hexanone	ND	62
127-18-4	Tetrachloroethene	83	31
79-34-5	1,1,2,2-Tetrachloroethane	ND	31
1[illegible]3-88-3	Toluene	ND	31
1[illegible]8-90-7	Chlorobenzene	ND	31
100-41-4	Ethylbenzene	ND	31
1[illegible]0-42-5	Styrene	ND	31
3[illegible]0-20-7	m&p-Xylenes	ND	31
95-47-6	o-Xylene	ND	31

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

6.2 SUMMARY 23513

Data File : C:\HPCHEM\1\DATA\B4488.D
Acq On : 25 Jul 95 12:04 pm
Sample : 90008 SB-1
Misc : 1G
Quant Time: Jul 25 12:59 1995

Vial: 9
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :
Last Update : Mon Oct 15 08:57:55 1990
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	6.24	645	185180	50.00	ug/l	0.00
18) 1,4-Difluorobenzene	8.57	886	897185	50.00	ug/l	0.00
32) Chlorobenzene-d5	14.06	1452	730304	50.00	ug/l	0.00
System Monitoring Compounds						%Recovery
15) 1,2-Dichloroethane-d4	7.48	773	387949	51.19	ug/l	102.37%
33) Toluene-d8	11.11	1148	924092	50.55	ug/l	101.10%
43) Bromofluorobenzene	16.67	1721	82998	50.15	ug/l	100.31%
Target Compounds						Qvalue
8) Acetone	2.73	282	12055	6.94	ug/l m	66
10) Methylene Chloride	3.28	339	12616	2.01	ug/l m	81
36) Tetrachloroethene	12.29	1270	95024	13.43	ug/l	98
45) Naphthalene	28.01	2890	360	202.70	ug/l	100

MK 8/15/95

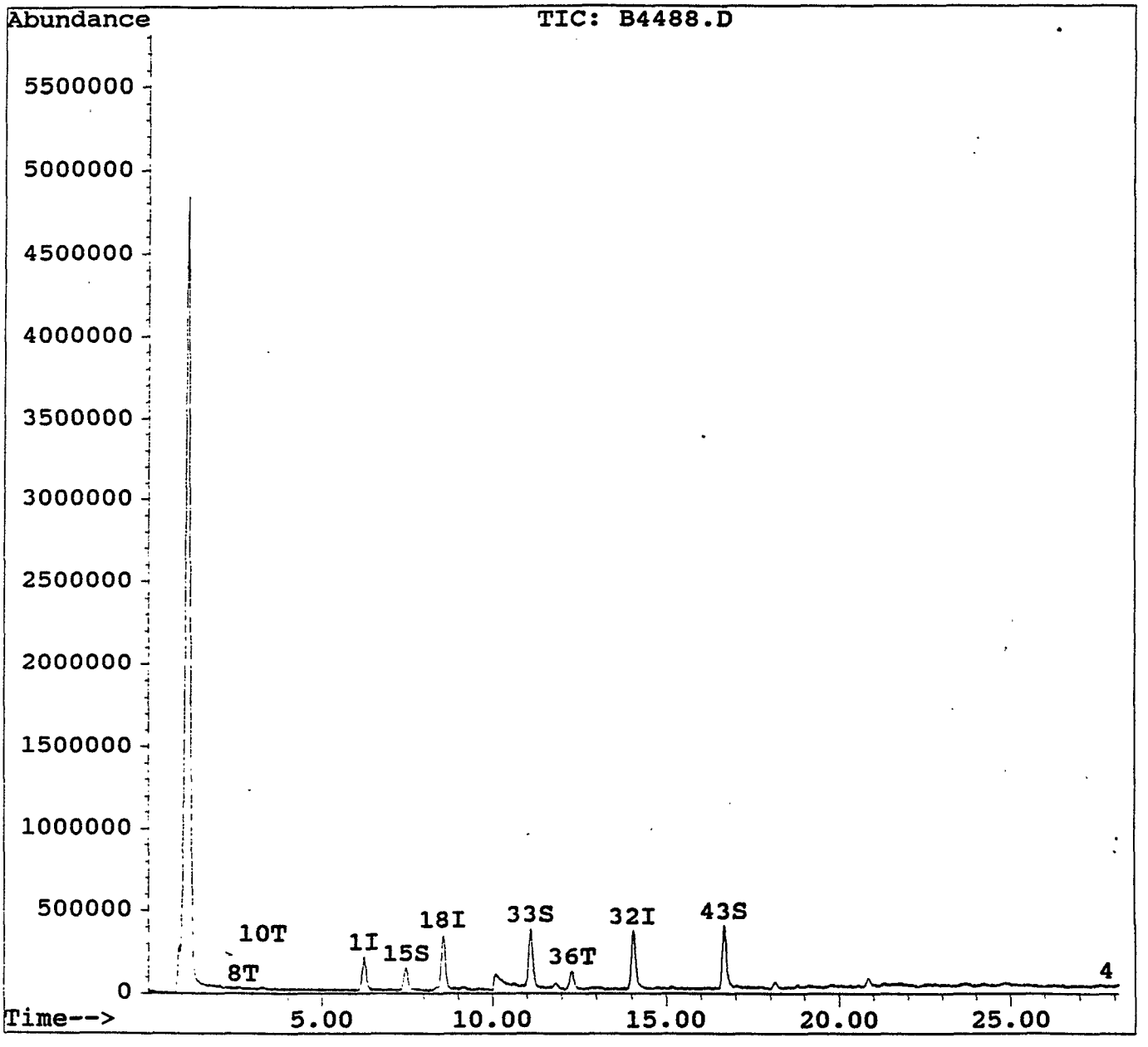
(#) = qualifier out of range (m) = manual integration

Quantitation Report

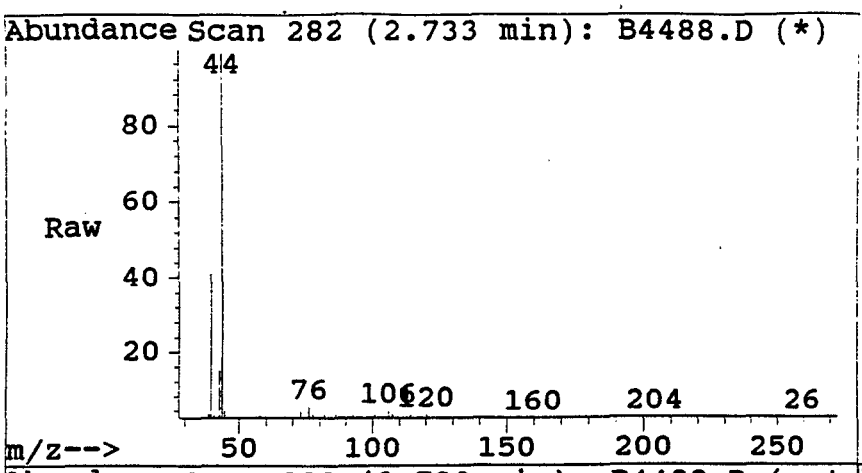
Data File : C:\HPCHEM\1\DATA\B4488.D
Acq On : 25 Jul 95 12:04 pm
Sample : 90008 SB-1
Misc : 1G
Quant Time: Jul 25 12:59 1995

Vial: 9
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :
Last Update : Mon Oct 15 08:57:55 1990
Response via : Single Level Calibration



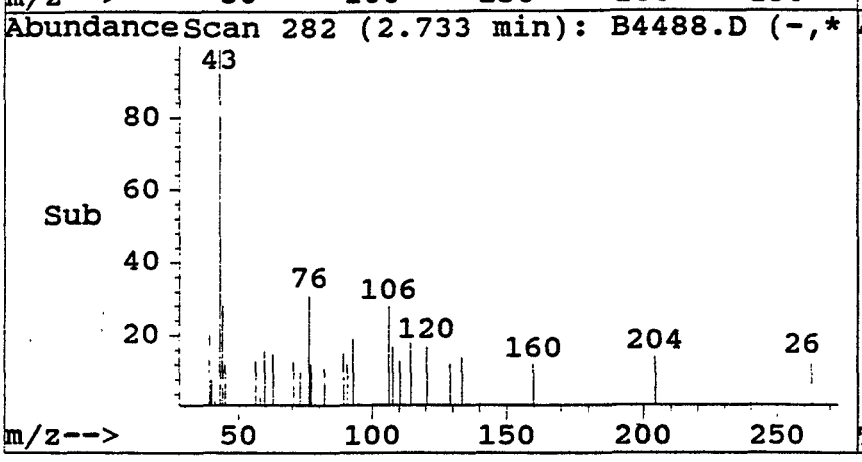
AR301478

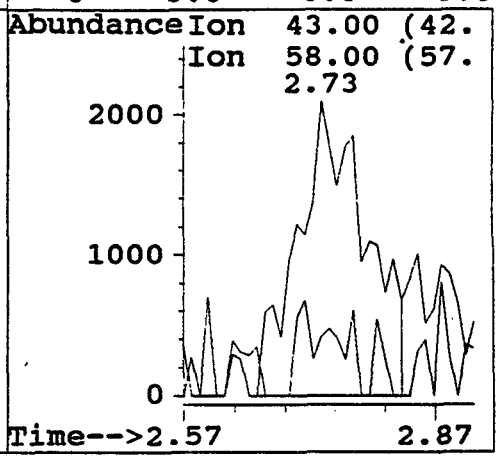


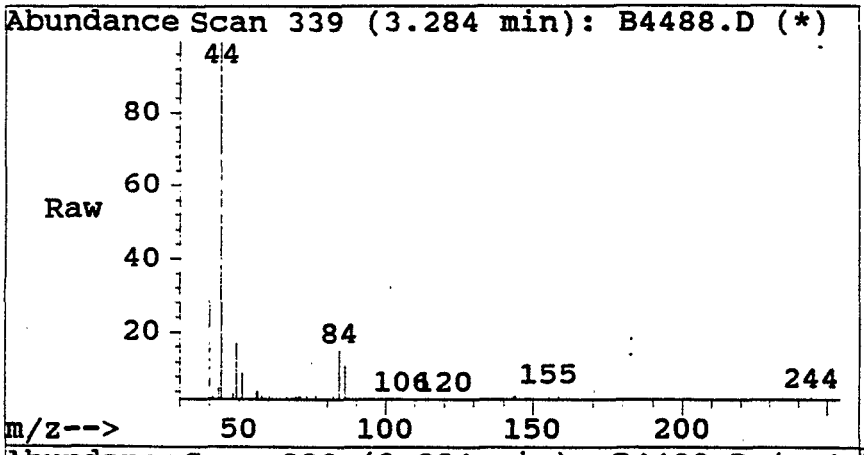
#8
Acetone
Concen: 6.94 ug/l m
RT: 2.73 min Scan# 282
Delta R.T. -0.02 min
Lab File: B4488.D
Acq: 25 Jul 95 12:04 pm

Tgt Ion:43 Resp: 12055

Ion	Ratio	Lower	Upper
43	100		
58	9.2	6.5	46.5
0	0.0	0.0	0.0
0	0.0	0.0	0.0



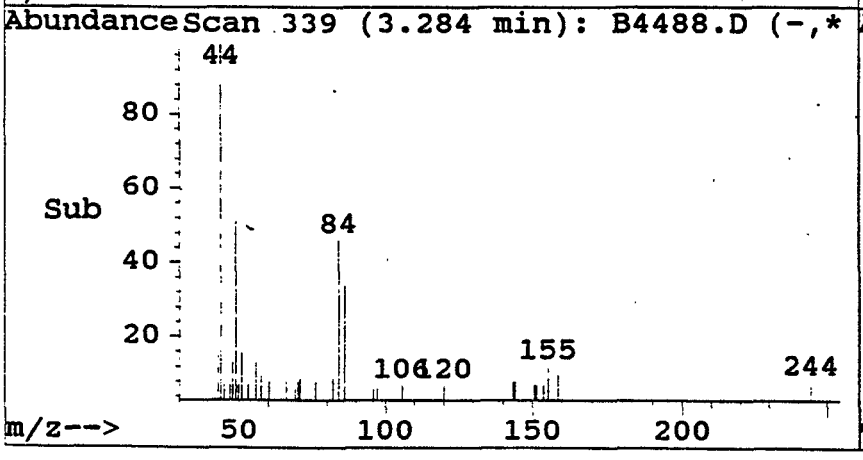


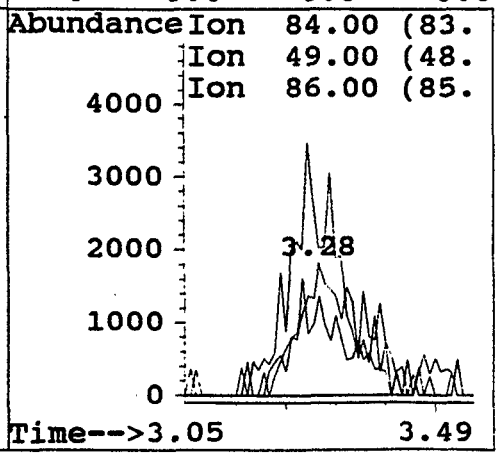


#10
Methylene Chloride
Concen: 2.01 ug/l m
RT: 3.28 min Scan# 339
Delta R.T. 0.01 min
Lab File: B4488.D
Acq: 25 Jul 95 12:04 pm

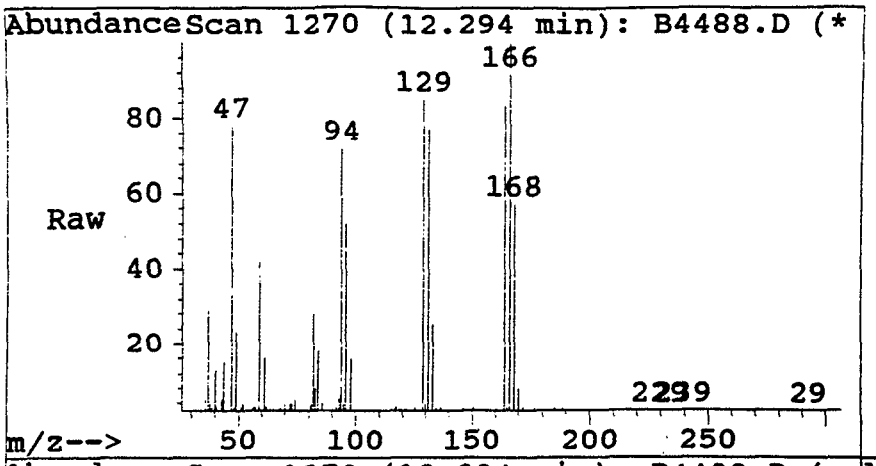
Tgt Ion:84 Resp: 12616

Ion	Ratio	Lower	Upper
84	100		
49	111.9	94.8	134.8
86	75.0	43.6	83.6
0	0.0	0.0	0.0





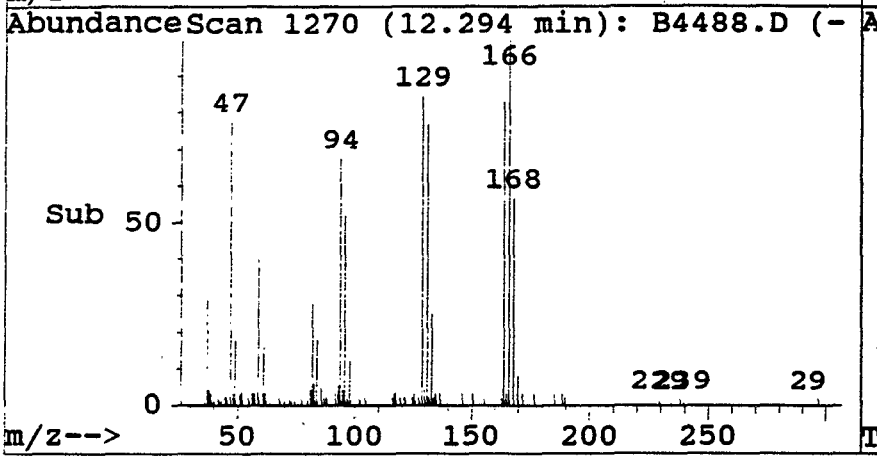
AR301479

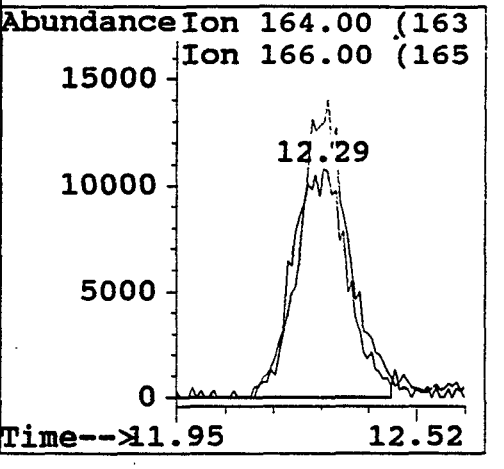


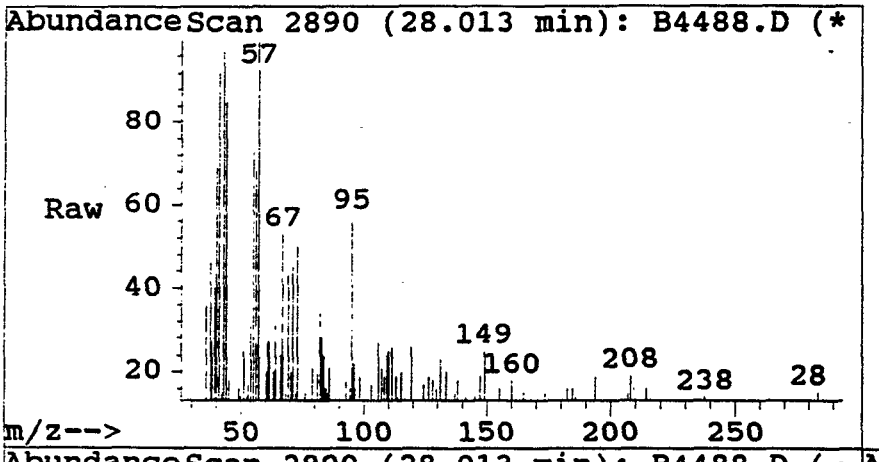
#36
Tetrachloroethene
Concen: 13.43 ug/l
RT: 12.29 min Scan# 1270
Delta R.T. 0.02 min
Lab File: B4488.D
Acq: 25 Jul 95 12:04 pm

Tgt Ion:164 Resp: 95024

Ion	Ratio	Lower	Upper
164	100		
166	127.8	105.6	145.6
0	0.0	0.0	0.0
0	0.0	0.0	0.0



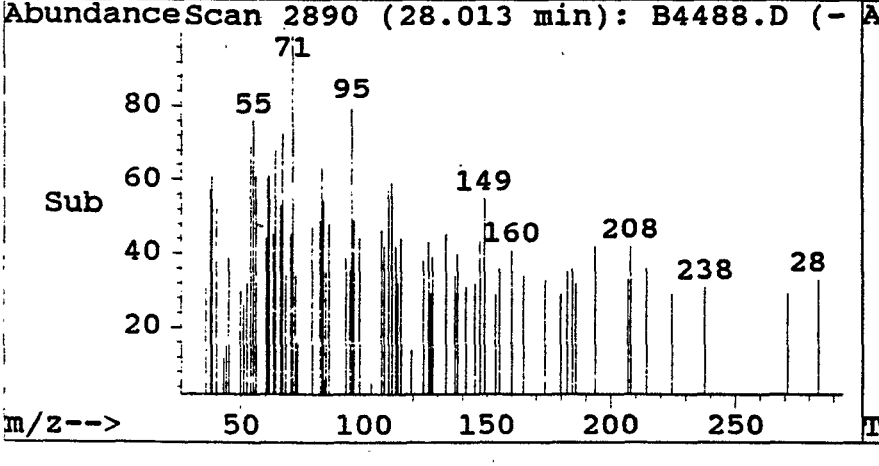


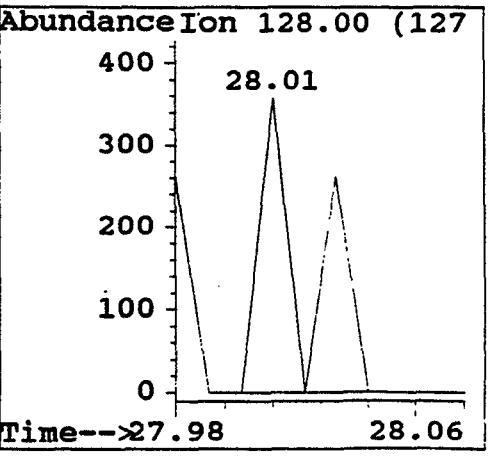


#45
Naphthalene
Concen: 202.70 ug/l
RT: 28.01 min Scan# 2890
Delta R.T. -0.04 min
Lab File: B4488.D
Acq: 25 Jul 95 12:04 pm

Tgt Ion:128 Resp: 360

Ion	Ratio	Lower	Upper
128	100		
0	0.0	0.0	0.0
0	0.0	0.0	0.0
0	0.0	0.0	0.0





AR301480

Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

AB SAMPLE # : 90009
MATRIX : SOIL
CLIENT ID : John Evan's SB-2(5-7)
ample wt/vol : 1G
. Moisture : 16.7

ANALYSIS DATE : 07/24/1995
RECVD DATE : 07/19/1995
ID FILE : g18.id
DATA FILE : b4478

Compound		Result (ug/kg)	Detection Limit (ug/kg)
1-87-3	Chloromethane	ND	60
74-83-9	Bromomethane	ND	60
75-01-4	Vinyl Chloride	ND	60
5-00-3	Chloroethane	ND	60
5-09-2	Methylene Chloride	16 J	30
67-64-1	Acetone	ND	60
5-15-0	Carbon Disulfide	ND	60
5-35-4	1,1-Dichloroethene	ND	30
5-34-3	1,1-Dichloroethane	ND	30
156-59-2	cis-1,2-Dichloroethene	20 J	30
6-60-5	trans-1,2-Dichloroethene	ND	30
-66-3	Chloroform	ND	30
107-02-2	1,2-Dichloroethane	ND	30
78-93-3	2-Butanone	ND	60
-55-6	1,1,1-Trichloroethane	ND	30
-23-5	Carbon Tetrachloride	ND	30
75-27-4	Bromodichloromethane	ND	30
-87-5	1,2-Dichloropropane	ND	30
061-01-5	cis-1,3-Dichloropropene	ND	30
-01-6	Trichloroethene	40	30
124-48-1	Dibromochloromethane	ND	30
-00-5	1,1,2-Trichloroethane	ND	30
-43-2	Benzene	ND	30
10061-02-6	trans-1,3-Dichloropropene	ND	30
75-25-2	Bromoform	ND	30
8-10-1	4-Methyl-2-Pentanone	ND	60
1-78-6	2-Hexanone	ND	60
127-18-4	Tetrachloroethene	280	30
-34-5	1,1,2,2-Tetrachloroethane	ND	30
8-88-3	Toluene	ND	30
8-90-7	Chlorobenzene	ND	30
100-41-4	Ethylbenzene	ND	30
0-42-5	Styrene	ND	30
0-20-7	m&p-Xylenes	ND	30
-47-6	o-Xylene	ND	30

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

.0 SUMMARY 23513

Quantitation Report

03

Data File : C:\HPCHEM\1\DATA\B4478.D
Acq On : 24 Jul 95 6:28 pm
Sample : 90009 SB-2
Misc : 1G
Quant Time: Jul 25 8:17 1995

Vial: 15
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	6.23	643	256088	50.00	ug/l	0.00
18) 1,4-Difluorobenzene	8.56	884	1368246	50.00	ug/l	0.00
32) Chlorobenzene-d5	14.05	1450	1081498	50.00	ug/l	0.00
System Monitoring Compounds						**%Recovery**
15) 1,2-Dichloroethane-d4	7.45	770	467920	52.51	ug/l	105.02%
33) Toluene-d8	11.09	1145	1428808	54.58	ug/l	109.15%
43) Bromofluorobenzene	16.65	1718	103060	43.85	ug/l	87.69%
Target Compounds						**Qvalue**
10) Methylene Chloride	3.29	339	22964	2.58	ug/l #	55
14) cis-1,2-Dichloroethene	5.73	592	48455	3.43	ug/l m	92
23) Trichloroethene	8.92	921	61465	6.63	ug/l	89
36) Tetrachloroethene	12.28	1268	433089	47.00	ug/l m	98

JLC 8/15/95

(#) = qualifier out of range (m) = manual integration

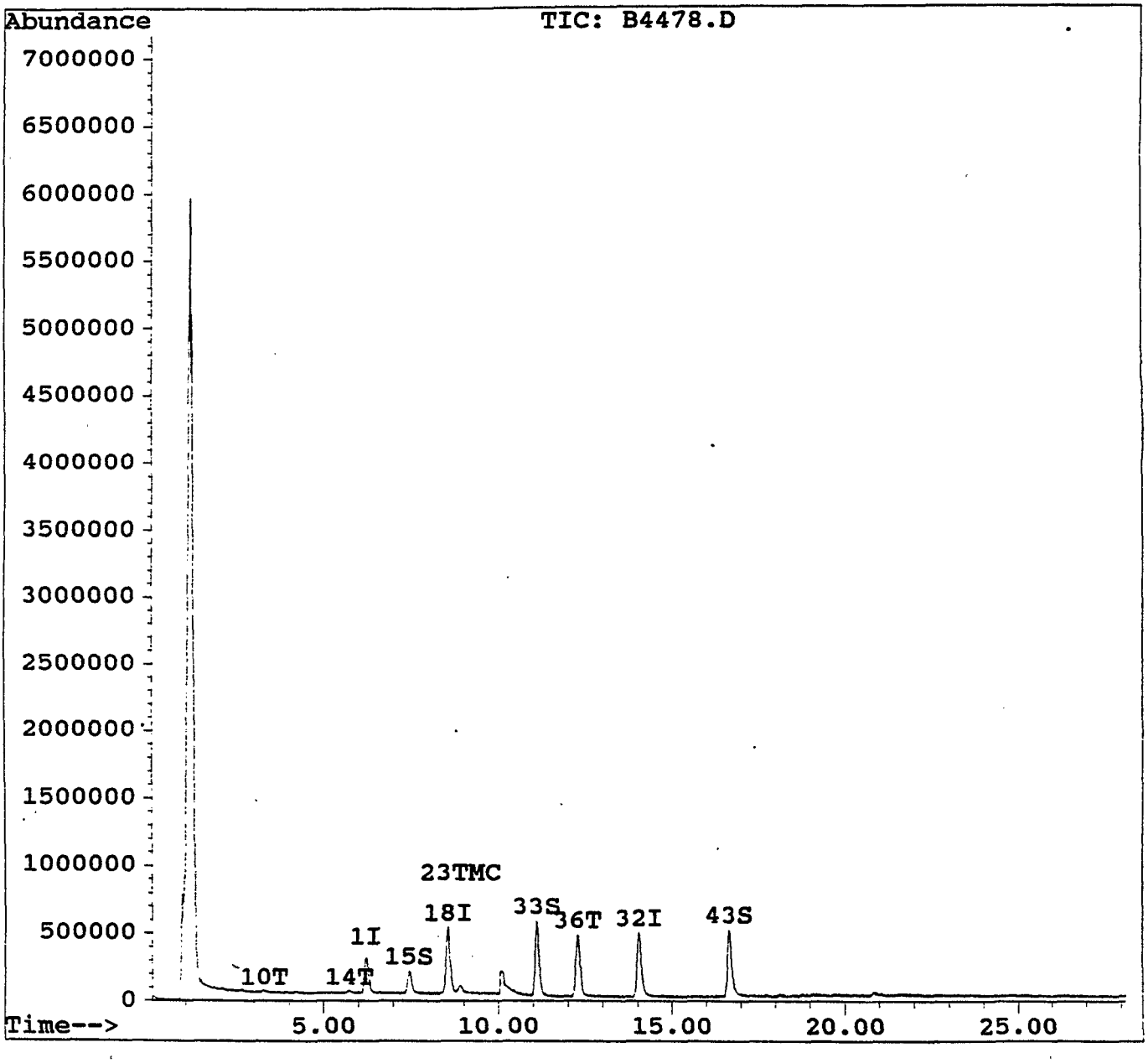
Quantitation Report

032

Data File : C:\HPCHEM\1\DATA\B4478.D
Acq On : 24 Jul 95 6:28 pm
Sample : 90009 SB-2
Misc : 1G
Quant Time: Jul 25 8:17 1995

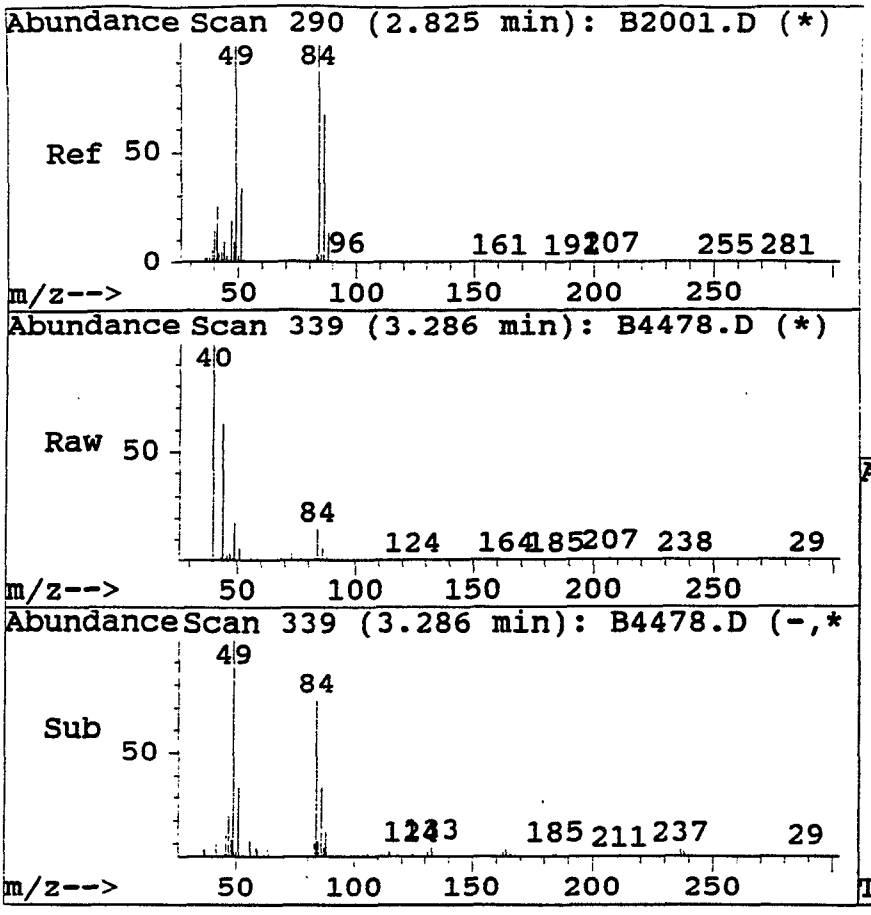
Vial: 15
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



MK 5/14/95

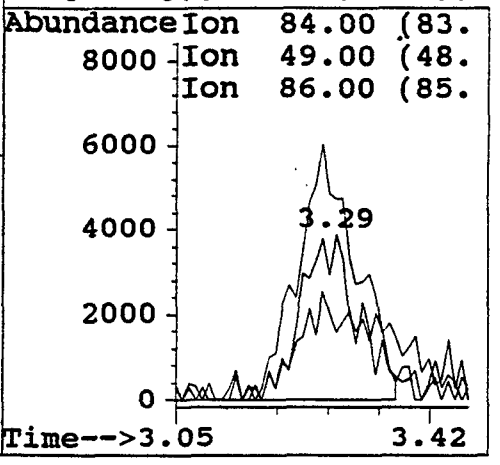
AR301483

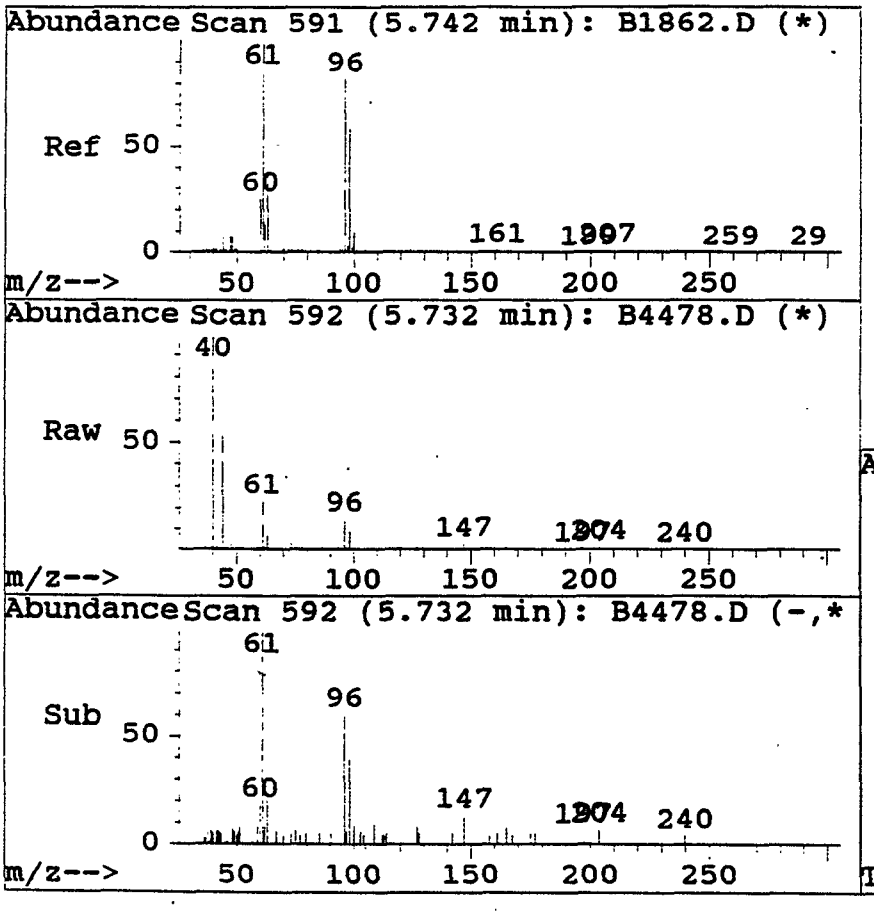


#10
Methylene Chloride
Concen: 2.58 ug/l
RT: 3.29 min Scan# 339
Delta R.T. 0.01 min
Lab File: B4478.D
Acq: 24 Jul 95 6:28 pm

Tgt Ion:84 Resp: 22964

Ion	Ratio	Lower	Upper
84	100		
49	172.6	94.8	134.8#
86	39.9	43.6	83.6#
0	0.0	0.0	0.0

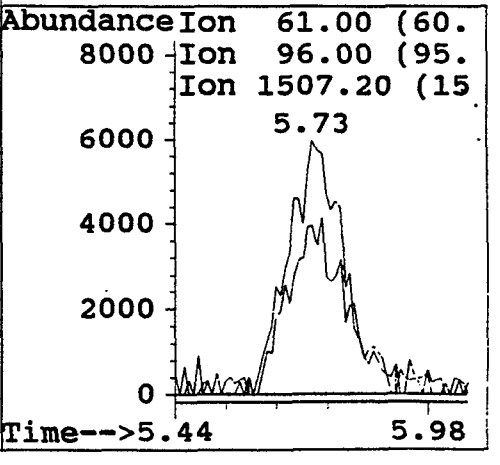


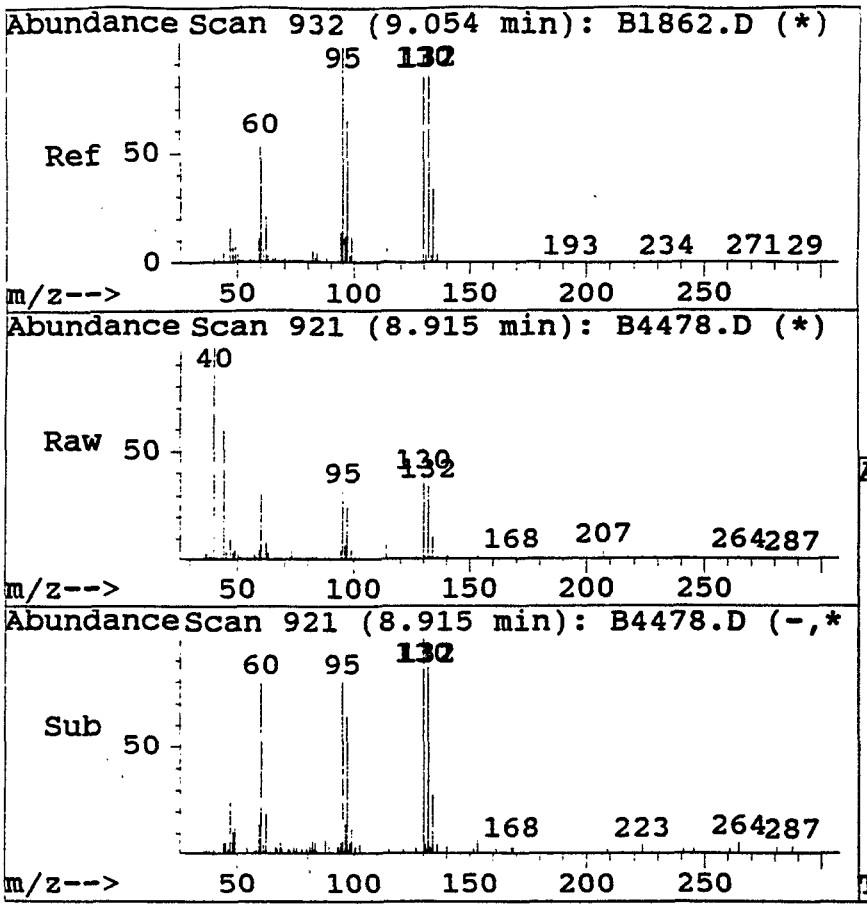


#14
cis-1,2-Dichloroethene
Concen: 3.43 ug/l m
RT: 5.73 min Scan# 592
Delta R.T. -0.02 min
Lab File: B4478.D
Acq: 24 Jul 95 6:28 pm

Tgt Ion:61 Resp: 48455

Ion	Ratio	Lower	Upper
61	100		
96	65.9	58.1	98.1
1507	0.0	0.0	20.0
0	0.0	0.0	0.0

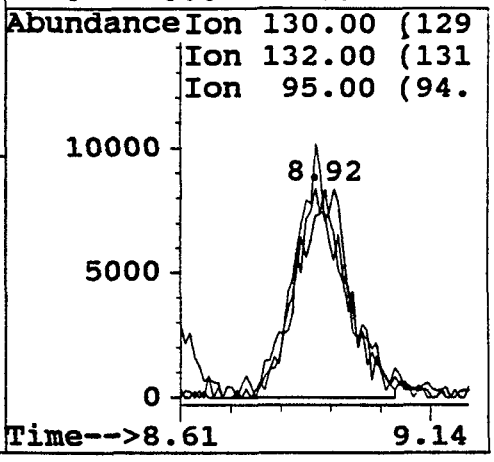


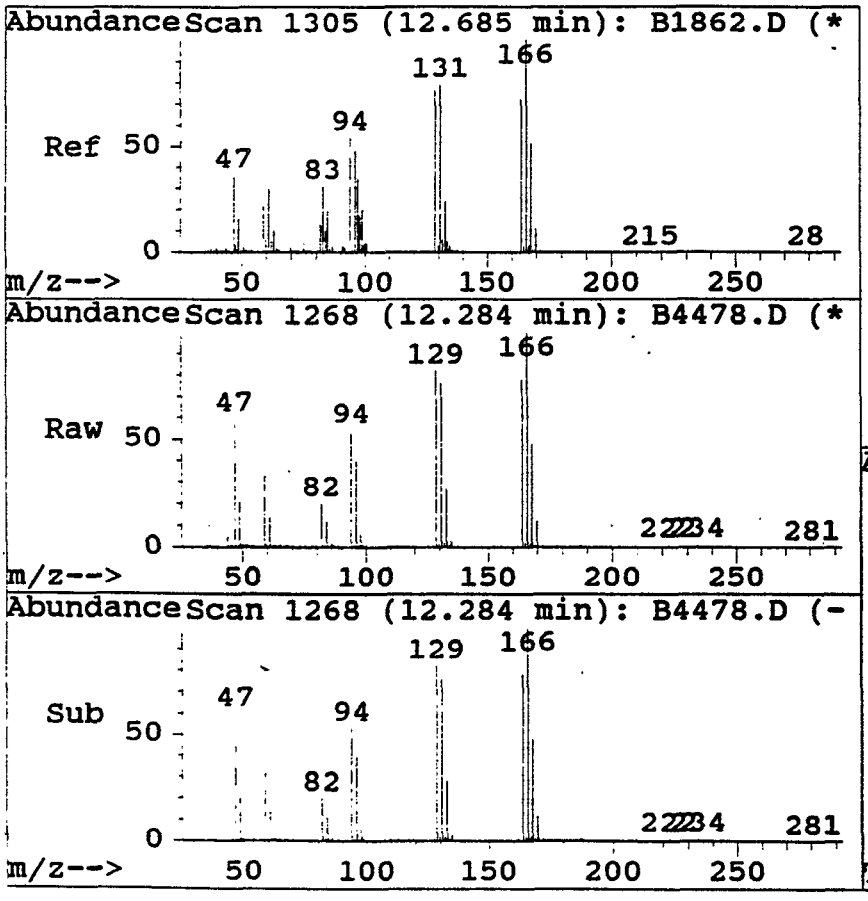


#23
Trichloroethene
Concen: 6.63 ug/l
RT: 8.92 min Scan# 921
Delta R.T. 0.00 min
Lab File: B4478.D
Acq: 24 Jul 95 6:28 pm

Tgt Ion:130 Resp: 61465

Ion	Ratio	Lower	Upper
130	100		
132	100.0	72.9	112.9
95	77.7	70.7	110.7
0	0.0	0.0	0.0

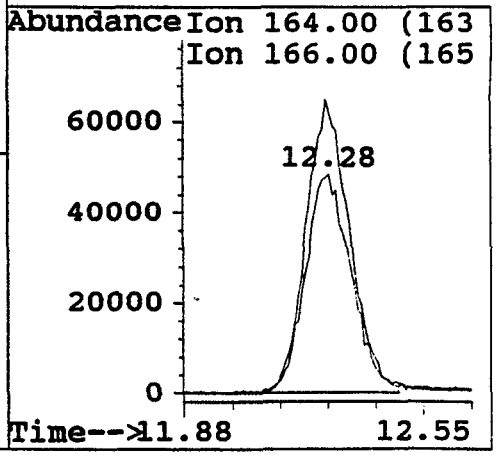




#36
Tetrachloroethene
Concen: 47.00 ug/l m
RT: 12.28 min Scan# 1268
Delta R.T. 0.00 min
Lab File: B4478.D
Acq: 24 Jul 95 6:28 pm

Tgt Ion:164 Resp: 433089

Ion	Ratio	Lower	Upper
164	100		
166	128.2	105.6	145.6
0	0.0	0.0	0.0
0	0.0	0.0	0.0



Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 90010
MATRIX : SOIL
CLIENT ID : John Evan's SB-3(7-9)
Sample wt/vol : 1G
% Moisture : 21.0

ANALYSIS DATE : 07/24/199[illegible]
RECVD DATE : 07/19/199[illegible]
ID FILE : g18.id
DATA FILE : b4479

Compound		Result (ug/kg)	Detection Limit (ug/kg)
[illegible]-87-3	Chloromethane	ND	63
74-83-9	Bromomethane	ND	63
75-01-4	Vinyl Chloride	ND	63
[illegible]5-00-3	Chloroethane	ND	63
[illegible]5-09-2	Methylene Chloride	25 J	32
67-64-1	Acetone	ND	63
[illegible]5-15-0	Carbon Disulfide	ND	63
[illegible]5-35-4	1,1-Dichloroethene	ND	32
75-34-3	1,1-Dichloroethane	ND	32
156-59-2	cis-1,2-Dichloroethene	270	32
[illegible]6-60-5	trans-1,2-Dichloroethene	ND	32
[illegible]-66-3	Chloroform	ND	32
107-02-2	1,2-Dichloroethane	ND	32
78-93-3	2-Butanone	ND	63
[illegible]-55-6	1,1,1-Trichloroethane	ND	32
[illegible]-23-5	Carbon Tetrachloride	ND	32
75-27-4	Bromodichloromethane	ND	32
[illegible]7-5	1,2-Dichloropropane	ND	32
[illegible]061-01-5	cis-1,3-Dichloropropene	ND	32
79-01-6	Trichloroethene	670	32
124-48-1	Dibromochloromethane	ND	32
[illegible]-00-5	1,1,2-Trichloroethane	ND	32
[illegible]-43-2	Benzene	ND	32
10061-02-6	trans-1,3-Dichloropropene	ND	32
75-25-2	Bromoform	ND	32
[illegible]8-10-1	4-Methyl-2-Pentanone	ND	63
[illegible]1-78-6	2-Hexanone	ND	63
127-18-4	Tetrachloroethene	1000	32
79-34-5	1,1,2,2-Tetrachloroethane	ND	32
[illegible]8-88-3	Toluene	ND	32
108-90-7	Chlorobenzene	ND	32
100-41-4	Ethylbenzene	ND	32
[illegible]0-42-5	Styrene	ND	32
[illegible]0-20-7	m&p-Xylenes	ND	32
95-47-6	o-Xylene	ND	32

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

[illegible].3 SUMMARY 23513

Quantitation Report

036

Data File : C:\HPCHEM\1\DATA\B4479.D
Acq On : 24 Jul 95 7:05 pm
Sample : 90010 SB-3
Misc : 1G
Quant Time: Jul 25 8:21 1995

Vial: 16
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	6.16	636	210425	50.00	ug/l	-0.07
18) 1,4-Difluorobenzene	8.26	853	1330513	50.00	ug/l	-0.30
32) Chlorobenzene-d5	14.07	1452	952692	50.00	ug/l	0.02
System Monitoring Compounds						**%Recovery**
15) 1,2-Dichloroethane-d4	7.18	741	382526	52.24	ug/l	104.48%
33) Toluene-d8	11.14	1150	1165485	50.54	ug/l	101.08%
43) Bromofluorobenzene	16.68	1721	98862	47.75	ug/l	95.49%
Target Compounds						**Qvalue**
10) Methylene Chloride	3.24	334	28673	3.92	ug/l m	69
14) cis-1,2-Dichloroethene	5.70	589	488609	42.08	ug/l m	52
23) Trichloroethene	8.61	889	960580	106.49	ug/l m	0
36) Tetrachloroethene	12.34	1273	1319734	162.59	ug/l #	75

MK 8/15/95

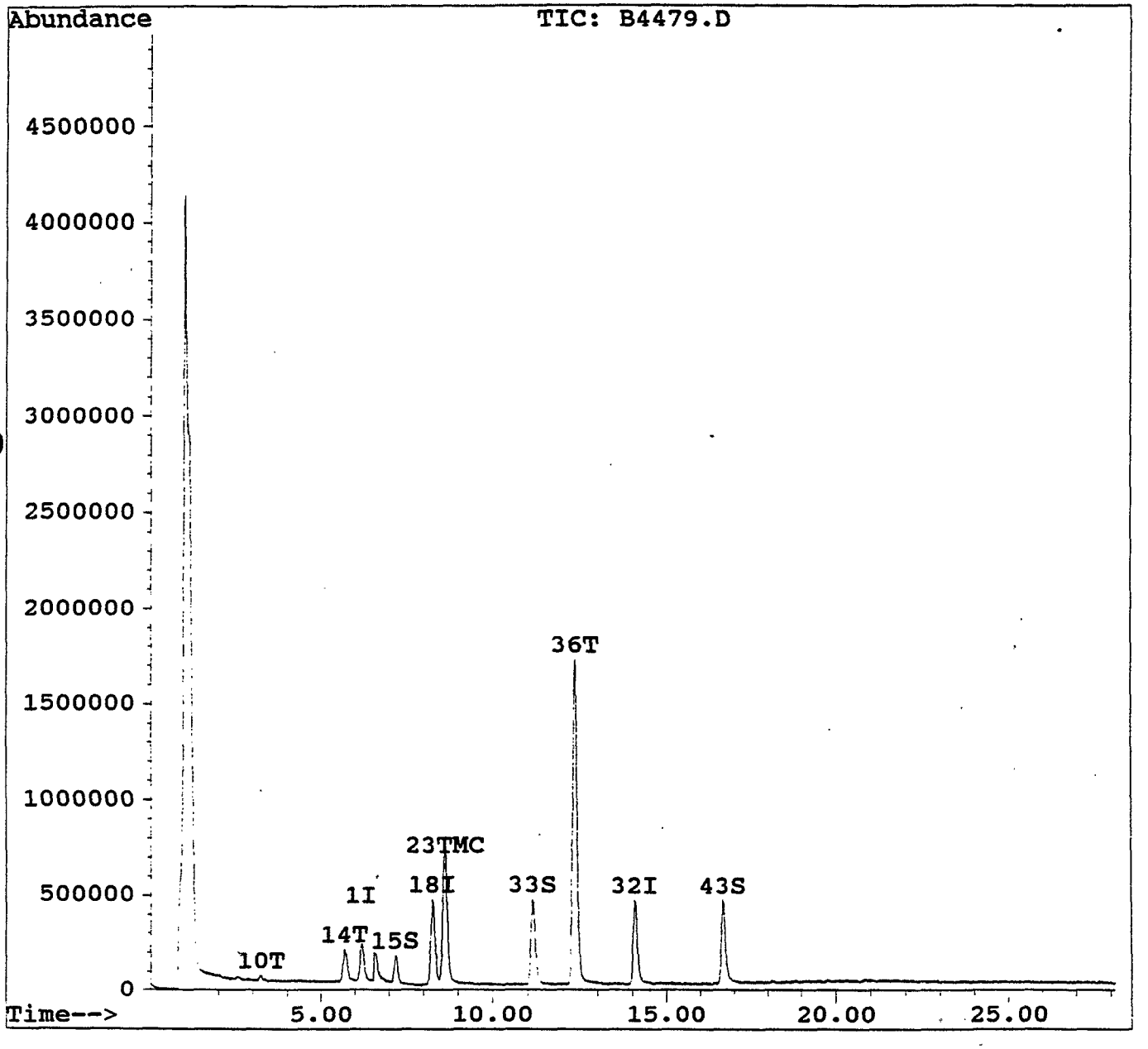
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4479.D
Acq On : 24 Jul 95 7:05 pm
Sample : 90010 SB-3
Misc : 1G
Quant Time: Jul 25 8:21 1995

Vial: 16
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



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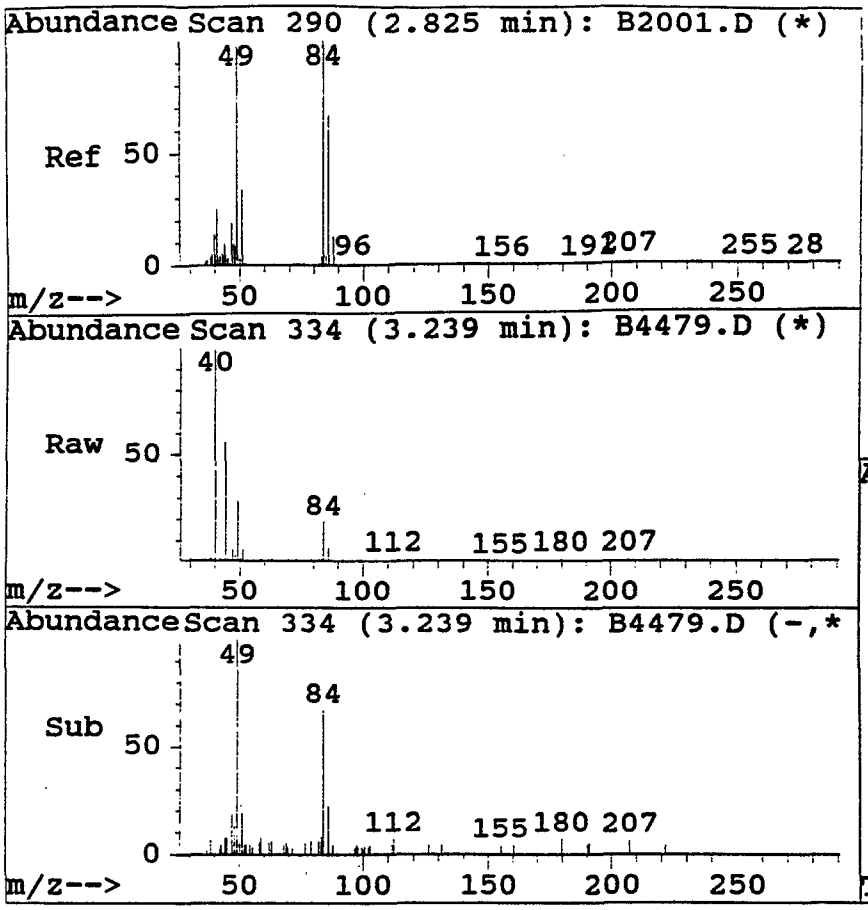
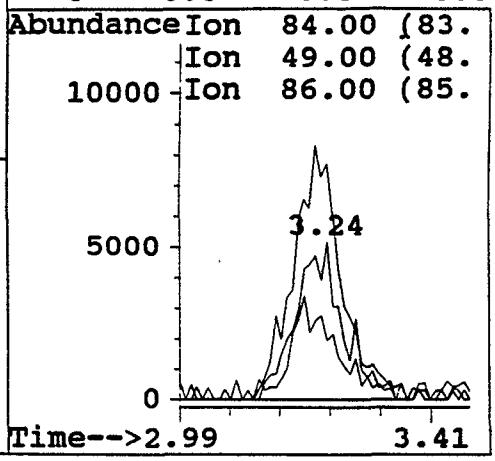
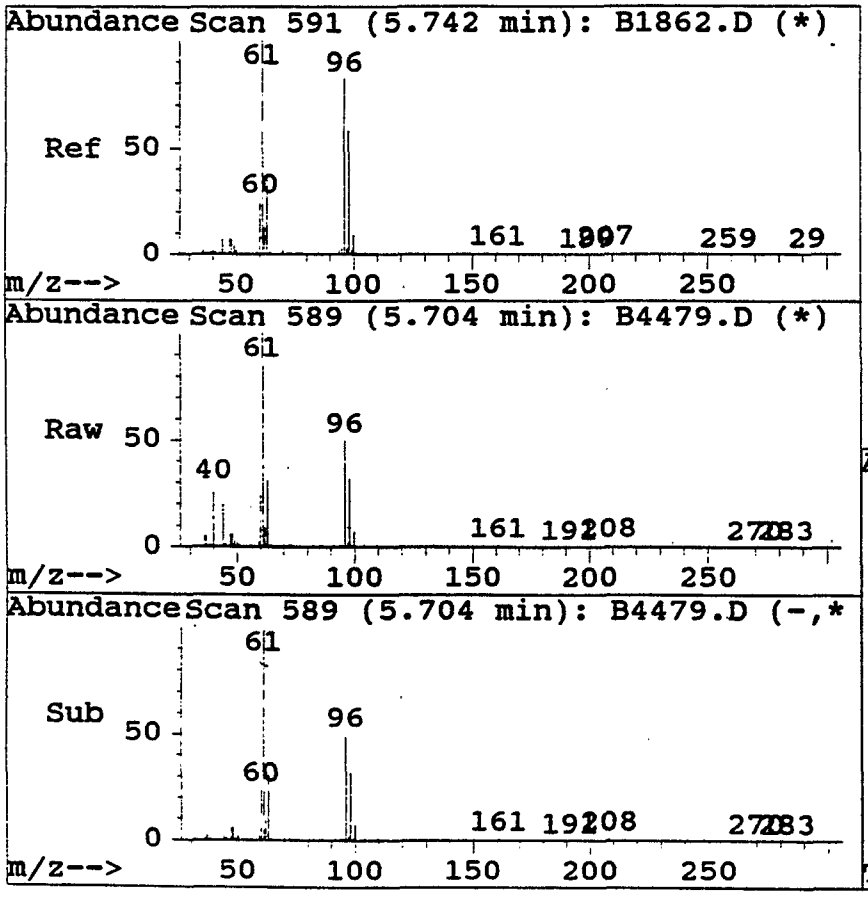


#10
Methylene Chloride
Concen: 3.92 ug/l m
RT: 3.24 min Scan# 334
Delta R.T. -0.04 min
Lab File: B4479.D
Acq: 24 Jul 95 7:05 pm

Tgt Ion:84 Resp: 28673

Ion	Ratio	Lower	Upper
84	100		
49	163.2	94.8	134.8#
86	58.6	43.6	83.6
0	0.0	0.0	0.0

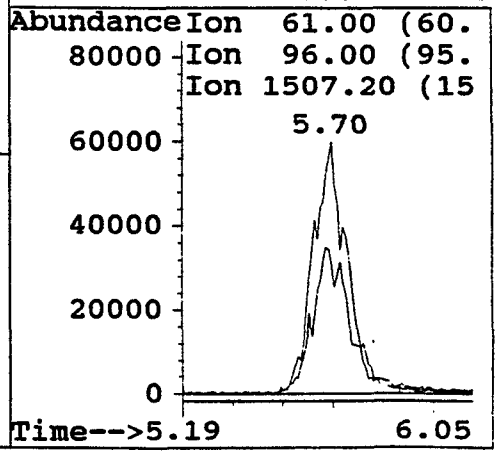


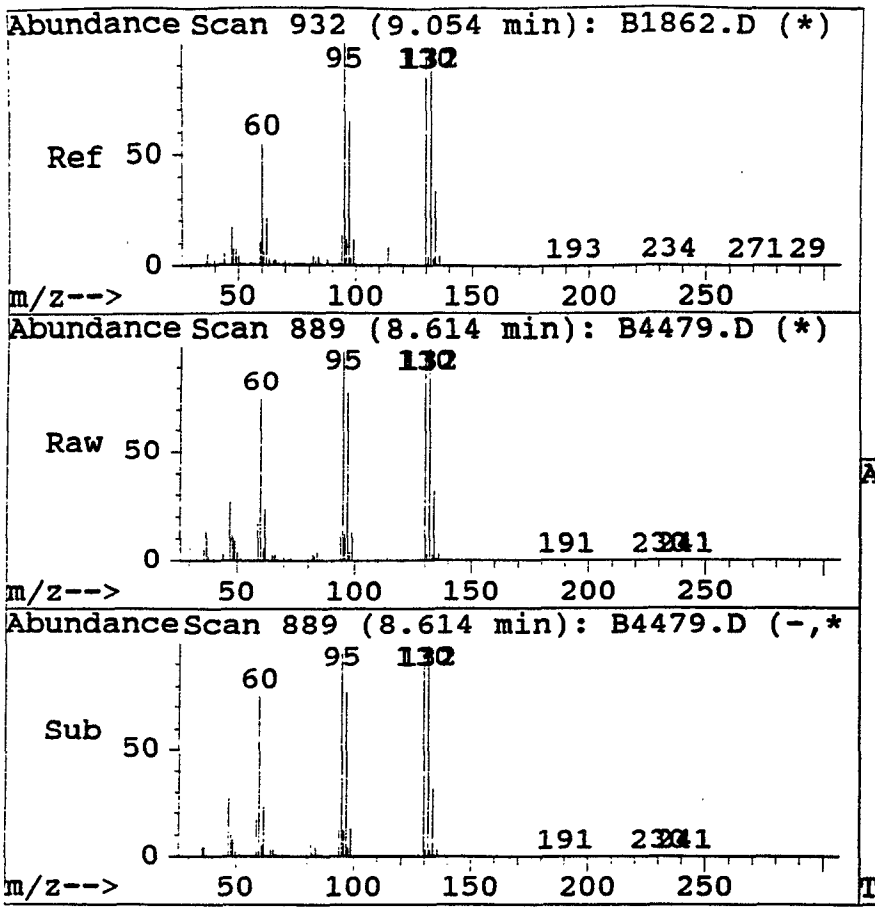


#14
cis-1,2-Dichloroethene
Concen: 42.08 ug/l m
RT: 5.70 min Scan# 589
Delta R.T. -0.05 min
Lab File: B4479.D
Acq: 24 Jul 95 7:05 pm

Tgt Ion:61 Resp: 488609

Ion	Ratio	Lower	Upper
61	100		
96	50.5	58.1	98.1#
1507	0.0	0.0	20.0
0	0.0	0.0	0.0

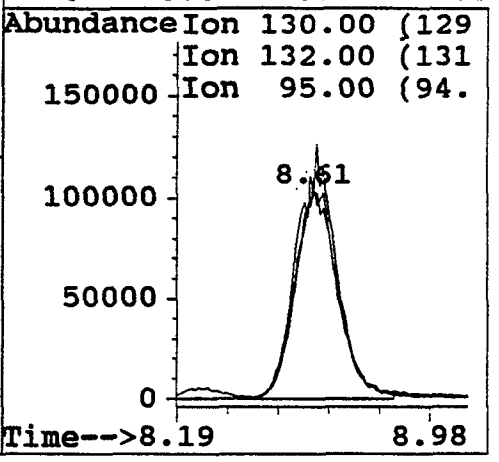


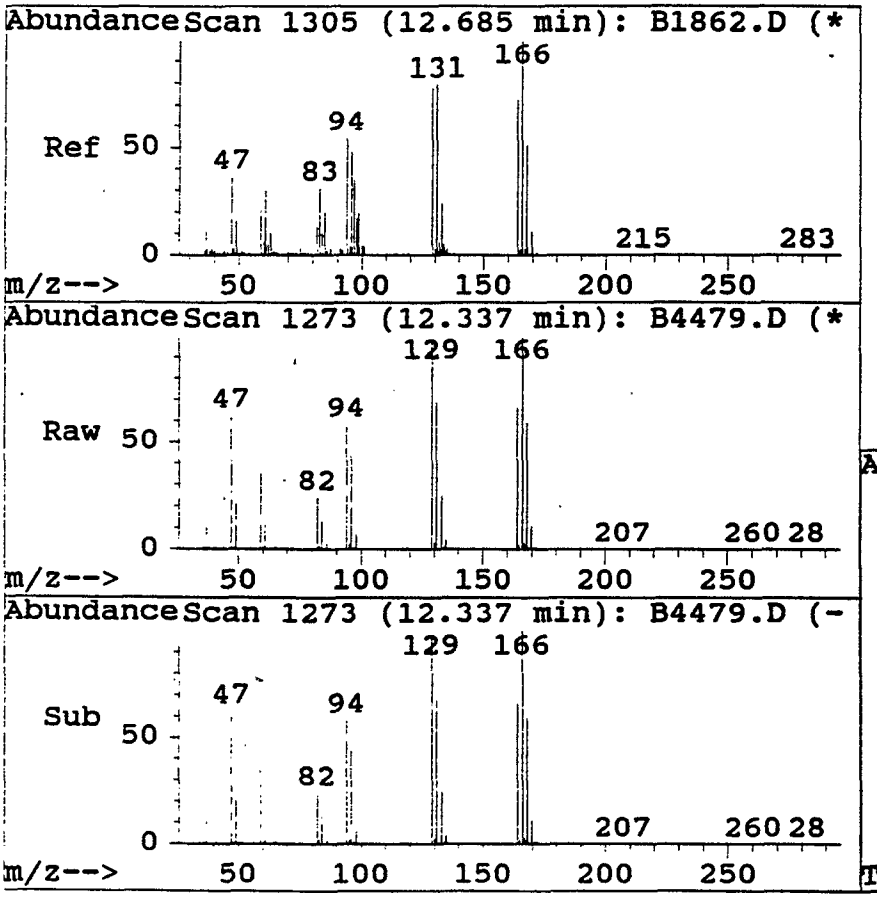


#23
Trichloroethene
Concen: 106.49 ug/l m
RT: 8.61 min Scan# 889
Delta R.T. -0.30 min
Lab File: B4479.D
Acq: 24 Jul 95 7:05 pm

Tgt Ion:130 Resp: 960580

Ion	Ratio	Lower	Upper
130	100		
132	103.3	72.9	112.9
95	100.3	70.7	110.7
0	0.0	0.0	0.0

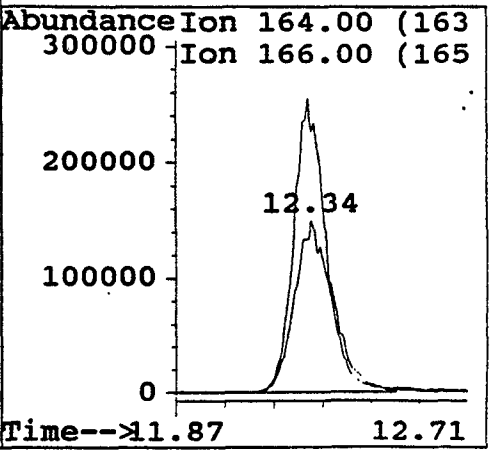




#36
Tetrachloroethene
Concen: 162.59 ug/l
RT: 12.34 min Scan# 1273
Delta R.T. 0.05 min
Lab File: B4479.D
Acq: 24 Jul 95 7:05 pm

Tgt Ion:164 Resp: 1319734

Ion	Ratio	Lower	Upper
164	100		
166	153.9	105.6	145.6#
0	0.0	0.0	0.0
0	0.0	0.0	0.0



VOLATILE ORGANIC COMPOUNDS DATA SHEET

LAB SAMPLE # : 90011
MATRIX : SOIL
CLIENT ID : John Evan's SB-4(9-10.5)
Sample wt/vol : 1G
% Moisture : 21.1

ANALYSIS DATE : 07/24/1995
RECVD DATE : 07/19/1995
ID FILE : g18.id
DATA FILE : b4480

	Compound	Result (ug/kg)	Detection Limit (ug/kg)
74-87-3	Chloromethane	ND	63
7 -83-9	Bromomethane	ND	63
7 -01-4	Vinyl Chloride	ND	63
75-00-3	Chloroethane	ND	63
7 -09-2	Methylene Chloride	25 J	32
6 -64-1	Acetone	ND	63
75-15-0	Carbon Disulfide	ND	63
75-35-4	1,1-Dichloroethene	ND	32
7 -34-3	1,1-Dichloroethane	ND	32
156-59-2	cis-1,2-Dichloroethene	250	32
156-60-5	trans-1,2-Dichloroethene	ND	32
6 -66-3	Chloroform	ND	32
1 7-02-2	1,2-Dichloroethane	ND	32
78-93-3	2-Butanone	ND	63
7 -55-6	1,1,1-Trichloroethane	ND	32
5 -23-5	Carbon Tetrachloride	ND	32
75-27-4	Bromodichloromethane	ND	32
78-87-5	1,2-Dichloropropane	ND	32
1 061-01-5	cis-1,3-Dichloropropene	ND	32
7 -01-6	Trichloroethene	540	32
124-48-1	Dibromochloromethane	ND	32
7 -00-5	1,1,2-Trichloroethane	ND	32
7 -43-2	Benzene	ND	32
10061-02-6	trans-1,3-Dichloropropene	ND	32
75-25-2	Bromoform	ND	32
1 3-10-1	4-Methyl-2-Pentanone	ND	63
591-78-6	2-Hexanone	ND	63
127-18-4	Tetrachloroethene	1500 D	32
7 -34-5	1,1,2,2-Tetrachloroethane	ND	32
108-88-3	Toluene	ND	32
108-90-7	Chlorobenzene	ND	32
1)-41-4	Ethylbenzene	ND	32
1)-42-5	Styrene	ND	32
330-20-7	m&p-Xylenes	ND	32
95-47-6	o-Xylene	ND	32

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

6.3 SUMMARY 23513

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4480.D
Acq On : 24 Jul 95 7:40 pm
Sample : 90011 SB-4
Misc : 1G
Quant Time: Jul 25 8:26 1995

Vial: 17
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	6.19	639	151903	50.00	ug/l	-0.04
18) 1,4-Difluorobenzene	8.26	853	1050691	50.00	ug/l	-0.30
32) Chlorobenzene-d5	14.08	1453	717519	50.00	ug/l	0.03
System Monitoring Compounds						**%Recovery**
15) 1,2-Dichloroethane-d4	7.18	741	281342	53.23	ug/l	106.45%
33) Toluene-d8	11.15	1151	907736	52.26	ug/l	104.52%
43) Bromofluorobenzene	16.70	1723	74155	47.55	ug/l	95.10%
Target Compounds						**Qvalue**
10) Methylene Chloride	3.22	332	20595	3.90	ug/l #	72
14) cis-1,2-Dichloroethene	5.68	587	330922	39.47	ug/l #	35
23) Trichloroethene	8.62	890	609744	85.60	ug/l m	0
36) Tetrachloroethene	12.31	1270	1528785	250.07	ug/l #	74

MK 8/15/95

(#) = qualifier out of range (m) = manual integration

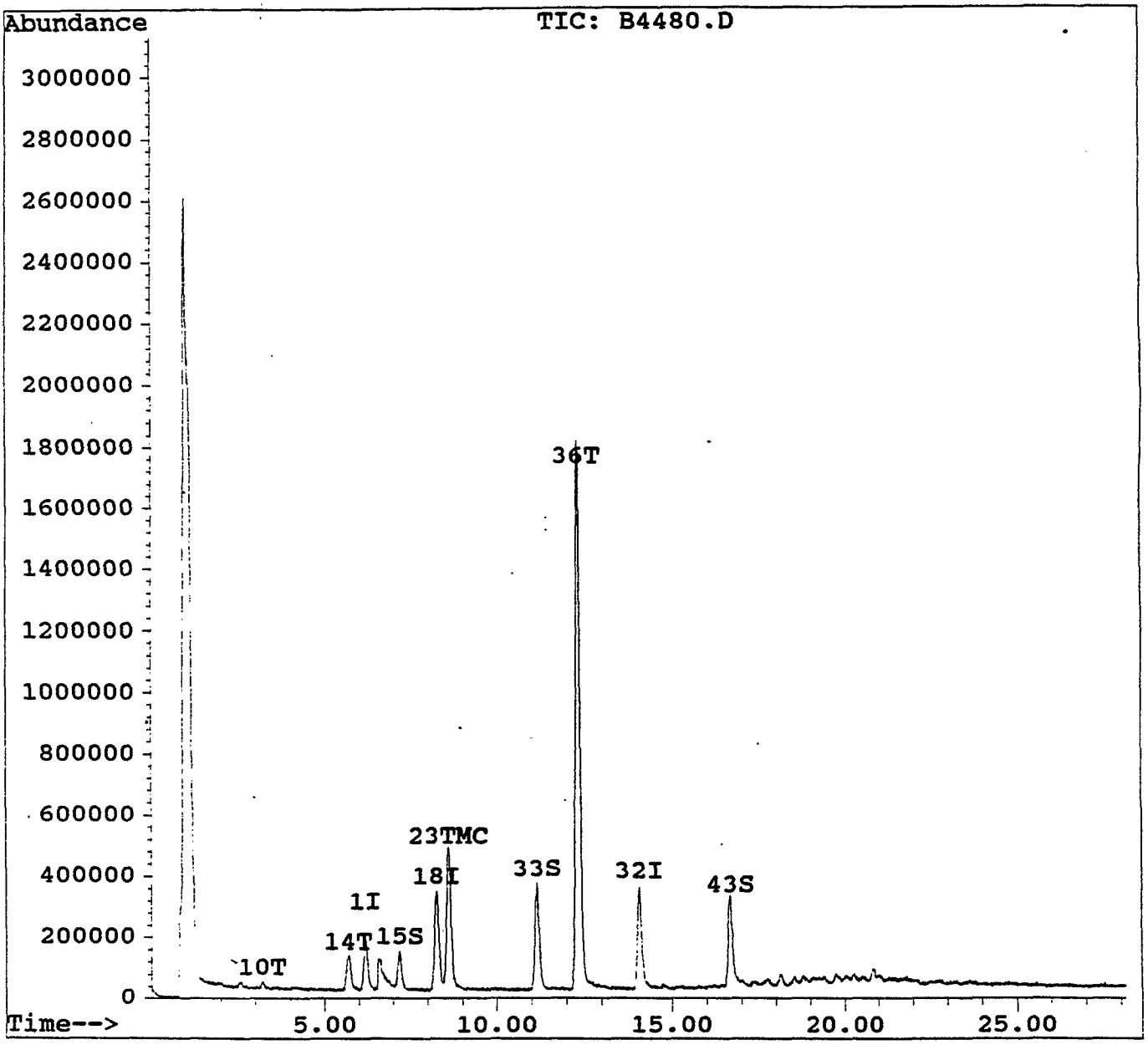
AR301492

Quantitation Report

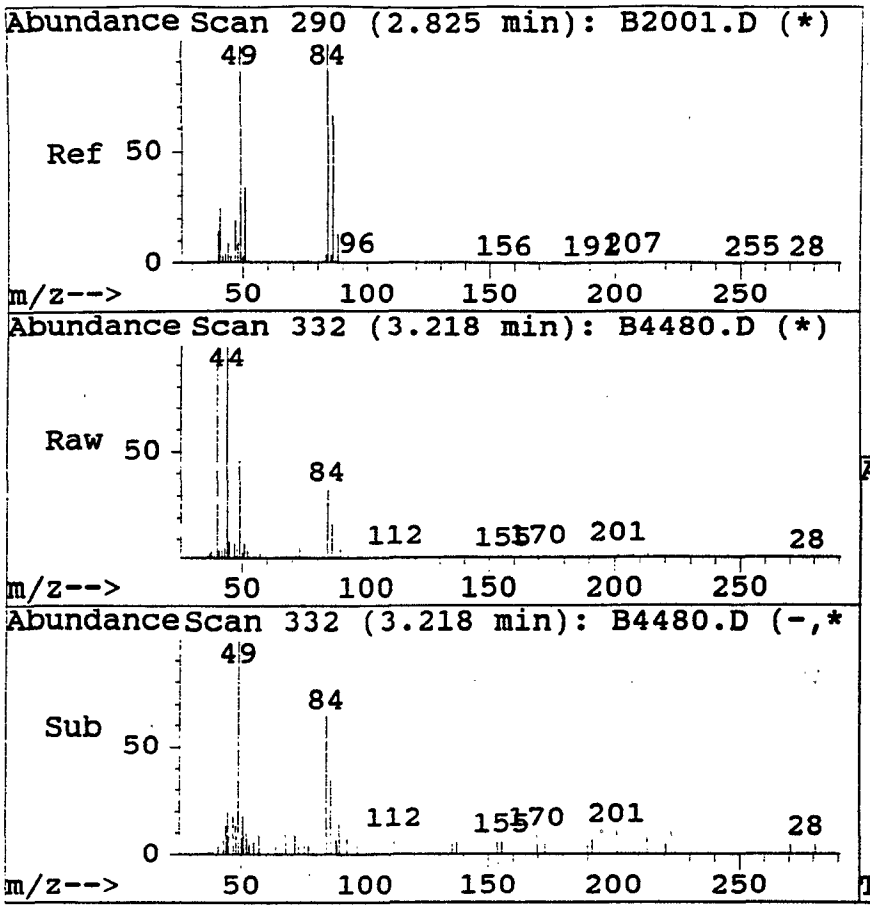
Data File : C:\HPCHEM\1\DATA\B4480.D
Acq On : 24 Jul 95 7:40 pm
Sample : 90011 SB-4
Misc : 1G
Quant Time: Jul 25 8:26 1995

Vial: 17
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



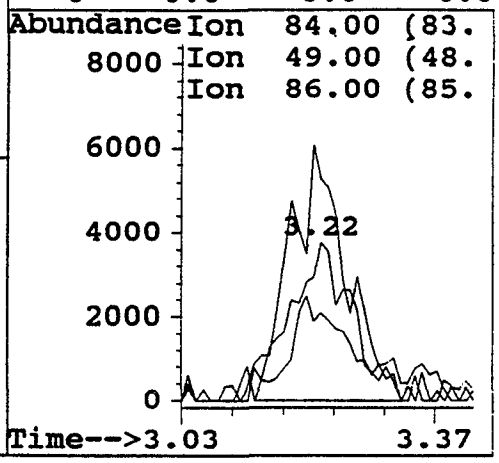
AR301493

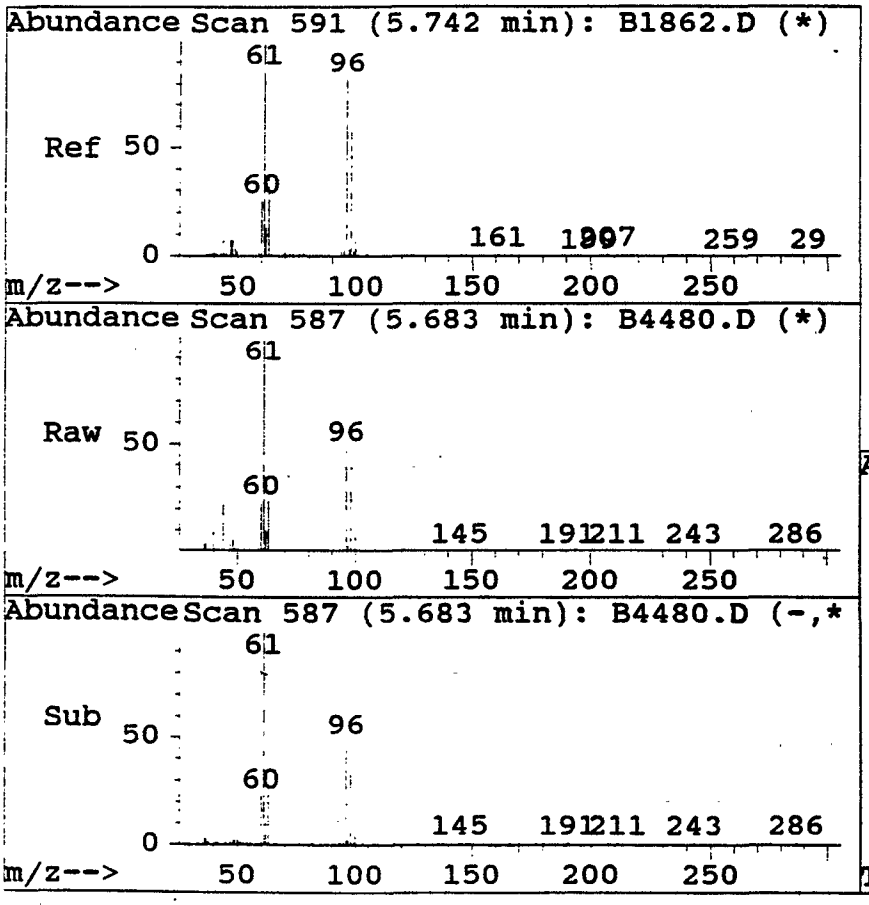


#10
Methylene Chloride
Concen: 3.90 ug/l
RT: 3.22 min Scan# 332
Delta R.T. -0.06 min
Lab File: B4480.D
Acq: 24 Jul 95 7:40 pm

Tgt Ion:84 Resp: 20595

Ion	Ratio	Lower	Upper
84	100		
49	160.3	94.8	134.8#
86	61.9	43.6	83.6
0	0.0	0.0	0.0

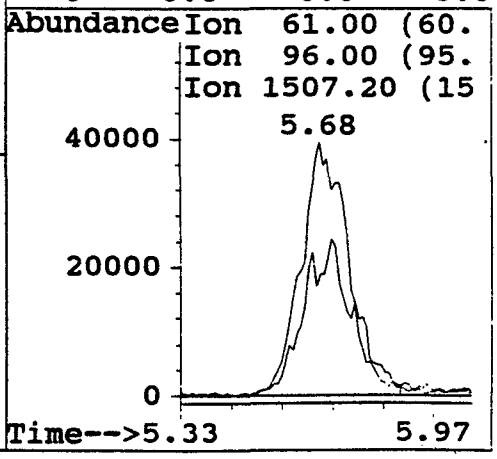




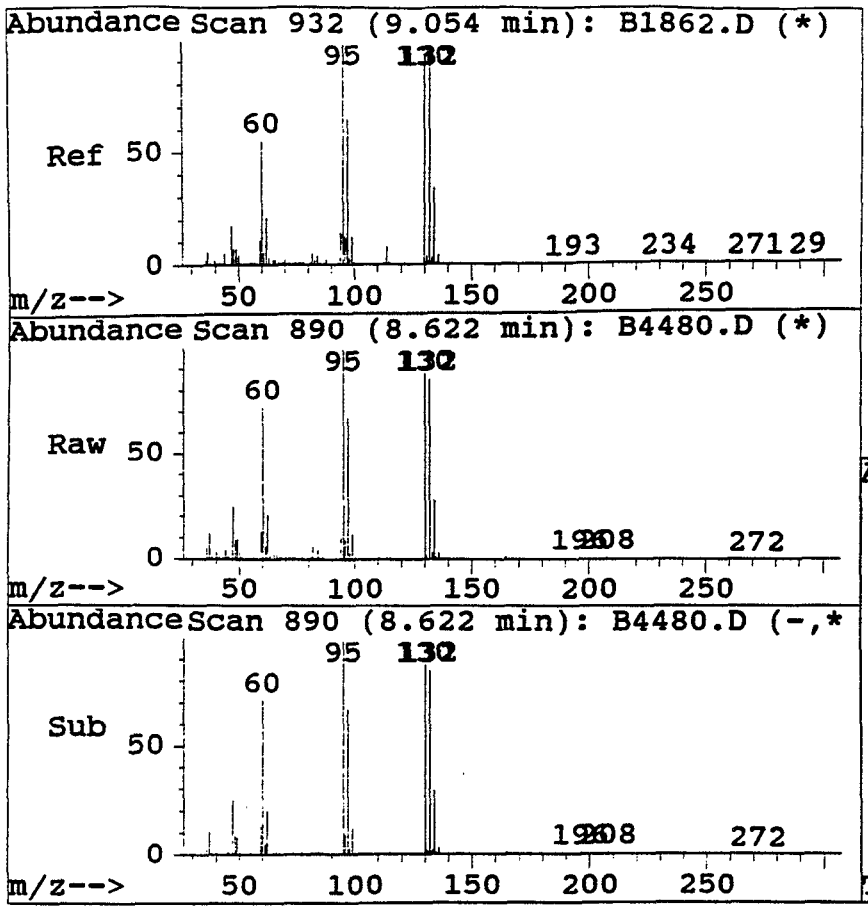
#14
cis-1,2-Dichloroethene
Concen: 39.47 ug/l
RT: 5.68 min Scan# 587
Delta R.T. -0.07 min
Lab File: B4480.D
Acq: 24 Jul 95 7:40 pm

Tgt Ion:61 Resp: 330922

Ion	Ratio	Lower	Upper
61	100		
96	21.7	58.1	98.1#
1507	0.0	0.0	20.0
0	0.0	0.0	0.0



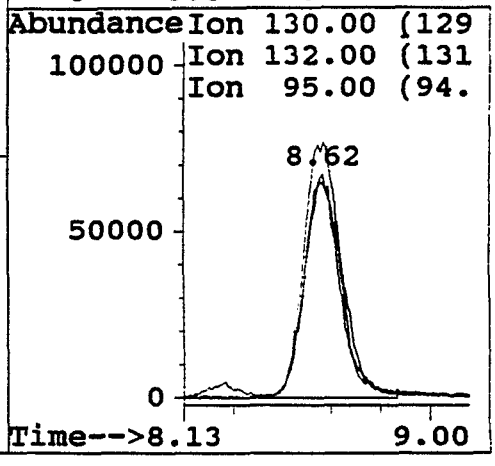
AR301494

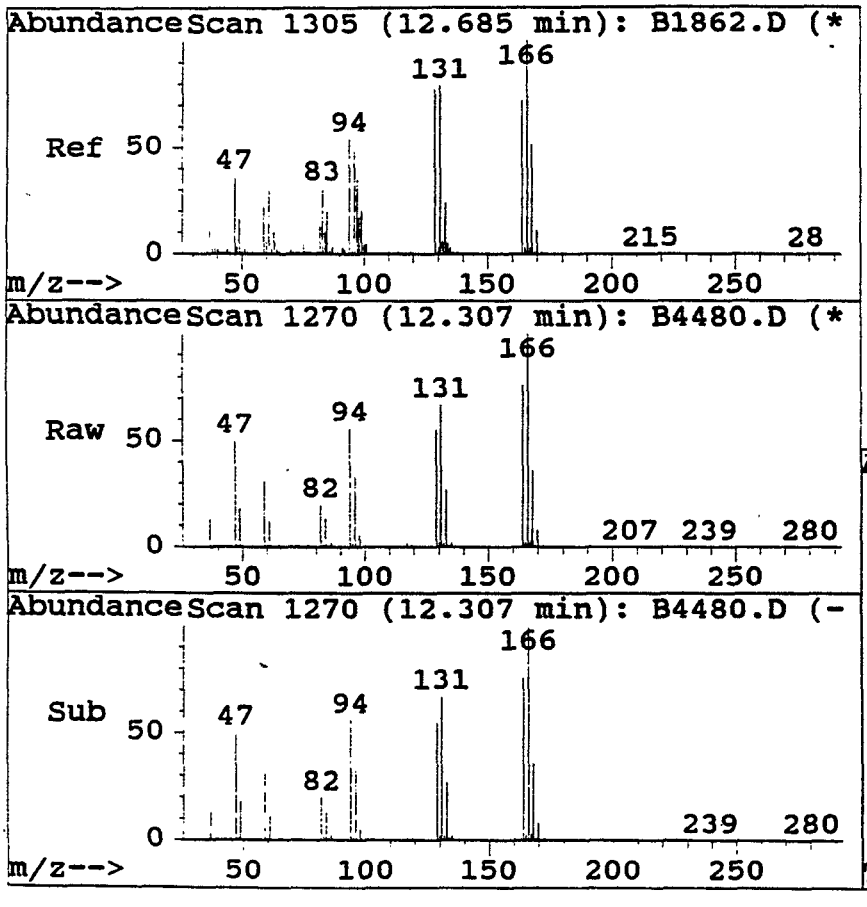


#23
Trichloroethene
Concen: 85.60 ug/l m
RT: 8.62 min Scan# 890
Delta R.T. -0.29 min
Lab File: B4480.D
Acq: 24 Jul 95 7:40 pm

Tgt Ion:130 Resp: 609744

Ion	Ratio	Lower	Upper
130	100		
132	96.3	72.9	112.9
95	113.9	70.7	110.7#
0	0.0	0.0	0.0

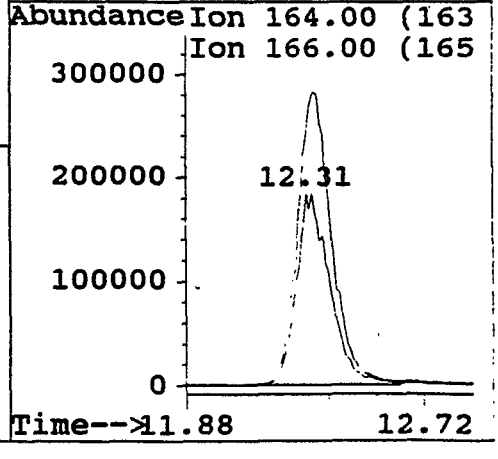




#36
Tetrachloroethene
Concen: 250.07 ug/l
RT: 12.31 min Scan# 1270
Delta R.T. 0.02 min
Lab File: B4480.D
Acq: 24 Jul 95 7:40 pm

Tgt Ion:164 Resp: 1528785

Ion	Ratio	Lower	Upper
164	100		
166	155.0	105.6	145.6#
0	0.0	0.0	0.0
0	0.0	0.0	0.0



Data File : C:\HPDOS4\B4543.D
Acq On : 28 Jul 95 3:13 pm
Sample : 90011
Misc : 0.04G
Quant Time: Aug 14 10:26 1995

Vial: 12
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Fri Apr 14 09:14:33 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Bromochloromethane	6.17	637	185770	50.00 ug/l	0.04
18) 1,4-Difluorobenzene	8.56	884	929200	50.00 ug/l	0.07
32) Chlorobenzene-d5	14.02	1448	762396	50.00 ug/l	-0.01
System Monitoring Compounds					**%Recovery**
15) 1,2-Dichloroethane-d4	7.42	767	373470	56.33 ug/l	112.67%
33) Toluene-d8	11.08	1144	966016	51.58 ug/l	103.16%
43) Bromofluorobenzene	16.65	1719	83266	50.65 ug/l	101.30%
Target Compounds					**Qvalue**
10) Methylene Chloride	3.23	333	14135	2.39 ug/l #	70
19) 2-Butanone	5.98	618	1643	1.04 ug/l #	2
23) Trichloroethene	8.86	915	30861	5.12 ug/l m	4
36) Tetrachloroethene	12.25	1265	70682	11.91 ug/l m	48

MC 8/14/95

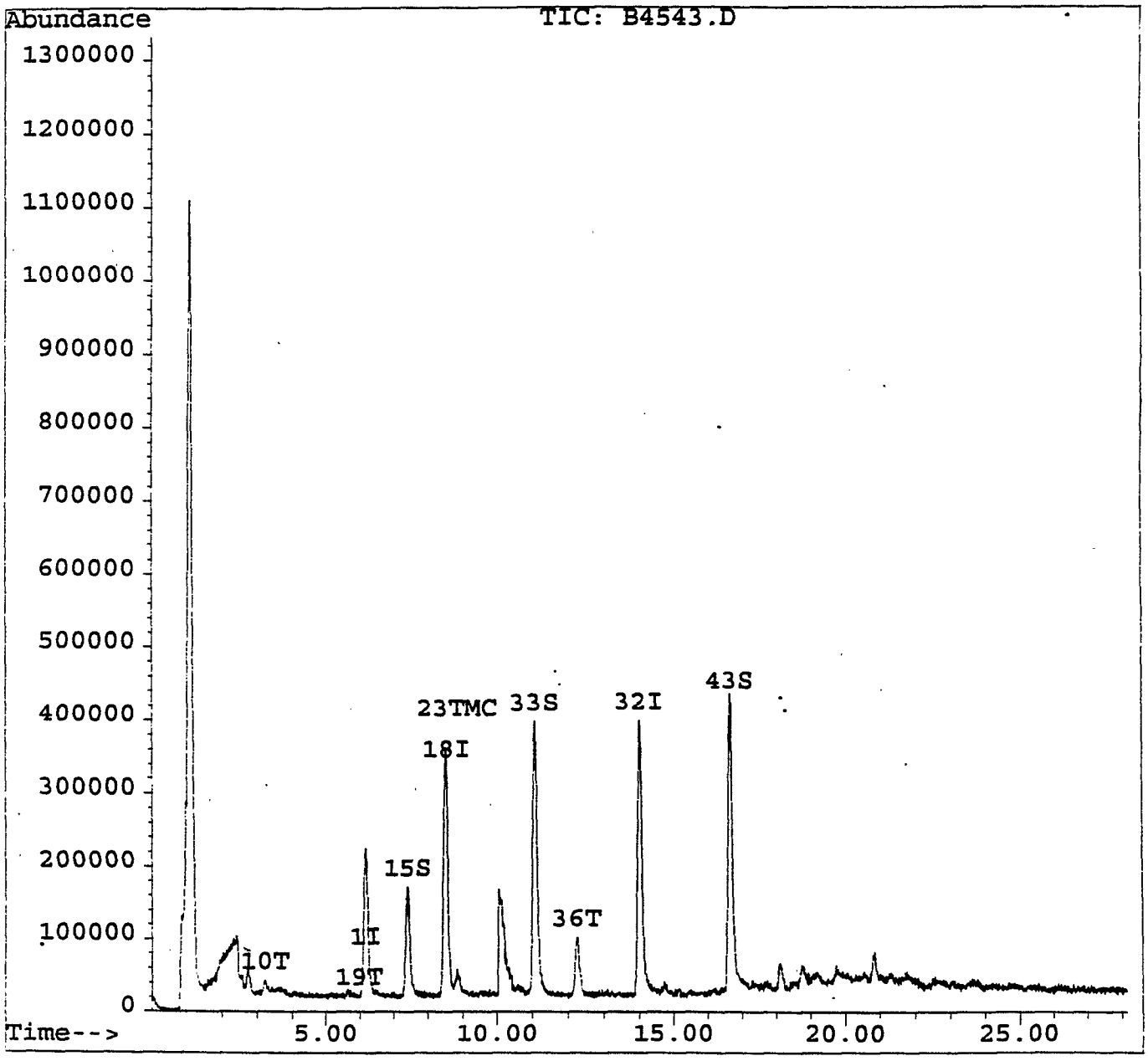
(#) = qualifier out of range (m) = manual integration

Quantitation Report

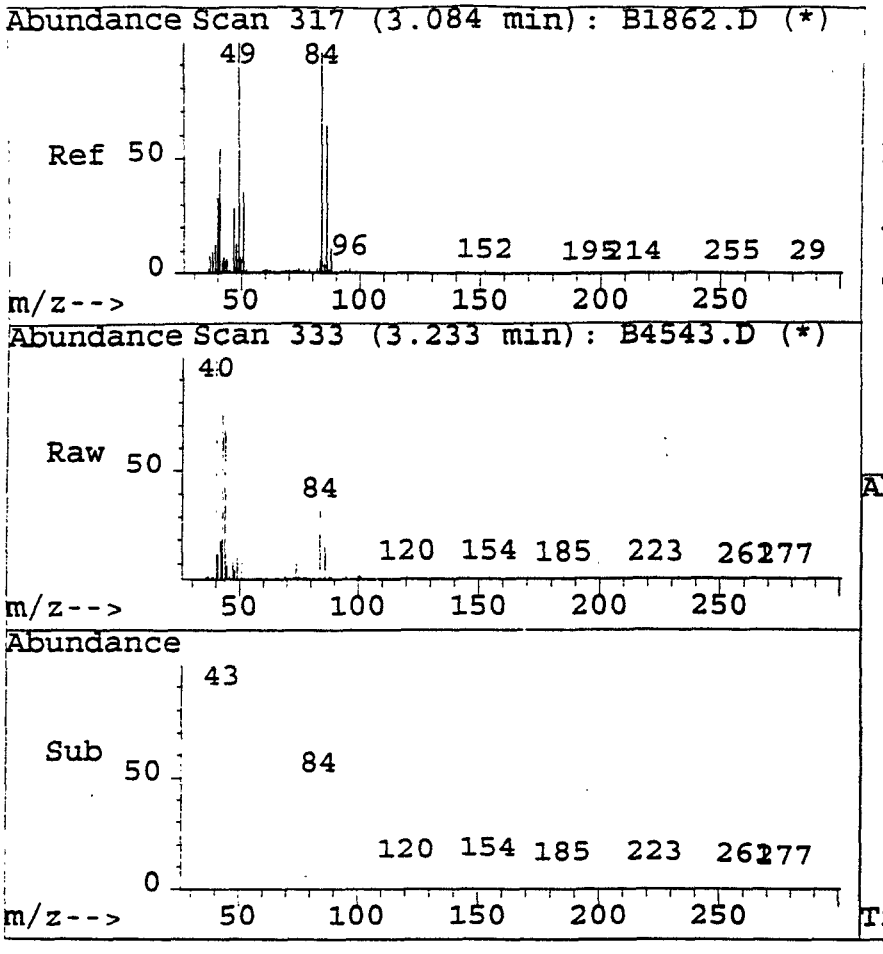
Data File : C:\HPDOS4\B4543.D
Acq On : 28 Jul 95 3:13 pm
Sample : 90011
Misc : 0.04G
Quant Time: Aug 14 10:26 1995

Vial: 12
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Fri Apr 14 09:14:33 1995
Response via : Single Level Calibration



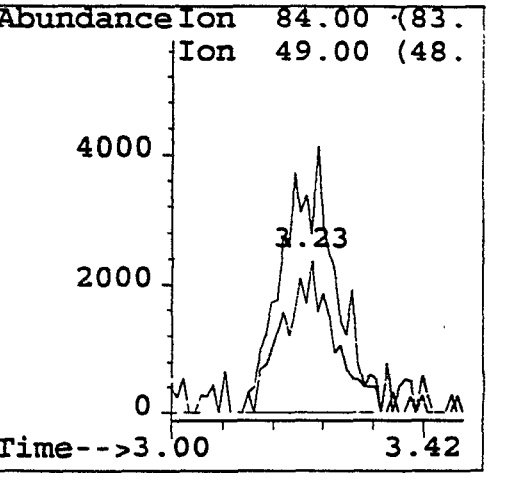
AR301497

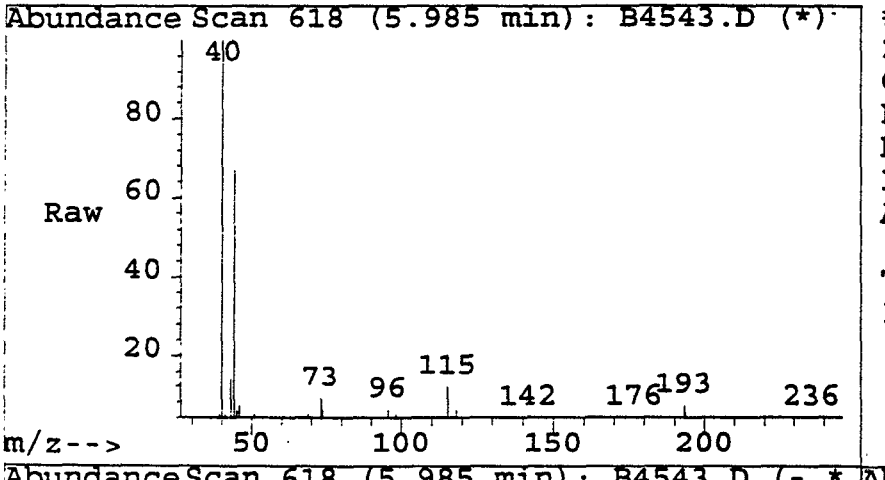


#10
Methylene Chloride
Concen: 2.39 ug/l
RT: 3.23 min Scan# 333
Delta R.T. 0.06 min
Lab File: B4543.D
Acq: 28 Jul 95 3:13 pm

Tgt Ion:84 Resp: 14135

Ion	Ratio	Lower	Upper
84	100		
49	101.2	94.8	134.8
86	15.6	43.6	83.6#
0	0.0	0.0	0.0

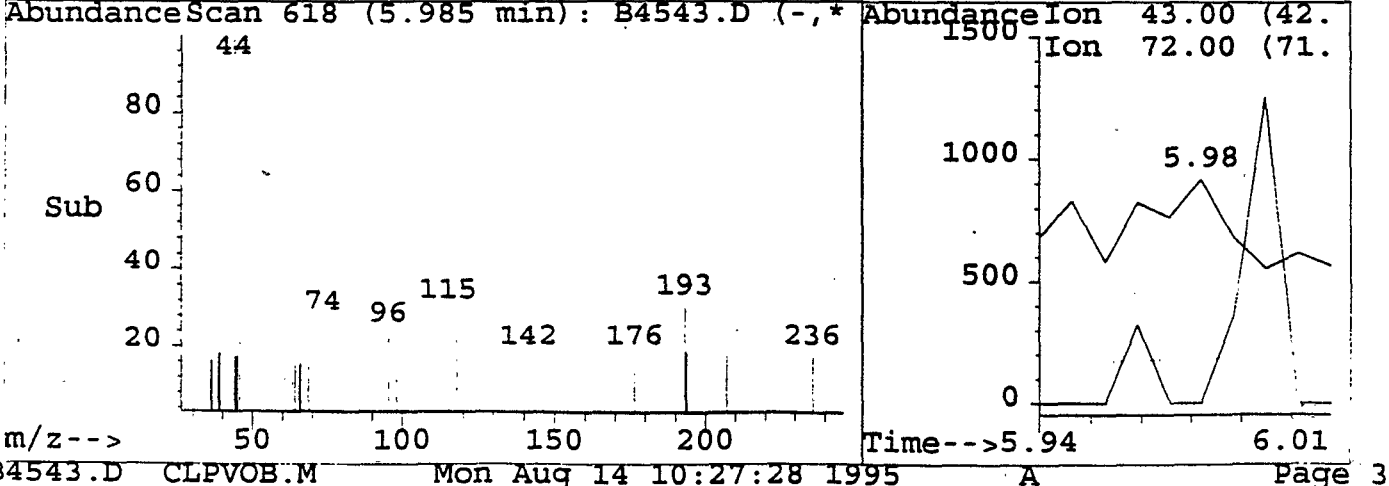


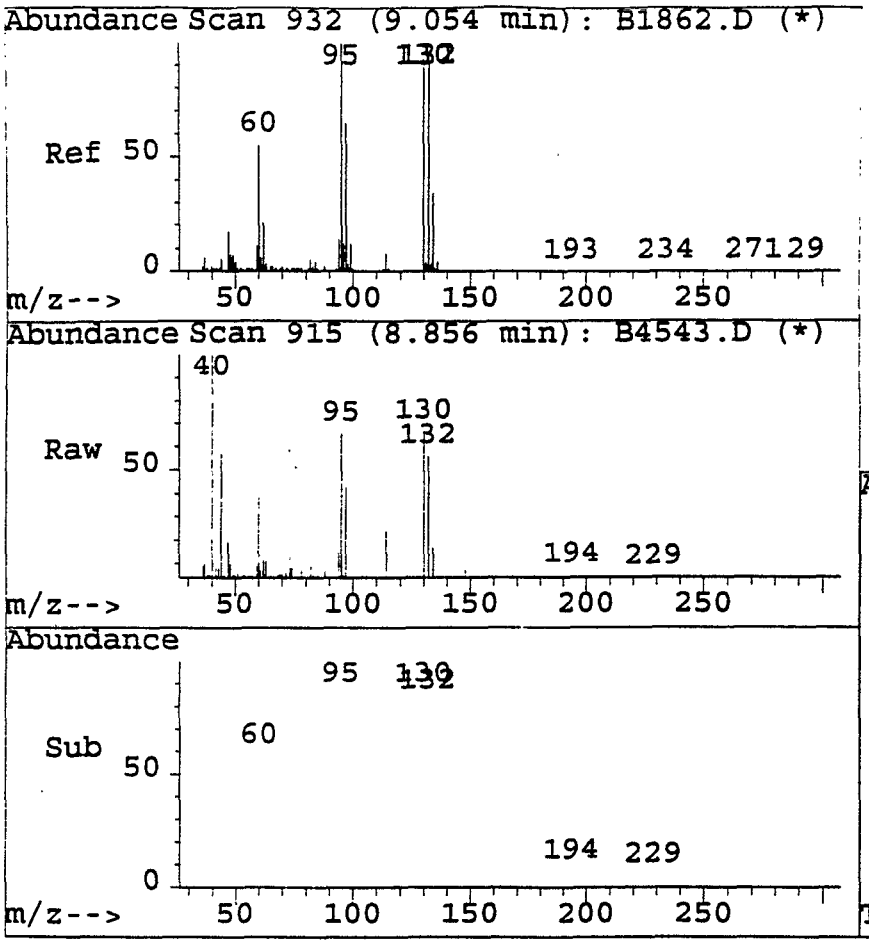


#19
2-Butanone
Concen: 1.04 ug/l
RT: 5.98 min Scan# 618
Delta R.T. 0.05 min
Lab File: B4543.D
Acq: 28 Jul 95 3:13 pm

Tgt Ion:43 Resp: 1643

Ion	Ratio	Lower	Upper
43	100		
72	56.7	0.0	35.6#
0	0.0	0.0	0.0
0	0.0	0.0	0.0

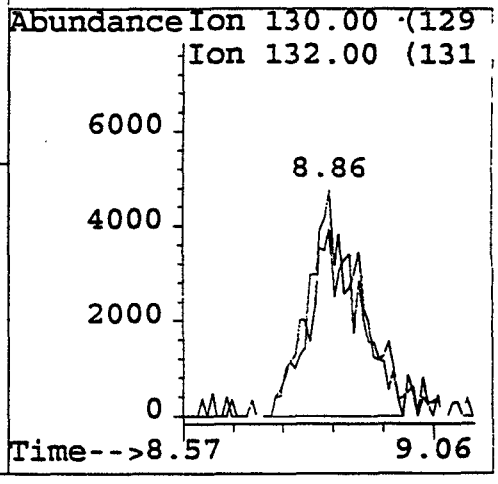


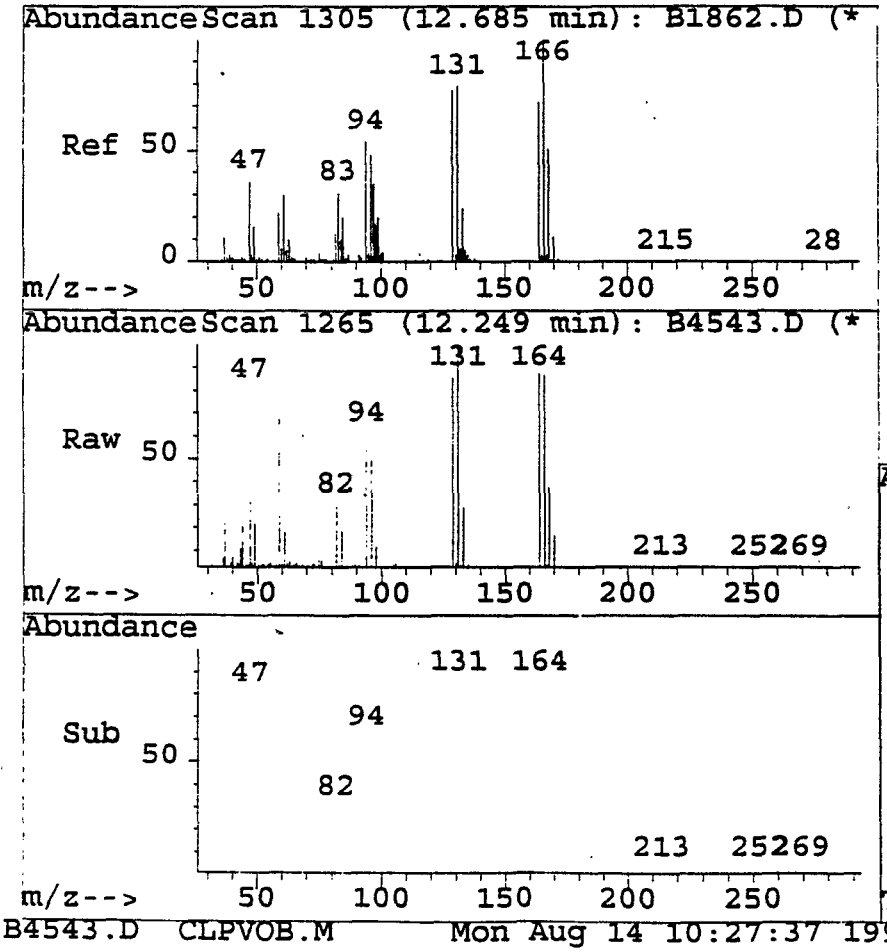


#23
Trichloroethene
Concen: 5.12 ug/l m
RT: 8.86 min Scan# 915
Delta R.T. 0.02 min
Lab File: B4543.D
Acq: 28 Jul 95 3:13 pm

Tgt Ion:130 Resp: 30861

Ion	Ratio	Lower	Upper
130	100		
132	82.4	72.9	112.9
95	97.5	70.7	110.7
0	0.0	0.0	0.0

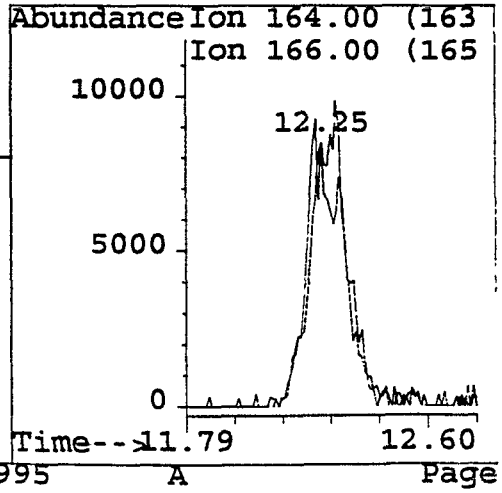




#36
Tetrachloroethene
Concen: 11.91 ug/l m
RT: 12.25 min Scan# 1265
Delta R.T. -0.02 min
Lab File: B4543.D
Acq: 28 Jul 95 3:13 pm

Tgt Ion:164 Resp: 70682

Ion	Ratio	Lower	Upper
164	100		
166	95.4	105.6	145.6#
0	0.0	0.0	0.0
0	0.0	0.0	0.0



AR301499

Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 90012
MATRIX : SOIL
CLIENT ID : John Evan's SB-5(10.5-11)
Sample wt/vol : 1G
% Moisture : 11.2

ANALYSIS DATE : 07/24/1995
RECVD DATE : 07/19/1995
ID FILE : g18.i
DATA FILE : b4481

Compound		Result (ug/kg)	Detection Limit (ug/kg)
7 -87-3	Chloromethane	ND	56
74-83-9	Bromomethane	ND	56
75-01-4	Vinyl Chloride	ND	56
7 -00-3	Chloroethane	ND	56
7 -09-2	Methylene Chloride	15 J	28
67-64-1	Acetone	ND	56
75-15-0	Carbon Disulfide	ND	56
7 -35-4	1,1-Dichloroethene	ND	28
75-34-3	1,1-Dichloroethane	ND	28
156-59-2	cis-1,2-Dichloroethene	33	28
1 6-60-5	trans-1,2-Dichloroethene	ND	28
6 -66-3	Chloroform	ND	28
107-02-2	1,2-Dichloroethane	ND	28
78-93-3	2-Butanone	6 J	56
7 -55-6	1,1,1-Trichloroethane	ND	28
5 -23-5	Carbon Tetrachloride	ND	28
75-27-4	Bromodichloromethane	ND	28
7 7-5	1,2-Dichloropropane	ND	28
1 061-01-5	cis-1,3-Dichloropropene	ND	28
75-01-6	Trichloroethene	48	28
124-48-1	Dibromochloromethane	ND	28
7 -00-5	1,1,2-Trichloroethane	ND	28
7 -43-2	Benzene	ND	28
10061-02-6	trans-1,3-Dichloropropene	ND	28
75-25-2	Bromoform	ND	28
1 3-10-1	4-Methyl-2-Pentanone	ND	56
5 1-78-6	2-Hexanone	ND	56
127-18-4	Tetrachloroethene	110	28
79-34-5	1,1,2,2-Tetrachloroethane	ND	28
1 3-88-3	Toluene	ND	28
1 3-90-7	Chlorobenzene	ND	28
100-41-4	Ethylbenzene	ND	28
1 -42-5	Styrene	ND	28
3 -20-7	m&p-Xylenes	ND	28
95-47-6	o-Xylene	ND	28

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

5.6 SUMMARY 23513

Data File : C:\HPCHEM\1\DATA\B4481.D
Acq On : 24 Jul 95 8:19 pm
Sample : 90012 SB-5
Misc : 1G
Quant Time: Jul 25 8:30 1995

Vial: 18
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

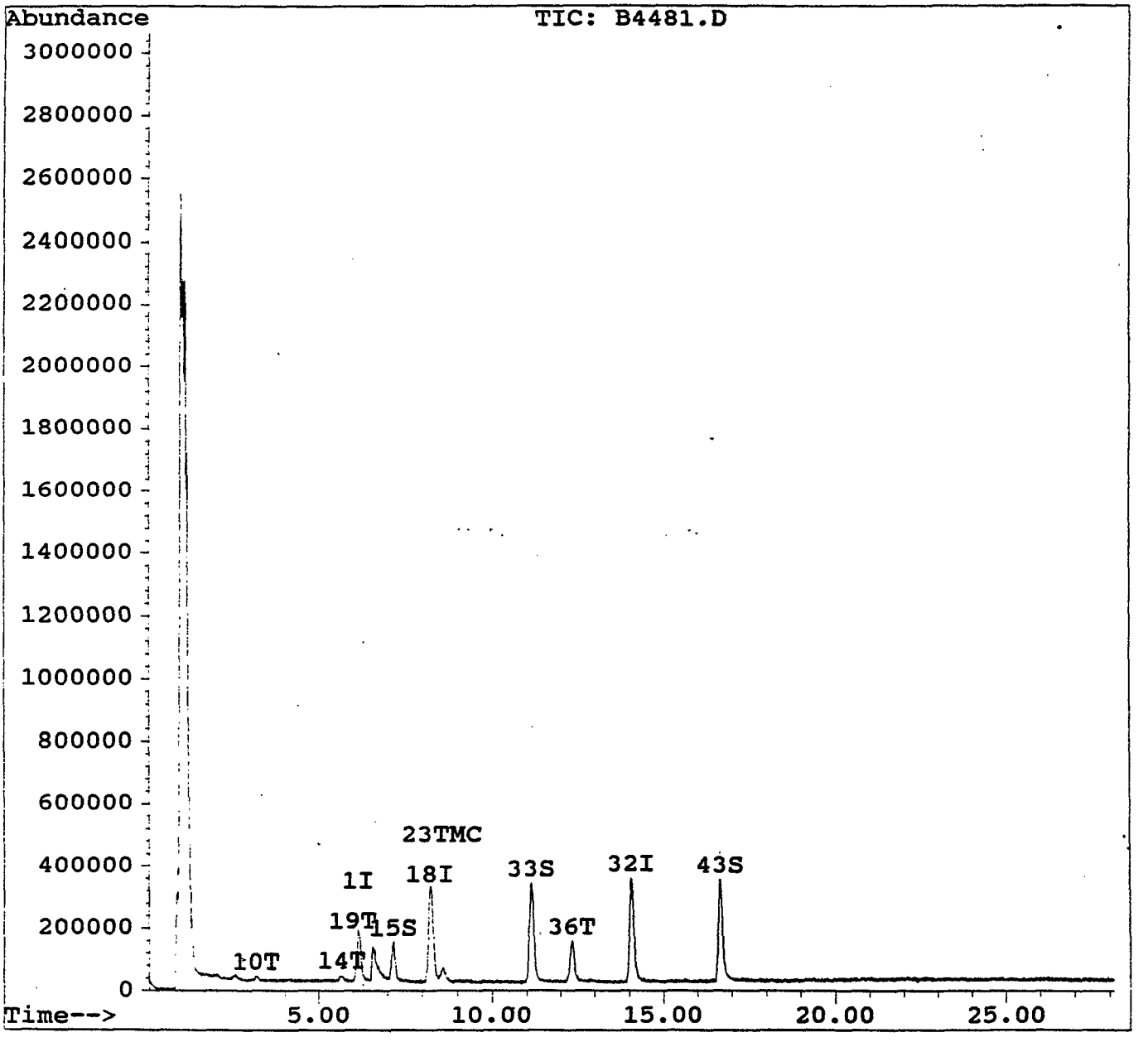
Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Bromochloromethane	6.17	638	156419	50.00 ug/l	-0.05
18) 1,4-Difluorobenzene	8.22	849	976646	50.00 ug/l	-0.34
32) Chlorobenzene-d5	14.07	1452	734676	50.00 ug/l	0.01
System Monitoring Compounds					**%Recovery**
15) 1,2-Dichloroethane-d4	7.18	741	298488	54.84 ug/l	109.68%
33) Toluene-d8	11.15	1151	889780	50.03 ug/l	100.06%
43) Bromofluorobenzene	16.67	1721	74252	46.50 ug/l	93.00%
Target Compounds					**Qvalue**
10) Methylene Chloride	3.16	326	14774	2.72 ug/l	89
14) cis-1,2-Dichloroethene	5.66	585	49839	5.77 ug/l m	61
19) 2-Butanone	6.00	620	1653	1.04 ug/l m	84
23) Trichloroethene	8.58	886	56404	8.52 ug/l m	4
36) Tetrachloroethene	12.31	1271	119410	19.08 ug/l	97

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\B4481.D
Acq On : 24 Jul 95 8:19 pm
Sample : 90012 SB-5
Misc : 1G
Quant Time: Jul 25 8:30 1995

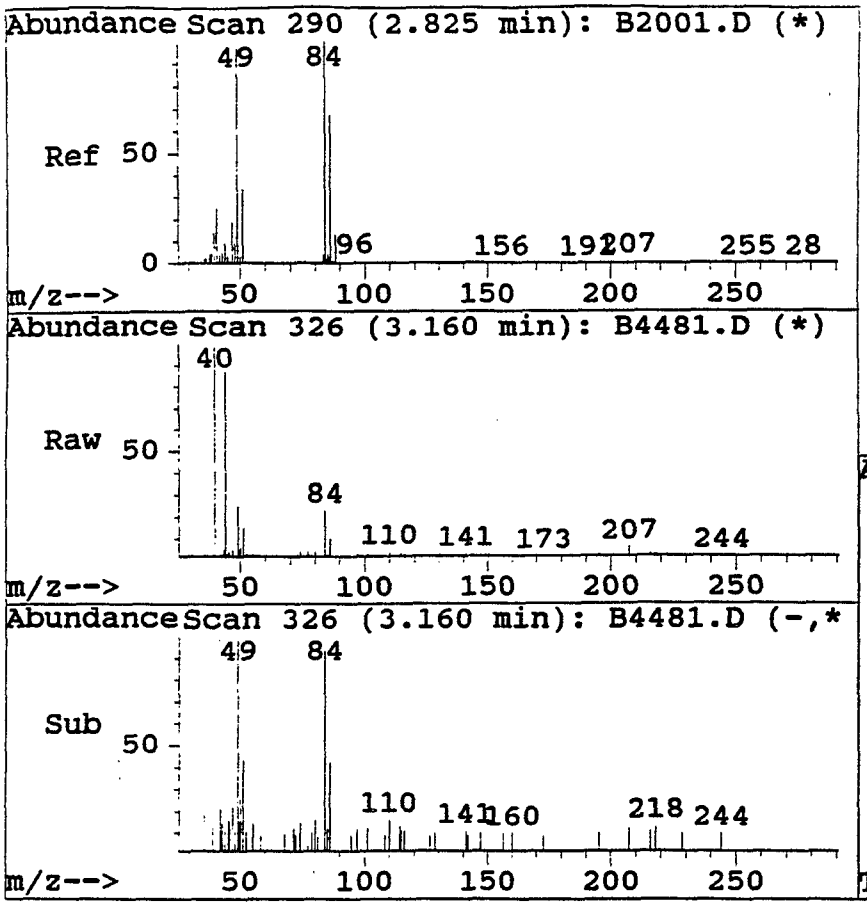
Vial: 18
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



MC 8/15/95

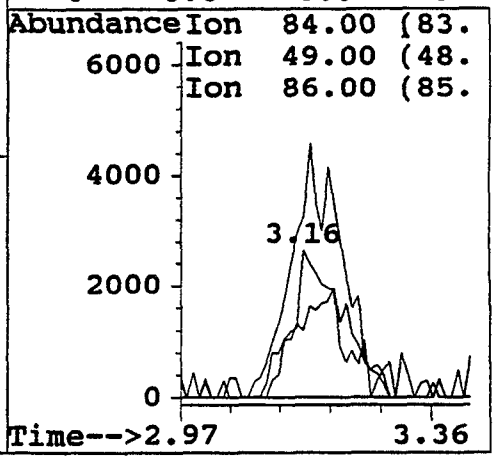
AR301502

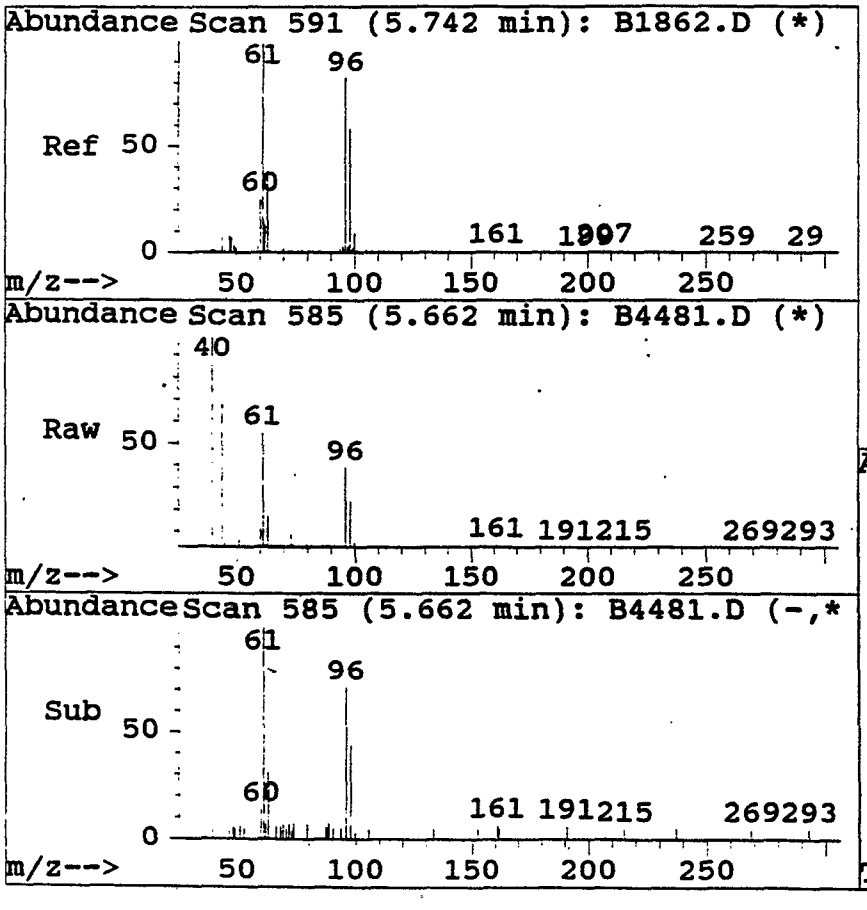


#10
Methylene Chloride
Concen: 2.72 ug/l
RT: 3.16 min Scan# 326
Delta R.T. -0.12 min
Lab File: B4481.D
Acq: 24 Jul 95 8:19 pm

Tgt Ion:84 Resp: 14774

Ion	Ratio	Lower	Upper
84	100		
49	97.9	94.8	134.8
86	60.4	43.6	83.6
0	0.0	0.0	0.0

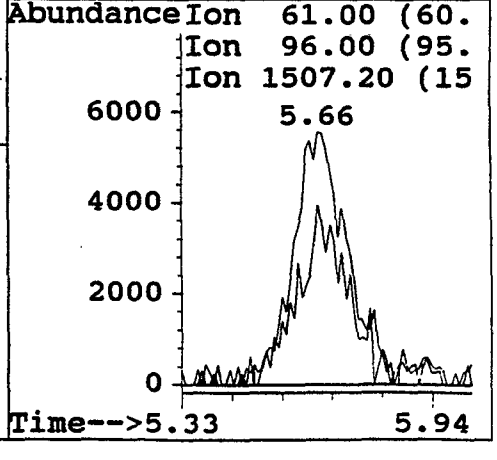


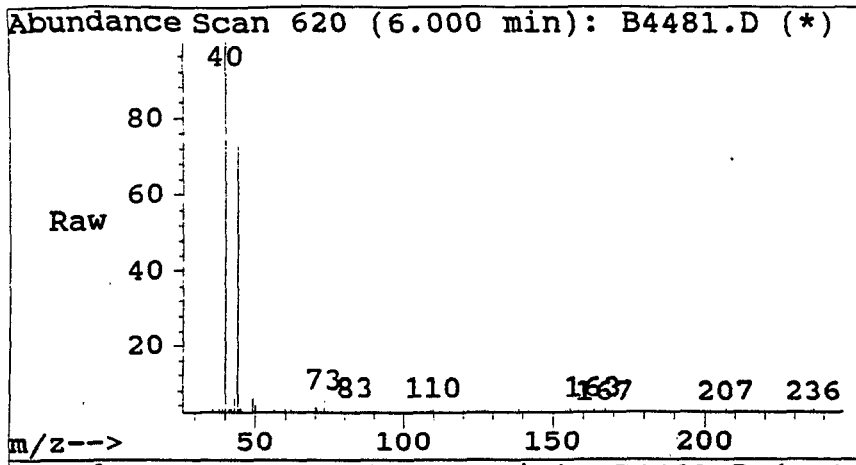


#14
cis-1,2-Dichloroethene
Concen: 5.77 ug/l m
RT: 5.66 min Scan# 585
Delta R.T. -0.09 min
Lab File: B4481.D
Acq: 24 Jul 95 8:19 pm

Tgt Ion:61 Resp: 49839

Ion	Ratio	Lower	Upper
61	100		
96	71.1	58.1	98.1
1507	0.0	0.0	20.0
0	0.0	0.0	0.0

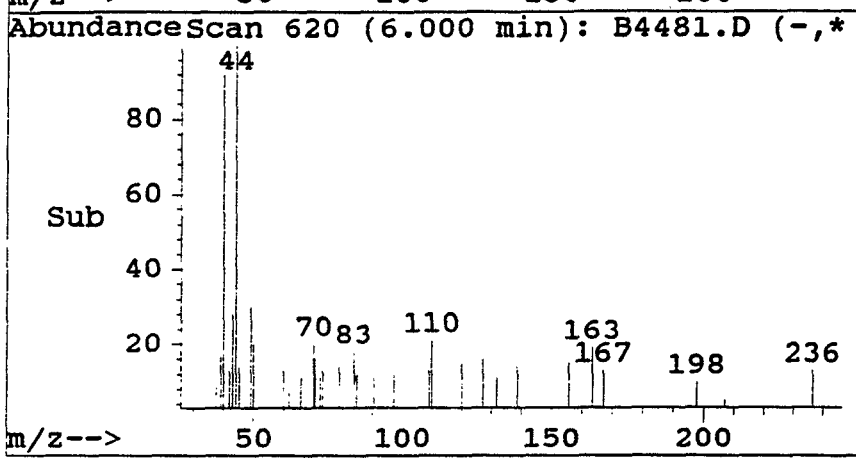


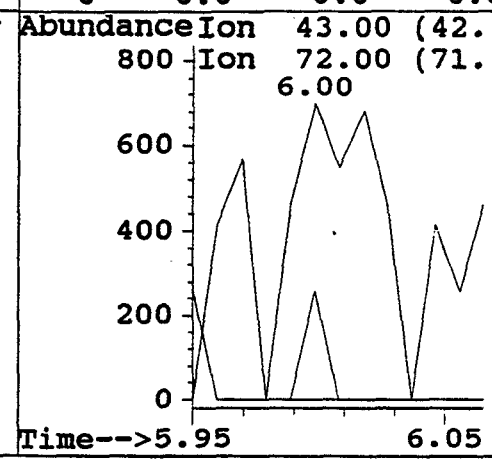


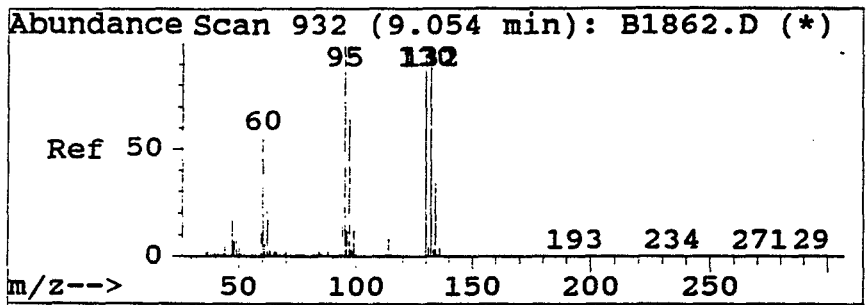
#19
2-Butanone
Concen: 1.04 ug/l m
RT: 6.00 min Scan# 620
Delta R.T. -0.04 min
Lab File: B4481.D
Acq: 24 Jul 95 8:19 pm

Tgt Ion:43 Resp: 1653

Ion	Ratio	Lower	Upper
43	100		
72	9.1	0.0	35.6
0	0.0	0.0	0.0
0	0.0	0.0	0.0



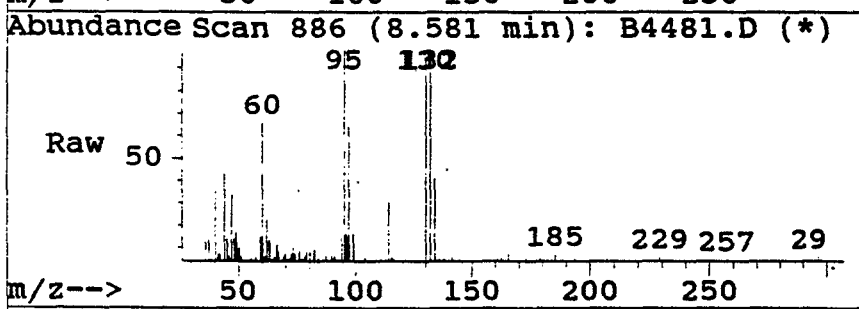


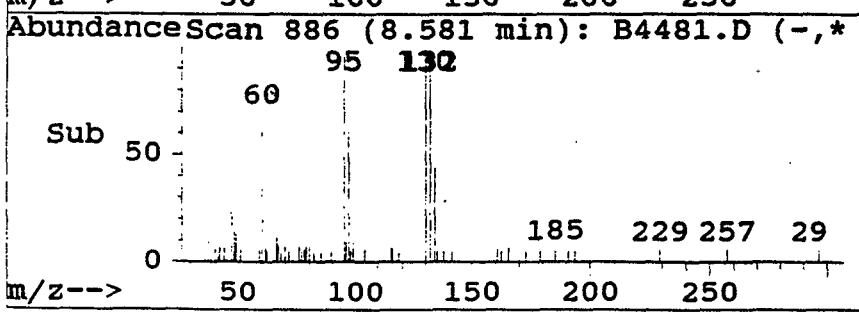


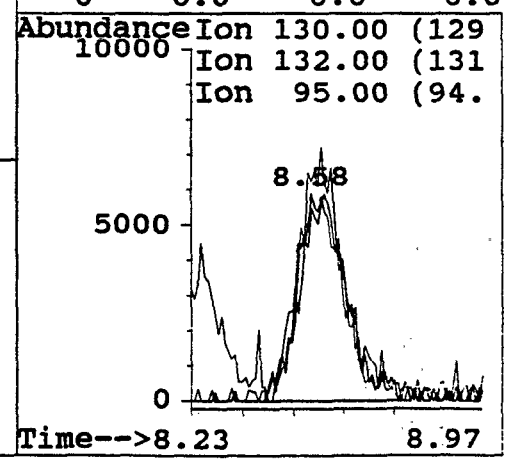
#23
Trichloroethene
Concen: 8.52 ug/l m
RT: 8.58 min Scan# 886
Delta R.T. -0.33 min
Lab File: B4481.D
Acq: 24 Jul 95 8:19 pm

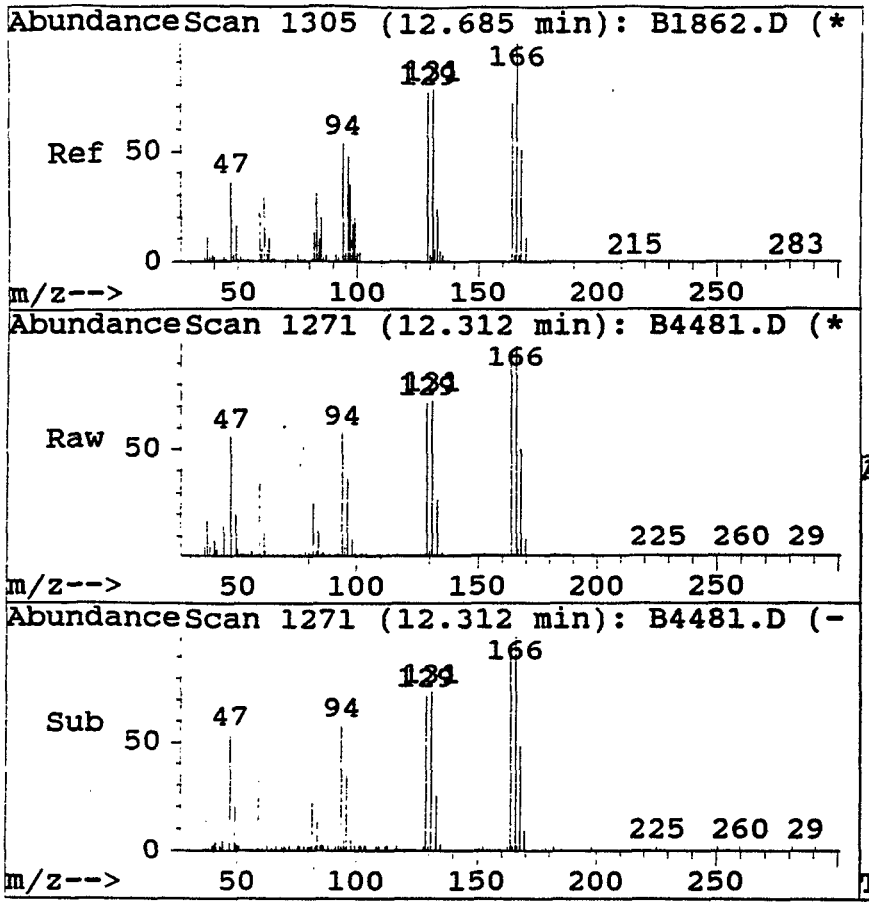
Tgt Ion:130 Resp: 56404

Ion	Ratio	Lower	Upper
130	100		
132	93.2	72.9	112.9
95	105.8	70.7	110.7
0	0.0	0.0	0.0





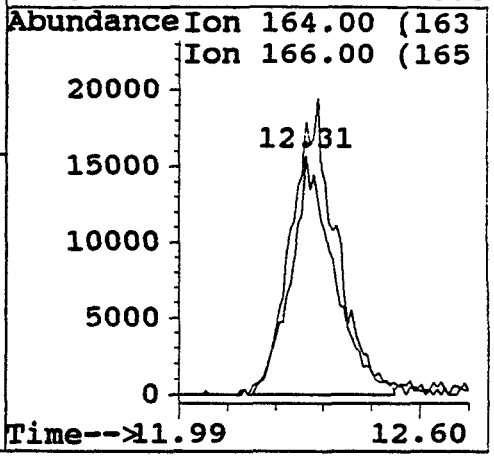




#36
Tetrachloroethene
Concen: 19.08 ug/l
RT: 12.31 min Scan# 1271
Delta R.T. 0.03 min
Lab File: B4481.D
Acq: 24 Jul 95 8:19 pm

Tgt Ion:164 Resp: 119410

Ion	Ratio	Lower	Upper
164	100		
166	128.6	105.6	145.6
0	0.0	0.0	0.0
0	0.0	0.0	0.0



Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 90014
MATRIX : WATER
CLIENT ID : SPLP/#90013
ample wt/vol : 5ML

ANALYSIS DATE : 07/24/1995
RECVD DATE : 07/20/1995
ID FILE : g18t.id
DATA FILE : b4484

	Compound	Result (ug/L)	Detection Limit (ug/L)
71-43-2	Benzene	3 J	5
6-23-5	Carbon Tetrachloride	ND	5
108-90-7	Chlorobenzene	4 J	5
67-66-3	Chloroform	ND	5
07-02-2	1,2-Dichloroethane	ND	5
5-35-4	1,1-Dichloroethene	ND	5
78-93-3	2-Butanone	ND	10
127-18-4	Tetrachloroethene	87	5
9-01-6	Trichloroethene	64	5
5-01-4	Vinyl Chloride	ND	10
106-46-7	1,4-Dichlorobenzene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

..0 SUMMARY 23513

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4484.D
Acq On : 24 Jul 95 10:15 pm
Sample : 90014 SPLP90013
Misc : 5ML
Quant Time: Jul 25 8:41 1995

Vial: 21
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Bromochloromethane	6.16	636	267125	50.00 ug/l	-0.07
18) 1,4-Difluorobenzene	8.56	884	1355272	50.00 ug/l	0.00
32) Chlorobenzene-d5	14.05	1450	1092260	50.00 ug/l	0.00
System Monitoring Compounds					**%Recovery**
15) 1,2-Dichloroethane-d4	7.42	766	495999	53.36 ug/l	106.72%
33) Toluene-d8	11.09	1145	1416481	53.57 ug/l	107.15%
43) Bromofluorobenzene	16.67	1720	119008	50.13 ug/l	100.26%
Target Compounds					**Qvalue**
22) Benzene	7.43	767	61794	2.61 ug/l m	100
23) Trichloroethene	8.88	917	583123	63.47 ug/l #	85
36) Tetrachloroethene	12.26	1265	805677	86.57 ug/l	86
38) Chlorobenzene	14.10	1455	72440	3.82 ug/l	82

TMC 7/25/95

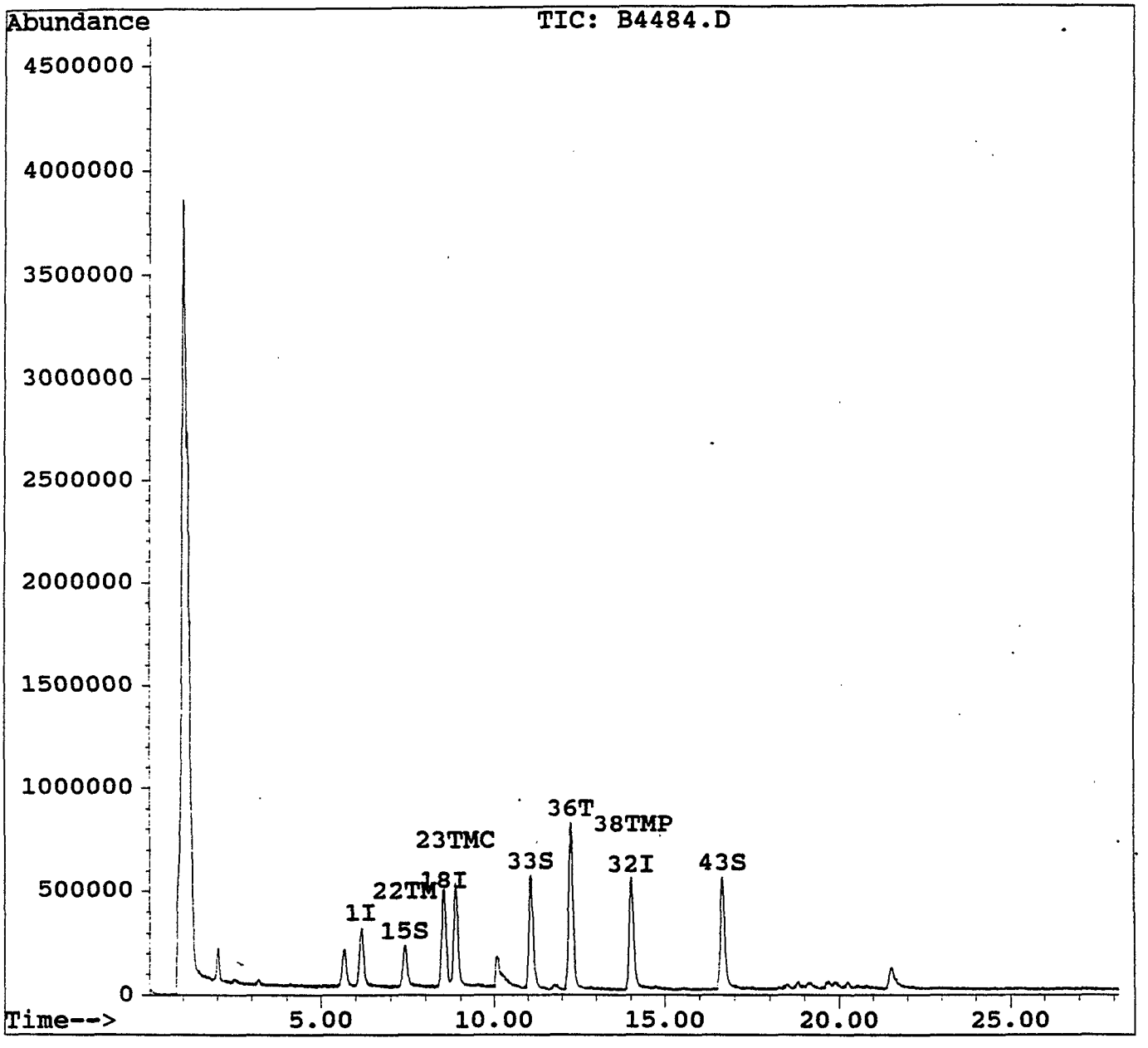
(#) = qualifier out of range (m) = manual integration

Quantitation Report

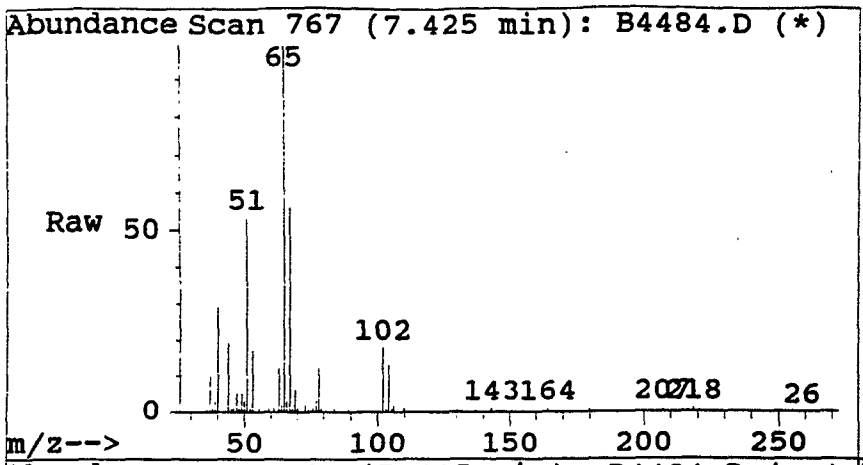
Data File : C:\HPCHEM\1\DATA\B4484.D
Acq On : 24 Jul 95 10:15 pm
Sample : 90014 SPLP90013
Misc : 5ML
Quant Time: Jul 25 8:41 1995

Vial: 21
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



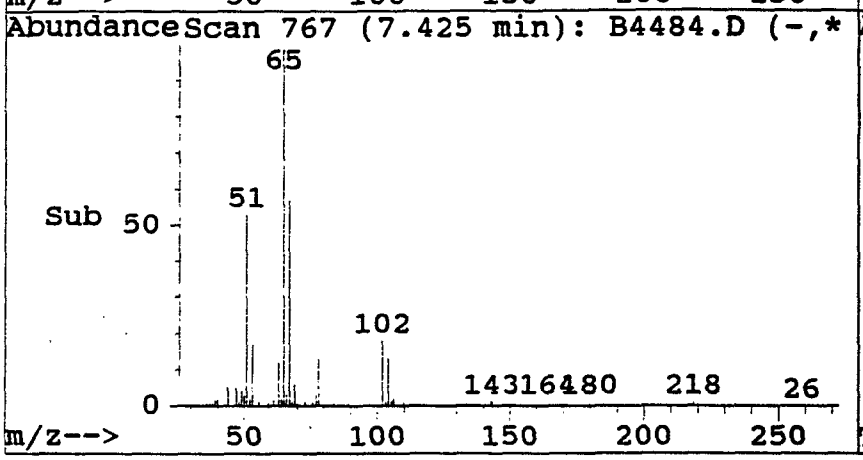
MC 7/25/95

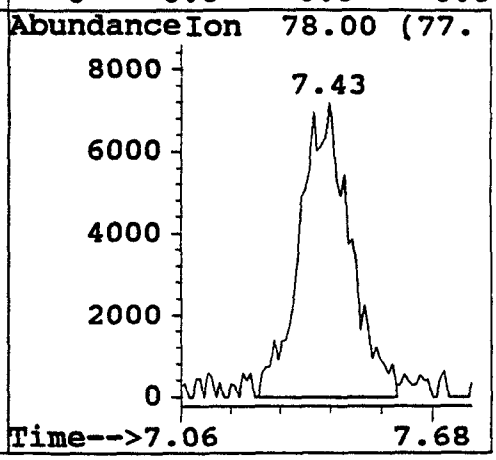


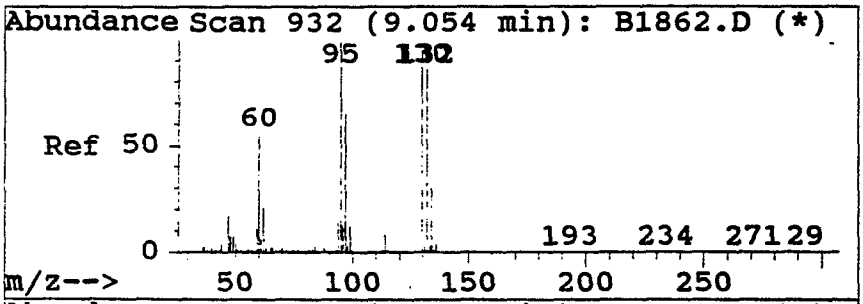
#22
Benzene
Concen: 2.61 ug/l m
RT: 7.43 min Scan# 767
Delta R.T. -0.02 min
Lab File: B4484.D
Acq: 24 Jul 95 10:15 pm

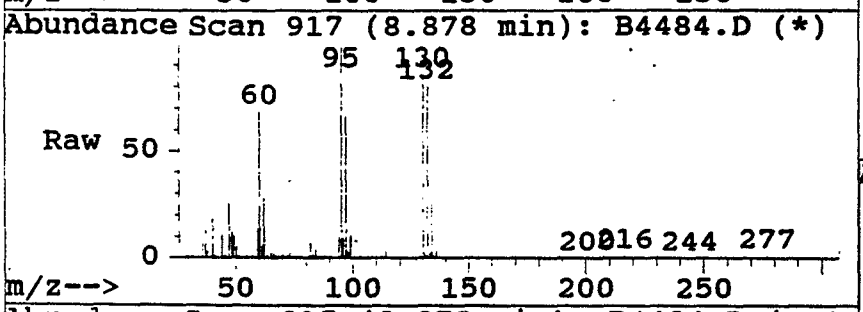
Tgt Ion:78 Resp: 61794

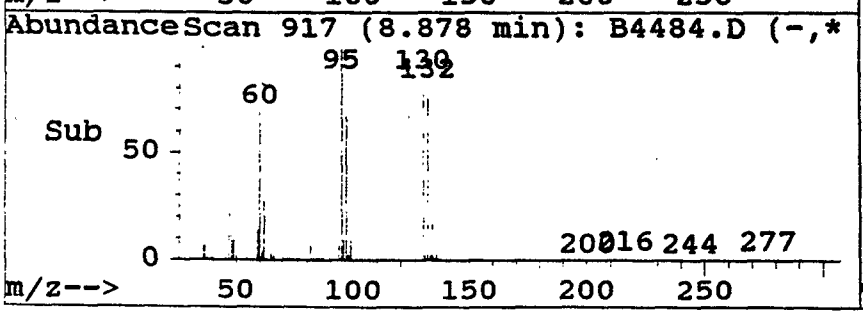
Ion	Ratio	Lower	Upper
78	100		
0	0.0	0.0	0.0
0	0.0	0.0	0.0
0	0.0	0.0	0.0







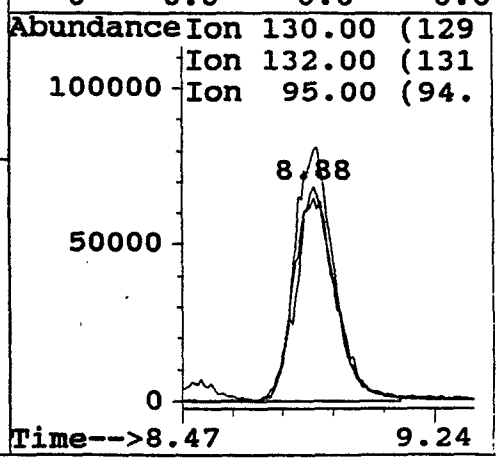


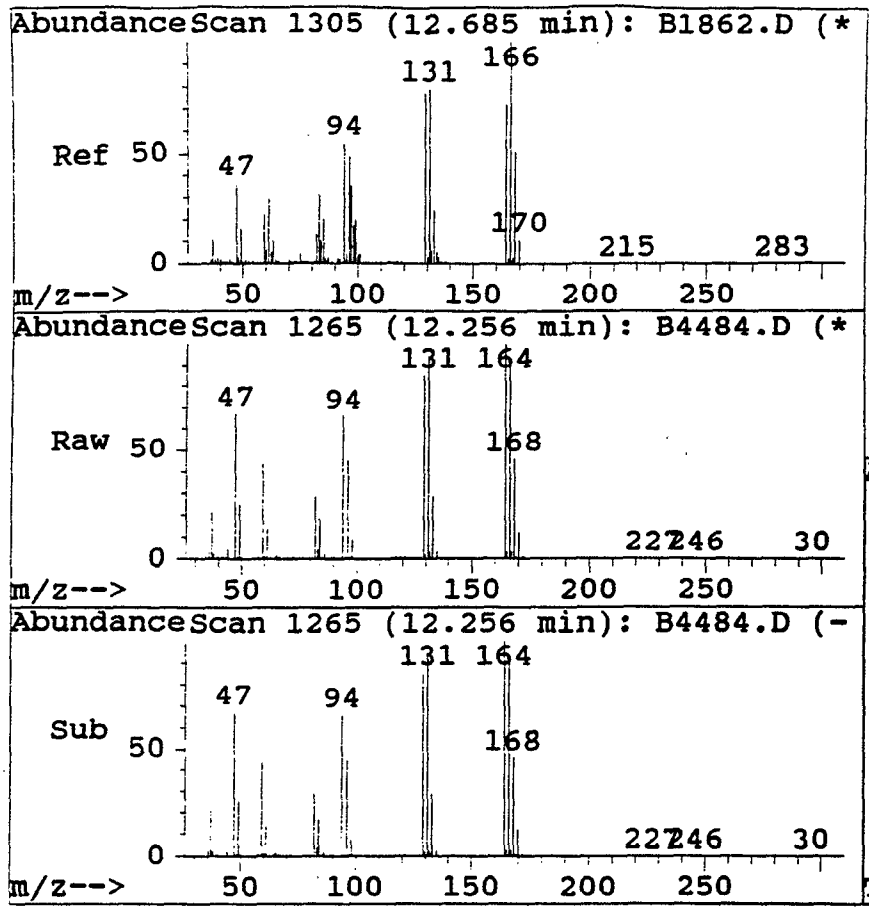


#23
Trichloroethene
Concen: 63.47 ug/l
RT: 8.88 min Scan# 917
Delta R.T. -0.03 min
Lab File: B4484.D
Acq: 24 Jul 95 10:15 pm

Tgt Ion:130 Resp: 583123

Ion	Ratio	Lower	Upper
130	100		
132	94.7	72.9	112.9
95	117.7	70.7	110.7#
0	0.0	0.0	0.0

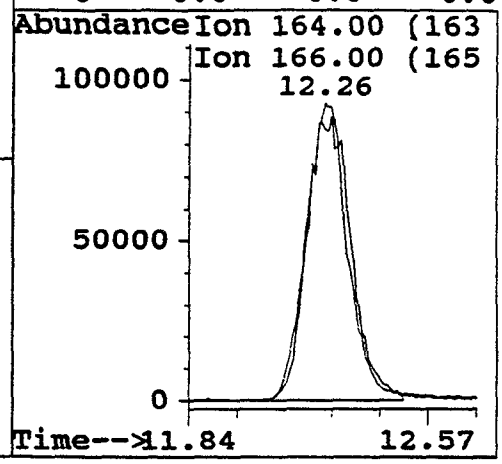


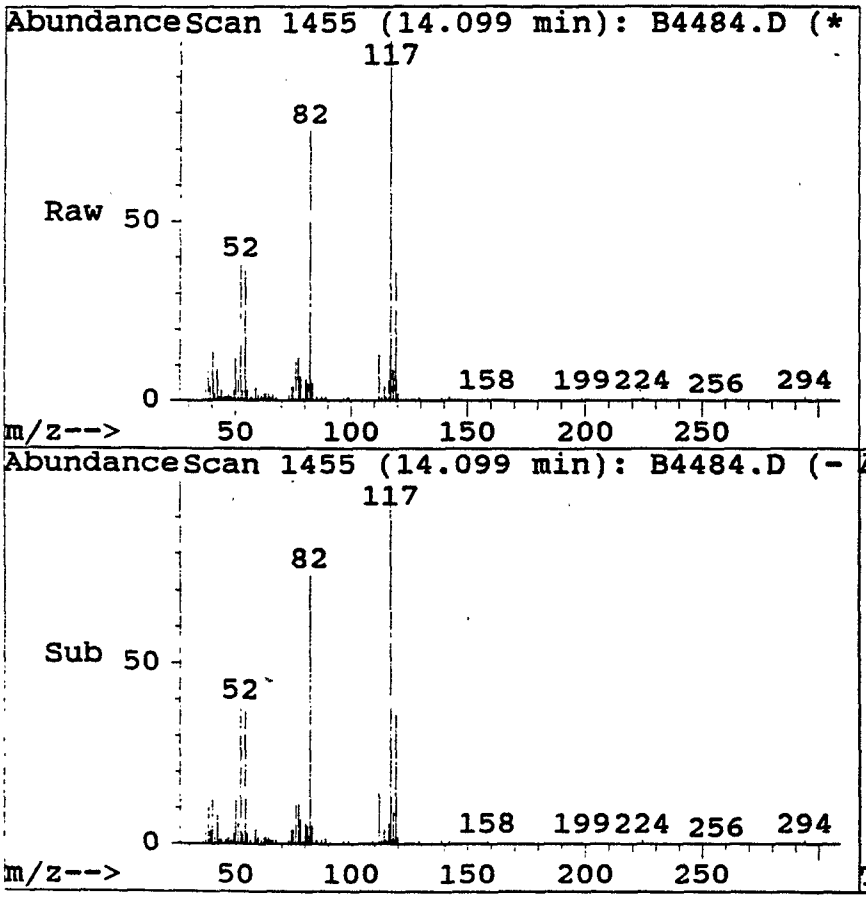


#36
Tetrachloroethene
Concen: 86.57 ug/l
RT: 12.26 min Scan# 1265
Delta R.T. -0.03 min
Lab File: B4484.D
Acq: 24 Jul 95 10:15 pm

Tgt Ion:164 Resp: 805677

Ion	Ratio	Lower	Upper
164	100		
166	109.5	105.6	145.6
0	0.0	0.0	0.0
0	0.0	0.0	0.0

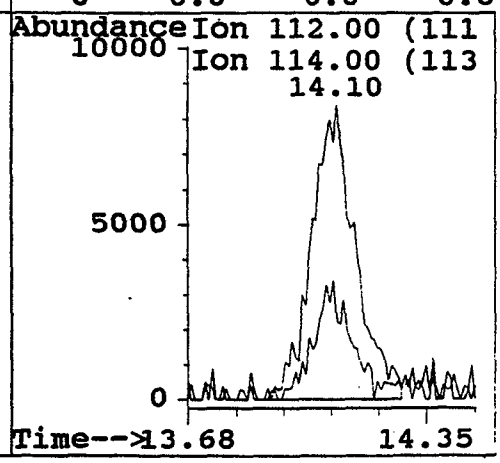




#38
Chlorobenzene
Concen: 3.82 ug/l
RT: 14.10 min Scan# 1455
Delta R.T. 0.01 min
Lab File: B4484.D
Acq: 24 Jul 95 10:15 pm

Tgt Ion:112 Resp: 72440

Ion	Ratio	Lower	Upper
112	100		
114	22.3	12.4	52.4
0	0.0	0.0	0.0
0	0.0	0.0	0.0



2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	VBLK01	109	95	98		
02	/89888	109	104	100		
03	/89685C	102	105	85		
04	/89686C	108	102	99		
05	/89687C	108	101	97		
06	/89688	107	107	95		
07	/90008	112	109	94		
08	/90009	105	109	88		
09	/90010	104	101	96		
10	/90011	106	105	95		
11	/90012	110	100	93		
12	/89888MS	111	105	100		
13	/89888MSD	99	105	94		
14	/90014	107	107	100		
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
SMC1	= 1,2-Dichloroethane-d4	(71-121)
SMC2	= Toluene-d8	(85-115)
SMC3	= Bromofluorobenzene	(81-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	VBLK01	101	95	107		
02	/89974	103	99	95		
03	/89973	109	99	93		
04	/89886	105	104	92		
05	/90066	111	98	94		
06	/89880B	108	105	90		
07	/89887D	108	96	93		
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
SMC1	= 1,2-Dichloroethane-d4	(76-114)
SMC2	= Toluene-d8	(88-110)
SMC3	= Bromofluorobenzene	(86-115)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Level: (low/med) LOW

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	/90008	102	101	100		
02	/89881B	111	94	102		
03	/89882B	114	100	91		
04	/89883B	112	99	104		
05	/89884B	103	104	103		
06						
07						
08						
09						
10						
11						
12						
13						
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18						
19						
20						
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22						
23						
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25						
26						
27						
28						
29						
30						

		QC LIMITS
SMC1	= 1,2-Dichloroethane-d4	(71-121)
SMC2	= Toluene-d8	(85-115)
SMC3	= Bromofluorobenzene	(81-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	VBLK01	101	94	104		
02	/90011	113	103	101		
03						
04						
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		QC LIMITS
SMC1	= 1,2-Dichloroethane-d4	(76-114)
SMC2	= Toluene-d8	(88-110)
SMC3	= Bromofluorobenzene	(86-115)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM II VOA-1

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO. 1R.

VBLK01

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4471.D Lab Sample ID: BLANK

Date Analyzed: 7/24/95 Time Analyzed: 1405

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: A

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	/89888	BH4	B4472.D	1442
02	/89685C	MW-9	B4473.D	1520
03	/89686C	MW-3	B4474.D	1557
04	/89687C	FB	B4475.D	1635
05	/89688	TB	B4476.D	1713
06	/90008	SB-1	B4477.D	1751
07	/90009	SB-2	B4478.D	1828
08	/90010	SB-3	B4479.D	1905
09	/90011	SB-4	B4480.D	1940
10	/90012	SB-5	B4481.D	2019
11	/89888MS	BH4MS	B4482.D	2057
12	/89888MSD	BH4MSD	B4483.D	2136
13	/90014	S90013	B4484.D	2215
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV VOA 3/90

VOLATILE ORGANIC COMPOUNDS DATA SHEET

LAB SAMPLE # : METHOD
MATRIX : WATER
LIENT ID :
ample wt/vol : 5ML

ANALYSIS DATE : 07/24/199
RECVD DATE :
ID FILE : g18.id
DATA FILE : b4471

Compound		Result (ug/L)	Detection Limit (ug/L)
4-87-3	Chloromethane	ND	10
4-83-9	Bromomethane	ND	10
75-01-4	Vinyl Chloride	ND	10
5-00-3	Chloroethane	ND	10
5-09-2	Methylene Chloride	ND	5
67-64-1	Acetone	ND	10
75-15-0	Carbon Disulfide	ND	10
5-35-4	1,1-Dichloroethene	ND	5
5-34-3	1,1-Dichloroethane	ND	5
156-59-2	cis-1,2-Dichloroethene	ND	5
156-60-5	trans-1,2-Dichloroethene	ND	5
7-66-3	Chloroform	ND	5
07-02-2	1,2-Dichloroethane	ND	5
78-93-3	2-Butanone	ND	10
-55-6	1,1,1-Trichloroethane	ND	5
5-23-5	Carbon Tetrachloride	ND	5
27-4	Bromodichloromethane	ND	5
7-5	1,2-Dichloropropane	ND	5
061-01-5	cis-1,3-Dichloropropene	ND	5
-01-6	Trichloroethene	ND	5
124-48-1	Dibromochloromethane	ND	5
79-00-5	1,1,2-Trichloroethane	ND	5
-43-2	Benzene	ND	5
061-02-6	trans-1,3-Dichloropropene	ND	5
75-25-2	Bromoform	ND	5
08-10-1	4-Methyl-2-Pentanone	ND	10
1-78-6	2-Hexanone	ND	10
7-18-4	Tetrachloroethene	ND	5
79-34-5	1,1,2,2-Tetrachloroethane	ND	5
8-88-3	Toluene	ND	5
8-90-7	Chlorobenzene	ND	5
100-41-4	Ethylbenzene	ND	5
100-42-5	Styrene	ND	5
0-20-7	m&p-Xylenes	ND	5
-47-6	o-Xylene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.0 SUMMARY

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4471.D
Acq On : 24 Jul 95 2:05 pm
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Jul 25 7:35 1995

Vial: 8
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Bromochloromethane	6.21	642	78658	50.00 ug/l	-0.01
18) 1,4-Difluorobenzene	8.58	887	329150	50.00 ug/l	0.02
32) Chlorobenzene-d5	14.05	1451	295647	50.00 ug/l	0.00
System Monitoring Compounds					**%Recovery**
15) 1,2-Dichloroethane-d4	7.50	775	148853	54.38 ug/l	108.77%
33) Toluene-d8	11.13	1150	340012	47.51 ug/l	95.02%
43) Bromofluorobenzene	16.69	1723	31631	49.23 ug/l	98.45%

Target Compounds — Qvalue

(#) = qualifier out of range (m) = manual integration

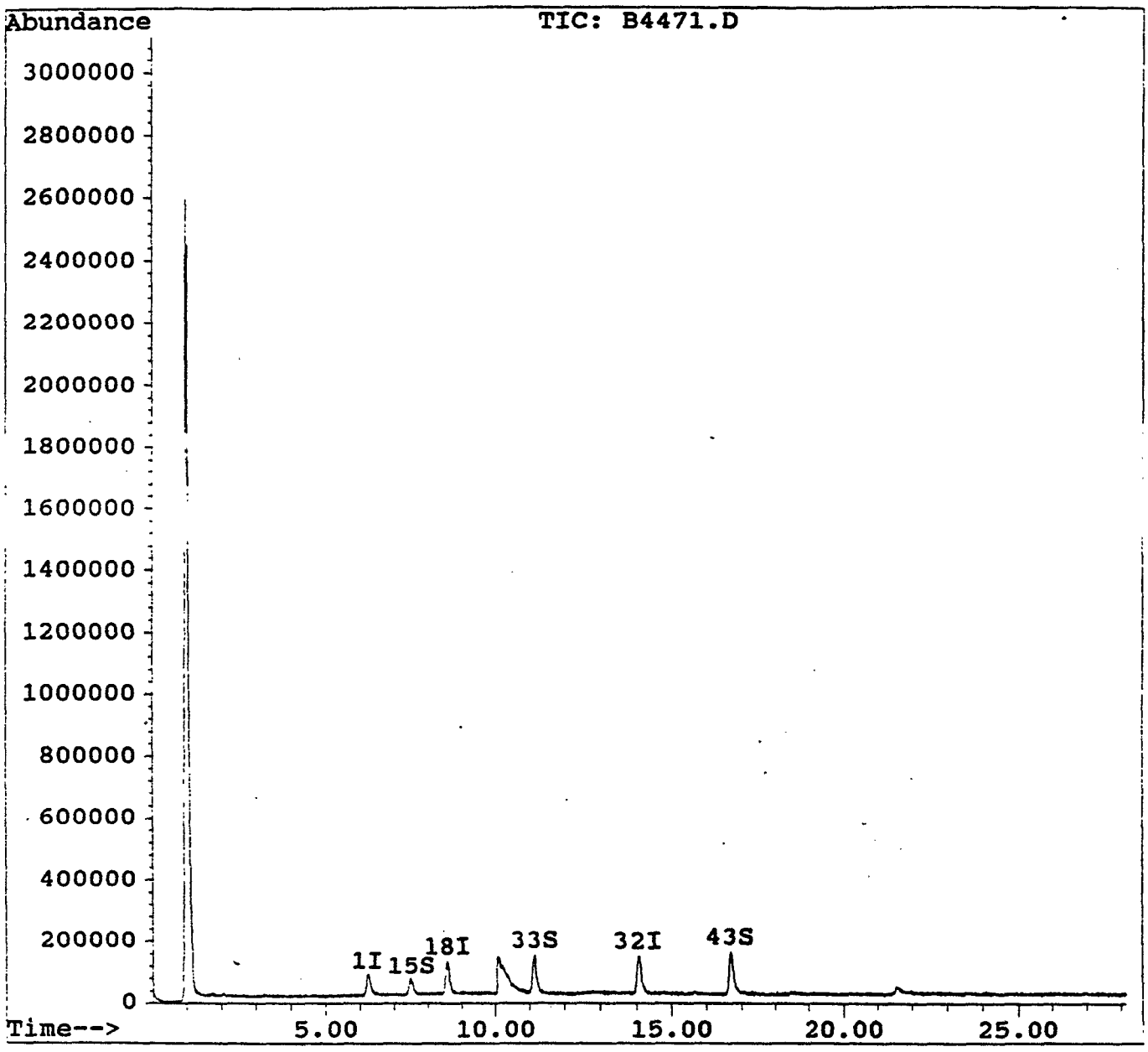
Quantitation Report

167

Data File : C:\HPCHEM\1\DATA\B4471.D
Acq On : 24 Jul 95 2:05 pm
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Jul 25 7:35 1995

Vial: 8
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



AR301518

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.: 16

VBLK01

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4487.D Lab Sample ID: BLANK

Date Analyzed: 7/25/95 Time Analyzed: 1127

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: A

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	/90008	SB-1	B4488.D	1204
02	/89974	TRIP	B4489.D	1405
03	/89973	MW1-01	B4490.D	1445
04	/89881B	T17	B4491.D	1522
05	/89882B	T89979	B4492.D	1600
06	/89883B	T19	B4493.D	1637
07	/89884B	T89981	B4494.D	1714
08	/89886	TB	B4498.D	1942
09	/90066	SPLPBLK	B4499.D	2016
10	/89880B	FB	B4500.D	2056
11	/89887D	TCLPBLK	B4501.D	2136
12				
13				
14				
15				
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27				
28				
29				
30				

COMMENTS:

AR301519

Raytheon
Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

LAB SAMPLE # : METHOD
MATRIX : WATER
CLIENT ID :
Sample wt/vol : 5ML

ANALYSIS DATE : 07/25/199
RECVD DATE :
ID FILE : g18.id
DATA FILE : b4487

	Compound	Result (ug/L)	Detection Limit (ug/L)
74-87-3	Chloromethane	ND	10
74-83-9	Bromomethane	ND	10
75-01-4	Vinyl Chloride	ND	10
75-00-3	Chloroethane	ND	10
75-09-2	Methylene Chloride	ND	5
67-64-1	Acetone	ND	10
75-15-0	Carbon Disulfide	ND	10
75-35-4	1,1-Dichloroethene	ND	5
75-34-3	1,1-Dichloroethane	ND	5
156-59-2	cis-1,2-Dichloroethene	ND	5
156-60-5	trans-1,2-Dichloroethene	ND	5
67-66-3	Chloroform	ND	5
107-02-2	1,2-Dichloroethane	ND	5
78-93-3	2-Butanone	ND	10
71-55-6	1,1,1-Trichloroethane	ND	5
56-23-5	Carbon Tetrachloride	ND	5
75-27-4	Bromodichloromethane	ND	5
78-87-5	1,2-Dichloropropane	ND	5
10061-01-5	cis-1,3-Dichloropropene	ND	5
79-01-6	Trichloroethene	ND	5
124-48-1	Dibromochloromethane	ND	5
79-00-5	1,1,2-Trichloroethane	ND	5
71-43-2	Benzene	ND	5
10061-02-6	trans-1,3-Dichloropropene	ND	5
75-25-2	Bromoform	ND	5
108-10-1	4-Methyl-2-Pentanone	ND	10
591-78-6	2-Hexanone	ND	10
127-18-4	Tetrachloroethene	ND	5
79-34-5	1,1,2,2-Tetrachloroethane	ND	5
108-88-3	Toluene	ND	5
108-90-7	Chlorobenzene	ND	5
100-41-4	Ethylbenzene	ND	5
100-42-5	Styrene	ND	5
330-20-7	m&p-Xylenes	ND	5
95-47-6	o-Xylene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.0 SUMMARY

Quantitation Report

171

Data File : C:\HPCHEM\1\DATA\B4487.D
Acq On : 25 Jul 95 11:27 am
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Jul 25 12:57 1995

Vial: 8
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :
Last Update : Mon Oct 15 08:57:55 1990
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Bromochloromethane	6.26	647	41875	50.00 ug/l	0.03
18) 1,4-Difluorobenzene	8.60	889	179599	50.00 ug/l	0.03
32) Chlorobenzene-d5	14.08	1455	159166	50.00 ug/l	0.03

System Monitoring Compounds					%Recovery
15) 1,2-Dichloroethane-d4	7.50	776	86834	50.67 ug/l	101.33%
33) Toluene-d8	11.11	1148	188341	47.27 ug/l	94.54%
43) Bromofluorobenzene	16.68	1723	19223	53.30 ug/l	106.59%

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

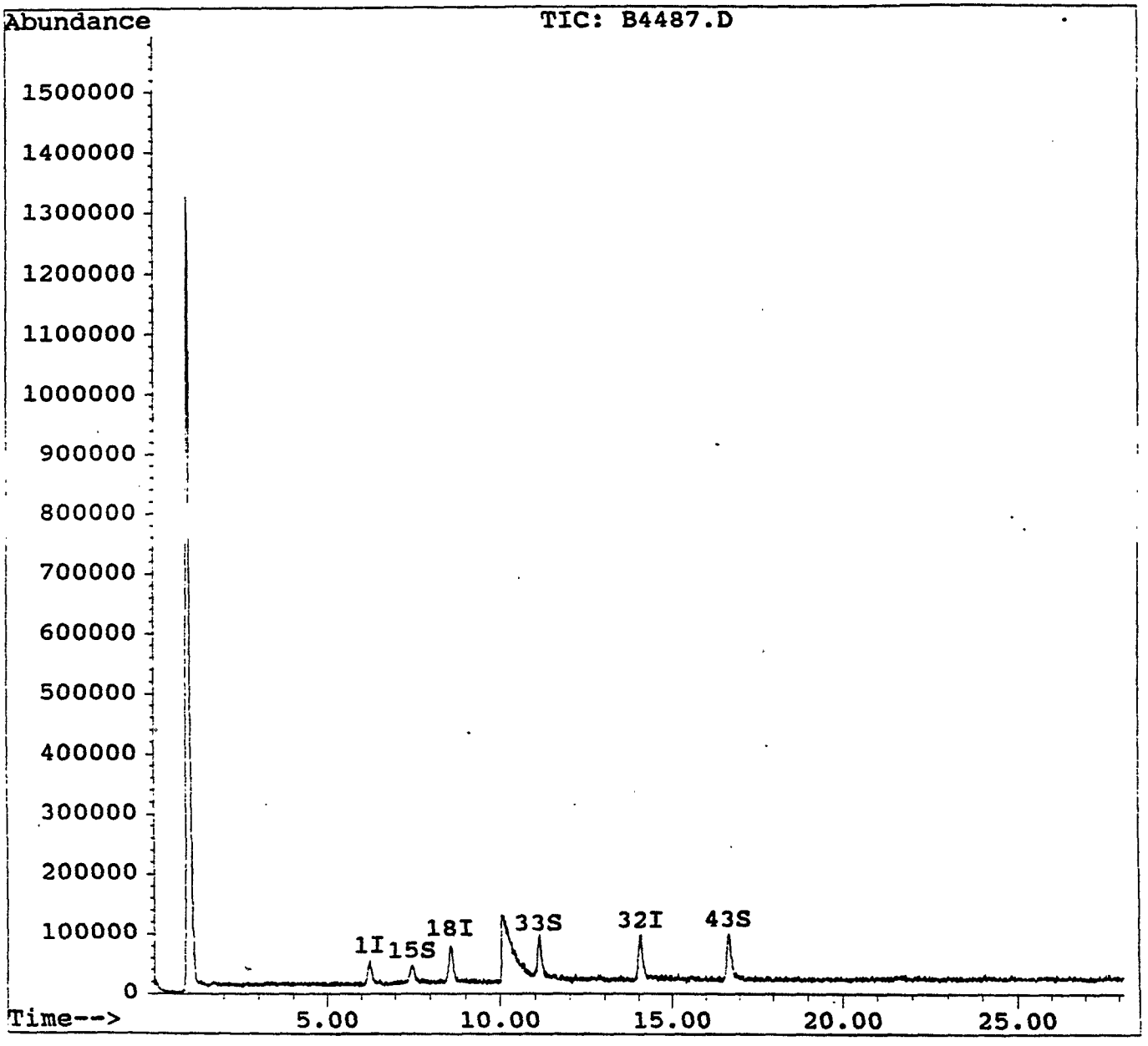
AR301521

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4487.D
Acq On : 25 Jul 95 11:27 am
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Jul 25 12:57 1995

Vial: 8
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :
Last Update : Mon Oct 15 08:57:55 1990
Response via : Single Level Calibration



4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO. 117.

VBLK01

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4542.D Lab Sample ID: BLANK

Date Analyzed: 7/28/95 Time Analyzed: 1436

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	/90011	SB-4	B4543.D	1513
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
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30				

COMMENTS:

FORM IV VOA 3/90

Raytheon
Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

LAB SAMPLE # : METHOD
MATRIX : WATER
CLIENT ID :
Sample wt/vol : 5ML

ANALYSIS DATE : 07/28/1995
RECVD DATE :
ID FILE : g18.id
DATA FILE : b4542

	Compound	Result (ug/L)	Detection Limit (ug/L)
74-87-3	Chloromethane	ND	10
74-83-9	Bromomethane	ND	10
5-01-4	Vinyl Chloride	ND	10
75-00-3	Chloroethane	ND	10
75-09-2	Methylene Chloride	ND	5
7-64-1	Acetone	ND	10
5-15-0	Carbon Disulfide	ND	10
75-35-4	1,1-Dichloroethene	ND	5
5-34-3	1,1-Dichloroethane	ND	5
56-59-2	cis-1,2-Dichloroethene	ND	5
156-60-5	trans-1,2-Dichloroethene	ND	5
67-66-3	Chloroform	ND	5
07-02-2	1,2-Dichloroethane	ND	5
78-93-3	2-Butanone	ND	10
71-55-6	1,1,1-Trichloroethane	ND	5
-23-5	Carbon Tetrachloride	ND	5
-27-4	Bromodichloromethane	ND	5
78-87-5	1,2-Dichloropropane	ND	5
061-01-5	cis-1,3-Dichloropropene	ND	5
-01-6	Trichloroethene	ND	5
124-48-1	Dibromochloromethane	ND	5
79-00-5	1,1,2-Trichloroethane	ND	5
-43-2	Benzene	ND	5
061-02-6	trans-1,3-Dichloropropene	ND	5
75-25-2	Bromoform	ND	5
8-10-1	4-Methyl-2-Pentanone	ND	10
1-78-6	2-Hexanone	ND	10
127-18-4	Tetrachloroethene	ND	5
-34-5	1,1,2,2-Tetrachloroethane	ND	5
8-88-3	Toluene	ND	5
108-90-7	Chlorobenzene	ND	5
100-41-4	Ethylbenzene	ND	5
0-42-5	Styrene	ND	5
0-20-7	m&p-Xylenes	ND	5
95-47-6	o-Xylene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

AR301524

.0 SUMMARY

Data File : C:\HPDOS4\B4542.D
Acq On : 28 Jul 95 2:36 pm
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 14 10:40 1995

Vial: 11
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Aug 14 10:36:45 1995
Response via : Single Level Calibration

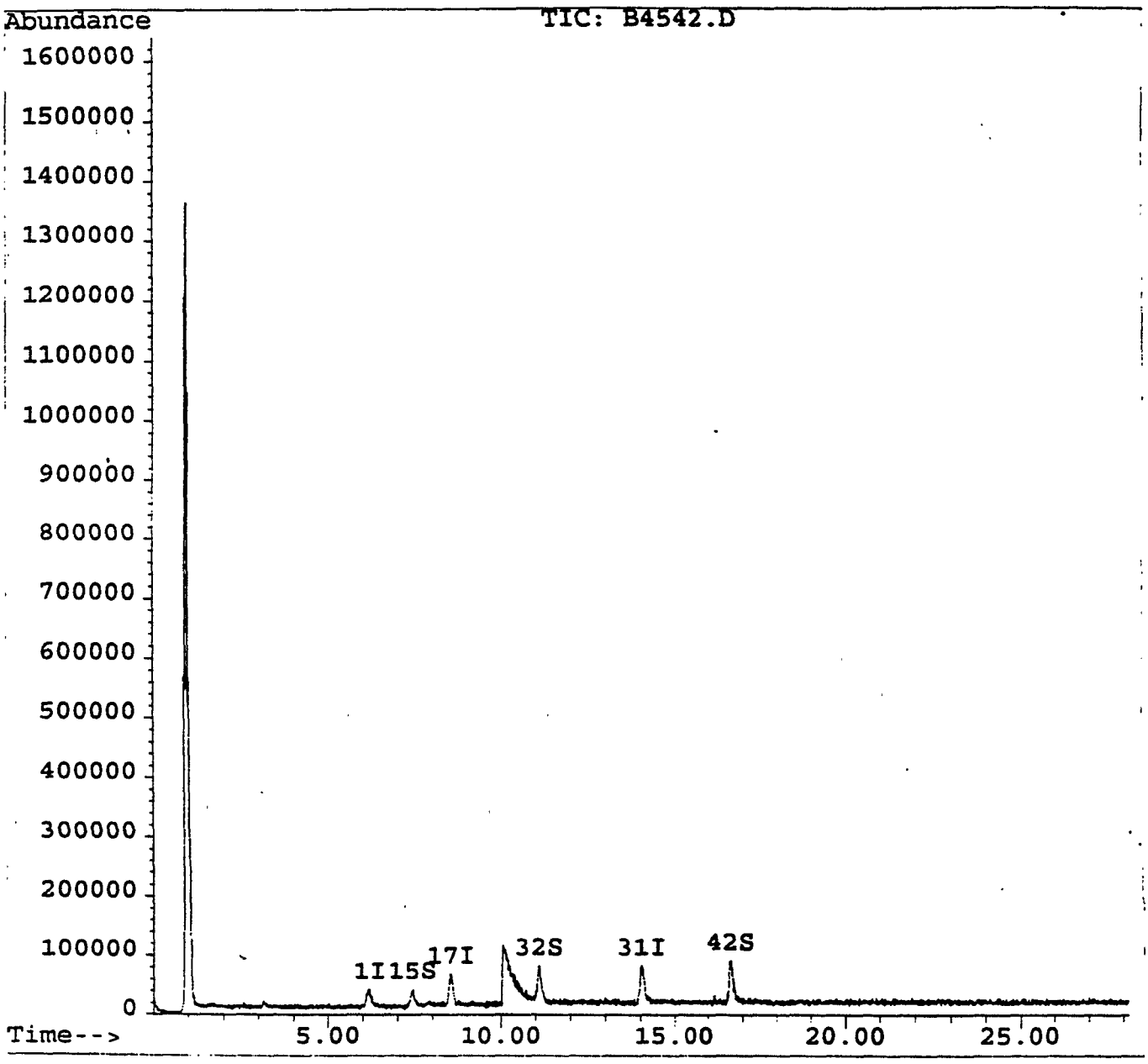
Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Bromochloromethane	6.21	642	31306	50.00 ug/l	0.02
17) 1,4-Difluorobenzene	8.55	885	139805	50.00 ug/l	0.03
31) Chlorobenzene-d5	14.05	1453	128897	50.00 ug/l	-0.03
System Monitoring Compounds					**%Recovery**
15) 1,2-Dichloroethane-d4	7.44	770	76945	50.64 ug/l	101.29%
32) Toluene-d8	11.13	1151	146860	46.95 ug/l	93.89%
42) Bromofluorobenzene	16.69	1725	7843	52.21 ug/l	104.42%
Target Compounds					**Qvalue**

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPDOS4\B4542.D
Acq On : 28 Jul 95 2:36 pm
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 14 10:40 1995

Vial: 11
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Aug 14 10:36:45 1995
Response via : Single Level Calibration



WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Matrix Spike - Sample No.: /89888

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	#	QC. LIMITS REC.
1,1-Dichloroethene	50	0	38.34	77	*	(61-145)
Benzene	50	0	46.92	94	*	(71-120)
Trichlorethene	50	0	47.34	95	*	(76-127)
Toluene	50	0	51.23	102	*	(76-125)
Chlorobenzene	50	0	54.38	109	*	(75-130)

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MS % REC	#	% RPD	#	QC LIMITS RPD	REC.
1,1-Dichloroethene	50	42.37	85	*	9		16	(61-145)
Benzene	50	52.15	104	*	10		14	(71-120)
Trichloroethene	50	52.88	106	*	11		11	(76-127)
Toluene	50	55.40	111	*	9		13	(76-125)
Chlorobenzene	50	54.67	109	*	0		13	(75-130)

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

Comments:

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4482.D
Acq On : 24 Jul 95 8:57 pm
Sample : 89888MS
Misc : 5G
Quant Time: Jul 25 8:34 1995

Vial: 19
Operator: GWEN
Inst : 5970 -
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units		Dev(Min)
1) Bromochloromethane	6.15	635	214788	50.00	ug/l		-0.08
18) 1,4-Difluorobenzene	8.53	881	1089997	50.00	ug/l		-0.03
32) Chlorobenzene-d5	14.02	1447	834753	50.00	ug/l		-0.03
System Monitoring Compounds							**%Recovery**
15) 1,2-Dichloroethane-d4	7.37	761	414969	55.52	ug/l		111.04%
33) Toluene-d8	11.09	1145	1058172	52.37	ug/l		104.73%
43) Bromofluorobenzene	16.63	1716	91062	50.19	ug/l		100.38%
Target Compounds							**Qvalue**
6) 1,1-Dichloroethene	2.44	251	292826	38.34	ug/l	m	0
8) Acetone	2.63	271	16699	11.50	ug/l	m	32
10) Methylene Chloride	3.16	326	19773	2.65	ug/l	m	3
22) Benzene	7.38	762	892366	46.92	ug/l		100
23) Trichloroethene	8.85	914	349851	47.34	ug/l	#	83
35) Toluene	11.20	1156	607124	51.23	ug/l		9[illegible]
38) Chlorobenzene	14.09	1454	788915	54.38	ug/l		96

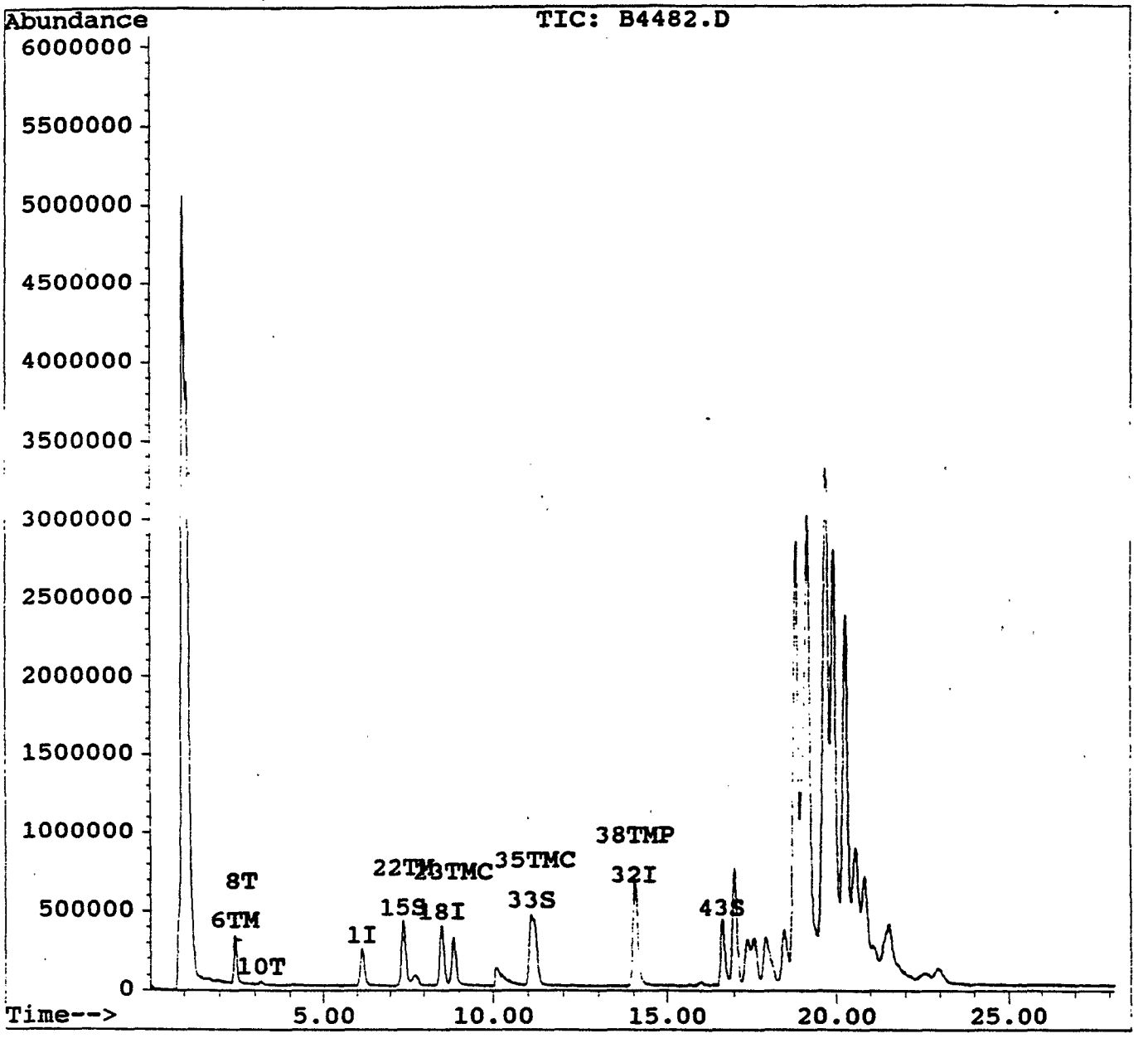
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4482.D
Acq On : 24 Jul 95 8:57 pm
Sample : 89888MS
Misc : 5G
Quant Time: Jul 25 8:34 1995

Vial: 19
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4483.D
Acq On : 24 Jul 95 9:36 pm
Sample : 89888MSD
Misc : 5G
Quant Time: Jul 25 8:37 1995

Vial: 20
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units		Dev(Min)
1) Bromochloromethane	6.15	635	276108	50.00	ug/l		-0.08
18) 1,4-Difluorobenzene	8.53	881	1301240	50.00	ug/l		-0.03
32) Chlorobenzene-d5	14.04	1449	948896	50.00	ug/l		-0.01
System Monitoring Compounds							**%Recovery**
15) 1,2-Dichloroethane-d4	7.41	765	477206	49.67	ug/l		99.34%
33) Toluene-d8	11.07	1143	1207906	52.59	ug/l		105.17%
43) Bromofluorobenzene	16.64	1717	96915	46.99	ug/l		93.99%
Target Compounds							**Qvalue**
6) 1,1-Dichloroethene	2.48	255	415993	42.37	ug/l	m	77
8) Acetone	2.70	278	18489	9.90	ug/l	m	98
10) Methylene Chloride	3.20	330	26024	2.71	ug/l	#	76
22) Benzene	7.40	764	1183948	52.15	ug/l	m	100
23) Trichloroethene	8.85	914	466450	52.88	ug/l	m	64
35) Toluene	11.20	1156	746397	55.40	ug/l	m	92
38) Chlorobenzene	14.09	1454	901587	54.67	ug/l		96

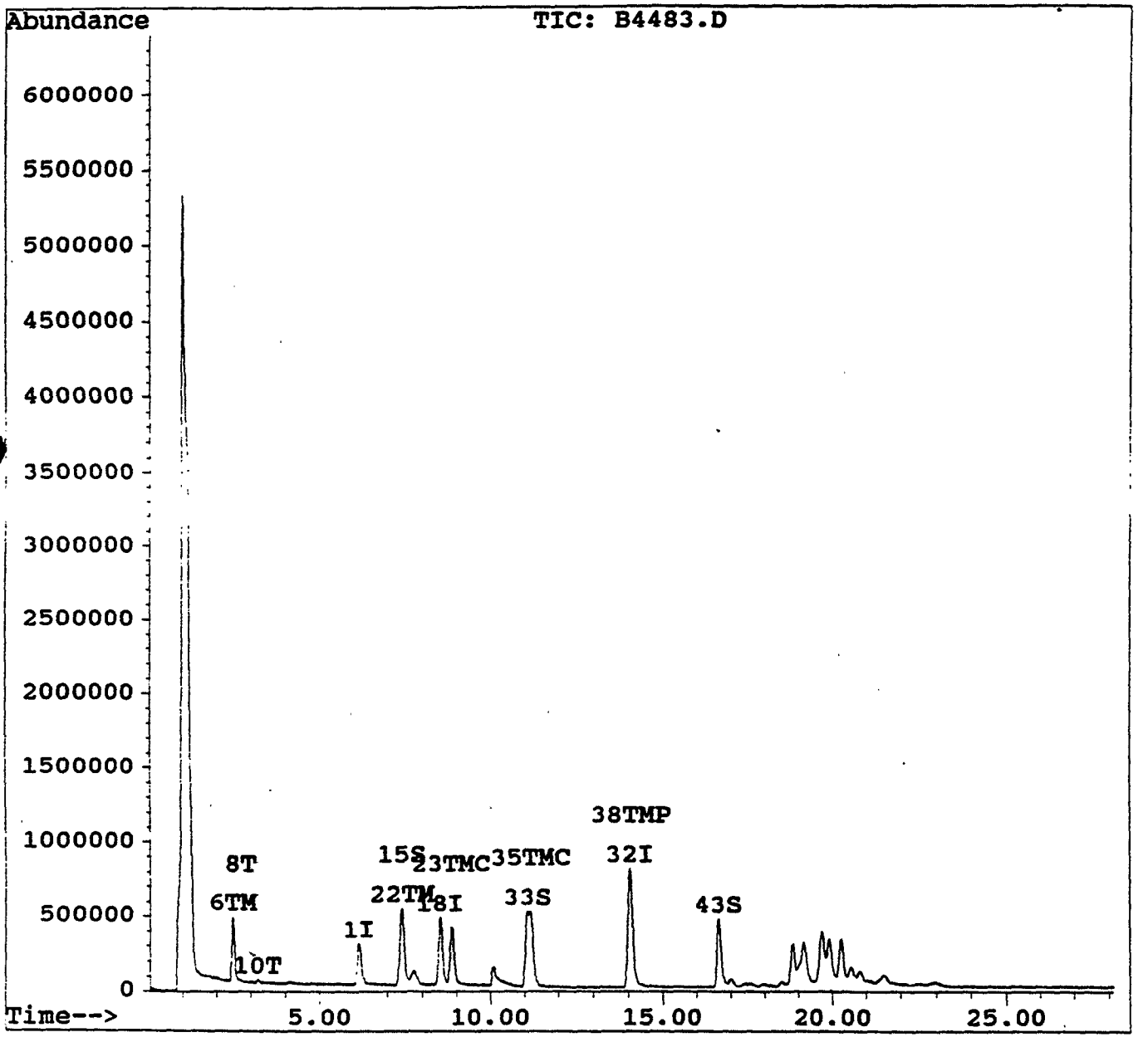
(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4483.D
Acq On : 24 Jul 95 9:36 pm
Sample : 89888MSD
Misc : 5G
Quant Time: Jul 25 8:37 1995

Vial: 20
Operator: GWEN
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\CLPVOB.M
Title : VOA Standards for 5 point calibration
Last Update : Mon Jul 24 13:40:49 1995
Response via : Single Level Calibration



AR301632

RAYTHEON ENGINEERS & CONSTRUCTORS
RAYTHEON ENVIRONMENTAL SERVICES LABORATORY

301 Chelsea Parkway
Boothwyn, Pa. 19061
(610) 497-8000

Report For:

McLaren/Hart (John Evan's Sons)
Mr. Russell Sacks
300 Steven's Dr.,Suite 200
Lester PA 19113

Job Number

7570067

Summary Number

23639

August 15, 1995

Reviewed by_____
Project Manager Dane Tanner

NJ ID# 77343	EPA ID# PA00078	PA ID# 23-272
CA ID# 1924	CO ID# PA00078	CT ID# PH0687
RI ID# A70	DE ID# PA00078	WV ID# 9915(C)
NC ID# 292	MA ID# M-PA078	SC ID# 89007
TN ID# 2927		NY ID# 11345

Raytheon Engineers
& Constructors, Inc.
Environmental Laboratory

301 Cheisea Parkway
Boothwyn PA 19061

610 497 8000
FAX 610 497 8005

Raytheon
Engineers & Constructors

August 15, 1995

McLaren/Hart (John Evan's Sons)
Mr. Russell Sacks
300 Steven's Dr.,Suite 200
Lester, PA 19113

Subject: RE&C Contract No. 7570067
Laboratory Analysis

Dear Mr. Sacks,

Attached is the analytical report for samples submitted to us on 07/19/1995. Inorganic sample results are reported on an as received basis unless otherwise noted. All organic sample results are reported on a dry weight basis unless otherwise noted.

All analyses are performed within method required holding times unless noted in a non-conformance report which, if necessary, is located following the method description summary. In addition, any conditions which may aid in the interpretation of the data are noted on this form.

If there are questions regarding this report, please contact me.

Very truly yours,

Joe C. Watt
Director

Raytheon
Engineers & Constructors

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Raytheon Engineers & Constructors, Inc.
Environmental Services Laboratory Data Summary
Summary # 23639

Log	Description	Code	Parameter	Result	Limit	Units	Sampled	Started	Complete	Analyst
90010	John Evan's SB-3(7-9)	1312	SPLP Leachate			Complete	07/19/1995	08/01/1995	08/02/1995	JVH
90659	John Evan's SB-X(5-7	G18	Acetone	34	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Benzene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Bromodichloromethane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Bromoform	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Bromomethane	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	2-Butanone	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Carbon Disulfide	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Carbon Tetrachloride	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Chlorobenzene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Chloroethane	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Chloroform	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Chloromethane	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Dibromochloromethane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	1,1-Dichloroethane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	1,2-Dichloroethane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	1,1-Dichloroethene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	cis-1,2-Dichloroethene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	trans-1,2-Dichloroethene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	1,2-Dichloropropane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	cis-1,3-Dichloropropene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	trans-1,3-Dichloropropene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Ethylbenzene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	2-Hexanone	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	4-Methyl-2-Pentanone	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Methylene Chloride	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Styrene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	1,1,2,2-Tetrachloroethane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Tetrachloroethene	6 J	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Toluene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	1,1,2-Trichloroethane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	1,1,1-Trichloroethane	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Trichloroethene	3 J	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	Vinyl Chloride	ND	12	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	o-Xylene	ND	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT
90659	John Evan's SB-X(5-7	G18	m&p-Xylenes	5 J	6	ug/kg	07/19/1995	08/15/1995	08/15/1995	DMT

CHAIN OF CUSTODY DOCUMENTATION

SHIP TO:
Raytheon
Engineers & Constructors
301 CHELSEA PARKWAY
BOOTHWYN, PA 19061
(215) 497-8000
(FAX -8005)

CLIENT: McLAREN/HART
LABORATORY JOB NO.: 7570067
PROJECT DESCRIPTION: JOHN EVAN'S JOB
SAMPLERS: CLIENT
SEND REPORT TO: SEND INVOICE TO:
PHONE: FAX:
DATA NEEDED BY: REPORT NEEDED BY:
REPORT TYPE: TIER I___ TIER II___ STANDARD___ QC___ OTHER___

FOR LAB USE ONLY:
P.O. NO.:
DUE DATE:
COOLER SEAL
YES ..... NO .....
BROKEN. . . .INTACT. . .
COOLER TEMP.: deg. F

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:
Resubmitted on 7/28/95 for VOA.

ANALYSIS REQUIRED

QUOTE NO.
SUMMARY NO. 23639

SAMPLE DATA						CONTAINER DATA				VOA 8260	WATER BUCKAP	SPLP-VOA	VOA-TCE & PCE	LABORATORY NO.
ID.	DATE	TIME	MATRIX	GRAB	COMP.	TYPE	NO.	PRESERVATIVE	pH					
SB-X (5-7)	7/19/95		S			4oz	1	—		X	X			90659
SB-3 (7-9)	"		"			"	1	—				X		90010
SPLP #90010	8/2/95		Leach			40z	2	—					X	90754

RELINQUISHED BY		RECEIVED BY		METHOD OF SHIPMENT
NAME: OF:	DATE: TIME:	NAME: K. Wolfe OF: PEAC	DATE: 7/19/95 TIME: 1556	AIRBILL NO.:
NAME: OF:	DATE: TIME:	NAME: OF:	DATE: TIME:	
NAME: OF:	DATE: TIME:	NAME: OF:	DATE: TIME:	

AR301537

9.11

RAYTHEON ENGINEERS
ENVIRONMENTAL LABORATORY

Methods Used for Summary# 23639:

Code	Description
1312	SPLP Leachate/SW-846 Method 1312
G18	GC/MS VOA (TCL List)/SW-846 Method 8260
G18T	Volatiles in TCLP leachate-ZHE/40CFR261 3/90 etal;SW846 8260
S06	Water by evaporation/ EPA-600 Mtd 160.3

Raytheon
Engineers & Constructors

F-32-1

REPORT OF NONCONFORMANCES AND COMMENTS

This Form is used for reporting any nonconformances (anything unusual) encountered in the performance of the analysis. Also recorded are any comments about the nature of the sample that might aid in the interpretation of the data.

Laboratory Sample Number: 90659,90010 & 90754

Summary Number: 23639

Date: 08/16/95

Analyst:

Analysis:

Comments (including nonconformances):

NONE FOUND

GC/MS Laboratory Chronicle

Raytheon
Engineers & Constructors

Date: 8.9.95
Fraction: VOA
Instrument: B
Tune File: BFB.D
Sequence File: VOA8D9
Method File: BFB624 8260
Analyst: DO
Supervisor:

Standard	Conc	Lot No.

Sample ID	Data File	Inj Vol	ALS #	Dilution	Injection time	Comments
BFB 25ng/ul	B4655.D	2ul	-			
50ug/L 8260 cal	B4656.D	5ml	1			
Method Blank	B4657.D	5ml	2			
90568	B4658.D	10g	4			
91050	B4659.D	5ml	5			rerun 0.025ml
91051	B4660.D	5ml	6			rerun 0.05ml
91052	B4661.D	5ml	7			rerun 0.05ml
EQ Blank	B4662.D	5ml	8			
90448A	B4663.D	5ml	9			
90447A	B4664.D	5ml	10			
90513	B4665.D	5ml	11			
90754	B4666.D	5ml	12			
90890	B4667.D	5ml	13			
90891	B4668.D	5ml	14			
90892	B4669.D	5ml	15			
90893	B4670.D	5ml	16			
90894	B4671.D	5ml	3			

GC/MS Laboratory Chronicle

Raytheon
Engineers & Constructors

Date: 8-14-95
Fraction: VOA
Instrument: B
Tune File: BFB D
Sequence File: VO8814
Method File: BFB624 8260
Analyst: [illegible]
Supervisor:

Standard	Conc	Lot No.

Sample ID	Data File	Inj Vol	ALS #	Dilution	Injection time	Comments
BFB 25ng/ul	B4698.D	20 l	-		08:09	
50ug/L 8260 Cal	B4699.D	5ml	1		08:31	
method Blank	B4700.D	5ml	2		09:52	
90836A	B4701.D	5.0	3		10:31	
91070	B4702.D	5ml	4		11.09	
91069	B4703.D	5ml	5		11:48	
91068C	B4704.D	5ml	6		12:26	
90767	B4705.D	5ml	7		13.08	rerun 0.25ml
90768	B4706.D	5ml	8		13:48	rerun 1ml
90769	B4707.D	5ml	9		14.29	
90755A	B4708.D	5.0	10		15:08	
91247	B4709.D	1.0	11	1.5	15:46	
90767	B4710.D	0.25ml	12	1.20	16:26	
90768	B4711.D	1ml	13	1.5	17:05	
91113	B4712.D	5.0	14		17:43	
91113 ms	B4713.D	5.0	15		18:22	
91113 msD	B4714.D	5.0	16		19.01	
91068C ms	B4715.D	5ml	4		19:40	
91068C msD	B4716.D	5ml	5		20:[illegible]	

AR301541

GC/MS Laboratory Chronicle

Raytheon
Engineers & Constructors

Date: 8-15-95
Fraction: VOA
Instrument: B
Tune File: BFB.U
Sequence File: VOA815
Method File: BFB624 8260
Analyst: DR
Supervisor:

Standard	Conc	Lot No.

Sample ID	Data File	Inj Vol	ALS #	Dilution	Injection time	Comments
BFB 25ng/ul	B4717.D	2ul	—		08:32	
50ng/ul 8260 std	B4718.D	5ul	1		09:06	
method Blank	B4719.D	5ul	2		10:31	
9111S	B4720.D	5ul	4		11:03	
9248A	B4721.D	5ul	5		11:47	
91249A	B4722.D	5ul	6		12:24	
90824	B4723.D	5ul	7		13:05	
90659	B4724.D	5ul	8		13:46	
91269	B4725.D	5ul	9		14:28	

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name : RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4655.D BFB Injection Date: 8/9/95

Instrument ID: B BFB Injection Time: 0953

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	30.2
75	30.0 - 66.0% of mass 95	55.5
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	86.5
175	4.0 - 9.0% of mass 174	6.0 (6.9)1
176	93.0 - 101.0% of mass 174	85.3 (98.6)1
177	5.0 - 9.0% of mass 176	5.1 (5.9)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

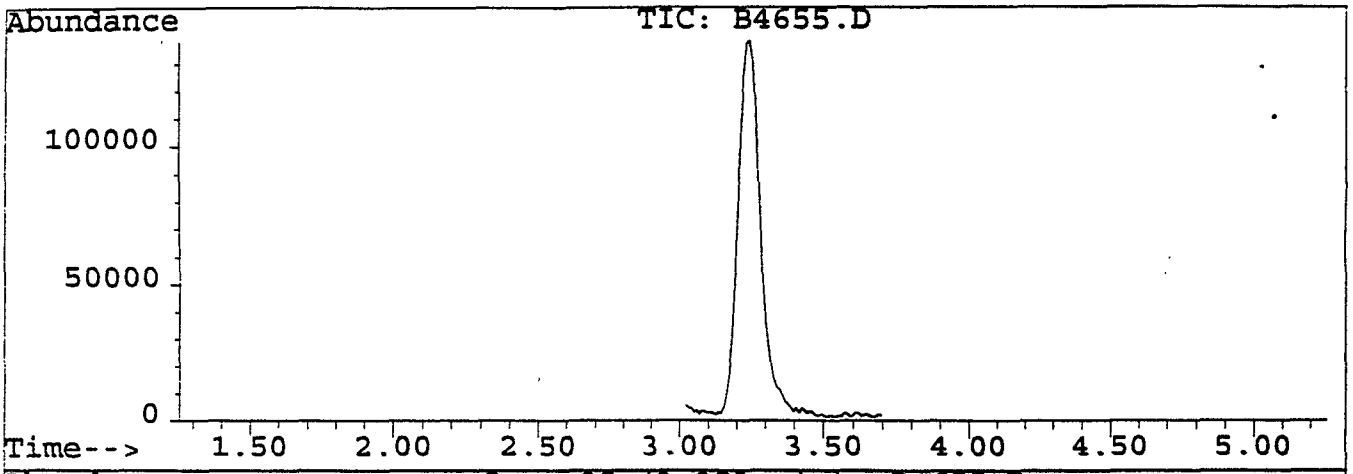
	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	50CALCHK	B4656.D	8/9/95	1042
02	VBLK01	MBLANK	B4657.D	8/9/95	1208
03	/90913	SPLP BLANK	B4665.D	8/9/95	1748
04	/90754	SP90010	B4666.D	8/9/95	1831
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

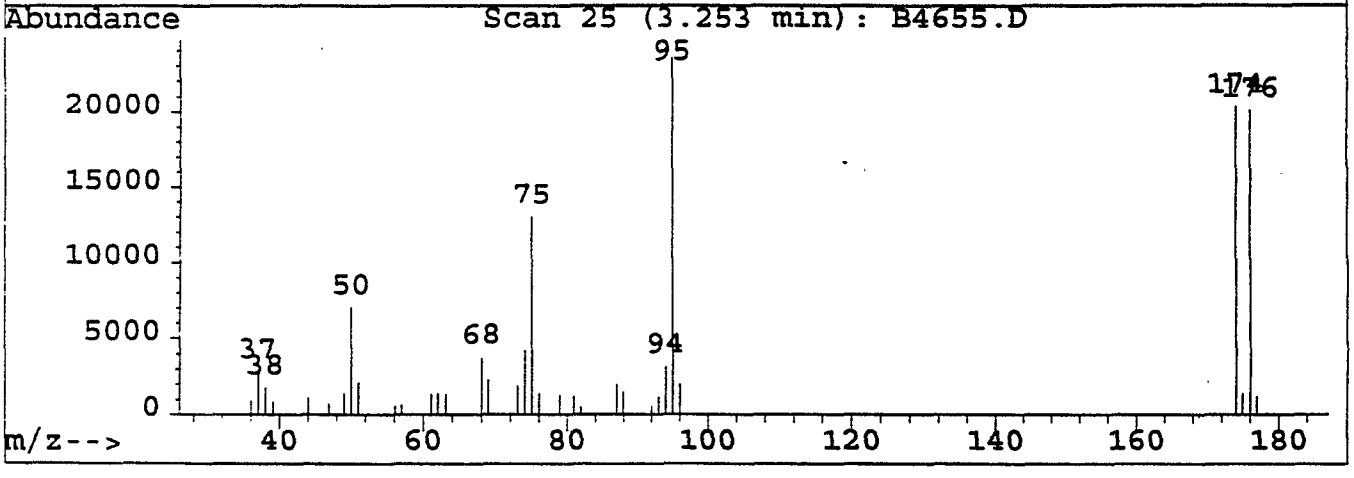
BFB

Data File : C:\HPDOS4\B4655.D
Acq On : 9 Aug 95 9:53 am
Sample : BFB 25NG/UL 2UL
Misc : 080995 09:55

Vial: 3
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\ENVDEF.M
Title :





Peak Apex is scan: 25

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	30.2	7087	PASS
75	95	30	60	55.5	13038	PASS
95	95	100	100	100.0	23504	PASS
96	95	5	9	8.5	1999	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	86.5	20336	PASS
175	174	5	9	6.9	1405	PASS
176	174	95	101	98.6	20056	PASS
177	176	5	9	5.9	1192	PASS

B4655.D ENVDEF.M Wed Aug 16 07:48:42 1995 A

AR301544

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name : RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4698.D BFB Injection Date: 8/14/95

Instrument ID: B BFB Injection Time: 0809

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	23.0
75	30.0 - 66.0% of mass 95	58.5
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	8.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	79.4
175	4.0 - 9.0% of mass 174	6.0 (7.6)1
176	93.0 - 101.0% of mass 174	76.6 (96.5)1
177	5.0 - 9.0% of mass 176	5.7 (7.5)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

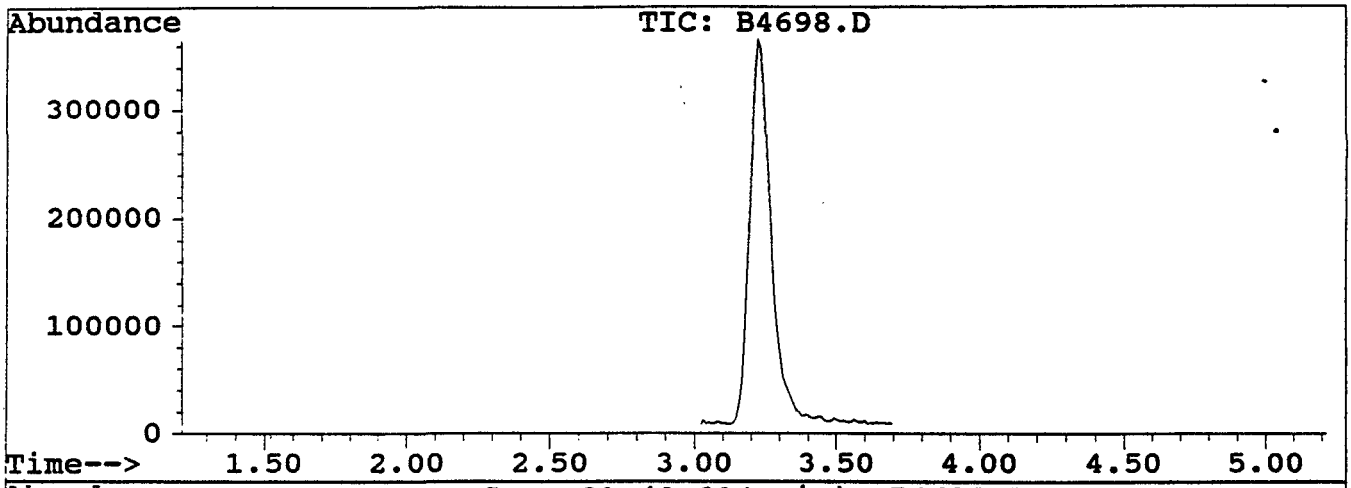
	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	50CALCHK	B4699.D	8/14/95	0834
02	VBLK01	MBLANK	B4700.D	8/14/95	0952
03	90836A	AC-B2	B4701.D	8/14/95	1031
04	/91070	TBLANK	B4702.D	8/14/95	1109
05	/91069	FBLANK	B4703.D	8/14/95	1148
06	91068C	KB-01	B4704.D	8/14/95	1226
07	/90767	NEW MW	B4705.D	8/14/95	1308
08	/90768	MWIOPO1A	B4706.D	8/14/95	1348
09	/90769	MWIAPO1B	B4707.D	8/14/95	1429
10	90755A	B 06-01	B4708.D	8/14/95	1508
11	/91247	SS-01-01	B4709.D	8/14/95	1546
12	90767DIL	NEW MWD	B4710.D	8/14/95	1626
13	90768DIL	PO1ADIL	B4711.D	8/14/95	1705
14	/91113	BABCOCK	B4712.D	8/14/95	1743
15	91113MS	BABCOCMS	B4713.D	8/14/95	1822
16	91113MSD	BABCOMSD	B4714.D	8/14/95	1901
17	91068CMS	KB-01MS	B4715.D	8/14/95	1940
18	91068CMSD	KB-01MSD	B4716.D	8/14/95	2018
19					
20					
21					
22					

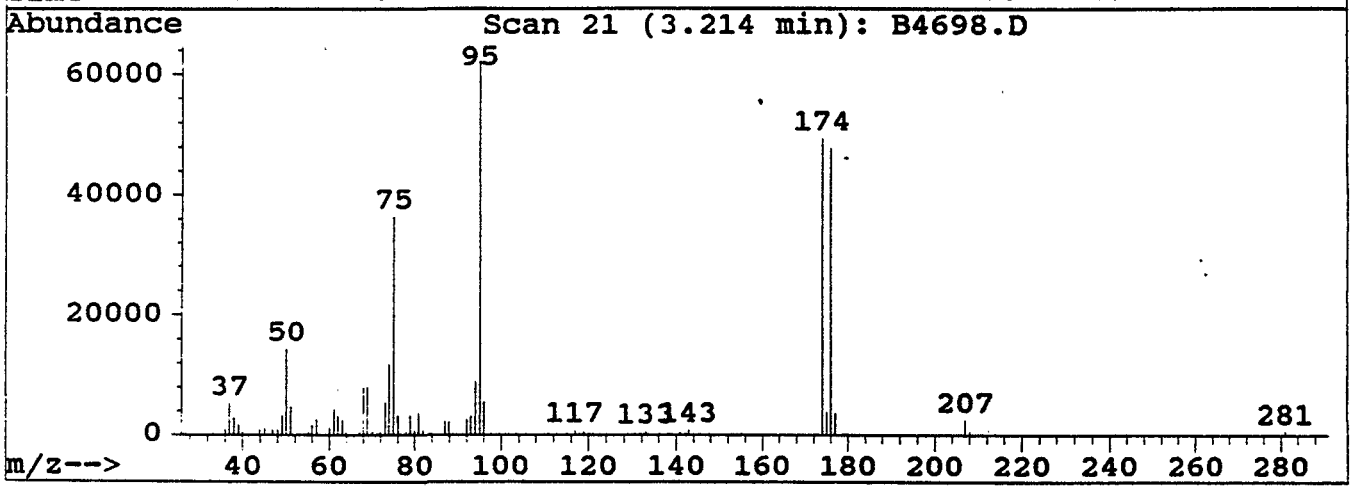
BFB

Data File : C:\HPCHEM\1\DATA\B4698.D
Acq On : 14 Aug 95 8:09 am
Sample : BFB 25NG/UL 2UL
Misc : 081495 08:10

Vial: 51
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration





Peak Apex is scan: 21

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	23.0	14314	PASS
75	95	30	60	58.5	36368	PASS
95	95	100	100	100.0	62160	PASS
96	95	5	9	8.8	5458	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	79.4	49336	PASS
175	174	5	9	7.6	3740	PASS
176	174	95	101	96.5	47624	PASS
177	176	5	9	7.5	3572	PASS

B4698.D 8260.M Wed Aug 16 08:36:05 1995 HPDOS4

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name : RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4717.D BFB Injection Date: 8/15/95

Instrument ID: B BFB Injection Time: 0832

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
50	8.0 - 40.0% of mass 95	24.5
75	30.0 - 66.0% of mass 95	57.2
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	50.0 - 120.0% of mass 95	57.5
175	4.0 - 9.0% of mass 174	4.8 (8.3)1
176	93.0 - 101.0% of mass 174	56.6 (98.5)1
177	5.0 - 9.0% of mass 176	4.9 (8.7)2

1-Value is % mass 174 2-Value is % mass 176

This check applies to the following SAMPLES, MS, MSD, BLANKS and STANDARDS:

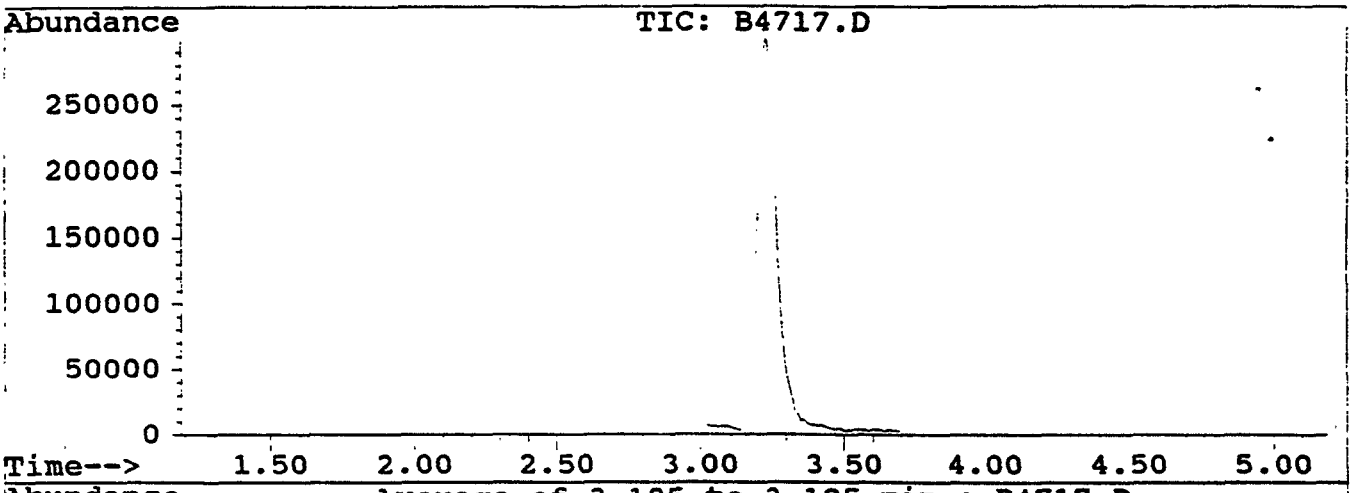
	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	50CALCHK	B4718.D	8/15/95	0906
02	VBLK01	MBLANK	B4719.D	8/15/95	1031
03	/91115	CS-1	B4720.D	8/15/95	1109
04	91248A	INF	B4721.D	8/15/95	1147
05	91249A	EFF	B4722.D	8/15/95	1224
06	/90824	TBLANK	B4723.D	8/15/95	1305
07	/90659	SB-X	B4724.D	8/15/95	1346
08	/91269	/27101	B4725.D	8/15/95	1428
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

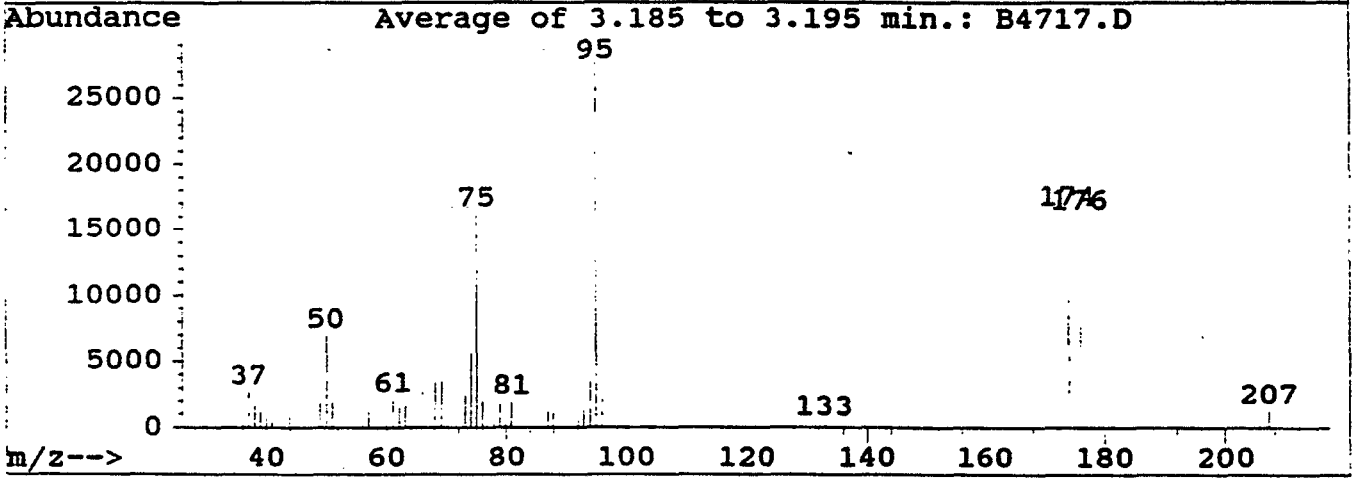
BFB

Data File : C:\HPCHEM\1\DATA\B4717.D
Acq On : 15 Aug 95 8:32 am
Sample : BFB 25NG/UL 2UL
Misc : 081595 08:30

Vial: 19
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\BFB624.M
Title :





Peak Apex is scan: 18

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	24.5	6923	PASS
75	95	30	60	57.2	16163	PASS
95	95	100	100	100.0	28252	PASS
96	95	5	9	7.5	2119	PASS
173	174	0	2	0.0	0	PASS
174	95	50	100	57.5	16232	PASS
175	174	5	9	8.3	1353	PASS
176	174	95	101	98.5	15981	PASS
177	176	5	9	8.7	1390	PASS

B4717.D BFB624.M Tue Aug 15 08:46:44 1995 HPDOS4

Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 90659
MATRIX : SOIL
CLIENT ID : John Evan's SB-X(5-7)
ample wt/vol : 5.0G
Moisture : 16.9

ANALYSIS DATE : 08/15/199
RECVD DATE : 07/19/199
ID FILE : g18.id
DATA FILE : b4724

	Compound	Result (ug/kg)	Detection Limit (ug/kg)
4-87-3	Chloromethane	ND	12
4-83-9	Bromomethane	ND	12
75-01-4	Vinyl Chloride	ND	12
5-00-3	Chloroethane	ND	12
5-09-2	Methylene Chloride	ND	6
67-64-1	Acetone	34	12
75-15-0	Carbon Disulfide	ND	12
5-35-4	1,1-Dichloroethene	ND	6
5-34-3	1,1-Dichloroethane	ND	6
156-59-2	cis-1,2-Dichloroethene	ND	6
56-60-5	trans-1,2-Dichloroethene	ND	6
7-66-3	Chloroform	ND	6
107-02-2	1,2-Dichloroethane	ND	6
78-93-3	2-Butanone	ND	12
-55-6	1,1,1-Trichloroethane	ND	6
5-23-5	Carbon Tetrachloride	ND	6
75-27-4	Bromodichloromethane	ND	6
7-87-5	1,2-Dichloropropane	ND	6
0061-01-5	cis-1,3-Dichloropropene	ND	6
0-01-6	Trichloroethene	3 J	6
124-48-1	Dibromochloromethane	ND	6
0-00-5	1,1,2-Trichloroethane	ND	6
-43-2	Benzene	ND	6
10061-02-6	trans-1,3-Dichloropropene	ND	6
75-25-2	Bromoform	ND	6
8-10-1	4-Methyl-2-Pentanone	ND	12
1-78-6	2-Hexanone	ND	12
127-18-4	Tetrachloroethene	6 J	6
79-34-5	1,1,2,2-Tetrachloroethane	ND	6
8-88-3	Toluene	ND	6
8-90-7	Chlorobenzene	ND	6
100-41-4	Ethylbenzene	ND	6
0-42-5	Styrene	ND	6
0-20-7	m&p-Xylenes	5 J	6
5-47-6	o-Xylene	ND	6

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

.2 SUMMARY 23639

Data File : C:\HPCHEM\1\DATA\B4724.D
Acq On : 15 Aug 95 1:46 pm
Sample : 90659 SB-X(5-7)
Misc : 5.0G
Quant Time: Aug 15 15:18 1995

Vial: 22
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 12:43:21 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.09	736	841784	50.00	ug/l	0.00
22) 1,4-Difluorobenzene	8.42	874	808256	50.00	ug/l	-0.02
37) Chlorobenzene-d5	14.02	1455	618993	50.00	ug/l	0.00
54) 1,4-Dichlorobenzene-d4	19.12	1984	587201	50.00	ug/l	0.00
System Monitoring Compounds						**%Recovery**
19) Dibromofluorobenzene	6.75	700	627040	58.04	ug/l	116.09%
38) Toluene-d8	11.06	1148	788506	51.16	ug/l	102.33%
51) Bromofluorobenzene	16.64	1727	79056	53.41	ug/l	106.82%
Target Compounds						**Qvalue**
10) Acetone	2.54	263	32468	28.65	ug/l	95
27) Trichloroethene	8.80	913	15792	2.31	ug/l #	78
41) Tetrachloroethene	12.22	1268	33521	4.71	ug/l #	40
47) m&p-Xylenes	14.74	1529	80535	4.47	ug/l	97

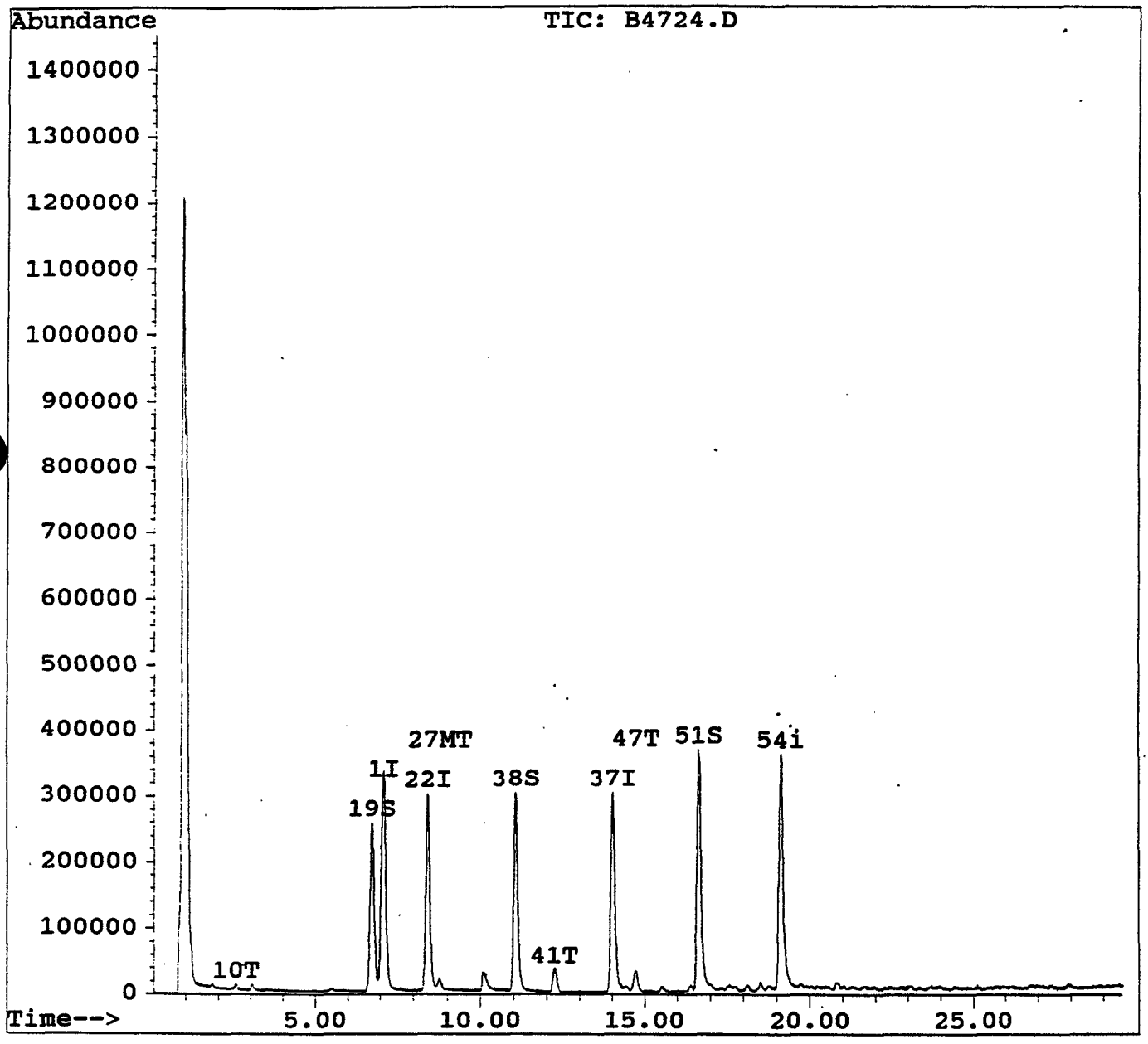
DR 5-14

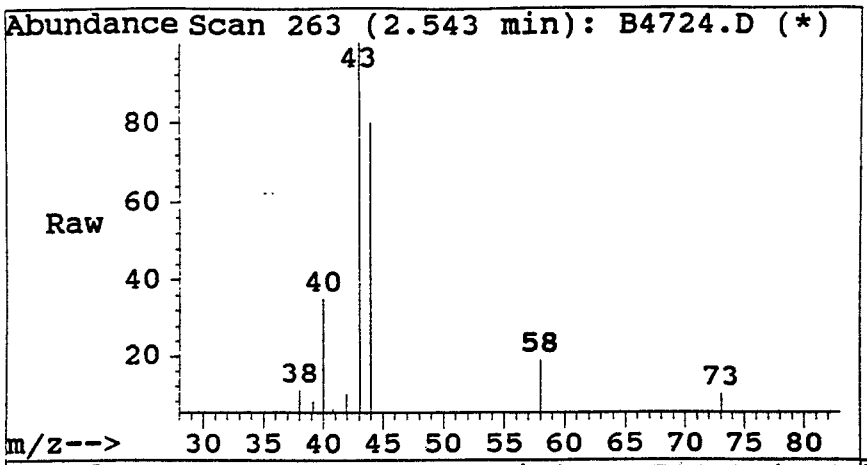
(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\B4724.D
Acq On : 15 Aug 95 1:46 pm
Sample : 90659 SB-X(5-7)
Misc : 5.0G
Quant Time: Aug 15 15:18 1995

Vial: 22
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 12:43:21 1995
Response via : Single Level Calibration

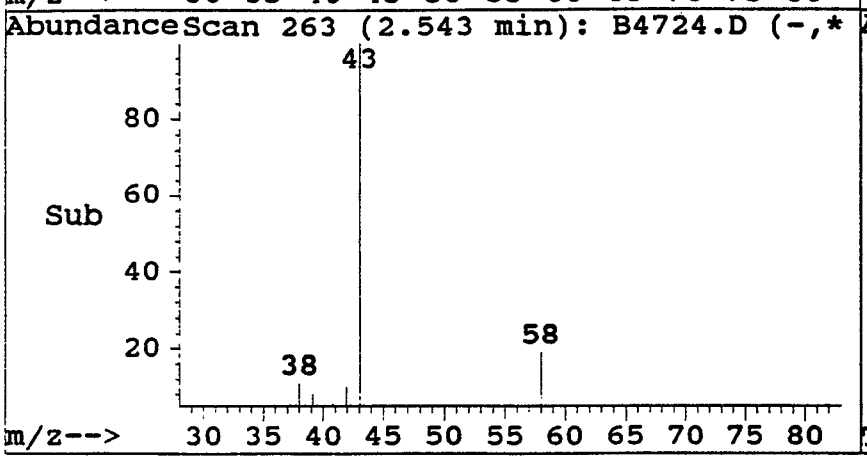


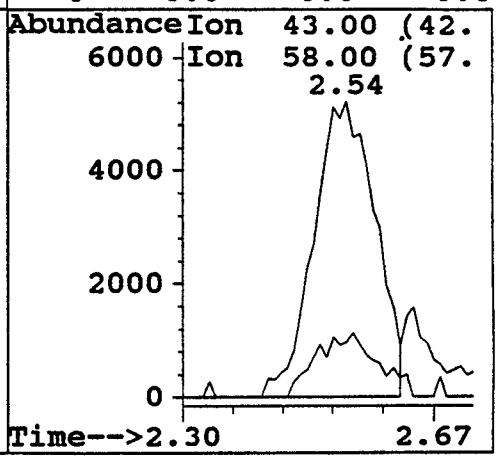


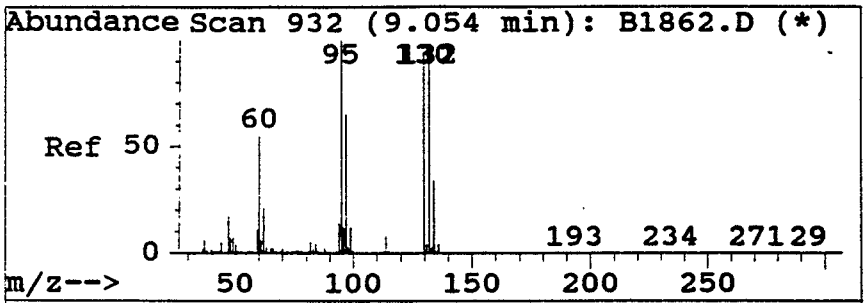
#10
Acetone
Concen: 28.65 ug/l
RT: 2.54 min Scan# 263
Delta R.T. -0.05 min
Lab File: B4724.D
Acq: 15 Aug 95 1:46 pm

Tgt Ion:43 Resp: 32468

Ion	Ratio	Lower	Upper
43	100		
58	21.4	4.1	44.1
0	0.0	0.0	0.0
0	0.0	0.0	0.0



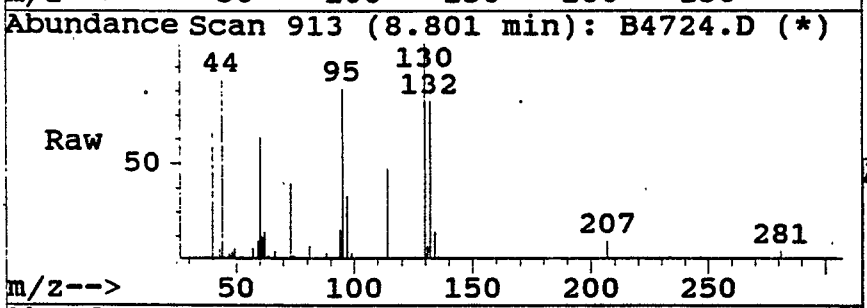


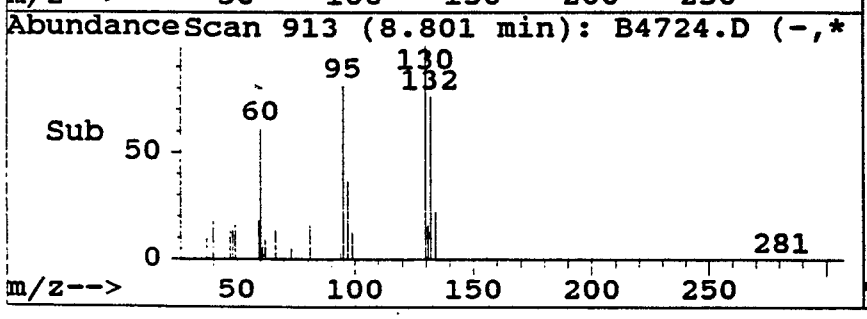


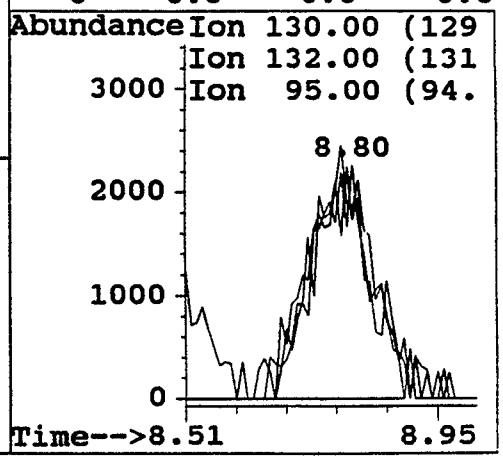
#27
Trichloroethene
Concen: 2.31 ug/l
RT: 8.80 min Scan# 913
Delta R.T. 0.01 min
Lab File: B4724.D
Acq: 15 Aug 95 1:46 pm

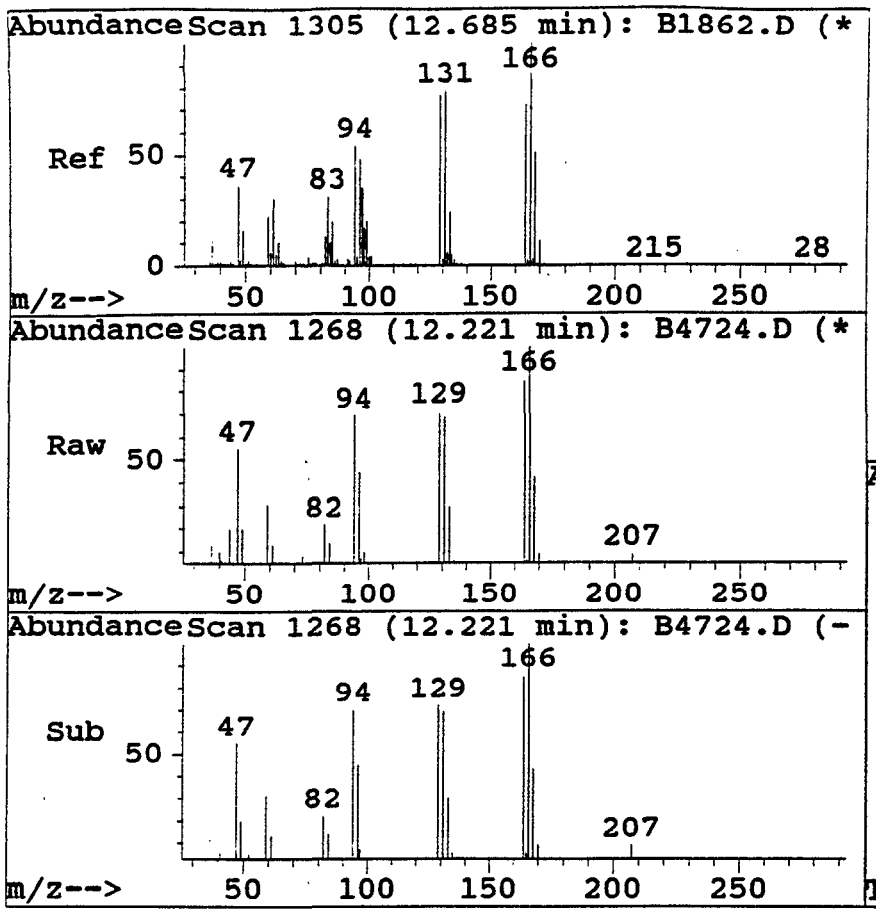
Tgt Ion:130 Resp: 15792

Ion	Ratio	Lower	Upper
130	100		
132	54.6	72.4	112.4#
95	109.7	82.8	122.8
0	0.0	0.0	0.0





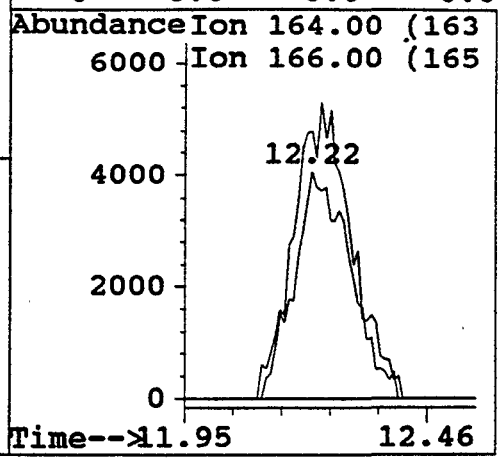


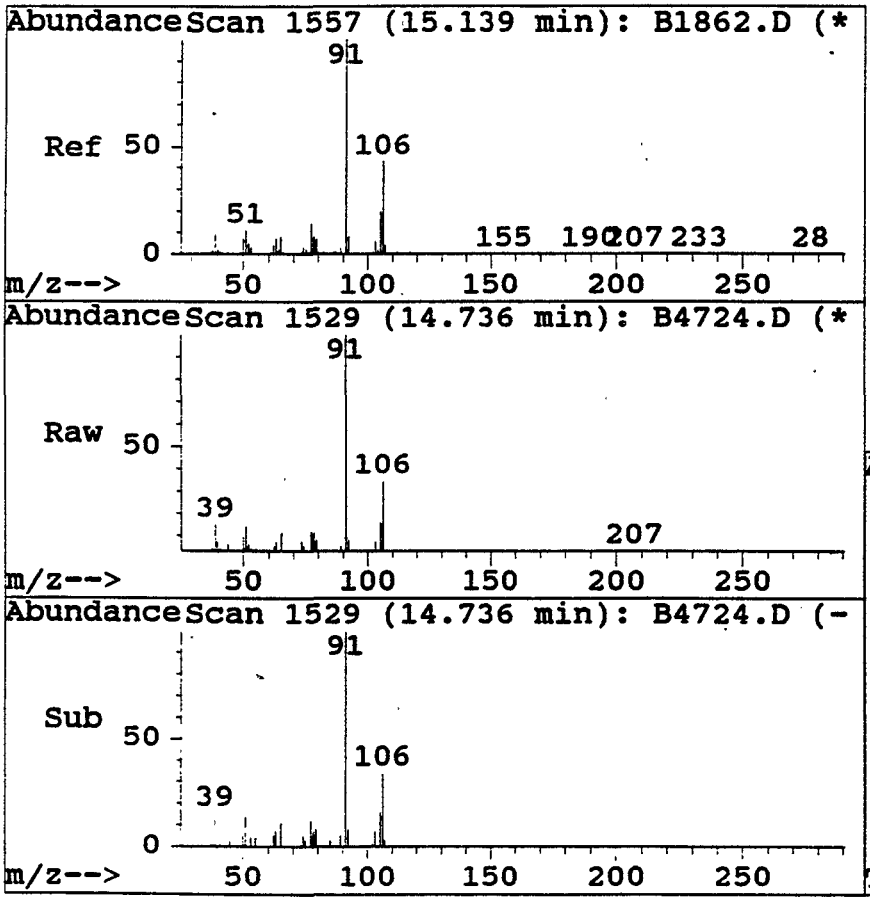


#41
Tetrachloroethene
Concen: 4.71 ug/l
RT: 12.22 min Scan# 1268
Delta R.T. -0.01 min
Lab File: B4724.D
Acq: 15 Aug 95 1:46 pm

Tgt Ion:164 Resp: 33521

Ion	Ratio	Lower	Upper
164	100		
166	58.2	107.1	147.1#
0	0.0	0.0	0.0
0	0.0	0.0	0.0

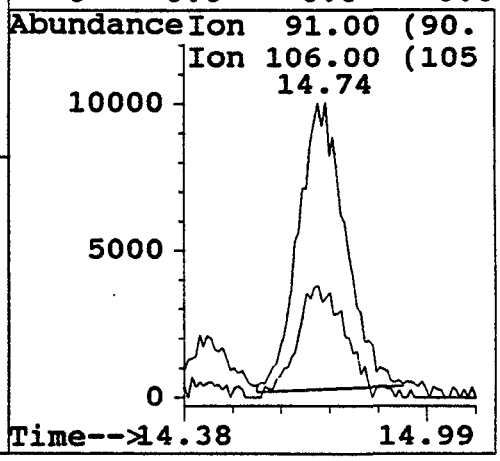




#47
m&p-Xylenes
Concen: 4.47 ug/l
RT: 14.74 min Scan# 1529
Delta R.T. 0.02 min
Lab File: B4724.D
Acq: 15 Aug 95 1:46 pm

Tgt Ion:91 Resp: 80535

Ion	Ratio	Lower	Upper
91	100		
106	39.3	21.1	61.1
0	0.0	0.0	0.0
0	0.0	0.0	0.0



2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Level: (low/med) LOW

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	VBLK01	106	97	102		
01	/91115	87	96	109		
02	/90659	116	102	107		
03	/91269	110	103	107		
04	VBLK02	99	101	108		
05	MS	119	113	118		
06	MSD	114	111	116		
07						
08						
09						
10						
11						
12						
13						
14						
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16						
17						
18						
19						
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22						
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		QC LIMITS
SMC1	= Dibromofluorobenzene	(71-121)
SMC2	= Toluene-d8	(85-115)
SMC3	= Bromofluorobenzene	(81-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

Raytheon
Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

LAB SAMPLE # : 90754
MATRIX : WATER
CLIENT ID : SPLP/#90010
Sample wt/vol : 5ML

ANALYSIS DATE : 08/09/1995
RECVD DATE : 08/02/1995
ID FILE : g18t.id
DATA FILE : b4666

Compound		Result (ug/L)	Detection Limit (ug/L)
71-43-2	Benzene	ND	5
56-23-5	Carbon Tetrachloride	ND	5
108-90-7	Chlorobenzene	ND	5
67-66-3	Chloroform	ND	5
107-02-2	1,2-Dichloroethane	ND	5
75-35-4	1,1-Dichloroethene	ND	5
78-93-3	2-Butanone	ND	10
127-18-4	Tetrachloroethene	ND	5
79-01-6	Trichloroethene	ND	5
75-01-4	Vinyl Chloride	ND	10
106-46-7	1,4-Dichlorobenzene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

.0 SUMMARY 23639

Quantitation Report

Data File : C:\HPCHEM\1\DATA\B4666.D
Acq On : 9 Aug 95 6:31 pm
Sample : 90754 SPLP of 90010
Misc : 5ML
Quant Time: Aug 10 10:06 1995

Vial: 8
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Wed Aug 09 08:50:19 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Pentafluorobenzene	6.96	721	415535	50.00 ug/l	-0.20
22) 1,4-Difluorobenzene	8.22	852	406881	50.00 ug/l	-0.25
37) Chlorobenzene-d5	14.04	1456	321736	50.00 ug/l	0.00
54) 1,4-Dichlorobenzene-d4	19.12	1983	266276	50.00 ug/l	-0.02
System Monitoring Compounds					**%Recovery**
19) Dibromofluorobenzene	6.70	694	281680	46.98 ug/l	93.95%
38) Toluene-d8	11.12	1153	399752	45.99 ug/l	91.99%
51) Bromofluorobenzene	16.66	1728	27394	45.68 ug/l	91.36%

Target Compounds Qvalue

8-10-95

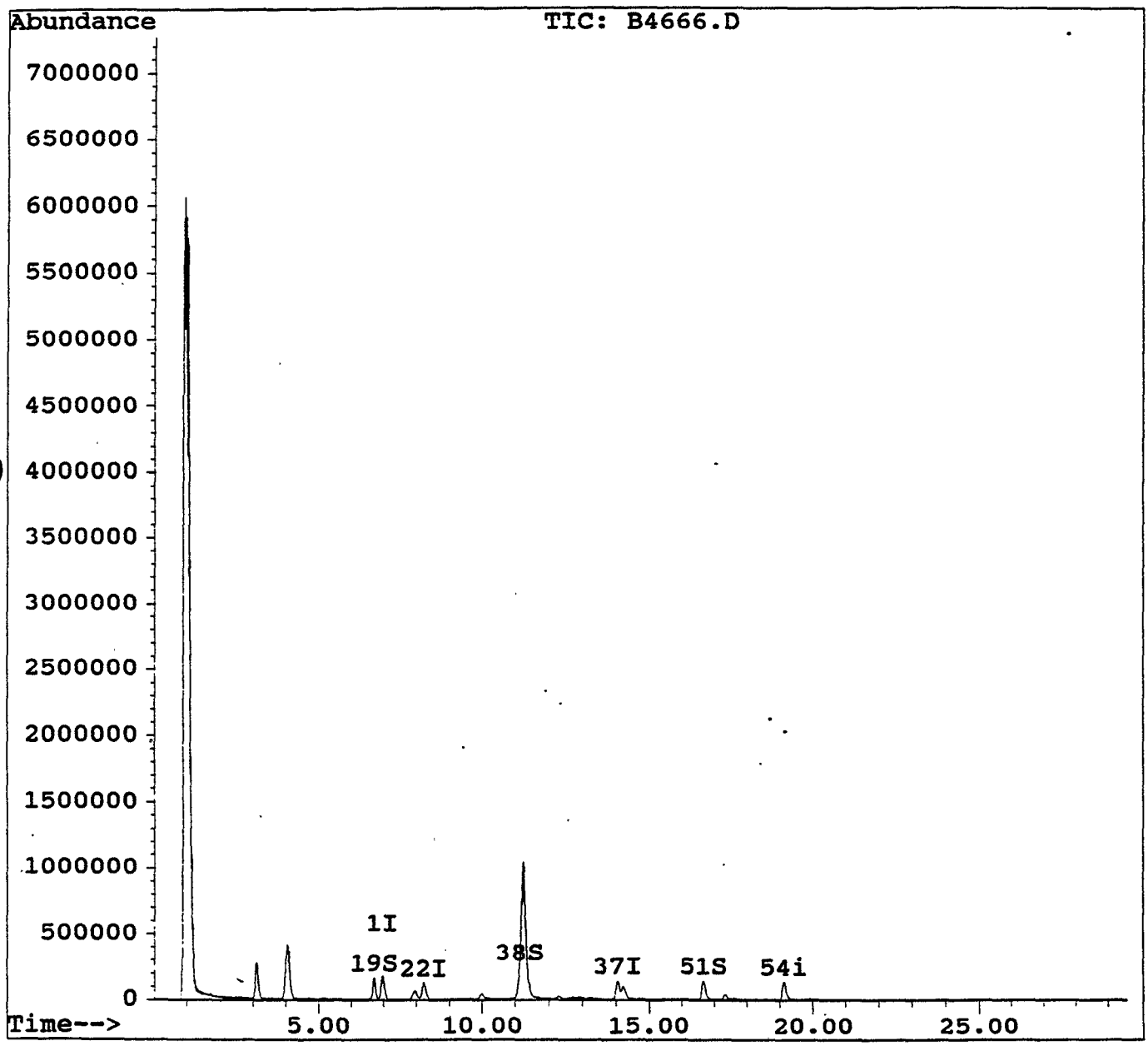
(#) = qualifier out of range (m) = manual integration

AR301556

Data File : C:\HPCHEM\1\DATA\B4666.D
Acq On : 9 Aug 95 6:31 pm
Sample : 90754 SPLP of 90010
Misc : 5ML
Quant Time: Aug 10 10:06 1995

Vial: 8
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Wed Aug 09 08:50:19 1995
Response via : Single Level Calibration



2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

	SAMPLE NO.	SMC1 #	SMC2 #	SMC3 #	OTHER #	TOT OUT
01	VBLK01	90	90	95		
02	/90913	100	92	101		
03	/90754	94	92	91		
04						
05						
06						
07						
08						
09						
10						
11						
12						
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14						
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29						
30						

		QC LIMITS
SMC1	= Dibromofluorobenzene	(76-114)
SMC2	= Toluene-d8	(88-110)
SMC3	= Bromofluorobenzene	(86-115)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : 90913
MATRIX : WATER
CLIENT ID : SPLP Blank
ample wt/vol : 5ML

ANALYSIS DATE : 08/09/199
RECVD DATE : 08/03/199
ID FILE : g18t.id
DATA FILE : b4665

	Compound	Result (ug/L)	Detection Limit (ug/L)
71-43-2	Benzene	ND	5
5-23-5	Carbon Tetrachloride	ND	5
108-90-7	Chlorobenzene	ND	5
67-66-3	Chloroform	ND	5
07-02-2	1,2-Dichloroethane	ND	5
5-35-4	1,1-Dichloroethene	ND	5
78-93-3	2-Butanone	ND	10
127-18-4	Tetrachloroethene	ND	5
9-01-6	Trichloroethene	ND	5
5-01-4	Vinyl Chloride	ND	10
106-46-7	1,4-Dichlorobenzene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

.0 SUMMARY 23713

Data File : C:\HPCHEM\1\DATA\B4665.D
Acq On : 9 Aug 95 5:48 pm
Sample : 90913 SPLP BLANK
Misc : 5ML
Quant Time: Aug 10 9:43 1995

Vial: 8
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Wed Aug 09 08:50:19 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.13	739	318945	50.00	ug/l	-0.03
22) 1,4-Difluorobenzene	8.44	876	215750	50.00	ug/l	-0.03
37) Chlorobenzene-d5	14.01	1454	297408	50.00	ug/l	-0.03
54) 1,4-Dichlorobenzene-d4	19.11	1983	163729	50.00	ug/l	-0.03

System Monitoring Compounds						%Recovery
19) Dibromofluorobenzene	6.77	702	230380	50.06	ug/l	100.11%
38) Toluene-d8	11.07	1149	369081	45.94	ug/l	91.88%
51) Bromofluorobenzene	16.64	1727	28070	50.64	ug/l	101.27%

Target Compounds Qvalue

8-10-95

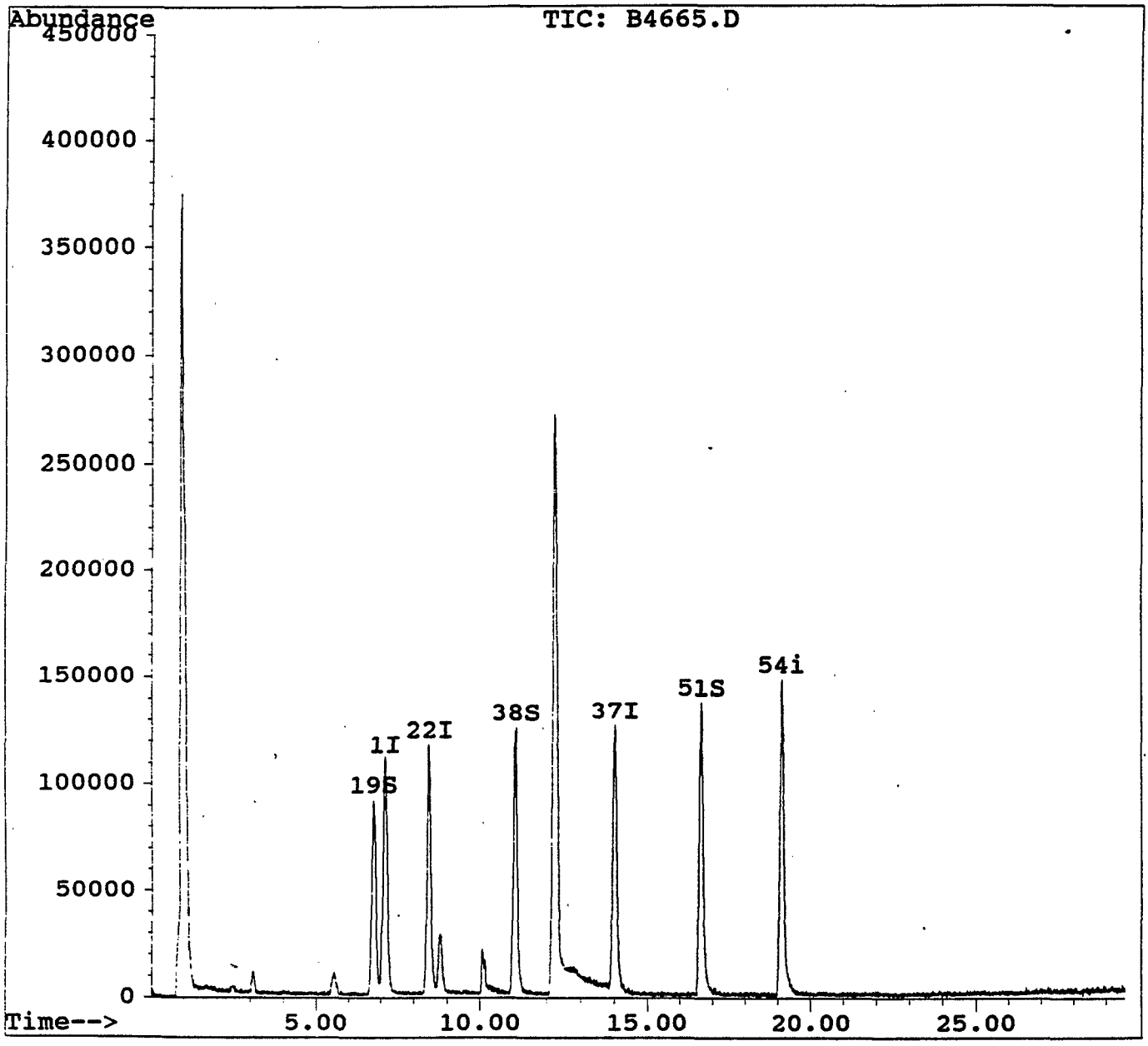
(#) = qualifier out of range (m) = manual integration

050

Data File : C:\HPCHEM\1\DATA\B4665.D
Acq On : 9 Aug 95 5:48 pm
Sample : 90913 SPLP BLANK
Misc : 5ML
Quant Time: Aug 10 9:43 1995

Vial: 8
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Wed Aug 09 08:50:19 1995
Response via : Single Level Calibration



AR301561

4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

VBLK01

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4657.D Lab Sample ID: MBLANK

Date Analyzed: 8/9/95 Time Analyzed: 1208

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	/90913	SPBLANK	B4665.D	1748
02	/90754	SP90010	B4666.D	1831
03				
04				
05				
06				
07				
08				
09				
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COMMENTS:

FORM IV VOA 3/90

Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : METHOD
MATRIX : WATER
CLIENT ID :
Sample wt/vol : 5ML

ANALYSIS DATE : 08/09/1995
RECVD DATE :
ID FILE : g18t.id
DATA FILE : b4657

Compound		Result (ug/L)	Detection Limit (ug/L)
71-43-2	Benzene	ND	5
56-23-5	Carbon Tetrachloride	ND	5
108-90-7	Chlorobenzene	ND	5
67-66-3	Chloroform	ND	5
107-02-2	1,2-Dichloroethane	ND	5
75-35-4	1,1-Dichloroethene	ND	5
78-93-3	2-Butanone	ND	10
127-18-4	Tetrachloroethene	ND	5
79-01-6	Trichloroethene	ND	5
75-01-4	Vinyl Chloride	ND	10
106-46-7	1,4-Dichlorobenzene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

SUMMARY

Data File : C:\HPDOS4\B4657.D
Acq On : 9 Aug 95 12:08 pm
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 9 13:42 1995

Vial: 2
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration

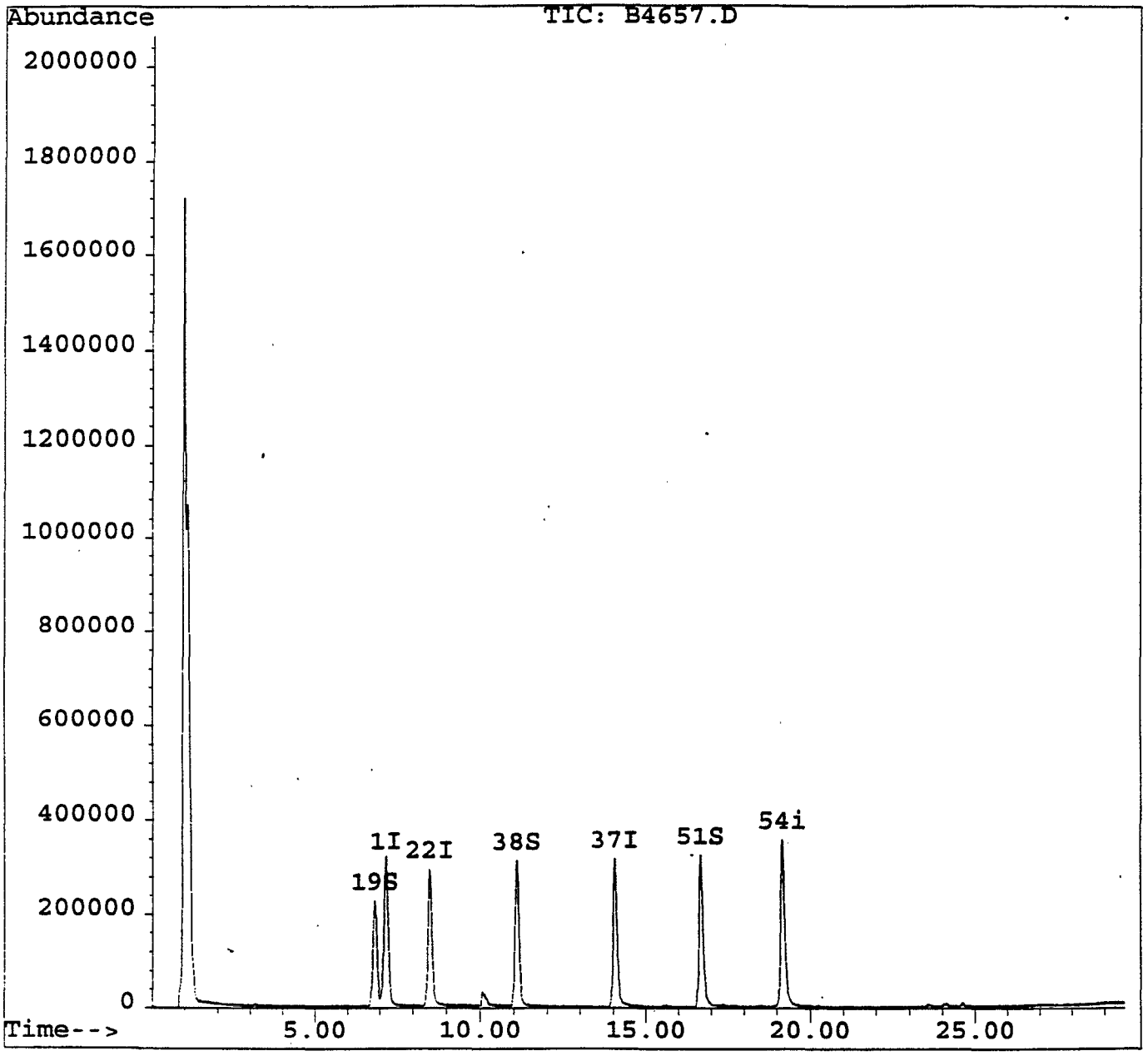
Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.18	745	870140	50.00	ug/l	0.03
22) 1,4-Difluorobenzene	8.49	881	919205	50.00	ug/l	0.02
37) Chlorobenzene-d5	14.06	1459	735244	50.00	ug/l	0.02
54) 1,4-Dichlorobenzene-d4	19.17	1989	676382	50.00	ug/l	0.03
System Monitoring Compounds						**%Recovery**
19) Dibromofluorobenzene	6.85	710	566602	45.13	ug/l	90.25%
38) Toluene-d8	11.10	1151	896020	45.11	ug/l	90.22%
51) Bromofluorobenzene	16.68	1731	64984	47.42	ug/l	94.84%

Target Compounds Qvalue

Data File : C:\HPDOS4\B4657.D
Acq On : 9 Aug 95 12:08 pm
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 9 13:42 1995

Vial: 2
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration



4A

VOLATILE METHOD BLANK SUMMARY

SAMPLE NO.

VBLK01

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4700.D Lab Sample ID: MBLANK

Date Analyzed: 8/14/95 Time Analyzed: 0952

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) N

Instrument ID: B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	90836A	AC-B2	B4701.D	1031
02	/91070	TBLANK	B4702.D	1109
03	/91069	FBLANK	B4703.D	1148
04	91068C	KB-01	B4704.D	1226
05	/90767	NEW MW	B4705.D	1308
06	/90768	MWIOPO1A	B4706.D	1348
07	/90769	MWIAPO1B	B4707.D	1429
08	90755A	B 06-01	B4708.D	1508
09	/91247	SS-01-01	B4709.D	1546
10	90767DIL	NEW MWD	B4710.D	1626
11	90768DIL	PO1ADIL	B4711.D	1705
12	/91113	BABCOCK	B4712.D	1743
13	91113MS	BABCOCMS	B4713.D	1822
14	91113MSD	BABCOMSD	B4714.D	1901
15	91068CMS	KB-01MS	B4715.D	1940
16	91068CMSD	KB-01MSD	B4716.D	2018
17				
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COMMENTS:

AR301566

Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : METHOD
MATRIX : WATER
CLIENT ID :
Sample wt/vol : 5ML

ANALYSIS DATE : 08/14/1995
RECVD DATE :
ID FILE : g18.id
DATA FILE : b4700

	Compound	Result (ug/L)	Detection Limit (ug/L)
74-87-3	Chloromethane	ND	10
74-83-9	Bromomethane	ND	10
75-01-4	Vinyl Chloride	ND	10
75-00-3	Chloroethane	ND	10
75-09-2	Methylene Chloride	ND	5
67-64-1	Acetone	ND	10
75-15-0	Carbon Disulfide	ND	10
75-35-4	1,1-Dichloroethene	ND	5
75-34-3	1,1-Dichloroethane	ND	5
156-59-2	cis-1,2-Dichloroethene	ND	5
156-60-5	trans-1,2-Dichloroethene	ND	5
67-66-3	Chloroform	ND	5
107-02-2	1,2-Dichloroethane	ND	5
78-93-3	2-Butanone	ND	10
71-55-6	1,1,1-Trichloroethane	ND	5
56-23-5	Carbon Tetrachloride	ND	5
75-27-4	Bromodichloromethane	ND	5
78-87-5	1,2-Dichloropropane	ND	5
10061-01-5	cis-1,3-Dichloropropene	ND	5
79-01-6	Trichloroethene	ND	5
124-48-1	Dibromochloromethane	ND	5
79-00-5	1,1,2-Trichloroethane	ND	5
71-43-2	Benzene	ND	5
10061-02-6	trans-1,3-Dichloropropene	ND	5
75-25-2	Bromoform	ND	5
108-10-1	4-Methyl-2-Pentanone	ND	10
591-78-6	2-Hexanone	ND	10
127-18-4	Tetrachloroethene	ND	5
79-34-5	1,1,2,2-Tetrachloroethane	ND	5
108-88-3	Toluene	ND	5
108-90-7	Chlorobenzene	ND	5
100-41-4	Ethylbenzene	ND	5
100-42-5	Styrene	ND	5
330-20-7	m&p-Xylenes	ND	5
95-47-6	o-Xylene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.0 SUMMARY

Data File : C:\HPDOS4\B4700.D
Acq On : 14 Aug 95 9:52 am
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 14 10:42 1995

Vial: 12
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.11	738	3333563	50.00	ug/l	0.17
22) 1,4-Difluorobenzene	0.00	1	0	0.00	ug/l	-8.20
37) Chlorobenzene-d5	14.01	1453	2471002	50.00	ug/l	-0.04
54) 1,4-Dichlorobenzene-d4	19.11	1981	2355161	50.00	ug/l	-0.02

System Monitoring Compounds						%Recovery
19) Dibromofluorobenzene	6.76	702	2009908	49.36	ug/l	98.73%
38) Toluene-d8	11.04	1145	3134311	50.74	ug/l	101.48%
51) Bromofluorobenzene	16.64	1725	238844	54.10	ug/l	108.20%

Target Compounds Qvalue

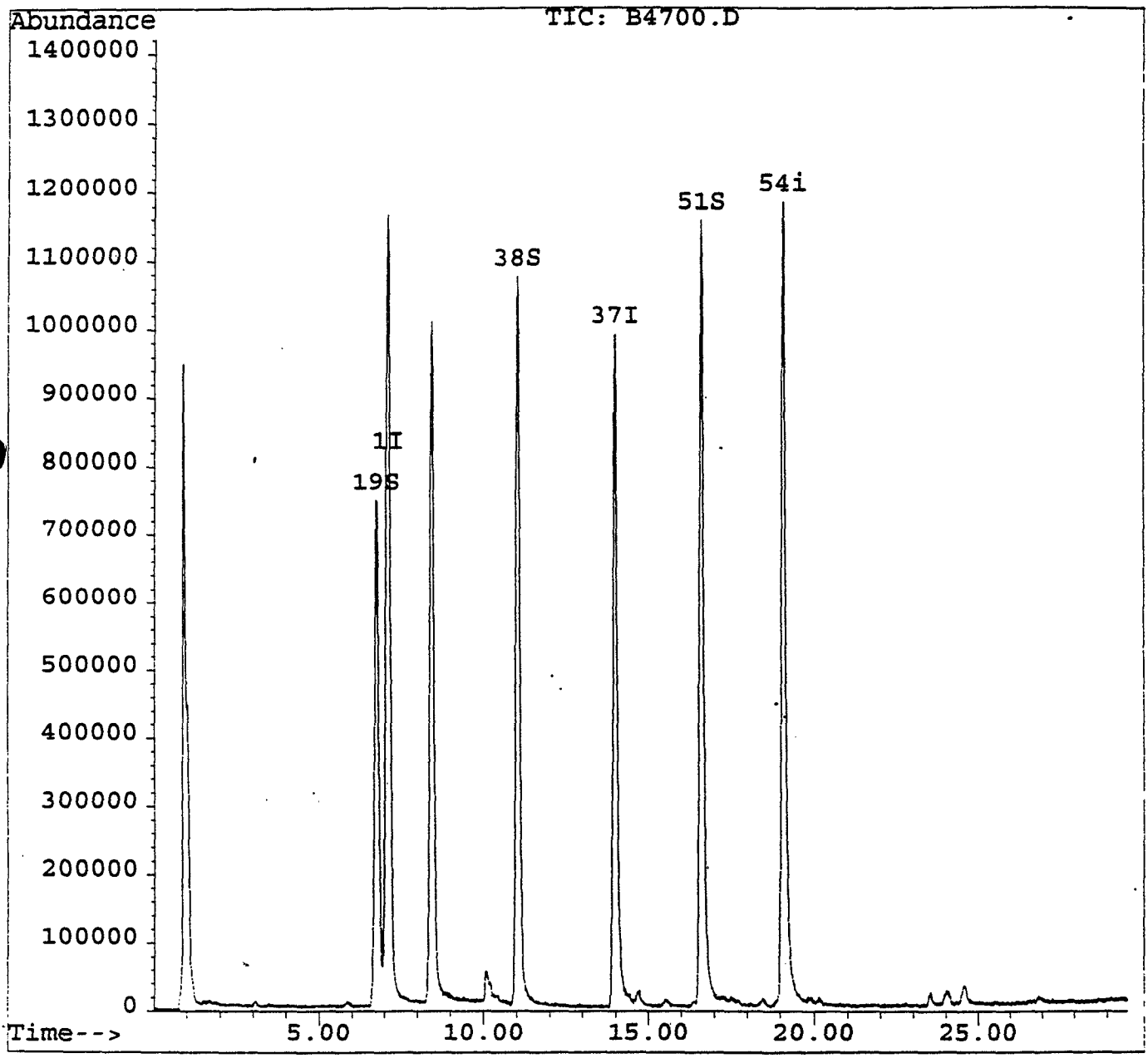
8-15-95

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPDOS4\B4700.D
Acq On : 14 Aug 95 9:52 am
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 14 10:42 1995

Vial: 12
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration



4A

SAMPLE NO. 1131

VOLATILE METHOD BLANK SUMMARY

VBLK01

Lab Name: RAYTHEON ENVIRONMENTAL Contract: N/A

Project No.: N/A Site: N/A Location: N/A Group: N/A

Lab File ID: B4719.D Lab Sample ID: MBLANK

Date Analyzed: 8/15/95 Time Analyzed: 1031

GC Column: DB-624 ID: 0.53 (mm) Heated Purge: (Y/N) Y

Instrument ID: B

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	/91115	CS-1	B4720.D	1109
02	91248A	INF	B4721.D	1147
03	91249A	EFF	B4722.D	1224
04	/90824	TBLANK	B4723.D	1305
05	/90659	SB-X	B4724.D	1346
06	/91269	/27101	B4725.D	1428
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS:

FORM IV VOA 3/90

AR301570

Raytheon
Engineers & Constructors

VOLATILE ORGANIC COMPOUNDS DATA SHEET

SAMPLE # : METHOD
MATRIX : WATER
CLIENT ID :
Sample wt/vol : 5ML

ANALYSIS DATE : 08/15/199
RECVD DATE :
ID FILE : g18.id
DATA FILE : b4719

	Compound	Result (ug/L)	Detection Limit (ug/L)
74-87-3	Chloromethane	ND	10
4-83-9	Bromomethane	ND	10
5-01-4	Vinyl Chloride	ND	10
75-00-3	Chloroethane	ND	10
5-09-2	Methylene Chloride	ND	5
7-64-1	Acetone	ND	10
5-15-0	Carbon Disulfide	ND	10
75-35-4	1,1-Dichloroethene	ND	5
5-34-3	1,1-Dichloroethane	ND	5
56-59-2	cis-1,2-Dichloroethene	ND	5
156-60-5	trans-1,2-Dichloroethene	ND	5
67-66-3	Chloroform	ND	5
07-02-2	1,2-Dichloroethane	ND	5
8-93-3	2-Butanone	ND	10
71-55-6	1,1,1-Trichloroethane	ND	5
6-23-5	Carbon Tetrachloride	ND	5
5-27-4	Bromodichloromethane	ND	5
8-87-5	1,2-Dichloropropane	ND	5
61-01-5	cis-1,3-Dichloropropene	ND	5
01-6	Trichloroethene	ND	5
24-48-1	Dibromochloromethane	ND	5
79-00-5	1,1,2-Trichloroethane	ND	5
71-43-2	Benzene	ND	5
0061-02-6	trans-1,3-Dichloropropene	ND	5
5-25-2	Bromoform	ND	5
108-10-1	4-Methyl-2-Pentanone	ND	10
591-78-6	2-Hexanone	ND	10
27-18-4	Tetrachloroethene	ND	5
9-34-5	1,1,2,2-Tetrachloroethane	ND	5
108-88-3	Toluene	ND	5
08-90-7	Chlorobenzene	ND	5
00-41-4	Ethylbenzene	ND	5
100-42-5	Styrene	ND	5
330-20-7	m&p-Xylenes	ND	5
5-47-6	o-Xylene	ND	5

ND - Not Detected
J - Indicates an Estimated Value below MDL
B - Analyte Also Found in blank
D - Diluted
E - Estimated

1.0 SUMMARY

Data File : C:\HPCHEM\1\DATA\B4719.D
Acq On : 15 Aug 95 10:31 am
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 15 12:53 1995

Vial: 12
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 12:43:21 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc	Units	Dev(Min)
1) Pentafluorobenzene	7.10	736	1574486	50.00	ug/l	-0.04
22) 1,4-Difluorobenzene	8.42	873	1506243	50.00	ug/l	-0.03
37) Chlorobenzene-d5	14.01	1453	1089448	50.00	ug/l	-0.04
54) 1,4-Dichlorobenzene-d4	19.12	1983	1114936	50.00	ug/l	0.00
System Monitoring Compounds						**%Recovery**
19) Dibromofluorobenzene	6.77	702	1017457	52.91	ug/l	105.82%
38) Toluene-d8	11.04	1145	1326257	48.70	ug/l	97.39%
51) Bromofluorobenzene	16.63	1725	99138	50.93	ug/l	101.86%

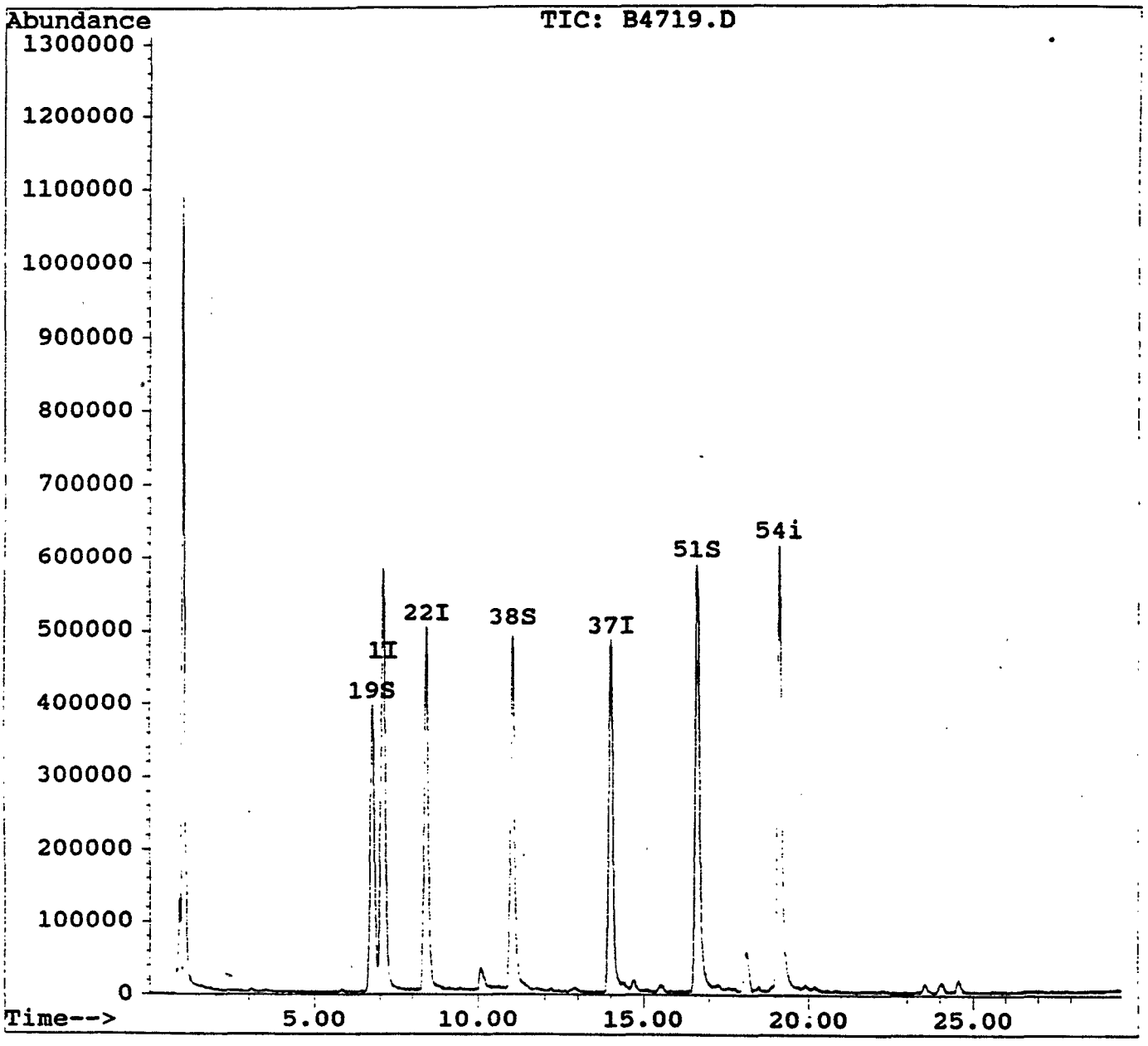
Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPCHEM\1\DATA\B4719.D
Acq On : 15 Aug 95 10:31 am
Sample : METHOD BLANK
Misc : 5ML
Quant Time: Aug 15 12:53 1995

Vial: 12
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 12:43:21 1995
Response via : Single Level Calibration



..S File : b4713
MSD File: b4714

eporting units: ug/l
Result File : b4712
Sample : Babcock

Compound	Sample Result	Conc Added	Conc MS	% Rec	Conc MSD	% Rec	% RPD	Limits % Rec	RPD
,1-Dichloroethene	ND	50	62.0	124	61.0	122	2	59-172	22
richloroethene	ND	50	46.0	92	48.0	96	4	62-137	24
Benzene	ND	50	51.0	102	57.0	114	11	66-142	21
oluene	ND	50	48.0	96	53.0	106	10	59-139	21
llorobenzene	ND	50	43.0	86	49.0	98	13	60-133	21

PPD 0 out of 5 outside limits

Spike Recovery 0 out of 10 outside limits

Data File : C:\HPDOS4\B4713.D
Acq On : 14 Aug 95 6:22 pm
Sample : 91113 MS
Misc : 5.0G
Quant Time: Aug 15 9:14 1995

Vial: 20
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Pentafluorobenzene	7.40	767	893921	50.00 ug/l	0.26
22) 1,4-Difluorobenzene	8.71	903	1053090	50.00 ug/l	0.26
37) Chlorobenzene-d5	14.28	1481	713099	50.00 ug/l	0.23
54) 1,4-Dichlorobenzene-d4	19.41	2013	531506	50.00 ug/l	0.28
System Monitoring Compounds					**%Recovery**
19) Dibromofluorobenzene	7.07	733	651635	59.68 ug/l	119.37%
38) Toluene-d8	11.34	1175	1006619	56.47 ug/l	112.93%
51) Bromofluorobenzene	16.92	1754	75035	58.89 ug/l	117.79%
Target Compounds					**Qvalue**
8) 1,1-Dichloroethene	2.52	260	258152	61.93 ug/l m	0
13) Methylene Chloride	3.28	339	90735	28.77 ug/l m	0
26) Benzene	7.59	787	731316	50.73 ug/l m	0
27) Trichloroethene	9.07	940	390681	45.51 ug/l m	0
40) Toluene	11.43	1185	517105	48.07 ug/l	95
45) Chlorobenzene	14.33	1486	579183	43.43 ug/l m	99

8-15-95

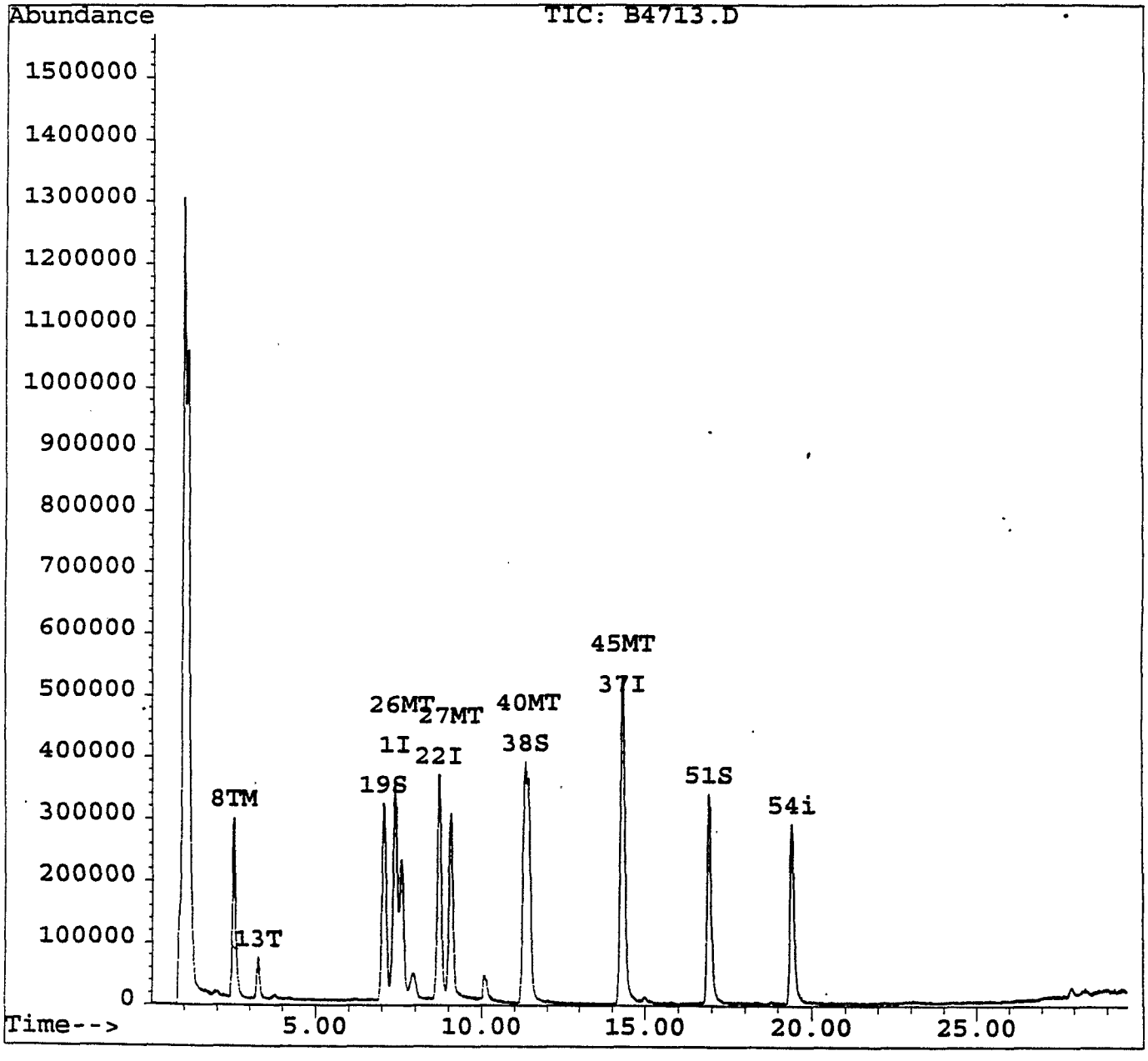
(#) = qualifier out of range (m) = manual integration

045

Data File : C:\HPDOS4\B4713.D
Acq On : 14 Aug 95 6:22 pm
Sample : 91113 MS
Misc : 5.0G
Quant Time: Aug 15 9:14 1995

Vial: 20
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration



AR301576

046

Data File : C:\HPDOS4\B4714.D
Acq On : 14 Aug 95 7:01 pm
Sample : 91113 MSD
Misc : 5.0G
Quant Time: Aug 15 9:17 1995

Vial: 21
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

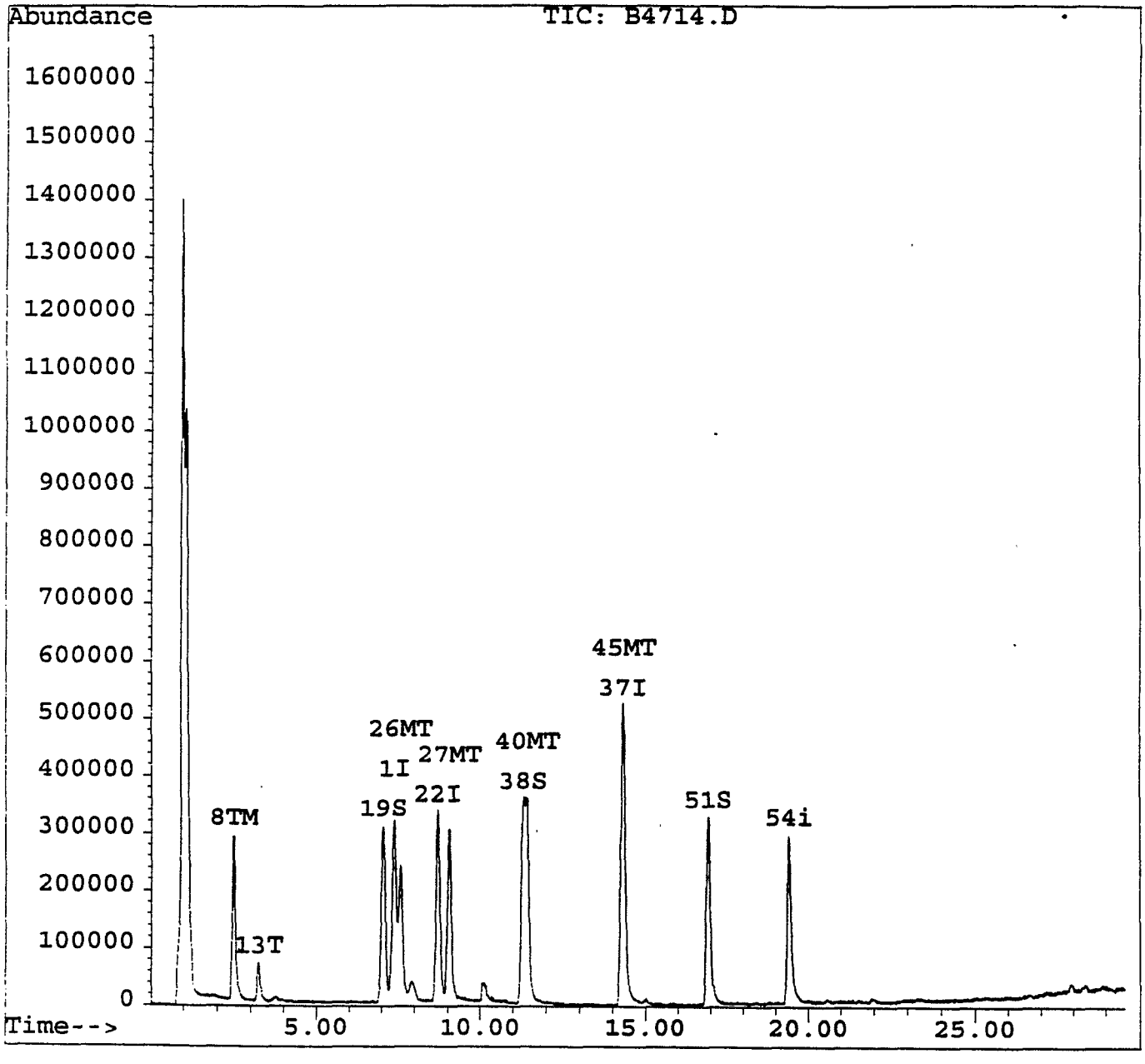
Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration

Internal Standards	R.T.	Scan	Response	Conc Units	Dev(Min)
1) Pentafluorobenzene	7.40	767	817328	50.00 ug/l	0.26
22) 1,4-Difluorobenzene	8.72	904	966980	50.00 ug/l	0.27
37) Chlorobenzene-d5	14.29	1482	655467	50.00 ug/l	0.24
54) 1,4-Dichlorobenzene-d4	19.41	2013	511309	50.00 ug/l	0.28
System Monitoring Compounds					**%Recovery**
19) Dibromofluorobenzene	7.05	731	567375	56.84 ug/l	113.67%
38) Toluene-d8	11.32	1173	913330	55.74 ug/l	111.48%
51) Bromofluorobenzene	16.91	1753	67742	57.84 ug/l	115.69%
Target Compounds					**Qvalue**
8) 1,1-Dichloroethene	2.50	258	231120	60.64 ug/l m	76
13) Methylene Chloride	3.26	337	91886	31.87 ug/l m	79
26) Benzene	7.57	785	757342	57.22 ug/l m	0
27) Trichloroethene	9.05	938	377148	47.84 ug/l m	0
40) Toluene	11.43	1185	522137	52.80 ug/l	93
45) Chlorobenzene	14.34	1487	602153	49.13 ug/l	97

8-15-95

(#) = qualifier out of range (m) = manual integration

Data File : C:\HPDOS4\B4714.D
Acq On : 14 Aug 95 7:01 pm
Sample : 91113 MSD
Misc : 5.0G
Quant Time: Aug 15 9:17 1995

Vial: 21
Operator: DANE
Inst : 5970 - In
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\8260.M
Title : VOA Standards for 5 point calibration
Last Update : Tue Aug 15 08:48:09 1995
Response via : Single Level Calibration