



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
LBS10042

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF:
ROBERTA WAGNER
304-558-0067

*709032209 410-381-1227
 SHIMADZU SCIENTIFIC INSTRUMENT
 7102 RIVERWOOD DRIVE
 COLUMBIA MD 21046

VENDOR

HEALTH AND HUMAN RESOURCES
 ENVIRONMENTAL CHEMISTRY LAB
 4710 CHIMNEY DRIVE
 CHARLESTON, WV
 25302 304-558-3530

SHIP TO

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
11/17/2009				
BID OPENING DATE: 12/17/2009		BID OPENING TIME 01:30PM		

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	EA	490-55	GAS CHROMATOGRAPH - MASS SPECTROMETER (GC-MS)		
<p>INSTRUMENT TO ANALYSE FOR TRIHALOMETHANES (THM) AND VOLATILE ORGANIC CHEMICALS (VOC) AND TO PURCHASE A GAS CHROMATOGRAPH - ELECTRON CAPTURE DETECTOR (GC-ECD) INSTRUMENT TO ANALYZE FOR HALOACETIC ACIDS (HAA5) IN DRINKING WATER TO FULFILL REQUIREMENTS OF UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA) REGULATIONS FOR COMPLIANCE MONITORING OF PUBLIC WATER SYSTEMS. COMPLIANCE MONITORING TESTING IS REQUIREMENT OF A STATE'S PRINCIPAL LABORATORY MANDATED UNDER FEDERAL CODE AT 40 CFR 142.10(B)(4) FOR THE STATE TO MAINTAIN PRIMACY OVER IT'S DRINKING WATER PROGRAM.</p> <p>THE INSTRUMENT WILL ALSO SERVE THE PURPOSE OF PROTECTING PUBLIC HEALTH BY PROVIDING TESTING CAPABILITIES TO PRIVATE WELL OWNERS.</p> <p>THIS INSTRUMENT IS TO BE INSTALLED FOR USE BY THE OFFICE OF LABORATORY SERVICES ENVIRONMENTAL CHEMISTRY LABORATORY AT 4710 CHIMNEY DRIVE, SUITE G, CHARLESTON, WEST VIRGINIA 25302.</p> <p>>> PLEASE SEE ATTACHED SPECIFICATIONS/COST SHEET. <<</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM TO THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p>						

RECEIVED
 2009 DEC -7 AM 9:36
 WV PURCHASING DIVISION

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>Heather Juzua</i>	TELEPHONE 800-388-6996	DATE 12-2-2009
TITLE Field Sales Engineer	FEIN 52-1035956	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



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<p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THE STATE MAY DEEM THE CONTRACT NULL AND VOID, AND TERMINATE SUCH CONTRACT WITHOUT FURTHER ORDER.</p> <p>INQUIRIES: WRITTEN QUESTIONS SHALL BE ACCEPTED THROUGH CLOSE OF BUSINESS ON 12/1/2009. QUESTIONS MAY BE SENT VIA USPS, FAX, COURIER OR E-MAIL. IN ORDER TO ASSURE NO VENDOR RECEIVES AN UNFAIR ADVANTAGE, NO SUBSTANTIVE QUESTIONS WILL BE ANSWERED ORALLY. IF POSSIBLE, E-MAIL QUESTIONS ARE PREFERRED. ADDRESS INQUIRIES TO:</p> <p>ROBERTA WAGNER DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25311</p> <p>FAX: 304-558-4115 E-MAIL: ROBERTA.A.WAGNER@WV.GOV</p> <p>THE MODEL/BRAND/SPECIFICATIONS NAMED HEREIN ESTABLISH THE ACCEPTABLE LEVEL OF QUALITY ONLY AND ARE NOT INTENDED TO REFLECT A PREFERENCE OR FAVOR ANY PARTICULAR BRAND OR VENDOR. VENDORS WHO ARE BIDDING ALTERNATES SHOULD SO STATE AND INCLUDE PERTINENT LITERATURE AND SPECIFICATIONS. FAILURE TO PROVIDE INFORMATION FOR ANY ALTERNATES MAY BE GROUNDS FOR</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>Heather Duzyn</i>	TELEPHONE 800-388-6996	DATE 12-2-2009
TITLE Field Sales Engineer	FEIN 52-1035956	ADDRESS CHANGES TO BE NOTED ABOVE

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<p>REJECTION OF THE BID. THE STATE RESERVES THE RIGHT TO WAIVE MINOR IRREGULARITIES IN BIDS OR SPECIFICATIONS IN ACCORDANCE WITH SECTION 148-1-4(F) OF THE WEST VIRGINIA LEGISLATIVE RULES AND REGULATIONS.</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p> <p>PLEASE NOTE: A CONVENIENCE COPY WOULD BE APPRECIATED.</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER:-----RW/FILE 22-----</p> <p>RFQ NO.:-----LBS10042-----</p> <p>BID OPENING DATE:---12/17/2009---</p> <p>BID OPENING TIME:---1:30 PM---</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID:</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>Heather Juzwa</i>	TELEPHONE 800-388-6996	DATE 12-2-2009
TITLE Field Sales Engineer	FEIN 52-1035956	ADDRESS CHANGES TO BE NOTED ABOVE

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LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
		Fax # 410-290-9140				
CONTACT PERSON (PLEASE PRINT CLEARLY):						
		Heather Juzwa 800-388-6996				
***** THIS IS THE END OF RFQ LBS10042 ***** TOTAL:						See Attached Quotations

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>Heather Juzwa</i>	TELEPHONE 800-388-6996	DATE 12-2-2009
TITLE Field Sales Engineer	FEIN 52-1035956	ADDRESS CHANGES TO BE NOTED ABOVE

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Gas Chromatograph – Mass Spectrometer

SPECIFICATIONS AND REQUIREMENTS:

The Environmental Chemistry Laboratory section of the Office of Laboratory Services is requesting to purchase a Gas Chromatograph – Mass Spectrometer (GC-MS) instrument to analyze for Trihalomethanes (THMs) and Volatile Organic Chemicals (VOCs).

1. A GC-MS instrument is needed to analyze THMs and VOCs in drinking water to fulfill requirements of United States Environmental Protection Agency (EPA) regulations for compliance monitoring of public water systems. Compliance monitoring testing is a requirement of a state's Principal State Laboratory mandated under federal code at 40 CFR 142.10(b)(4) for the state to maintain Primacy over its Drinking Water Program. The instrument will also serve the purpose of protecting public health by providing testing capabilities to private well owners. This instrument is to be installed for use by the Environmental Chemistry Laboratory located at 4710 Chimney Drive, Suite G, Charleston, WV 25302.
2. The technology of this GC-MS instrument must be able to fulfill the requirements of United States Environmental Protection Agency (EPA) method 524.2 (1995, Revision 4.1) for THMs and VOCs, and the resolution and sensitivity capability must be able to meet or exceed the limits of detection and minimum reporting levels required for these regulated compounds as stipulated under the federal Safe Drinking Water Act, and the Stage 2 Disinfection Byproduct Rule.
3. The GC-MS Instrument must be fully automated for analysis with a system controller that is loaded with the necessary software. System controller software must be able to export data to the existing Laboratory Information Management System (LIMS).
4. The GC-MS Instrument system controller software must be able to fulfill all of the analytical and quality control requirements stated in the EPA Method 524.2 (Rev. 4.1) as well as the pertinent requirements listed in Chapter IV of the EPA "Manual for the Certification of Laboratories Analyzing Drinking Water, Fifth edition, January 2005", for the analysis of THMs and VOCs in drinking water.
5. GC-MS Instrument must be fully compatible with a system software controlled autosampler that is a part of a Purge and Trap concentrator sampling system manufactured by OI Analytical. The autosampler is OI Analytical Model 4551-A. The Purge and Trap is the OI Analytical Eclipse Model 4660. The OI Analytical autosampler and purge and trap have already been purchased separately.
6. The GC-MS Instrument must come with a split/splitless capillary column injector compatible with a Purge and Trap sampling interface.
7. The GC-MS Instrument must come with a column for method 524.2 volatiles analysis.
8. The GC-MS Instrument must come equipped with a quadrupole mass spectrometer.
9. The GC-MS Instrument must be capable of mass scan rates at a minimum of 10,000 amu/sec.

10. The GC-MS Instrument must be capable of detecting a wide mass range at a minimum of 1.5-1090 (Daltons).
11. The GC-MS Instrument must come equipped with a 179 L/sec turbomolecular pump vacuum system, or better.
12. The GC-MS Instrument oven must be capable of a rapid cool-down rate, from 450°C to 50°C, in less than 6 minutes.
13. The GC-MS Instrument system must operate on 110-120 V AC.

Installation Requirements:

1. Vendor must install the GC-MS Instrument system in the Environmental Chemistry Laboratory in the Elk Office Center building at 4710 Chimney Drive, Suite G, Charleston, WV 25302.
2. Vendor must provide to the Environmental Chemistry Laboratory (ECL) Program Manager all relevant information concerning the installation in a documented form at least 2 weeks prior to the scheduled installation.
3. At the time of the GC-MS Instrument installation, Vendor must provide to the ECL Program Manager: All relevant system manuals for hardware components; system and application software documentation; a parts, supplies, accessories catalog.
4. Vendor must include all necessary cables and fittings and other costs for installation in the submitted bid price.
5. Installation and on-site training must be completed within 90 days of delivery date.

Training Requirements:

1. Vendor must provide, upon completion of installation, on-site training for Environmental Chemistry Laboratory personnel on the operation and user maintenance requirements of the GC-MS Instrument system.
2. All costs incurred by the Vendor including travel, lodging, and living expenses necessary to provide this basic training shall be included in the bid price.

Warranty Requirements:

1. Vendor must include in the total price of the equipment with at least 1-year factory warranty covering all system components.
2. Software support must be included as part of one-year warranty.
3. Warranty must include on-site service including labor, travel time, and expenses with a 24-hour on-site response time at no extra cost to maintain the specifications listed in this bid and the Vendor's product specifications. (Vendor should include a copy of the warranty.)
4. Warranty must begin upon acceptance of the completed installation and training.

Delivery Requirements:

1. The GC-MS Instrument and its components must be shipped for "inside delivery" by freight delivery company and must be delivered within 90 days of receipt of order.
2. The GC-MS Instrument and its components must be shipped "F.O.B. Destination" unless otherwise stated in quote by Vendor. Any shipping and handling requirements must be stated in Vendor's quote.

Gas Chromatograph – Electron Capture Detector**SPECIFICATIONS AND REQUIREMENTS:**

The Environmental Chemistry Laboratory section of the Office of Laboratory Services is requesting for purchase a Gas Chromatograph – Electron Capture Detector (GC-ECD) instrument to analyze for Haloacetic Acids (HAA5).

1. A GC-ECD instrument is needed to analyze HAA5 in drinking water to fulfill requirements of United States Environmental Protection Agency (EPA) regulations for compliance monitoring of public water systems. Compliance monitoring testing is a requirement of a state's Principal State Laboratory mandated under federal code at 40 CFR 142.10(b)(4) for the state to maintain Primacy over its Drinking Water Program. The instrument will also serve the purpose of protecting public health by providing testing capabilities to private well owners. This instrument is to be installed for use by the Environmental Chemistry Laboratory at 4710 Chimney Drive, Suite G, Charleston, WV 25302.
2. The technology of this GC-ECD instrument must be able to fulfill the requirements of United States Environmental Protection Agency (EPA) method 552.3 (2003, Revision 1.0) for Haloacetic Acids (HAA5) and the resolution and sensitivity capability must be able to meet or exceed the limits of detection and minimum reporting levels required for these regulated compounds as stipulated under the federal Safe Drinking Water Act, and the Stage 2 Disinfection Byproduct Rule.
3. The GC-ECD Instrument must be fully automated for analysis with a system controller that is loaded with the necessary software. System controller software must be able to export data to the existing Laboratory Information Management System (LIMS).
4. The GC-ECD Instrument system controller software must be able to fulfill all of the analytical and quality control requirements stated in the EPA Method 552.3 (Rev. 1.0) as well as the pertinent requirements listed in Chapter IV of the EPA "Manual for the Certification of Laboratories Analyzing Drinking Water, Fifth edition, January 2005", for the analysis of HAA5 in drinking water.
5. Instrument must be equipped with a system software controlled autosampler.
6. The GC-ECD Instrument must come with a split/splitless capillary column injector.

7. The GC-ECD Instrument must come equipped with a Primary GC Column for method 552.3 volatiles analysis. This is a DB-1701, 30-meter length, 0.25-mm i.d., 0.25- μ m film, fused silica capillary with chemically bonded (14% cyanopropylphenylmethylpolysiloxane), or equivalent bonded, fused silica column.
8. The GC-ECD Instrument must come equipped with a Secondary Confirmation GC Column. This is a DB-5.625, 30-meter length, 0.25-mm i.d., 0.25- μ m film, fused silica capillary with chemically bonded ("equivalent to" 5% phenylmethylpolysiloxane), or equivalent bonded, fused silica column.
9. The GC-ECD Instrument must come equipped with a low volume, micro, Electron Capture Detector for each of the Primary and Secondary Confirmation columns.
10. The GC-ECD Instrument system must operate on 110-120 V AC

Installation Requirements:

1. Vendor must install the GC-ECD Instrument system in the Environmental Chemistry Laboratory in the Elk Office Center building at 4710 Chimney Drive, Suite G, Charleston, WV 25302.
2. Vendor must provide to the Environmental Chemistry Laboratory (ECL) Program Manager all relevant information concerning the installation in a documented form at least 2 weeks prior to the scheduled installation.
3. At the time of the GC-ECD Instrument installation, Vendor must provide to the ECL Program Manager: All relevant system manuals for hardware components; system and application software documentation; a parts, supplies, accessories catalog.
4. Vendor must include all necessary cables and fittings and other costs for installation in the submitted bid price.
5. Installation and on-site training must be completed within 90 days of delivery date.

Training Requirements:

1. Vendor must provide on-site training for Environmental Chemistry Laboratory personnel on the operation and user maintenance requirements of the GC-ECD, following completion of installation.
2. Vendor must provide on-site training relevant to the acceptable performance of the EPA method 552.3.
3. All costs incurred by the Vendor including travel, lodging, and living expenses necessary to provide this training shall be included in the bid price.

Warranty Requirements:

1. Vendor must include in the total price of the equipment at least 1-year factory warranty covering all system components.
2. Software support must be included as part of one-year warranty

-
3. Warranty must include on-site service including labor, travel time, and expenses to maintain the specifications listed in this bid and the Vendor's product specifications (Vendor should include a copy of the warranty.)
 4. Warranty must begin upon acceptance of the completed installation and training.

Delivery Requirements:

1. The GC-ECD Instrument and its components must be shipped for "inside delivery" by freight delivery company and must be delivered within 90 days of receipt of order.
2. The GC-ECD Instrument and its components are to be shipped "F.O.B. Destination" unless otherwise stated in quote by Vendor. Any shipping and handling requirements must be stated in Vendor's quote.

RFQ COST SHEET

Bidders shall provide a cost for the following:

Gas Chromatograph – Mass Spectrometer (GC-MS) \$ _____

On-Site User Training (at installation of equipment) \$ _____

Gas Chromatograph – Electron Capture Detector (GC-ECD) \$ _____

On-site User Training (at installation of equipment) \$ _____

Freight/Shipping Charge \$ _____

Total Cost \$ See Attached Quotations

The award will be made to the vendor with the lowest overall total cost of the equipment which meets all requested specifications and requirements. Payment will be made in arrears.

Heather Juzwa
Vendor Signature

December 2, 2009
Date

STATE OF WEST VIRGINIA
Purchasing Division**PURCHASING AFFIDAVIT****VENDOR OWING A DEBT TO THE STATE:**

West Virginia Code §5A-3-10a provides that: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

PUBLIC IMPROVEMENT CONTRACTS & DRUG-FREE WORKPLACE ACT:

If this is a solicitation for a public improvement construction contract, the vendor, by its signature below, affirms that it has a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the **West Virginia Code**. The vendor **must** make said affirmation with its bid submission. Further, public improvement construction contract may not be awarded to a vendor who does not have a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the **West Virginia Code** and who has not submitted that plan to the appropriate contracting authority in timely fashion. For a vendor who is a subcontractor, compliance with Section 5, Article 1D, Chapter 21 of the **West Virginia Code** may take place before their work on the public improvement is begun.

ANTITRUST:

In submitting a bid to any agency for the state of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the state of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the state of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the state of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership or person or entity submitting a bid for the same materials, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

LICENSING:

Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agencies or political subdivision. Furthermore, the vendor must provide all necessary releases to obtain information to enable the Director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

CONFIDENTIALITY:

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.

Under penalty of law for false swearing (**West Virginia Code** §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

Vendor's Name: Shimadzu Scientific Instruments Inc.Authorized Signature: *Jacqui Ruscone* Date: December 2, 2009

State of West Virginia VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with **West Virginia Code**, §5A-3-37. (Does not apply to construction contracts) **West Virginia Code**, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the **West Virginia Code**. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

N/A

1. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or**,
 Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; **or**,
 Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; **or**,
2. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or**,
3. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; **or**,
4. **Application is made for 5% resident vendor preference for the reason checked:**
 Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; **or**,
5. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
 Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; **or**,
6. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
 Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Shimadzu Scientific Instruments Signed: *Jackie Puscione*
Date: December 2, 2009 Title: Sales Administrator

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive

ATTACHMENT
P.O.# LBS 10042

This agreement constitutes the entire agreement between the parties, and there are no other terms and conditions applicable to the licenses granted hereunder

Agreed

Jackie Rescurre 12-209
Signature Date

Sales Administrator
Title

Shimadzu Scientific Instruments
Company Name

Signature Date

Title

Agency/Division

WV-96
Rev 10/07

AGREEMENT ADDENDUM

In the event of conflict between this addendum and the agreement, this addendum shall control:

1. **DISPUTES** - Any references in the agreement to arbitration or to the jurisdiction of any court are hereby deleted. Disputes arising out of the agreement shall be presented to the West Virginia Court of Claims.
2. **HOLD HARMLESS** - Any clause requiring the Agency to indemnify or hold harmless any party is hereby deleted in its entirety
3. **GOVERNING LAW** - The agreement shall be governed by the laws of the State of West Virginia. This provision replaces any references to any other State's governing law.
4. **TAXES** - Provisions in the agreement requiring the Agency to pay taxes are deleted. As a State entity, the Agency is exempt from Federal, State, and local taxes and will not pay taxes for any Vendor including individuals, nor will the Agency file any tax returns or reports on behalf of Vendor or any other party.
5. **PAYMENT** - Any references to prepayment are deleted. Payment will be in arrears
6. **INTEREST** - Should the agreement include a provision for interest on late payments, the Agency agrees to pay the maximum legal rate under West Virginia law. All other references to interest or late charges are deleted.
7. **RECOUPMENT** - Any language in the agreement waiving the Agency's right to set-off, counterclaim, recoupment, or other defense is hereby deleted.
8. **FISCAL YEAR FUNDING** - Service performed under the agreement may be continued in succeeding fiscal years for the term of the agreement, contingent upon funds being appropriated by the Legislature or otherwise being available for this service. In the event funds are not appropriated or otherwise available for this service, the agreement shall terminate without penalty on June 30. After that date, the agreement becomes of no effect and is null and void. However, the Agency agrees to use its best efforts to have the amounts contemplated under the agreement included in its budget. Non-appropriation or non-funding shall not be considered an event of default.
9. **STATUTE OF LIMITATION** - Any clauses limiting the time in which the Agency may bring suit against the Vendor, lessor, individual, or any other party are deleted.
10. **SIMILAR SERVICES** - Any provisions limiting the Agency's right to obtain similar services or equipment in the event of default or non-funding during the term of the agreement are hereby deleted.
11. **ATTORNEY FEES** - The Agency recognizes an obligation to pay attorney's fees or costs only when assessed by a court of competent jurisdiction. Any other provision is invalid and considered null and void.
12. **ASSIGNMENT** - Notwithstanding any clause to the contrary, the Agency reserves the right to assign the agreement to another State of West Virginia agency, board or commission upon thirty (30) days written notice to the Vendor and Vendor shall obtain the written consent of Agency prior to assigning the agreement.
13. **LIMITATION OF LIABILITY** - The Agency, as a State entity, cannot agree to assume the potential liability of a Vendor. Accordingly, any provision limiting the Vendor's liability for direct damages to a certain dollar amount or to the amount of the agreement is hereby deleted. Limitations on special, incidental or consequential damages are acceptable. In addition, any limitation is null and void to the extent that it precludes any action for injury to persons or for damages to personal property.
14. **RIGHT TO TERMINATE** - Agency shall have the right to terminate the agreement upon thirty (30) days written notice to Vendor. Agency agrees to pay Vendor for services rendered or goods received prior to the effective date of termination.
15. **TERMINATION CHARGES** - Any provision requiring the Agency to pay a fixed amount or liquidated damages upon termination of the agreement is hereby deleted. The Agency may only agree to reimburse a Vendor for actual costs incurred or losses sustained during the current fiscal year due to wrongful termination by the Agency prior to the end of any current agreement term.
16. **RENEWAL** - Any reference to automatic renewal is hereby deleted. The agreement may be renewed only upon mutual written agreement of the parties.
17. **INSURANCE** - Any provision requiring the Agency to insure equipment or property of any kind and name the Vendor as beneficiary or as an additional insured is hereby deleted.
18. **RIGHT TO NOTICE** - Any provision for repossession of equipment without notice is hereby deleted. However, the Agency does recognize a right of repossession with notice.
19. **ACCELERATION** - Any reference to acceleration of payments in the event of default or non-funding is hereby deleted.
20. **CONFIDENTIALITY** - Any provision regarding confidentiality of the terms and conditions of the agreement is hereby deleted. State contracts are public records under the West Virginia Freedom of Information Act.
21. **AMENDMENTS** - All amendments, modifications, alterations or changes to the agreement shall be in writing and signed by both parties. No amendment, modification, alteration or change may be made to this addendum without the express written approval of the Purchasing Division and the Attorney General.

ACCEPTED BY:

STATE OF WEST VIRGINIA

Spending Unit: _____

Signed: _____

Title: _____

Date: _____

VENDOR

Company Name: Shimadzu Scientific Instruments Inc.

Signed: Jackie Puscione

Title: Sales Administrator

Date: December 2, 2009



QUOTATION

Number: SSI-17360-XBQT Rev. 1

QUOTE DESCRIPTION:

LBS10042 - GC - MS for EPA 524.2 and GC - ECD for HAA5. The discounted price for all MAS items includes a 0.75% Industrial Funding Fee as required by GSA. Line items 1 and 9 are included in the GSA MAS for contract, which expires March 31, 2012.

Roberta Wagner
State of West Virginia
PO Box 50130
2019 Washington Street East
Charleston, WV 25305, United States
Phone: 304-558-0067
Fax: 304-558-4115
E-mail: Roberta.A.Wagner@wv.gov

Effective Date	12/1/2009	Proposed Ship Date	30 Days/ARO
Expiration Date	12/31/2009	FOB	DESTINATION
Ship Method	BEST WAY	Shipping Terms	PREPAID & ADD
Inco Terms			

PLEASE SEE ATTACHED TERMS AND CONDITIONS

For questions or modifications about this quote, please contact your sales representative. If you are a tax exempt customer, please contact Customer Service and send a copy of your exemption certificate in with your order. The exemption certificate can also be faxed to 410-381-1222

Salesperson: Heather Juzwa MAT Regional Office
Phone: (800) 388-6996 Ext. 1673 7102 Riverwood Drive
E-mail: hljuzwa@SHIMADZU.com Columbia, MD 21046-2502

ADDITIONAL INFORMATION:

Please note: The QP-2010s promotional pricing does not include the AOC-20i/s liquid autosampler.

THANK YOU FOR YOUR INTEREST IN SHIMADZU SCIENTIFIC INSTRUMENTS

Authorization Signature

Date: 12/2/2009

For Order Placement:

Reference Quotation Number on Purchase Order
Shimadzu Scientific Instruments
7102 Riverwood Drive
Columbia MD 21046
Toll Free: 800-477-1227
Phone: 410-381-1227
Fax: 410-381-6781
E-mail: customer.service@shimadzu.com
Int'l Fax 410-309-6130
Int'l Email icsc@shimadzu.com



SHIMADZU

QUOTATION

Number: SSI-17360-XBQT Rev. 1

Line #	Product Number	Product Name	Qty	List Price	Ext'd Price
1	220-94793-30	QP-2010 PLUS EI VALUE PACKAGE	1	\$89,799.00	\$65,999.00
<p>QP-2010Plus EI Value Package Includes 22" monitor, Upgraded RV-3 rotary pump, NIST 08 library, AOC 20i and AOC-20S.</p> <p>This package includes a GC-2010 gas chromatograph and QP-2010Plus quadrupole mass spectrometer with a dual differential 200/200 l/sec turbo pump, Advanced Data Station, and GCMSsolution software. The QP- 2010Plus system has a mass range of 1.5-1090AMU and will accept a maximum column flow of 15 ml/min. This system scans up 10,000 AMU per second. The QP-2010 series software, GCMS Solutions contains three wizard driven features: Scan/SIM acquisition (FASST), automated creation of SIM acquisition parameters (COAST), and automated retention time updating based upon retention index (AART). Front ion source access and ease of maintenance are standard on all Shimadzu GCMS Systems. The GC-2010 includes one Split/Splitless injection port with AFC-2010 (Advanced Flow Control) that provides pressure up to 970kpa and flow up to 1200mL per minute. The SPL-2010 is suitable for columns from 0.1- 75. mm.id in split or splitless operation. The AFC provides control of all parameters related to the injection port including constant column linear velocity, split ratio, total flow, column flow, and septum purge flow. The oven supports 20 temperature programming steps. This system can measure 1pg of OFN (Octafluoronaphthalene) at over 200/1 RMS in scan mode. Includes He line filter, tools, spare consumable items. This package includes a data station with 22" monitor, RV-3 Edwards rotary pump, NIST 08 library and the AOC-20i and AOC 20S.</p>					
2	220-94707-01	TRANSFER LINE HEATER FOR GC-2010 OR GC-2014	1	\$324.00	\$275.40
<p>Transfer Line Heater for GC-2010 or GC-2014</p> <p>6" heater for transfer line to GC-2010 or GC-2014. Used to prevent cold spot in transfer line when connecting purge and trap or headspace to GC. Plugs in to auxilliary heater on GC</p>					
3	220-90001-07	REGULATOR W/CGA-580 ARGON/HELIUM/NITROGEN, 200 PSI DELIVERY PRESSURE FOR GC	1	\$447.00	\$379.95
<p>Gas Regulator, 19H580 He or N2 for GC</p> <p>Gas Regulator for helium or nitrogen; includes 1/8" outlet.</p>					
4	220-90212-00	COPPER TUBING 1/8 50 FEET	1	\$81.00	\$68.85
<p>Copper Tubing</p> <p>Copper tubing 1/8" 50 feet.</p>					
5	220-94678-02	4552 CABLE TO 4560/ ECLIPSE	1	\$119.00	\$101.16
<p>Handshake cable between GC-2010 and OI 4660 P&T</p>					
6	221-53393-01	ZU1, VALCO/UNION	1	\$20.00	\$17.00
7	220-99999-G1	Restek Catalogue 19915	1	\$560.00	\$560.00
<p>Rtx®-VMS, 30m, 0.25mm ID, 1.4µm</p>					
8	220-94843-42	GC-2010PLUS A DUAL SPL DUAL ECD	1	\$31,800.00	\$24,726.00
<p>GC-2010 Plus Dual SPL Dual ECD</p> <p>The GC-2010Plus is a state-of-the-art Gas Chromatograph giving unsurpassed performance and reliability. This GC includes two Split/Splitless injection ports with a digital Advanced Flow Control module and two Electron Capture Detectors. The AFC (Advanced Flow Control) module provides control of all parameters related to the injection port set points. It operates in a number of modes including Constant Linear Velocity and is capable of high pressure splitless injections. The GC oven is capable of 20 temperature program ramps and hold steps. Column Oven Cooling Time: 300° C to 50° C <3.5 minutes, Temp. Column oven Programming Rate: 70° C/min; Constant Linear Velocity, Pressure and flow program ramps with flow Control Range: 0 to 1200ml/min, Programming Rate: -400 to 400 ml/min.</p>					



SHIMADZU

QUOTATION

Number: SSI-17360-XBQT Rev. 1

Line #	Product Number	Product Name	Qty	List Price	Ext'd Price
<p>Column Oven Cooling Time: 300° C to 50° C < 3.5 minutes, Temp. Column oven Programming Rate: 70° C/min; Constant Linear Velocity, Pressure and flow program ramps with flow Control Range: 0 to 1200ml/min, Programming Rate: -400 to 400 ml/min., Atmospheric pressure compensation.</p> <p>Data system is not included. GC Control not supported by Class-VP. Must use GCSolutions</p>					
9	220-94600-00	GC SOLUTIONS SOFTWARE W/ RS232 CABLE	1	\$3,249.10	\$3,249.10
<p>GCsolution Software with RS232 Cable</p> <p>This software controls all Shimadzu GC systems. GC-2010, GC-17, GC-14 are all supported with all AFC, APC and detectors controlled as appropriate. Included are Shimadzu accessories and automatic sampling equipment. Capabilities for user administration and compliant data security, batch or single run acquisition and calibration, data review and correction, data comparison and full graphical reporting are in the standard package. This software handles up to four GC's with up to four detectors each. This software requires use of the Windows 2000 or XP operating system. When additional accessory control or additional processing capabilities are needed these units when added become an integral part of GCsolution</p> <p>Includes GCsolution. Software only, data station not included</p>					
10	220-97318-10	STANDARD WORKSTATION PC (DELL T3500-W3503)	1	\$1,850.00	\$1,850.00
<p>Standard Workstation PC – Dell Precision(Dual-Core Processor W3503)</p> <p>Dell Precision - Intel Core 2 Duo processor W3503 (2.40GHz/1067MHz/4MB L2) Mini Tower PC with Windows XP PRO SP2 with Windows Vista License. The system has an Intel® Core 2 Duo processor, 2048MB Dual Channel DDR3 1067MHz SDRAM, 160GB SATA hard drive, 16X DVD+/-RW Drive, Memory is expandable to 8GB DDR3 1067 SDRAM, 1.44 MB 3.5" floppy drive, USB keyboard, Optical Wheel mouse, 512MB PCIe x16 NVidia Graphics Card, Intel Integrated Gigabit 10/100/1000 network connection, Two PCI slots, two x16 PCI Express Slots, One PCI-Express x1, one Serial Port, One Parallel Port, 11 USB 2.0 (2 front,6 back and 3 Internal), Integrated High Definition Audio (no speakers). Warranty includes 3 year limited Warranty with 3 years standard next business day (NBD) onsite parts replacement and 3 years NBD onsite labor.</p>					
11	220-97320-10	DELL P2210, 22INCH PROFESSIONAL WIDESCREEN, FLAT PANEL	1	\$350.00	\$350.00
<p>DELL G2410, 24 inch LCD Widescreen, Flat Panel Monitor</p> <p>Panel Size: 24", Panel Type:TN - Twisted Nematic, Maximum Resolution:1920 x 1080 at 60 Hz, Contrast Ratio: 1000:1 (typical), Brightness: 250 cd/m2 (typical), Response Time: 5 ms (typical), Viewing Angle: 160° / 170° (typical), Color Support: 16.7 million colors, Pixel Pitch:0.277 mm, Device Type: widescreen Flat Panel Display 3 YR Limited Warranty, Advanced Portable Exchange by DELL</p>					
12	220-90001-07	REGULATOR W/CGA-580 ARGON/HELIUM/NITROGEN, 200 PSI DELIVERY PRESSURE FOR GC	1	\$447.00	\$379.95
<p>Gas Regulator, 19H580 He or N2 for GC</p> <p>Gas Regulator for helium or nitrogen; includes 1/8" outlet.</p>					
13	220-99999-G1	Restek Catalogue 11123	1	\$560.00	\$560.00
<p>Rtx®-CLP Cap. Column 30m, 0.25mm ID, 0.25um</p>					
14	220-99999-G1	Restek Catalogue 11243	1	\$570.00	\$570.00
<p>Rtx®-OPP2 Cap. Column 30m, 0.25mm ID, 0.25um</p>					



SHIMADZU

QUOTATION

Number: SSI-17360-XBQT Rev. 1

Line #	Product Number	Product Name	Qty	List Price	Ext'd Price
15	I&F	INSTALLATION AND CUSTOMER FAMILIARIZATION	1	\$0.00	\$0.00
16	BALANCE_OFFER	YOU MAY ADD A SHIMADZU BALANCE TO THIS ORDER AT 50% DISCOUNT ASK FOR DETAILS	1	\$0.00	\$0.00
17	1YW	1 YEAR WARRANTY	1	\$0.00	\$0.00

NOTE: Taxes are not included in the quoted amount

Total List Price	\$130,176.10
Total Line Item Discounts	\$31,089.69
Subtotal	\$99,086.41
Freight Amount	\$546.88
Total Amount	\$99,633.29



Terms and Conditions

GENERAL TERMS AND CONDITIONS OF SALE

Shimadzu Scientific Instruments, Inc.

PRICES

The prices set forth on the face hereof

(i) are Shimadzu Scientific Instruments, Inc.'s (hereinafter called SSI) domestic prices based upon manufacture of the quality and type ordered for shipment and end use within the United States and Canada only, all products shipped for end use outside the United States and Canada shall be subject to SSI's international prices,

(ii) are subject to revision when interruption, engineering changes or changes in quantity or quality are caused or requested by Buyer, and

(iii) unless otherwise specified, does not include warranty service or installation outside the United States and Canada Clerical errors by Shimadzu are subject to correction

SPECIFICATIONS

Weights and dimensions set forth in sales literature are not guaranteed unless previously certified in writing. SSI may, without affecting the obligations under this sales agreement, make what SSI regards as minor changes to the specifications of the product or products delivered under this sales agreement from those contained in sales literature.

TERMS OF PAYMENT

Subject to the credit approval by SSI, terms of payment on this sales agreement are net thirty (30) days from date of the invoice unless otherwise specifically stated on the face hereof. Invoices are payable at par on date due at any place of collection designated by SSI in funds bankable at par. Payment made beyond terms will be subject to simple interest of 1-1/2% per month on the outstanding balance. All orders are accepted subject to and the obligation of SSI to make deliveries is subject to the right of SSI to require of Buyer payment of all or any part of the purchase price in advance of delivery or to make shipment C.O.D. If Buyer fails to make advance payment when requested to do so by SSI or if Buyer is or becomes delinquent in the payment of any sum of any kind due SSI (whether or not arising out of this sales agreement) or refuses to accept C.O.D. shipments, then SSI shall have the right, in addition to any other remedy to which it may be entitled in law or in equity, to cancel this sales agreement, refuse to make further deliveries, and declare immediately due and payable all unpaid amounts of goods and services previously delivered to Buyer. Each shipment shall be considered a separate and independent transaction and payment therefore shall be made accordingly.

"Buyer must notify SSI within fifteen (15) days from the invoice date if Buyer has not received products."

SHIPMENTS

(a) The cost of packaging for domestic shipments is included in the quoted price. For international shipments or where special packaging is specified or necessary, a charge will be made to cover such expense.

(b) For shipments to and from places within the United States, all shipments--unless otherwise agreed in writing-- shall be FOB point of shipment and title and risk of loss or damage shall be passed to Buyer at the shipping point. The cost of transportation and insurance (if requested by Buyer) shall be borne by Buyer.

(c) For shipments from the United States to ports and or places outside the United States all shipments are--unless otherwise agreed in writing--FOB Columbia, MD. SSI's obligation to affect shipment of the products purchased by Buyer shall be fully discharged, and beneficial ownership, legal title and all risk of loss or damage shall pass to Buyer when the products are shipped to the named place of destination in the country of importation. If shipped FOB Destination, upon arrival Buyer shall be entitled to conduct a reasonable investigation of the products purchased by it, but all claims for losses due to loss or damage to products while in transit shall be waived unless made immediately in writing by Buyer, but not more than (30) thirty days after arrival. If Buyer shall fail or refuse to accept delivery of any of the products for unverifiable claims for loss or damage to products occurring while in transit, all sums paid on deposit shall be retained by SSI as liquidated damages, provided, however, that SSI may recover in full its actual damage from Buyer in the event that actual damages exceed the amount retained as liquidated damages.

(d) All claims for damage or loss of insured shipments shall be immediately communicated, when possible, to SSI at (410) 381-1227, 7102 Riverwood Drive, Columbia, Maryland 21046-2502, Attn: Customer Service. Buyer shall immediately notify delivering carrier of loss or damage to the shipment and SSI will cooperate with Buyer in the adjustment of all claims. Buyer agrees to permit SSI or SSI's representative to inspect damaged goods.

TERMINATION

Upon any termination or cancellation of this sales agreement by Buyer, either in whole or in part, Buyer agrees to promptly pay appropriate termination or cancellation charges invoiced by SSI. If appropriate, the termination charge shall be not less than twenty percent (20%) of the total amount of this sales agreement.

RETURNED GOODS

All returns must be pre-authorized by SSI and a Return Goods Authorization (RGA) number must appear on the face of the package.

Returned goods will be subject to a restocking charge. If appropriate, the restocking charge shall be not less than twenty percent (20%) of the total amount of this sales agreement.

DELIVERY

The scheduled shipping or delivery date shown on the face hereof is our best estimate of the time the order will be shipped and SSI assumes no liability for loss, general damages, or special or consequential damages due to delays.

TAXES

All applicable taxes, including but not limited to Federal, state and local excise, sales or use taxes, shall be borne by the Buyer. Buyer will provide proof of tax exempt status/exempt certification within 30 days of placing the order.

PATENTS

SSI shall defend any suit or proceeding brought against the Buyer so far as based upon an assertion that any product furnished under this sales agreement constitutes a direct infringement of any United States patent having a claim of claims covering solely the product itself, if notified promptly in writing and given authority, information and assistance (at SSI's expense) for the defense of same, and SSI shall pay all damages and costs awarded therein against Buyer. In case said product in such suit is held to constitute infringement and the use of

said product in enjoined, SSI shall, at its own option and at its own expense, either (1) procure for Buyer the right to continue using said product, (2) replace the same with a non-infringing product, (3) modify it so it becomes non-infringing, or (4) remove said product and refund the purchase price and transportation costs thereof. The foregoing obligations of SSI shall not apply to any infringement claim based upon (i) any use of any product sold hereunder in any process or in conjunction with any other product, or (ii) any product manufactured to Buyer's design or any product having a design arising out of compliance with Buyer's specifications. The foregoing states the entire liability of SSI for patent infringement by said product. If any suit or proceeding is brought against SSI based on claims that the goods manufactured by SSI in compliance with Buyer's specifications and supplied to Buyer directly infringe any fully issued United States patent, then the patent indemnity obligations herein stated with respect to SSI shall reciprocally apply with respect to Buyer.

WARRANTY

Subject to the exceptions and upon the conditions stated below, SSI warrants that the products sold under this sales agreement shall be free from defects in workmanship and materials for one year after shipment of the products to the original Buyer by SSI, and if any such products should prove to be defective within such one year period, SSI agrees, at its option, either (i) to correct by repair or, at SSI election, by replacement with equivalent product any such defective product, provided that investigation and factory inspection discloses that such defect developed under normal and proper use, or (ii) to refund the purchase price. The exceptions and conditions mentioned above are as follows:

- (a) Components or accessories manufactured by SSI which by their nature are not intended to and will not function for one year are warranted only to give reasonable service for a reasonable time; what constitutes reasonable time and reasonable service shall be determined solely by SSI. A complete list of such components and accessories is maintained at the factory;
 - (b) SSI makes to warranty with respect to components or accessories not manufactured by it, in the event of defect in any such component or accessory SSI will give reasonable assistance to Buyer in obtaining from the respective manufacturer whatever adjustment is authorized by the manufacturer's own warranty;
 - (c) any product claimed to be defective must, if required by SSI, be returned to the factory, transportation charges prepaid, and will be returned to Buyer with transportation charges collect unless the product is found to be defective, in which case SSI will pay all transportation charges;
 - (d) If the product is a reagent or the like, it is warranted only to conform to the quantity and content and for the period (but not in excess of one year) stated on the label at the time of delivery;
 - (e) SSI may from time to time produce a special printed warranty with respect to a certain product, and where applicable, such warranty shall be deemed incorporated herein by reference;
 - (f) SSI shall be released from all obligations under all warranties, either expressed or implied, if any product covered hereby is repaired or modified by persons other than its own authorized service personnel unless such repair by others is made with the written consent of SSI.
- IT IS EXPRESSLY AGREED THAT THE ABOVE WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND OF THE WARRANTY OF MERCHANTABILITY AND THAT SSI SHALL HAVE NO LIABILITY FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR FROM ANY CAUSE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF DATA, LOSS OF PRODUCTIVITY, LOSS OF BUSINESS, LOSS OF PROFIT, LOSS OF PLANT, EQUIPMENT OR PRODUCTION, EVEN IF SSI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, ARISING OUT OF THE MANUFACTURE, USE, SALE, HANDLING, REPAIR, MAINTENANCE OR REPLACEMENT OF ANY OF THE PRODUCTS SOLD UNDER THIS SALES AGREEMENT.

If an SSI Special Warranty (covering a designated item or items) is contained in the manual or is otherwise shipped with such designated item or items, the terms and conditions specified therein are incorporated herein by reference and shall supplement this warranty. In the event of a conflict between the terms and/or conditions specified herein and those specified in such Special Warranty, the terms and/or conditions of the Special Warranty shall control. Representations and warranties made by any person, including dealers and representatives of SSI, which are inconsistent or in conflict with the terms of this warranty, shall not be binding upon SSI unless reduced to writing and approved by an expressly authorized officer of SSI.

U.S. GOVERNMENT CONTRACTS

If the products to be furnished under this sales agreement are to be used in the performance of a U.S. Government contract or subcontract and a U.S. Government contract number shall appear on Buyer's order, those clauses of the applicable U.S. Government procurement regulation which are mandated by Federal Statute to be included in U.S. Government subcontracts shall be incorporated herein by reference including, without limitation, the Fair Labor Standards Act of 1938, as amended.

FDA REQUIREMENTS

If any product listed on the face of this sales agreement is subject to regulations of FDA as a device, then as to said product only, sale and delivery is contingent upon successful completion and processing of a 510(k) notice for such product.

APPLICABLE LAW; JURISDICTION VENUE

This sales agreement is made and entered into and shall be governed, enforced and interpreted in accordance with the laws of the State of Maryland, and Customer hereby expressly consents to jurisdiction of the courts of the State of MD on all matters relating hereto. In the event that either party commences litigation to enforce any provision hereof, said litigation shall be brought in the courts of Howard County, Maryland, and the prevailing party shall be entitled to an award to all costs and reasonable attorney's fees actually incurred.

This document contains the number of pages indicated, including all attachments. Authorized signature required on quotation pages.

Authorization Signature



Date: 12/2/2009



Shimadzu Scientific Instruments

7102 Riverwood Drive
Columbia MD 21046

Toll Free: 1.800.388.6996
Fax: 410.290.9140
www.ssi.shimadzu.com

November 23, 2009

Ms. Roberta Wagner
State of West Virginia
PO Box 50130
Charleston, WV 25305
Re: LBS10042

Dear Ms. Wagner,

I am writing in regards to your request for quotation LBS10042 for a Gas Chromatograph/Mass Spectrometer or GC/MS and a Gas Chromatograph-Electron Capture Detector, or GC-ECD. We intend to submit two bids. Shimadzu has released a new GC, the GC-2010 Plus since the first issue of this bid, and this is the instrument that will be bid.

Shimadzu Scientific Instruments (SSI) is the American subsidiary of Shimadzu Corporation, headquartered in Kyoto, Japan. Founded in 1875, Shimadzu is a \$2 billion multinational corporation with three major divisions: Medical Diagnostics, Aerospace/Industrial, and Analytical Instruments. The Analytical Division is one of the world's largest manufacturers of analytical instrumentation and environmental monitoring equipment.

In 1975, SSI corporate headquarters was established in Columbia, Maryland to provide analytical solutions to a wide range of laboratories in North, Central, and parts of South America. In the U.S., SSI has a network of more than 50 locations providing local and regional sales, service, and technical support.

It should be noted that we have free onsite training for as many days as needed for the end users to become proficient with the instrument. Our technical personnel can also be scheduled for re-trainings at no charge in the future.

Both of our bids will include two very high end Dell Data Stations with a 22" flat panel monitors.

Shimadzu also offers free phone support for the lifetime of the instrument.

We take the following exceptions to the bid specifications:

BID 1: QP-2010s

Gas Chromatograph/Mass Spectrometer Specifications and Requirements Section

Item 10: The GC/MS instrument must be capable of detecting a wide mass range of at least 1.5-1090 Daltons.

1110P • Balance • Ohaus N1110 • 0.01g/0.0001g • 1110P • 1110 • 1110S
1110P • 1110P
Antoinelec, Avon, MA, USA • 1110P • 1110P



QUOTATION

Number: SSI-17357-WD0E Rev. 1

QUOTE DESCRIPTION:

LBS10042 - GC - MS for EPA 524.2 and GC - ECD for HAA5. The discounted price for all MAS items includes a 0.75% Industrial Funding Fee as required by GSA. Line items 1 and 9 are included in the GSA MAS for contract, which expires March 31, 2012.

Roberta Wagner
State of West Virginia
PO Box 50130
2019 Washington Street East
Charleston, WV 25305, United States
Phone: 304-558-0067
Fax: 304-558-4115
E-mail: Roberta.A.Wagner@wv.gov

Effective Date	12/1/2009	Proposed Ship Date	30 Days/ARO
Expiration Date	12/31/2009	FOB	DESTINATION
Ship Method	BEST WAY	Shipping Terms	PREPAID & ADD
Inco Terms			

PLEASE SEE ATTACHED TERMS AND CONDITIONS

For questions or modifications about this quote, please contact your sales representative. If you are a tax exempt customer, please contact Customer Service and send a copy of your exemption certificate in with your order. The exemption certificate can also be faxed to 410-381-1222

Salesperson:	Heather Juzwa	MAT Regional Office
Phone:	(800) 388-6996 Ext. 1673	7102 Riverwood Drive
E-mail:	hljuzwa@SHIMADZU.com	Columbia, MD 21046-2502

ADDITIONAL INFORMATION:

Please note: The QP-2010s promotional pricing does not include the AOC-20i/s liquid autosampler.

THANK YOU FOR YOUR INTEREST IN SHIMADZU SCIENTIFIC INSTRUMENTS

Authorization Signature

Date: 12/2/2009

For Order Placement:

Reference Quotation Number on Purchase Order
Shimadzu Scientific Instruments
7102 Riverwood Drive
Columbia MD 21046
Toll Free: 800-477-1227
Phone: 410-381-1227
Fax: 410-381-6781
E-mail: customer.service@shimadzu.com
Int'l Fax 410-309-6130
Int'l Email icsc@shimadzu.com



QUOTATION

Number: SSI-17357-WD0E Rev. 1

Line #	Product Number	Product Name	Qty	List Price	Ext'd Price
1	220-94793-10	QP-2010S Value Package	1	\$65,969.00	\$51,500.00
<p>QP-2010S Value Package Includes the GCMS, upgraded RV-3 rotary pump, NIST 08 library, 22 inch Monitor, AOC 20i and AOC-20S</p> <p>This package includes a GC-2010 gas chromatograph and QP-2010S quadrupole mass spectrometer with a single 65 l/sec turbo pump, Advanced Data Station, and GCMSolution software. The QP- 2010S system has a mass range of 1.5-900 AMU and will accept a maximum column flow of 3 ml/min. This system scans up 10,000 AMU per second. The QP-2010 series software, GCMS Solutions contains three wizard driven features: Scan/SIM acquisition (FASST), automated creation of SIM acquisition parameters (COAST), and automated retention time updating based upon retention index (AART). Front ion source access and ease of maintenance are standard on all Shimadzu GCMS Systems. The GC-2010 includes one Split/Splitless injection port with AFC-2010 (Advanced Flow Control) that provides pressure up to 970kpa and flow up to 1200mL per minute. The SPL-2010 is suitable for columns from 0.1- 75. mm.id in split or splitless operation. The AFC provides control of all parameters related to the injection port including constant column linear velocity, split ratio, total flow, column flow, and septum purge flow. The oven supports 20 temperature programming steps. This system can measure 1pg of OFN (Octafluoronaphthalene) at over 30/1 RMS in scan mode. Includes He line filter, tools, spare consumable items. This package includes a data station with 22" monitor, RV-3 Edwards rotary pump, NIST 08 library and the AOC-20i and AOC 20S.</p>					
2	220-94707-01	TRANSFER LINE HEATER FOR GC-2010 OR GC-2014	1	\$324.00	\$275.40
<p>Transfer Line Heater for GC-2010 or GC-2014</p> <p>6" heater for transfer line to GC-2010 or GC-2014. Used to prevent cold spot in transfer line when connecting purge and trap or headspace to GC. Plugs in to auxilliary heater on GC</p>					
3	220-90001-07	REGULATOR W/CGA-580 ARGON/HELIUM/NITROGEN, 200 PSI DELIVERY PRESSURE FOR GC	1	\$447.00	\$379.95
<p>Gas Regulator, 19H580 He or N2 for GC</p> <p>Gas Regulator for helium or nitrogen; includes 1/8" outlet</p>					
4	220-90212-00	COPPER TUBING 1/8 50 FEET	1	\$81.00	\$68.85
<p>Copper Tubing</p> <p>Copper tubing 1/8" 50 feet.</p>					
5	220-94678-02	4552 CABLE TO 4560/ ECLIPSE	1	\$119.00	\$101.16
<p>Handshake cable between GC-2010 and OI 4660 P&T</p>					
6	221-53393-01	ZU1, VALCO/UNION	1	\$20.00	\$17.00
7	220-99999-G1	Restek Catalogue 19915	1	\$560.00	\$560.00
<p>Rtx®-VMS, 30m, 0.25mm ID, 1.4µm</p>					
8	220-94843-42	GC-2010PLUS A DUAL SPL DUAL ECD	1	\$31,800.00	\$24,726.00
<p>GC-2010 Plus Dual SPL Dual ECD</p> <p>The GC-2010Plus is a state-of-the-art Gas Chromatograph giving unsurpassed performance and reliability. This GC includes two Split/Splitless injection ports with a digital Advanced Flow Control module and two Electron Capture Detectors. The AFC (Advanced Flow Control) module provides control of all parameters related to the injection port set points. It operates in a number of modes including Constant Linear Velocity and is capable of high pressure splitless injections. The GC oven is capable of 20 temperature program ramps and hold steps. Column Oven Cooling Time: 300° C to 50° C <3.5 minutes, Temp. Column oven Programming Rate: 70° C/min; Constant Linear Velocity, Pressure and flow program ramps with flow Control Range: 0 to 1200ml/min, Programming Rate: -400 to 400 ml/min.</p>					



QUOTATION

Number: SSI-17357-WD0E Rev. 1

Line #	Product Number	Product Name	Qty	List Price	Ext'd Price
Column Oven Cooling Time: 300° C to 50° C < 3.5 minutes, Temp. Column oven Programming Rate: 70° C/min; Constant Linear Velocity, Pressure and flow program ramps with flow Control Range: 0 to 1200ml/min, Programming Rate: -400 to 400 ml/min., Atmospheric pressure compensation.					
Data system is not included. GC Control not supported by Class-VP. Must use GCSolutions					
9	220-94600-00	GC SOLUTIONS SOFTWARE W/ RS232 CABLE	1	\$3,249.10	\$3,249.10
GCsolution Software with RS232 Cable This software controls all Shimadzu GC systems. GC-2010, GC-17, GC-14 are all supported with all AFC, APC and detectors controlled as appropriate. Included are Shimadzu accessories and automatic sampling equipment. Capabilities for user administration and compliant data security, batch or single run acquisition and calibration, data review and correction, data comparison and full graphical reporting are in the standard package. This software handles up to four GC's with up to four detectors each. This software requires use of the Windows 2000 or XP operating system. When additional accessory control or additional processing capabilities are needed these units when added become an integral part of GCsolution Includes GCsolution. Software only, data station not included.					
10	220-97318-10	STANDARD WORKSTATION PC (DELL T3500-W3503)	1	\$1,850.00	\$1,850.00
Standard Workstation PC – Dell Precision(Dual Core Processor W3503) Dell Precision - Intel Core 2 Duo processor W3503 (2.40GHz/1067MHz/4MB L2). Mini Tower PC with Windows XP PRO SP2 with Windows Vista License. The system has an Intel® Core 2 Duo processor, 2048MB Dual Channel DDR3 1067MHz SDRAM, 160GB SATA hard drive, 16X DVD+/-RW Drive, Memory is expandable to 8GB DDR3 1067 SDRAM, 1.44 MB 3.5" floppy drive, USB keyboard, Optical Wheel mouse, 512MB PCIe x16 NVidia Graphics Card, Intel Integrated Gigabit 10/100/1000 network connection, Two PCI slots, two x16 PCI Express Slots, One PCI-Express x1, one Serial Port, One Parallel Port, 11 USB 2.0 (2 front,6 back and 3 Internal), Integrated High Definition Audio (no speakers). Warranty includes 3 year limited Warranty with 3 years standard next business day (NBD) onsite parts replacement and 3 years NBD onsite labor.					
11	220-97320-10	DELL P2210, 22INCH PROFESSIONAL WIDESCREEN, FLAT PANEL	1	\$350.00	\$350.00
DELL G2410, 24 inch LCD Widescreen, Flat Panel Monitor Panel Size: 24", Panel Type:TN - Twisted Nematic, Maximum Resolution:1920 x 1080 at 60 Hz, Contrast Ratio: 1000:1 (typical), Brightness: 250 cd/m2 (typical), Response Time: 5 ms (typical), Viewing Angle: 160° / 170° (typical), Color Support: 16.7 million colors, Pixel Pitch:0.277 mm, Device Type: widescreen Flat Panel Display. 3 YR Limited Warranty, Advanced Portable Exchange by DELL					
12	220-90001-07	REGULATOR W/CGA-580 ARGON/HELIUM/NITROGEN, 200 PSI DELIVERY PRESSURE FOR GC	1	\$447.00	\$379.95
Gas Regulator, 19H580 He or N2 for GC Gas Regulator for helium or nitrogen; includes 1/8" outlet					
13	220-99999-G1	Restek Catalogue 11123	1	\$560.00	\$560.00
Rbx®-CLP Cap. Column 30m, 0.25mm ID, 0.25um					
14	220-99999-G1	Restek Catalogue 11243	1	\$570.00	\$570.00
Rbx®-OPP2 Cap. Column 30m, 0.25mm ID, 0.25um					



SHIMADZU

QUOTATION

Number: SSI-17357-WD0E Rev. 1

Line #	Product Number	Product Name	Qty	List Price	Ext'd Price
15	I&F	INSTALLATION AND CUSTOMER FAMILIARIZATION	1	\$0.00	\$0.00
16	BALANCE_OFFER	YOU MAY ADD A SHIMADZU BALANCE TO THIS ORDER AT 50% DISCOUNT. ASK FOR DETAILS	1	\$0.00	\$0.00
17	1YW	1 YEAR WARRANTY	1	\$0.00	\$0.00

NOTE: Taxes are not included in the quoted amount

Total List Price	\$106,346.10
Total Line Item Discounts	\$21,758.69
Subtotal	\$84,587.41
Freight Amount	\$539.68
Total Amount	\$85,127.09



Terms and Conditions

GENERAL TERMS AND CONDITIONS OF SALE

Shimadzu Scientific Instruments, Inc.

PRICES

The prices set forth on the face hereof

(i) are Shimadzu Scientific Instruments, Inc.'s (hereinafter called SSI) domestic prices based upon manufacture of the quality and type ordered for shipment and end use within the United States and Canada only, all products shipped for end use outside the United States and Canada shall be subject to SSI's international prices,

(ii) are subject to revision when interruption, engineering changes or changes in quantity or quality are caused or requested by Buyer, and

(iii) unless otherwise specified, does not include warranty service or installation outside the United States and Canada. Clerical errors by Shimadzu are subject to correction.

SPECIFICATIONS

Weights and dimensions set forth in sales literature are not guaranteed unless previously certified in writing. SSI may, without affecting the obligations under this sales agreement, make what SSI regards as minor changes to the specifications of the product or products delivered under this sales agreement from those contained in sales literature.

TERMS OF PAYMENT

Subject to the credit approval by SSI, terms of payment on this sales agreement are net thirty (30) days from date of the invoice unless otherwise specifically stated on the face hereof. Invoices are payable at par on date due at any place of collection designated by SSI in funds bankable at par. Payment made beyond terms will be subject to simple interest of 1-1/2% per month on the outstanding balance. All orders are accepted subject to and the obligation of SSI to make deliveries is subject to the right of SSI to require of Buyer payment of all or any part of the purchase price in advance of delivery or to make shipment C.O.D. If Buyer fails to make advance payment when requested to do so by SSI or if Buyer is or becomes delinquent in the payment of any sum of any kind due SSI (whether or not arising out of this sales agreement) or refuses to accept C.O.D. shipments, then SSI shall have the right, in addition to any other remedy to which it may be entitled in law or in equity, to cancel this sales agreement, refuse to make further deliveries, and declare immediately due and payable all unpaid amounts of goods and services previously delivered to Buyer. Each shipment shall be considered a separate and independent transaction and payment therefore shall be made accordingly.

"Buyer must notify SSI within fifteen (15) days from the invoice date if Buyer has not received products."

SHIPMENTS

(a) The cost of packaging for domestic shipments is included in the quoted price. For international shipments or where special packaging is specified or necessary, a charge will be made to cover such expense.

(b) For shipments to and from places within the United States, all shipments—unless otherwise agreed in writing—shall be FOB point of shipment and title and risk of loss or damage shall be passed to Buyer at the shipping point. The cost of transportation and insurance (if requested by Buyer) shall be borne by Buyer.

(c) For shipments from the United States to ports and or places outside the United States all shipments are—unless otherwise agreed in writing—FOB Columbia, MD. SSI's obligation to affect shipment of the products purchased by Buyer shall be fully discharged, and beneficial ownership, legal title and all risk of loss or damage shall pass to Buyer when the products are shipped to the named place of destination in the country of importation. If shipped FOB Destination, upon arrival Buyer shall be entitled to conduct a reasonable investigation of the products purchased by it, but all claims for losses due to loss or damage to products while in transit shall be waived unless made immediately in writing by Buyer, but not more than (30) thirty days after arrival. If Buyer shall fail or refuse to accept delivery of any of the products for unverifiable claims for loss or damage to products occurring while in transit, all sums paid on deposit shall be retained by SSI as liquidated damages, provided, however, that SSI may recover in full its actual damage from Buyer in the event that actual damages exceed the amount retained as liquidated damages.

(d) All claims for damage or loss of insured shipments shall be immediately communicated, when possible, to SSI at (410) 381-1227, 7102 Riverwood Drive, Columbia, Maryland 21046-2502, Attn: Customer Service. Buyer shall immediately notify delivering carrier of loss or damage to the shipment and SSI will cooperate with Buyer in the adjustment of all claims. Buyer agrees to permit SSI or SSI's representative to inspect damaged goods.

TERMINATION

Upon any termination or cancellation of this sales agreement by Buyer, either in whole or in part, Buyer agrees to promptly pay appropriate termination or cancellation charges invoiced by SSI. If appropriate, the termination charge shall be not less than twenty percent (20%) of the total amount of this sales agreement.

RETURNED GOODS

All returns must be pre-authorized by SSI and a Return Goods Authorization (RGA) number must appear on the face of the package. Returned goods will be subject to a restocking charge. If appropriate, the restocking charge shall be not less than twenty percent (20%) of the total amount of this sales agreement.

DELIVERY

The scheduled shipping or delivery date shown on the face hereof is our best estimate of the time the order will be shipped and SSI assumes no liability for loss, general damages, or special or consequential damages due to delays.

TAXES

All applicable taxes, including but not limited to Federal, state and local excise, sales or use taxes, shall be borne by the Buyer. Buyer will provide proof of tax exempt status/exempt certification within 30 days of placing the order.

PATENTS

SSI shall defend any suit or proceeding brought against the Buyer so far as based upon an assertion that any product furnished under this sales agreement constitutes a direct infringement of any United States patent having a claim of claims covering solely the product itself, if notified promptly in writing and given authority, information and assistance (at SSI's expense) for the defense of same, and SSI shall pay all damages and costs awarded therein against Buyer. In case said product in such suit is held to constitute infringement and the use of

said product in enjoined, SSI shall, at its own option and at its own expense, either (1) procure for Buyer the right to continue using said product, (2) replace the same with a non-infringing product, (3) modify it so it becomes non-infringing, or (4) remove said product and refund the purchase price and transportation costs thereof. The foregoing obligations of SSI shall not apply to any infringement claim based upon (i) any use of any product sold hereunder in any process or in conjunction with any other product, or (ii) any product manufactured to Buyer's design or any product having a design arising out of compliance with Buyer's specifications. The foregoing states the entire liability of SSI for patent infringement by said product. If any suit or proceeding is brought against SSI based on claims that the goods manufactured by SSI in compliance with Buyer's specifications and supplied to Buyer directly infringe any fully issued United States patent, then the patent indemnity obligations herein stated with respect to SSI shall reciprocally apply with respect to Buyer.

WARRANTY

Subject to the exceptions and upon the conditions stated below, SSI warrants that the products sold under this sales agreement shall be free from defects in workmanship and materials for one year after shipment of the products to the original Buyer by SSI, and if any such products should prove to be defective within such one year period, SSI agrees, at its option, either (i) to correct by repair or, at SSI election, by replacement with equivalent product any such defective product, provided that investigation and factory inspection discloses that such defect developed under normal and proper use, or (ii) to refund the purchase price. The exceptions and conditions mentioned above are as follows:

- (a) Components or accessories manufactured by SSI which by their nature are not intended to and will not function for one year are warranted only to give reasonable service for a reasonable time; what constitutes reasonable time and reasonable service shall be determined solely by SSI. A complete list of such components and accessories is maintained at the factory;
- (b) SSI makes to warranty with respect to components or accessories not manufactured by it, in the event of defect in any such component or accessory SSI will give reasonable assistance to Buyer in obtaining from the respective manufacturer whatever adjustment is authorized by the manufacturer's own warranty;
- (c) any product claimed to be defective must, if required by SSI, be returned to the factory, transportation charges prepaid, and will be returned to Buyer with transportation charges collect unless the product is found to be defective, in which case SSI will pay all transportation charges;
- (d) If the product is a reagent or the like, it is warranted only to conform to the quantity and content and for the period (but not in excess of one year) stated on the label at the time of delivery;
- (e) SSI may from time to time produce a special printed warranty with respect to a certain product, and where applicable, such warranty shall be deemed incorporated herein by reference;
- (f) SSI shall be released from all obligations under all warranties, either expressed or implied, if any product covered hereby is repaired or modified by persons other than its own authorized service personnel unless such repair by others is made with the written consent of SSI. IT IS EXPRESSLY AGREED THAT THE ABOVE WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND OF THE WARRANTY OF MERCHANTABILITY AND THAT SSI SHALL HAVE NO LIABILITY FOR SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR FROM ANY CAUSE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOSS OF USE, LOSS OF DATA, LOSS OF PRODUCTIVITY, LOSS OF BUSINESS, LOSS OF PROFIT, LOSS OF PLANT, EQUIPMENT OR PRODUCTION, EVEN IF SSI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, ARISING OUT OF THE MANUFACTURE, USE, SALE, HANDLING, REPAIR, MAINTENANCE OR REPLACEMENT OF ANY OF THE PRODUCTS SOLD UNDER THIS SALES AGREEMENT.

If an SSI Special Warranty (covering a designated item or items) is contained in the manual or is otherwise shipped with such designated item or items, the terms and conditions specified therein are incorporated herein by reference and shall supplement this warranty. In the event of a conflict between the terms and/or conditions specified herein and those specified in such Special Warranty, the terms and/or conditions of the Special Warranty shall control. Representations and warranties made by any person, including dealers and representatives of SSI, which are inconsistent or in conflict with the terms of this warranty, shall not be binding upon SSI unless reduced to writing and approved by an expressly authorized officer of SSI.

U.S. GOVERNMENT CONTRACTS

If the products to be furnished under this sales agreement are to be used in the performance of a U.S. Government contract or subcontract and a U.S. Government contract number shall appear on Buyer's order, those clauses of the applicable U.S. Government procurement regulation which are mandated by Federal Statute to be included in U.S. Government subcontracts shall be incorporated herein by reference including, without limitation, the Fair Labor Standards Act of 1938, as amended.

FDA REQUIREMENTS

If any product listed on the face of this sales agreement is subject to regulations of FDA as a device, then as to said product only, sale and delivery is contingent upon successful completion and processing of a 510(k) notice for such product.

APPLICABLE LAW; JURISDICTION VENUE

This sales agreement is made and entered into and shall be governed, enforced and interpreted in accordance with the laws of the State of Maryland, and Customer hereby expressly consents to jurisdiction of the courts of the State of MD on all matters relating hereto. In the event that either party commences litigation to enforce any provision hereof, said litigation shall be brought in the courts of Howard County, Maryland, and the prevailing party shall be entitled to an award to all costs and reasonable attorney's fees actually incurred.

This document contains the number of pages indicated, including all attachments. Authorized signature required on quotation pages

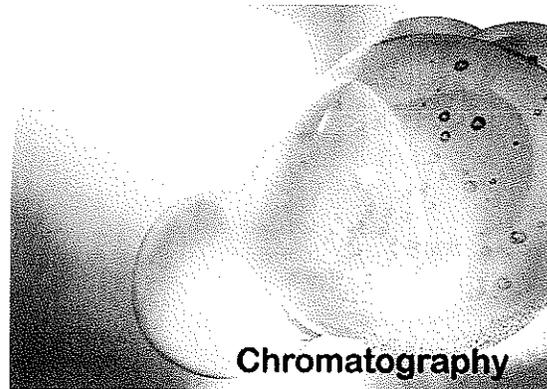
SSI-17357-WD0E Rev 1

Authorization Signature



Date: 12/2/2009

Application Note



Linear Retention Index Function (LRI) in GCMSsolution 2.4

An excellent help for identification confirmation of target compounds in complex chromatograms

Whenever a complex analysis has to be done with a large number of peaks and interfering matrix signals GCMS identification may be time consuming and/or difficult. Examples are the analysis of flavours and fragrances or the screening of pollutants in environmental/food matrices. As a help for identification the concept of linear retention index (LRI, Temperature ramp condition) may be applied. The concept is well known for a long time but now the standard Shimadzu GCMSsolution 2.4 software offer an easy and practical handling of this concept. The procedure is visualized in figure 1.

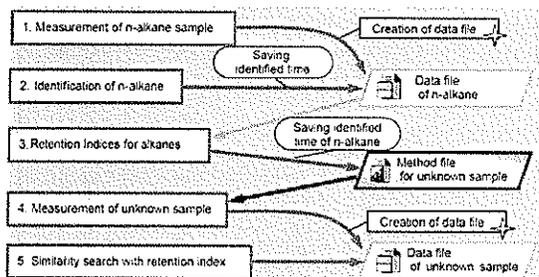


Fig 1: Flow diagram for the LRI concept

The procedure is described in more detail in the following. In figure 2 the TIC relative to a n-alkane mix is shown together with the compound table after identification.

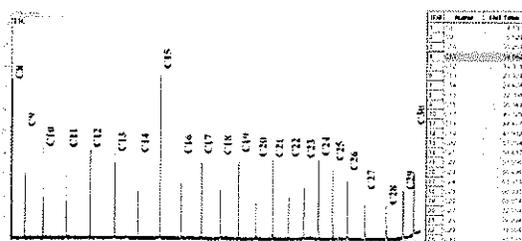


Fig 2: TIC of an n-alkane mix recorded under temperature ramp condition

The compound table is stored in the data file (all in one data file structure of GCMSsolution software).

The method for the unknown samples with the LRI calibration can either be derived from the alkane file or freely created using the GCMS real time or GCMS analysis editor (off line method development) offering maximum flexibility. In any way the retention index calculation based on the n-alkanes are stored in the method. Here as an example the GCMS analysis editor is used.

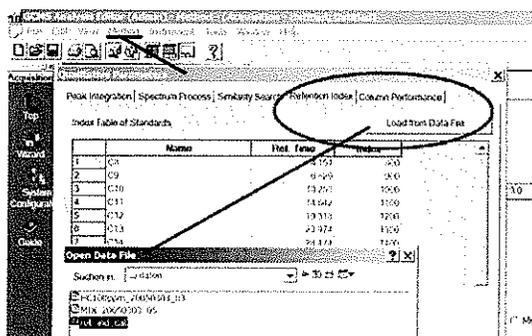


Fig 3: Method qualitative parameters. The LRI is automatically calculated from the carbon number in the name field multiplied by 100

With the "Load from Data File" button the alkane data file is selected and the list of alkanes together with the retention times is read from the alkane file. The LRI is automatically calculated. Finally the method is saved. The next step is to record the unknown sample and to make an identification by library search. The figure 4 shows a part of a TIC where two peaks (fenchol and terpineole) elute close together resulting in spectra for each compound which are interfered by the other. However due to the alkane calibration each scan point on the TIC trace is correlated with an LRI indicated in the lower part of figure 4. The LRI for the 2 peaks are 1090 and 1091.

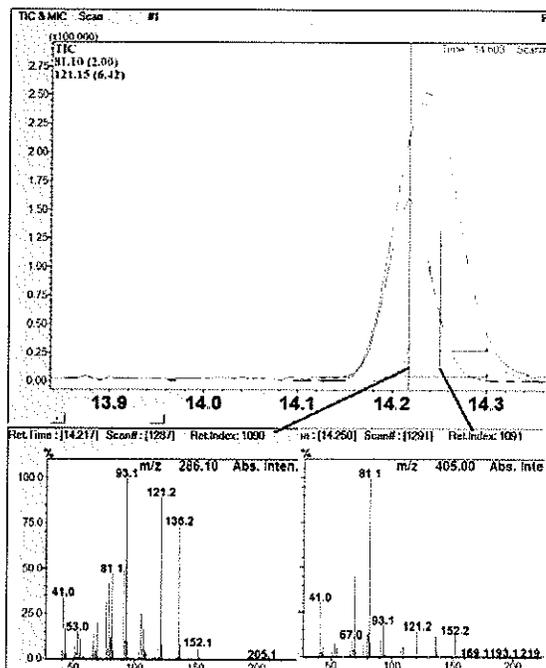


Fig. 4: Peaks of fenchol and terpineol at selected mass traces and spectra at the top

So even without background subtraction it is possible to differentiate the two peaks by the difference in LRI.

In addition it is possible to perform a library search with or without an LRI filter. The parameters how to do it are also set in the qualitative parameter window. This is shown in figure 5

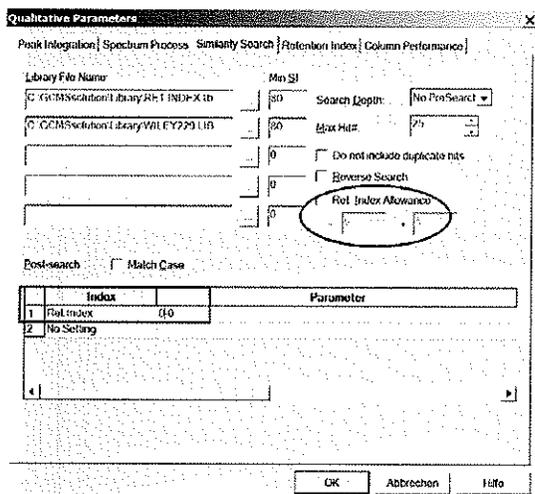


Fig. 5: Method qualitative parameters – similarity search tab

Retention index allowance filter can be set as well as retention index range filter. The library search can be performed simultane-

ously in up to 5 libraries (commercial or private). Here as an example one with and one without LRI entries is used. Figure 6 indicates the library search result of the raw spectra indicated in figure 4. Two lists of matches with decreasing similarity indices SI are shown.

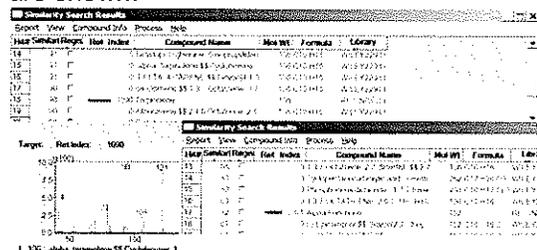


Fig. 6: Library search results using two libraries. One with the other without LRI entries. Among the list the hits from the private library containing LRIs are marked by the red dash

When using the LRI filter with allowance of ± 1 only one hit in each case remains. This is shown in figure 7.

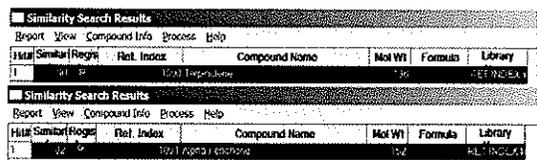


Fig. 7: Library search results using an LRI filter

With background subtraction the similarities are of course much higher as demonstrated in figure 8 for the compound terpinolene.

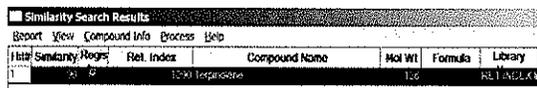


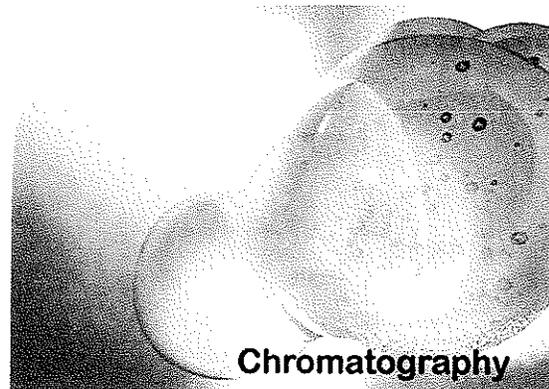
Fig. 8: Library search result for terpinolene with LRI filter and spectrum background subtraction

The LRI function of GCMSsolution 2.4 offers a convenient help in routine identification work of complex chromatograms. At the same time library searches can be done with libraries which contain or do not contain LRIs.

The given specifications serve purely as technical information for the user. No guarantee is given on technical specification of the described product and/or procedures.

Application Note

Automatic Adjustment of Retention Times (AART) in GCMSsolution 2.5 - An excellent help for complex samples



Whenever a complex GCMS analysis has to be done with a large number of peaks corresponding to samples with dirty matrices the retention times may differ due to aging of the column and/or because the column has to be shortened in order to recover separation performance. Then all the target peaks in the compound table usually have retention times which are no longer correct. GCMSsolution 2.5 offers the possibility to automatically set the new retention times into the compound table of the method and, in addition, all time relevant parameters of the GCMS realtime analysis like SIM (Selected Ion Monitoring) tables are updated. Any compromise on the separation efficiency is avoided as the hardware parameters like the best mean linear velocity is still used. The concept is based on usage of the linear retention index (LRI). The LRI is automatically calculated for the compounds after injection of an n-alkane standard. The corresponding window is indicated in figure 1.

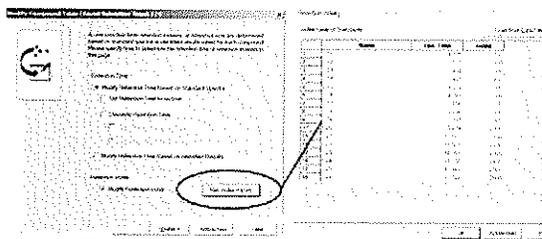


Fig. 1: Retention index calibration based on a n-alkane sample. The retention times are load from the n-alkane data file

Of course, the LRI can also be used as an identification help which is described elsewhere [1]. After loading the n-alkane data file the linear retention indices are calculated for the target compounds. Figure 2 shows a compound table of a pesticide sample with

retention times and the LRIs calculated on the basis of the LRI calibration shown in figure 1

Fig. 2: TIC data and part of the compound table of a pesticide sample

In case the capillary column has to be cut the retention times are shifted. For the pesticide sample this is demonstrated in figure 3. Here the column length was changed from 30 m to 28 m.



Fig. 3: Two runs of the pesticide sample shown in figure 2. Top: Data corresponding to the 30 m length. Bottom: Data corresponding to 28 m length

To adjust retention times inside the compound table just another injection of the n-alkane sample is done after cutting. Then the retention times of the pesticide compound table is adjusted on the basis of the new retention times of the n-alkanes and the LRI information. The latter is mainly influenced just by the stationary phase material which remains unchanged between the experiments. The main part of the procedure is visualized in figure 4.

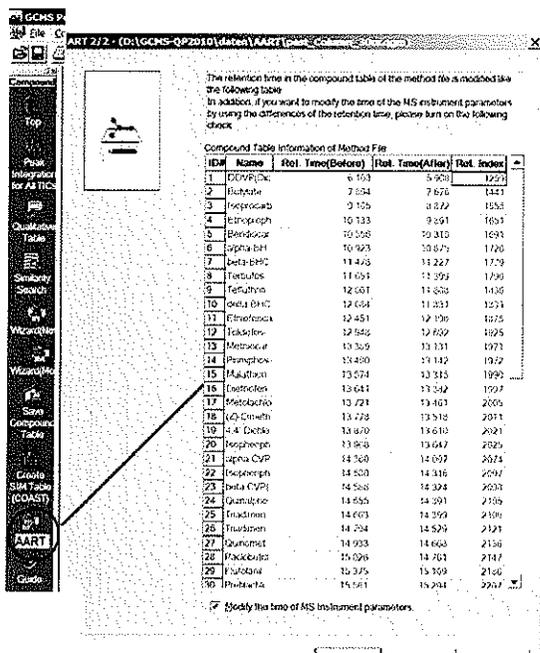


Fig. 4: AART function inside GCMSsolution 2.5 and box with retention times before and after adjustment.

There the retention times of the compounds before and after adjustment is indicated together with the LRI information. After completing this step the whole compound table contains the new retention times for reanalysis of unknowns measured with the column after cutting. The method is very reliable and precise. This is derived from a comparison where the retention times of the pesticides were manually checked and compared with the ones predicted from the automatic method. The result is shown in figure 5 for the 28 m length.

Compound Name	28m		
	Real	Predicted	Diff(RT)
1 DDVP(Dichlorvos)	6.120	6.103	0.017
2 Butylate	7.927	7.923	0.004
3 Isoprocab	9.143	9.134	0.009
4 Ethoprophos	10.174	10.182	0.012
5 Bendiocarb	10.599	10.594	0.005
6 alpha-BHC	10.968	10.952	0.016
7 beta-BHC	11.528	11.513	0.013
8 Terbufos	11.700	11.689	0.011
9 Tefluthrin	12.113	12.117	-0.004
10 delta-BHC	12.134	12.121	0.013
11 Ethiofencarb	12.500	12.489	0.011
12 Tolclofos-methyl	13.000	12.988	0.012
13 Methiocarb	13.442	13.432	0.010
14 Pirimiphos-methyl	13.453	13.452	0.001
15 Malathion	13.628	13.627	0.001
47 Cyfluthrin-1	20.363	20.356	0.007
48 Cyfluthrin-2	20.446	20.443	0.003
49 Cyfluthrin-3,4	20.562	20.555	0.007
50 Halfenprox	20.718	20.706	0.012
51 Silafluofen	21.095	21.086	0.009
52 Fenvalerate-1	21.597	21.584	0.013
53 Fenvalerate-2	21.602	21.788	0.014
54 Difenconazole-1	22.054	22.039	0.015
55 Difenconazole-2	22.126	22.111	0.015
56 Imibenzonazole	23.516	23.503	0.013

Fig.5: Comparison of automatic calculation of retention times set into the compound table using AART and the observed retention times in the data file

As can be seen from Figure 4 the box "Modify the time of MS instrument parameters" is checked. This makes sure that all time related MS parameters like SIM windows or time events for detector gain are automatically updated

[1] Shimadzu Application Note: Linear Retention Index Function (LRI) in GCMSsolution 2.4
An excellent help for identification confirmation of target compounds in complex chromatograms

The given specifications serve purely as technical information for the user. No guarantee is given on technical specification of the described product and/or procedures.



Determination of Volatile Organics in Drinking Water According to EPA Method 524.2 Using GC/MS

This method is an example of EPA Method 524.2 Drinking Water analysis using the Shimadzu QP-2010s GC/MS. This Method is suitable for identifying and quantitating volatile organics at low levels in aqueous matrix. The Environmental Protection Agency requires that this analysis be performed in compliance with the protocol specified in the United States Federal Register 40 CFR, and this method is not meant to replace this criteria.

The following is an example of the instrument setup and the performance achieved under these conditions in accordance with Method 524.2

Experimental

Equipment

This analysis was performed using the Shimadzu QP-2010s Mass Spectrometer, the standard GC-2010 Gas Chromatograph with Advanced Flow Control, the Tekmar 3100 Purge and Trap and Archon water/soil autosampler.

Using the standard SPL-2010 split/splitless injection port on the GC-2010 as a gas flow splitter, the Method was performed with a Shimadzu 3.4mm id. liner. These results were obtained using a 0.18mm X 20m X 1um phase SH-VMS column from Shimadzu.

Standards

The Standards were prepared in accordance with the Method's specifications and transferred to 40mL vials for sampling. The concentrations used for the 25ml injection volumes were .5ppb – 10ppb. The internal standards and surrogates were held constant at 5ppb. During the sampling, the water was spiked with the Internal Standards and Surrogates and transferred to the Purge and Trap. The calibration curve was run and the results processed to determine the RSD for each compound in the target analyte list

Mass - Spectrometer

The QP-2010s method file setup specified that the mass filter was to be scanned and data acquired from mass 35 to mass 260. The scan rate was set to scan the chromatographic peaks 10-15 times for the narrowest chromatographic peak

GC

The GC-2010 was set up with a multi-rate temperature profile and the Advanced Flow Control was programmed to provide a constant linear velocity from the column into the mass spectrometer ion source. The last peak is at 10.2 minutes.

QC

GCMS Setup

- Inlet Temperature: 230C
- Ion Source Temperature: 200C
- Interface Temperature: 230C
- Injection Mode: Split (15:1)
- Flow Rate: Linear Velocity (37.0cm/sec)
- Oven Temperature: 40C (2 min)-(20C/min)-240C (1 min)
- Solvent Cut Time: 0.7 min
- Acquisition Mode: Scan
- Mass Range: m/z 35-260
- Detector Voltage: 1.02 kV

Purge and Trap Setup

- Sample Volume: 5 mL
- Purge Flow: 40 mL/min
- Purge Time: 11 min
- Dry Purge Time: 1 min
- Desorb Temperature: 250C
- Desorb Flow: 300 mL/min
- Desorb Time: 2 min
- Bake Flow: 300 mL/min
- Bake Temperature: 270C
- Bake Time: 2 min

After the QP-2010s was tuned using the Automatic tuning function, the qualification standard of 1µL of a 5µg/mL Bromofluorobenzene (BFB) solution was purged and the instrument passed all ion criteria requirements.

Next, the Initial Calibration Curve was acquired and processed. The day following the Initial Calibration Curve acquisition, a Continuing Calibration Standard was injected after a fortified laboratory blank and all compounds met the stability criteria. Lastly, a detection limit study was performed following 524.2 Method criteria.

Results:

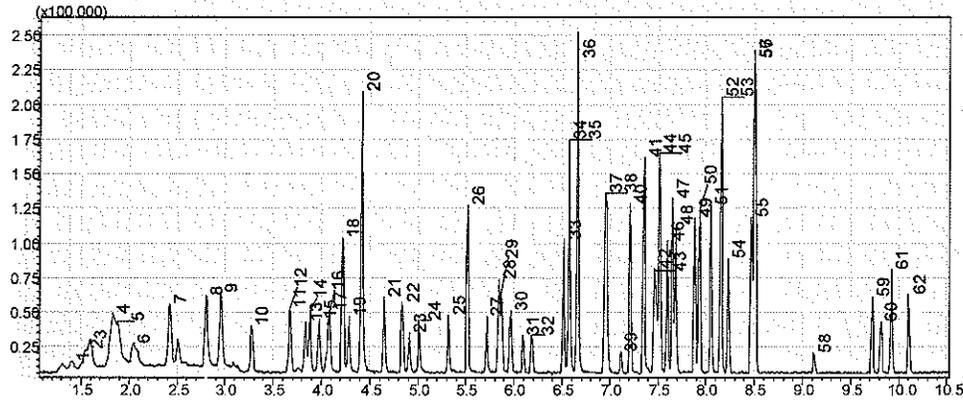


Figure 1: Chromatogram of 0.5ppb calibration standard for Method 524.2 on the QP-2010s GC/MS

Tuning:

Spectrum testing of the system was done for every 8 hours of operation. Any time the responses for the spectrum of the acceptance testing criteria compound Bromofluorobenzene do not fall within the range of acceptable deviations shown, maintenance or adjustment is required to conform with the method criteria. Tuning results achieved by performing this analysis and meeting the method criteria are in Table 1. The tune stability was tested and showed consistent tune, passing the acceptance criteria for over 30 calibration check standards. No readjustment of the hardware to correct the instrument spectral generation was required. When readjustment is required, the automatic tuning software resets the optics parameters to the required levels to reestablish the results shown in Figure 2.

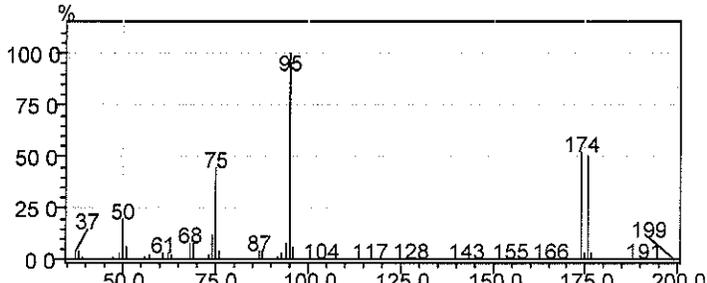


Figure 2: Mass spectrum of Bromofluorobenzene (BFB)

m/z	Spectrum Check Criteria	Result
50	15 to 40 percent of mass 95	18.39
75	30 to 80 percent of mass 95	44.08
95	base peak, 100 percent	100.00
96	5 to 9 percent of mass 95	6.67
173	< 2 percent of mass 174	0.52
174	> 50 percent of mass 95	57.88
176	95 to 100 percent of mass 174	98.06
177	5 to 9 percent of mass 176	6.33

Table 1: Ion abundance criteria for BFB

Quality Control Data:

Calibration

Table 2 shows the results of calibration for levels of a five-point curve from .5 ppb. to 10 ppb. To achieve the results shown by the process used, first establish the chromatography and integration parameters based on repeated injection of the low standard. Then inject the high standard and adjust the multiplier/detector voltage to a level that ensures that the ion intensities for the

high standard approach the instrument's electrical saturation point. This setting is then used to create the method offset voltage for comparison to the automatic tuning voltage result, thereby ensuring that when the ion optics are adjusted, the system is returned to operating parameters in the shortest possible time. Figure 3 shows the chromatography of the gases for the low standard.

The higher % RSD value for the Methylene chloride shown in Table 2 is due to laboratory contamination of

this compound from proximity to units that were performing solvent injection techniques.

ID	Compound Name	Level 1 RF	Level 2 RF	Level 3 RF	Level 4 RF	Level 5 RF	Mean RF	RF %RSD
1	Dichlorodifluoromethane	0.15	0.12	0.17	0.21	0.20	0.15	4.30
2	Chloromethane	0.60	0.51	0.46	0.45	0.42	0.49	7.03
3	Vinyl chloride	0.38	0.34	0.41	0.43	0.43	0.38	10.73
4	Bromomethane	0.04	0.04	0.05	0.04	0.05	0.04	9.86
5	Chloroethane	0.22	0.22	0.25	0.23	0.23	0.23	5.72
6	Trichlorofluoromethane	0.24	0.27	0.30	0.30	0.31	0.29	9.67
7	1,1-Dichloroethene	0.23	0.24	0.27	0.27	0.28	0.26	7.68
8	Dichloromethane	0.49	0.49	0.52	0.47	0.51	0.50	3.40
9	trans-1,2-Dichloroethene	0.25	0.28	0.30	0.29	0.30	0.28	7.66
10	1,1-Dichloroethane	0.54	0.57	0.63	0.60	0.63	0.59	6.75
11	2,2-Dichloropropane	0.01	0.02	0.01	0.02	0.02	0.02	11.34
12	cis-1,2-Dichloroethene	0.30	0.31	0.33	0.32	0.35	0.32	5.80
13	Chloroform	0.51	0.49	0.54	0.51	0.55	0.52	4.27
14	Bromochloromethane	0.13	0.14	0.15	0.14	0.15	0.14	5.09
15	1,1,1-Trichloroethane	0.35	0.35	0.38	0.36	0.39	0.37	4.93
16	1,1-Dichloropropene	0.43	0.41	0.45	0.44	0.49	0.44	5.91
17	Carbon tetrachloride	0.23	0.24	0.26	0.26	0.28	0.25	8.58
18	Benzene	1.39	1.38	1.44	1.38	1.48	1.41	2.98
19	1,2-Dichloroethane	0.41	0.41	0.45	0.43	0.47	0.43	6.56
20	Fluorobenzene	ISTD	ISTD	ISTD	ISTD	ISTD	ISTD	
21	Trichloroethene	0.26	0.27	0.30	0.28	0.31	0.28	6.59
22	1,2-Dichloropropane	0.33	0.36	0.39	0.37	0.40	0.37	6.93
23	Bromodichloromethane	0.33	0.35	0.39	0.37	0.40	0.37	7.29
24	Dibromomethane	0.17	0.18	0.19	0.18	0.20	0.18	5.61
25	cis-1,3-Dichloropropene	0.47	0.48	0.54	0.52	0.57	0.51	8.23
26	Toluene	1.22	1.22	1.33	1.26	1.37	1.28	5.27
27	trans-1,3-Dichloropropene	0.38	0.38	0.41	0.39	0.45	0.40	7.49
28	1,1,2-Trichloroethane	0.25	0.25	0.29	0.27	0.30	0.27	8.00
29	Tetrachloroethene	0.24	0.25	0.27	0.26	0.29	0.26	7.02
30	1,3-Dichloropropane	0.56	0.58	0.64	0.60	0.66	0.61	6.80
31	Dibromochloromethane	0.21	0.23	0.25	0.24	0.26	0.24	8.44

ID	Compound Name	Level 1 RF	Level 2 RF	Level 3 RF	Level 4 RF	Level 5 RF	Mean RF	RF %RSD
32	1,2-Dibromoethane	0.29	0.28	0.32	0.29	0.33	0.30	7.07
33	Ethylbenzene	1.16	1.24	1.41	1.40	1.57	1.36	11.93
34	Chlorobenzene	0.73	0.76	0.82	0.80	0.87	0.79	6.78
35	1,1,1,2-Tetrachloroethane	0.22	0.23	0.25	0.23	0.26	0.24	5.84
36	m/p-Xylene	0.53	0.55	0.62	0.62	0.67	0.60	9.89
37	o-Xylene	0.51	0.54	0.60	0.59	0.66	0.58	9.91
38	Styrene	0.80	0.85	0.99	0.97	1.08	0.94	12.02
39	iso-Propylbenzene	1.17	1.22	1.38	1.37	1.53	1.34	10.75
40	Bromoform	0.07	0.07	0.08	0.08	0.09	0.08	10.52
41	1,1,2,2-Tetrachloroethane	0.49	0.49	0.53	0.51	0.56	0.51	5.45
42	4-Bromofluorobenzene (Sur)	0.25	0.26	0.26	0.26	0.26	0.26	1.77
43	n-Propylbenzene	1.47	1.54	1.74	1.73	1.93	1.68	10.66
44	1,2,3-Trichloropropane	0.40	0.41	0.46	0.43	0.47	0.44	7.30
45	Bromobenzene	0.28	0.29	0.31	0.30	0.33	0.30	6.65
46	1,3,5-Trimethylbenzene	1.05	1.11	1.25	1.25	1.38	1.21	10.94
47	2-Chlorotoluene	0.93	0.98	1.10	1.08	1.20	1.06	9.91
48	4-Chlorotoluene	1.03	1.09	1.22	1.19	1.32	1.17	9.55
49	tert-Butylbenzene	0.81	0.88	0.98	0.96	1.07	0.94	10.41
50	1,2,4-Trimethylbenzene	1.03	1.14	1.28	1.25	1.37	1.21	10.72
51	sec-Butylbenzene	1.30	1.38	1.56	1.53	1.72	1.50	10.87
52	p-iso-Propyltoluene	0.97	1.02	1.19	1.17	1.32	1.13	12.11
53	1,3-Dichlorobenzene	0.54	0.56	0.63	0.60	0.66	0.60	8.11
54	1,4-Dichlorobenzene	0.54	0.55	0.60	0.58	0.64	0.58	7.19
55	n-Butylbenzene	0.94	1.00	1.13	1.15	1.31	1.11	12.98
56	1,2-Dichlorobenzene-D4(Sur)	0.32	0.33	0.34	0.34	0.34	0.34	2.64
57	1,2-Dichlorobenzene	0.52	0.54	0.60	0.57	0.62	0.57	7.34
58	1,2-Dibromo-3-chloropropane	0.10	0.11	0.12	0.11	0.13	0.11	8.53
59	1,2,4-Trichlorobenzene	0.29	0.32	0.36	0.35	0.40	0.34	12.19
60	Hexachlorobutadiene	0.19	0.18	0.20	0.20	0.22	0.20	7.93
61	Naphthalene	0.95	0.99	1.15	1.12	1.32	1.11	13.30
62	1,2,3-Trichlorobenzene	0.29	0.32	0.36	0.35	0.40	0.35	11.76

Table 2: Calibration results for Method 524.2

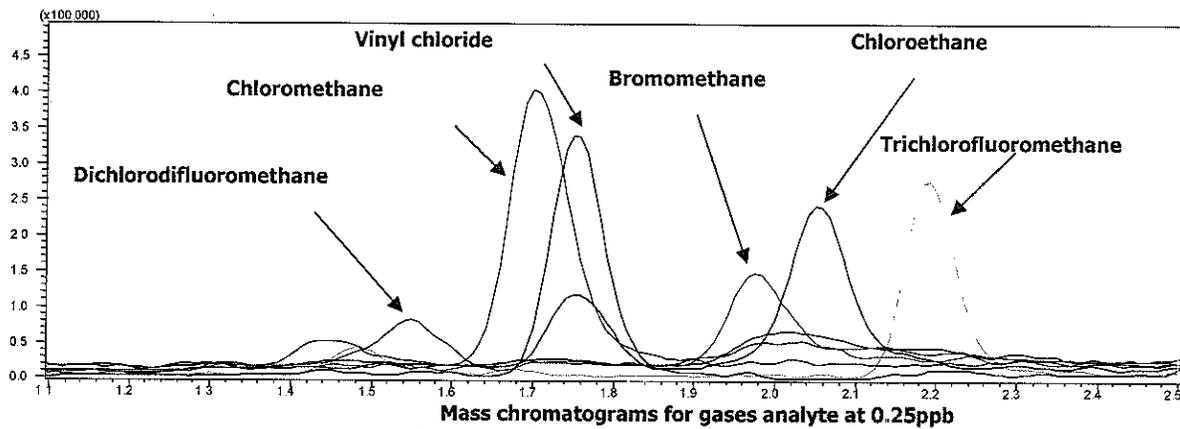


Figure 3: Chromatography of the first six gas compounds at 0.25ppb

Detection Limit Study:

The method detection limit results for this analysis are shown below in Table 3

Compound	stddev	Det Limit	Compound	stddev	Det Limit	Compound	Surr	Surr
dichlorodifluoromethane	0.104	0.327	1,2-dichloropropane	0.089	0.282	Bromofluorobenzene-Surr	0.101	0.317
Chloromethane	1	0.270	bromodichloromethane	0.094	0.296	bromobenzene	0.102	
vinyl chloride	4	0.221	dibromomethane	0.087	0.273	n-propylbenzene	2	0.321
Bromomethane	8	0.213	cis-1,3-dichloropropene	0.095	0.301	2-chlorotoluene	0.098	0.308
Chloroethane	9	0.304	toluene	0.098	0.309	1,3,5-trimethylbenzene	0.108	0.339
trichlorofluoromethane	4	0.300	trans-1,3-dichloropropene	0.099	0.314	4-chlorotoluene	6	0.300
1,1-dichloroethene	9	0.267	1,1,2-trichloroethane	0.093	0.294	tert-butylbenzene	9	0.307
methylene chloride	6	0.219	1,3-dichloropropane	0.094	0.298	1,2,4-trimethylbenzene	1	0.314
Trans-1,2-dichloroethene	9	0.285	tetrachloroethene	0.094	0.298	sec-butylbenzene	0.108	0.339
1,1-dichloroethane	5	0.297	dibromochloromethane	0.102	0.320	4-isopropyltoluene	6	0.319
2,2-dichloropropane	0.094	0.295	1,2-dibromoethane	0.103	0.323	1,3-dichlorobenzene	1	0.305
cis-1,2-dichloroethene	4	0.287	chlorobenzene	0.102	0.320	1,4-dichlorobenzene	8	0.304
Chloroform	7	0.272	1,1,1,2-tetrachloroethane	0.108	0.339	n-butylbenzene	9	0.289
bromochloromethane	3	0.302	ethylbenzene	0.092	0.289	1,2-dichlorobenzene-d4 Surr	Surr	
1,1,1-trichloroethane	5	0.262	m,p-xylene	0.093	0.294	1,2-dichlorobenzene	7	0.291
1,1-dichloropropene	0.105	0.330	o-xylene	0.098	0.309	1,2-dibromo-3-chloropropane	4	0.208
carbon tetrachloride	0.095	0.298	styrene	0.088	0.278	1,2,4-trichlorobenzene	4	0.262
benzene	2	0.280	bromoform	0.102	0.322	hexachlorobutadiene	0.09	0.283
fluorobenzene	ISTD		isopropylbenzene	0.103	0.326	naphthalene	3	0.265
1,2-dichloroethane	2	0.242	1,1,2,2-tetrachloroethane	0.102	0.322	1,2,3-trichlorobenzene	1	0.292
trichloroethene	1	0.302	1,2,3-trichloropropane	0.094	0.296			

Table 3: MDI results for EPA Method 524.2 (seven replicates run at 1.0ppb)

For more information on Shimadzu GC/MS, please visit

www.ssi.shimadzu.com/QPS

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November 23, 2009

Ms Roberta Wagner
State of West Virginia
PO Box 50130
Charleston, WV 25305
Re: LBS10042

Dear Ms Wagner,

I am writing in regards to your request for quotation LBS10042 for a Gas Chromatograph/Mass Spectrometer or GC/MS and a Gas Chromatograph-Electron Capture Detector, or GC-ECD We intend to submit two bids Shimadzu has released a new GC, the GC-2010 Plus since the first issue of this bid, and this is the instrument that will be bid.

Shimadzu Scientific Instruments (SSI) is the American subsidiary of Shimadzu Corporation, headquartered in Kyoto, Japan. Founded in 1875, Shimadzu is a \$2 billion multinational corporation with three major divisions: Medical Diagnostics, Aerospace/Industrial, and Analytical Instruments The Analytical Division is one of the world's largest manufacturers of analytical instrumentation and environmental monitoring equipment.

In 1975, SSI corporate headquarters was established in Columbia, Maryland to provide analytical solutions to a wide range of laboratories in North, Central, and parts of South America. In the U.S , SSI has a network of more than 50 locations providing local and regional sales, service, and technical support.

It should be noted that we have free onsite training for as many days as needed for the end users to become proficient with the instrument. Our technical personnel can also be scheduled for re-trainings at no charge in the future.

Both of our bids will include two very high end Dell Data Stations with a 22" flat panel monitors

Shimadzu also offers free phone support for the lifetime of the instrument.

We take the following exceptions to the bid specifications:

BID 1: QP-2010s

Gas Chromatograph/Mass Spectrometer Specifications and Requirements Section

Item 10: The GC/MS instrument must be capable of detecting a wide mass range of at least 1.5-1090 Daltons.

• • • • •
• • • • •



Shimadzu Scientific Instruments

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www.ssi.shimadzu.com

The Shimadzu QP-2010s has a mass range of 1.5-900 Daltons. The VOA method specified does not have compounds with a greater mass than 300 Daltons.

Item 12: The GC/MS instrument must come equipped with a 179 L/sec turbomolecular pump or better.

Shimadzu's QP-2010s comes with a 65 L/sec turbomolecular pump. It should also be noted that Shimadzu is the only vendor that quotes the larger RV-3 roughing pump, which is easier on the turbomolecular pump

Gas Chromatograph – Electron Capture Detector Specifications and Requirements Section

Shimadzu takes no exceptions to this portion of the bid.

BID 2: QP-2010 Plus

Gas Chromatograph/Mass Spectrometer Specifications and Requirements Section

Gas Chromatograph – Electron Capture Detector Specifications and Requirements Section

Shimadzu takes no exceptions to this bid

Thanks again for the opportunity to earn your business

Sincerely,

Heather Juzwa
Field Sales Engineer
724-745-2662
hljuzwa@shimadzu.com