| INVITATION TO BID - Addendum 01 | | BID DUE DATE AND TIME |
|---|---|---|
| BOARD OF SUPERVISORS OF<br>LOUISIANA STATE UNIVERSITY<br>AND AGRICULTURAL & MECHANICAL COLLEGE | | **10/24/2023 11:00 AM CT** |

**SOLICITATION** RFQ-0000002064
**SUPPLIER #**
**SUPPLIER NAME AND ADDRESS**

**RETURN BID TO**

lsubids@lsu.edu

**Buyer** Amy Hill Bourgeois
**Buyer Phone**
**Buyer Email** ahill5@lsu.edu
**Issue Date** 10/05/2023

TITLE: Helium Recovery System

Addendum 01: Notice is given to all parties that this solicitation is amended by the University as stated herein. This Addendum is hereby made an official part of this solicitation. See attached supplier inquiries and responses.

**To Be Completed By Supplier**

1. _____"No Bid" (sign and return this page only).
2. _____My Company does not wish to receive future solicitations for this spend category.
3. Specify your Delivery: To be made within _____ days after receipt of order.
4. If applicable, Supplier's Addendum Acknowledgement/Response:
   As an authorized agent/signatory of the supplier, I/we acknowledge receipt of this Addendum, and
   _____submit no alterations/clarifications to our original bid.
   _____submit superseding revisions/clarifications to our original bid as written herein or attached hereto.

**General Instructions to Suppliers**

1. Sealed bids for furnishing the items and/or services specified are hereby solicited, and will be received by LSU Procurement at the "Return Bid To" address stated above, until the specified due date and time.
2. Read the entire solicitation, including all terms, conditions and specifications.
3. All bid information and prices must be typed or written in ink. Any corrections, erasures or other forms of alteration to unit price are to be initialed by the supplier.
4. Bid prices are to be quoted FOB LSU/Destination and inclusive of any and all applicable shipping and handling charges unless otherwise specified in the solicitation. Any invoiced delivery charges not quoted and itemized on the LSU purchase order are subject to rejection and non-payment.
5. Payment is to be made within 30 days after receipt of properly executed invoice, or delivery and acceptance, whichever is later.
6. By signing this solicitation, the supplier certifies compliance with all general instructions to suppliers, terms, conditions and specifications; and further certifies that this bid is made without collusion or fraud.

| SUPPLIER NAME | MAILING ADDRESS |
|---|---|
| AUTHORIZED SIGNATURE | CITY, STATE ZIP |
| PRINTED NAME | PHONE # |
| TITLE | FAX # |
| E-MAIL | FEDERAL TAX ID # |

**LSU RFQ-0000002064**

**Helium Recovery System**

**Addendum 01**

**Inquiry 1**

Helium flow rate: The amount of helium that needs to be recovered per unit of time (usually in standard cubic feet per minute, SCFM) must be known.

**Response 1**

The largest helium flow rate occurs at CAMD when cooling down our superconducting magnets from 77K to 4K. The helium highest flow is when the first 250L dewar of liquid is transferred to the cryostat, completely boiling off and producing 6,622 cu-ft gas. We need to capture this gas in one day. Assuming 2000 cu-ft remains in the bag, compressing 4,622 cu-ft over 9.5 hours requires a compressor with **8 SCFM, the size specified in item (1.1).** A higher SCFM in (1.1) will allow us to carry out the task in less time which is desirable. Once compressed in cylinders, the He gas can be liquified slowly but we need at least 22 liquid liters/day **as specified in item (1.5)**. During normal operations (not transfers) we produce approximately 0.1 SCFM of He gas.

At Chemistry the average liquid consumption is 4.1L/day that produces 109 cu-ft He gas or 0.08 SCFM. A 300 cu-ft collection bag will fill in 2.8 days. A **7 SCFM compressor** will transfer 300 cu-ft of gas to cylinders in 43 min. **This is the size specified in item (2.2)**

**Inquiry 2**

Helium concentration: Are there any impurities? If so, what are the impurities and what's the concentration?

**Response 2**

The gas He is collected in a closed system from liquid He boil off so there are no impurities from the He source. There may be some adventitious moisture in the collection system.

**Inquiry 3**

Purification requirements: If the recovered helium needs to meet specific purity standards, such as removing impurities or moisture, those requirements must be communicated.

**Response 3**

The gas He must be purified from adventitious contaminants such as moisture and other gases as they will cause the liquid He to contain other liquids or frozen gases and may damage the liquefier. Automatic purifiers produce He to 99.999% or better.

**Inquiry 4**

Space limitations: The available space for installing the helium recovery system should be provided, it can affect the selection and configuration of equipment.

**Response 4**

The CAMD site has no space limitations – our experimental hall is 25,500 sq-ft with 40 ft ceilings. The Chemistry room is 23'x21' with one area 14'x10'x9' high and the other part of the room has 7' ceilings.

**Inquiry 5**

Desired automation level.

**Response 5**

This is indicated in items (1.6) and (2.4).

**Inquiry 6**

Budget limitations.

**Response 6**

Estimated budget is $450,000.00.