

भारत सरकार/GOVERNMENT OF INDIA
अंतरिक्ष विभाग/DEPARTMENT OF SPACE
क्रय यूनिट-III/PURCHASE UNIT-III
विक्रम साराभाई अंतरिक्ष केंद्र/VIKRAM SARABHAI SPACE CENTRE
तिरुवनंतपुरम/THIRUVANANTHAPURAM – 695 022
Tel: (0471) 2563676/3775/3609
email: spso_prso_pur@vssc.gov.in, pso2_prso_pur@vssc.gov.in

EXPRESSION OF INTEREST

Ref. No. VSSC/SPRE/APEP/EOI-ZET/02/2023

Date: 24/03/2023

एपीईपी/वीएसएससी, आलुवा, कोच्ची में अमोनियम परक्लोरेट मातृ द्रव उपचार संयंत्र (एपीएमएलपी)
की स्थापना (ईओआइ)

Expression-Of-Interest (EOI) for Establishing Ammonium Perchlorate Mother Liquor Treatment Plant (APMLP) at APEP/VSSC, Aluva, Kochi

इच्छुक प्रत्याशित निर्माता हमारे संदर्भ सं. VSSC/SPRE/APEP/EOI-ZET/02/2023 का उद्धरण करते हुए
27/04/2023 [16:00 Hrs.] को या उससे पहले निम्नलिखित पते पर अपनी अभिरुचि की अभिव्यक्ति दे सकते हैं।

VSSC invites, EOI from prospective bidders for **Establishing Ammonium Perchlorate Mother Liquor Treatment Plant (APMLP) at APEP/VSSC, Aluva, Kochi**. Interested parties may furnish their Expression of Interest in Sealed Envelope quoting our Reference No. VSSC/SPRE/APEP/EOI-ZET/02/2023 on or before **27/04/2023 [16:00 Hrs.]** to the following address:

नोट:- मेक इन इंडिया नीति के अनुसार केवल श्रेणी-I और श्रेणी-II के स्थानीय आपूर्तिकार इस बोली में भाग लेने के पात्र हैं।

Note:- Only Class-I and Class-II Local suppliers as per Make in India policy are only eligible to participate in the bid

वरि. क्रय एवं भंडार अधिकारी / Sr. Purchase & Stores Officer,
क्रय यूनिट III /Purchase Unit- III,
आरएफएफ क्षेत्र, इसरो पीओ/ RFF Area, ISRO. PO,
तिरुवनंतपुरम/Thiruvananthapuram- 695022.
फोन/Ph: 0471-256 3775/3609

EOI documents are available at our website www.isro.gov.in and www.vssc.gov.in.

Please Note:

PRE-EOI MEETING: Parties can visit APEP/VSSC, Aluva on any working days (10.00 hr to 16.00 hr) with prior intimation on **or before 10/04/2023** to get first-hand knowledge regarding the plant & location before submission of EOI.

Contact details: Sr. Purchase & Stores Officer
Purchase Unit- III, RFF Area, ISRO. PO,
Thiruvananthapuram- 695022
Ph: 0471-256 3775/3609 , email id: spso_prso_pur@vssc.gov.in

हस्ताक्षरित/Sd/-

वरि.प्रधान, क्रय एवं भंडार/ Sr.Head, Purchase & Stores



GOVERNMENT OF INDIA
DEPARTMENT OF SPACE, ISRO
VIKRAM SARABHAI SPACE CENTRE
PURCHASE & STORES DIVISION
Tel: (0471) 2563775; Fax: (0471) 2562105

Ref.No. VSSC/SPRE/APEP/EOI-ZET/02/2023

Date: 24/03/2023

INVITATION FOR EXPRESSION OF INTEREST

Vikram Sarabhai Space Centre (VSSC) proposes to invite Expression-Of-Interest (EOI) for Establishing Ammonium Perchlorate Mother Liquor Treatment Plant at APEP, Aluva, Kochi-683 112,

Ammonium Perchlorate Experimental Plant (APEP) of VSSC, ISRO located at Aluva, Kerala, is entrusted with manufacture and supply of Ammonium Perchlorate (AP) for various programs of ISRO. In-house technology has been developed by VSSC for converting crude mother liquor into other chemicals, which can be used in the manufacturing of AP. This technology involves various unit operations/ processes like dissolution, double displacement reactions, precipitation, thickening, filtration, acidification, purification and scrubbing. This technology was demonstrated as a continuous process in a smaller scale of capacity @ 4 m³/day. This EOI is aimed at short listing suitable vendors from competent Engineering firms for executing a full scale "AP Mother Liquor Treatment Plant" on turnkey basis. The scope of work involves process scale up from 4 m³/day to 30 m³/day in continuous process, plant design, manufacture, installation, platforms & structures, construction of building, commissioning and performance demonstration.

Interested parties may submit their Expression of Interest to Senior Purchase & Store Officer, Unit III, SPRE Purchase, VSSC, Thiruvananthapuram -695022 quoting reference number **on or before 16.00 hrs 27/04/2023**. Prior to the submission of EOI, interested parties may visit APEP/VSSC, Aluva on any working days (10.00 hr to 16.00 hr) with prior intimation on or before 10/04/2023 to get first-hand knowledge regarding the plant location.

The EOI should contain the details about the supplier as mentioned in the document ref no. VSSC/SPRE/APEP/EOI-ZET/01/2023, which is available in our website www.isro.gov.in and www.vssc.gov.in.

For further details, terms & conditions, Senior Purchase & Store Officer, Unit III, SPRE Purchase, VSSC, Thiruvananthapuram -695022 may be contacted (preferably through e-mail: spsprso_pur@vssc.gov.in) quoting the ref no. VSSC/SPRE/APEP/EOI-ZET/02/2023.



**Invitation for Expression of Interest for Establishing Ammonium
Perchlorate Mother Liquor Treatment Plant at APEP/ VSSC, Aluva, Kochi**

1.0 INTRODUCTION

Ammonium Perchlorate Experimental Plant (APEP) of VSSC/ ISRO located at Aluva, Kerala, manufactures Ammonium Perchlorate (AP) for launch vehicles of ISRO. During the manufacturing of AP, mother liquor (ML) containing sodium chloride, ammonium perchlorate and sodium chlorate, is produced. The ML is presently considered as effluent and disposed of safely.

A new process was indigenously developed by APEP to recover the AP in the ML to the maximum possible extent. This technology involves various unit operations/ processes like dissolution, double displacement reactions, precipitation, thickening, filtration, acidification, purification and scrubbing. It is demonstrated as a continuous process in a smaller scale of 4 m³/ day.

It is proposed to establish a full-scale plant (**AP Mother Liquor Treatment Plant, APMLP**) for converting ML into other usable chemicals. Proposals/ Eoi are invited from competent engineering firms for process scale-up, design and establishment of APMLP having mother liquor treatment capacity of 30 m³/day, on a turnkey basis. This document describes the functional requirements, simplified process description, materials and other terms and conditions.

2.0 OBJECTIVE AND SCOPE OF WORK

The objective of inviting EOI is to identify competent vendors for carrying out the scale up of continuous process from 4 m³/day to 30 m³/day, design of plant, infrastructure, procurement of equipment, integration, building construction and civil works, installation and commissioning of a 30 m³/day **AP Mother Liquor Treatment Plant** at APEP, Aluva, Kochi, Kerala, as per the details given in this document.

The continuous process technology developed by VSSC shall be provided to the bidders shortlisted through EOI, prior to issuing RFP document against signing of Non-Disclosure Agreement (NDA).

The plant is located beside Aluva - Munnar Road, about 15 km from Cochin Airport and 6 km from Aluva town.

Address: Ammonium Perchlorate Experimental Plant (APEP)
VSSC/ISRO, Erumathala P.O.
Aluva, Ernakulam District
Kerala, India, PIN - 683112

3.0 ELIGIBILITY CRITERIA

The vendor shall furnish the following details to qualify for the bidding:

- a) The vendor shall be a reputed engineering firm with minimum 5 years of experience in process scale up, plant design and establishment of similar chemical plants OR

pharmaceutical OR Sodium bicarbonate OR solid-liquid processing plants on turnkey basis. The consultants/ consortium with joint ventures with 5 years' experience as mentioned above are also eligible for submitting offer. The EOI shall be supported with documentary evidence for three similar completed works, each costing not less than Rs 3 crore OR two similar completed works costing not less than Rs 5 crore OR one similar completed work costing not less than Rs 8 crore. Bidders are expected to provide details of purchase order that are successfully executed, with addresses and contact details, for assessment by VSSC team.

- b) Company profile detailing technical manpower. Vendor shall furnish the quality implementation certification (like ISO) awarded to them. Also, a brief write-up on the quality department existing with them, total number of staff, in-house capabilities in process scale up, plant design and realization, outsourcing areas proposed for this contract, etc.

The vendor must ensure themselves that they fulfill the eligibility criteria mentioned above before submitting the offer.

4.0 MODE OF SUBMISSION OF EOI

Vendor shall furnish the EOI in their letterhead with details of contact person, and in the following format. **No mention of price shall be given in the EOI.**

Part A

Covering note expressing the interest to participate in the bid. This is to be typed on company's letter head and signed by the authorized signatory.

Part B

Declaration that they have understood the processes and list of equipment, listed in following Sections.

Part C

Documentary evidence towards fulfilling the eligibility criteria as given in Section 3.

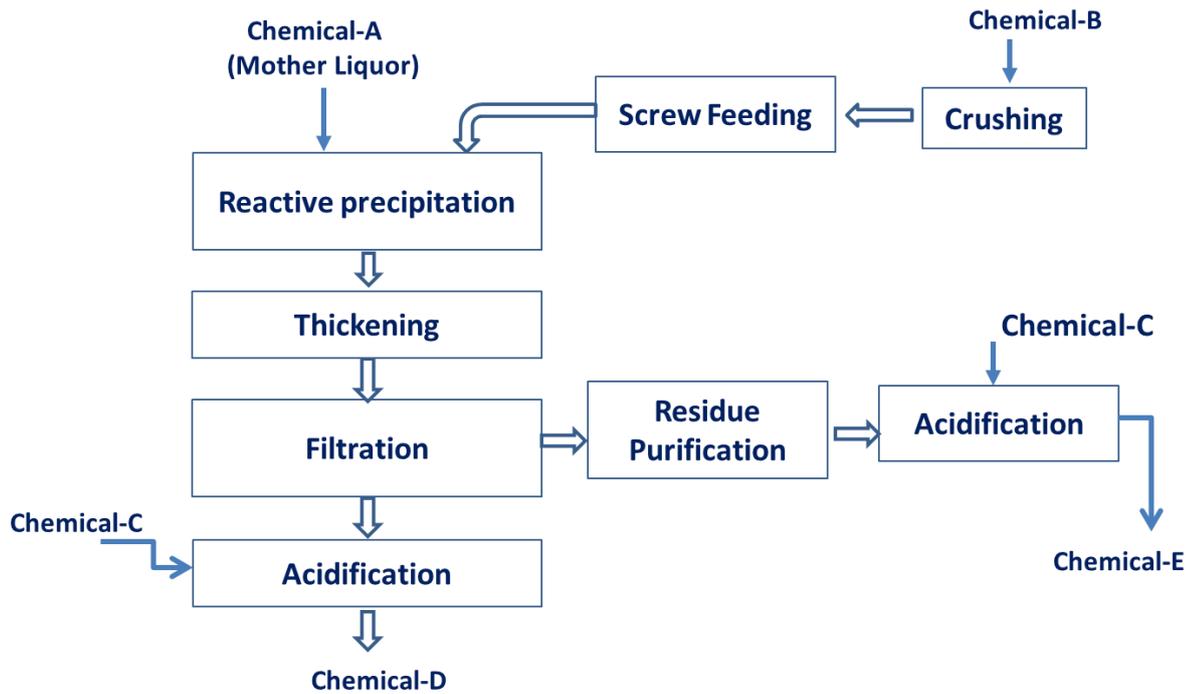
5.0 MODE OF EVALUATION OF EOI

Based on the EOIs received, vendors shall be shortlisted on technical competence, conformance to the general specifications, experience in handling similar projects etc. VSSC may also choose to visit the vendors office/ projects, as and when required. Shortlisted vendors shall be invited to VSSC for giving detailed presentation and relevant technical inputs. RFP (Request For Proposal) shall be issued to the short listed parties for submitting detailed offer in two-part bid mode against signing Non-Disclosure Agreement (NDA). After further technical scrutiny and price bid opening, the work will be awarded to the qualified and competitively priced vendor, on turnkey project basis.

6.0 SIMPLIFIED PROCESS DESCRIPTION

The basic process description given below show different unit operations/processes in APMLP. The plant shall convert AP mother liquor at the rate of 30 m³/day into other materials. Offers submitted against EOI will be evaluated by Department. Eligible parties

satisfying EOI terms & conditions mentioned as per this document will be shortlisted. Shortlisted parties can obtain the specifications of chemicals A, B, C, D & E in the below process chart, on request against signing NDA.



Basic Process Flow Diagram

7.0 SELECTION OF EQUIPMENT

Sl. No	Process Step	Material of Construction & Suggested Equipments
1	Crushing	Suggested Equipment: Continuously operated lump crusher/ suitable particle size reducing equipment Suggested MOC for solid contact parts: SS316. All other material can be MS
2	Screw Feeder	Suggested Equipment: Continuous operated screw feeder/ suitable powder conveying equipment Suggested MOC for solid contact parts: SS316. All other material can be MS
3	Reactive Precipitation	
a)	Dissolution Reactor	Suggested Equipment: Jacketed Continuous Stirred Tank Reactor/ equivalent Suggested MOC: SS 316L or material having better resistance to corrosion. The solution will have pH in the range of 5 to 8, temperatures in the range 25 °C to 50 °C
b)	Chemical Reactor	Suggested Equipment: Continuous Stirred Tank Reactor/ equivalent Suggested MOC: SS 316L or material having better resistance to corrosion. The solution will have pH in the range of 5 to 8, temperatures variations from 25 °C to 50 °C

c)	Precipitator	Suggested Equipment: Continuous precipitator/Tubular reactor with screw for solid liquid mixing/ equivalent equipment Suggested MOC: SS 316L or material having better resistance to corrosion. The solution will have pH in the range of 5 to 8, temperatures variations from 25 °C to 50 °C
4	Thickener	Suggested Equipment: Continuous thickener/suitable thickening equipment Suggested MOC: SS 316L or material having better resistance to corrosion. The solution will have pH in the range of 5 to 8, temperatures variations from 25 °C to 50 °C
5	Filtration	Suggested Equipment: Continuous pusher type centrifuge/ Suitable Equipment. Equipment shall have high filtration efficiency. Suggested MOC: SS 316L or material having better resistance to corrosion
6	Acidification	
a)	Primary acidification reactor	Suggested Equipment: Spiral wound HDPE stirred tank reactor /Suitable non-metallic equipment. Suggested MOC: HDPE/ Teflon/ material having better resistance to corrosion. The solution will have pH in the range of 1 to 8 and temperature variations from 25 °C to 50 °C
b)	Secondary acidification reactor	Suggested Equipment: Spiral wound HDPE stirred tank reactor /Suitable non-metallic equipment. Suggested MOC: HDPE/ Teflon/ material having better resistance to corrosion. The solution will have pH in the range of 1 to 8 and temperature variations from 20 °C to 50 °C
7	Residue purification	Suggested Equipment: Jacketed SS316 L reactor/ equivalent Suggested MOC: SS316L jacketed Reactor (Material shall have good resistance to corrosion). The solutions will have pH in the range of 4 to 11 and temperature variations from 25 °C to 100 °C
8	Residue conversion	Suggested Equipment: Glass lined reactor/ equivalent equipment Suggested MOC: Glass lined reactor (Material shall have good resistance to corrosion). The solutions will have pH in the range of 2 to 11 and temperature variations from 20 °C to 100 °C

8.0 INSTRUMENTATION AND CONTROL

Plant shall be equipped with fully automated PLC based control system with monitoring and controlling features of essential process parameters. Corrosive nature of the plant environment shall be taken care while selecting the sensors/ transmitters and control system. There shall be provision for manual operation and suitable safety interlocks.

9.0 General Terms and Conditions

- a) The entire work shall be executed on a turnkey basis by the vendor and handed over to VSSC in fully operational condition.

- b) The vendor shall be responsible for process scale up, plant design, civil building design, plant layout, procurement of materials/ equipment/ subsystems, civil works, erection, testing and commissioning.
- c) Interested parties can visit APEP/VSSC, Aluva on any working days (10.00 hr to 16.00 hr) with prior intimation within two weeks from the date of advertisement to get firsthand knowledge regarding the plant & location before submission of EOI.
- d) Civil works related to erection of all equipments, piping system, etc. including building is in the scope of Vendor.
- e) Electrical works of the entire facility complete in all respect shall be the responsibility of the vendor.
- f) The responsibility of hiring necessary manpower, tools, transport, loading and unloading of equipments for the total work lies with the vendor.
- g) Guarantee Test Run (GTR) shall be carried out jointly by party and department for 10 days continuously with maximum processing capacity (@ 30 m³/day) for ascertaining overall performance of the facility and products quality.
- h) Performance demonstration of the plant after GTR of the plant has to be carried out for 1 month. The responsibility of demonstration lies jointly by party and VSSC, and party shall carry out all the necessary works/modifications required for demonstrating the plant.
- i) VSSC also reserves the right to cancel the whole process without assigning any reasons thereof.
- j) Party shall ensure the emission/ discharge levels within the permissible limits of KSPCB/ CPCB.
- k) The Purchase Order/Contract shall prohibit the contractor/supplier to sublet, transfer or assign the order/Contract or any part thereof or interests therein or benefit or advantage thereof in any manner whatsoever, to any other party without the written consent of the Centre/Unit. Such consent by the Centre/Unit, however, shall not relieve or discharge the Contractor/Supplier from any obligation, duty or responsibility under the Purchase Order/Contract
- l) Intellectual Property Rights (IPR)
 - a. To the best of their knowledge, both parties do not infringe on any intellectual property rights of any third party on any matter as stipulated in the scope of the EOI. In the event of any future litigation, the obligation of the parties will be restricted to defending themselves.
 - b. Any Intellectual Property Right related to the Project generated out of the project will be the joint property of the party and ISRO and the benefit out of the same will be mutually decided by the party and VSSC.