



Spatsol Technologies



Engineering & IT Consultants

File No: S2T/DGMM/Let: 013

Dated: 5th September 2019

Deputy Chief Inspector of Mines,
Inspector of Mines,
Mines and Mineral Development Department,
Government of Sindh,
Karachi

Subject: Submission of Performance Security

Project: Conducting Environmental Mapping of Mining Areas of Sindh for the Conservation of Minerals and Natural Resources

Reference: Letter No.CIM/ADP/E-Mapping/Agreement/2019/803
Date: 28-08-2019

Pay Order: Pay Order No. 4516262 (Rs. 500,000), Standard Chartered Bank
Pay Order No. 02013661 (Rs. 484,759), DIB Bank

Dear Sir,

Enclosed herewith 02 Nos contract agreements in original for the subject project duly awarded to M/s Spatsol Technologies in association with EMC Pakistan Pvt. Ltd.

Also please find enclosed 02 No Pay Order referred above amounting to Rs. 984,759/- as part performance security.

It submitted to kindly consider remaining 5% performance bond already submitted as earlier submitted under Bid Security Amount.

Sincerely,

M. Fahad Uddin
Geospatial Manager Technical
Address: F 194/4, Park Lane, Block-5,
Clifton Karachi. (021-35875489)
Cell: 0346-2385113



**CONTRACT FOR ENGINEERING
CONSULTANT SERVICES**

Government of Sindh, through Inspectorate of Mines,
Mines and Mineral Development, Department.

And

SPATSOL TECHNOLOGIES ENGINEERING & IT CONSULTANTS

FOR

Conducting Environmental Mapping of Mining Areas of Sindh for the
Conservation of Minerals and Natural Resources.

As Per Tors (Annexure-A)
Brief Scope of the Services

Of

Environmental Mapping of Mining Areas of Sindh for the
Conservation of Minerals and Natural Resources.

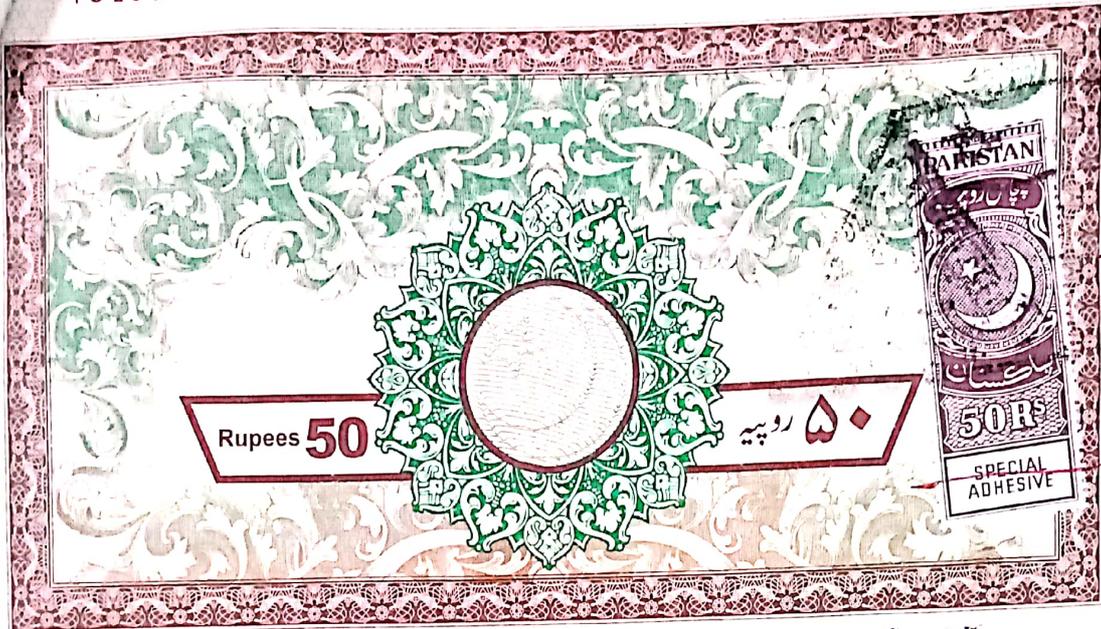
(Name of Project)

Dated 7th Aug, 2019



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SYED IRSHAD AHMED JILANEE
CHIEF INSPECTOR OF MINES, SINDH
KARACHI



GHULAM SADIQ STAMP VENDOR
 Lic # 79, Shop # 113, New Ruby Centre,
 Talpur Road, Boulton S.No.....19258
 Market, Karachi. Date.....
 Issue to with AddressMR.....MUHAMMAD YAQOOB
 Through with AddressMR.....Advocate L.No. 1459
 Purpose:
 Value Rs: Attached.....
 Stamp Vendors Signature.....
 (NOT USE FOR FREE WILL & DIVORCE PURPOSE)
 VENDOR NOT RESPONSIBLE FOR FAKE DOCUMENTS

23 JUL 2019

OFFICE SUPERINTENDENT
 Stamp Office, City Court
 ROP KARACHI
 07 AUG 2019

CONTRACT

This CONTRACT ("Contract") is entered into this 9th, August 2019 by and between Government of Sindh, through Inspectorate of Mines, Mines & Mineral Development, Department "the PA" having its principal place of business at ST-19/1, Block-6, Gulshan-e-Iqbal, Main University Road, Karachi, and Spatsol Technologies Engineering & IT Consultants private limited "the Consultant" having its principal office located at office No. F-194/4 Block-5 Park Lane, Clifton, Karachi.

WHEREAS, the PA wishes to have the Consultant performing the service hereinafter referred to, and

WHEREAS, the Consultant is willing to perform these services,

NOW THEREFORE THE PARTIES hereby agree as follows:

1. Services

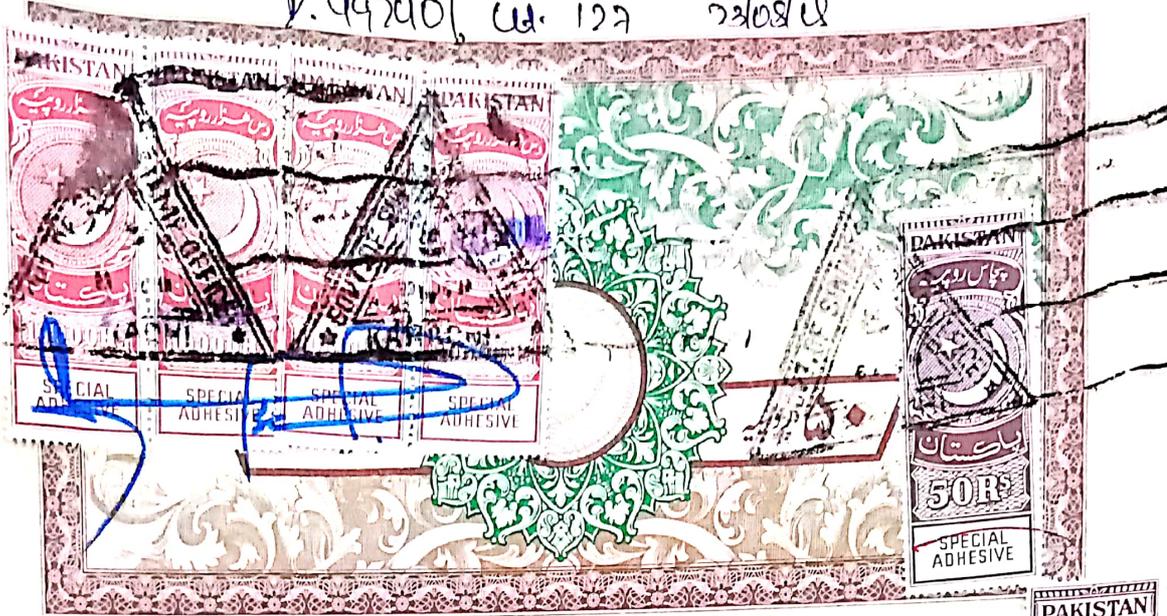
- (i) The Consultant shall perform the services specified in Annex A, viz "Terms of Reference and Scope of Services" except Coal mining, which is made an integral part of this Contract "Environmental Mapping of Mining Areas of Sindh for the Conservation of Minerals and Natural Resources".
- (ii) The Consultant shall provide the reports listed in Annex B, "Consultant's Reporting obligations," within the time periods listed in such Annex, and the personnel listed in Annex C, "Cost Estimate of Services, List of personnel and Schedule of Rates" to perform the Services.



[Signature]
 SYED IRSHAD AHMED JILANI
 CHIEF INSPECTOR OF MINES SINDH
 KARACHI

S760998

P. 49200/ U.A. 127



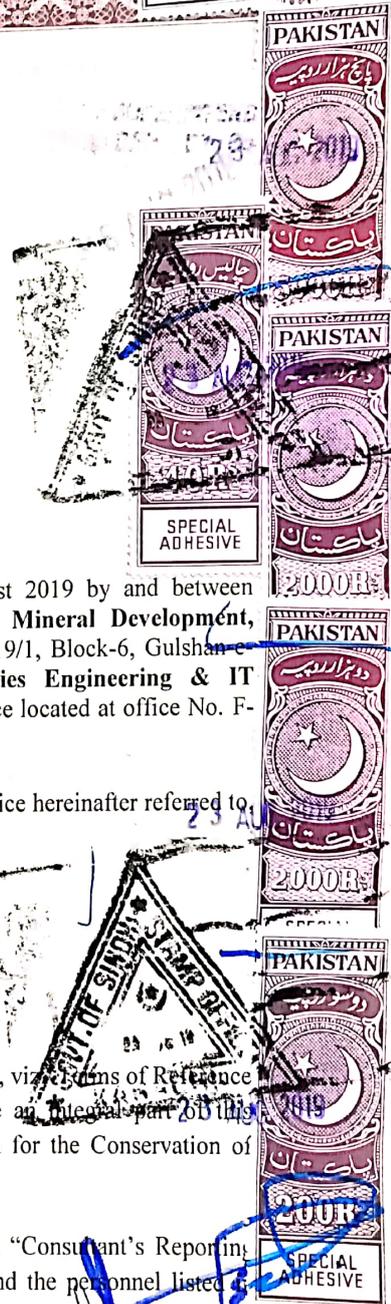
ANIL AKHTAR STAMP VENDOR
 Lic # 05, Shop # 04, New Ruby Centre,
 Talpur Road, Boulton Market, Karachi

06 AUG 2019

17380

Issue to with Address Mr
 Through with Address MR **MUHAMMAD YAQOOB**
 Purpose **ADVOCATE L.No.1459**
 Value Rs. Attached.....

Stamp Vendor's Signature
 (NOT USE FOR FREE WILL & DIVORCE PURPOSE)
 Vendor Not Responsible for Fake Documents



CONTRACT

This CONTRACT ("Contract") is entered into this _____, August 2019 by and between Government of Sindh, through Inspectorate of Mines, Mines & Mineral Development, Department "the PA" having its principal place of business at ST-19/1, Block-6, Gulshan-e-Iqbal, Main University Road, Karachi, and Spatsol Technologies Engineering & IT Consultants private limited "the Consultant" having its principal office located at office No. F-194/4 Block-5 Park Lane, Clifton, Karachi.

WHEREAS, the PA wishes to have the Consultant performing the service hereinafter referred to, and

WHEREAS, the Consultant is willing to perform these services,

NOW THEREFORE THE PARTIES hereby agree as follows:

1. Services

(i) The Consultant shall perform the services specified in Annex A, viz "Terms of Reference and Scope of Services" except Coal mining, which is made an integral part of this Contract "Environmental Mapping of Mining Areas of Sindh for the Conservation of Minerals and Natural Resources".

(ii) The Consultant shall provide the reports listed in Annex B, "Consultant's Reporting obligations," within the time periods listed in such Annex, and the personnel listed in Annex C, "Cost Estimate of Services, List of personnel and Schedule of Rates" to perform the Services.



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OFFICE SUPERINTENDENT
 City Court
 Karachi

23 AUG 2019

2. **Term**

The Consultant shall perform the Services during the period commencing [1st July, 2019] and Continuing through [30th June 2021] or any other period as may be subsequently agreed by the parties in writing.

3. **Payment**

A **Ceiling**

For Services rendered pursuant to Annex, A, the PA shall pay the consultant an amount not to exceed [Rs. 19,695,170]. This amount has been established based on the understanding that it includes all of the Consultant's costs and profits as well as any taxes, fees, etc obligation that may be imposed on the Consultant.

B **Payment Conditions**

Payment shall be made In Pakistani Rupees, no later than 30 days following submission by the Consultant of invoices in duplicate to the Coordinator designed in paragraph 4.

4 **Economic Price Adjustment** Not Applicable

5 **Project Administration**

A **Coordinator**

The PA Designates Mr/Ms. [Mr.Mansoor-ul-Haque, Inspector of Mines (Development)] as PA's coordinator; the coordinator shall be responsible for the coordination of activities under the Contract, for receiving and approving invoices for payment, and for acceptance of the deliverables by the PA.

B **Timesheets**

During the course of their work under this contract the consultant's employees providing Services under this Contract may be required to complete timesheets or any other document used to identify time spent, as instructed by the Coordinator.

C **Records and Accounts**

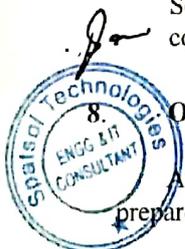
The Consultant shall keep accurate and systematic records and accounts in respect of the Services, which will clearly indentify all charges and expenses. The PA reserves the rights to audit, or to nominate a reputable accounting firm to audit, the Consultant's records relating to amounts claimed under this Contract during its term and any extension, and for a period of three months thereafter.

6 **Performance Standard**

The Consultant undertakes to perform the Services with the highest standards of professional and ethical competence and integrity. The Consultant shall promptly replace any employees assigned under this Contract that the PA considers unsatisfactory.

7. **Confidentiality**

The Consultants shall not, during the term of this Contract and within two years after its expiration, disclose any proprietary or confidential information relating to the Services, this Contract or the PA's business or operations without the prior written consent of the PA.



8. Ownership of Material

Any studies, reports or other material, graphic, software or otherwise, snaps and videos prepared by the Consultant for the PA under the contract shall belong to and remain the

property of the PA. The Consultant may retain a copy of such documents and software.

9. Consultant not to engage in the Certain Activities

The Consultant agrees that, during the term of this Contract and after its termination, the Consultants and any entity affiliated with the Consultant, shall be disqualified from providing goods, works or Services (other than the Services or any continuation thereof) for any project resulting from or closely related to the Services.

10 Insurance

The Consultant will be responsible for taking out any appropriate insurance coverage for their personnel and equipments.

11. Assignment

The Consultant shall not assign this Contract or Subcontract and portion thereof it without the PA's Prior written consent.

12. Law Governing Contract and Language

The Contract shall be governed by the laws of Islamic Republic of Pakistan or the Provincial Government and the language of the Contract shall be English.

13. Dispute Resolution

Any dispute arising out of this Contract, which cannot be amicably settled between the parties, shall be referred to adjudication/arbitration in accordance with the Arbitration Act of 1940.

FOR THE PA

FOR THE CONSULTANT

Signed by

Syed Irshad Ahmed Jilane

Title: Chief Inspector of Mines, Sindh.

Inspectorate of Mines, Mines & Mineral,

Development Department.

SYED IRSHAD AHMED JILANE
CHIEF INSPECTOR OF MINES, SINDH
KARACHI

Signed by

Abdul Fatah Babar Sani

Managing Director

Spatsol Technologies Engineering &

IT Consultants.



General Conditions of Contract

1. GENERAL PROVISIONS

1.1 Definitions

Unless the context otherwise requires, the following terms whenever used in this Contract have the following meanings:

- (a) "Applicable Law" means the Sindh Public Procurement Act, there under Rules 2010.
- (b) "Procuring Agency PA" means the implementing department which signs the contract
- (c) "Consultant" means a professional who can study, design, organize, evaluate and manage projects or assess, evaluate and provide specialist advice or give technical assistance for making or drafting policies, institutional reforms and includes private entities, consulting firms, legal advisors, engineering firms, construction managers, management firms, procurement agents, inspection agents, auditors, international and multinational organizations, investment and merchant banks, universities, research institutions, government agencies, nongovernmental organizations, and individuals.
- (d) "Contract" means the Contract signed by the Parties and all the attached documents listed in its Clause 1 that is General Conditions (GC), the Special Conditions (SC), and the Appendices.
- (e) "Contract Price" means the price to be paid for the performance of the Services, in accordance with Clause 6;
- (f) "Effective Date" means the date on which this Contract comes into force and effect pursuant to Clause GC 2.1.
- (g) "Foreign Currency" means any currency other than the currency of the PA's country.
- (h) "GC" mean these General Conditions of Contract.
- (i) "Government" means the Government of Sindh.
- (j) "Local Currency" means Pak Rupees.
- (k) "Member" means any of the entities that make up the joint venture/consortium/ association, and "Members" means all these entities.
- (l) "Party" means the PA or the Consultant, as the case may be, and "Parties" means both of them.
- (m) "Personnel" means persons hired by the Consultant or by any Sub- Consultants and Assigned to the performance of the Services or any part thereof.
- (n) "SC" means the Special Conditions of Contract by which the GC may be amended or supplemented.
- (o) "Services" means the consulting services to be performed by the Consultant pursuant to this Contract, as described in the Terms of References.
- (p) "Sub-Consultants" means any person or entity to whom/which the Consultant subcontracts any part of the Services.
- (q) "In writing" means communicated in written form with proof of receipt.

1.2 Law Governing Contract

This Contract, its meaning and interpretation, and the relation between the Parties shall be governed by the applicable law.



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1.3 Language

This Contract is executed in the language specified in the SC, which shall be the binding and controlling language for all matters relating to the meaning or interpretation of this Contract.

1.4 Notices

1.4-1 Any notice, request or consent required or permitted to be given or made pursuant to this Contract shall be in writing. Any such notice, request or consent shall be deemed to have been given or made when delivered in person to an authorized representative of the Party to whom the communication is addressed, or when sent to such Party at the address specified in the SC.

1.4-2 A Party may change its address for notice hereunder by giving the other Party notice in writing of such change to the address specified in the SC.

1.5 Location

The Services shall be performed at such locations as are specified in special condition of contract and, where the location of a particular task is not so specified, at such locations, whether in the Government's country or elsewhere, as the PA may approve.

1.6 Authority of Member in Charge

In case the Consultant consists of a joint venture/ consortium/ association of more than one individual firms, the Members hereby authorize the individual firms or specified in the SC to act on their behalf in exercising all the Consultant's rights and obligations towards the PA under this Contract, including without limitation the receiving of instructions and Payments from the PA.

1.7 Authorized Representatives

Any action required or permitted to be taken, and any document required or permitted to be executed under this Contract by the PA or the Consultant may be taken or executed by the Officials specified in the SC.

1.8 Taxes and Duties

The Consultant, Sub-Consultants, and their Personnel shall pay such direct or indirect taxes, duties, fees, and other impositions levied under the Applicable Law as specified in the SC, the amount of which is deemed to have been included in the Contract Price.

1.9 Fraud and Corruption

If the PA determines that the Consultant and/or its Personnel, sub-contractors, sub-consultants, services providers and suppliers has engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices, in competing for or in executing the Contract, then the PA may, after giving 14 days' notice to the Consultant, terminate the Consultant's employment under the Contract, and may resort to other remedies including blacklisting/disqualification as provided in SPPR 2010.

Any personnel of the Consultant who engages in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Contract shall be removed in accordance with Sub-Clause 4.2.

Integrity Pact

A. If the Consultant or any of his Sub-consultants, agents or servants is found to have violated or involved in violation of the Integrity Pact signed by the Consultant as Appendix-G to this Form of Contract, then the Client shall be entitled to:

(a) recover from the Consultant an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by the Consultant or any of his Sub-consultant, agents or servants.



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SYED USMAN AHMED JALAYEE
CHIEF INSPECTOR OF WORKS, Sindh
MARCH

- (a) terminate the Contract; and
- (b) Recover from the Consultant any loss or damage to the Client as a result of such termination or of any other corrupt business practices of the Consultant or any of his Sub-consultant, agents or servants
- (c) On termination of the Contract under Sub-Para (b) of this Sub- Clause, the Consultant shall proceed in accordance with Sub- Clause 1.9 A. Payment upon such termination shall be made under Sub-Clause 1.9 A after having deducted the amounts due to the Client under 19 B Sub-Para (a) and (c).

2. COMMENCEMENT, COMPLETION, MODIFICATION AND TERMINATION OF CONTRACT.

2.1 Effectiveness of Contract

This Contract shall come into effect on the date the Contract is signed by both Parties and such other later date as may be stated in the SC. The date the Contract comes into effect is defined as the Effective Date.

2.2 Commencement of Services

The Consultant shall begin carrying out the Services not later than the number of days after the Effective Date specified in the SC.

2.3 Expiration of Contract

Unless terminated earlier pursuant to Clause GC 2.6 hereof, this Contract shall expire at the end of such time period after the Effective date as specified in the SC.

2.4 Modifications or Variations

Any modification or variation of the terms and conditions of this Contract, including any modification or variation of the scope of the Services, may only be made by written agreement between the Parties. However, each Party shall give due consideration to any proposals for modification or variation made by the other Party.

2.5 Force Majeure

The failure on the part of the parties to perform their obligation under the contract will not be considered a default if such failure is the result of natural calamities, disasters and circumstances beyond the control of the parties

2.5.2 No Breach of Contract

The failure of a Party to fulfill any of its obligations under the contract shall not be considered to be a breach of, or default under, this Contract insofar as such inability arises from an event of Force Majeure, provided that the party affected by such an event (a) has taken all reasonable precautions, due care and reasonable alternative measures in order to carry out the terms and conditions of this Contract, and (b) has informed the other Party as soon as possible about the occurrence of such an event.

2.5.3 Extension of Time

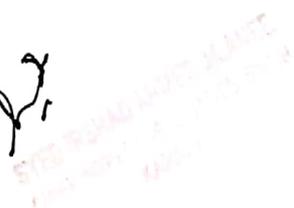
Any period within which a Party shall, pursuant to this Contract, complete any action or task, shall be extended for a period equal to the time during which such Party was unable to perform such action as a result of Force Majeure.

2.5.4 Payments

During the period of their inability to perform the Services as a result of an event of Force Majeure, the Consultant shall be entitled to continue to be paid under the terms of this Contract, as well as to be reimbursed for additional costs reasonably and necessarily incurred by them during such period for the purposes of the Services and in reactivating the Service after the end of such period.



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2.6 Termination

2.6.1 By the PA

The PA may terminate this Contract in case of the occurrence of any of the events specified in paragraphs (a) through (f) of this Clause GC

2.6.1. In such an occurrence the PA shall give a not less than thirty (30) days' written notice of termination to the Consultant, and sixty (60) days in the case of the event referred to in (e).

- (a) If the Consultant does not remedy the failure in the performance of their obligations under the Contract, within thirty (30) days after being notified or within any further period as the PA may have subsequently approved in writing.
- (b) If the Consultant becomes insolvent or bankrupt.
- (c) If the Consultant, in the judgment of the PA has engaged in corrupt or fraudulent practices in competing for or in executing the Contract
- (d) If, as the result of Force Majeure, the Consultant(s) are unable to perform a material portion of the Services for a period of not less than sixty (60) days.
- (e) If the PA, in its sole discretion and for any reason whatsoever, decides to terminate this Contract.
- (f) If the Consultant fails to comply with any final decision reached as a result of arbitration proceedings pursuant to Clause GC 8 hereof.

2.6.2 By the Consultant

The Consultants may terminate this Contract, by not less than thirty (30) days' written notice to the PA, such notice to be given after the occurrence of any of the events specified in paragraphs (a) through (c) of this Clause GC 2.6.2:

- (a) If the PA fails to pay any money due to the Consultant pursuant to this Contract without consultants fault.
- (b) Pursuant to Clause GC 7 hereof within forty-five (45) days after receiving written notice from the Consultant that such payment is overdue.
- (c) If, as the result of Force Majeure, the Consultant is unable to perform a material portion of the Services for a period of not less than sixty (60) days.
- (d) If the PA fails to comply with any final decision reached as a result of arbitration pursuant to Clause GC 8 hereof.

2.6.3 Payment upon Termination

Upon termination of this Contract pursuant to Clauses GC 2.6.1 or GC 2.6.2, the PA shall make the following payments to the Consultant:

- (a) payment pursuant to Clause GC 6 for Services satisfactorily performed prior to the effective date of termination;
- (b) except in the case of termination pursuant to paragraphs (a) through (c), and (f) of Clause GC 2.6.1, reimbursement of any reasonable cost incident to the prompt and orderly termination of the Contract, including the cost of the return travel of the Personnel and their eligible dependents.



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SYED IRSHAD AHMED JILANEE
CHIEF INSPECTOR OF MILES, SINDH
KARACHI.

3. OBLIGATIONS OF THE CONSULTANT

3.1 General

3.1.1 Standard of Performance

The Consultant shall perform the Services and carry out their obligations hereunder with all due diligence, efficiency and economy, in accordance with generally accepted professional standards and practices, and shall observe sound management practices, and employ appropriate technology and safe and effective equipment, machinery, materials and methods. The Consultant shall always act, in respect of any matter relating to this Contract or to the Services, as faithful advisers to the PA, and shall at all times support and safeguard the PA's legitimate interests in any dealings with Sub-Consultants or third Parties.

3.2 Conflict Of Interests

The Consultant shall hold the PA's interests paramount, without any consideration for Future work, and strictly avoid conflict with other assignments or their own corporate interests.

3.2.1 Consultants not to Benefit from Commissions, Discounts, etc.

The payment of the Consultant pursuant to Clause GC 6 shall constitute the Consultant's only payment in connection with this Contract or the Services, and the Consultant shall not accept for their own benefit any trade commission, discount, or similar payment in connection with activities pursuant to this Contract or to the Services or in the discharge of their obligations under the Contract, and the Consultant shall use their best efforts to ensure that the Personnel, any Sub-Consultants, and agents of either of them similarly shall not receive any such additional payment.

3.2.2 Consultant and Affiliates not to be Otherwise Interested in Project

The Consultant agrees that, during the term of this Contract and after its termination, the Consultant and any entity affiliated with the Consultant, as well as any Sub-Consultants and any entity affiliated with such Sub-Consultants, shall be disqualified from providing goods, works or services (other than consulting services) resulting from or directly related to the Consultant's Services for the preparation or implementation of the Project.

3.2.3 Prohibition of Conflicting Activities

The Consultant shall not engage, and shall cause their Personnel as well as their Sub-Consultants and their Personnel not to engage, either directly or indirectly, in any business or professional activities which would conflict with the activities assigned to them under this Contract.

3.3 Confidentiality

Except with the prior written consent of the PA, the Consultant and the Personnel shall not at any time communicate to any person or entity any confidential information acquired in the course of the Services, nor shall the Consultant and the Personnel make public the recommendations formulated in the course of, or as a result of, the Services.

3.4 Insurance to be Taken out by the Consultant

The Consultant (a) shall take out and maintain, and shall cause any Sub-Consultants to take out and maintain, at their (or the Sub-Consultants', as the case may be) own cost but on terms and conditions approved by the PA, insurance against the risks, and for the coverage, as shall be specified in the SC; and (b) at the PA's request, shall provide evidence to the PA showing that such insurance has been taken out and maintained and that the current premiums have been paid.

3.5 Consultant's Actions Requiring PA's Prior Approval

The Consultant shall obtain the PA's prior approval in writing before taking any of the following actions:

- (a) entering into a subcontract for the performance of any part of the Services,
- (b) appointing such members of the Personnel not listed by name in Annexure-C, and



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Stamp: SYED IRSHAD AHMED JILANI
CHIEF INSPECTOR OF TAXES, SINDH
MARRACH

- (c) entering into a subcontract for the performance of any part of the Services.
- (d) appointing such members of the Personnel not listed by name in Annexure-C, and
- (e) Any other action that may be specified in the SC.

3.6 Reporting Obligations.

- (a) The Consultant shall submit to the PA the reports and documents specified in (PA may insert appendix) hereto, in the form, in the numbers and within the time periods set forth in the said Appendix.
- (b) Final reports shall be delivered in soft copies in the form of USB in addition to the hard copies specified in said Appendix.

3.7 Documents Prepared by the Consultant to be the Property of the PA

- (a) All plans, drawings, specifications, designs, reports, other documents and software submitted by the Consultant under this Contract shall become and remain the property of the PA, and the Consultant shall, not later than upon termination or expiration of this Contract, deliver all such documents to the PA, together with a detailed inventory thereof.
- (b) The Consultant may retain a copy of such documents and software. Restrictions about the future use of these documents, if any, shall be Specified in the SC.

3.8 Accounting, Inspection and Auditing

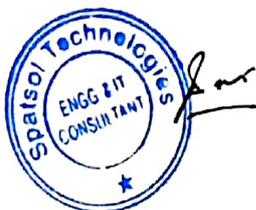
3.8.1 The Consultant shall keep, and shall cause its Sub-consultants to keep, accurate and systematic accounts and records in respect of the Contract, in accordance with internationally accepted accounting principles and in such form and detail as will clearly identify relevant time changes and costs.

3.8.2 The Consultant shall permit, and shall cause its Sub-consultants to permit, the PA and / or persons appointed by the PA to inspect its accounts and records relating to the performance of the Contract and the submission of the Proposal to provide the Services, and to have such accounts and records audited by auditors appointed by the PA or requested by the PA. The Consultant's attention is drawn to Clause 1.9.1 which provides, inter alia, that acts intended to materially impede the exercise of the PA's inspection and audit rights provided for under Clause 3.8 constitute a prohibited practice subject to contract termination (as well as to a determination of Ineligibility pursuant to the PA's prevailing sanctions procedures).

4. CONSULTANT'S PERSONNEL

4.1 Description of Personnel

The Consultant shall employ and provide such qualified and experienced Personnel and Sub-Consultants as are required to carry out the Services. The titles, agreed job descriptions, minimum qualifications, and estimated periods of engagement in the carrying out of the Services of the Consultant's Key Personnel are described in Appendix C. The Key Personnel and Sub-Consultants listed by title as well as by name in Appendix C are hereby approved by the PA.



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SYED IRSHAD AHMED JILANEE
-CHIEF INSPECTOR OF MINES, SINDH
KARACHI.

4.2 Removal and/or Replacement of Personnel

- (a) Except as the PA may otherwise agree, no changes shall be made in the Key Personnel. If, for any reason beyond the reasonable control of the Consultant, such as retirement, death, medical incapacity, among others, it becomes necessary to replace any of the Key Personnel, the Consultant shall provide as a replacement a person of equivalent or better qualifications.
- (b) If the PA finds that any of the Personnel have (i) committed serious misconduct or have been charged with having committed a criminal action, or (ii) have reasonable cause to be dissatisfied with the performance of any of the Personnel, then the Consultant shall, at the PA's written request specifying the grounds thereof, provide as a replacement a person with qualifications and experience acceptable to the PA.
- (c) The Consultant shall have no claim for additional costs arising out of or incidental to any Removal and/or replacement of Personnel.

5. OBLIGATIONS OF THE PA

5.1 Assistance and Exemptions

The PA shall use its best efforts to ensure that the Government shall provide the Consultant such assistance and exemptions as specified in the SC.

5.2 Changes in the Applicable Law Related to Taxes and Duties

If, after the date of this Contract, there is any change in the Applicable Law with respect to taxes and duties which increases or decreases the cost incurred by the Consultant in performing the Services, then the remuneration and reimbursable expenses otherwise payable to the Consultant under this Contract shall be increased or decreased accordingly by agreement between the Parties, and corresponding adjustments shall be made to the amounts referred to in Clauses GC 6.2 (a) Or (b), as the case may be.

5.3 Services and Facilities

The PA shall make available free of charge to the Consultant the Services and Facilities listed under Appendix F

6. PAYMENTS TO THE CONSULTANT

Security

The consultant has to submit bid security and the performance security at the rate mention in SC.

Lump-Sum Payment

The total payment due to the Consultant shall not exceed the Contract Price which is an all inclusive fixed lump-sum covering all costs required to carry out the Services described in Appendix A. Except as provided in Clause 5.2, the Contract Price may only be increased above the amounts stated in Clause 6.2 if the Parties have agreed to additional payments in accordance with Clause 2.4.

6.3 Contract Price

The price payable in Pak Rupees/foreign currency/ is set forth in the SC.



[Handwritten Signature]
SYED IRSHAD AHMED ULANEE
CHIEF INSPECTOR OF MINES, SINDH
KARACHI.

6.4 Payment for Additional Services

For the purpose of determining the remuneration due for additional services as may be agreed under Clause 2.4, a breakdown of the lump- sum price is provided in Appendices D and E.

6.5 Terms and Conditions of Payment

Payments will be made to the account of the Consultant and according to the payment schedule stated in the SC. unless otherwise stated in the SC; the first payment shall be made against the provision by the Consultant of an advance payment guarantee for the same amount, and shall be Valid for the period stated in the SC. Such guarantee shall be in the form set forth in Appendix G hereto, or in such other form, as the PA shall have approved in writing. Any other payment shall be made after the conditions listed in the SC for such payment have been met, and the Consultant has submitted an invoice to the PA specifying the amount due.

GOOD FAITH

7.1 Good Faith

The parties undertake to act in good faith with respect to each other's rights under this Contract and to adopt all reasonable measures to ensure the realization of the objectives of this Contract.

7. SETTLEMENT OF DISPUTES

8.1 Amicable Settlement

The Parties agree that the avoidance or early resolution of disputes is crucial for a smooth execution of the Contract and the success of the assignment. The Parties shall use their best efforts to settle amicably all disputes arising out of or in connection with this Contract or its interpretation.

8.2 Dispute Resolution

Any dispute between the Parties as to matters arising pursuant to this Contract that cannot be settled amicably within thirty (30) days after receipt by one Party of the other Party's request for such amicable settlement may be submitted by either Party for settlement in accordance with the provisions specified in the SC.



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III. Special Conditions of Contract

Amendments of, and Supplements to, Clauses in the
General Conditions of Contract

Number of
GC Clause

- 1.1 Sindh Public Procurement Act and Sindh Public Procurement Rules 2010
(amended in 2019).
- 1.3 The language is English.
- 1.4 The addresses are:
Procuring Agency: ST-19/1, Block-6, Gulshan-e-Iqbal, Main University Road,
Karachi
Attention: Syed Irshad Ahmed Jilane
Facsimile: 021-99244243
E-mail: chief.inspector.sindh@gmail.com
Consultant: M/s Spatsol Technologies, Engineering & IT Consultants, F -194/4
Block- 5 Park Lane, Clifton, Karachi
Attention: Abdul Fatah Babar Sani
Facsimile: 021-5875489
E-mail: info@spatsoltech.com
- 1.6 {The Member in Charge is *[insert name of member]*}
This clause is deleted as it is not applicable
- 1.7 The Authorized Representatives are:

For the PA: Chief Inspector of Mines, Sindh

For the Consultant: Managing Director, Spatsol technologies



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The Consultant shall pay all relevant taxes & fees including stamp duty and service charges etc.

The Consultant must be informed in Clause Reference 3.7 of the Data Sheet about which alternative the PA wishes to apply.

The PA warrants that the Consultant, the Sub-Consultants and the Personnel shall be exempt from (or that the PA shall pay on behalf of the Consultant, the Sub-Consultants and the Personnel, or shall reimburse the Consultant, the Sub-Consultants and the Personnel for) any indirect taxes, duties, fees, levies and other impositions imposed, under the Applicable Law, on the Consultant, the Sub-Consultants and the Personnel in respect of:

- (a) Any payments whatsoever made to the Consultant, Sub-Consultants and the Personnel (other than nationals or permanent residents of Pakistan), in connection with the carrying out of the Services;
- (b) Any equipment, materials and supplies brought into the Government's country by the Consultant or Sub-Consultants for the purpose of carrying out the Services and which, after having been brought into such territories, will be subsequently withdrawn there from by them;
- (c) Any equipment imported for the purpose of carrying out the Services and paid for out of funds provided by the PA and which is treated as property of the PA;
- (d) Any property brought into the province by the international Consultant, any Sub-Consultants or the Personnel or the eligible dependents of such Personnel for their personal use and which will subsequently be withdrawn there from by them upon their respective departure from the Government's country, provided that:
 - (1) The Consultant, Sub-Consultants and Personnel, and their eligible dependents, shall follow the usual customs procedures of the Government's country in importing property into the Government's country; and
 - (2) If the Consultant, Sub-Consultants or Personnel, or their eligible dependents, do not withdraw but dispose of any property in the Pakistan for which customs duties and taxes have been exempted, the Consultant, Sub-Consultants or Personnel, as the case may be, (i) shall bear such customs duties and taxes in conformity with the regulations of the Government's country, or (ii) Shall reimburse them to the PA if they were paid by the PA at the time the property in question was brought into the Government's country.



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- 2.2 The date for the commencement of Services is [1st September-2019].
- 2.3 The time period shall be [Twenty four months].
- 3.4 Not applicable
- 3.5 (c) Not applicable
- 3.7 (b) The Consultant shall not use these documents and software for purposes unrelated to this Contract without the prior written approval of the PA.

5.1 Not applicable

6.1 Performance security shall not exceed 10% of contract amount.

6.3 The amount in Pak Rupees [19,695,170].

(The total amount for 1st phase is Rs. 9,847,585/-).

(The total amount for 2nd phase is Rs. 9,847,585/-).

6.5 The accounts are:

for foreign currency or currencies: Not applicable

for local currency: [A/c No. 102226-7 DDO Development, NBP, Gulshen-e-Iqbal, Karachi]

Payments shall be made according to the following schedule:

The Consultant shall be entitled to payment for :

- (a) Payable on approval of Inception Report of each phase by the Contract award committee, Twenty (20) percent of the total value of services.
- (b) Payable on approval of Interim Report of each phase by the contract award committee, Thirty (30) percent of the total value of services.
- (c) Payable on approval of Final Report of each phase by the contract award committee, Fifty (50) percent of the total value of services.
- (d) The 1st, 2nd and 3rd installment payment to the consultant will be subject to the approval by the Chief Inspector of Mines, Mines & Mineral Development Department and Government of Sindh with the permission of committee, constituting by the Department to review the reports submitting by the consultant from time to time.



SYED AHMED HANEE
CHIEF INSPECTOR OF MINES, SINDH
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8.3

Disputes shall be settled by complaint Re-dressal Committee define in SPP-Rules-2010 (amended in 2019) or through arbitration Act of 1940 in accordance with the following provisions:

Rules 31 to 34 of SPPRA Rules 2010 (amended in 2019).

8.4

The scope of services to be provided by the Consultant will be as per TORs.

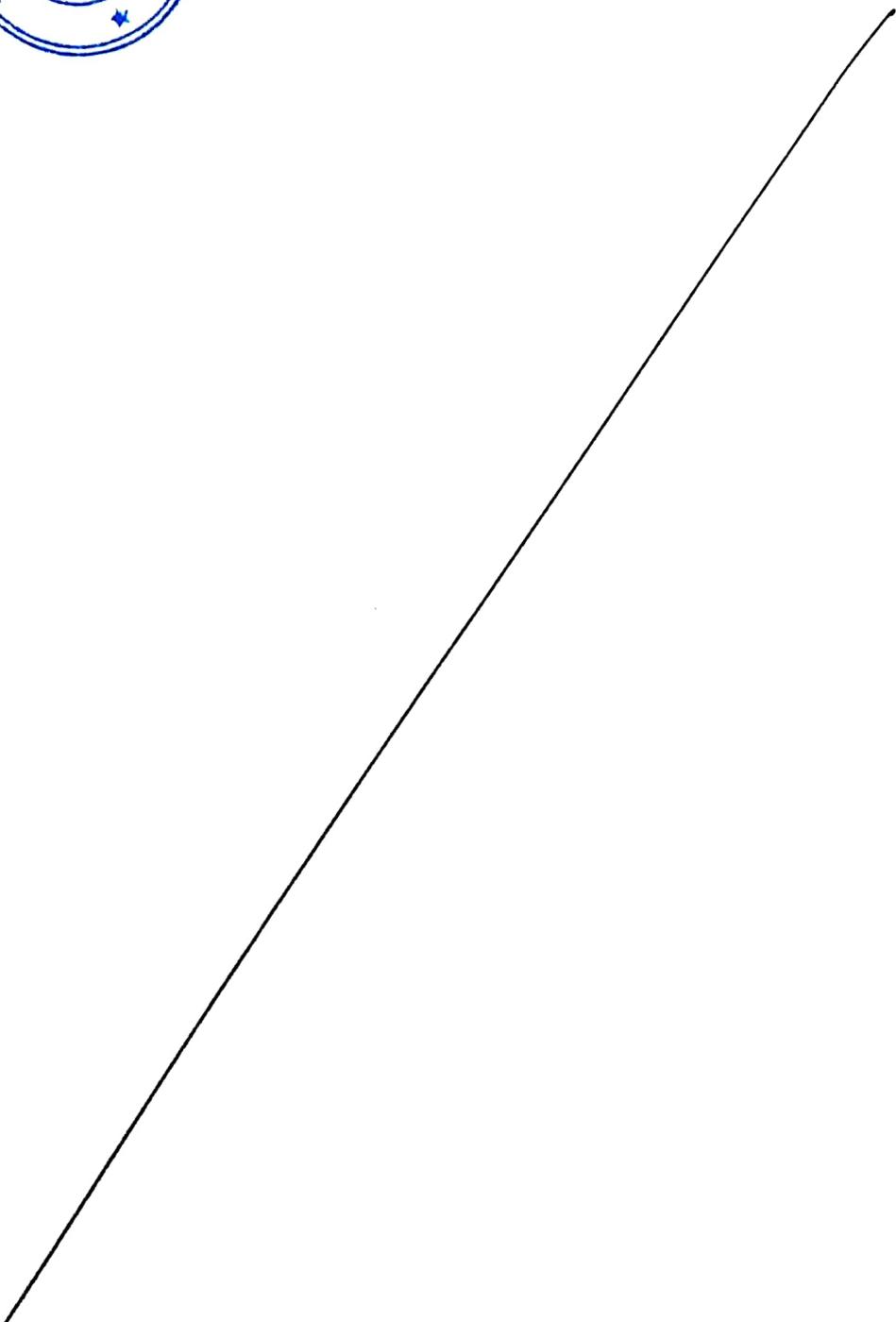


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Annexure-A
Terms of references (TORs)



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KARACHI.



TERMS OF REFERENCE (TORs)

For Consultant to conduct

“Environmental Mapping of Mining Areas of Sindh for the Conservation of Minerals & Natural Resources”.

1. Introduction

The Province of Sindh contains abundant potential for mining of minerals, with a thriving base already established by ongoing operations. However this sector fails to reach its optimum Productivity due to a number of reasons, amongst which is the absence of comprehensive data regarding the location, distribution and surrounding details of the mines throughout the province. This adds into the already limited amount of data available concerning the habitats, physical features, and natural resources in the vicinity of current and prospective mines.

Mines & Minerals Department, Government of Sindh through Inspectorate of Mines has accordingly proposed district wise digital mapping of the entire mining sector to identify all current provisions. This Environmental Mapping can bridge this critical information gap by providing a comprehensive knowledge base containing not just the spatial spread of mines across the province of Sindh with all inherent details, but also the environmental and social features of the areas where these mines are located.

Due to the dearth of a centralized knowledge-based pertaining to the locations and distribution of mines in Sindh, the authorities and responsible department are at a handicap in making well-informed policy decisions. In the past most interventions in terms of provision of Environmental mitigation measures are constrained by the lack of baseline data on environmental and social indicators and the scattered location of the mining sites across the Province in an unorganized manner. The availability of a well-mapped cache of information which should ideally describe in detail the actual, on-ground location and spread of the Mines in Sindh and their surroundings. It would be the first step towards broad-scale development and advancement of the Mining Sector.

Additionally, owing to the environmental degradation inherent to mining operations, the Natural resources in the vicinity of the mines are threatened. These include the pastures for grazing herds, natural/man-made water bodies which provide nourishment for the agricultural bread basket of Sindh, and the protected reserves and sanctuaries housing many precious and endangered wildlife species. These natural resources are scattered all across the Sindh Province and in many locales are in vicinity of the mining operations. Therefore it becomes imperative for the policy body and authorities to be acutely aware of the macro-environment and surroundings of all such mines, particularly in the environmentally sensitive regions which may be at risk due to mining activities. This would allow the authority to plan in advance and ensure that the mine operators do not endanger the natural resources of the province. This tie in to the Sustainability Goals of the Government of Sindh and would allow the province to reap the economic benefits of a sustainable and productive mining sector, whilst conserving the environment of the land and the livelihood of the populace dependent on these natural resources.

2. General Description of the Project:

Environmental Mapping will include the use of software's and satellite imagery data that would describe the mining industry in spatial pattern from mine and ore body exploration to closure and Reclamation. Geographical Information System (GIS) & Remote Sensing (RS) techniques will be used to generate the spatial maps which will be based on the mineral identification, surrounding natural resources, mining extent & location, environmental sensitive areas, mineral zoning, minerals formation and changes in land & topography etc. The mapping will provide an overview of the current sizing and plotting of mine openings, waste piles, surrounding natural resources and cultural features. It is conducted to delineate areas with different probabilities of hosting certain types of mineralization. Mapping will enable the department to evaluate its current and prospective mining developments.

This will be taken along with separate survey which will be conducted throughout the mining areas of Sindh province for the Mapping study and after confirmation and ground truthing, will be put in the mapping software.



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The Environmental Mapping is envisaged to be conducted in two phases over the course of two years through a recognized Consultant. In this study, all the mining areas in the districts of Thatta, Sukkur, Hyderabad, Khairpur, Jamshoro, Sanghar, Qamber & Shahdad kot, Karachi, Dadu and Tharparkar. This part will be called as ground truthing and confirmatory survey. Whilst in the, mapping of all the identified areas will be conducted as per Geographical Information System (GIS) & Remote Sensing (RS) techniques.

In mapping, the basic step for consultant is to develop a base map using high resolution latest satellite imageries. This map will form basis and all information through field surveys and from environmental studies is plotted on it to demonstrate the conditions of the mines, the extent and formality of the operations, their economic prospects and the effects if any on the surrounding area. It would also record in detail, the various environmental features surrounding the mines, the habitations, residences, population and socio-economic conditions. GIS will identify environmentally sensitive areas where the mining activities could lead to an unacceptable level of adverse environmental impacts. These will be represented through detailed Maps included in the final submissions.

The process of GIS is continuous process in a sense that any change on the ground can be compared from the base maps and layer of different environmental attributes will be plotted on the base maps.

At present there are about 25 minerals as mentioned below which are being mined in Sindh, due to which now the Government has taken tremendous efforts for the large-scale mining activities. The Granite and Lake Salt of Tharparkar district are one of them. The limestone and shale are abundant in Sindh.

Name of 25 Minerals.

- Granite
- China Clay
- Lime Stone
- Silica Sand
- Clay (Shale Clay Ball Clay Fire Clay)
- Quartzite
- Bentonite
- Dolomite
- Celestine
- Laterite
- Chalk
- Fullers Earth
- Lake Salt
- Trona/Soda Ash
- Red Ochre
- Gypsum
- Calcite
- Flint Stone
- Sand Stone
- Marble
- Aggregate Stone
- Rati/Bajri
- Ordinary Stone
- Gravel
- Ordinary Sand.

3. Scope of the project:

The consultant/consulting firm would be required to do following:



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i. A Comprehensive environmental mapping would set the baseline for the natural resources of the province. It would capture the location of the mines (mechanized, small scale, arsenal & illegal) with up-to-date on site data gleaned from field visits by expert with focus on the Spatial Surrounding i.e. Environmental, geographical and geological features of the area. Detailed surveys will reveal the condition of the mine, number of mineworkers (Position Wise), the extent of the operations, change in land (existing land use and land cover mineral resources about 5 sq.km surrounding the mine), their economic prospect and the effects of mining if any on the surrounding area. It would also record in detail, the various environmental features surrounding the mines, the habitation, residences, population and socio-economic condition etc. These shall be represented through detailed maps submitted in final report.

The Component involves development of digital environmental maps for all mining side in project districts. The Geo referenced based data shall be helpful in inventorying all available data sets prevailing in and near vicinity of the mining site and shall be helpful as facilitation tool for overall planning, implementation monitoring of investment, resettlement and compensation, environmental monitoring and other related activities.

ii. Develop the Digital Environmental map of mining areas of Sindh using latest software and satellite imagery data and Geographical Information (GIS) and Remote Sensing (RS) Techniques for real time process and updating the data base which must capture location of each and every mine (other than coal) describing the pattern from ore exploration, exploitation to closure and reclamation.

iii. This project will also depict mineral identification, mineral resources surrounding natural Resources, mining extent, environmental sensitive areas, mineral zoning, mineral formation, change in land (existing land use & land cover) and topography.

4. Objectives of Project:

A study of Environmental Mapping for Mining areas of Sindh for the conservation of the Minerals & Natural resources involves the following objectives and expected outcomes:

- To develop digital Environmental Map using Geographical Information System (GIS) this will be available for the Department and enable it to evaluate the current and prospective mining developments.
- To Expand the Mining Sector by focusing on exploration and evaluation of mining Resources.
- To promote the facilitation role of Government to prospecting investors using up-to-date mines information and location as well as promote the environment-friendly mining practices with acute mitigation of environmental hazards for sustainable development of mining sector.
- To identify the informal mining practices and interventions by the department.

5. Project Location/Targeted Areas:

The Environmental Mapping is envisaged to be conducted in two phases over the course of two years through a recognized Consultant. In phase one, the mining areas in the districts of Thatta, Sukkur, Hyderabad, Sanghar and Tharparkar will be mapped whilst the second phase will cover the mines from the districts of Khairpur, Jamshoro, Karachi, Qamber & Shahdad kot, and Dadu.

6. Duration of Project:

The scope of the project extends to entire mining areas of Sindh province particularly Tharparkar, Hyderabad, Sukkur, Sanghar, Thatta, Jamshoro, Karachi, Khairpur, Qamber & Shahdadkot, and Dadu districts.

Duration of the study: 02 Years, one year for each phase
Month of commencement after issuance of work order (Expected months of commencement is September 2019).
Expected month of Completion: August-2021



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7. Reporting:

The consultant will submit the Inception, Interim and Final reports of study besides will also be required to submit monthly progress reports to the Procuring Agency throughout the course of the study. They should provide a true reflection of physical progress to date and should highlight any impediments in executing completion the task to the required standard. On submission of each report, the Consultant will give presentation on the progress of work and after completion of each phase; they will give presentation to PA on end product to demonstrate it as pilot project.

In the technical proposal, the consultant will design work assignment according to time frame for the submission of Inception, Interim & Final reports of each phase and its payment as given below. The Consultant provided the same in their technical Proposal, (**Appendix-E**).

In the methodology and approach of Technical proposal the consultant will provide the stages of execution of work and details of each activity which will be covered in inception & interim and final report. They have to submit inception, interim and final report within 03 months 07 months and 12 months respectively after execution of contract/ issuance of work order for 1st phase. For 2nd phase they have to submit the Inception, Interim & Final reports within 03 months, 07 months and 12 months after completion of 1st phase. After evaluation and approval of these reports by Evaluation/Review committee, payment to consultant will be made as follows:

- (1) 20% on the approval of Inception report of each phase.
- (2) 30% on the approval of Interim report of each phase.
- (3) 50% on the approval of Final report of each phase.

No mobilization charges will be paid to the Consultant.

8. Man Power Requirement.

The study will be conducted through reputable consultant per Sindh Public Procurement Rules 2010, amended in 2017. The following technical staff will be associated with the consultant during the study for technical support, liaison and monitoring of project staff. The consultant will train them with every step of study, including preparation of base map, digitization of data, development of Geographical information system (Web Portal), installation and execution of software and coordinates conversation etc.

- One Inspector from (H.Q).
- One Environmental Inspector.
- Two Computer Programmers.
- Area Inspector of each District.

9. Capacity Building and Training Programme.

The consultant will develop a list of activities that builds skills & expands knowledge about the project to the Inspectorate of Mine and with Local & Internal targeted training Program for relevant/technical staff of the Inspectorate of the mines. Moreover the consultant will design and deliver a series of workshop and seminar with the collaboration of Mines & Mineral Development Department with regard to the project.

The Consultant shall provide:

1. Requisite trainings and capacity development programme to the relevant Inspectors and nominated staff.
2. Necessary hardware and software within the project cost for long term sustainability of the project (Its detail and specification should be provided with technical proposal), besides providing details with cost for IT infrastructure. The Consultant provided the same in their technical proposal (**Appendix-F**).



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3. GNSS system with certified and approved Government Licenses within the project cost (Its detail and specification should be provided with technical proposal), (Appendix-G).

10. Detailed List of Activities.

The activity may consist of development of the GIS based map with the following assignments.

There should be a separate mine map in a scale 1:50,000 of each district, and all the mining activities in the district should be covered in the study.

1. The consultant should cover all mining activities whether it comes within leased area or Illegal mining activities by the locals.
2. The Consultant should provide the coordinates conversion from user grid Degree minutes& seconds and to design application (Mobile App) to access the mining areas.
3. Within 05 KM radius of mining areas the following Environmental information should be identified.
 - Water (Surface & Ground water Quality and levels)
 - Land (Geology, Soil erosion, Soil Characteristics, crop or Natural vegetation cover etc)
 - Atmosphere (Rainfall, temperature, dust, noise, smoke, winds, climatic seasons etc)
 - Biological Environment (Flora & Fauna)
 - Socio-Economic Environments (Socio-Ecological, Land tenure, NGOs, Population Characteristics etc).
 - Economic (Income, living standard, family expenditure etc)
 - Institutional (Governments units, agricultural, irrigation, livestock, transport, business and industries, tourism etc)
 - Cultural (Archaeological resources, Cultural property, religious sites etc)
4. Previously studies or reports or feasibility studies should be considered as secondary data. Fresh survey should be carried out during the study.
5. The consultant should provide the district wise details of labour working in the mining areas of Sindh.
6. From low to high resolution satellite images with licensed software for GIS should be Provided by the consultant.
7. After reconnaissance survey of each district for the collection of base line data of the area the Consultant will liaison with the field Inspector (s) to verify the sites whether it covers all the mining activities in his Jurisdiction or not.
8. The procuring agency shall verify the proposed Project team members with all the key professionals nominated in the technical proposal.
9. The consultant will designate appropriate staff or members of project team to close coordination with the PA's concerned area Inspector, Environmental Inspector and Computer programmer and shall ensure necessary project coordination and field survey verification with them to incorporate their technical feedback.
10. The consultant shall also review existing studies and identify information gaps.

11. Scope of Work

The scheme is initiated by the Inspectorate of Mines, Mines & Mineral Development Department, Government of Sindh to undertake and develop Digital Environmental map and Geo-database of Mining areas of Sindh province so that compliance of Mining Labour laws to ensure health & safety of the mine workers, may be made easily.

This study comprising on the following two phases.



Syed Irshad Ahmed Jilanee
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Phase-I: - During first year of the project Environmental Mapping through GIS & RS and detailed survey of mining areas of Tharparkar, Hyderabad, Sukkur, Sanghar and Thatta districts will be conducted, (The total amount for 1st phase is Rs. 9,847,585/-).

Phase-II: - During the second year of the project Environment Mapping through GIS & RS and detailed survey of mining area of Jamshoro, Karachi, Khairpur, Qamber & Shahdadt, and Dadu districts will be conducted, (The total amount for 2nd phase is Rs. 9,847,585/)

i. Preparation of Base Map and integrated Geo-database Development:

The Consultant shall purchase latest (0.4m) resolution multispectral satellite imageries of mining areas of Sindh (estimated area 2000 Sq-km approximately) excluding coal mining and develop baseline mapping integrating topographical/ terrain, spatial distribution of mining areas, social, environmental and infrastructure. The geo-database and mapping shall incorporate data of mining areas of Sindh as well as Geological Survey of Pakistan GSP maps and sheets. The base map shall contain several layers with attribute datasets capable of generating spatial analysis and generating a variety of thematic maps. These strategic and operational plans would cover land form and land use, loss of natural habitat and vegetation, wildlife resources; local population and villages, and other environmental and social issues.

The developed digitalized maps would cover information but not limited to the following:

- Spatial distribution of Mining areas using high/low resolution Digital Model (DEM).
- Distinct distribution with location of a) mine/quarry and b) processing/crushing plants
- Number of workers (Position Wise) employed in each mine/crushing Unit.
- General Topography of the area
- Existing Hydrology and streams/waterways/catchments
- Existing Land use & Land Cover
- Identification of Minerals being mined and of surrounding area of 05 Square kilometer around each mine that involves type of rock/mineral, quantity and usage, mineralogy, geochemistry and geotechnical properties of rock/mineral.
- Wildlife Resources (including large canopy trees)
- Protected Area boundaries
- Nearby villages / cities / population centers/any historical place.
- Existing Infrastructure
- Roads and transportation
- Transmission Lines/ Major Utilities

The Consultant shall also map and digitize the following information near existing mining area:

- Population centers, road network, surface water networks, drinking water resources such as tube wells, pondsetc. Health units, clinics and hospitals; schools etc as baseline data as acceptable capture scales nearest to the mining areas.
- Whenever possible, the current infrastructure elements should be shown using maps, graphs and images.

ii. Geo-Techniques Spatial Data:

The Consultant shall incorporate the available and existing technical sub-surface technical investigation data of mining bearing area of Sindh including geo spectral surface and sub-surface information of Minerals, available environmental and natural features within 05km radius of Mining activities. The integrated geo-technical data shall enable in determining whether there is sufficient data to prepare model on the sub surface horizontal and vertical domains. The spatial data will contribute in developing tenement mapping and preparing an integrated geo database.

iii. Development of GIS based Map/Web Portal.

The development of digital map on web based GIS for mining areas would be built upon with existing and future mining activities. The consultant shall design a comprehensive mines and minerals web portal with integrated digital spatial data layers and system incorporating software for the management of mining areas and natural resources developed as GIS spatial data layers.



*SYED RASHID AHMED KHAN
CHIEF INSPECTOR OF MINES, SINDH
MIRJAPUR*

12. GIS Software.

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POI(Point of Interest)

A specific point through one may find information

- (i) Location of each every mine(Other Than Coal)
- (ii) Describing the pattern from ore exploration, its exploitation to closer and reclamation.
- (iii) Mineral identification, mineral resources surrounding 05Sq-km of mine.
- (iv) Mineral zoning, mineral formation.
- (v) Mining extent change in land (existing land uses and cover, topography)
- (vi) Environmental sensitive areas.
- (vii) Environmental, geological and geographical features of surrounding area of mine.
- (viii) All aspects covered under scope of project.

13. Integrated Geo-database

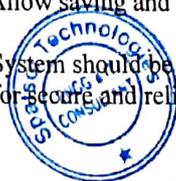
The proposed Mining geo-database will be specially designed to store, record and maintain data of all the mines and it can be retrieved through query the information which have been discussed above in POI including spatial features comprised of points, lines and polygons.

14. Web Application

Web Application is special design software/website that can be accessible over network. This website will be very helpful to find any information regarding the mines. The aim is to develop a responsive website compatible with other electronic devices.

GIS System that is responsive to the following requirement:

- The Graphical User Interface (GUI) of the system will be web based that can be accessed on any device with customized user friendly interface.
- GIS based Map/web portal is to be designed to develop a robust and transparent Web Based Geographic System that will provide the web interface for the data management of mineral leases and providing online geo-database mineral and mining resources information in Sindh. Whereby one can conveniently select and categorize POIs from a given geo-database. The envisaged system will perform the following major functions:
 - The POIs will be stored in a database that will be integrated with the web interface of the system.
 - User friendly Automatic Dimensions Conversion of coordinates.
 - Provision to update geo-database and spatial data GIS layers with system secure login and retrieval system
 - User friendly Customization and Toolbar.
 - Filtration option by different categories.
 - Connectivity & offline Editing.
 - A system capable to produce layouts, reports, generates statics and export tables for the management to take proper decision.
 - A system that include various level of security and access to the information, set Privileged to different roles.
 - Allow saving and exporting spatial and textual, attribute data.
 - System should be developed on established standard OGC compliant resource Platform for secure and reliable data dissemination and data accessibility.



Signature

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KARACHI.

- Recovery/backups (failure of any device/data backups).
- Provision of updating the system including revision and updating of maps.
- Primarily the project should be developed as web application and for desktop Computers but it can also be implemented for mobile devices such as PDAs, handheld Devices, cell phone etc.
- Provision of latest remote sensing techniques for valuable visual and spectral data to analyse processing of regional mineral and mining resources map.
- The system should be designed and capable of Real time data streaming and data storage for system update collected with input device i.e. Desktop computer, mobile device as laptop PDAS, handheld devices, cell phones etc.

15. Obligations

Consultant/ Consulting firm will furnish:-

- The requirement of software & hardware (router, switches, and pcs etc.)
- Domain purchasing and payment (yearly/monthly) one year after completion of study.
- Security of GIS.
- Reliability.
- Recovery backup.
- Server owner (Consultant/Department)
- Regular updating of Map or GIS /Continuous process.
- Software for the conversion of user grid to GPS coordinates and Vis-versa.



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 SYED IRSHAD AHMED JILANEE
 CHIEF INSPECTOR OF MINES, SINDH
 KARACHI.

PERFORMANCE GUARANTEE, BID BOND AND CERTIFICATE OF SUFFICIENCY

The successful consultant (s) will be required to place a performance guarantee to the Sponsor to the value of 10% of the total value of services; which will remain effective after the three months of the completion of the project.

With regard to the scope, quality and extent of the work the consultant(s) will be required to submit a Certificate of Sufficiency that the work undertaken under his management, in conjunction with any earlier work, is sufficient for the work to the highest internationally accepted standards including World Bank standards. In the event of any dispute, either with sponsor or third party, which is demonstrably justified with regard to the sufficiency of the programme, invalidation of this certificate, will be considered cause to call down the Performance Guarantee.

The Consultants are required to submit a bid bond in the form of Demand Draft in favour of Inspector of Mines (Development), DDO for an amount of 5% of the value of their bid proposal. The draft will be valid for a period of three months after closing date for submission of the proposals. The Demand Draft should be attached with the Technical Proposal, which will be forfeited in favour of the sponsor in case, the successful consultant (s) fails to complete the documentation required for undertaking of the work. The Bid Bond will be returned to the Successful Consultant (s) on the completion of the required documentation and to the unsuccessful bidder on their written request.

PROFESSIONAL INDEMNITY INSURANCE

It will be required to the consultant(s) that he provides and undertakes and demonstrates that he maintains professional indemnity insurance, valid for all aspects of the work undertaken as per scope of work as mentioned in the TORs.

SUGGESTIONS

The suggestions, if any, from the Consultant appointed or carrying out this study, reach during execution of the study, to improve quality of the final report without any extra financial burden or with insignificant expenses, shall be considered by Government.



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CHIEF INSPECTOR OF MINES, SINDH
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(ANNEXURE-B)

CONSULTANT REPORTING OBLIGATIONS

Pursuant to sub-Clause GC-3-6 the consultants shall submit the following reports:

[List format, frequency and contents of reports, persons to receive them, dates of submission and the number of copies of each submittal, etc. if no reports are to be submitted, state here "Not Applicable"]

Report to be submitted as per TORs



THE PERSONAL LISTED

S.No	Name of Expert	Position	Qualification	FIRM
1	A.F. Babar Sani	Team Leader / Project Coordinator / GIS / RS Specialist	MSc Civil / Geospatial Technologies - USA	Spatsol Technologies
2	Mr. Syed Nadeem Arif	Project Director/Managing Director	<ul style="list-style-type: none"> ▪ B.E (Civil), NED University of Engineering & Technology, 1992 ▪ MBA (Strategic Management), University of New South Wales, Australia, 1997 ▪ Certified Auditor for ISO 9001, ISO 14001 and OHSAS 18001 	EMC Pakistan Private Limited
3	Munir Ahmad	Environmental Expert	B.Sc. (Civil), M.Sc. (Env.), P.E (USA), P.Eng. (Canada)	Spatsol Technologies
4	Khalid Memon	Mines Development Engineer	B.E. Civil Engineering from N.E.D. Karachi, Pakistan, 1985.	Spatsol Technologies
5	Dr. Badar Munir Khan Ghauri	Air & Noise Quality Monitoring Expert	<ul style="list-style-type: none"> ▪ Post-Doctoral Fellowship, Wadsworth Center for Laboratories and Research State Department of Health, Albany, N.Y., 1202, USA, 1993 ▪ Doctor of Chemical Engg, Institute National Des Sciences Appliquees, Toulouse, France, 1983 ▪ Master Environmental Engg, Asian Institute of Technology, Bangkok, Thailand, 1979 ▪ Bachelors Chemical Engg, University of 	EMC Pakistan Private Limited



SYED IRSHAD AHMED JILANEE
CHIEF INSPECTOR OF MINES, SINGH
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			Engineering and Tech. Lahore, 1976	
6	Mr. Shams ul Haq Memon	Forestation Expert	<ul style="list-style-type: none"> ▪ Bachelor of Science in Forestry , University of Peshawar, 1973 ▪ Master of Science in Zoology (Specialization in Entomology), University of Sindh, Jamshoro, Pakistan, 1967 	EMC Pakistan Private Limited
7	Dr. Lekhraj Kella	Flora & Fauna Expert	<ul style="list-style-type: none"> ▪ Ph.D (Physical & Financial of Agroforestry Crops for Reclamation of Saline Soils, Texas A&M University, College Station, USA, 1994 ▪ Masters (Rangelands Ecology & Management), Texas A&M University, College Station, USA, 1991 ▪ Post Graduate Diploma (Forest Planning through Remote Sensing), ITC, Enschede, Netherlands, 1982 ▪ Bachelors (Forestry), Peshawar University, Pakistan, 1975 ▪ Masters (Agricultural Engineering), Sindh University, Pakistan, 1970 ▪ Bachelors (Agricultural Engineering), Sindh University, Pakistan, 1969 	EMC Pakistan Private Limited
8	Dr. Syed Ali Ghalib	Wildlife Expert	<ul style="list-style-type: none"> ▪ Ph.D., Zoology, University of Karachi, 2010 ▪ M.Sc. Zoology, University of Karachi, 1965 ▪ B.Sc, Zoology, Chemistry, University of Sindh, 1963 	EMC Pakistan Private Limited



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9	Dr. Kaneez Fatima	Senior Sociologist	<ul style="list-style-type: none"> ▪ Ph.D (Sociology from Department of Sociology, University of Karachi, Pakistan ▪ Masters of Arts (Sociology with specialization in Survey Research Methods, Community Development, Anthropology, Criminology, Demography and Population Dynamics, Organizational Behavior, Social Psychology, and Social Change) from University of Karachi, Pakistan ▪ Bachelor of Arts, (Sociology, Education, Political Science), University of Karachi, Karachi, Pakistan. ▪ Post Graduate Diploma in Statistics, University of Karachi, Karachi, Pakistan 	EMC Pakistan Private Limited
10	Zahid Iqbal	Senior Topographic Surveyor	Bachelor of Science (B.Sc.) (Physics and Mathematics) Bachelor of Science (B.Sc.) (Hons) (War Studies)	Spatsol Technologies
11	Hina Masood	GIS / RS Specialist	PhD in Geography University of Karachi MS in Geography University of Karachi	Spatsol Technologies
12	Kamran Akhtar	GIS / RS Specialist	M.S.C (Master in Geography)	Spatsol Technologies
13	Rashid Hussain	GIS Specialist	M.S.C (Master in Geography)	Spatsol Technologies
14	Javed Mehmood	GIS Specialist	M.S.C (Master in Geography)	Spatsol Technologies




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15	Shumaila Zareen	GIS Specialist / RS Specialist	M.S.C (Master in Geography)	Spatsol Technologies
16	Asma bint-e-Ismael	GIS Specialist	M.Sc (Master in Science)	Spatsol Technologies
17	Ehtesham Sarwar	CAD Expert	M.S.C (Master in Geography)	Spatsol Technologies
18	Abdul Qadir	CAD Expert	M.S.C (Master in Geography)	Spatsol Technologies
19	Ruqia Rehman	CAD Expert	M.A. in Philosophy from Karachi University	Spatsol Technologies
20	Dr. Ali Rashid Tabrez	Senior Geologist	<ul style="list-style-type: none"> ▪ Ph. D (Geological Oceanography), University of Southampton, U.K, 1995 ▪ Masters (Geology), Lakehead University, Thunder Bay, Ontario, Canada Indian, 1983 Masters (Geology), University of Karachi, Pakistan 	EMC Pakistan Private Limited
21	Ali Manzar Khan	Geologist	M.Sc. in Geology	Spatsol Technologies
22	Aneeq Mehmood Abbasi	Geologist	M.Sc. in Geology	Spatsol Technologies
23	Sajjad Bhatti	IT / MIS Specialist	MS-IT – PIMSAT 2011, MCS, B.Sc	Spatsol Technologies
24	Shakil Ahmed	IT / MIS Specialist	MCS, B.Sc	Spatsol Technologies
25	Mr. Saquib Ejaz Hussain	Environmental & Social Consideration Specialist	<ul style="list-style-type: none"> ▪ Masters in Chemical Engineering Thermodynamics, Department of Applied Chemistry & Chemical 	EMC Pakistan Private Limited



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			Technology, University of Karachi, 2006	
26	Mr. Muhammad Haseeb	Environmental Specialist	<ul style="list-style-type: none"> ▪ Masters in Environmental Studies, Department of Environmental Studies, University of Karachi, 2010 ▪ Masters Applied Chemistry and Chemical Technology, Department of Applied Chemistry & Chemical Technology, University of Karachi, 2005 	EMC Pakistan Private Limited
27	Mr. Khurram Shams Khan	Socio-economic Expert	<ul style="list-style-type: none"> ▪ MSc. Water Management (Sustainable Agricultural Development), 2006 ▪ Bachelor of Economics and Environmental Studies, 2002 	EMC Pakistan Private Limited
28	Mr. Ahmed Zohair Siddiqui	Environmental Engineer	<ul style="list-style-type: none"> ▪ Master of Associate Auditor/Environmental Engineering, University of Melbourne, Australia, 2012 ▪ Bachelor of Engineering (Civil), NED University of Engineering & Technology, Pakistan, 2008 	EMC Pakistan Private Limited
29	Ghulam Rasool Mirza	Senior Surveyor (Associate)	Diploma in Civil Engineering from Government Technical College Rasul Distt. Gujrat in 1965.	Spatsol Technologies
30	Annus Ullah Khan	Surveyor	Bachelor in Civil Engineering From NED University	Spatsol Technologies
31	Kamran Asif	Surveyor	Master of Science (M.Sc)	Spatsol Technologies
32	M. Shehroz Bin Hashim	Surveyor	Bachelor in Civil Engineering From NED University	Spatsol Technologies
33	Danish Ansari	Surveyor	M. A Economics	Spatsol Technologies
34	M.Mohsin Khan	Surveyor	Bachelor Social Science	Spatsol Technologies



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DECLARATION OF FEES, COMMISSION AND BROKERAGE ETC. PAYABLE BY THE SUPPLIERS OF GOODS, SERVICES & WORKS IN CONTRACTS

Contract No. 1/2019 Dated _____
 Contract Value: Rs.19,695,170
 Contract Title: ENVIRONMENTAL MAPPING OF MINING AREAS OF SINDH FOR THE CONSERVATION OF MINERALS AND NATURAL RESOURCES.

“Spatsol Technologies Engineering & IT Consultants private limited” hereby declares that it has not obtained or induced the procurement of any contract, right, interest, privilege or other obligation or benefit from Government of Sindh (GoS) or any administrative subdivision or agency thereof or any other entity owned or controlled by GoS through any corrupt business practice.

Without limiting the generality of the foregoing, “Spatsol Technologies Engineering & IT Consultants private limited” represents and warrants that it has fully declared the brokerage, commission, fees etc. paid or payable to anyone and not given or agreed to give and shall not give or agree to give to anyone within or outside Pakistan either directly or indirectly through any natural or juridical person, including its affiliate, agent, associate, broker, consultant, director, promoter, shareholder, sponsor or subsidiary, any commission, gratification, bribe, finder’s fee or kickback, whether described as consultation fee or otherwise, with the object of obtaining or inducing the procurement of a contract, right, interest, privilege or other obligation or benefit in whatsoever form from Procurement agency (PA), except that which has been expressly declared pursuant hereto.

“Spatsol Technologies Engineering & IT Consultants private limited” certifies that it has made and will make full disclosure of all agreements and arrangements with all persons in respect of or related to the transaction with Procurement agency (PA) and has not taken any action or will not take any action to circumvent the above declaration, representation or warranty.

“Spatsol Technologies Engineering & IT Consultants private limited” accepts full responsibility and strict liability for making any false declaration, not making full disclosure, misrepresenting facts or taking any action likely to defeat the purpose of this declaration, representation and warranty. It agrees that any contract, right, interest, privilege or other obligation or benefit obtained or procured as aforesaid shall, without prejudice to any other rights and remedies available to Procurement agency (PA) under any law, contract or other instrument, be voidable at the option of Procurement agency (PA).



for

[Signature]

Notwithstanding any rights and remedies exercised by Procurement agency (PA) in this regard, "Spatsol Technologies Engineering & IT Consultants private limited" agrees to indemnify Procurement agency (PA) for any loss or damage incurred by it on account of its corrupt business practices and further pay compensation to Procurement agency (PA) in an amount equivalent to ten times the sum of any commission, gratification, bribe, finder's fee or kickback given by "Spatsol Technologies Engineering & IT Consultants private limited" as aforesaid for the purpose of obtaining or inducing the procurement of any contract, right, interest, privilege or other obligation or benefit in whatsoever form from Procurement agency (PA).

Procuring Agency
Syed Irshad Ahmed Jilane
Title: Chief Inspector of Mines, Sindh
Inspectorate of Mines, Mines and
Mineral Development Department.



Supplier/Contractor/Consultant
Mr. Abdul Fatah Baber Sani
Title: Managing Director
Spatsol Technologies Engineering
& IT Consultants private limited.

SYED IRSHAD AHMED JILANE
CHIEF INSPECTOR OF MINES, SINDH
KARACHI

Break down of lump-sum price of contract

[List here the elements of cost used to arrive at the breakdown of the lump-sum price of contract]

1. Remuneration for various items on the basis of rate as mutually agreed.
2. Other reimbursable direct cost expenditure.
3. Total, remuneration and reimbursement direct costs expenditure = (1+2).

Note:

This appendix will exclusively be used for determining remuneration for Additional Services in accordance with Sub-Clause GC 6.4. The breakdown of the lump sum prize follow as under;

- i. Payable on the approval of Inception Report of each Phase by the review committee 20% of total value of Services.
- ii. Payable on the approval of Interim Report of each Phase by the review committee 40% of total value of Services.
- iii. Payable on the approval of Final Report of each Phase by the review committee 50% of total value of Services.

*Note: Applied for Revision
2 for*



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CHIEF INSPECTOR OF MINES, SINDH
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(Appendix-B)

Break down of Contract Price in Local Currency

[List here the elements of cost used to arrive at the breakdown of the Contract price Local Currency]

1. Remuneration for various items on the basis of rate as mutually agreed.
2. Other reimbursable direct cost expenditure related to :

- (a) Support Staff, and work charged staff;
- (b) Office Expenditure related to:

- (i) Rentals;
- (ii) Furnishing and equipment;
- (iii) Operation and maintenance of office, office equipment and furniture, office supplies.

- (c) Transport including running and maintenance, and other associated costs;
- (d) Traveling etc.
- (e) Other costs.

3. Total, Remuneration and reimbursement direct costs expenditure = (1+2).

Note:

This appendix will exclusively be used for determining remuneration for Additional Services in accordance with Sub-Clause GC 6.4. The breakdown of the lump sum prize follow as under;

- i. Payable on the approval of Inception Report of each Phase by the Review Committee 20% of total value of Services.
- ii. Payable on the approval of Interim Report of each Phase by the Review Committee 30% of total value of Services.
- iii. Payable on the approval of Final Report of each Phase by the Review Committee 50% of total value of Services.

*Nota: Applied for Revision
2. Jan*



[Signature]
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CHIEF INSPECTOR OF MINES, SINDH
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(Appendix-C)

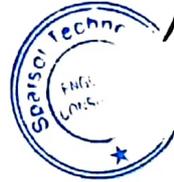
Services and facilities to be provided by the client.

The client shall make available the following Services and Facilities:

1. Services and Facilities of the Client.

The client shall make available to the Consultants, Sub Consultants and the Personnel, for the purposes of the Services and free of any charge, the Services, facilities and property, at the times and in the manner specified hereunder:

- (a) The Consultant will furnish the following requirements before commencement of Works/Services. The departments and agencies include.
- (b) Home Department, Government of Sindh instruction/guideline issued by Home Department from time to time will be adhered for security of consultant at the place of Services



SYED IRSHAD AHMED JILANE
CHIEF INSPECTOR OF MINES, SINDH
KARACHI.

(Appendix-D)

Terms and Condition of payment.

Payment shall be made according to the following schedule:

The Consultant shall be entitled to payment for:

1. Payable on the approval of Inception Report of each Phase by the Contract Award committee 20% of total value of Services.
2. Payable on the approval of Interim Report of each Phase by the Contract Award committee 40% of total value of Services.
3. Payable on the approval of Final Report of each Phase by the Contract Award committee 50% of total value of Services.
4. The first, second and third installment payment to the consultant will be subject to the approval by the Chief inspector of Mines, Mines & Mineral Development Department, Government of Sindh with the permission of Review Committee.



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CHIEF INSPECTOR OF MINES, SINDH
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Item	Description
Inception Report	<p>1) Coordination Meetings with Inspectorate Project Office streamlining the scope and objectives.</p> <p>1.1 Review of Terms of References / clarifications required.</p> <p>1.2 Evaluation of available Datasets in terms of Mineral Leases,</p> <ul style="list-style-type: none"> - exploration status, - availability of the geological datasets / geological investigations conducted - Sub-surface / stratigraphic information - Discussion on mapping requirements of surface and sub surface and mineral spatial sprawl - Requirement of undertaking Environmental evaluation and environmental Impact assessments and geo database development and mapping / interventions and technical evaluation of required for mapping impact due to Mine Developments and its effects on ecology and adjoin areas. <ul style="list-style-type: none"> - Hydrological Assessments - Terrain Assessments - Socio-economic Assessments <p>2) Review and Submission of Geo database Development and Mapping Road Map.</p> <p>3) Technical Review of the proposed technological integration for the development of online Web Portal</p> <p>4) Assessment of Standard Practices and envision to translate SOP into Digital formulation for the Mines and Mineral exploration</p> <p>5) Mineral Sites Surveys in Phase I Districts Reconnaissance Surveys Assessment of Areas of Interest to procure High Resolution Satellite Imageries</p> <p>6) Propose Sites For the Establishment of Bench Marks at Mineral Sites Locations</p> <p>7) Submission of proposed Hardware and propose online technological Solution.</p>
Mid Term/Interim Report	<p>2) Proposed Baseline Districts wide Datasets: Procurement of baselines Mapping of Survey Given Districts under Phase I & II , Field Surveys and Procurement of Hybrid / High Resolution Satellite Imageries and Surveys will conducted in 'Parts' classifying Phase I Districts under Mid Term Report I & II and all associated and allied developments will be carried out accordingly. Similarly the same approach will be adopted for Phase II Districts.</p> <ul style="list-style-type: none"> - Description of spatial data layers / topological Details and description of meta data associated with the spatial data Layers. <p>3) Procurement of Phase I Part A Survey Districts Hybrid (Landsat / SPOT) and High Resolution Satellite Imageries</p> <ul style="list-style-type: none"> - Imagery Processing Details - Details & Baselines Districts wide Mapping <p>4) Details on Procurement of Baseline Districts / Taluka Boundaries, Infrastructure Feature Datasets including Roads/ Villages/Landmarks / Education / Health / Forest / Hydrology / Lakes/ others as specified by Dept.</p> <p>5) Details on Procurement of Digital Elevation Model (DEM) and development of Delineated Watersheds & Terrain Model with Slopes and inundation and vulnerability assessments with reference to Mineral Leases Sites.</p> <p>6) Details on Procurement of GSP maps / geo-referencing of sheets / Digitization / Geo database Development.</p> <p>7) Environmental / ecological mapping & Geo database development.</p>

	<p>8) Mineral Leases GNSS based Field Survey /Leases Coordinates Data capture /Data processing / Coordinate Transformation /Geographic Coordinates and Mapping / integrated Geo database Development.</p> <p>9) Arc-GIS Desktop Application Developments / Geo database Development - GIS Lab proposed Hardware / software procurement.</p> <p>10) Survey Districts Mineral Leases Layouts Development and standard A0 and A3 Size Mineral Leases Maps Printing &Submission.</p> <p>11) Online maps publications / .Net Framework / MS SQL spatial data Layers integration / Web Portal Development.</p> <p>12) Online Geo database integration and Query Model Development</p> <p>13) Online Mineral Site Liege Survey Data Integration</p> <p>14) Hiring of manpower/ GIS Development and Mapping Training of Inspectorate designated staff 15) GIS Lab institutionalization</p>
Final Report	<p>Final Report Submission with complete list of Mapping Catalogs / Survey Districts under Phase 1 & 2 - Final Geo database Module / Customization Models / Review / Necessary rectification required. Completion Report / Certificate Issuance</p>



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(Appendix-F)
CONSULTANT HARDWARE PROPOSAL

HARDWARE CLASSIFICATION

I HARDWARE FOR SURVEY WORKS

- ✓ GNSS System (Base Station and 01 Rover)
- ✓ Android Mobile Phones 03 No
- ✓ 360 Degree Google Street view Camera (01)

II HARDWARE FOR GIS MAPPING AND DEVELOPMENT

Server Work Station Min Reqd. 01
 Desktops Computers Min Reqd. 03
 Laptop / Tablet Min Reqd. 01
 Printers Min Reqd. 02 (A3/A4)
 Networking

III GIS LAB FURNITURE

Manager Desk and Chair
 GIS Developer Workstation Desk with Chairs 03 No Set
 Printer Desk
 Network Side Rack

Visitors Chairs

Name	Specification
Desktop Computer	Intel Core i5 or higher CPU @ 3.0 GHz , Windows 10, 4 GB RAM, NIC 10/100/1000, 1 TB SATA Hard Disk, 19" LED Display
Laptop Computer	Inter Core i7 CPU @ 3.0 Ghz, Windows 10 , 8 GB RAM, 500 GB Hard Disk, NIC 10/100/1000, Laptop carrying case
GIS WORKSTATION	HPZ8401125W <ul style="list-style-type: none"> • (1450W/200V) • 90PercentEffChassis, • IntelXeonE5-2699v32.3213318C1stCPU, • IntelXeonE5-2699v32.3
HP Design Jet Multi function Plotter	FCC Class A emissions – for use in commercial environments, not residential environments <ul style="list-style-type: none"> • Up to 1.5 in/sec (color, 200 dpi); up to 4.5 in/sec (grayscale, 200 dpi) • Up to 2400 x 1200 optimized dpi • HP Thermal Inkjet • 4 (cyan, magenta, yellow, matte black) • 8.3 to 36-in wide sheets; 11 to 36-in rolls
Laser Printer Black A3	Up to 35 ppm, Print resolution Up to 1200 by 1200 dpi / HP Fast Res 1200; HP Pro Res 1200; Resolution Enhancement technology (Ret) /Processor 600 MHz , Memory 64 MB (expandable up to 320 MB)
Printer / Scanner / Fax	4800 x 9600 dpi for exceptional scans of photos, slides, negatives, documents / Superior color accuracy, photo reproduction with six-color, 96-bit scanning / Automatic red-eye removal and detail enhancement /Duty cycle of up to 2,000 pages
Modems / WiFi Router	4800 x 9600 dpi for exceptional scans of photos, slides, negatives, documents / Superior color accuracy, photo reproduction with six-color, 96-bit scanning / Automatic red-eye removal and detail enhancement /Duty cycle of up to 2,000 pages providers
Software	Arc-GIS 10.x



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(Appendix-G)

CONSULTANT HARDWARE PROPOSAL

GNSS System
(Base Station and Rover)

FOIF BASE STATION ITEMS	FOIF ROVER ITEMS	FOIF ROVER ITEMS
FDL-5 External	Controller	DGPS Tape
Tribratch Adopter	DGPS Battery	Data Cable
DGPS Battery	DGPS Battery Charger	Charger Cable
DGPS Battery Charger	Controller Charger	DGPS Rod
Power Cable	Internal Antenna GSM	Adopter5/8" Screw
Extension Pole	Atenna	Quick Tripod
	Clipper	Procurement of Hardware

CONSULTANT HARDWARE PROPOSAL
GNSS System (Base Station and Rover)

FOIF GNSS SYSTEM PROPOSED		
One Base one Rover set	Horizontal Static accuracy: 3mm ± 0.5PPM	Operating distance 30k m Radius or better
Software accessories with post processing software	Operating temperature: 30 to 65oC	Vertical Static accuracy y: 6mm ± 0.5PPM
Data collector with Real Time Post processing Survey software	Memory: 4GB or better	Shock proof and water proof
Channel: 220 or more	UHF External RADIO 35W Automatic correct system	Built-In Tilt Sensor / Tilt up to ±30 degree
Voice Messages	Internal Antenna GSM	Adopter5/8" Screw
Tracking Signals: GPS L1 C/A, L2 E, L2C, L5 GLONASS: L1 C/A, L1P,L2 C/A, L2P SBAS(WASS/EGNOS/MSAS Beidou : B1, B2 (Activated)	Automatic data collection during centering	Quick Tripod



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