TENDER ENQUIRY # PROC-SERVICES/CB/WS-4222/2019

RATE RUNNING CONTRACT FOR HIRING OF MUD ENGINEERING SERVICES ALONGWITH MUD CHEMICALS IN CENTER / SOUTH REGION ON AS AND WHEN REQUIRED BASIS

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ENCLOSURES

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SECTION-A

INTRODUCTION / SCOPE OF WORK

Oil & Gas Development Company Limited (OGDCL),a leading exploration and production company, requiresMud Engineering Services along with Mud chemicals for Water Base Mud (WBM)&Oil Base Mud (OBM)in Center / South Region. For this purpose OGDCL plans to enter into rate running Contract for a period of 02 years and extendable with mutual consent for its upcoming drilling and work-over wells in Center / South Region of Pakistan for hiring of Mud Engineering Services along with Mud Chemicals on as and when required basis.

All the wells in the above referred region will be drilled during the fiscal years **2019– 2021**,with low-high weighted Water Base or Oil Base Mud (as needed); solid tolerant, inhibitive mud systems with tolerance to temperature of ± 150 – 400°F at TD.

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SECTION-B

TERMS OF REFERENCE (TOR)

INSTRUCTIONS TO BIDDERS

Bidder shall not leave (i) any item of requirement un-answered, (ii) blank, or (iii) Will not write only yes instead of giving details of the technical and miscellaneous requirements. Compliance to above will firm the completeness of their bid. A simple "YES" is not acceptable as answer.

1. The Bidder should be internationally recognized and well established in rendering drilling fluid engineering services & supply of Mud Chemicals.

2. All the supplies (materials & lab equipment) should be in good, A-one condition for the Performance of the services.

3. Each bidder should have well established base along with mud chemical yard with substantial quantities of mud chemicals (local & imported) in stock and adequate stock of the standard drilling fluid testing equipments and their spares, mud testing chemicals, reagents, consumables etc. as well as fully operational Drilling Fluids analytical / engineering lab equipped with standard / modern mud testing equipment in Pakistan. Moreover all chemicals bags & Lab reagents to be marked with manufacturing / expiry dates and shelf life of the chemical clearly mentioned on tags.

4. In case, the bidder has no permanent base and lab facilities in Pakistan it will provide in its technical proposal a plan as well as firm time schedule of establishing / commissioning the same as per clause-3, which should not be greater than 45 days after issuance of LOI. The bidder will confirm the modus-operandi for emergency supplies in order to ensure continued supply of chemicals during drilling phase on as and when required. The procedure and time required be mentioned specifically as this will be the key technical criteria. Moreover the department has the prerogative to check / inspect the base / lab facilities at any time as & when required.

5. Bidder will have to submit the proof of satisfactory track record for provision of Mud Engineering Services alongwith Mud chemicals provided in or outside Pakistan. Case histories of suggested mud systems, experience of working with different mud systems, and mud chemicals supplied on consignment basis to other E & P companies for at least 20 wells to be attached with the technical bid.

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6. For reference purpose only, the bidder will provide the addresses and contact numbers (other than OGDCL) of the clients to whom they have provided services during the recent past 05 years.

7. Each bidder will submit complete data documents such as Technical specification sheets & MSDS for each of their proposed mud chemicals as per technical specifications as per industry prevailing practicesormentioned at Section-H.

8. Each bidder will have to prepare and submit detailed mud programs in its technical proposal for a well in Center /South region, based on the data being provided with the bid document in the light of their experience / exposure in similar/adjoining areas. The program should also provide phase wise total estimated mud volumes, dosages of each chemical, total estimated mud chemicals requirement for each phase and the total mud chemical requirement for the entire well including contingency materials that may be required for each well.

9. The mud programs should include recommendations for preventives/remedial measures, treatments & procedures for any anticipated & potential mud / hole problems for each section of hole. All the mud chemicals should be as per attached specification. The successful bidder will have to run the submitted program within the proposed cost, if desired by OGDCL.

10. The bidders must have to submit the 1 kg /1 Litre sample of the following twelve (12) no. of mud chemicals along with technical bids within 10 days of bid submission. The valid receipt / tracking details supplied through national / international courier services must necessarily be attached with the technical bid otherwise the bid will be rejected. No sample will be accepted / entertained after 10 days of Technical Bid Opening if not provided along with the bid, and the bid will be rejected. Moreover the lab analysis of samples would be undertaken at OGDCL own or any other reputable lab of OGDCL choice and acceptance of results will be binding over the bidders. In case of non-conforming of any sample to technical specification of tender document, the bid will stand disqualified.

10.1 API Bentonite (Non-Treated)	10.2 Shale Stabilizer
10.3 PAC-R	10.4 PAC-LV
10.5 PHPA	10.6 Poly Glycol
10.7 Xanthan Gum	10.8 Primary Emulsifier for OBM
10.9 Secondary Emulsifier for OBM	10.10 Oil Base Mud Gel
10.11 Fluid reducer for OBM	10.12 Wetting agent for OBM

11. The bidder(s) obtaining qualifying marks in each clause as per Technical Evaluation Criteria (TEC) will be declared technically responsive subject to

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fulfilling all the other terms and conditions/instruction to the bidders as per all Enclosures.

12. The bidder qualifying Technical Evaluation criterion will be eligible for financial competition.

13. Bidders are required to mention the unit price and total cost of all the mud chemicals separately given in Financial Bid Format for North region exactly as per Units used for costing of mud chemicals given in Financial Bid Format for (WBM) and (OBM) respectively.

14. Bidders should mention the following in their bid that:

    (i) Technical specifications of the offered mud chemicals, conform to the specifications mentionedat section-H, **each bidder should fill-in the given tables with the exact value of these properties of their quoted product. Only to write conforming to or O.K. will not be sufficient.**

    (ii) Country of origin and shelf life of each quoted chemical.

    (iii) Brand names of their products against each chemical

    (iv) Complete valid **Standard Price List** along with applicable discount (based on **at rig site**) for all mud chemicals which are not included in Financial Bid Format to be attached with the Financial Bid for reference purpose, however, the same shall not be the part of the Contract.

15. The consumption of mud chemicals will be dependent on the requirement. OGDCL ex-stock chemicals including contingency material, if available at Rig site will be utilized first.

16. All the mud chemicals will be charged on actual consumption basis and the contractor will maintain sufficient stock of mud chemicals at well site during drilling operation.

17. Payment will be made for the material actually consumed after verification of invoices from Operation Manager/ Company Man / Mud Engineer and Well Services Department of the purchaser (OGDCL).

18. Mud Engineering Service Charges per day for mud engineer to be quoted in the bid. Mobilization/ demobilization of personnel and mud testing equipment will be on contractor's account. OGDCL will not provide transport to Engineers from nearest airport to & from well site, whereas it will be the sole responsibility of the contractor in accordance with laid down procedure of the company and / or Govt. of Pakistan i.e., security clearance / valid work visa, pick & drop etc. OGDCL will provide boarding and lodging for contractor's personnel at rig site.

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19. Mud Engineer who will render the services should be at least Science Graduate or Graduate Chemical Engineer with minimum 08years experience or in case of Intermediate / High school with minimum 30 years relevant continuous working experience at field and not exceeding to 65 years of age. C.V's of proposed Mud Engineers be enclosed with the technical bid.

20. Bidder should submit CVs of at least 10 designated mud engineers with the Technical proposal for provision of Mud Engineering Services.

21. Proposed Mud Engineers should be fluent in spoken and written English with adequate experience in Pakistan (Preferably). In case of Mud Engineer of any non-English language origin, documentary evidence proving that the proposed mud engineers have undertaken English language course from a reputed/ recognized institution. It will be mandatory to submit the certificates with the CVs of proposed mud engineers.

22. Designated engineers must be permanent/Contractual employees of the bidding company.

23. Service Company should ensure provision of all essential Mud Testing Equipments, chemical reagents and glassware, etc. at well site for maintaining excellent mud parameters (OGDCL will not be responsible to provide the same). List of such material is to be submitted along with the bid. Standard test kit will be included in per day rate of Mud Engineer.

24. The Service Company should ensure judicious use of chemicals by its Mud Engineer working at Rig site. The same would also be monitored by Well Services Department of OGDCL, similarly the invoices would be verified accordingly and amount would be paid for justified usage only.

25. The contractor is bound to submit separate invoices for Mud Chemicals & Mud Engineering Services.

26. OGDCL has the prerogative to either acquire both Mud Engineering services and Mud Chemicals or Mud Chemicals alone subject to requirement of operation at any well / OGDCL base store locating in that region.

27. OGDCL reserves the right to place its own Mud Engineer, whereas, the Service Company will only provide Mud Chemicals i.e. no Mud Engineer of the Service Company will be deputed on that Rig.

28. The contractor is bound to provide firm schedule of procurement (import / shipment) of Mud chemicals and their availability at site (if required by OGDCL).

29. The contractor is bound to provide the material in its required physical state (solid/liquid) given in Financial bid Format.However due to non-availability of the required physical state of any mud chemical with the contractor than contractor is bound to provide the chemical of same specification from the standard list. However the chemical would be paid / charged as per rate quoted in the bid.

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30. Similarly if any mud chemical from Financial bid format is not available with the contractor than contractor is bound to provide the same chemical with same specification from the standard competitive list. However the chemical would be paid / charged as per rate quoted in the bid.

31. The contractor is bound to provide the material as per quoted brand name during whole contract period.

32. The required / recommended dosage of each chemical should be according to its grade & composition.

33. The Contractor will be responsible for damages & wastages of its mud chemicals, if any,at contractor's expense, during drilling operations. Contractor will be responsible for disposal of solid waste generated at well-site due to consumption of Mud Chemicals which may comprise of empty bags of all sizes / types, cans, drums etc. at no cost to OGDCL.

34. The contractor should provide complete Mud Testing Equipments, chemical reagents and glassware, etc. at well site required for job for maintaining excellent mud parameters (OGDCL will not be responsible to provide the same). List of such material is to be submitted / comprehended along with the bid.

35. Beside the conventional testing equipment, HPHT Filter Press, 6-8 speeds/ variable speed Rheometer, MBT kit, Pilot test kit, Digital pH meter, Garret gas train with complete array of Dragger's tubes or any other equipment required for testing of fluid, will also be provided as per requirement of OGDCL at no extra cost.

36. The Contractor will also confirm to arrange special mud tests (if required) from Analytical mud laboratory abroad at no cost to OGDCL. Effective R&D (Research & Development) services to be provided by the Contractor at no cost to OGDCL.

37. Contractor will provide dimensions of mud chemical platforms required for placement/storage of their mud chemicals at rig-site. All mud chemicals should be palletized and wrapped for protection against weather implications like rain, moisture, sunlight, and handling damages. Contractor will also be responsible for providing tarpaulin covers etc to prevent damage of their mud chemicals.

38. For easy product identification, each pallet/drum/sack should be clearly labeled on 4 sides with stickers indicating weight and total quantity of the product.

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38. Mobilization / Transportation of mud chemicals and demobilization of left over mud material will be on contractor's account. OGDCL will arrange off loading and handling of mud chemicals at site. However, OGDCL will not be responsible for damages/ wastages and deterioration of contractor's mud chemicals for any reasons (i.e. handling, loading and off loading) during drilling operations. Moreover no chemical would be demobilized from well site without prior intimation to OGDCL.

39. Only those mud chemicals will be stored at well site in sufficient quantities which are required as per mud programs. No other chemical will be stored at well site without approval of OGDCL. OGDCL Location will not be used, in any case, as transit location of the contractor.

40. Mud chemicals should be of A-One grade and should fully comply with API, attached technical specifications at section "H" or prevailing industry practices. During the whole contract period if any material/chemical found to be Sub-standard then it will be deducted/charged at zero rate with no excuse without assigning any explanation. OGDCL will not be responsible for providing Lab Analysis Report to the contractor for such deductions. Beside this, action will also be taken against the contractor as per company's rule.

41. The Useful Life or Shelf Life of all the Mud Chemicals, provided by the contractor during the contract period, should be beyond the contract period.

42. OGDCL has the right to get sample of any Mud Chemical of contractor from Rig Site and get tested from OGDCL lab or any recognized lab in Pakistan at any time without witness of Contractor's representative or prior notice and information to the Contractor.

43. Only two dedicated mud engineers will be assigned for the entire duration of the well on rotational basis i.e. one at a time who will be responsible for 24 hours operations. Second mud engineer may be required in case of emergency depending on the requirement of the company. The day rate of the 2nd Mud Engineer must also be quoted in the financial bid.

44. The contractor will ensure the well site stay of their assigned mud engineer on 28/28 or 28/14 days rotation basis. No over stay will be allowed after 28 days.

45. Designated mud engineers should have more than 08 years on-hand recent experience with competency in running solids tolerant inhibited mud systems (Lignosulphonate / Lignite type, non disperse fresh water KCL/GLYCOL/PHPA, Silicate, Sodium / Potassium Formate and Oil Base Mud Systems). The designated engineer must have the ability to prepare / run any type of drill-in fluids, non-damaging to reservoir as per program or other than program if needed according to some exigent situation. Designated mud engineer should be capable of running all types of brine completion fluids. He should have high competence in dealing with low/high pressures (loss/gain) and well control problems and knowledge of SCE.

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46. All professionals designated for field duty should have adequate H_2S training.

47. The contractor will be bound to provide only those Mud Engineers whose CVs are provided with the bid.

48. Before sending any Mud Engineers, other than the one approved by OGDCL (out of listed 10 engineers) to Rig Site, OGDCL's written inprincipal approval will be mandatory.

49. The Contractor should have necessary Mud Engineering& Hydraulics support software's data, etc having one copy/product certificate with field engineer.

50. Contractor should provide technical back-up support on quality control & quality assurance of material. The contractor should have a senior mud engineer/consultant stationed in Pakistan, at no additional cost to OGDCL, having mud engineering experience of minimum 20 years with different mud systems in Pakistan and will be assigned as Technical coordinator for meeting with relevant OGDCL personnel at Islamabad Head office for technical support and to get the requirement of chemicals on monthly basis and to arrange inventory as per need analysis. Minimum 01 No. CV of consultant should also be enclosed with the technical bid.

51. Contractor's Engineer at site will have to submit daily detailed API mud report together with weekly / monthly mud and inventory reports etc.

52. Contractor will submit 02 hard copies and one soft copy on CD of detailed Mud Recap at the end of the each well as per OGDCL requirement within one month of the completion of the well, containing complete mud data, tables, charts, and their analysis along with conclusion / recommendations. These reports to comprise of complete Data Analysis of mud related hole problems encountered in detail (of each section drilled), steps taken to resolve the problem and recommendations for future wells on the basis of lessons learnt to mitigate / avoid (if possible) these problems. The data analysis section is to be attached separately with mud re-cap.

53. Required material will be imported by the contractor at his own on consignment basis & Import/ Export custom clearance, custom duties or any other cost of the contractor material/equipment will be at contractor's account

54. Import/ Export custom clearance permits for contractor's equipment / chemicals shall be obtained by the contractor at contractor's expense. OGDCL will extend its co-operation by dispersing Import authorization Letter. In this regard contractor will ensure that the material/equipment explicitly imported & utilized exclusively for OGDCL's drilling operations.

55. Spacious warehouse and sizeable inventory/ stock of mud chemicals / Equipments/Mud Lab facilities at their base in Pakistan to be maintained all the time during contract period to cater the requirement of 3 - 4 wells simultaneously.

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56. The contractor will be bound to provide /submit detailed mud programs if required by OGDCL and provide required Mud chemicals on consignment basis, along with complete field lab with mud testing equipment and reagents as per attached requirement.

57. The contractor is required to comply with company's Quality Management System / QHSE Management System and is bound to submit equipment function test / QA / QC / certificates, third party inspection reports for products and equipment.

58. All the Contractor's personnel must abide by & conform to company's HSEQ policy & any periodic changes, in true letter & spirit.

59. Regular visits of Contractor's HSE co-coordinator & Technical Coordinator to well-site to ensure implementation of all HSE & QA/QC requirements as per company policy.

60. OGDCL reserves the right to make any amendment in tender documents at any stage before technical bid opening.

61. If any of the information provided by the bidders proves wrong or any counterfeited/unlawful/fake/forge document is submitted to mislead the company, OGDCL reserves the right to disqualify such bids without further assigning any reason and may initiate proceedings against bidder.

62. The de-barred / black listed firms are not eligible to apply. However after completion of debarred time period, formal approval / NOC from OGDCL management must be acquired before submission of bid and copy of letter must be enclosed in the bid.

63. Bid price for Mud chemicals shall be firm and inclusive of all applicable taxes and levies as per Government of Pakistan regulations excluding Provincial Sales Tax / ICT/GST. Provincial Sales Tax/ ICT/GST if applicable will be paid by OGDCL.

64. Compliance/Acceptance of all terms &conditions of the Bid documents is compulsory. No exceptions/deviations from the tender documents will be acceptable.

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SECTION- C

OGDCL has planned to drill number of exploratory & development wells in Center /Southregionsof Pakistan during the Fiscal Years **2019-21**. Tentative well Plan for a typical representative well in these region are as follow.

TENTATIVE DEPTHS, VOLUMES, TYPES OF DRILLING FLUIDS AND PARAMETERS REQUIRED FOR REPRESENTATIVE WELLS IN CENTER / SOUTH REGION FOR REFERENCE ONLY I.E. DEPTHS/ MUD SYSTEMS/MUD VOLUMES/ MUD PARAMETERS/ CASING POLICIES/NO. OF CASINGS/CASING SIZES MAY CHANGE AS PER DESIGN OF ANY SPECIFIC WELL IN REGION.

(CENTER REGION)

				WBM		OBM/ SBM	
Phase No.	Hole Size (Inch)	Interval	Csg Size (Inch)	Fluid Type	Tentative mud parameters range	Oil Base Mud	Tentative mud parameters range
I	28"	0-410	24 ½"	Spud Mud/ Air Drilling	SG 1.04-1.10 F/Vis: 70-80 Ph:8.5-9.0	NIL	
II	22"	410-910	18 5/8"	KCl-PHPA polymer Mud System	SG 1.10-1.25 F/Vis:60-70 pH: 9.0-10 PV:16-19 YP:28-30 GEL:7-8/18-21 W/L(cc): <8.0 Cake (mm): 1 Solids:6-14 Glycol (v/v)3% KCl> 15PPB MBT: 15-20 PPB	Oil Base Mud	SG 1.10 – 1.25 Oil/water ratio: 75/25 to 85/15 6rpm: >8 HPHT W/L (cc) at 190°F: <3.0 Water phase salinity: >160 g/l Cl- Electrical stability: >800 volts
III	17"	910-1745	13-3/8"	KCl / NDF/Sodium Formate / Potassium Formate / Under Balance Drilling (UBD)	SG 1.04-1.15 F/Vis:60-65 pH: 9.0-10 PV:14-17 YP:25-30 GEL:6-7/18-20 W/L(cc): <8.0 Cake (mm): 1 Solids:4-9 KCl> 15PPB MBT: 15-20 PPB	NIL	
IV	12-1/4"	1745-3150	9-5/8"	KCl / NDF/Sodium Formate / Potassium Formate / Under Balance Drilling (UBD)	SG 1.06-1.20 F/Vis:55-60 pH: 9.0-10 PV:14-18 YP:20-25 GEL:5-6/12-15 W/L(cc): <6.0 Cake (mm): 1 Solids:4-12 KCl> 15PPB MBT: 15-20 PPB	NIL	
V	8-1/2"	3150-4100	7" Liner	KCl / NDF/Sodium Formate / Potassium Formate	SG 1.25-1.80 F/Vis:50-55 pH: 9.0-10 PV:19-33 YP:18-20 GEL:4-5/12-15 W/L(cc): < 5.0	NIL	

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					Cake (mm): 1 Solids:14-29 KCl> 15PPB MBT: 15-20 PPB	
VI	5-7/8"	4100 - 4900	5" Liner	KCl / NDF/Sodium Formate / Potassium Formate	SG 1.30-1.60 F/Vis:45-50 pH: 9.0-10 PV:21-28 YP:15-20 GEL:3-5/9-15 W/L(cc): < 5.0 Cake (mm): 1 Solids:15-23 KCl> 15PPB MBT: 15-20 PPB	NIL
	Completion	-	-	KCl/ NaCl/ $CaCl_2$ Brine/ $CaBr_2$/ ZincBromide	SG 1.05-1.30	NIL

(SOUTH REGION)

				WBM		OBM/ SBM	
Phase No.	**Hole Size (Inch)**	**Interval (M)**	**Csg. Size (Inch)**	**Fluid Type**	**Tentative mud parameters range**	**Oil Base Mud**	**Tentative mud parameters range**
I	26"	0- 300	13-3/8"	Bentonite Spud Mud	SG 1.05-1.10 F/Vis: 70-80 pH: 8.5-9.0	NIL	
II	17-1/2"	300-1390	13-3/8"	KCl-PHPA with Glycol or Silicate Mud System	SG 1.10-1.20 F/Vis:60-70 pH: 9.0-10 PV:16-18 YP:20-25 GEL:8-9/18-20 W/L(cc): < 5.0 Cake (mm): 1 Solids:6-12 Glycol (v/v)3% KCl> 15PPB MBT: 15-20 PPB	Oil Base Mud	SG 1.10 – 1.20 Oil/water ratio: 75/25 to 85/15 6rpm: >8 HPHT W/L (cc) at 190°F: <3.0 Water phase salinity: >160 g/l Cl- Electrical stability: >800 volts
II	12-1/4"	1390 - 3000	9-5/8"	KCl-PHPA with Glycol or Silicate Mud System	SG 1.20-1.25 F/Vis:55-60 pH: 9.0-10 PV:18-19 YP:18-20 GEL:6-7/15-18 W/L(cc): < 5.0 Cake (mm): 1 Solids:12-14 Glycol (v/v)3% KCl> 15PPB	Oil Base Mud	SG 1.20 – 1.25 Oil/water ratio: 75/25 to 85/15 6rpm: >8 HPHT W/L (cc) at 190°F: <3.0 Water phase salinity: >160 g/l Cl- Electrical stability: >800 volts

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					MBT: 15-20 PPB		
III	8-1/2"	3000 - 3740	7" Liner	KCl / NDF/ Sodium Formate / Potassium Formate	SG 1.20-1.30 F/Vis:50-55 pH: 9.0-10 PV:18-21 YP:20-22 GEL:4-5/12-15 W/L(cc): < 5.0 Cake (mm): 1 Solids:12-15 KCl> 15PPB MBT: 15-20	NIL	
IV	Completion	-	-	KCl/ NaCl/ $CaCl_2$ Brine/ $CaBr_2$/ ZincBromide	SG 1.10-1.25	NIL	

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SECTION- D

TENTATIVE MEASURED INTERVALS FOR REPRESENTATIVE WELL IN CENTER REGION FOR REFERENCE ONLY I.E. INTERVALS/FORMATIONS/LITHOLOGY MAY CHANGE ASPER DESIGN REGION.OF ANY SPECIFIC WELL IN THE

(CENTER REGION)

IT INCLUDES FOLLOWING BUT NOT LIMITED TO THESE CONCESSIONS I-E, PIKOH; UCH; LOTI; ZIN; DHODAK; BAHU; MARI AND QADIRPUR ETC

1	*PIRKOH*	*0 - 110*	*Limestone*
2	*SIRKI*	*110-165*	*Shale and Clay/ Claystone*
3	*HABIB RAHI LST.*	*165-410*	*Limestone and Marl*
4	*GHAZIJ SHALE*	*410-910*	*Shale, Marl and Limestone*
5	*SUI MAIN LIMESTONE*	*910-1435*	*Limestone*
6	*DUNGHAN*	*1435-1650*	*Limestone, Shale, Marl and sandstone*
7	*UPPER RANI KOT*	*1650-1745*	*Shale and Limestone*
8	*LOWER RANI KOT*	*1745-1815*	*Sandstone, Shale and Limestone*
9	*PAB SANDSTONE*	*1815-2065*	*Sandstone, Shale and Clay/Claystone*
10	*FORT MUNRO*	*2065-2160*	*Limestone and Shale*
11	*MUGHAL KOT*	*2160-2210*	*Sandstone and Shale*
12	*PARH*	*2210-2450*	*Limestone*
13	*UPPER GORU*	*2450-2940*	*Limestone*
14	*LOWER GORU*	*2940-3145*	*Limestone and Marl*
15	*SEMBAR*	*3145-4100*	*Shale, Sandstone and Siltstone*
16	*CHILTAN*	*4100-4700*	*Limestone*

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(SOUTH REGION)

IT INCLUDES FOLLOWINGBUT NOT LIMITED TO THESE CONCESSIONS I-E, KUNNER; PASAHKI; SINJHORO; TANDO ALLAH YAR; TANDO ALAM; GUDDU; THAL; THORA; LASHARI; BITRISIM; SARA ; KHEWARI; TEGANI AND NIM ETC.

Sr.No.	*Formation*	*MD(m)*	*Lithology*
1	***POST EOCENE***	***0-495***	***Sandstone, Clay/Claystone& Conglomerate***
2	***KIRTHER***	***495-855***	***Limestone, Shale & Marl***
3	***LAKI***	***855-1280***	***Limestone,Marl& Shale***
4	***SML***	***1280-1390***	***Limestone, Marl & Shale***
5	***RANI KOT***	***1390 - 2300***	***Sandstone, Shale, Clay/Claystone and Limestone***
6	***UPPER GORU***	***2300 - 2610***	***Marl and Shale***
7	***LOWER GORU SHALE UNIT***	***2610-3147***	***Shale, Siltstone, Marl &Sandstone***
8	***BASAL SAND***	***3147-3187***	***Sandstone and Shale***
9	***TALHAR SHALE***	***3187-3262***	***Shale***
10	***MASSIVE SAND***	***3262-3722***	***Sandstone and Shale***
11	***SEMBAR***	***3722-3740***	***Shale***

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SECTION- E

*REGION WISE MINIMUM STOCK LEVEL OF **WATER BASE MUD CHEMICALS** TO BE MAINTAINED DURING DRILLING AT RIG/ WELL SITES*

S.NO	DESCRIPTION	UNITS	MINIMUM STOCK LEVELS IN CENTER / SOUTH REGION
1	API Bentonite (Non-Treated)	M.Ton	10.00
2	KLS	M.Ton	05.00
3	CMC(LV)	M.Ton	05.00
4	CMC(HV)	M.Ton	05.00
5	Synergistic Polymer	M.Ton	05.00
6	Spotting Chemical SFT	M.Ton	6.00
7	Shale Stabilizer	M.Ton	5.00
8	Potassium Chloride (KCl)*	M.Ton	20.00
9	Sodium Formate*	M.Ton	20.00
10	Potassium Formate*	M.Ton	20.00
11	Potassium Hydroxide (KOH)	M.Ton	02.00
12	Xanthan Gum (XC Polymer)	M.Ton	05.00
13	H_2S Scavenger ($ZnCO_3$)	M.Ton	02.00
14	API Starch	M.Ton	05.00
15	Poly Glycol*	(55 Gln. Drum)	45.00
16	PAC (Regular)	M.Ton	05.00
17	PAC (SL)	M.Ton	05.00
18	PHPA*	M.Ton	05.00
19	Defoamer for SilicateMud*	200 Litres/Drum	25.00
20	Mud Lubricant	55Gln. Drum	05.00
21	Mud Detergent	55Gln. Drum	05.00

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22	Mud Defoamer	(55 Gln Drum)	05.00
23	Bactericide/ Biocide	(55 Gln Drum)	05.00
24	Corrosion Inhibitor	55 Gln Drum)	50.00
25	Calcium Bromide Powder*	M.Ton	30.00
26	Zinc Bromide Solution*	M^3	100.00
27	Lime Stone Powder ($CaCo_3$)	M.Ton	05.00
28	Caustic Soda Flakes	M.Ton	03.00
29	Soda Ash	M.Ton	04.00
30	Soda Bicarb	M.Ton	60.00
31	Calcium Chloride*	M.Ton	50.00
32	Common Salt*	M.Ton	5.00
33	Mica (Fine)**	M.Ton	5.00
34	Mica (Coarse)**	M.Ton	5.00
35	Non Damaging Acid Soluble LCM**	M.Ton	5.00
36	Non Damaging Cellulosic Fibrous LCM**	M.Ton	10.00
37	Saw Dust**	M.Ton	10.00
38	Cotton Seed Hull**	M.Ton	10.00

* ***Minimum stock level will be dependent on type of mud/brine system being used.***

** ***Minimum stock level of LCMs will be dependent on nature of loss zones (Damaging or non-damaging LCM).***

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SECTION- F

*REGION WISE MINIMUM STOCK LEVEL OF **OIL BASE MUD CHEMICALS** TO BE MAINTAINED DURING DRILLING AT RIG/ WELL SITES*

S.NO.	DESCRIPTION	UNITS	MINIMUM STOCK LEVELS IN CENTER / SOUTH REGION
1	***Primary Emulsifier***	***(55 Gln Drum)***	**75**
2	***Secondary Emulsifier***	***(55 Gln Drum)***	**60**
3	***Oil Mud Gel***	***M.Ton***	**20**
4	***High Temperature Stabilizer / Filtration Control Additive***	***M.Ton***	**08**
5	***Oil Mud Surfactant/Wetting Agent***	***(55 Gln Drum)***	**08**
6	***Calcium Oxide/Hydroxide***	***M.Ton***	**25**
7	***Oil Mud Thinner***	***(55 Gln Drum)***	**10**

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SECTION - G

*MINIMUM STOCK LEVEL OF **LAB EQUIPMENT / REAGENT / GLASS WARE** TO BE MAINTAINED DURING DRILLING FOR EACH RIG/ WELL SITE*

It is to be ensured that Mud Lab at Rig site should have the following Equipment in fully working condition as well as the availability of necessary glass ware & Reagents:

S#	Description	Quantity
1.	VG meter (Rheometer)110 / 220 volts	1
2.	Mud Balance	1
3.	Pressurized Mud Balance	1
4.	Marsh Funnel with Cup	1
5.	API Filter press	1
6.	Garret gas Train complete	1
7.	HPHT Filter press	1
8.	CO_2 Cartridge (01 dozen pack)	5
9.	Stop Watch & Timer	1 each
10.	Retort Kit	1
11.	Sand Testing Kit	1
12.	Centrifuge, Hand Held	1
13.	Digital Weighing Scale for field test 0.5 g to 1 Kg	1
14.	Hot Plate	1
15.	Hamilton Beach Mixer	1
16.	pH Meter	1
17.	pH Paper 1-14 (100 strips pack)	5
18.	MBT Kit (complete)	1
19.	Thermo Cup	1
20.	Electrical voltage transformers 220v-110v & 220v-12v	1 each
21.	Potassium Ion Test Kit	1
22.	Sodium Silicate Test Kit	1
23.	Phenolphthalein Indicator	100 ml
24.	Potassium Chromate Indicator	100 ml
25.	Hardness Buffer Solution	150 ml
26.	Hardness Indicator	100 ml
27.	Methyl Orange or Brom Cresol green	100 ml
28.	Sulphuric Acid (N/50)	1000 ml
29.	Silver Nitrate (0.282 N)	500 ml
30.	Silver Nitrate (0.0282 N)	1000 ml
31.	Standard Versanate Solution (EDTA) (0.01 M)	500 ml
32.	Standard Versanate Solution (EDTA) (0.1 M)	500 ml
33.	Sufficient Glass-ware to conduct required tests.	

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SECTION- H

TECHNICAL SPECIFICATIONS OF MUD CHEMICALS

1. API BENTONITE (NON-TREATED)

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS API - 13A SECTION-5	EXACT VALUE OF THE OFFERED PRODUCT
01.	Yield Point/ Plastic Viscosity Ratio	1.5 Maximum	
02.	Dispersed plastic viscosity	10 CP, Minimum	
03.	Dispersed filtrate volume	12.5 cm^3, Maximum	

2. SODIUM CARBOXY METHYL CELLULOSE LOW VISCOSITY GRADE (CMC-LV)

A)

SR. NO.	PHYSICAL PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Appearance	Light colored hygroscopic free flowing powder	
02.	Moisture content ASTM D 1439	8% Maximum	
3.	Bulk Density (g / L)	650 Minimum	

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B) PERFORMANCE EVALUATION

PERFORMANCE TESTING (AS PER API SECTION 9)			
SR.NO.	**PERFORMANCE TEST**	**REQUIREDSPECIFICATIONS**	**EXACT VALUEOF THE OFFERED PRODUCT**
1.	Viscometer dial reading at 600 RPM	90 Maximum	
2.	Filtrate volume	10 cm^3 Maximum	

3. SODIUM CARBOXY METHYL CELLULOSE HIGH VISCOSITY (CMC-HV)

A)

SR. NO.	PHYSICALPROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Appearance	Light colored hygroscopic free flowing powder	
02.	Moisture content ASTM D 1439	8% Maximum	
03.	Degree of Substitution ASTM D 1439	0.75 Minimum	
04.	pH of 1% Solution in distilled water (25 °C)	7 - 10	
05.	Sieve Limit (%) Retention on 16 mesh ASTM (1.18 mm)	1 Maximum	
06.	Bulk Density (g/l)	550 Minimum	

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B) **PERFORMANCE TESTING**

(AS PER API SECTION 10)

SR. NO.	PERFORMANCE TEST		REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
1.	Viscometer Dial Reading at 600 rpm	In de-ionized Water	30 cps Minimum.	
		40 g/L Salt water	30 cps Minimum.	
	API Spec. 13 A - 10	In Saturated Salt water	30 cps Minimum.	
2.	Fluid Loss		10 cm^3, Maximum	

4. POTASSIUM LIGNOSULPHONATE (KLS)

A)

SR. NO.	PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Physical state	Free flowing powder, free from dirt and any foreign material.	
02.	Solubility	5% solution in water (w/v) should not leave any residue.	
03.	Moisture Content	8% Maximum	
04.	Active sulphonated Lignin content	85% Minimum	
05.	pH of 5% Solution	3-6 Approx.	
06.	Chromium ions content	0.01% Maximum	
07.	Potassium ions content	3 -5% Minimum	
08.	Lignosulphonate group	Positive	

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B) PERFORMANCE EVALUATION:

SR. NO.	PERFORMANCE TESTS	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	**a)** Prepare 800 ml of 10% (w/v) of API treated bentonite suspension in distilled water by stirring for 30 minutes with laboratory stirrer and age for 48 hrs at 90±2°C. Treat this mud with 200ml of 20% (w/v) solution of lab grade Potassium Chloride (KCl) and stir for 30 minutes with laboratory stirrer and then age this suspension for 24hrs at 24±2 °C. Stir the mud for 15 minutes with laboratory stirrer and raise its pH to 9.0-9.5 with 4N KOH solution and adjust its apparent viscosity in the range of 25-30cp by diluting with 4% KCl solution if required and also record yield point. **b)** Treat this mud with 1% (w/v) of the Potassium Lignosulphoate (KLS) and adjust pH in the range 10-10.5 with 4N KOH solution and stir for 10 minutes with Hamilton Beach Mixer at high speed and divide this mud into 02 parts. Record a) Apparent viscosity of 1st portion. b) Yield point of 1st portion.	Apparent viscosity should not exceed 50% of the value obtained for KCl base mud as at 1(a). Yield point should not exceed 25% of the value obtained for KCl base mud as at 1(a).	

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02.	Hot roll the 2nd portion of KLS treated mud as at 1(b) at 160±2°C for 24hrs in a roller oven. Cool the mud to 24±2°C and stir for 10 minutes with a Hamilton Beach Mixer at high speed and record its a) Apparent viscosity b) Yield point.	Apparent viscosity should not exceed 50% of the value obtained for the KCl base mud as at 1(a). Yield point should not exceed 25% of the value obtained for the KCl base mud as at 1(a)	

5. SYNERGISTIC POLYMER
(A High Temperature Mud Conditioner)

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE IN CASE OF THE OFFERED PRODUCT
01.	Appearance	Greyish brown to black, free flowing powder.	
02.	Thermal Stability	204 °C (400 F°) minimum	
03.	Bulk Density	35-50 Lbs/ft³. (560-800 Kg/Cum)	
04.	Solubility in water	90% minimum	
05.	Effectiveness at 230 °C after rolling for 16 hours	6 ppb. should cut down HPHT filtrate loss volume by 50% without remarkable increase in gellation of fresh water base mud.	
06.	Effectiveness at 160°C after rolling for 16 hours.	7 ppb should cut down HPHT filtrate loss volume by 50% without remarkable increase in gelation of salt water base mud.	

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6. SPOTTING CHEMICAL (BLACK MAGIC SFT OR ITS EXACT EQUIVALENT)

A)

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE IN CASE OF THE OFFERED PRODUCT
1.	Appearance	Free flowing powder	
2.	Density	1.04 – 1.20 gm/cc	

B) PERFORMANCE EVALUATION:

SR. NO.	PERFORMANCE TESTS	REQUIREDSPECIFICATIONS	EXACT VALUEOF THEOFFERED PRODUCT
01.	**Lubricity Coefficient Test:** Prepare a Bentonite suspension having Apparent Viscosity 10cp, (prepared by dilution of API Bentonite, pre-hydrated for 72 hrs with Distilled water), treat the suspension with 1% (w/v) of the additive. Determine the lubricity coefficient of the treated suspension on a lubricity tester.	It should not be more than 0.25.	
02.	**Filter Cake Cracking Test:** Prepare a Bentonite suspension having Apparent Viscosity 15 cp by diluting pre-hydrating Bentonite (at 90±2°C for 72 hrs.) with distilled water. Obtain a Filter Cake of this mud in the API Filter Press by carrying out filtration for 30 minutes at 100 psi pressure using Whatman Filter paper No. 01. Throw the mud away, wash the mud cake with slow stream of water without removing the mud cake from the cell and fill the cell with 100 ml of HSD oil containing 2.5% w/v spotting fluid. Close the cell and apply 100 psi pressure for 2 hrs. Release pressure, throw out the HSD solution and observe cracking pattern on the mud	It should develop	

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	cake.	extensive cracks.	
03.	**Mud Cake Cracking Test:** Prepare a Bentonite suspension having Apparent Viscosity 15 cp by diluting pre-hydrating Bentonite (at 90±2°C for 72 hrs.) with distilled water and load it to S.G 1.20 with Baryte. Obtain a Filter Cake of this mud in the API Filter loss apparatus by carrying out filtration for 30 minutes at 100 psi pressure (use Whatman Filter paper No. 01).Throw the mud away, wash the mud cake with slow stream of water without removing the mud cake from the cell and fill the cell with 100 ml of HSD oil containing 2.5% w/v spotting fluid. Apply 100 psi pressure, after closing the cell and determine the time required for collection of 100 ml filtrate.	The time required should not be more than 50 minutes.	

7. SHALE STABILIZER (SODIUM ASPHALT SULFONATE)

A)

SR.NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE IN CASE OF THE OFFERED PRODUCT
1.	Appearance	Black powder free from dirt and any foreign material	
2.	Density (g/ Cm^3)	1.25 – 1.50	
3.	Solubility (i) In Distilled water (ii) In Dimethyl Sulphoxide	 65 % (Minimum) 30 % (Minimum)	
4.	pH of 2% (w/v) solution in distilled water at 24±2°C	8.5 (Minimum)	
5.	Moisture Content, percent by mass	10.0 (Maximum)	

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B) PERFORMANCE EVALUATION:

SR. NO.	PERFORMANCE TESTS	REQUIREDSPECIFICATIONS	EXACT VALUEOF THEOFFERED PRODUCT
01	**Lubricity Test:** Prepare a Bentonite suspension having Apparent Viscosity 15 cp, (prepared by dilution of API Bentonite, pre-hydrated @ 90±2 °C for 72 hrs) Treat the suspension with 2% (w/v) sample by stirring in Hamilton Beach Mixer at medium speed for 15 minutes. Determine the lubricity coefficient of the treated suspension on a lubricity tester.	It should not be more than 0.30.	
02.	**Bentonite Inhibition Test:** (a) Prepare a Bentonite suspension (blank) by stirring 7.5% (w/v) API Bentonite with distilled water in Hamilton Beach Mixer at high speed for 15 minutes. Determine its Apparent Viscosity and Yield point. (b) Add 3% (w/v) sulphonated Asphalt sample to distilled water and stir at high speed in Hamilton Beach Mixer for 10 minutes. To this add 7.5% (w/v) API Bentonite and stir again in Hamilton Beach Mixer at high speed for 15 minutes. Determine its Apparent Viscosity and Yield point.	Apparent Viscosity Should not be more than 35% of the value obtained for blank in 2(a) above. Yield point should not be more than 15% of the value obtained for blank in 2(a) above.	

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8. *POTASSIUM CHLORIDE (KCl)*

SR. NO.	PHYSICAL PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Physical state	White crystalline / granular powder free from visible impurities	
02.	Purity as KCl(on dry basis) % by mass	96 % Minimum	
03.	Moisture Content % by mass	2% Maximum	
04.	Matter insoluble in water % by mass	0.5% Maximum	
05.	Calcium Content as Ca^{2+}	2000 ppm Maximum	

9. SODIUM FORMATE (HCOONa)

SR.NO.	PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
1.	Appearance	White crystalline powder	
2.	% Sodium Formate (HCOONa)	96% Minimum	
3.	% Sodium Chloride (NaCl)	0.2 % Maximum	
4.	% Sodium Carbonate (Na_2CO_3)	0.5% Maximum	
5.	% Sodium Hydroxide (NaOH)	1% Maximum	
6.	% of water (H_2O)	0.5% Maximum	
7.	% of iron (Fe)	5 ppm Maximum	
8.	Water insoluble content (%)	0.3% Maximum	

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10. POTASSIUM FORMATE (HCOOK)

SR. NO.	PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Appearance	White crystalline small flakes	
2.	% Potassium Formate (HCOOK) (on dry basis)	96% Minimum	
3.	% Potassium Chloride (KCl)	1 % Maximum	
4.	% Potassium Carbonate (K_2CO_3)	2% Maximum	
5.	% Potassium Hydroxide (KOH)	1% Maximum	
6.	% of water (H_2O)	1 % Maximum	
7.	Water insoluble content (%)	0.3% Maximum	

11. POTASSIUM HYDROXIDE (KOH) FLAKES

SR. NO.	PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Physical state	The material should be in the form of flakes, free from dirt and foreign mater.	
02.	Purity as KOH, percent by mass.	90% Minimum	
03.	Carbonate (as K_2CO_3), percent by mass.	1.0 Maximum	
04.	Sodium (as Na), percent by mass.	1.0 Maximum	
05.	Nitrate compounds, percent by mass.	0.01 Maximum	
06.	Chloride (as KCl), percent by mass.	0.25 Maximum	

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12. XANTHAN GUM-XC POLYMER

SR.NO.	PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THEOFFERED PRODUCT
01.	PhysicalState	The material should be a free flowing powder, free from lumps, dirt and foreign matter.	
02.	Moisture content,percent by mass.	13 % (Maximum)	
03.	Starch, Guar or their derivative	Absent	
04.	Mesh size	95 % (Min) less than 40 mesh	
05.	Toxicity	Non Toxic	
06.	Bio-Degradability	Bio-Degradable	

PERFORMANCE TESTS:

SR.NO.	TESTS	REQUIREDSPECIFICATIONS	EXACT VALUEOF THEOFFERED PRODUCT
01.	Prepare 0.5% (w/v) solution of the sample in distilled water, containing 4% (w/v) of LR grade sodium chloride, by stirring in Hamilton Beach Mixer, at a medium speed for 20 minutes. Adjust the pH in the range of 8-9 by addition of 1N-NaOH solution while stirring. Determine the rheological properties of the suspension at 25^0C. a) Apparent Viscosity, cp b) Gel (0 minute), lbs / 100 ft^2	 16-25 5.0 (Minimum)	
	Prepare 0.5% (w/v) solution of the sample in distilled water, by stirring in Hamilton Beach Mixer at medium		

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02.	speed for 20 minutes. Adjust the pH 8-9 with 1N-NaOH solution. Add to it equal volume of 6% (w/v) pre-hydrated API Non-treated bentonite suspension and stir further for 20 minutes. Determine its rheological properties and API filtration loss. Transfer this mud to aging cell and hot roll for 18 hrs at 100±5^{0}C. Cool to 25^{0}C and determine rheological parameters and API filtration loss at 25^{0}C. Change in parameters before and after hot rolling should be as under; a) Apparent Viscosity, cp b) Yield point, lb/100ft^{2}C) API Filtration loss, ml	Shall not decrease.Shall not decrease.Shall not increase.	
03.	To 500ml of distilled water, add 5ml of 3% (w/v) solution of Calcium Chloride (fused or LR grade) and to this solution add 0.5% (w/v) of the sample, while stirring in Hamilton Beach Mixer at medium speed for 20 minutes. Add to it 0.2% (w/v) Chrome Alum Powder (LR grade) and stir further for 10 minutes. Adjust pH 8-9 over a period of 20 minutes by slowly adding 1N-NaOH solution, while stirring at medium speed. Determine the rheological parameters of this suspension at 24±2^{0}C. They should be as under: a) Apparent Viscosity, cp b) Yield point, lb/100ft^{2}c) Gel (0 minute), lbs /100 ft^2 d) Gel (10 minutes), lbs /100 ft^2	30 (Minimum)30 (Minimum)15 (Minimum)30 (minimum)	

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13. HYDROGEN SULPHIDE SCAVENGER (ZINC CARBONATE)

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Physical State	White crystalline powder, free from dirt and any foreign material	
02.	Density (g / cm^3)	3.5	
03.	Zinc content(weight percent)	55% Minimum	
04.	Loss on ignition (weight percent)	25-30% Maximum	
05.	Moisture	2.5% Maximum	
06.	Heavy metal (as Pb)	0.05% Maximum	
07.	Sulphate (SO_4)	0.80% Maximum	
08.	Particle size	Min 95% should pass through 200 Mesh	
09.	Reactivity	1.0 PPB scavenges 500 PPM Hydrogen Sulphide Minimum	

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14. API STARCH

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONSAPI-13A SECTION-11	EXACT VALUE OF THE OFFERED PRODUCT
01.	**Viscometer Dial** Reading at 600 rpm in 40 g/L Salt Water in Saturated Salt Water	 18, maximum 20, maximum	
02.	**Filtrate Volume** In 40 g/L Salt Water In Saturated Salt Water	 10 cm^3, maximum 10 cm^3, maximum	
03.	Residue Greater than 2000 micrometers	No residue	

15. POLY GLYCOL

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Chemical Name	Poly Glycol	
2.	Appearance	Pale Yellow to opaque, brown liquid	
3.	Specific Gravity	1.0-1.015	
4.	Solubility in water	Miscible in fresh water to a salinity of min 90,000 mg/ Ltr. Cl^-.	
5.	Cloud Point	>150°F (66°c) @ 3% in 10% NaCl solution in water.	
6.	Flash Point	>230°F (110°C) (PMCC)	

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16. POLYANIONIC CELLULOSE - REGULAR GRADE (PAC-R)

A)

SR. NO	DESCRIPTION	REQUIREDSPECIFICATION AS PER API 13A-SECTION-18	PROPERTIES OF THE QUOTED PRODUCT
01.	Appearance	Off white powder	
02.	Degree of substitution ASTM-D1439	0.9 Min	
03.	Moisture content ASTM-D1439	10% Maximum.	
04.	Presence of starch or starch derivatives	Absent	
05.	Apparent Viscosity	50 cP Maximum	
06.	API Filtrate Volume	23 ml Maximum	

17. POLY ANIONIC CELLULOSE (LOW VISCOSITY GRADE)

A:

SR.NO.	DESCRIPTION	REQUIREDSPECIFICATION	PROPERTIES OF THE QUOTED PRODUCT
01.	Appearance	Off white, free flowing powder.	
02.	%age of PAC as (Na-CMC)	75 % (Minimum)	
03.	Degree of substitution	1.0 (Minimum)	
04.	Presence of starch or starch derivatives	Absent	

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05.	pH of 1% solution (at 25 °C)	7 – 9 Approx.	
06.	Moisture content	10% Maximum.	
07.	Bulk Density, (g/L)	600-800	

B) PERFORMANCE TESTS:

SR. NO.	PERFORMANCE TESTS	REQUIREDSPECIFICATIONS	EXACT VALUEOF THEOFFERED PRODUCT
01.	Apparent viscosity (cp) of 1% (w/v) suspension of product at 24±2 °C, prepared by stirring for 15minutes in Hamilton Beach Mixer at high speed in; I. Distilled Water II. 4% salt water prepared by dissolving 4gm LR grade NaCl in 100ml of distilled water.	20 CP (Maximum)16 CP (Maximum)	
02.	Yield of 15cp (apparent viscosity) suspension, prepared by stirring for 15minutes in Hamilton Beach Mixer at high speed in; I. Distilled water II. 4% salt solution as prepared at 1(II).	90Cum/M.Ton (Min) 70 Cum/M.Ton (Min)	
03. (a) (b)	**Performance in fresh water mud:** Preparation of Base Mud Prepare 10% Bentonite (w/v) suspension using API grade Bentonite in distilled water, age for 24 hrs at 90°C, dilute with distilled water, stir for 15 minutes in Hamilton Beach Mixer at high speed, treat with 10% NaOH solution to adjust pH 9.0-9.5. & Apparent viscosity 15-20 CP at 25°C. Also determine Yield Point & Water Loss. Treat Base Mud at 3(a) with 0.5% (w/v) of PAC-LV. Stir for 15 minutes in Hamilton Beach Mixer at high speed. Divide into two parts.		

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	Performance at 25°C . i- Apparent Viscosity ii- Yield Point iii- API Water Loss Performance at 120°C . Age second portion of the mud at 3(b) in hot rolled condition at 120°C for 24 hours. After aging, cool it down to 25°C , stir for 6 minutes in Hamilton Beach Mixer at high speed & determine i- Apparent Viscosity ii- Yield Point iii- API Water Loss	2.5 times of 3(a) (Max)1.5 times of 3(a) (max)50 % of 3(a) Max) 2.5 times of 3(a) (Max)1.5 times of 3(a) (max)50 % of 3(a) Max)	
04 (a) (b)	**Performance test in salt water mud:** Preparation of Base Mud Prepare 10% Bentonite (w/v) suspension using API grade Bentonite in distilled water, age for 24 hrs at 90°C, To this suspension, add 4% (w/v) Sodium Chloride (NaCl) at room temperature (by dissolving 20 gram of NaCl salt in 500 ml distilled water), treat with 10% NaOH solution to adjust pH 9.0-9.5. Dilute with 4% (w/v) salt water to attain Apparent viscosity 15-20 CP at 25°C. Also determine Yield Point & Water Loss. Treat Base Mud at 4(a) with 0.5% (w/v) of PAC-LV. Stir for 15 minutes in Hamilton Beach Mixer at high speed. Performance at 25°C . i- Apparent Viscosity ii- Yield Point iii- API Water Loss	2 times of 4(a) (Max)1.5 times of 4(a) (max)25 % of 4(a) Max)	

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18. PARTIALLY HYDROLYZED POLYACRYLAMIDE (PHPA)

A

Sr.No.	PHYSICAL PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Appearance	White free flowing powder or dust free micro-beads	
02.	pH(1% solution)	7.0 - 8.5 Approx.	
03.	Moisture Content	10 % (Maximum)	

B) PERFORMANCE TESTS:

SR.NO.	PERFORMANCE TESTS	REQUIREDSPECIFICATIONS	EXACT VALUEOF THEOFFERED PRODUCT
01.	Apparent viscosity (cp) of 0.2% (w/v) polymer solution in Distilled water I. At 25±1 °C II. After aging at 110°C. For 16 hours	09 CP(Minimum)Decrease in Apparent Viscosity 20% (Maximum) of 01(I)	
02.	Apparent viscosity (cp) of 4CP Bentonite (Pre- Hydrated) suspension at 0.2% (w/v) polymer concentration with pH 9.0 I. At 25±1 °C. II. After aging at 110°C. For 24 hours	15 CP (Minimum)Decrease in Apparent Viscosity 20% (Maximum) of 02(I))	
03.	Calcium Tolerance Apparent viscosity of 0.4 % (w/v) Polymer Concentration I. In Distilled water. II. In 100 ppm Ca++ solution made from distilled water.	To be Determined. It should be**60%** (minimum) of 03(I)	

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19. SILICATE DEFOAMER

A:

SR. NO.	PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	APPEARANC	Silicone type de-foamer and anti-foamer in a medium chain alcohol base carrier	
02.	Specific Gravity @ 70 °F	0.98 – 1.02	
03.	H2O %	0.25 % Maximum	
04.	Flash point (PMCC) °F	>212 °F	
05	pH	6.5 – 7.5	
06.	Dispersability	Should be soluble or dispersible in oil and water	

B:PERFORMANCE EVALUATION:

SR.NO.	PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Foam Reducing Index: Base Fluid: Deionized water: 1400 ml Sodium chloride (99% pure): 560 gm Hydroxyl ethyl cellulose (HEC pure high viscosity grade): 8 gm ***Procedure:*** Measure the deionized water into a big jar. Add the NaCl while stirring on a high speed mixer. Stirrer ten (10) minutes at a minimum of 7500 rmp. Slowly shift in the HEC and stir for an additional thirty (30) minutes. 1. Transfer the 350 ml of the base fluid into a waring blender jar. Seat the cover securely. Place the jar on the blender. 2. Stir exactly 30 seconds at the highest speed.		

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	3. Immediately pour the foam into a 1000 ml graduated cylinder and start the timer 4. Record the highest point of the foam after 5 minutes. Subtract 350 ml from the reading to determine the amount of foam of the base (Fb). 5. Rinse out and dry the waring blender jar and the graduated cylinder. 6. Pour 350 ml of the base fluid into the blender jar. Add 8 drops of defoamer. Seat the cover securely and place the jar on the blender. 7. Repeat steps 2-5 again subtracting 350 ml from the reading to determine the amount of foam for the sample (Fs). 8. Determine the foam reducing index (FRI) as follow: **FRI** = $\frac{(Fb - Fs)}{Fb} \times 100$ *Where:* FRI = Foam reducing index Fb = Amount of foam remaining in the base Fs = Amount of foam remaining in the sample	50 % Minimum	

20. EXTREME PRESSURE MUD LUBRICANT

A:

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
	Appearance	Dark viscous liquid at ambient temperature , free from suspended impurities	
	Specific Gravity	0.90 – 0.97 (SG)	
	Flash Point	>99 °C	

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B) PERFORMANCE TEST

SR. NO.	PERFORMANCE TEST	REQUIRED SPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
	LUBRICITY TEST		
01.	***a). In Fresh Water Mud.*** Prepare 7.5% (W/V) Bentonite suspension in distilled water, by stirring with a Lab Stirrer (5000-6000 rpm) for 30 Min. and ageing at 90° C for 48 Hrs. and re-stirring the same for 15 minutes. Add appropriate quantity of distilled water to adjust apparent viscosity in the range of 15-16 CP. Add 0.5% (w/v) of the product, stir with Hamilton Beach Mixer for 15 Minutes at high speed. Measure Lubricity Coefficient by Lubricity Tester	0.15 (Maximum)	
	b). In Salt Water Mud. Prepare 8-10%(W/V) Bentonite suspension in distilled water, by stirring with a Lab Stirrer (5000-6000 rpm) for 30 Min. and ageing at 90° C for 48 Hrs, add 4% (w/v) Sodium Chloride (LR grade) and age for 24 Hrs. at 25° . Adjust the apparent viscosity of this suspension to 15-16 CP by dilution with 4% Sodium Chloride Solution. Then add 0.5% (w/v) of the product, stir with Hamilton Beach Mixer for 15 Minutes at high speed. Measure Lubricity Coefficientby Lubricity Tester.	0.20 (Maximum)	
	EXTREME PRESSURE - LUBRICATION TEST		

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02.	***(a). In Fresh Water Mud.*** Prepare Bentonite suspension as mentioned at Sr. No.01(a) and filter through 200 mesh and similarly treat with 0.5% (w/v) of the product, stir with Hamilton Beach Mixer for 15 Minutes at high speed. Determine its Film strength at 300 in-lb load and 1000 rpm with E.P Lubricity tester. ***b). In Salt Water Mud.*** Prepare salt water Bentonite suspension as mentioned at Sr. No. 01(b) and similarly treat with 0.5% (w/v) of the product, stir with Hamilton Beach Mixer for 15 Minutes at high speed. Determine its Film strength at 300 in-lb load and 1000 rpm with E.P Lubricity tester.	20,000 psi (Minimum) 20,000 psi (Minimum)	
03.	**FOAM TEST** Prepare fresh water Bentonite suspension at Sr. No. 1(a) and add 0.5% (w/v) of the product. Stir for 15 Minutes at high speed in Hamilton Beach Mixer and determine SG of Mud after waiting of 01 minute.	> 0.80	

21. MUD DETERGENT

A)

SR. NO	PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Appearance	Clear Viscous liquid	
02.	General Chemical Composition	Please specify in the next column	
03.	Specific Gravity at 25 ^{0}C	1.00 – 1.10	
04.	pH of 1% (v/v) solution of the product in distilled water.	7.0-9.0	

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05.	Solubility i) Water Soluble ii) Brine Soluble	YesYes	
06.	Freezing Point	1 °C (30 °F) or less	
07.	Flash point	Greater than 210 °F(99 °C)	
08.	Dosage Range	Please specify in the next column	

B) PERFORMANCE TESTS:

SR. NO	LAB TESTS	REQUIRED SPECIFICATIONS	EXACT VALUEOF THE OFFERED PRODUCT
01.	Surface tension of 0.25% (v/v) solution of the product in distilled water at 25°C, dynes/cm	35.0 (Max)	
02.	***Emulsion Stability Test:*** Take 485ml of distilled water, add 15ml High Speed Diesel Oil (HSD) slowly while stirring with HamlitionBeach Mixer at medium speed. Add 01ml of the product while stirring, continue stirring for 05minutes. Transfer the contents to 500ml measuring cylinder to observed phase separation, a) Immediate separation of HSDoil b) Separation of HSD oil after 24hrs at room temperature.	Nil 02ml (Max)	

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03.	***Mud Lubricity Coefficient:*** Prepare 10cp Bentonite suspension in distilled water, add 0.5% (v/v) of product and stir for 05minutes in Hamilton Beach Mixer at medium speed. De-foam it with 04-05 drops of defoamer (if necessary). Determine Lubricity coefficient with lubricity ester.	0.20 (Max)	
04.	***Foaming Tendency Test:*** Prepare 0.1% (v/v) solution of the product in distilled water, stir for 10minutes in Hamilton Beach Mixer at high speed. Immediate transfer the contents along with foam to measuring cylinder. Allow to stand for 15minutes and then measure the total volume of the contents along with foam.%increase in volume should be.	05% (Max)	

22. MUD DEFOAMER

A)

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Physical State	Liquid	
2.	Specific Gravity	0.85 – 1.04 S.G.	
3.	Chemical nature	Blend of high molecular alcohols & light petroleum distillate	
4.	pH (1 % aqueous solution)	7.5 – 8.5	

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5.	Kerosene Oil	> 50 % Minimum	
6.	Flash Point	> 50 ^{0}C Minimum	
7.	Freezing Point	Less than 0 ^{0}C	
8.	Dosage range in case of severe foaming problem in KCL-PHPA polymer mud system	Please mention in % v/v in next column	

b) PERFORMANCE TEST

SR. NO.	PERFORMANCE TEST	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Prepare 7% Bentonite suspension in distilled water and age for 24 hrs at 90^{0}C. Stir the sample in Hamilton Beach Mixer at low speed for 15 minutes and increase up to 1.30 SG with API Barite. Add 3% (w/v) Gypsum followed by 3% (w/v) KLS. Adjust pH between 9-9.5 by adding 5N caustic soda solution. Stir for 30 minutes with a Hamilton Beach Mixer at high speed. The S.G of stirred mud should fall below 1.05 by adding appropriate quantity of KLS. Treat with 500 ppm of product. Stir for 30sec and determine SG of mud.	1.28 Minimum	

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23. CORROSION INHIBITOR (FILMING AMINE TYPE)

A)

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Appearance	Clear brown to yellow color liquid	
02.	Chemical nature	Filming amine type Combination of Imidazoline&Ethoxylated Fatty Amines	
03.	Amine content	15% Minimum of tertiary amine	
04.	Surfactant in formulation	The product should also contain Non-Ionic Surfactant	
05.	Odor	Aromatic	
06.	Specific Gravity	1.01 – 1.03 at 20°C	
07.	pH range	7.0 – 9.0	
08.	Pour point	Less than -5°C	
09.	Flash point	Greater than 75°C	
10.	Solubility	100% soluble in water	

24. CALCIUM BROMIDE POWDER

SR.NO	DESCRIPTION	REQUIREDSPECIFICATION	PROPERTIES OF THE QUOTED PRODUCT
1.	Physical State	White free flowing crystalline Powder	
2.	Purity as $CaBr_2$	95% (Minimum)	
3.	Chloride content as Cl^-	3.0 % (Maximum)	
4.	Water insoluble content	0.03% (Maximum)	
5.	pH (5% solution at 25 °C)	6.0 – 8.0	
6.	Density	3.30 Kg/L (Minimum)	

25. CALCIUM BROMIDE SOLUTION

SR.NO	DESCRIPTION	REQUIREDSPECIFICATION	PROPERTIES OF THE QUOTED PRODUCT
1.	Physical State	Clear Brine	
2.	Purity as $CaBr_2$	52% (Minimum)	
3.	pH (5% solution at 25 °C)	6.0 – 8.0	
4.	Density	14.2 lb/US gallon (Minimum)	

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26. ZINC BROMIDE SOLUTION

(72% ZnBr2, HAVING S.G 2.30)

SR.NO	DESCRIPTION	REQUIREDSPECIFICATION	PROPERTIES OF THE QUOTED PRODUCT
1.	Physical State	Clear brine	
2.	% of $ZnBr_2$ (by weight)	72 % Minimum	
3.	Chloride content	0.2 % Max	
4.	Sulphate Content	0.05 % Max	
5.	Heavy metal as lead	5 ppm Max	
6.	Iron	10 ppm Max	
7.	Specific Gravity	2.3 min	
8.	pH	4 - 5	
9.	Water insoluble	None	

27. LIME STONE POWDER

A:

SR. NO	DESCRIPTION	REQUIRED SPECIFICATION	PROPERTIES OF THE QUOTED PRODUCT
1.	Physical State	Free from dirt & foreign material	
2.	Specific Gravity (S.G)	2.65 (Minimum)	
3.	% Purity as CaCO3	95% Minimum	
4.	Solubility in 15% HCL	95% Minimum	
5.	Water soluble contents	Less than 200 PPM	
6.	Retention on 200 US Mesh Sieve	Less than 05% by weight	
7.	Shelf life	Minimum 03 Years	

B: PACKAGING:

Should be packed in one (01) M.Ton jumbo bag, export quality having thick inner liner for rendering the material completely moisture proof.

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28. CAUSTIC SODA FLAKES

A:

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Appearance	White deliquescent flakes	
02.	Concentration as NaOH %	97% Minimum	
03.	Sodium chloride %	0.04 % Maximum	
04.	Sodium Carbonate %	01 % Maximum	

B: PACKAGING:

Should be packed as 25 Kg net per bag in export quality HDPE bags having thick inner liner for rendering the material completely moisture proof.

29. SODA ASH

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Percentage purity (Total Alkalinity as Na_2CO_3)	97% Minimum	
02.	Chloride as NaCL (percent by mass)	0.85 % Maximum	
03.	Iron as Fe_2O_3 (percent by mass)	0.007% Maximum	
04.	Matter insoluble in water (percent by mass)	0.15% Maximum	
05.	Sulphates as Na_2SO_4 (percent by mass)	0.08% Maximum	
06.	Bulk Density (gms/ Liter)	450-600 gms/ Liter	

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30. SODA BICARB

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Appearance	Fine White Powder	
02.	Percentage purity (total alkalinity as $NaHCO_3$)	98 % Minimum	
03.	Loss on Drying (% by weight)	0.20 % Maximum	
04.	Insoluble substances	Clear solution on dissolving 1 gm in 20 ml water)	

31. ANHYDROUS CALCIUM CHLORIDE

A:

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Physical appearance	White prills/ flakes, free from impurities	
02.	Purity as anhydrous Calcium chloride ($CaCL_2$)	94% Minimum	
03.	Specific Gravity	2.15 Minimum	
04.	Alkalinity as $Ca(OH)_2$ (Percent by mass)	0.5% Maximum	
05.	Concentration of soluble salts as MgCL2, NaCL. KCL etc.	4.0 % Maximum	
06.	Matter insoluble in water (Percent by mass)	0.5 % Maximum	
07.	Density of CaCL2 saturated brine	11.6 ppg (1.40 S.G)	

B: PACKAGING:

Should be packed in one (01) M.Ton jumbo bag, export quality having thick inner liner for rendering the material completely moisture proof.

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32. COMMON SALT

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
01.	Appearance	White powder	
02.	Purity as NaCl % (on bone dry basis)	95% Minimum	
03.	Moisture content %	5 % Maximum	
04.	Matter insoluble in water	Not more than 01%	
05.	Sieve analysis Retention on US Mesh No.16 screen	Not more than 5% Moreover no particle size must be greater than 10 mesh	

33. NON DAMAGING CELLULOSIC FIBROUS LCM

(FINE)

SR. NO.	PHYSICAL PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Particle size	(i) 80-90% should pass thru 100 mesh screen. (ii) No particle size must be greater than 4 mesh in any case out of retention on 100 mesh screen.	
2.	Specific Gravity	0.4 to 0.5	
3.	Thermal Stability	220 ^{o}C (Minimum)	

COARSE:

SR. NO.	PHYSICAL PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUE OFTHE OFFERED PRODUCT
1.	Particle size	(i) Retention on 80 mesh should not be less than 80%. (ii) Retention on 10 mesh should not be more than 10%.	

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		(iii) No particle size must be greater than 3 mesh in any case out of retention on 10 mesh screen.	
2.	Specific Gravity	0.4 to 0.5	
3.	Thermal Stability	220^0 C (Minimum)	

PACKAGING:

- 12.5kg/bag of the product
- Should be packed in good quality multi-wall paper (at least 03 plies). The bags should also have inner polythene layer to render the material moisture proof.
- Palletized, shrink wrapped and strapped.

34. SAW DUST

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Physical appearance	Dry, free from any foreign material and wooden chips	
2.	Sieve analysis Retention on US Mesh No 10 screen	Not more than 05% . However no particle size must be greater than 04 mesh in any case out of 05% accumulation.	

PACKAGING:

200 kg net per bag in brand new jumbo bags.

35. COTTON SEED HULL

SR. NO.	PHYSICAL PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Physical appearance	Solid, dry, free from dirt, foreign material & Linter	

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PACKAGING:

- 200 kg net per bag in brand new jumbo bags

36. MICA (FINE)

SR. NO.	PHYSICAL PROPERTIES	REQUIREDSPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Physical appearance	Dry, free from any foreign material, Silver to grey powder	
	Sieve analysis		
2.	Retention on 10 Mesh screen	10% Maximum No particle size must be greater than 4 mesh in any case out of 10% accumulation.	
3.	Retention on 100 Mesh screen	90% Minimum	

PACKAGING:

- Packed in 25 Kg export quality polypropylene bags with inner lining of polyethylene to render the material completely moisture proof.
- The material should be palatalized as 750 kg, wrapped & tightly strapped.

37. MICA (COARSE)

A:

SR. NO.	PHYSICAL PROPERTIES	REQUIRED SPECIFICATIONS	EXACT VALUE OF THE OFFERED PRODUCT
1.	Physical appearance	Dry, free from any foreign material, Silver to Grey Flakes	
	Sieve analysis		
2.	Retention on 04 Mesh screen	5% Maximum No particle size must be greater than 3 mesh in any case out of 5% accumulation.	

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3.	Retention on 10 Mesh screen	90% Minimum	

B PACKAGING:

- Packed in 25 Kg export quality polypropylene bags with inner lining of polyethylene to render the material completely moisture proof.
- The material should be palatalized as 750 kg, wrapped & tightly strapped.

Item No.	Name of the Chemicals/ Additives	Specifications
38	**Biocide**	Biocide liquid, API and OCMA grade, packed in 05 gallon can.
39	**Non Damaging Acid Soluble LCM**	Blend of HEC and graded calcium carbonate suitable for preparing hi-vis pills to control fluid loss in producing formations, packed in 25kg, 3 ply export bags with inner polyethylene lining.

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40- 44. OIL BASE MUD PACKAGE

DETAILS OF PACKAGE

The package will consist of the following chemicals/additives.

40. Primary emulsifier for oil base mud
41. Secondary emulsifier for oil base mud
42. Viscosifier / Oil base mud gel
43. Fluid Loss Control Agent / high temperature stabilizer for oil base mud
44. Wetting agent for oil base mud

PERFORMANCE TEST

The supplier will mention the exact quantities of the above said chemicals / additives of the package, Barite and HSD oil along with detail mixing procedure to formulate 1 liter of oil base mud (oil water ratio 90:10, containing 28 grams of 94 % pure anhydrous calcium chloride $CaCl_2$) in 100 ml distilled water (having the following properties at 49(±) 3°C.

1. Specific Gravity = 2.0
2. Yield Point = 30 lbs/100 sq.ft (Maximum)
3. HT-HP Fluid Loss at 175° C and 500 Psi differential pressure=10 ml (Max)
4. Break Down Voltage = 1200 volts (Minimum)

The oil base mud having above mentioned properties, when hot rolled in a roller oven for 16 hrs at 170°C, cooled to 49 (±) 3° C and stirred for 20 minutes in Hamilton Beach Mixer at high speed, should have not more than 10 % variation in the values of above mentioned properties.

SR. NO	PROPERTIES	BEFORE HOT ROLLING	AFTER HOT ROLLING AT 170°C
1.	Specific Gravity (S.G)		
2.	Yield Point (lbs/100 sq.ft)		
3.	HT-HP Fluid Loss (ml)		
4.	Break Down Voltage (volts)		
Note: - Details of Mixing Procedure to be provided by each Bidder is mandatory.			

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EVALUATION CRITERIA

STEPS TO BE FOLLOWED FOR EVALUATION

Evaluation of the bids will be based on following:

i) Submission of bids in compliance with general tendering instructions

ii) Conformity of Technical bids with Technical requirement and TOR.

iii) Technical evaluation as per the criteria of Qualifying marking system.

iv) Opening of Commercial / Financial bids of technically qualified bidders only.

v) Commercial / Financial evaluation of technically qualified contractors as per Financial Bid Format.

vi) Technically qualified and commercially lowest bidder meeting respective criteria will be selected, subject to the acceptance of all OGDCL terms and conditions of the contract.

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TECHNICAL EVALUATION CRITERIA

S. No	Tender Requirement	Minimum Acceptable Requirement	Minimum Qualifying Marks	Maximum Marks
1.	Compliance of allmudchemicals technical specifications at Section-H and API / OCMA etc. according to nature of the chemical.	Fully conforming to technical specifications of all the mud chemicals as per Section-H, API/OCMA and prevailing industry practices as per nature of mud chemical.	05	05
2.	Total number of Mud Engineers who are on the pay roll of the company. 10 marks will be given in case of 10 mud engineers fulfilling the required qualification and experience criteria.	Min 10 Mud Engineers at least Science Graduate /Chemical Engineer with 08 years field experience in Mud Technology OR Inter/high school with min 30 years field experience as Mud Engineer. For additional 01 mark will be given in case of more than 10 mud engineers fulfilling required criteria.	10	11
3.	Evaluation of submitted samples i.e. compliance of submitted/offered mud chemicals with technical specifications at Section-H and API / OCMA etc. according to nature of the chemical.	Fully conforming to technical specifications as per Section-H of all 12 Nos. samples of Mud Chemicals submitted at the time of tender opening. For additional chemicals further 02 Marks will be given.	10	12
4.	Product Data Memorandums (PDMs) of mud chemicals as per API,prevailing industry practices or attached technical specifications Section-H.	At least for 35 WBM chemicals as per Section-H along with 05 Nos. of OBM Chemicals. For additional set of three (03) chemical's 01 Marks will be given (max up to 55 mud chemicals.)	10	15
5.	Material Safety Data Sheets (MSDS) of mud chemicals.	At least for 35 WBM chemicals along with 05 Nos. of OBM Chemicals. For additional set of three (03) chemical's 01 Marks will be given (max up to 55 mud chemicals.)	10	15
6.	QA/QC certificates/ third party laboratory report of all WBM mud chemicals along with 05 No. OBM Chemicals from an internationally reputable laboratory.	Lab evaluation reports as per as per API,prevailingindustry practices or attachedtechnical specifications at Section-H from a lab of international repute for at least 35 WBM chemicals and 5 OBM chemicals. For additional set of three (03)	10	15

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		chemical's 01 Marks will be given (max up to 55 mud chemicals.)		
7.	(a). Status of contractors established office set up, Chemicals Ware house and Mud testing lab in Pakistan.(Max 07 Marks) (b).In case, the bidder has no permanent base and lab facilities in Pakistan,completeplan / modus-operandi as well as firm time schedule of establishing / commissioning the same in Pakistan.(Max 05 Marks)	(a). Detailed addresses/phones/ fax/ e-mail of each to be provided. (b). Detail plan and firm time schedule which should not be greater than 45 days after issuance of LOI.	05	07
8.	Previous track record for supply of mud chemicals for the last 05 years providing full detail of number and names of wells along with case histories where services rendered in or outside Pakistan. Additional 02mark will be given in case of 25 or more case histories.	At least 20 wells case histories including 05 wells where oil base mud services rendered by the company with proof.	03	05
9.	(a) If bidder has not previously rendered the Mud Engineering Services to OGDCL then track record with reputed 03 Nos. (at least) International E&P companies duly certified for performance on their company letter head during last five (05) years must be provided. Additional 02mark will be given in case of 05 or more Certificates. (b) In case of previous contract history with OGDCL, the performance will be evaluated strictly on the basis of Quality & performance of Mud chemicals previously used at OGDCL wells. ½ mark will be deducted for each of the substandard chemical.	(a) Certificate of satisfaction from 03 Nos. International companies with relevant experience for each company. (b) The previous performance with OGDCL will be evaluated on basis of performance of chemicals supplied to OGDCL (1/2 mark No. each for basic set of chemicals i.e. Gel, CMCs, PACs KLS, KL, KCl, Shale inhibitor, Xanthan Gum, Spotting chemical and Oil Base Mud Chemicals.	13	15
		Total	**76**	**100**

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SECTION – J

FINANCIAL BID FORMAT

(1 – 4)

1. FINANCIAL BID FORMAT FOR WATER BASE MUD (WBM) CHEMICALS FOR CENTER / SOUTH REGION

SR#	DESCRIPTION	BRAND PRODUCT NAME (TO BE FILLED IN BY THE BIDDER)	UNIT	ESTIMATED QTY. REQURIED	UNIT COST WITH GST (US$)	UNIT COST WITH OUT GST (US$)	TOTAL COST WITH GST (US$)	TOTAL COST WITH OUT GST (US$)
1	API Bentonite (Non-Treated)		M.Ton	40.00				
2	CMC(LV)		M.Ton	10.00				
3	CMC(HV)		M.Ton	10.00				
4	KLS		M.Ton	10.00				
5	Synergistic Polymer		M.Ton	5.00				
6	Spotting Chemical SFT		M.Ton	10.00				
7	Shale Stabilizer		M.Ton	10.00				
8	Potassium Chloride (KCl)		M.Ton	40.00				
9	Sodium Formate		M.Ton	10.00				
10	Potassium Formate		M.Ton	10.00				
11	Potassium Hydroxide (KOH)		M.Ton	4.00				
12	Xanthan Gum (XC Polymer)		M.Ton	3.00				
13	H_2S Scavenger ($ZnCO_3$)		M.Ton	3.00				
14	API Starch		M.Ton	5.00				
15	Poly Glycol		(55 Gln. Drum)	10.00				
16	PAC (Regular)		M.Ton	10.00				
17	PAC (LV)		M.Ton	10.00				
18	PHPA		M.Ton	10.00				
19	Defoamer for Silicate Mud		10 Gln. Cane	10.00				
20	Mud Lubricant		(55 Gln Drum)	15.00				
21	Mud Detergent		(55 Gln Drum)	5.00				
22	Mud Defoamer		(55 Gln Drum)	5.00				
23	Corrosion Inhibitor		(55 Gln Drum)	5.00				
24	Bectericide/ Biocide		(55 Gln Drum)	5.00				

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25	Calcium Bromide Powder		M.Ton	60.00				
26	Calcium Bromide Solution		IBC TANK of 1M³	40.00				
27	Zinc Bromide Solution		1 M³	40.00				
28	Lime Stone Powder ($CaCO_3$)		M.Ton	100.00				
29	Caustic Soda Flakes		M.Ton	20.00				
30	Soda Ash		M.Ton	5.00				
31	Soda Bicarb		M.Ton	5.00				
32	Calcium Chloride		M.Ton	60.00				
33	Common Salt		M.Ton	50.00				
34	Mica (Fine)		M.Ton	10.00				
35	Mica (Coarse)		M.Ton	10.00				
36	Non Damaging Acid Soluble LCM		M.Ton	10.00				
37	Non Damaging Cellulosic Fibrous LCM		M.Ton	10.00				
38	Saw Dust		M.Ton	10.00				
39	Cotton Seed Hull		M.Ton	10.00				
TOTAL COST FOR WBM CHEMICALS WITH GST:-								
TOTAL COST FOR WBM CHEMICALS WITH OUT GST (A):-								

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2. FINANCIAL BID FORMAT FOR OIL BASE MUD (OBM) CHEMICALS

FOR CENTER / SOUTH REGION

SR#	DESCRIPTION	Exact Equivalent OR better to	BRAND PRODUCT NAME (TO BE FILLED IN BY THE BIDDER)	UNIT	ESTIMATED QTY. REQURIED (NORTH REGION)	UNIT COST WITH GST (US$)	UNIT COST WITH OUT GST (US$)	TOTAL COST WITH GST (US$)	TOTAL COST WITH OUT GST (US$)
1	Oil Mud Emulsifier/ Primary Emulsifier	Invermul, Vertoil, Carbotec or equivalent		(55 Gln Drum)	50.00				
2	Oil Mud Emulsifier/			(55 Gln Drum)	30.00				
3	Oil Mud Gel	Geltone, CarboGel or equivalent.		M.Ton	25.00				
4	High Temp. Stabilizer/ Filtration	Duratone, Carbotrol or equivalent		M.Ton	10.00				
5	Oil Mud Surfactant/ Wetting Agent	E.Z.Mul, Carbomul or equivalent		(55 Gln Drum)	5.00				
6	Lime	Lime, Kenox or equivalent		M.Ton	25.00				
7	Oil Mud Thinner	Versathin or equivalent		(55 Gln Drum)	10.00				
TOTAL COST FOR OBM CHEMICALS WITH GST :-									
TOTAL COST FOR OBM CHEMICALS WITH OUT GST (B):-									

Note:

(i) ***Rate of chemicals all the Mud (WBM, OBM& W.O / Completion Fluid) are to be quoted strictly as per units given in the bid.***

(ii) ***The bidder should quote separate rate with GST and without GST as per rate format.***

(iii) ***Specifications of the OBM Chemicals should meet OBM package specifications.***

(iv) ***Quantities of all the Mud Chemicals (WBM, OBM & W.O / Completion) are estimated and for financial evaluation purpose only. However payment would be made as per actual chemical consumption which may vary from estimated quantity as per OGDCL requirement for the required Mud or Brine System.***

vetted please

SAIMA MAQSOOD
Senior Mud Engineer
Ext: 2221

3. FINANCIAL BID FORMAT FOR MUD ENGINEERING SERVICES CHARGES FOR WATER BASE & OIL BASE MUD SYSTEM

MUD ENGINEERING SERVICES CHARGES FOR ONE WELL ONLY

MUD SYSTEM	PRIME MUD ENGINEER			2ND MUD ENGINEER *			TOTAL COST OF MUD ENGG. SERVICES CHARGES FOR BOTH MUD ENGINEERS FOR ONE WELL WITHOUT ICT/PST (USD) (I = E + H)
	ESTIMATED NO. OF DAYS (C)	MUD ENGINEERING PER DAY RATE WITH OUT ICT/PST (USD) (D)	TOTAL CHARGES FOR MUD ENGINEERS USD (E = C X D)	ESTIMATED NO. OF DAYS (F)	MUD ENGINEER CHARGES WITH OUT ICT/PST PER DAY RATE (USD) (G)	TOTAL CHARGES FOR 2nd MUD ENGINEER (USD) (H = F X G)	
WBM / OBM System	150			50			

* Will be engaged only in case of exigency if dictated by the hole.

Note:

i. ***No. of days are tentative and for financial evaluation purpose only, which may vary as per actual requirement of OGDCL.***

ii. ***Bidder should quote rate as per rate format.***

vetted please

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Senior Mud Engineer
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04. SUMMARY OF FINANCIAL BID FORMAT FOR MUD ENGINEERING SERVICES ALONG WITH MUD CHEMICALS IN CENTER / SOUTH REGION

Sr. No	Description	Cost of Water Base Mud (WBM) Chemicals for one (01) well WITHOUT GST (US$) (A)	Cost of Oil Base Mud (OBM) Chemicals for one (01) wellWITHOUT GST (US$) (B)	Total Cost of Mud Chemicals for one 01 year US$ (K)	Total Cost of Mud Engineering Services charges for one (01) well WITH OUT ICT/PST (US$) (I)	Total Cost of Mud Engineering Services for one (01) yearWITH OUT ICT/PST US$ (L)	Total Cost of Mud Engineering Services along with Mud Chemicals For one (01) year US$ (M)	Total Cost of Mud Engineering Services along with Mud Chemicals For Two (02) year US$ (N)
1.	Center /South Region for 02 wells drilled with WBM system and 01 well drilled with OBM system approximately per year			(For 02 Wells drilled with WBM and 01 Well with OBM (approximately) per year) K = 2(A) + B		For approximately 03 wells as per description L= I x 3	M = K + L	N = 2 x M

Note:

i. ***Financial evaluation will be carried out without taxes (ICT/PST/GST)***

ii. ***No. of wells are tentative and for financial evaluation purpose only, which may vary as per actual requirement of OGDCL.***

AMOUNT OF BID BOND:

Bid Bond /Bid Security amounting to **US$ 130,000/-** or equivalent PKRis to be attached / provided with the technical bid. Please see Master Set of Tender Document for further details.

NOTE:-

Willed please

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Senior Mud Engineer
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- The master set of tender documents (services) uploaded on OGDCL's website (www.ogdcl.com) is the integral part of this TOR.

Vetted please

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