ऑयल इंडिया
OIL INDIA

Oil India Limited
INDEG Department
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Corrigendum- 3 dt. 06.12.2024

To EOI Ref. No.: INDEG/OIL/EOI/07/762/Phase I-XX - 2024-25 dated 20.09.2024

This corrigendum is issued to include the item specification of serial no. 169

Honourable Prime Minister has said, "Aatmanirbhar Bharat is not about being self-contained or being closed to the world, it is about being self -sustaining and self-generating.

In order to propagate above views of Honourable Prime Minister, “Aatmanirbhar Bharat Abhiyyan” has been launched. Oil India Limited (OIL) is committed to take forward vision of “Aatmanirbhar Bharat Abhiyyan” for Import substitution of items required by Oil India Limited (OIL).

Interested companies are requested to send their Expression of Interest with all documentary evidence for the items listed herewith as per format attached to INDEG Department of OIL at Email ID: indeg@oilindia.in.

Development orders will be placed for the items, if found suitable as per OIL’s Development order policy as uploaded in our website: www: oil-india.com >>Flagship program.

Vendors may send their Expression of Interest by 16.12.2024.

(Please type on your Letter Head)

Ref. No……. Date:

To
Chief General Manager (INDEG)
INDEG Department
Oil India Limited
Duliajan-786602
Assam
(Email ID: indeg@oilindia.in)

Expression of Interest

1. Company Details

1	Company Name	
	Whether manufacturer. If not, whether dealer, distributor etc.	
2	Location	
3	Address	
4	Contact Person	
5	E-mail ID	
6	Mobile/Cell Phone No	
7	Product/Service Proposed for Development	
8	Quantity Offered for Field Trial (Based on field requirement, actual quantity to be decided)	
9	Delivery Schedule	
10	Estimated Price of the Product / Unit/service	
11	Have you supplied this item to Indian Oil & Gas Companies (names of companies)	

2. Details with copies of relevant documents

1	Details of infrastructure available
2	Manpower details
3	Equipment, Machineries & testing details available
4	Existing product/service details including the offered items/services
5	Copy of last two years Audited Balance Sheet of the Company
6	Copy of company Incorporation Certificate along with Memorandum of Association (MOA) / Articles of Association (AOA) OR Copy of partnership deed in case of partnership company
7	Copy of GST Registration Certificate
8	Copy of PAN Card
9	Copy of MSME Certificate, if any
10	Copy of NSIC Certificate, if any

Name: ……..…….. Signature …… Designation……

Import Substitution Items List

Sl. no.	ITEM DESCRIPTION
1	CROME CASING PIPES
2	CHROME TUBING PIPES
3	DRILL PIPES
4	HEAVY WEIGHT DRILL PIPE
5	DRILL COLLARS AND LIFTING PLUG
6	DRILLING STABILIZERS
7	DRILLING/ WORKOVER HANDLING TOOLS --- ELEVATORS, TONGS, SLIPS etc.
8	POTASSIUM FORMATE
9	SOLID CONTROL EQUIPMENT --- MUD CLEANER/ DEGASSER/ CENTRIFUGE/ LINEAR MOTION SHALE SHAKER
10	SUCKER ROD PUMP (SRP) AND ITS ACCESSORIES
11	SRP INSERT PUMP
12	ETHYL MERCAPTAN
13	LOW SHEAR VELOCITY FLUIDS/POLYMERS
14	EMD CHEMICAL DOSING PUMP, RECIPROCATING PUMP
15	HSP 20/40, ISP 20/40, ISP 30/50 MESH
16	PIG TRACKER/TRANSMITTER
17	PIPELINE LOCATOR
18	LOGGING CABLES
19	TRI CONE ROLLER DRILLING BITS OF VARIOUS SIZES
20	11"OD STANDARD REVERSE CIRCULATING JUNK BASKET & 7.7/8" OD REVERSE CIRCULATING JUNK BASKET
21	PDC DRILL BITS OF VARIOUS SIZES
22	FISHING TOOL; 6.5/8 INCHES OD JUNK SUB FOR OPERATION INSIDE 8.1/2 INCHES HOLE
23	IMPRESSION BLOCK FOR 4.5 INCH OD, 5.0 INCH OD, 9.625 INCH OD & 13.375 INCH OD CASING
24	PNEUMATIC SPINNER
25	5.1/ 2" PREMIUM THREADED CASING (GRADE: N80 & GRADE P110)
26	CASED HOLE LOGGING UNITS WITH TOOLS AND ACCESSORIES ALONG WITH INSTALLATION, COMMISSIONING AND TRAINING
27	WIRELINE MAST UNIT, INCLUDING TRAINING AND INSTALLATION& COMMISSIONING
28	OIL WELL EXPLOSIVES: (I) 2-1/8 INCH TUBING CUTTER ALONG WITH DETONATOR AND HARDWARE ACCESSORIES (II) 1-9/16 INCH TUBING PUNCHER/ CIRCULATION CHARGE & HARDWARE ACCESSORIES
29	OIL WELL EXPLOSIVES: EXPLOSIVES FOR BAKER PRESSURE SETTING TOOLS: POWER CHARGE, PRIMARY IGNITOR & SECONDARY IGNITOR
30	PROCUREMENT OF OIL WELL EXPLOSIVES USED IN EXPLORATION AND PRODUCTION OF HYDROCARBON (I) DEEP PENETRATION CHARGES (II) RESISTORIESS DETONATOR ASSY, (III) DETO CORD 80 HMX NYLON LS 1.4S (IV) 54 MM STRIP CARRIER, 6SPF, 12 FT/3 M LONG (V) DETOCORD /CHARGE CLIPS (VI) TANDEM CONNECTOR ,2.1/8" STRI P CARRIES (VII) SPLICE BOOT FOR LEAD WIRE (VIII) DETONATOR CORD RETAINER (IX) 53.975 MM (2.1/8") OD FIRING HEAD ASSY

	(X) NUT & BOLT FOR CONNECTING STRIP (XI) NUT & BOLT FOR CONNECT TANDEM(XII) DETO CORD END SEAL (100 NOS./PKT) (XIII) 2.1/8" CHARGE TIGHTENING WRENCH
31	27.1/2" (698.50 MM) ROTARY TABLE
32	7.1/16" X 10 M DOUBLE RAM BOP WITH ACCESSORIES
33	13.5/8" X 10 M SINGLE RAM BOP WITH ACCESSORIES
34	3.1/16" X 10 M FLEXIBLE STEEL HOSES FOR CHOKE MANIFOLD 3.1/8" X 5 M FLEXIBLE STEEL HOSES FOR CHOKE MANIFOLD
35	2.1/16" X 5M - SS FLEXIBLE STEEL HOSE 3.1/16" X 10M - SS FLEXIBLE STEEL HOSE 3.1/8" X 5M FLEXIBLE STEEL HOSES
36	THERMAL WELLHEADS FOR 7" AND 9.5/8" CASING COMPLETION WITH INSTALLATION & COMMISSIONING
37	HOSE VIBRATOR
38	ROTARY HOSE, DRILLING IN ASSORTED LENGTH
39	2.34 MM (0.092") PIANO WIRELINE (WELL MEASURING LINE)
40	STATIC GEL STRENGTH ANALYZER
41	ELECTRONIC RESERVOIR PRESSURE AND TEMPERATURE MEASURING GAUGE.
42	AUTOMATIC DISTILLATION APPARATUS
43	FT – IR SPECTROPHOTOMETER
44	RHEOMETER
45	350 SHORT TON DRILLING HOOK & ELEVATOR LINKS (250 SHORT TON, 350 SHORT TON AND 500 SHORT TON)
46	DIGITAL ACOUSTIC LIQUID LEVEL MEASURING CUM DYNAMOMETER EQUIPMENT (ECHOMETER)
47	CROSS OVER, PREMIUM BOX X API EUE & PUP-JOINT, 2.7/8", PREMIUM IN ASSORTED LENGTH
48	GEOLOGICAL THIN SECTION PREPARATION UNIT COMPRISING OF CUTTING, VACUUM IMPREGNATION, GRINDING AND POLISHING EQUIPMENT AND CONSUMABLES.
49	POLARISED MICROSCOPE
50	PONY DRILL COLLAR
51	PREMIUM TUBING
52	37.1/2” ROTARY TABLE
53	AIR GAS PERMEAMETER
54	DOUBLE BLOCK AND BLEED ISOLATION PLUG
55	GAS CHROMATOGRAPH
56	LOW TO MODERATE TEMPERATURE CEMENT RETARDER
57	HIGH TEMPERATURE FLUID LOSS CONTROL CEMENT ADDITIVE
58	XCD-POLYMER
59	XC-POLYMER (PREMIUM)
60	POLY ANIONIC CELLULOSE-REGULAR
61	POLY ANIONIC CELLULOSE-SUPER LO
62	JUNK SUB 5.1/2 INCH & 7 INCH
63	13.5/8-INCH X 10000 PSI ANNULAR BOP
64	13.5/8-INCH X 10000 PSI Double RAM BOP.

65	CT REELS
66	SUPER FISHING JAR
67	DRILLING JAR
68	OVERSHOTS
69	SLAMMER LOGGING CABLES
70	3” LEFT HAND KELLY
71	MULTI ELEMENT ANALYZER
72	HIGH PERFORMANCE EP LUBE
73	MERCURY FREE PVT SYSTEM
74	SURFACE MEMORY GAUGE
75	ACCESSORIES OF LOGGING CABLE
76	DOWNHOLE PRESSURE TEMPERATURE GAUGE
77	REAL TIME KINEMATIC DIFFERENTIAL GLOBAL POSITIONING SYSTEM
78	FLOW ASSURANCE SOFTWARE
79	SEISMIC SURVEY DESIGNING AND MODELLING SOFTWARE
80	LOW TO MODERATE TEMPERATURE FLUID LOSS CONTROL CEMENT ADDITIVE
81	HIGH TEMPERATURE CEMENT RETARDER
82	CEMENT FRICTION REDUCER
83	ISOTOPE RATIO MASS SPECTROMETER
84	FISHING TOOL – 6.75” OD, AXIAL VIBRATIONAL, SHOCK ABSORBING TOOL 8” OD, AXIAL VIBRATIONAL, SHOCK ABSORBING TOOL
85	TUBING STRIPPER
86	NANO-GRAPHENE BASED LUBRICANT
87	TUBING RETRIEVABLE, SURFACE CONTROLLED, SUB-SURFACE SAFETY VALVE (TR-SCSSSV) WITH ACCESSORIES
88	6 1/2" FISHING BUMPER SUB
89	CORE DRESSER
90	CORE PLUG DRILLING EQUIPMENT
91	CIRCULATING OVERSHOT (FISHING TOOL)
92	REVERSE CIRCULATING JUNK BASKET - (FISHING TOOL)
93	METAL MUCHER JUNK MILL - (FISHING TOOL)
94	CORE FLOODING SYSTEM
95	3.1/2 INCH OD DOWN HOLE MUD MOTOR
96	JAR INTENSIFIER (FISHING TOOL)
97	3. 3/8 - 3/5” TAG PERFORATION CHARGES AND ACCESSORIES - EXPLOSIVES
98	2 1/8” UNIPHASE THROUGH TUBING PERFORATION CHARGE AND ACCESSORIES - EXPLOSIVES
99	2.7/8" MUD MOTOR
100	DOUBLE PLUG CEMENTING HEAD
101	ROTARY TAPER TAP (FISHING TOOL)
102	CEMENTING UNIT

103	HOT TAPPING UNIT
104	DRILLING SIMULATOR
105	WELLHEAD SAMPLING KIT
106	SPEAR (FISHING TOOL)
107	ECHOMETER
108	4" REVERSE CIRCULATING JUNK BASKET- FISHING TOOL
109	2" AND 2 5/8" DRILL COLLAR SEVERING TOOL (DCST) EXPLOSIVES
110	WELL SERVICING PUMP PACKAGE FOR WORKOVER OPERATION
111	DIE COLLAR - FISHING TOOL
112	PACKER MILLING & RETRIEVABLE TOOL - FISHING TOOL
113	DRILL PIPE SPINNER
114	DRILL COLLAR ELEVATOR
115	TORQUE MASTER
116	**LT-OSD -** specialized multicomponent chemical formulation that is highly crude specific and is to be designed to effectively separate water from the crude oil emulsion when the curing temperature inside the Emulsion Treater (ET) vessels is 45° C and below. LT-OSD is categorized as LT-OSD: Type I and LT - OSD: Type – II depending on their performance on different type of emulsion characteristics in various oilfields of upper Assam. **PHYSICAL PARAMETERS (For LT OSD Type I and LT OSD Type II)** i) **Appearance:** The product should be completely homogeneous, free flowing liquid between temperatures 5 Degree C and 45 Degree C. It should be free of any insoluble matter, and the product should smell typically like a petroleum distillate and should not have any other obnoxious smell. Moreover, the bidder has to use the same solvent which has been used in the approved Advance Sample, for manufacturing the bulk supply. ii) **Solubility:** Should be soluble in dry crude oil, and also in water-in-crude emulsions containing between 5 % to 60% (+/- 2 %) water. iii) **Compatibility:** The product should be non-corrosive; it must have pH between 6 & 8, and must be compatible with all materials of construction, including alloys. iv) **Shelf Life:** 12 months (Minimum) from the date of bid closing (for Advance Sample) / from the date of dispatch (for bulk supplies against any order) v) **Flash Point:** 50 Degree C minimum (PMCC Method). Performance (for LT OSD Type I) The product should be able to separate at least 80% water within 30 minutes and 95% water within 60 minutes from Fresh representative crude oil emulsion (untreated with OSD) at 45 °C in a conventional laboratory test, at a dosage normally not exceeding 60 PPM and also not exceeding that of a field proven product (reference sample) giving specified water separation under identical test conditions. The separation should be clear and distinct - without any water or oil droplets remaining in the other phase, or any sludge formation at the interface. The separated water should be clear, and should not contain more than 3000 PPM of oil, as measured spectrophotometrically. Performance (for LT OSD Type II)

	The product should be able to separate at least 60% water within 30 minutes and 95% water within 90 minutes from Fresh representative crude oil emulsion (untreated with OSD) at 45 Deg C in a conventional laboratory bottle test or 95 % water within 10 minutes at 45 Deg C in centrifuge test at a dosage normally not exceeding 120 PPM and also not exceeding that of a field proven product (reference sample) giving specified water separation under identical test conditions. The separation should be clear and distinct - without any water or oil droplets remaining in the other phase, or any sludge formation at the interface. The separated water should be clear, and should not contain more than 500 PPM of oil, as measured spectrophotmetrically. **Sample Submission** For Quality Assessment test in OIL's laboratory, 1.5 kg (500 gms each in three bottles) of the sample should be submitted in airtight and properly sealed bottles made of either glass or metal for Laboratory evaluation. Samples submitted in plastic bottles would not be accepted. The samples to be submitted by the Vendor to include the following: i. Sample Marking: ii. Name of the sample iii. Quantity iv. Manufacturer / Supplier's Name & Address Sample related documents: i. **Material Safety Data Sheet (MSDS):** The MSDS should have safety, handling, first-aid, storage, disposal, Toxicological and Ecological Information. ii. **Product Data Sheet (PDS):** PDS should include the following information: 1 Brand/Product name 2 Colour 3 Smell 4 Generic Composition (all active components in case of blends) 5 Solvent Used and its boiling point/range 6 Specific Gravity at 25°C 7 Flash Point (PMCC, °C) 8 Melting Point (°C) 9 Congealing Point (°C) 10 Date of Manufacture 11 Shelf Life (Months)
117	**Enzyme** used for wellbore clean up, perforation zone clean up and stuck pipe removal jobs by removing filter cake in water base mud / well completion fluid. **Bio-surfactant** used along with Enzyme for wellbore clean up, perforation zone clean up and stuck pipe removal jobs in water base mud / well completion fluid.
118	Casing Clamp for 5.1/2", 7" & 9.5/8" casings.
119	CMC-Low Viscous Grade (LVG)
120	Pregelatinized Starch (PGS)
121	Magcoasphasol (MGP)
122	2 Inch OD Through Tubing Scallop Hollow Carrier Spiral Perforating Gun System & Accessories (Explosives and Hardware)
123	13.5/8" x 5000PSI W.P. Double studded Double Pack off Adapter Flange as per API SPEC 6A

124	11" x 10000 PSI W.P. Double studded Double Pack off Adapter Flange as per API SPEC 6A
125	POTASSIUM SULPHATE
126	ANTI-SETTLING CEMENT ADDITIVE
127	GAS BLOCK CEMENT ADDITIVE
128	POLYAMINE
129	SODIUM FORMATE
130	LEFT HAND DRILL PIPE
131	BLADED JUNK MILL
132	ROTARY WASH OVER SHOE, WASH OVER PIPES AND DRIVE SUB
133	FLAT BOTTOM MILL
134	TAPER MILL
135	7.1/16" X 10 M ANNULAR BOP
136	7.1/16" X 5 M ANNULAR BOP
137	SHORT PIN TAPES (LEFT HAND):
138	90 T TUBING SWIVEL
139	7.1/16" X 5 M DOUBLE RAM BOP WITH ACCESSORIES
140	7.1/16" X 5 M SINGLE RAM BOP WITH ACCESSORIES
141	FULL OPENING SAFETY VALVE (FOSV)
142	CUP TYPE TESTER
143	TEST PLUG
144	JAR TESTER
145	MUD PUMP PRESSURE SYSTEM
146	X RAY DEFRACTOMETER
147	SHOCK SUBS
148	TONG LINE PULL AND LOAD CELL ASSEMBLY
149	INTERNAL CASING CUTTER
150	BATTERY OPERATED DIGITAL PUMP STROKE COUNTER SYSTEM
151	0.108" SLICKLINE
152	PREMIUM CONNECTION VACUUM INSULATED TUBING & CROSSOVER (VIT)
153	**OSD Type-I:** General Description of the item: Oil Soluble Demulsifier (OSD: Type - I) is a crude specific formulation which is used for breaking water- in- crude oil emulsion.

PHYSICAL PARAMETERS

i. **Appearance:** The product should be completely homogeneous, free flowing liquid between temperatures 5 Degree C and 45 Degree C. It should be free of any insoluble matter, and the product should smell typically like a petroleum distillate and should not have any other obnoxious smell. Moreover, the bidder has to use the same solvent which has been used in the approved Advance Sample, for manufacturing the bulk supply.
ii. **Solubility:** Should be soluble in dry crude oil, and in water-in-crude emulsions containing between 5 % to 60 % (+/- 2 %) water.
iii. **Compatibility:** The product should be non-corrosive; it must have pH between 6 & 8, and must be compatible with all materials of construction, including alloys.
iv. **Thermal Stability:** The product should be stable and effective even if the fluid treated with this product is exposed to a temperature of 70°C for up to 3 hours.
v. **Shelf Life:** 12 months (Minimum) from the date of bid closing (for Advance Sample) / from the date of dispatch (for bulk supplies against any order)
vi. **Flash Point:** 50 Degree C minimum (PMCC Method).

Performance (for OSD Type I)

The product should be able to separate at least 80% water within 30 minutes and 95% water within 60 minutes from Fresh representative crude oil emulsion (untreated with OSD) at 60 °C in a conventional laboratory test, at a dosage normally not exceeding 60 PPM and also not exceeding that of a field proven product (reference sample) giving specified water separation under identical test conditions. The separation should be clear and distinct - without any water or oil droplets remaining in the other phase, or any sludge formation at the interface. The separated water should be clear, and should not contain more than 3000 PPM of oil, as measured spectrophotometrically.

Sample Submission

For Quality Assessment test in OIL's laboratory, 1.5 kg (500 gms each in three bottles) of the sample should be submitted in airtight and properly sealed bottles made of either glass or metal for Laboratory evaluation. Samples submitted in plastic bottles would not be accepted.

The samples to be submitted by the Vendor to include the following:

i. Sample Marking:
ii. Name of the sample
iii. Quantity
iv. Manufacturer / Supplier's Name & Address

Sample related documents:

i. Material Safety Data Sheet (MSDS): The MSDS should have safety, handling, first-aid, storage, disposal, Toxicological and Ecological Information.
ii. Product Data Seet (PDS): PDS should include the following information:

1 Brand/Product name
2 Colour
3 Smell
4 Generic Composition (all active components in case of blends)
5 Solvent Used and its boiling point/range
6 Specific Gravity at 25°C
7 Flash Point (PMCC, °C)

	8 Melting Point (°C) 9 Congealing Point (°C) 10 Date of Manufacture 11 Shelf Life (Months)
154	CONTINUOUS CONTROL LINE ALONG WITH ACCESSORIES FOR DOWNHOLE CHEMICAL INJECTION SYSTEM
155	**Oil Evacuation & Filling Station** The Oil Evacuation & Filling Station is a system comprising of a vacuum pump, circulation pump, a reservoir for oil, and interconnected hoses and valves to control the flow mounted on a portable cart designed to evacuate air out of, and fill oil into a logging tool under vacuum. The Oil Evacuation & Filling Station is a system designed to evacuate air out of, and fill oil into a logging tool under vacuum. It is used so that the logging tool is completely free from air, moisture, impurities when oil is filled into it. The system consists of the following main components: 1. An oil reservoir/tank approx. 20 litres. 2. 0.33 HP Vacuum pump running on 220Vac, 50Hz Supply 3. 0.5 HP Variable speed DC circulation pump controlled by a Motor Controller running on 220Vac, 50Hz Supply 4. A portable cart on which the system is mounted. 5. Transparent Hoses, unions, and valves to control flow as per usage rated for working pressure of 400 PSI or higher. 6. Power supply etc. 7. Inline filters to filter out any impurities in the oil. The system has a fill line connected to the pump, which takes suction from the oil reservoir and fills up the tool through one port, and a return line which flows the oil out of the second port of the tool and into the reservoir. Both lines have inline filters so that the oil entering the tool and the reservoir are free from impurities. The system is designed such that the vacuum is created in the tool before and during the filling so that the oil in the tool is devoid of any air. The system is also able to intake oil into the reservoir for refilling from one of its lines. Another feature of the system is to be able to clean and de-gas the oil present in the reservoir by circulating it in a closed loop through the filters in a vacuum state without the tool being connected to the system. A combination of hoses, unions, tees, tubes, valves, and quick connects in the system controls the flow of oil depending on whether only vacuum, only circulation, a combination of both, or oil cleaning is required.
156	CHEMICAL NAME: **Liquid Flow Improver – Type II (LFI –Type II)** UNIT OF MEASUREMENT: kg (kilogram) **Chemical used for reduction of viscosity and Pour Point of crude oil.** **PHYSICAL PARAMETERS** I. **State:** Homogeneous, clear and free-flowing liquid at a temperature of 22°C and above, free from insoluble (liquid or solid) matter II. **Smell:** The product should smell typically like a petroleum distillate, and should not have any other obnoxious smell III. **Solvent:** Use of only the following solvents is permissible for manufacturing the Advance Sample and the bulk supply: Toluene / Xylene or mixed Xylene / Ethyl

Benzene or combination thereof. The solvent should not contain organic compounds like 2-Pinene, 3Carene, D-Limonene or Terpenolene even in trace amount. Moreover, the bidder has to use the same solvent which has been used in the approved Advance Sample, for manufacturing the bulk supply.

IV. **Congealing Point: 10°C** (or lower)

V. **Melting Point: 20°C** (or lower)

VI. **Viscosity** of the product at 20°C when measured at 25 inverse seconds shear rate with Brookfield DV-III cone & plate Rheometer (with CPE-41 cone): **80 cP** (or lower)

VII. **Solubility:** Soluble in Toluene and HSD in all proportions at 22°C and above

VIII. **Shelf life:** 18 months (minimum) from the date of dispatch of the Advance Sample / consignments

Test procedure for measuring Congealing & Melting Points

For determination of Congealing and Melting Points of a "LFI – Type II" product, 5 gm sample of that product would be taken in a 10 mL graduated and stoppered borosilicate glass test tube. That tube would be immersed up to 10 mL mark in a refrigerated water bath maintained at 16°C. After 10 minutes, the temperature of the water bath would be set to the next lower even number (i.e. 14°C), and thereafter would be set to decrease in steps of 2°C. There would be a gap of 10 minutes between two successive steps. The physical state (liquid / gel) of the sample would be checked after 10 minutes from the time the water bath is set at that temperature, before reducing the bath temperature further by 2°C. The temperature at which the sample gels completely, would be noted as Congealing Point of that "LFI – Type II" product.

After the Congealing Point of the sample is reached, the temperature of the water bath would be set to increase by 2°C in successive steps at 10-minute intervals, and the physical state of the sample is checked before every stepping-up of temperature. The temperature at which the sample is found to have completely melted, would be noted as Melting Point of that "LFI – Type II" product.

Congealing and Melting Point temperatures would be recorded and reported in even numbers, because of the temperature ramping protocol described above.

PRODUCT PERFORMANCE TEST IN THE LABORATORY

2.a. Test Procedure

2.a.1. Test on crude oil treated at 50°C.

The typical test crude oil will have water content up to one percent and Pour Point normally in the range of 27°C to 36°C. 500 mL of the test crude oil would be heated at 50°C in a water bath for 30 minutes, and then treated with the "LFI – Type II" sample at a dosage not exceeding 1000 ppm (weight / volume). The treated crude oil would again be heated at 50°C for 30 minutes, to complete the crude oil treatment process.

The following two parameters of the treated crude oil shall be evaluated within 48 hours:

i. **Viscosity:** Apparent viscosity (cP) would be measured at a shear rate of 25 inverse seconds by Brookfield DV-III cone & plate Rheometer (with CPE-41 cone) through a pre-defined software programme at temperatures starting from 30°C down to 15°C (or limited by the viscosity measurement range of the instrument) at 3-degree intervals.

ii. **Pour Point:** Pour Point (°C) would be measured as per ASTM D-5853.

2.a.2. Test on crude oil treated at its Pour Point temperature.

	500 mL of the untreated (raw) test crude oil would be heated up to 50°C in a water bath, then cooled down to its Pour Point temperature (which would normally be in 27°C to 36°C range) with constant stirring with a mechanical stirrer**.** 1000 ppm (weight / volume) of the "LFI – Type II" sample (Advance Sample / consignment sample) would be added to the crude oil at that temperature while stirring the crude oil constantly, and the stirring would continue for another 5 minutes. The Pour Point of that treated crude oil would be measured (without any pre-heating) immediately thereafter. **2.b. Performance Requirement** **2.b.1. Crude oil treated at 50°C.** **i. Viscosity:** Apparent Viscosity (AV) of the test crude oil treated [as per para 2.a.1 above] with any "LFI – Type II" sample (**Advance Sample** / consignment sample) not exceeding 1000 ppm should compare positively (under identical test conditions) with AV of the same test crude oil treated at identical dosage with a **reference sample**. However, even if the test crude oil treated with any "LFI – Type II" sample (Advance Sample / consignment sample) shows a deviation (higher value) up to ten percent in AV compared to the AV of the crude oil treated with the reference sample, that "LFI – Type II" sample (Advance Sample / consignment sample) would be considered to have passed this performance evaluation criterion. The comparison of AV would be done at the viscosity measuring temperature of 15°C. However, in case AV measurement of the crude oil sample treated with reference "LFI – Type II" sample at 15°C is not possible because the AV increases beyond the viscosity measurement range of the Rheometer at 15°C and 25 inverse seconds shear rate, then the comparison would be done at the lowest temperature (18°C or above at 3°C intervals) at which AV of the crude oil sample treated with the reference "LFI – Type II" sample could be measured. **ii. Pour Point:** The Pour Point of the test crude oil treated with any "LFI – Type II" sample (Advance Sample / consignment sample) at a dosage not exceeding 1000 ppm should be equal to or less than the Pour Point of the same test crude oil treated with the reference sample at identical dosage. **2.b.2. Crude oil treated at its Pour Point temperature.** The Pour Point of the test crude oil treated at its Pour Point temperature [following the procedure as described in Point No. 2.a.2 above] with 1000 ppm of a "LFI – Type II" sample (Advance Sample / consignment sample) should be equal to or less than the Pour Point of the same test crude oil treated with the reference sample at 1000 ppm**,** under identical test conditions.
157	**<u>ELEVATORS</u>:** **a. 5.½ Inches Casing Single Joint Elevator.** a.a Description: Single joint collar type elevator for handling 5.½ inches (139.70 mm) od casing, 5 short ton capacity as per the following minimum specifications for each item. a.b The item must be complete with swivel suspension assembly of 5 short ton capacity. a.c Elevator should be made from high quality alloy steel, fully heat treated, equipped with latch and safety lock combination. The item should be manufactured, tested, and monogrammed strictly as per API 8C (latest edition) PSL-2. **b. 7 Inches Casing Single Joint Elevator.** b.a Description: Single joint collar type elevator for handling 7 inches (177.80 mm)

od casing, 5 short ton capacity as per the following minimum specifications for each item.

b.b The item must be complete with swivel suspension assembly of 5 short ton capacity.

b.c Elevator should be made from high quality alloy steel, fully heat treated, equipped with latch and safety lock combination. The item should be manufactured, tested, and monogrammed strictly as per API 8C (latest edition) PSL-2.

c. Side Door Elevator for Handling 4.1/2" OD Casing/Liner, 250 Ton (Short) Capacity.

c.a Description: Collar Type Side Door Elevator as per API 8C, PSL-2, 250 Ton rated Capacity, for handling 4.1/2" OD Casing.

c.b PSL-2 components shall be fabricated from materials meeting the applicable requirements for ductility specified in API Specification 8C - 6.3.7 (Table - 2).

c.c SR-1 Proof Load Test: The items (7 INCHES OD CASING SIDE DOOR ELEVATORS) shall be given a proof load test and subsequently examined in accordance with 8.6.2 and will be marked "SR-1" accordingly near the load rating identification (API Specification 8C-Annex A.2). Test reports, verified by any one of the OIL's approved third-party inspection agencies.

c.d SR-3 Data Book: The Manufacturer's Data Book as per API Specification 8C - Annex A.4 for all the items will be submitted along with the supply.

d. Side Door Elevator for Handling 7" OD Casing/Liner, 250 Short Ton Capacity.

d.a Description: Collar Type Side Door Elevator as per API 8C, PSL-2, 250 Ton rated Capacity, for handling 177.80 mm (7") OD Casing.

d.b PSL-2 components shall be fabricated from materials meeting the applicable requirements for ductility specified in API Specification 8C - 6.3.7 (Table - 2).

d.c SR-1 Proof Load Test: The items (7 INCHES OD CASING SIDE DOOR ELEVATORS) shall be given a proof load test and subsequently examined in accordance with 8.6.2 and will be marked "SR-1" accordingly near the load rating identification (API Specification 8C-Annex A.2). Test reports, verified by any one of the OIL's approved third-party inspection agencies.

d.d SR-3 Data Book: The Manufacturer's Data Book as per API Specification 8C - Annex A.4 for all the items will be submitted along with the supply.

e. Collar Type Centre Latch Elevator for 4.3/4" OD Drill Collars, 150 Short Ton Capacity.

e.a Description: Collar Type Centre Latch Elevator, 90-degree square shoulder for handling 120.65 mm (4.3/4") OD Drill Collar with lift plugs (i.e. without ziplift recess).

e.b Safety Latch Lock, Latch & Extra handle at the rear of the elevator.

e.c The elevators shall be manufactured, load tested & certified as per API Spec. 8C (PSL-2).

e.d Marking (including API Monogram) shall be done as per API 8C Specification.

e.e The maximum weight of the elevator should not be more than 168 Kgs (370 lbs).

e.f PSL-2 components shall be fabricated from materials meeting the applicable requirements for ductility specified in API Specification 8C - 6.3.7 (Table - 2).

e.g SR-1 Proof Load Test: The items (4.3/4 INCHES OD DRILL COLLAR ELEVATORS) shall be given a proof load test and subsequently examined in accordance with 8.6.2 and should be marked "SR 1" accordingly near the load rating identification (API Specification 8C - Annex A.2). Test reports, verified by any one of the OIL's approved third-party inspection agencies.

e.h SR-3 Data Book: The Manufacturer's Data Book as per API Specification 8C -

	Annex A.4 for all the items should be submitted along with the supply.
158	**CHART RECORDER WITH PRESSURE GAUGE:** **a. Hydraulic Pressure Recorder: (10000 PSI)** a.a High Pressure Portable Hydraulic Pressure Recorder system for working with 04 (Four) hours clock (Manual clock system). a.b Capacity of the recorder system: 10000 psi (420 kg /sq.cm). a.c The system should be of NOV-MD TOTCO pressure recorder, Model M366 or equivalent. a.d Single pen recorder with one pressure input (0-10000 psi). a.e The item should be complete with following accessories: i. 15 feet (4590 mm) long x 0.25-inch (6.37 mm) H.P. hose assembly. ii. High pressure recorder with 5-inch pressure indicator. iii. Diaphragm protector. iv. Check Valve. v. Coupling, half disc female and half disc male. vi. Glass Cover. vii. Glass Gasket. viii. Fluid Injector instrument. ix. Chart (Standard 12-inch circular chart paper). x. Calibration kit. **b. Hydraulic Pressure Recorder: (6000 PSI)** b.a High Pressure Portable Hydraulic Pressure Recorder system for working with 04 (Four) hours clock (Manual clock system). b.b Capacity of the recorder system: 6000 psi (420 kg /sq.cm). b.c The system should be of NOV-MD TOTCO pressure recorder, Model M365-415 or equivalent. b.d Single pen recorder with one pressure input (0-6000 psi). b.e The item should be complete with following accessories: i 15 feet (4590 mm) long x 0.25-inch (6.37 mm) H.P. hose assembly. ii High pressure recorder with 5-inch pressure indicator. iii Diaphragm protector. iv Check Valve. v Coupling, half disc female and half disc male. vi Glass Cover. vii Glass Gasket. viii Fluid Injector instrument. ix Chart (Standard 12-inch circular chart paper). x Calibration kit.
159	CHEMICAL NAME: **Liquid Flow Improver – Type I (LFI –Type I)** UNIT OF MEASUREMENT: kg (kilogram) **Chemical used for reduction of viscosity and Pour Point of crude oil.** **PHYSICAL PARAMETERS** i. **State:** Homogeneous, clear and free-flowing liquid at a temperature of 24°C and above, free from insoluble (liquid or solid) matter ii. **Smell:** The product should smell typically like a petroleum distillate, and should not have any other obnoxious smell iii. **Solvent:** Use of only Toluene and Xylene solvent (Ortho, Meta, Para and Ethylbenzene isomer) is permissible for manufacturing the Advance Sample and the subsequent bulk supply. The solvent should not contain organic compounds like 2-Pinene, 3-Carene, D- Limonene, Terpenolene, Indane, Styrene, Naphthalene and bicyclic compounds even in trace amount. OIL has the

authority to verify the components through necessary experimentations. In case the deviation in solvent components is observed between advance and bulk supply, OIL has the right to reject the consignment.

iv. **Congealing Point:** 14°C (or lower)
v. **Melting Point:** 22°C (or lower)
vi. **Viscosity** of the product at 20°C when measured at 25 inverse seconds shear rate with Brookfield cone & plate Rheometer (with CPE-41 cone): 80 cP (or lower)
vii. **Solubility:** Soluble in Toluene and HSD in all proportions at 24°C and above
viii. **Shelf life:** 18 months (minimum) from the date of dispatch of the Advance Sample / consignments

Test procedure for measuring Congealing & Melting Points

For determination of Congealing and Melting Points of a "LFI – Type I" product, 5 gm sample of that product would be taken in a 10 mL graduated and stoppered borosilicate glass test tube. That tube would be immersed up to 10 mL mark in a refrigerated water bath maintained at 18°C. After 10 minutes, the temperature of the water bath would be set to the next lower even number (i.e. 16°C), and thereafter would be set to decrease in steps of 2°C. There would be a gap of 10 minutes between two successive steps. The physical state (liquid / gel) of the sample would be checked after 10 minutes from the time the water bath is set at that temperature, before reducing the bath temperature further by 2°C. The temperature at which the sample gels completely, would be noted as Congealing Point of that "LFI – Type I" product.

After the Congealing Point of the sample is reached, the temperature of the water bath would be set to increase by 2°C in successive steps at 10-minute intervals, and the physical state of the sample is checked before every stepping-up of temperature. The temperature at which the sample is found to have completely melted, would be noted as Melting Point of that "LFI – Type I" product.

Congealing and Melting Point temperatures would be recorded and reported in even numbers, because of the temperature ramping protocol described above.

2. PRODUCT PERFORMANCE TEST IN THE LABORATORY

2.a. Test Procedure

2.a.1. Test on crude oil treated at 50°C

The typical test crude oil will have water content up to one percent and Pour Point normally in the range of 27°C to 36°C. 500 mL of the test crude oil would be heated at 50°C in a water bath for 30 minutes, and then treated with the "LFI – Type I" sample at a dosage of 400 ppm (weight / volume). The treated crude oil would again be heated at 50°C for 30 minutes, to complete the crude oil treatment process.

The following two parameters of the treated crude oil shall be evaluated within 48 hours:

i. **Viscosity:** Apparent viscosity (cP) would be measured at a shear rate of 25 inverse seconds by Brookfield cone & plate Rheometer (with CPE-41 cone) through a pre-defined software programme at temperatures starting from 30°C down to 15°C (or limited by the viscosity measurement range of the instrument) at 3-degree intervals.
ii. **Pour Point:** Pour Point (°C) would be measured as per ASTM D-5853.

2.a.2. Test on crude oil treated at its Pour Point temperature

500 mL of the untreated (raw) test crude oil would be heated up to 50°C in a water bath, then cooled down to its Pour Point temperature (which would normally be in 27°C to 36°C range) with constant stirring with a mechanical stirrer. 400 ppm (weight / volume) of the "LFI – Type I" sample (Advance Sample / consignment sample) would be added

	to the crude oil at that temperature while stirring the crude oil constantly, and the stirring would continue for another 5 minutes. The Pour Point of that treated crude oil would be measured (without any pre-heating) immediately thereafter. **2.b. Performance Requirement** **2.b.1. Crude oil treated at 50°C** i. **Viscosity:** Apparent Viscosity (AV) of the test crude oil treated [as per para 2.a.1 above] with any "LFI – Type I" sample (Advance Sample / consignment sample) at 400 ppm should compare positively (under identical test conditions) with AV of the same test crude oil treated at 400 ppm with a reference sample. However, even if the test crude oil treated with any "LFI – Type I" sample (Advance Sample / consignment sample) shows a deviation (higher value) up to ten percent in AV compared to the AV of the crude oil treated with the reference sample, that "LFI – Type I" sample (Advance Sample / consignment sample) would be considered to have passed this performance evaluation criterion. The comparison of AV would be done at the viscosity measuring temperature of 15°C. However, in case AV measurement of the crude oil sample treated with reference "LFI – Type I" sample at 15°C is not possible because the AV increases beyond the viscosity measurement range of the Rheometer at 15°C and 25 inverse seconds shear rate, then the comparison would be done at the lowest temperature (18°C or above at 3°C intervals) at which AV of the crude oil sample treated with the reference "LFI – Type I" sample could be measured. ii. **Pour Point:** The Pour Point of the test crude oil treated with any "LFI – Type I" sample (Advance Sample / consignment sample) at 400 ppm should be equal to or less than the Pour Point of the same test crude oil treated with the reference sample at 400 ppm. **2.b.2. Crude oil treated at its Pour Point temperature** The Pour Point of the test crude oil treated at its Pour Point temperature [following the procedure as described in Point No. 2.a.2 above] with 400 ppm of a "LFI – Type I" sample (Advance Sample / consignment sample) should be equal to or less than the Pour Point of the same test crude oil treated with the reference sample at 400 ppm, under identical test conditions.
160	**Bactericide - Type-I** (FOR CONTROL OF SULPHATE REDUCING BACTERIA IN FRESH WATER AND FORMATION WATER SYSTEMS IN OILFIELD OPERATION) **1. GENERIC COMPOSITION (Chemical type):** Ammonium or Phosphonium (including THPS) based compounds, or their blend with other chemistries. Presence of free formaldehyde above 0.5% in the finished product is not acceptable. **2. PHYSICAL CHARACTERISTICS:** **(a) Appearance:** Should be a clear, free-flowing homogeneous liquid under ambient temperatures (8°C - 40°C) and should be free of any insoluble matter. **(b) Solubility:** Should be soluble in fresh water and saline (3000-5000 ppm) produced Formation water in all proportions. **(c)Compatibility:** The product should be compatible with produced formation water, and various proprietary oil-field chemicals like Oil Soluble Demulsifiers (OSD), Deoilers (cationic polyelectrolytes), corrosion inhibitors, oxygen scavengers etc that could be in use at different stages (injection points) for treatment of the same fluid. **(d) Thermal Stability:** The product should be stable and effective even if the fluid treated with this product is exposed to a temperature of 70°C for upto 3 hours. **(e) Shelf Life:** The product should be stable and should not lose its potency for one year (minimum) from the date of manufacture, if kept under normal ambient storage

conditions.

3. PERFORMANCE

a) Laboratory: The product will be tested in the laboratory as per API RP 38 procedure. The product under evaluation should be able to inhibit growth of SRB for 28 days at a dosage normally not exceeding 50 PPM, and not exceeding the minimum effective dosage of a field proven Bactericide product (of the same category) when tested under identical test conditions.

b) Field: In the fields, the product should be able to inhibit the growth of SRB at a dosage and application regime which has earlier been optimized with a field-approved product.

4. ACCEPTANCE CRITERIA

a) Tender Sample: A tender sample has to be submitted in the quantity as specified under the Point (5) below; and it has to meet the Generic Composition [1], Physical Characteristics [2] and Laboratory Performance criteria [3.a] as specified above. In addition, the offer should be accompanied by all relevant information and the self-certification as sought under Point [7] below, for it to be technically acceptable.

b) Bulk Supply: Every batch of material supplied against any Developmental / Bulk order has to meet the laboratory performance specification [3.a] in the quality assessment test to be carried out in OIL after arrival of the consignments in Duliajan. The supplied material is also required to match the physical characteristics and the laboratory performance of its tender sample (the sample against the performance of which the order would be placed, and which would be kept as a reference sample in the laboratory) when tested under identical test conditions. The supplied material will be deemed acceptable after passing this laboratory evaluation.

5. SUBMISSION OF TENDER SAMPLE: Suppliers / manufacturers have to submit 1500 gm or 1500 ml sample of the product they are offering, in three (500 gm x 3 or 500 ml x3) sealed and air-tight bottles free of cost for laboratory evaluation. They are also required to upload (in case of e-tender) or submit all relevant product information detailed under point [7] below, along with their tender documents.

6. PACKING OF BULK SUPPLY: 200 Kg nett in new HDPE drums. Name of the product, batch number, date of manufacture, manufacturer's name and address, OIL's order number and material code (85055619) should be stencilled with indelible paint in bold letters in a contrast color both at the top and on the side of every drum.

7. PRODUCT INFORMATION TO BE PROVIDED BY THE SUPPLIER:

a) PRODUCT DATA SHEET (PDS), which should include the following information:

Brand name of the product
Generic Composition (all active components in case of blends)
Solubility in water
Specific Gravity at 25°C
Flash Point (PMCC, °C)
Date of Manufacture
Shelf Life (Months)

b) SELF - CERTIFICATION: The supplier must submit a certificate mentioning either absence or presence of free Formaldehyde in the offered formulation. In case free Formaldehyde is present in the formulation, its quantity (in percentage) must be mentioned in the certificate. OIL reserves the right to check the free Formaldehyde content in the tender sample and the bulk supplies and reject the sample or the supply if the free Formaldehyde content is found to be higher than the specified upper limit.

c) SAFETY, HANDLING, FIRST-AID, STORAGE & DISPOSALINSTRUCTIONS (MSDS)

	d) TOXICOLOGICAL AND ECOLOGICAL INFORMATION
161	**Bactericide - Type-II** (FOR CONTROL OF SULPHATE REDUCING BACTERIA IN FRESH WATER AND FORMATION WATER SYSTEMS IN OILFIELD OPERATION) **1. GENERIC COMPOSITION (Chemical type):** Gluteraldehyde or its blend with other chemistries. Presence of free formaldehyde above 0.05% in the finished product is not acceptable. **2. PHYSICAL CHARACTERISTICS:** **(a) Appearance:** Should be a clear, free-flowing homogeneous liquid under ambient temperatures (8°C - 40°C) and should be free of any insoluble matter. **(b) Solubility:** Should be soluble in fresh water and saline (3000-5000 ppm) produced Formation water in all proportions. **(c)Compatibility:** The product should be compatible with produced formation water, and various proprietary oil-field chemicals like Oil Soluble Demulsifiers (OSD), Deoilers (cationic polyelectrolytes), corrosion inhibitors, oxygen scavengers etc that could be in use at different stages (injection points) for treatment of the same fluid. **(d) Thermal Stability:** The product should be stable and effective even if the fluid treated with this product is exposed to a temperature of 70°C for upto 3 hours. **(e) Shelf Life:** The product should be stable and should not lose its potency for one year (minimum) from the date of manufacture, if kept under normal ambient storage conditions. **3. PERFORMANCE** **a) Laboratory:** The product will be tested in the laboratory as per API RP 38 procedure. The product under evaluation should be able to inhibit growth of SRB for 28 days at a dosage normally not exceeding 50 PPM, and not exceeding the minimum effective dosage of a field proven Bactericide product (of the same category) when tested under identical test conditions. **b) Field:** In the fields, the product should be able to inhibit the growth of SRB at a dosage and application regime which has earlier been optimized with a field-approved product. **4. ACCEPTANCE CRITERIA** **a) Tender Sample:** A tender sample has to be submitted in the quantity as specified under the Point (5) below; and it has to meet the Generic Composition [1], Physical Characteristics [2] and Laboratory Performance criteria [3.a] as specified above. In addition, the offer should be accompanied by all relevant information and the self-certification as sought under Point [7] below, for it to be technically acceptable. **b) Bulk Supply:** Every batch of material supplied against any Developmental / Bulk order has to meet the laboratory performance specification [3.a] in the quality assessment test to be carried out in OIL after arrival of the consignments in Duliajan. The supplied material is also required to match the physical characteristics and the laboratory performance of its tender sample (the sample against the performance of which the order would be placed, and which would be kept as a reference sample in the laboratory) when tested under identical test conditions. The supplied material will be deemed acceptable after passing this laboratory evaluation. **5. SUBMISSION OF TENDER SAMPLE:** Suppliers / manufacturers have to submit 1500 gm or 1500 ml sample of the product they are offering, in three (500 gm x 3 or 500 ml x3) sealed and air-tight bottles free of cost for laboratory evaluation. They are also required to upload (in case of e-tender) or submit all relevant product information detailed under point [7] below, along with their tender documents. **6. PACKING OF BULK SUPPLY:** 200 Kg nett in new HDPE drums. Name of the product, batch number, date of manufacture, manufacturer's name and address, OIL's order number and material code (85055621) should be stencilled with indelible paint in bold letters in a contrast color both at the top and on the side of every drum.

	7. PRODUCT INFORMATION TO BE PROVIDED BY THE SUPPLIER: **a) PRODUCT DATA SHEET (PDS)**, which should include the following information: Brand name of the product Generic Composition (all active components in case of blends) Solubility in water Specific Gravity at 25°C Flash Point (PMCC, °C) Date of Manufacture Shelf Life (Months) **b) SELF - CERTIFICATION:** The supplier must submit a certificate mentioning either absence or presence of free Formaldehyde in the offered formulation. In case free Formaldehyde is present in the formulation, its quantity (in percentage) must be mentioned in the certificate. OIL reserves the right to check the free Formaldehyde content in the tender sample and the bulk supplies and reject the sample or the supply if the free Formaldehyde content is found to be higher than the specified upper limit. **c) SAFETY, HANDLING, FIRST-AID, STORAGE & DISPOSALINSTRUCTIONS (MSDS)** **d) TOXICOLOGICAL AND ECOLOGICAL INFORMATION**
162	CHEMICAL NAME: **Scale Inhibitor** UNIT OF MEASUREMENT: kg (kilogram) **Chemical used for control of Calcium Carbonate scale in Formation water systems in oilfield operations** **PHYSICAL PARAMETERS** **a) State:** The product should be a clear, free-flowing homogeneous liquid under ambient temperatures (8°C - 40°C) and should be free of any insoluble matter. **b) Solubility:** The product should be soluble in fresh water and saline (3000-5000 ppm) produced Formation water in all proportions. **c) Compatibility:** The product should have pH between 6.0 & 8.0, and it should be compatible with produced formation water. **d) Thermal Stability:** The product should be stable and effective even if the fluid treated with this product is exposed to a temperature of 70°C for up to 3 hours. **e) Shelf Life:** 18 months (Minimum) from the date of bid closing (for tender samples) / from the date of dispatch (for bulk supplies against any order) PERFORMANCE: Laboratory Test Method **i) Scaling medium** Calcium Chloride Solution: 1.1025 gm of Calcium Chloride (CaCl2.2H2O) and 4 gm of Sodium Chloride (NaCl) are dissolved in distilled water (whose pH is adjusted to 8.0 prior to addition of these chemicals) and volume made up to 1 litre to give a 300 ppm Calcium solution in saline (4000 ppm) medium. Sodium Carbonate Solution: 1.0620 gm of Sodium Carbonate (Na2CO3) and 4 gm of Sodium Chloride (NaCl) are dissolved in distilled water (whose pH is adjusted to 8.0 prior to addition of these chemicals) and volume made up to 1 litre to give 600 ppm Carbonate solution in saline (4000 ppm) medium. Scale Inhibitor (SI) stock Solution: 1000 ppm of SI stock solution is prepared by adding 100 micro-litre of SI sample in 100 mL of distilled water (whose pH is adjusted to 8.0 prior to SI addition). **ii) Scale Inhibitor dosage:** 5 (five) ppm **iii) Temperature:** 60 °C **iv) Exposure period: 18** hours **v) Performance evaluation:** 50 mL each of warm (by keeping the solutions at 60 °C for 2 hours) Calcium Chloride solution and Sodium Carbonate solution are mixed by shaking

	in presence of 5 ppm of Scale Inhibitor, and kept in an incubator at 60 °C for 18 hours under static condition. The efficiency of the Scale Inhibitor is calculated by comparing the concentration of the Calcium ion (by EDTA titration) in the SI-doped solution with that in a Blank Test conducted without the addition of the Scale Inhibitor. vi) Inhibitor efficiency required: 45% minimum. <u>Percent inhibition values may be calculated as follows:</u> $\% \text{ Inhibition} = (Ca - Cb)/(Cc - Cb) \times 100$ Where: Ca = Ca^{2+} concentration in the treated sample after precipitation Cb = Ca^{2+} concentration in the blank after precipitation Cc= Ca^{2+} concentration in the blank before precipitation
163	CHEMICAL NAME: **DEOILER** UNIT OF MEASUREMENT: kg (kilogram) Chemical used for reducing the oil content in produced formation water in oilfield operations **<u>PHYSICAL PARAMETERS</u>** **a) State:** The product should be a clear, free-flowing homogeneous liquid under ambient temperatures (8°C - 40°C) and should be free of any insoluble matter. **b) Solubility:** The product should be soluble in fresh water and saline (3000- 5000 ppm) produced Formation water in all proportions. **c) Compatibility:** The product should be non-corrosive, it must have pH between 6.5 and 7.5 and must be compatible with all materials of construction, including alloys. **d) Thermal Stability:** The product should be stable and effective even if the fluid treated with this product is exposed to a temperature of 70°C for up to 3 hours. **e) Shelf Life:** 12 months (Minimum) from the date of bid closing (for Advance Sample) / from the date of dispatch (for bulk supplies against any order) **PERFORMANCE: Laboratory Test Method** The performance of the advance sample / consignment sample will be tested in the laboratory on oil-in-water emulsions (formation water) collected from outlet of the Emulsion Treater, situated at any field installations. This oil in water test emulsion may normally contain up to 3000 PPM of emulsified oil. This emulsion will be treated with the advance sample / consignment sample, and the treated water will be aerated for 15 minutes and then allowed a quiescent time of 5 minutes. After this treatment process, the oil content in the treated water should not be more than 50 PPM, as measured spectrophotometrically. The test dosage of the advance sample / consignment sample normally would not exceed 50 PPM and shall be pegged with the minimum dosage of a reference sample, at which it yields the specified oil content in that test emulsion under identical test conditions.
164	Upper Kelly Cock and Lower Kelly Cock
165	Roto Hammer and Intensifier
166	LH Peripheral Milling Tool to run inside 5-1/2” Casing, Fishing tool
167	PREMIUM SAND SCREEN: 1.0 Construction: Multilayer Outer Shroud: HD Perforated Tube (Material: SS316L) Drainage layer: 20 mesh above & below Control Layer (Material: Inconel 825) Control Layer: ER Weave-Erosion Resistant Double Layer Dutch Weave (Material: Inconel 825)

	Inner Shroud: HD Perforated Tube (Material: SS316L) (m) Maximum OD: 3.500 Inch (n) Minimum ID: 2.441 Inch (o) Drift ID: 2.347 Inch (p) Screen Length: 108 Inch (2743 mm) (q) Overall Length: 120 Inch (3048 mm) (r) Blank Length (Box/Pin): 6 Inch (152 mm) (s) Pore Size: 250 Microns (t) Tolerance: High Accuracy for CH Operation (±10% max) (u) Mechanical Properties: Collapse Pressure: 3000 psi. Burst Pressure: 3000 psi. (v) End Connection: 3.5" VAMTOP Box Up & Pin Down with Bull Nose at bottom. 2.0 SAFETY SHEAR SUB: Suitable for 5.1/2 Inch Casing Tubing OD: 2.7/8 Inch Max OD: 3.5 inch Minimum ID: 2.441 Inch Drift ID: 2.347 Inch Metallic Material: L-80 13 Cr Non-Metallic Materials: HNBR (O-Rings) Thread Connection: 2-7/8" VAMTOP Box up x 3.5" VAMTOP Pin down. Release mechanism: Straight pull.
168	Seal Bore Hydraulic Packer for 5.1/2",20-23PPF Csg with ISO 14310/API Spec 11D1 V0 Validation. Specifications of Packer: Work string conveyed, hydraulic-set, retrievable, seal bore production packer. The packer should be designed specifically for high-pressure environment. The packer shall be suitable for following duty conditions: - i. The packer should be designed and validated to ISO 14310 / API Spec 11D1 V0. ii. Casing Size: 139.77 mm (5.1/2") OD x 29.82 - 34.3 Kg. /m (20 – 23 PPF) iii. Setting Depth: 5500 m Maximum iv. Maximum working differential pressure: 704.22 Kg/Sq.Cm.(10000 PSI) from both sides. v. Maximum Temperature at setting depth: 135 Deg.C (275 Deg.F) vi. Service: Sweet Natural Gas, Condensate, Crude Oil and Formation Water. vii. Well Fluid: Format based. viii. Should be suitable for application in Vertical, Deviated & Horizontal well bores. ix. High-Rate Gas wells. x. CO2 Content: #5% xi. H2S Content: Nil The packer shall fulfil following dimensional parameters and material of construction: i. Top connection: VAMTOP BOX, 73 mm (2.7/8") OD, 6.4 ppf tubing thread compatible to be run with 2.7/8" DP /2.7/8" N80/L80 EUE tbg. / 2.7/8" P110 premium connection tbg. & requisite cross overs to be provided. ii. Bottom connection: 2-7/8"6.40 LB/FT [9.52 KG/M] VAM TOP PIN iii. Maximum OD of packer: 4.540" iv. Seal bore ID: 2.400" v. Drift ID: 2.347"

	vi. Material Grade: L-80 13 Cr vii. Elastomer Material: FKM viii. O-Ring Material: FKM ix. Non-elastomer Material: 30% Glass Filled Polyether Ether Ketone (PEEK) x. Burst Pressure: 9,237 PSI [63.68 MPA] xi. Collapse Pressure: 8,775 PSI [60.50 MPA] xii. Tensile Strength: 145 KLB [645 KN] xiii. Validation grade: V0 xiv. Quality grade: Q1 xv. Setting Method: Hydraulic xvi. Retrievable Method: Tension Release (Straight Pull) Common Notes: 1. The bidder shall confirm that the goods, materials to be supplied shall be new, of recent make, of the best quality & workmanship. The manufacturer shall supply completely newly manufactured equipment and shall be guaranteed by the seller for a period of 18 months from the date of dispatch / shipment or 12 months from the date of receipt at destination, whichever is earlier, against defects arising from faulty materials, workmanship, or design. Defective goods/materials or parts notified by OIL to the seller shall be replaced immediately by the seller FOR destination basis including payment of all taxes and duties at seller's expense. This guarantee shall survive and hold good Notwithstanding inspection, payment for and acceptance of the goods. 2. Bidder shall clearly mention the model/part number of the quoted item along with the page number of their product catalogue where the specification of the quoted model / item is mentioned in his product catalogue. Bidder to establish link of quoted item vis-à-vis his catalogue/literature. 3. The Bidder shall submit technical literature along with the quotation which must have the following information: i) Cross Sectional Drawing of the Packer with part number & part list. ii) Details of elastomer of sealing components iii) Dimensional information of the Packer. iv) Specification guide for the quoted model of the Packer. v) Packer setting & releasing mechanism. vi) Redressing procedure of packer 4. The bidder shall confirm that the packer shall be manufactured & tested as per API 11D1 / ISO 14310 Specification as detailed below. i) Design Validation Grade: V0 ii) Quality Grade: Q1 5. A copy of valid API 11D1 / ISO 14310 certificate of the OEM as on original bid closing of the tender shall be submitted with the technical offer. 6. The bidder shall confirm that the Manufacturer's name, Unique Identification Number / Equipment Serial number & OIL's PO no. shall be die-stamped on the body of each packer. 7.The bidder shall confirm that the materials shall be inspected by any of OIL's approved Third-party Inspection Agency (viz. M/S Lloyds or M/S Bureau Veritas or M/S RITES or M/S DNV or M/S IRS or M/S Tuboscope Vecto only) and Third-party inspection report shall be submitted along with supply of the materials. 8. The bidder shall offer duly inspected material by NABL certified lab for further acceptance by TPIA. 9. The bidder shall confirm that the Third-party inspection shall be covering the following aspects to ensure conformance to ISO 14310/API 11D1 Standard (latest edition). - Raw Material Inspection (Metallic & Non-metallic) - Heat Treatment (if any)

	- Dimensions and Qty. - NDE Inspection - Pressure Test - Drift Test - Thread Inspection - Documentation - Any other areas that TPIA deems necessary 10. The bidder shall confirm that the bidder shall submit following documents along with material supply. a. Product data sheet containing all the information as per para 7.2.1 of API 11D1. b. Technical operation manual containing all the information as per para 7.2.2 of API 11D1. c. Product identification: as per para 7.3 of API 11D1. d. OEM's Guarantee certificate for performance at the specified operating conditions. e. Test certificate from the manufacturer for the elastomers. f. TPI reports. 11. The bidder shall provide part list with part numbers of the Redress kit.
169	**Drag Reduction Agents:** “Drag reduction agents (DRA) are pipeline flow improvers used primarily in the oil and gas industry. Friction resistance is the main form of fluid energy loss in pipe transportation. During the transportation of crude oils/ multi petroleum products through pipelines, a tremendous amount of energy is wasted due to frictional pressure loss. This frictional pressure loss decreases overall transmission efficiency of the pipeline system and increases the pipeline operating costs. Drag reducing agents (DRAs) are formulated products that reduce frictional pressure during fluid flow in a conduit or pipeline. DRAs allow increased flow using the same amount of energy or decreased pressure drop for the same flow rate of fluid in pipelines.”

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