OIL & GAS DEVELOPMENT COMPANY LIMITED
PROCUREMENT DEPARTMENT, ISLAMABAD
FOREIGN SECTION C

(To be completed, filled in, signed and stamped by the principal)

ANNEXURE 'A'

Material: SOFTWARE FOR ADVANCED PETROPHYSICAL ANALYSIS ALONG WITH MAINTENANCE & SUPPORT
Tender Enquiry No: PROC–FC/CB/P&P/RMD–3390/2019
Due Date:
Evaluation Criteria: FULL

SCHEDULE OF REQUIREMENT

Sr No	Description	Unit	Quantity	Unit Price (FOB)	Total Price (FOB)	Unit Price FOR	Total Price FOR	Deviated From Tender Spec. If Any
1	Software License for Advanced Petrophysical Analysis	Number	2					
2	Annual Maintenance for One Year	Number	2					

Note:

Note: BIDDER IS ADVISED THAT PAYMENT WILL BE MADE AS PER THE FOREIGN PROCUREMENT PAYMENT TERMS AVAILABLE AT OGDCL WEBSITE (TENDERS TAB) EFFECTIVE FROM FEBRUARY 27, 2018.

1) PURSUANT TO TENDER CLAUSE # 2.2, 11.4, 13 & 35.3.2, BID BOND AMOUNTING TO USD 4,000/- OR EQUIVALENT TO PAK RUPEES MUST BE SUBMITTED WITH THE TECHNICAL BID AND VALID FOR 150 DAYS FROM THE DATE OF OPENING OF THE BID.
2) **TERMS AND CONDITIONS:** BIDDER IS ADVISED TO CAREFULLY READ ALL THE TERMS AND CONDITIONS OF THE TENDER DOCUMENT AVAILABLE AT OGDCL WEBSITE IN THE MASTER TENDER DOCUMENT.
3) **TOR:** THE ATTACHED TOR (10 PAGES) IS INTEGRAL PART OF SOR.

TERMS OF REFERENCE (TOR)

FOR

PROCUREMENT OF
ADVANCED PETROPHYSICAL INTERPRETATION SOFTWARE LICENSES ALONGWITH MAINTENANCE & SUPPORT

FOR

PETROPHYSICAL/WORKOVER & EOR DIVISION (RMD)

Table of Contents:

1. Objective:

M/s OGDCL Reservoir Management Department intends to procure Advanced Petrophysical/Log Interpretation software licenses (all inclusive modules) along with Maintenance and full time local in-house support services with comprehensive data processing functionalities to meet the ongoing RMD Petrophysical/Workover & EOR division requirements.

2. Software Requirement:

The specifications for Advanced Petrophysical/Log Analysis Interpretation software and its M&SS are as follows:

- The software language should be English only and there must not be any grammatical / spelling mistake in the whole software.
- M/s OGDCL intends to purchase **02 software licenses**, afterwards OGDCL shall become the owner of the intellectual property without paying any extra fee/charges.
- Petrophysical/Log Analysis Interpretation software version should be the latest available.
- Software updates, upgrades and modifications will be sent to OGDCL via any convenient, fast and reliable media, to upload by bidder's technical team accordingly.
- Any fault, bug in software reported should be rectified within 48 hours.
- Provide details/resume of in-house support Geo-Scientist/Engineer.
- Initial term of M&SS contract will be for **03 years** and can be extendable further with mutual consent.
- The bidder shall be able to provide M&SS throughout the contract period onsite (locally) and online as well (internationally even when required).
- The M&SS rates (for all modules, etc.) shall be quoted in tabular form and shall remain same for the whole period of contract.
- In case of award of contract, the vendor will have to provide project workflows.
- M&SS start date will be set as the date of signing of agreement after installation of software on hardware.
- Bug fixes, patch, new version and updates, should be installed as they become available, free of cost during M&SS contract period.

The software program should contain all but not limited to as undermentioned Open Hole Wireline/LWD/MWD/Cased hole/Mud logs and RCA/SCAL data processing and interpretation functions:

1- Digital Petrophysical Database
2- Data import/Export in all industry standard format
3- Data view composite plots/cross section printing
4- 2D and 3D cross plots single to multiwall include all the vendors
5- Mathematical function/Petrophysical calculators/Basic programing
6- Petrophysical data Editing/Normalization/Depth shifting
7- Data environmental corrections includes all the vendors
8- Basic and Multi mineral deterministic Petrophysical evaluation
9- Advanced Probabilistic/Stochastic Petrophysical evaluation
10- Reservoir cut off summary reports generation
11- Petrophysical uncertainty analysis Monte Carlo
12- Multi well Structure/Stratigraphic correlation panels generation
13- Unconventional shale gas TOC calculation
14- Nuclear Magnetic resonance (NMR data processing and interpretation)
15- Advanced Sonic data processing/interpretation (Mono pole and Dipole, Dispersion, Stoneley)
16- Bore Hole geological image processing / interpretation all vendors
17- RCA/SCAL data processing/ saturation height function core and logs based function.
18- Log based Rock physics modules
19- Bore hole Geo-Mechanic
20- Cased hole saturation evaluation/CBL evaluation
21- Formation Pressure Test data analysis
22- Litho facies, rock class /Rock typing by statistical methods using log and core data

3. Technical & Financial Evaluation Criteria

Technical and Financial evaluation criteria (undermentioned) has been set to qualify for the tender. For final bid evaluation, 70% weightage will be given for technical evaluation and 30% for financial evaluation. The lowest bidder will attain the maximum points in financial evaluation and others would be ranked on sliding scale. The points obtained in technical evaluation and financial evaluation will then be combined and the contract will be awarded to the bidder obtaining maximum points.

4. Technical Evaluation

- The Technical evaluation will be based on the criteria under mentioned in Technical Evaluation table. The potential bidders are required to strictly follow the sequence of Technical Evaluation Criteria Table and submit their proposals accordingly.

- With respect to TEC Table; in Description of Technical Terms, bidder's software must fulfill/score for all terms to qualify other than "Any additional valuable Features" terms. Else the bidder will be declared as technically non-responsive.
- With respect to TEC Table; in Description of General Terms full marks each in A and B Terms respectively are required for scoring, else the bidder will be declared as technically non responsive and its financial proposal will not be opened. The qualifying marks in Technical Evaluation are therefore 90 points.

Sr. No.	Description of General Terms	Does the function exist? Type "Y" for Yes and "N" for No	Marks Allocated (10)	Marks Obtained	Total Marks Scored
A	Full time in-house software support service for contract period.		**05**		
B	Comprehensive 3-4 weeks training/ technical support for understanding, handling and processing of advanced modules for a team of 5-6 Geoscientists by well experienced global domain experts.		**05**		

Sr. No.	Modules/ Functions	Required Specification	Description of Technical Terms	Y/N	Marks Allocated (90)	Marks Obtained	Total Marks Scored
1	**Project Management**	Connection/ Integration with external databases	Petrel, TechLog, Openworks Database, DecisionSpace Geoscience database, Paradigm Geolog Database, Shell Logic Database, ODM Database, Read/Write Via Openspirit.		5		
		Other	Direct Well transfer (all well objects) from one project to another.				
			Autosave, Project Folder Access from within Project.				
			Multi User, Multi Well capability in all types of projects.				
2	**Data Loading & Data Management Capability**	External Files Import, Export/ Direct Data access from external databases	LAS (1.2, 2.0, 3.0), Single line, Multiple line, Multiple Las Batch Load, LIS, DLIS (Single, Batch Load), ASCII (Single, Batch Load), DBASE, Spread/Sheet Interval Loader, Capillary Pressure Data Loader, Well Attributes ASCII Loader, Formation Testing Data in LAS/LIS/DLIS, Picture Curves (Image Referencing while loading), Zones/Tops/Picks/Core data Loading, Capability to load selected wells from project into memory.		10		
		Data Management	Separate Manager for each data object, Well list for Wells, Single, Multi Well Header (For Well Header Management), Single, Multi Well Curve Set (For Curve Set Management), Single, Multi Well Curve header (For Curve header & Curve Management), Single, Multi Well Zones/Tops/Picks (For Zones/Tops/Picks Management), Curve listing for Drag & Drop, Delete curve, Transfer/Copy curves from Well to Well within project, Curve spreadsheet display & editing.				
3	**Data Visualization and Plotting Capability**	Log Plots	Plot range editor, Automatic Data History management. Keeps record of each well its curve, its creation date, time, user, module from which it is created, module/process from which it is updated etc., Predefined and Custom Log Plots.		10		
		Well Diagram & Schematics	Horizontal Log plots, Custom log plots save & load, Set custom log plots to default, Well Diagram log plot and 3D plot, Well Diagram curve filling, Well Diagram cross section view				
		Histogram	Single, Multi Well Histogram along with all statistical parameters display, Single, Multi Well Interactive Histogram/Curve Normalization,				

		Cross plots/ Statistical Plots	Single, Multi Well Cross plot with capability of plotting four variables in single cross plot, Single, Multi Well 3D cross plots, All vendors templates overlay in 2D & 3D Cross plots, Regression capability in cross plots, Cross plot Frequency display, Cross plot with Histogram for each curve, Polygon based area selection from cross plots.				
		Ternary Plots	Numeric/Text curves from polygon on cross plots, Multi curve cross plots, Single, Multi Well Ternary Plots.				
		Star Plots	Polygon based area selection from Ternary Plots, Numeric/Text curves from polygon on Ternary Plots, Single, Multi Well Star plots along with statistical display.				
		Box Plots	Star plot grouping on the basis of zones, wells, facies, depth etc, Single, Multi Well Spectral plots along with statistical display.				
		Well Map viewer/ Base Map	Single, Multi Well Box plots along with statistical display, Box plot grouping on the basis of zones, wells, facies, depth etc., Well map view with boundaries, Shape file, .Dat file support, Deviated well display on map, Interactive well selection from map, Well map based find capability, Well selection on user defined map area.				
		3D Parameter Viewer	Direct well list from map, Well properties from well map, 3D Map viewer for multi well parameter viewing				
		3D Borehole Display	Supports Curves, Zones, Properties, Parameter 3D Display, Capability to display well path, along with grid, Contour.				
		Image Analysis Plots	3D Borehole display for image logs, 3D Borehole display for well diagram/schematic, Image tool plots, Static, Dynamic, both Dip Picking Plot, Auto Dip Picking Plot, 360 Picture only Plot, Wellbore Cross Plots with capability to display in Log Plots, Dip Polar Plots, Walkout Plots, Cumulative Plots, Scatter Plots.				
4	**Data Editing/ Manipulation**	Curve Editing	Stereo net Plots, Image Histogram Plot, Interactive Curve Edit Point based, Stream based, Value based, Interactive Baseline Editing, Interactive Trend/Square curve picking & editing, Auto trend curve computation, Array		5		

			curve, point curve, text curve interactive editing, Array curve, point curve, text curve spreadsheet editing, Curve Filtering, Array curve averaging, Graphical editing.				
		Depth Shifting	Curve rescaling, Curve data gap filling (Point curves to continuous curve), Single, Multi curve depth shifts, Interactive Bulk Depth Shift.				
		Curve Splicing	Interactive Stretch & Squeeze Depth Shift, Automatic Depth Offset curve computation, Single, Multi Curve splicing.				
		Array Curve Editing	Interactive Curve splicing, Manual Curve splicing, Array Image data editing, Array to curve computation, Curve to array computation, Electrical, Acoustic Image generation from Array Curve.				
5	**Pre-Calculation/ Pre-Processing**	Basic Log Functions	Single line user formula, Multi line user formula, Gradient/Point based Temperature Curve computation, Gradient/Point based Pressure Curve computation, Resistivity of water from SP log, Standalone Porosity Computation, Standalone Matrix Computation, Standalone Rwa Computation, Standalone Sw Computation, Standalone Permeability Computation, Standalone Curve Derivation, Standalone Curve Integration, Standalone Velocity, Conductivity, Volumetric Cross Section Computation, Standalone Horner Plot, Standalone NMR Fluids Computation, True Vertical Depth Computation from Deviation Survey, True vertical & True Stratigraphic Thickness Computation, Numeric to Text & Text to Numeric Conversion, Coordinates Management, All vendors environment corrections.		10		
6	**Interpretation**	Quick Log Analysis	V-Shale, Porosity (total & effective), Saturation, Permeability, Reservoir Summary Report, Borehole Computations, Lithology Computation.		10		
		Deterministic Petrophysics	Basic to Multi Mineral Petrophysical Evaluation, Multiple Sw Equation, Reservoir Summary Report.				
7		Advance Multi Mineral Solver	Probabilistic Petrophysical Evaluation.		10		

	Advanced Interpretation	Monte Carlo Simulation/ Uncertainty Analysis	Sensitivity Analysis for Sw computation and other petrophysical estimation i.e. reservoir summary, CPI parameters.				
		Curve Predication	Statistical Methods.				
		Cluster Analysis/Facies Prediction	Multiple Linear Regression, Neural Network, Cluster Analysis, SOM (Self Organizing Maps),Principal Component Analysis, Contingency Table for facies comparison.				
		Rock Physics	Fluid Substitution Analysis, Laminated Fluid Substitution Analysis, Elastic Impedance and Time Depth Curve.				
		Geomechanics	1D & 2D Modelling, Dynamic Elastic Moduli, Well bore stability, Pore Pressure Computation, Brittleness Index, Fracture Gradient, Overburden & horizontal stress computations.				
8	**Production Engineering**	Cased Hole Analysis	Cement & Pipe Evaluation, PLT Processing & Interpretation.		4		
			Sigma Sw Analysis, Sigma Time Lapse Analysis.				
9	**Core Data**	Data loading/ Management	Digital image and spread sheet, ASCII LAS , Geological description, facies etc.		5		
		RCA/SCAL/EOR	All industry standard correction on RCA and SCAL data.				
		Thin sections/ Sedimentology	Geolocal description/facies classification Text to Numeric.				
10	**Reservoir Engineering**	Capillary Pressure (SCAL) Data Interpretation	Saturation Height Modelling Core and Log based all industry regression methods, functions i.e. J-fun, Thomeer, Skilet, Cuddy.		3		
		Hydraulic Flow Units	Rock Type Classification, RQI, Pittman, winland etc.				
		Formation Testing Analysis	RFT, MDT, Fluid Contact Analysis.				
11	**Acoustic Waveform Processing**	Sonic Processing	Acoustic Waveform processing and diagnostics enables the user to process Acoustic Waveform data to determine Compressional, Shear, Stoneley, Flexural, and Quadrupole wave slowness as well as calculate Cross-Dipole Anisotropy. The module uses semblance processing to generate correlograms which can then be displayed as variable-density log (VDL) and interactively picked to identify the various components of the waveform.		5		

12	**NMR Interpretation**	NMR data Normalization, Calibration & Interpretation	Processing to Interpretation.		3		
13	**Image Analysis**	Image data loading	All Vendors corrections, Speed correction, Gap Filling, Gain, Navigation QC.		5		
		Image Processing	Static & Dynamic				
		Image Interpretation	Predefined and custom tool definitions, Autodip picking, Fracture/faults, dips, bedding, textural Analysis.				
14	**Unconventional**	Unconventional Reservoir Evaluation	TOC Estimation using logs & core methods.		5		
		Rock Mechanics	The Unconventional option is used for quick computations, and to assist selection of input parameters for the other modules in the Unconventional Resources Suite.				

5. Financial Evaluation

Bidder shall quote for software license cost along with M&SS in the following format:

Description	Qty.	License Purchase Price (in US$)	01 Year Maintenance & In-house Local Support Service Price (in US$)	03 Years Maintenance & In-house Local Support Services Price (in US$)
Advanced Petrophysical Interpretation Software	2			
Total Price of 02 Licenses and 03 Years Maintenance & In-house Local Support Services:	-			

6. General Terms & Conditions:

- The bidder should impart a comprehensive 3-4 weeks training/support for understanding, handling and processing of advanced modules for a team of 5-6 Geoscientists by well experienced global domain experts, covering data processing and interpretation of (Deterministic and probabilistic log analysis, Nuclear Magnetic Resonance, Borehole Formation imaging (Electrical & Acoustics tools), Rock typing and

Saturation Height Function (RCA & SCAL), Sonic wave processing (Anisotropy, Dispersion, Fracture, Stress and Geo mechanics), Unconventional Shale and tight gas evaluation.

- Bidder should have international foot prints including R&D centers, existing global clients base and global technical support structure.
- In-house support Geo-Scientist/Engineer must have atleast 4-6 year's experience of petrophysical interpretation software.

7. Financial Proposal & Strength

- Financial proposal of Advanced Petrophysical Interpretation Software Procurement and Maintenance & Support shall be inclusive of all applicable taxes, duties and levies, except Provincial/ICT Sales Tax on services. The prices shall be quoted in US$ and shall be inclusive of all applicable taxes, duties and levies, except Provisional/ICT sales tax on services.
- Bidders must have turnover of over US $ 10 million annually. The Company shall provide copies of its Audited, Consolidated Financial Statements.
- Bidder shall provide the pricing details as mentioned in Table under Sr. No. 5, however, payment of Maintenance & In-House Local Support Service will be made yearly.

8. Timing

The bidder should deliver the product within one month after signing of contract.