

**CLARIFICATION#2 AGAINST TENDER # PROC-SERVICES/CB/EXPL-4979/2021– HIRING OF SERVICES FOR A GEOCHEMICAL EVALUATION OF THE PETROLEUM SYSTEMS OF KOHAT-POTWAR FOLD BELTS, UPPER INDUS BASIN, PAKISTAN**

Following Clarifications have been made in the subject tender.

Sr#	Questions for Clarification	OGDCL Reply
	<b><u>Phase I</u></b>	
1	Please specify which data base format are suitable to load to OGDCL machines.	An appropriate Data base format will be decided in later stage to load data to OGDCL machines.
2	Are the TOCs measured with other methods as well? (e.g., TOC-LECO Analyzer?)	Available TOC data are from LECO and ROCK EVAL Machine
3	Can you please provide details on the type of data to be expected under “Oil analytical data”?	Oil analytical data” are the distillation products along with oil physical properties i.e. gravity, viscosity, Hydrogen sulfide, salt and water content, R. Index, RVP, Pour point etc.
4	Can you please provide details on the type of data to be expected under “Well report”?	“Well report” include End of well reports/completion reports having details on stratigraphy, lithology, testing and etc.
5	Is there any log data in raw format (not PDF) available?	Log data in raw format will not be available for this study.
6	Are any of the GC and GCMS data available in raw format (original run file from the analytical instrument) or only as numerical values in tables and graphs (excel and/or pdf)?	The GC and GCMS data is not available in raw format. Only graphs and numerical values.
7	Are there any rock (cores, side wall cores, cuttings) and fluid samples available for additional analyses or will all the new analysis require new sampling? Can the list of available rock and fluid samples be shared with the consultant during Phase I?	For additional analyses, Well cuttings are available while outcrops, oil seeps, and oil and gas samples will be collected as per requirement.
	<b><u>Phase II</u></b>	
8	Please confirm that for organic petrographic analysis only vitrinite reflectance measurements are included (hence excluding visual kerogen general assessment).	Visual kerogen analysis (VKA) is the part of VR and is included.
9	Can any additional analysis be proposed (as optional) in the lab work section? Should these be added to the existing table or as a separate table?	Yes, any additional analysis can be proposed (as optional) in the lab work section as a separate table.
10	Do OGDCL plan to include pressurized samples collection? Please note that	Oil and gas samples will be collected from well heads.

	pressurized sample bottles require handling by trained personnel.	
11	As part of the lab analysis, for Gas Samples: please confirm that item #26 "Isotopic analysis of sulfur" is expected to be measured on H <sub>2</sub> S. Is this measurement expected to be performed on pressurized gas samples?	Sulfur is available in elemental and H <sub>2</sub> S forms. Objective is to know the origin and genesis of H <sub>2</sub> S in a part of the basin. H <sub>2</sub> S will be collected from well head
12	What is the expected H <sub>2</sub> S level? What is the expected reservoir pressure? Depending on the pressure and H <sub>2</sub> S level different type of metallurgy need to be considered for sample containers.	H <sub>2</sub> S level varies up to 12 mol%.
	<b><u>Phase III</u></b>	
13	Please explain if the phrase as stated in tender (section 3.3 b, p. 4) is correct - "1D OR multi-layer map-based BPSM". A fully coupled 3D BPSM will model – as requested in the tender – "Generated and expelled volume and nature of hydrocarbons (per square kilometer)". A modelling approach solely based on 1D models can be used to assess the generation potential of source rocks at well and pseudo-well locations but will not be able to model hydrocarbon quality or quantity. A coupled approach with 1D BPSM AND multi map-based modelling would be possible, assuming that "multi map-based modelling" refers to 3D BPSM. Is that what the OGDCL is asking for? If not, could you please further specify the modelling approach that is suggested?	1D <b>OR</b> multi-layer map-based BPSM" is required to assess the level of thermal maturity and nature of hydrocarbons i.e. oil vs gas depending on the organofacies and maturity, and to establish the relationship between generated (in kitchen) and discovered (in reservoir) HCs Further to confirm the hydrocarbon kitchens i.e. local vs. basinal. To address and calculate the resource potential of hydrocarbons for the whole area is not required, however based on 1D <b>OR</b> multi-layer map-based BPSM, generated and expelled volume (per square kilometer) and nature of hydrocarbons at 1D locations shall be modelled/calculated.
14	Could you please clarify the amount of structural complexity of the area? Can this area be modelled without taking any structural restoration methods into account?	Main objective is to model the present day/recent kitchens, so structural restoration may not be needed.
15	How many source rocks are to be expected?	This will be the outcome of the study.
16	How many reservoir levels are to be expected?	Reservoirs varies laterally in the study area. Overall production is coming from 15 reservoirs ranging in depth from 2000 to 5500m
17	Can you please provide a base map displaying the location of 2D/3D seismic surveys and any additional information regarding seismic lines/volumes (location, status /interpreted, depth converted, etc./). <u>This information is essential to preparing an offer for Phase III.</u>	Seismic base map along with required data will be provided to successful bidder if required.
18	Regarding BHT, are all the necessary recordings incorporated in the log headers for (Horner) corrections (BHT measurements, circulation time, time	Regarding BHT, Log headers with required information are available.

	since circulation)?	
	<b><u>T&amp;C</u></b>	
19	Regarding the mention “Consultant will provide (if required) the bottles/ampules/tubes for collection and shipment of oil and gas samples”, please specify if the cost of any bottles/ampules/tubes or sample containers and their handling and/or shipment in general should be included in the financial bid.	The required bottles /ampules / tubes along with sampling kit and required accessories will be shipped/imported by the contractor and will be delivered on OGDCL’s designated location in Islamabad. Import clearance of bottles /ampules / tubes will be the responsibility of the contractor. Price/charges (if any) of bottles /ampules / tubes and their transportation will be included in the financial quote in the pricing of samples analyses/tests, and shall not be quoted and claimed separately in the financial bid.