

CLARIFICATION#5 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
1	The TOR explains that during Phase I the bidder will add to the database and interpret some amount of geochemical data that previously were published in journal articles. Is the published geochemical data in addition to the kind and amount of data identified elsewhere in the table on pp. 4-5 – or does that table already include the amount and kind of geochemical data that were published in articles?	As described in the TOR, the contractor will extract and add all legacy and published data in the database, and also will interpret the same. Published data is separate data belonging to the wells of the same area.
2	Does OGDCL require the bidder to create the geochemical database using a specific format: e.g., Excel; Access; GWIS?	Yes, a proper database will be required to place all the data in integrated form. Same data will be exported to load on the OGDCL machine.
3	On what kind of natural gas samples were the compositional and C isotopic data measured: i.e., produced gas samples or mud-gas samples?	These data belong to produced gas samples.
4	Does any PVT data have to be added to the database? Geochemists typically utilize only certain kinds of PVT data: e.g., formation pressure; saturation pressure; single-stage flash GOR; API gravity of the HC liquid phase; molecular composition of the gas phase; viscosity.	Yes, PVT data (e.g., formation pressure; saturation pressure; single-stage flash GOR; API gravity of the HC liquid phase; molecular composition of the gas phase; viscosity) have to be added to the database.
5	1D basin models do not produce maps of migration pathways or HC accumulations. They only show the timing and volume of oil and natural gas generated and expelled at single points (in units of mg HC/g TOC). Those HC generation and expulsion volumes can be converted to surface volumes (bbl/sq. km) if the bulk rock density, gas density, and oil density are known. Will OGDCL provide the data required to calculate HC generation and expulsion volumes in bbl/sq. km?	1D basin models are 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. regional. To produce maps of migration pathways may not be required, however based on 1D models, generated and expelled volume (per square kilometer) and nature of hydrocarbons at 1D locations shall be modelled/calculated. OGDCL will provide the required information.
6	Will OGDCL provide other kinds of geological information required to perform the 1D HC charge modeling: e.g., stratigraphic columns with age-depth pairs for formation tops at pseudo-well locations; the lithology of each formation; present-day mean	Yes, OGDCL will provide the required data.

	temperature, bottom-hole temperature, and surface elevation at pseudo-well locations; the thickness of thrust sheets and the time when they were emplaced?	
7	The effects of stacked or imbricate thrust sheets on source-rock maturity are not easily modeled using 1D modeling software. The timing of HC generation will depend on the timing of the emplacement of a single thrust sheet (unless a single package containing imbricate thrust faults is used). Is this scheme adequate?	Main objective is to model the present day/recent kitchens which may not have multiple thrust sheets.
8	Can OGDCL provide a digital copy of any of the references listed on page 15 if they are difficult for the bidder to acquire?	OGDCL will provide soft copies if required in scanned or pdf format.
9	Clarify the nature of the 2-week online workshop during Phase III. Will that workshop be a training course that includes lectures explaining important geochemical principles, and practical exercises that involve interpreting geochemical data measured on source-rock samples, oil seeps, oil/condensate samples, and natural gas samples? Or will it be a different kind of workshop?	This will be the participation of OGDCL professionals as counterparts to share the local knowledge and discuss the findings and workflows implemented in the study. In case of virtual, the consultant will present and discuss the progress fortnightly or so to keep counterparts onboard.