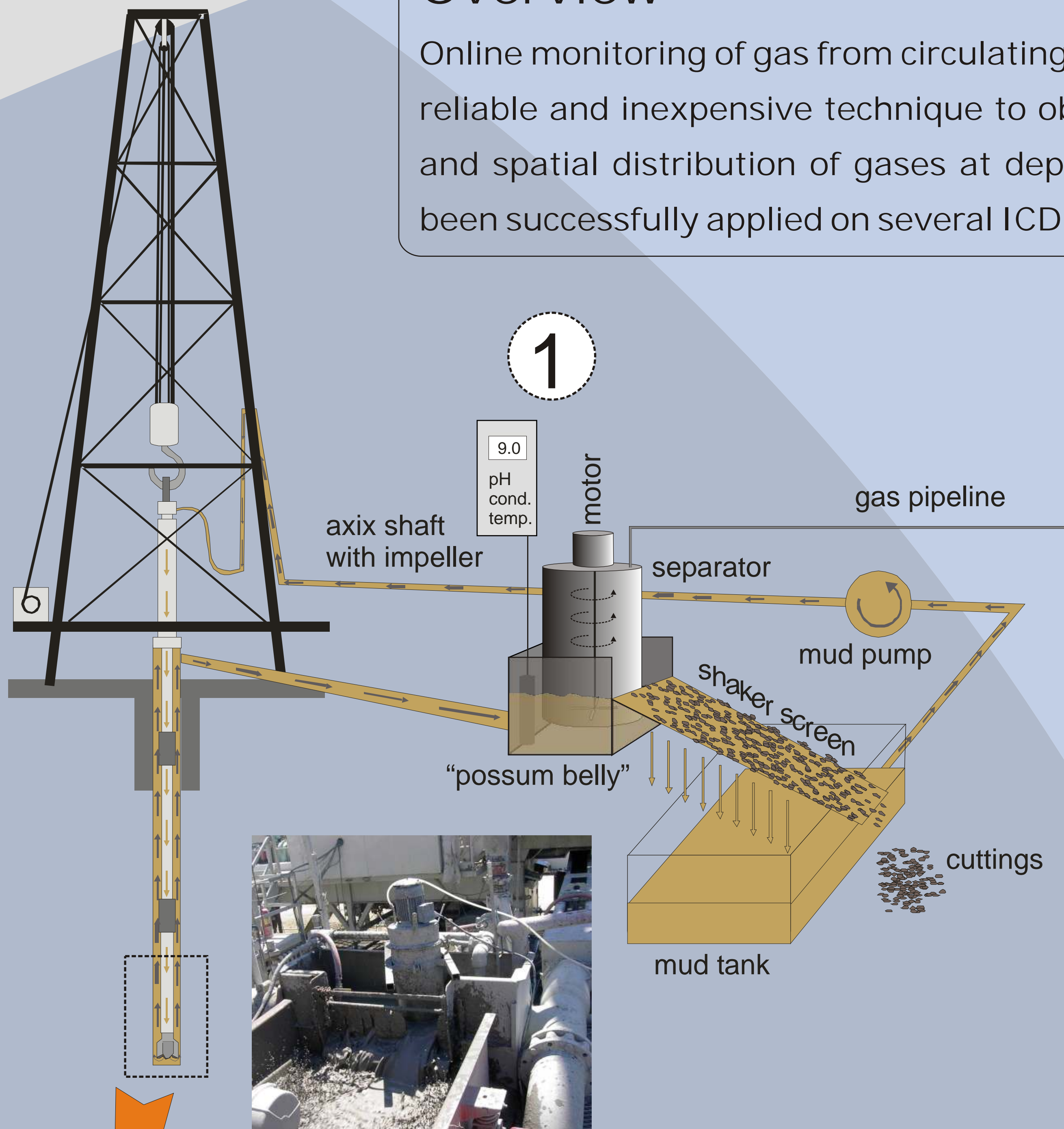


Online Gas Monitoring of Drilling Mud

Overview

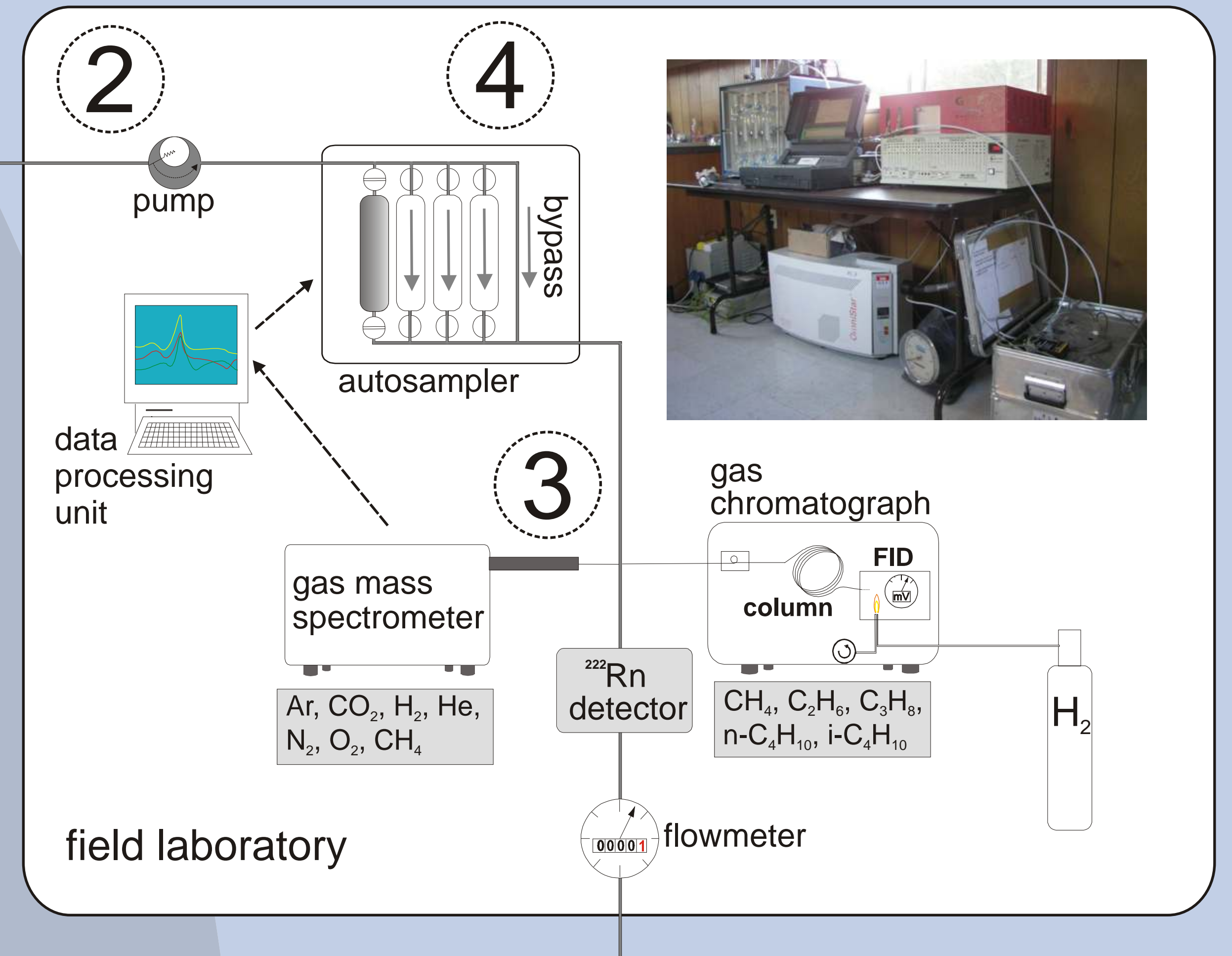
Online monitoring of gas from circulating drilling mud has been proven being a reliable and inexpensive technique to obtain information on the composition and spatial distribution of gases at depth-in real time [1]. The method had been successfully applied on several ICDP drilling projects and IODP Exp. 319.



Experimental Setup

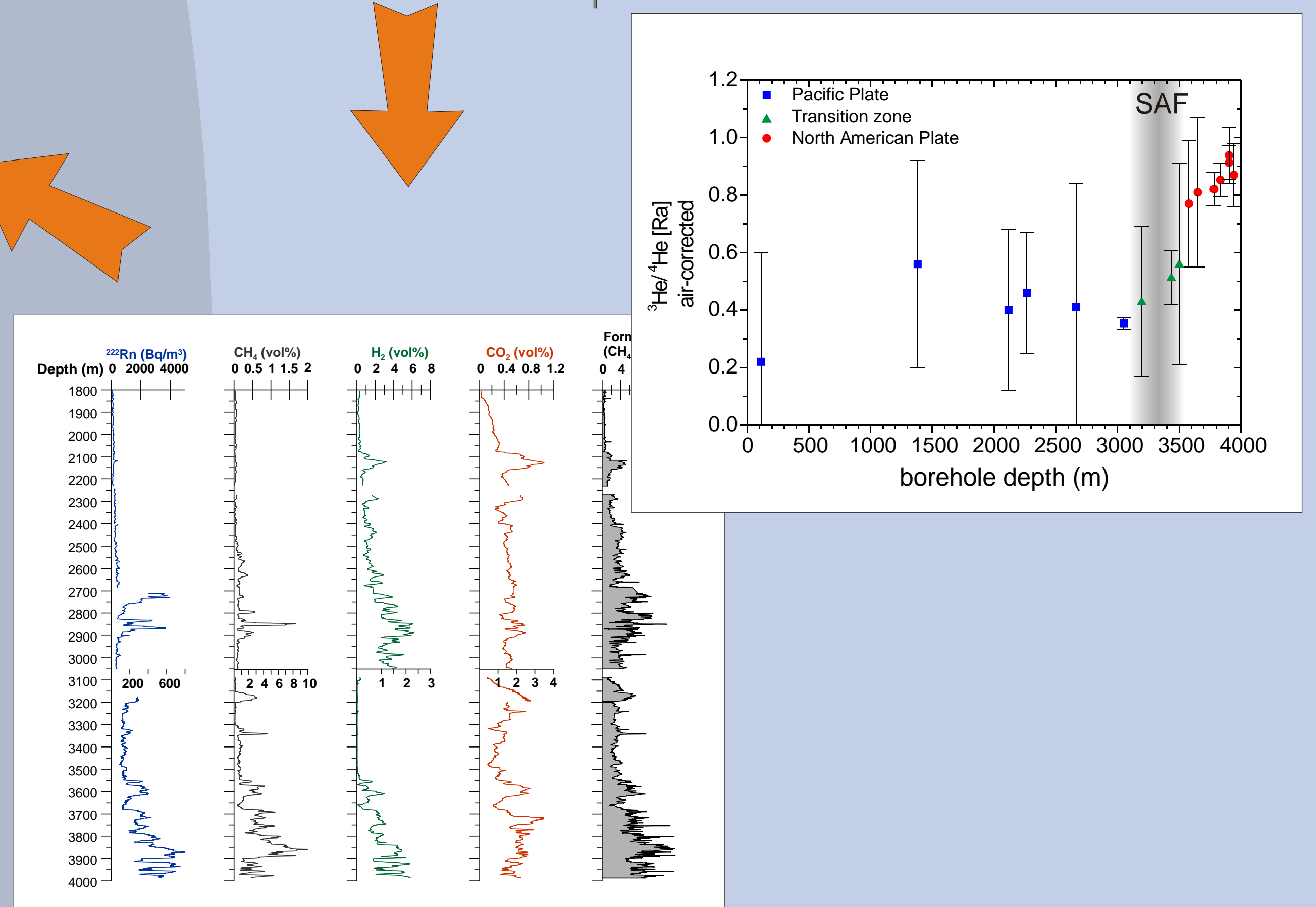
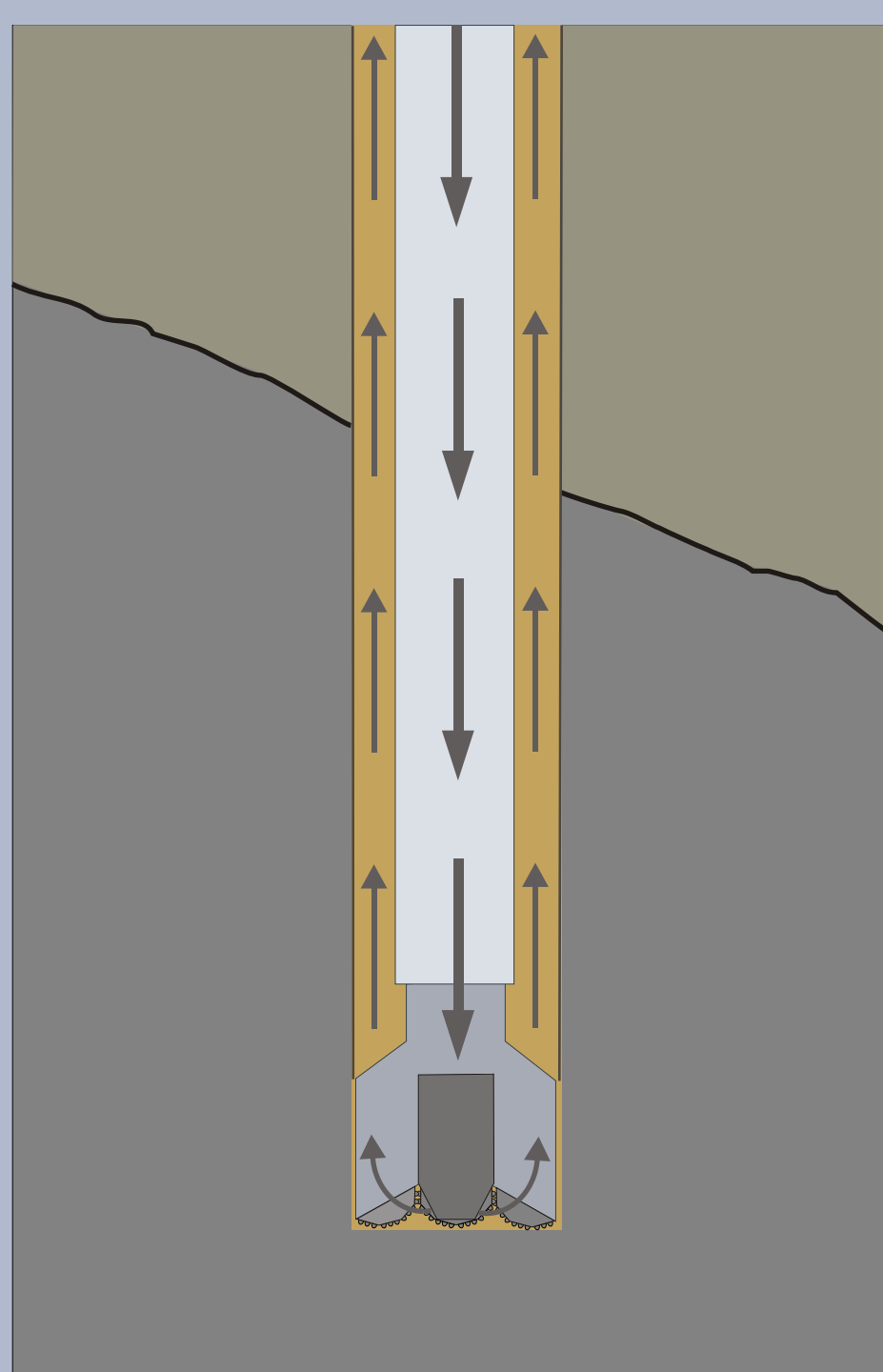
For online drilling mud gas analysis, the dissolved gas is

- 1 continuously extracted from returning drilling mud in an airtight gas-water separator located at the "possum belly",
- 2 pumped in a field laboratory nearby the shale shakers,
- 3 automatically analysed for its composition (CO_2 , N_2 , H_2 , O_2 , He , Ar , CH_4 , C_2H_6 , C_3H_8 , $i/n\text{-C}_4\text{H}_{10}$, and ^{222}Rn) in real-time, and
- 4 automatically sampled for further studies (stable isotopes, noble gases).



Outcome

- Online drilling mud gas monitoring is suitable to detect fluid-bearing horizons, shear zones, open fractures, sections of enhanced permeability and methane hydrate occurrences in the subsurface of fault zones [3, 4, 6], volcanoes [5], geothermal and permafrost areas [2], and others.
- Off-site isotope studies on mud gas samples help reveal the origin, evolution, and migration mechanisms of deep-seated fluids [4].
- It also has important application to aiding decisions if and at what depth rock or fluid samples should be taken or formation testing should be performed.



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