



Ecological catastrophes caused by the thermal pollution of the lithosphere during the oil and gas development

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In this report the author raises the following questions to be answered through the analysis of old and new temperature survey data: (1) How to evaluate thermal pollution of the lithosphere caused by the oil and gas development? (2) Does thermal pollution of the earth surface also take place along with the pollution of rocks? (3) How long do any changes in thermal regime remain in the earth's crust after the production or injection is stopped? (4) What the consequences will we bear as a result of such a drastically changing distribution of temperature (T) and thermal gradients that have been recorded? All production and injection wells are the source of thermal pollution of the lithosphere, underground hydrosphere and, as a consequence, atmosphere. Intensive fluid and gas withdrawal or injection of water changes natural distribution of temperatures throughout the geological section up to the daylight surface. At first sight, thermal pollution of lithosphere seems none of a catastrophe. However, temperature logging data, analyzed by the author, show that changes in thermal regime of the earth's crust during the development of oil and gas fields in some regions can under certain conditions produce disastrous effects. These consequences may include (1) the temperature changes of the near-surface strata and the corresponding impact on the flora, fauna and climate; (2) propagation of thermal pollution by underground fluids to great distances; (3) a great range of T changes up to 60 C in some regions that remain over long periods after the well operations are stopped. We may hope that the total effect of the thermal pollution will not be great enough to significantly change the climate above and below the surface, but this destructive phenomenon does exist and must be taken into consideration for the prevention of ecocatastrophes in future.