

Recommendations for Environmental Impact Assessment of Geothermal Projects on Mature Oil Fields

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Abstract : This paper analyses possible geothermal energy production from a mature oil reservoir based on exploitation of underlying aquifer thermal energy for the purpose of heating public buildings. Research was conducted based on the case study of the City of Ivanic-Grad public buildings energy demand and Ivanic oil field that is situated in the same area. Since the City of Ivanic is one of the few cities in the EU where hydrocarbon exploitation has been taking place for decades almost entirely in urban area, decommissioning of oil wells is inevitable; therefore, the research goal was to investigate how to extend the life-time of the reservoir by exploiting geothermal brine beneath the oil reservoir in an environmental friendly manner. This kind of a project is extremely complex in all segments, from documentation preparation, implementation of technological solutions, and providing ecological measures for environmentally acceptable geothermal energy production and utilization. New mining activities that will be needed for the development of geothermal project at the observed Hydrocarbon Exploitation Field Ivanic will be carried out in order to prepare wells for increasing geothermal brine production. These operations involve the conversion of existing wells (well completion for conversion of the observation wells to production ones) along with workover activities, installation of new heat exchangers, and pipelines. Since the wells are in the urban area of the City of Ivanic-Grad in high density populated area, the inhabitants will be exposed to the different environmental impacts during preparation phase of the project. For the purpose of performing workovers, it will be necessary to secure access to wellheads of existing wells. This paper gives guidelines for describing potential impacts on environment components that could occur during geothermal production preparation on existing mature oil field, recommends possible protection measures to mitigate these impacts, and gives recommendations for environmental monitoring.

Keywords : geothermal energy production, mature oil field, environmental impact assessment, underlying aquifer thermal energy

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