

## **PROBLEMS OF MONITORING EXISTING OIL WELLS OF WESTERN UKRAINE**

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The territory of Ukraine has a large number of wells, as the history of hydrocarbon production dates back to XVI - XVII centuries. The western region of Ukraine is represented by several oil and gas regions: Lviv, Ivano-Frankivsk, Chernivtsi and Zakarpattia regions, which has a total of 91 deposits. Special attention in Western Ukraine should be paid to the Boryslav oil and gas field, which began to be developed in 1854.

Since the oil was in layers at a depth of only tens, or sometimes about hundreds of meters, the production was conducted through primitive oil wells - pits. In those years in Boryslav there were about 5 thousand such pits with a depth of 35-40 m. In 1870, oil production in Boryslav reached 10.6 thousand tons. There were about 800 small businesses, which employed almost 10 thousand workers [1]. Foreign firms from the USA, Canada, Belgium, France, Germany for the purpose of enrichment carried out exhaustive exploitation of deposits, respectively, without paying attention to labor protection, care of the environment and ignoring keeping records of wells in the documentation. Thus chaotically there were all new places of oil production and in a terrible state remained abandoned primitive wells.

After 1939, the industrial enterprises of the oil and gas and ozokerite industry were nationalized and subordinated to the Ukrnaftovydobutok trust (management in Boryslav). In the 1950s, all enterprises in the industry joined the association "Ukrnafta». Since then, a clear register of existing wells has been maintained. Cartographic materials show the locations of wells and existing technological equipment, but the condition of such paper media does not always satisfy the image quality. To reduce industry risks, GIS and assistive technologies with unlimited use and flawless programs should be used. The oil and gas industry is based on data that make up 80% of spatial parameters and uses spatial information at every stage of the life cycle, from analysis and study of prospects, evaluation and production, to the completion phase.

Currently, the situation in the region is not easy. A long period of time, when the Boryslav oil field was depleted without proper responsible operation, led to an environmental problem, environmental pollution. The main cause of environmental problems are natural and man-made geochemical anomalies caused by the increased content of hydrocarbon gases in the soil layer, resulting in the accumulation of significant amounts of hydrocarbon gases in some basements of residential buildings and other structures, which leads to dangerous situations. [2]. There are closed (not currently operated) oil and gas wells left without proper protection on the territory, which carry a special danger. This is another good reason to monitor and control

existing wells (operated or canned), and to identify abandoned wells. Management of 3D-GIS facilities helps to accurately monitor related environmental changes in near real time for health, safety and the environment and to respond quickly to emergencies during the uncontrolled accumulation of hydrocarbons with the subsequent occurrence of possible emergencies. Digital mapping minimizes risks and increases return on investment. The integration of spatial databases into existing oil and gas sector systems uses state-of-the-art software specialized in the industry with tools and models to obtain a wide range of information databases. Fig. 2 shows the GlobalEnergyMapper oil and gas spatial data tool.

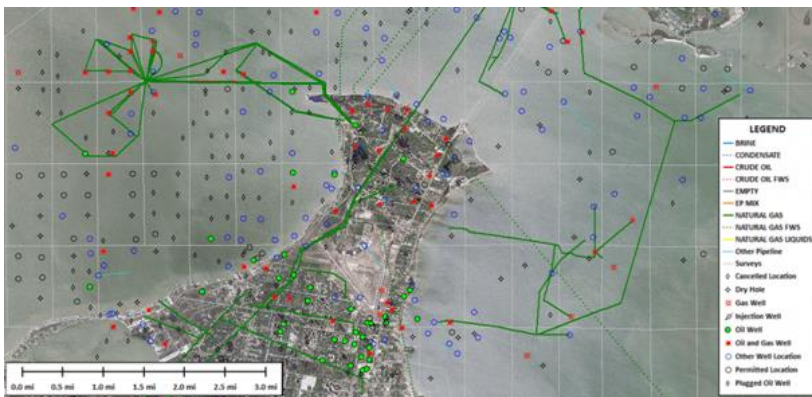


Fig. 1.GlobalEnergyMapper - spatial data tool of the oil and gas industry

Currently, at the level of responsible enterprises operating the field, these problems are being addressed. They involve high-tech equipment and manpower to update information on existing technological equipment and use modern software to compile new cartographic materials. It would be worthwhile at the level of local councils and communities, and possibly the top leadership of the state, to pay more attention to the solution of this problem and in similar regions to attract more resources to address the issue.

The paper discusses the need to monitor wells in problem areas, where oil production has been carried out by various companies for many years and currently there is no clear picture of accounting for wells of the old fund.

#### References:

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