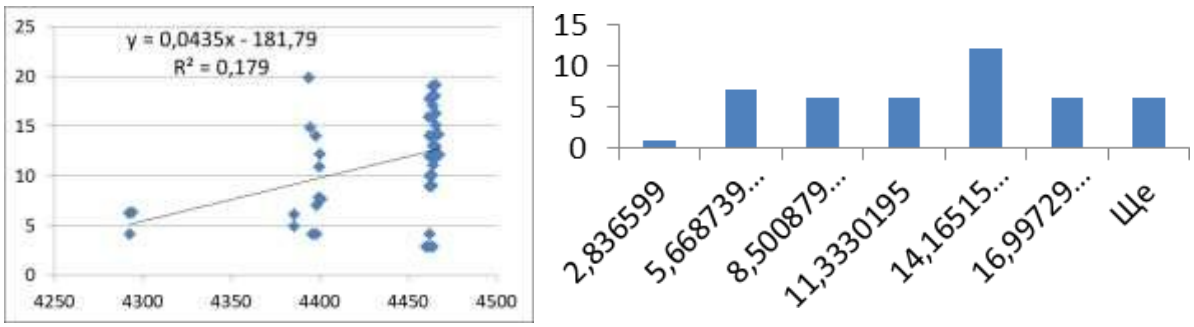

Figure 2 – Graph of magnetic susceptibility versus depth (a) and histogram of magnetic susceptibility values (b) for C_1v_1 deposits

Thus, the use of Microsoft Excel for processing geological and geophysical data proves to be an effective approach due to its versatility, accessibility, and wide range of functionalities.

However, for more complex tasks or larger datasets, the use of specialized software solutions or programming languages may be required.

References:

1. Y.O. Ivanov, V.T. Matviienko, Y.D. Popov. Fundamentals of Working with the Microsoft Excel System: A Textbook for Students of All Faculties. — Kyiv: VPC "Kyiv University", 1999. — 80 p.

2. Shurovskyi O.D. et al. Report on "High-Precision Gravimetric Profiling for the Identification of Decompaction Zones in Visean Carbonate and Clastic Deposits Prospective for Oil and Gas Exploration within the Khortytsia Area." — Ivano-Frankivsk, 2003.

3. Microsoft Excel Formulas and Functions (Office 2021 and Microsoft 365).

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ENVIRONMENTAL SAFETY IN THE DEVELOPMENT OF THE PIVNICHNO-DOLYNA OIL AND GAS FIELD

The oil and gas industry is strategically important for Ukraine's economy, as it provides a significant portion of the country's energy needs and contributes to the development of other industries. However, along with its economic importance, oil and gas activities create a significant burden on the environment. Air, water, and

soil pollution, as well as impacts on biodiversity, are just some of the environmental issues that arise from oil and gas production and transportation.

One such facility that has a significant environmental footprint is the Pivnichno-Dolyna field, which has been in operation since 1963. Over the decades of its operation, the field has accumulated serious environmental problems, including air, water and land pollution, as well as man-made environmental impact. Long-term operation of the field has led to significant changes in ecosystems that need to be addressed immediately to ensure the sustainability of the environment [1, 3, 4].

The purpose of this work is to improve environmental safety during the development of the Pivnichno-Dolyne field by introducing modern environmental protection technologies and effective methods of environmental risk management. The implementation of these technologies will not only reduce the negative impact on the environment but also ensure the economic efficiency of hydrocarbon production, which is key to the sustainable development of the oil and gas industry in Ukraine [1].

Oil and gas production at oil and gas fields leads to serious environmental problems, as it is accompanied by pollution of the air, soil and water bodies with oil products, heavy metals and carcinogenic substances. This creates numerous threats to the environment and the health of people living near such facilities [2].

The Pivnichno-Dolynske field is characterized by environmental issues such as significant air pollution caused by flares that burn associated petroleum gas. This process pollutes the air with various toxic emissions, including nitrogen oxides and hydrogen sulfide. In addition, petroleum products entering water bodies cause pollution, which negatively affects aquatic ecosystems and access to clean water for local residents. Another important factor is soil degradation, which occurs as a result of the construction of infrastructure for oil production and transportation, as well as due to accidents and oil spills that change the physical and chemical properties of soils [1].

The existing monitoring of the environmental situation at the field shows significant violations of the established air and water pollution standards. Monitoring studies record exceeding the maximum permissible concentrations of pollutants in the air and water bodies, which indicates an unsatisfactory state of the environmental situation [1, 4].

The main environmental risks that require attention are groundwater contamination, air pollution from emissions, and soil degradation due to oil spills. These factors can lead to serious consequences for human health and the environment, making it imperative to urgently improve existing monitoring systems and introduce more effective tools for managing environmental risks. Modernization of monitoring systems will allow timely detection of changes in the environmental situation and prompt response to possible threats.

References

1. Zinchenko V.F. Ecological safety of oil and gas facilities. - Ivano-Frankivsk: IFNTUOG, 2015. - 215 p.

2. Furdychko O.I., Tretiak A.M. Environmental monitoring. - K.: Condor, 2011. - 360 p.

3. Hryniuk M.M. Environmental risk management in the oil and gas industry. - Oil and Gas Energy, 2021, No. 2, pp. 34-41.

4. Technogenic environmental pollution and methods of its assessment: Ruta, 2012. 312 p.

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FEATURES OF CHEMICAL AND RADIATION MONITORING OF ATMOSPHERIC AIR AT UKRAINIAN NPPS

Chemical and radiation monitoring of atmospheric air at nuclear power plants (NPPs) of Ukraine is a key element in ensuring environmental and radiation safety. It allows timely detection and control of radionuclides and chemicals emissions that may affect public health and the environment. This topic becomes particularly relevant in conditions of martial law and threats associated with potential accidents at nuclear power facilities.

Automated radiation monitoring systems (ARMS) were implemented at Ukrainian NPPs. They provide continuous monitoring of the air in the observation zone. For example, the ARMS at the Rivne NPP [1] include stationary and mobile stations that measure activity of inert radioactive gases, iodine and other nuclides. Data is transmitted in real time to the central station and to the station website.

At Khmelnytska NPP [2], a system for measuring carbon-14 (C-14) in emissions through ventilation pipes was implemented. Measurements are carried out using the liquid scintillation method, which allows recording light flashes during the radionuclide decay.

The Pivdennoukrainska NPP uses VF technology for sampling tritium and radiocarbon. Both the “dry” method for tritium and the “wet” method for carbon are used. The equipment allows assessing the impact of these radionuclides on the total radiation dose of the population.