

Ministry of Ecology and Natural Resources of Ukraine
State ecological academy of postgraduate education and management of the Ministry of Ecology and
Natural Resources of Ukraine

CONCLUSION N95

of the state ecological expertiza of the draft of “Agreement on sharing hydrocarbons which will be
extracted in the Oleska area”

The state ecological expertiza of the draft of “Agreement on sharing hydrocarbons which will be
extracted in the Oleska area” was made according to the Law of Ukraine "On Ecological Expertiza" and under
paragraph 2 of article 11 of the Law of Ukraine "On Production Sharing Agreements".

Ministry of Ecology and Natural Resources of Ukraine had examined the environmental expert
assessment of the draft of “Agreement on sharing hydrocarbons which will be extracted in the Oleska area”,
which was prepared by State Ecological Academy of Postgraduate Education and Management of the Ministry
of Ecology and Natural Resources of Ukraine (cover letter from 08.08.2013 N 644/1), which is an integral part
of this conclusion, and the Ministry considers it possible to recognize the environmental substantiation
sufficient and to give it positive assessment on condition of compliance with environmental legislation.

Annex: environmental expert assessment

Minister

O.A.Proskuryakov

Positive conclusion is valid for three years from the date of its issuance. If during that time the
realization of the decision on the project of state ecological expertiza has not commenced, a new state
ecological expertiza on the project shall be conducted.

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The environmental expert assessment of the draft of “Agreement on sharing hydrocarbons which will
be extracted in the Oleska area”

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1. INTRODUCTION

Ukraine is among the countries whose economic development is largely constrained by the lack of its own hydrocarbons. Therefore, in recent years, Ukraine is increasingly concerned with diversification of its energy sources.

One of the components of this process is the development of new hydrocarbon deposits, including mining for unconventional gas resources (shale gas, coalbed methane, tight gas reservoirs, etc.).

A probable presence of shale gas within most of the territory of Ukraine, presence of highly qualified professionals and advanced industrial infrastructure, including existing network of gas pipelines are attractive.

Analytical studies of the draft of the AGREEMENT on SHARING of hydrocarbons extracted within the Oleska area (hereinafter - Agreement), including its provisions on the protection of the environment, were performed for the purpose of its expert ecological assessment.

According to the agreement, during the operations with hydrocarbons all necessary measures will be taken to comply with the legislation of Ukraine, regulations on environmental protection and pollution prevention which are in line with international practice on activities in the oil and gas industry, including:

- Preservation of land and prevention of excessive degradation of soils;
- Preservation of water by limitation of water use for operations associated with the production of hydrocarbons;
- Protection of surface and groundwater from contamination by chemicals used for hydraulic fracturing, and maximize the use is not intended for drinking water and water that returns from productive layer for operations associated with the production of hydrocarbons;
- Use of effective technologies reducing salinity of water that returns from productive layer and is re-injected into underground horizons;
- Performance of initial and periodic analysis of the impact of operations associated with the production of hydrocarbons in near-surface and underground waters within areas where the operations associated with the production of hydrocarbons;
- Elimination of leaks and spills of technological solutions;
- Assessment and reduction of environmental risks;
- Minimization of emergencies during operations associated with the production of hydrocarbons;
- Promoting proper conditions of health and safety in order to minimize risks to human health.

According to the agreement the necessary actions and measures will be provided to prevent pollution, eliminate consequences of the harmful effects on the environment and human health, and to protect the environment (fauna and flora), water or any other natural resources in operations associated with the production of hydrocarbons in accordance with the laws of Ukraine.

Before any commitments on geological study are carried out at the site, investors will perform assessment of the level of pollution within parts of the site where any transactions with hydrocarbons will be

soon made, including geophysical surveys at the initial stage of work. The scope, timing and procedure of an environmental assessment shall be determined by the Operator (Chevron company) and approved by the Ministry of Ecology and Natural Resources of Ukraine (or its successor). At least once every two years assessment of further impact on the environment will be performed to track any significant effects on the environment.

Ministry of Ecology and Natural Resources of Ukraine together with the representatives of the Committees on Environment of Ivano-Frankivsk and Lviv regional councils, and investors will organize and hold a tender among qualified scientific institutions of Ukraine in accordance with the laws of Ukraine, which will be based on openness and competition, for environmental research, collection of samples of air, water and soil, as well as monitoring in the areas where operations with hydrocarbons are proposed. That is, in accordance with Appendix "G" of the Agreement, the winner of the tender will carry out regular independent environmental monitoring. The Agreement already has provided for a source of funding for this environmental monitoring.

Under the Agreement, the Operator shall make reasonable efforts to prevent any negative impact on land belonging to the Nature Reserve Fund of Ukraine, which may happen directly as a result of operations with hydrocarbons, in accordance with the laws of Ukraine.

2. DESCRIPTION

2.1. Location of the proposed activities

According to the Decree of the Cabinet of Ministers of Ukraine of November 30, 2011 № 1297 "On the competition for an agreement on the distribution of hydrocarbons extracted within Oleska field", the area is 6324 km² (six thousand three hundred twenty-four square kilometers) within Lviv and Ivano-Frankivsk regions.

2.2. General characteristics of the object of the proposed activity

The agreement covers the stage of geological exploration, and the stages of pilot and industrial development simultaneously in several fields within the licensed area.

The stage of geological studies is five (5) years and may be extended by agreement with the State authority. During the stage of geological exploration investors must fulfill all the requirements of environmental protection legislation of Ukraine.

Before the end of the stage of geological exploration Investors in consultation with the State competent authority shall decide on the move to the implementation of the stage of the pilot and industrial development. If investors take a positive decision on the transition to implementation of this stage, the operator must inform the State competent authority. Then operator shall prepare a work program and budget for the pilot development for one or more areas of pilot development and submit them to the state competent authority (SCA) for approval. After approval by SCA operator shall initiate works in accordance with the work program and budget of the pilot development in accordance with Ukrainian legislation and international standards of oil and gas practice.

2.3. Assessment of impacts on the environment during the operations

Any human activity harms the environment. Even hiking trails cause the relocation of some species of flora and fauna. Therefore, the planned activities within the drilling platforms and other oil and gas activity distracts the soil, increases the emission of harmful substances into the air from construction equipment, increases the level of electromagnetic radiation, noise impact (all within the sanitary zone). Impact on the environment is inevitable, and mitigation measures should be integrated into the works under the Agreement.

Large-scale production of shale gas is being carried out for less than 20 years. Furthermore new technologies that reduce the need for water, reduce the use of reagents and generally reduce the impact of work related to shale gas on the environment are constantly emerging.

At present we are talking only about the potential risks of impact on the environment, since the question of the commencement of extractive activities remains open. Only after the 5 year long geological study of the areas it will be clear whether it is appropriate to begin commercial development of gas from unconventional sources, based on available gas reserves. If such reserves will not be enough, the Operator may decide, in consultation with the SCA, that such development is commercially impractical and the project stops.

Extraction of natural gas from conventional or unconventional sources is associated with risks and threats to the environment and human health, as follows:

- air pollution;
- Excessive use of water;
- Use of chemicals for hydraulic fracturing (HDF);

- possible presence of natural radioactivity of rocks;
- Problems of processing, treatment and recycling of used water;
- potential contamination of surface water and drinking water layers;
- technological seismology.

Environmental threats include:

- proximity to protected areas;
- impact on local biodiversity;
- the balance of greenhouse gas emissions.

2.3.1. Impact on water resources and air

Limited water resources of Ukraine is an unfavorable factor for large-scale development of hydrocarbon resources from unconventional sources, as it implies wide use of hydraulic fracturing technology, which will require the use of significant amounts of water. Agreement provides for limited use of surface water for hydraulic fracturing, and the priority is given to maximize the use of reservoir water, including its reuse.

Regarding the threat of groundwater contamination in the implementation of vertical drilling should be noted that the threat is exaggerated, since its protection is achieved through the construction of wells, which implies construction of a number of casing that isolate downhole space separating it from the aquifers.

Fuel flows from barns for waste water piled near wells and potentially threatening near-surface waters is possible at any wells associated with the production of conventional or unconventional sources of hydrocarbons. These threats can be reduced by Operator by use of closed systems and its control. This process is governed by the relevant regulations and is under strict supervision of the state authorities for their implementation.

The quality of surface water can have a negative impact by dust produced from the drilling sites and the creation of new roads to access the resource. These effects can also be mitigated and possibly eliminated by placing wells and roads away from surface water sources and application of advanced technologies to wastewater.

The process of hydraulic fracturing is injection of fluid into the formation under high pressure which results in opening of existing cracks or creation of new ones in bottomhole zone. To prevent cracks from closing (after removal of pressure) sand or other disjoining material is pumped together with the liquid. As a result permeability of the rock face of working space area is increasing, and the whole system of cracks connects well with remote productive parts of the reservoir. Radius of fractures can reach several tens of meters. Share of water and sand in fracturing solution in the course of such work is more than 99%.

It should be noted that the technology of hydraulic fracturing is not a new technological operation. In Ukraine, it was first used in 1954 in the Donbas and by this time is used to increase hydrocarbon debits from traditional collectors.

Also, for almost 50 years state geological and oil&gas extracting enterprises, particularly - in the years of independence Ukraine - the state company "Ukrnafta", widely uses technology of hydraulic fracturing, particularly in the Lviv, Ivano-Frankivsk and other areas where HDF are conducted, including powerful ones.

Water use

To perform hydraulic fracturing in a single borehole 20 thousand of cubic meter of water is needed. Within one hole fracturing can be done several times. It should be noted that coal mines and nuclear power plants use much larger volumes of water. For example, to produce an equivalent amount of energy from coal three times more amount of water is needed than for the extraction of shale gas. Production of ethanol requires ten times more water compared to gas production from unconventional sources. According to the Assessment of the Massachusetts Institute of Technology in the United States, the proportion of water use for HDF is less than 1% of the total balance of consumption in areas of gas production from unconventional sources.

Since fracturing in horizontal wells is carried out in multiple stages, to ensure environmental protection, the systems of collection and reuse of hydraulic solution are used.

Related underground (reservoir) water and waste water (recycling, re-use of waste water) can be potential sources of water for HDF. It should be noted that international and Ukrainian oil and gas companies have long been widely using practice of closed cycle water use.

According to the Agreement, on the contract area (which is located in the Lviv and Ivano-Frankivsk oblasts) Operator shall conduct all operations with hydrocarbons, including opting for and application of hydraulic fracturing, in accordance with the laws of Ukraine, good international practices of the oil and gas

industry and provisions of the Agreement. All technologies used by the Operator will go through permit procedures as required by the legislation of Ukraine, including on environmental issues.

Currently, the latest technology of hydraulic fracturing without the use of water is tested. Thus, in five years it is possible that so-called "waterless" technology of hydraulic fracturing will be used, as the operator has undertaken to use modern technologies in the area of Oleska field.

Waste water management

The main ways of waste water management:

- Optimum is to process and treat water for its further use in the project;
- Water can be purified in local treatment plants for further use, eg for agriculture;
- Water can be filled in deep geological layers and voids.

If reverse water is injected into deep aquifers, it can lead to contamination of the layers and create risks for shallow aquifers, if between them there is a hydrodynamic connection.

Aquifer, which accumulate drinking water supplies, and gas layers are separated by thick layers of sedimentary rocks. The layers of drinking water are in Ivano-Frankivsk and Lviv regions at depths less than 400 m, when the reservoir of unconventional gas - at 2500-5000 m. Based on the fact that the cracks of HDF, depending on the density of rocks, range from several meters to several tens of meters, filtration of chemicals used in hydraulic fracturing through the thick dense rocks for over 2 km into the layers with drinking water is almost impossible.

Use of chemicals

Harmful substances that potentially may be emitted from the extraction of gas from unconventional sources include greenhouse gases, particularly carbon dioxide CO₂, methane CH₄, nitrous oxide N₂O, as well as pollutants such as sulfur dioxide, SO₂, nitrogen oxides NO_x, particulate matters, volatile organic compounds, carbon monoxide CO, substances used directly for hydraulic fracturing, as well as the content of the reverse waters, including chemicals and naturally occurring radioactive substances leached from geologic formations.

Depending on the number of stages of GDF up to 20 thousand cubic meters of water is pumped in each well. Reverse waters constitute 80-100%, and the proportion of water that can be purified - 70-80%. Given the average concentration of components at 0.2% in downflow water, total amount of chemicals will be about 20-25 tons. In terms of transportation, delivery of these chemicals to the area where drilling will be carried out will require 1-2 large tanks.

In countries that carry out extraction of shale gas by hydraulic fracturing, particularly in the USA, the companies according to the law publish lists of chemicals that are used for production. Anyone can easily obtain such information. This information is open to the public on the web page of the Natural Gas from Shale Fluid and Additive Component Transparency Service or NGS FACTS) (www.ngsfacts.org). In the United States it is also required from the operators to keep records of chemicals used for drilling or stored in wells.

Operator under the Agreement, carrying out activities in Ukraine, will not only comply with these requirements of the global oil and gas activities, but also additional obligations to previously disclose to public authorities and public information on the titles of the chemicals that it uses in hydraulic fracturing.

Most modern production processes use chemicals and their use is safe in limited, scientifically reasonable amount. For example, treatment plants for drinking water use large amounts of chlorine. If it is used correctly, it is safe for employees and provide clean water for the community. But there is always a potential risk of violation of rules and regulations, which can lead to serious consequences for the environment. The situation with the use of chemicals in hydraulic fracturing is similar - they are quite safe when used properly, but can be dangerous, especially in case of spills during transportation and storage on drilling sites.

Studies have shown that the probability of water contamination in operations of shale gas, particularly in hydraulic fracturing, occurs not due to the very fact of these works, but due to improper design, improper cementing of wells, improper handling of chemicals. It is therefore the quality of works done by Operator, appropriate standards and requirements for the process of production, regulation and control by government bodies are very important.

As already noted, Cretaceous layers of Oleska area located at considerable depths and isolated from underground aquifers of Devonian, Jurassic, Cretaceous and Neogene periods that lie higher above them. Natural insulation is reliable – it is a waterproof layers of clay, mudstone, siltstone, the thickness of which reaches many hundreds of meters. In addition, the angle of the underground water-containing layers leads towards the southwest, in the direction of the Carpathian foredeep and the edge of the East European platform.

Based on the fact that in the Oleska area water horizons occur at depths less than 400 meters, and the potentially gas-bearing shale - at a depth of two and a half kilometers, it is clear that small portion of fluid that

got into shale rock as a result of hydraulic fracturing, just can not get through more than two-kilometer thickness of shielding rocks up to water sources. The rest of the liquid rises through a vertical borehole to the surface with natural gas and formation water, and is mandatory recycled and used for subsequent fracturing. The technologies on collection and disposal of liquid on the surface is quite simple and is worked out in detail, and at this stage of work the threat of environmental pollution is minimal. A more likely danger of contamination by chemicals used in hydraulic fracturing fluids is associated not with drilling, but with transportation and storage of these substances. Therefore Ukrainian regulator, based on experience of the USA, is developing stringent standards for the industry, will conduct the necessary inspections, including in terms of tightness of containers, in which chemicals are transported and stored.

An international symposium on "Unconventional Natural Gas: Energy Security Strategy of Ukraine", was held in Ivano-Frankivsk region - the area where it is planned to extract shale gas. In addition to international experts and diplomats one could hear the opinion of Ukrainian scientists, receive preliminary assessments of feasibility of development of Oleska area and its impact on the environment.

Experts agreed that Oleska area that covers part of the Lviv and Ivano-Frankivsk regions should be actively explored, but wide public involvement and issues related to the protection of the environment shall not be forgotten.

"There is no doubt that Oleska area shall be studied and developed. However, the role of the public in no way shall be excluded. We need to learn to talk to people, to convince them that it is not only that work places will be created, but also that the operations on the site will be environmentally friendly", says Professor Ivano-Frankivsk National University of Oil and Gas Oleg Adamenko.

In his opinion, Oleska area requires an environmental audit, evaluation of hydroecological potential of water resources, which will be sources of water for each well, preparation of environmental impact assessment based on environmental audits, and creation of environmental services at every drilling site.

Experts have repeatedly stressed that shale gas shall be developed in environmentally safe way. Therefore, Ivano-Frankivsk National University of Oil and Gas conducted a series of studies related to the selection of water resources and contamination.

Having studied the hydroecological potential of the Western region of Ukraine, scholars have found that there is enough water needed for shale gas mining, but they are distributed unevenly, so each waterway should have its own individual approach and each well should have its individual water supply system.

The researchers selected samples for environmental load on 1141 sites and have allocated within Oleska field 4 possible environmental states: normal, satisfactory, intense and complex.

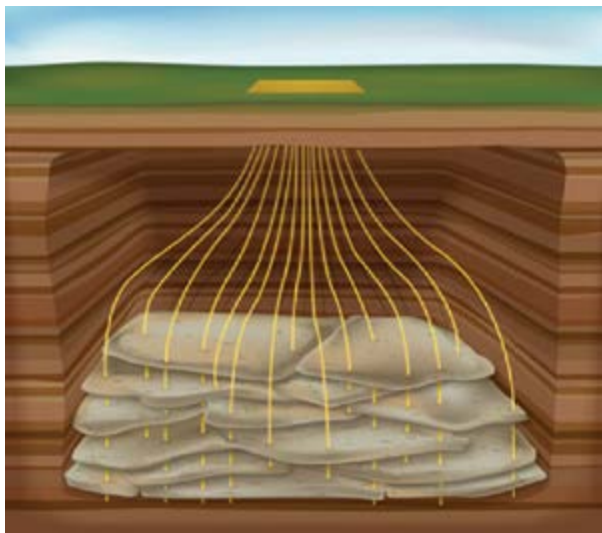
"Such adverse environmental states such as crisis, critical, catastrophic, which are usual for Donbass, the Dnieper, the eastern regions of Ukraine, are not present here. Situation here is basically normal," - he said.

The balance of greenhouse gas emissions

There is a risk associated with the likely release of methane, but it is estimated by the USA Environmental Protection Agency (EPA), that today in the country the methane leakage from natural gas wells is less than 2%. It is generally assumed that, if the leakage of methane is less than 8%, it is more environmentally beneficial compared to coal mining.

EPA's Analysis in 2011 showed that the average methane emission for all wells, including oil and gas in the United States ranged from 0.7%, according to the Greenhouse Gas Reporting Program, and to 1.6%, based on data from the National Environmental evaluation.

Moreover, due to the reorientation of the industry toward gas, which replaced significant amount of coal from the US domestic market, CO² emissions today had fallen to a level that was observed twenty years ago. Thus, **gas from unconventional sources contributes to reduction of anthropogenic emissions of CO².**



Changes in the landscape

The picture shows multiple sloped wells for gas production from the compacted sandstone. Application by the Operator of such modern drilling technology – multiple wells from one site - automatically reduces the impact on the landscape and infrastructure load without reducing performance.

In addition, after reclamation the surface area of each drilling site can be largely renewed, in order to what it is proposed to separately keep the top layer of soil. It is expected to remove 20-40 cm of the topsoil and store it for reclamation. Drilling of 8-16 wells will take from 1 to 2 years. After which 90% of the surface area of each drilling site can be changed.

Reaction to the fracturing of the geological environment, which is a key element of technology in shale gas, is mostly related not to the geological structure, but to the mechanical features of rocks (their integrity, lack of tectonic disturbances). These include, first of all, the anisotropy of strength of the gas-bearing layers, when the strength of stratification is much smaller than the thickness, which significantly increases the efficiency of hydraulic fracturing and the levels of gas recovery.

According to the legislation of Ukraine no industrial facilities, regardless of whether they are designed for gas production from unconventional sources, or for other industrial purposes, cannot be located either on the site of nature-protected areas or within their protection zones.

The impact on local biodiversity

Noise is a major irritant for some species, especially birds. When the drilling starts it lasts usually 24 hours a day and creates noise and smoke from diesel generators, which could adversely affect some species.

Round-clock activity also requires the lighting of the area at night. In addition, there will be a movement of trucks. Drilling works can take up to several months, depending on the depth of the well and the type of rock. It is possible to avoid or minimize the impact on biodiversity, if the safety distances are kept (according to German experts from LBST, it is 500 m between well sites and water bodies). It is also recommended to avoid migration corridors of rare species. Technological platforms of gas production from unconventional sources are much safer for birds, for example, than wind power sites with many high towers and moving blades of wind turbines that generate not only the danger of mechanical nature, but also are a source of infrasonic vibrations that repel birds from traditional routes of migration.

2.4. Assessment of the impact of planned activities on the man-made environment

According to studies conducted in the United States and in the UK on the HF, slight seismic vibrations are possible. Similar phenomena is inherent to the extraction of hydrocarbons from traditional sources. Such fluctuations are not the result of HF, but a consequence of improper use of water injection technology. Thus, in 2011 the UK operations of HF were suspended in the test area of Suadrilla Resources Ltd. after shaking of surfaces of magnitude 1.5 and 2.3 occurred. It shall be noted that human beings do not feel at all the earthquakes of magnitude up to 2-2,3. After comprehensive investigation and finding out the fact that the seismic events were caused not by hydraulic fracturing, but because of the shifting of tectonic plates in relation to each other due the effect of excessive lubrication of waste water, development of gas reserves from unconventional sources with the use of hydraulic fracturing was restored.

Seismic vibrations which were observed after two hydraulic fracturing at the field Bowland Shale in the UK are considered to be exceptional cases. After making the study British experts had found out that these earthquakes were caused by the accumulation of fluid, used for hydraulic fracturing, in the closest fracture zone. Based on the physical model, developed after the observations of seismicity, British experts had identified the highest possible level of earthquake that can be expected during the upcoming hydraulic fracturing in similar geological conditions that took place at the well Preese Hall – magnitude will not be above 3.0. Thus, it can be concluded that seismic activity during hydraulic fracturing – the occurrence of vibrations and shocks is connected with the technological processes of recycling of water, which was used for hydraulic fracturing, but not by the hydraulic fracturing itself. American and British experts also identified areas of decreasing the probability of seismic activity. The main of them is the rapid pumping out of fluid after hydraulic fracturing.

The second conclusion is that seismic activity caused by human intervention, also happens in another situations. Scientists had noticed that not only utilization of water, but also extraction of large volumes of gas from traditional sources, oil and water from the thickness of the earth may affect on the tensions, which are existing in the rock, in unpredictable ways, what can lead to minor seismic activity. Micro earthquakes with the magnitude of more than 3 points are caused also because of activity in the coal mines. In particular, coal mining in the United Kingdom caused thousands of earthquakes. For example, in the area of Lancashire there was a lot of seismic activity of magnitude to 3.1 because of mining.

At the same time, public is not disturbed by the threats of coal mining or pumping out of water from the underground horizons, which can cause much greater seismic activity.

Thus, the danger of earthquakes appearance is too exaggerated and it is caused not by the process of hydraulic fracturing, but by the incorrect management of waste water in the past. Water recycling technology has been already improved, and the danger of even weak earthquakes is practically absent. However, strict and steady state and public control over the processes of gas extraction from the unconventional sources is a prerequisite for decreasing of the potential risks from the use of hydraulic fracturing.

3. VALUATION GENERALIZING PART

Article 51 of the Law of Ukraine "On Environmental Protection" provides that all projects of commercial and other activities absolutely must have materials (section) assessment of its impact on the environment and human health. Development of gas from unconventional sources is no exception. Impact assessment is developed with the requirements of legislation on environmental protection, environmental capacity of the area, state of the environment in a place where it is planned to place the objects, environmental forecasts, perspectives of socio-economic development, power and types of common impact of harmful factors and objects on the environment.

Worldwide experience identifies two main types of environmental risks. First – is conservation of the land fund in subsoil area, which is granted for use. In realization of projects of exploration and gas extraction from unconventional sources, special attention is paid to the reducing of land plots for development. In the world's best practice that could be applied to the Oleska area, this is achieved by drilling multiple wells from one site.

The second risk – is the depletion and pollution of water resources:

- protection of ground and surface waters from the reagents which are used for hydraulic fracturing, directly from the well during the passage of the solution under pressure, especially at the groundwater level, and during the hydraulic fracturing;

- decreasing of the water amount, which is necessary for the full cycle of shale gas extraction.

These problems are solved by modern and tested in practice technologies, based on the experience of the operator's work, and by constant control over the running of works by environmental and mining supervision state controlling bodies.

According to the report "Ukraine shale gas: environmental and regulatory assessment", prepared by an expert group of the United States Agency for International Development (USAID) in pursuance of the Memorandum of understanding between the Government of Ukraine and the Government of the United States on unconventional gas resources on 15.02.2011, approved by the Cabinet of Ministers of Ukraine on 09.02.2011 № 100-p, if the well is properly placed, built, tested and monitored, the threat of groundwater pollution by the drilling process and hydraulic fracturing will be very small. Transfusion and leakage from hangars also threaten shallow groundwater levels, but these threats can be reduced by using of closed water systems, establishing the baseline water quality standards and testing groundwater before the drilling. It is necessary to establish and to enforce some standards.

Water from the developed wells and existing wells can be reused. Water for drilling and hydraulic fracturing can come from local wastewater treatment plants or industrial wastewater, accompanying underground (shale) water or repeatedly used technical water.

Now gas production in developed conventional fields is declining. According to the forecasts till 2020 level of gas production in Ukraine will fall to 17 billion cubic meters. At the present there is no practice of drilling at the big depths of Black Sea. In perspective is the extraction of methane gas of coal seams.

Hydraulic fracturing is used since 1957. Countering of the rock mass – thousands of atmospheres. Drinking water is located on the depth of 400 meters and drilling will be carried out on the depth of more than 2.5 km.

Penetration of polluted water and infection by bacteria is impossible. Near the drilling the process of water pollution is usually much lower than near the ordinary wells.

Extraction of shale gas – it is the first step to ensure the region with it's own energy resources. Realization of the project in the Oleska area will bring to the region tens billions of dollars of investment, will create thousands of workplaces, will provide additional incomes to the budgets of all levels in tens billions hryvnias and will increase own production of natural gas in billions of cubic meters per year.

Local governments in the process of concluding and implementing production sharing agreements have its authority. Thus, before concluding the agreement with the winner of an open competition and until the beginning of works on finding shale gas, the regional council at its session should adopt the decision on approval of the draft of the production sharing agreement before the signing of Agreement. During the implementation of the Agreement the regional council, through the participation of its representative in the

Interagency Commission of the conclusion and implementation of production sharing agreements, will take part in the approving of annual work programs and budgets, which will be implemented by the investor, and will conduct constant monitoring of their implementation.

Thus, in our view, the current legislation of Ukraine on production sharing agreement provides investors with the conditions of successful implementation of large-scale projects of searching and extraction gas from shale and tight rocks, and the central executive bodies, local authorities and the public are provided by clear mechanisms for participation in decision-making on economic, social and environmental conditions of the production sharing agreements, as well as by control over the implementation of the investment obligations and work program.

Also it should be considered that the European Parliament allowed the development of shale gas in the EU. In the spring of 2014 EU directives, which were jointly developed by the general directorates of energy and of environment, which will give the green light to accelerated searching and extraction of shale gas in the EU, are expected to be adopted. And this is despite the fact that the issues of ecology and environmental protection are very sensitive for Brussels and individual member states.

According to the results of analytical studies of the draft of the AGREEMENT ON SHARING HYDROCARBONS WHICH WILL BE EXTRACTED IN THE OLESKA AREA, including PROVISIONS FOR ENVIRONMENTAL PROTECTION, and conducting on their basis the comparative analysis and assessment of the degree of environmental safety, planned activities comply with the requirements of current environmental legislation on environmental protection, of rational use and reproduction of natural resources, of ensuring environmental security.