

DONBAS ENVIRONMENT: INVISIBLE FRONT



Environmental consequences of the war in the East of Ukraine in the context of international humanitarian law and in the practical dimension



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The report was prepared by the NGO Truth Hounds with the assistance of National Endowment for Democracy as part of the project on human rights monitoring and documenting and on establishing of facts that may contain signs of war crimes in the East of Ukraine as part of the ongoing armed conflict.

Truth Hounds is a team of experienced human rights professionals that has been working on documenting war crimes and crimes against humanity in the war contexts since 2014. We aim at fighting against the impunity of perpetrators of international crimes and grave human rights violations through investigation, documentation and monitoring, advocacy, problem solving for vulnerable groups. During its activities, Truth Hounds has prepared seven major submissions to the International Criminal Court and 25 submissions to the Prosecutor's Office of Ukraine.

The National Endowment for Democracy (NED) is a private, nonprofit foundation dedicated to the growth and strengthening of democratic institutions around the world. Each year the foundation makes more than 1,700 grants to support the projects of non-governmental groups abroad who are working for democratic goals in more than 90 countries.

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A photo of Truth Hounds is used for illustration on the title page.

LIST OF ABBREVIATIONS

AFU	Armed Forces of Ukraine
AKM	modernized Kalashnikov automatic rifle
AP I	Additional Protocol to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), of 8 June 1977
AP II	Additional Protocol to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II)
ARC	Autonomous Republic of Crimea
ATO	Anti-Terrorist Operation
CCU	Criminal Code of Ukraine
DFS	Donetsk Filtration Station
So-called “DPR”	so-called “Donetsk People’s Republic”
ECtHR	European Court of Human Rights
EEC	entry-exit checkpoint
ENMOD Convention	Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques
GC I	Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (12 August 1949)
GC II	Geneva Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea (12 August 1949)
GC III	Geneva Convention (III) relative to the Treatment of Prisoners of War (12 August 1949)
GC IV	Geneva Convention (IV) relative to the Protection of Civilian Persons in Time of War (12 August 1949)
IAG	illegal armed group
IHL	international humanitarian law
INSO	International NGO Safety Organization
JFO	Joint Forces Operation
So-called “LPR”	so-called “Luhansk People’s Republic”
MCO	military-civil administration
MOC	municipally owned corporation
NGO	non-governmental organization
OSCE	Organization for Security and Co-operation in Europe
PACE	Parliamentary Assembly of the Council of Europe
RF	Russian Federation
RPG	rocket-propelled grenade launcher
RS	Rome Statute
SOC	state-owned corporation
UNICEF	United Nations Children’s Fund
USNR	Ukrainian Steppe Nature Reserve
WASH Cluster	international group for matters of sanitization, water supply and hygiene



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1 | Summary

The ecological situation of the territory of Donetsk and Luhansk regions, which have become the backdrop to an armed conflict with active armed hostilities from 2014 to 2021 and are partially under the control of occupying forces, has significantly deteriorated in recent years, showing signs of an ecological catastrophe. A tendency towards deterioration can be witnessed in the majority of the elements of the area's ecosystems. This report provides an in-depth description of the status of these elements, the data of which has been collected and analyzed by Truth Hounds documenters. The research was conducted in the form of field missions in Luhansk and Donetsk regions in Ukrainian-controlled areas, as well as in the form of a so-called "desk study" that lasted several months. The data obtained testifies to the current state and the dynamics of changes in soil composition, surface and wastewater, the situation relating to coal, metallurgical, oil-refining and chemical industries and their impact on the environment, flora and fauna, including forests, rare examples of species in nature reserves, infrastructure systems and

supply in the region. In all cases, the hostilities and the occupying regime have a direct negative impact on the environment.

The report also gives considerable attention to an analysis of international humanitarian law in order to provide a legal assessment of the actions in the context of military conflicts which harm the environment. The following are analyzed: the possibility of applying Art. 438 of the Criminal Code of Ukraine, qualifying the facts here revealed as war crimes against the environment, and also mechanisms given for bringing both individuals and the violating state as a whole to international legal responsibility.

The focus of the study is to articulate the urgency of ecological issues directly related to or resulting from the military conflict, their potentially transnational nature and the growing trend of threats in the absence of access to territories not under governmental control for appropriate monitoring, evaluation and influence on processes.



2 | Objective of the report

This report addresses a number of matters, amongst which the following are the principal issues at hand:

- ☑ Signaling the direct and indirect impact on the environment of hostilities taking place during the military conflict in eastern Ukraine;
- ☑ Indicating the direct and indirect impact on the environment of the occupying regime of certain areas of Donetsk and Luhansk regions;
- ☑ Providing evidence that may indicate the committing of war crimes against the environment
- ☑ Outlining qualifying mechanisms for revealed incidents under Art. 438 of the Criminal Code of Ukraine;
- ☑ Emphasizing the urgency of ecological problems in the territory affected by military conflict, and declaring the need for urgent access for specialists and monitoring missions to sites posing an increasing danger in the non-government controlled territory.

3 | Methodology of the report

The report has been created on the basis of information gathered by Truth Hounds during three field missions, of a total duration of 18 days, conducted in Donetsk and Luhansk regions in November 2019, and March and April 2021, as well as in places and areas which are impacted by the conflict. The field teams visited industrial facilities, institutions and sites, as well as a nature reserve, and they investigated and uncovered the facts of real, as well as potential, harm to the environment in the context of the armed conflict. A number of meetings were conducted with heads of coal mining enterprises, engineers, specialists in the ecology of military-civilian administrations, employees of nature reserves, representatives of local communities, and activists.

Since the aim of the report is not only the collection of data that may indicate the committing of war crimes against the environment, but also the raising of awareness in regard to environmental problems in the region, in preparation for writing the report, the documenters used a method of combining

documenting facts, which consisted of both a “classical” approach to the gathering of information, such as interviewing witnesses and using photo and video recordings of the incident site, and obtaining data by conducting standard interviews with industry experts and representatives of various enterprises, services, and departments. In addition, in the process in writing the report, we conducted our own research on the impact of the military conflict on the environment, which consisted of collecting soil and water samples and subsequently transferring them to the relevant laboratory for analysis, the results of which are given in this report. A significant part of the work was the “desk study”, during which reports were studied by various departments, organizations and high-profile institutions in order to trace the dynamics of changes and to compile a comprehensive picture of the subject under investigation.

The time limits of the research are defined as the beginning of summer 2014 until the present.

4 | Structure of the report

This report comprises legal information, providing a general definition of war crimes against the environment and determining the mechanisms for the application of the norms of international humanitarian law for the establishment and correct qualification of this type of crime. In a largely descriptive section there is a considerable amount of actual data on cases where the military conflict has negatively impacted the environment, and some actual data on the extent of damage is

additionally highlighted. This section is divided thematically according to the various types of ecological damage and their sources. At the end of the report, a legal analysis of whether the facts can be qualified as war crimes against the environment is given. Moreover, a list of recommendations to the executive and informal structures, decision makers, as well as other persons of influence is given.



5 | Protection of the environment in IHL.

Despite the obvious and justified focus of IHL on the protection of the victims of armed conflict and civilian objects, the principles of IHL, the Additional Protocols to the Geneva Conventions, customary IHL norms, and the norms of “environmental” conventions lay the foundations for the protection of the environment in armed conflict.

In regard to principles, the key guidelines in IHL for protection of the environment are the principle of distinction, which requires attacks to be directed solely at military objectives and, in exceptional cases, civilian targets if so required by urgent military necessity. The principle is customary in nature, but some of its nuances are also found in Article 23 (g) of the Hague Regulations¹ of 1907, Article 53 of the Fourth Geneva Convention², and Articles 48 and 52 of Additional Protocol I (AP I)³, among others. For the environment, the principle involves the banning of making natural objects, or the environment as such, the object of an attack.

Other IHL principles offer an understanding of how hostilities are to be conducted when there exists the threat that they may pose a threat to the environment. These principles are the prohibition of indiscriminate attacks, the principle of proportionality, and taking precautionary measures.

Special IHL regulation of protection of the environment is concentrated in a number of articles of AP I and a special international treaty, the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental

Modification Techniques (the so-called ENMOD Convention)⁴.

The most relevant provisions of AP I (and, thus, the provisions applicable in the event of an international armed conflict) relating to the environment are:

- ☑ **Article 35**, which prohibits “to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment”;
- ☑ **Article 55**, which requires that, “Care shall be taken in warfare to protect the natural environment against widespread, long-term and severe damage”, and stipulates that “This protection includes a prohibition of the use of methods or means of warfare which are intended or may be expected to cause such damage to the natural environment and thereby to prejudice the health or survival of the population”;
- ☑ **Article 56**, which protects works and installations containing dangerous forces (dams, dykes, nuclear electrical generating stations) from attacks, retaliation

The ENMOD Convention is devoted exclusively to the protection of the environment during armed conflict (as is the case of AP I, this Convention applies exclusively to international armed conflict). The key commitment made by the parties to the Convention (including Ukraine and the Russian Federation) is that of

1 Convention IV respecting the Laws and Customs of War on Land and its annex: Regulations concerning the Laws and Customs of War on Land https://zakon.rada.gov.ua/laws/show/995_222#Text

2 Convention relative to the Protection of Civilian Persons in Time of War (Ukrainian/Russian) https://zakon.rada.gov.ua/laws/show/995_154#Text

3 Additional Protocol to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), of 8 June (Ukrainian/Russian) https://zakon.rada.gov.ua/laws/show/995_199#Text

4 Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques <https://2009-2017.state.gov/t/isn/4783.htm>



not engaging in “military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State Party”. The Convention specifies that the term “environmental modification techniques” is to be understood as “any technique for changing – through the deliberate manipulation of natural processes – the dynamics, composition or structure of the Earth, including its biota, lithosphere, hydrosphere and atmosphere, or of outer space”.

An examination of these international legal norms on the protection of the environment during armed conflicts allows a clarification of what may be considered a breach of IHL obligations. Before directly assessing the information gathered by Truth Hounds documenters and presented in this report, it should be noted that the AP I and the ENMOD Convention set different thresholds for the application of the provisions of these agreements. Thus, in the first case, impacting the environment in such a way that cumulatively causes wide-ranging, long-term and serious damage is prohibited. In the case of the Convention, however, States’ obligation to protect the environment is activated when “widespread, long-term or severe effects” are concerned. This signifies that the threshold for the application of AP I is higher than that of the ENMOD Convention.

In regard to definitions of widespread, long-term or severe effects, the texts of AP I and the ENMOD Convention do not provide specific guidance on the relevant definitions. However, the doctrine and, in particular, the commentary of the International Committee of the Red Cross to these international treaties, allows for the formulation of approaches for establishing their possible meaning. Thus, widespread damage (effects) means that which affects several hundred square kilometers, long-term means a period approximately equal to a season (3 months), or up to several decades in the case of

ENMOD, and severe involves significant damage to human life, natural economic resources and other assets.

A further, important preliminary remark is that AP I, unlike the ENMOD Convention, does not require harm to the environment, but only the possibility of (potential for) harm.

5.1 War crimes against the environment

International treaties on IHL, to which Article 438 of the Criminal Code of Ukraine refers in particular⁵, do not clearly indicate which attack on the environment could be considered a serious violation of IHL and, consequently, a war crime. However, the Rome Statute of the International Criminal Court may serve as a guide in this sense⁶. Article 8(2)(b)(iv) of the RS defines a war crime as “Intentionally launching an attack in the knowledge that such attack will cause incidental loss of life or injury to civilians or damage to civilian objects or widespread, long-term and severe damage to the natural environment which would be clearly excessive in relation to the concrete and direct overall military advantage anticipated”. As is evident from the wording, the RS uses the formula of AP I, which requires the cumulative presence of widespread, long-term and severe damage to the environment. In addition to the RS, Elements of Crimes offers a further explanation of this crime, requiring the following elements::

a. Material element. The material element of the war crime in question presupposes, first of all, the committing of an attack. For the purposes of this article of the RS, an attack can signify not only an armed attack, but also any acts of violence. In addition, this element involves causing widespread, long-term and severe damage to the environment. Furthermore, the

5 Criminal Code of Ukraine. Law of Ukraine <https://zakon.rada.gov.ua/laws/show/2341-14/conv#n3040>

6 Rome Statute of the International Criminal Court https://zakon.rada.gov.ua/laws/show/995_588#Text

Elements of Crimes requires such damage to be clearly disproportionate to the expected immediate military superiority that perpetrators hoped to obtain.

- b. Mental element.* In accordance with the Elements of Crime, the act must have been committed intentionally, with the awareness that the attack would cause widespread, long-term and severe damage to the environment.
- c. Contextual element.* This element consists of committing an act in the context of an international armed conflict and the perpetrator being aware of the existence of an armed conflict. Therefore, here we can only state that the ICC has recognized

that, at least in part, the armed conflict is international in nature. This fact has also repeatedly been confirmed in other Truth Hounds reports⁷. With this in mind, the actions documented in this report are considered to have been committed in the context of an international armed conflict. The existence of an armed conflict could not but be known to the perpetrators of the documented actions, since they took part in it, were subordinate to military command, performed its tasks, and were present in the areas of military operations.

⁷ <https://truth-hounds.org/reports/>

6 | Risks to the environment caused by disruption to mine workings.

General characteristics: in total, there are currently 220 coal mines in the Donetsk coal basin, 97 of which are operational, 14 of which are in drainage mode, 39 of which are flooding, and 70 of which are in the process of closure. In total, only two mines have been deregistered due to the completion of closure⁸.

One defining feature of the mines of this region is that many of them are linked by hydrological underground connections, in particular the mines that are located on different sides of the front line (for example, the “Pivdenna” mine in Toretsk and the “Haharin” mine in Horlivka (not under government control). A general characteristic is that all of the mines in the region are critical infrastructure, and

are therefore potentially dangerous facilities (high-risk facilities, according to the legal definition)¹⁰. The performance indicators of the mines show significant changes resulting from the armed conflict. It should be noted that the situation in regard to mines not under government control is not well known, as there is no access to the facilities themselves, and any information has to be obtained from open sources of the relevant “official” bodies or from relevant groups of social network users. Thus, the data on objects in the non-government-controlled territory contained in this report may at times not coincide with factual data. The table below gives an overview of the situation in relation to the mines of the Donetsk and



Mining industry facilities in the region.⁹

8 <https://r2p.org.ua/tehnichni-rekomendaciyi-zmenschennya-ryzykiv-shidna-ukrayina/>

9 <https://deis.menr.gov.ua/?fbclid=IwAR2Xc7zKqXe7vICiHcfHDbnkOpr4GbE9t4ZFidhE2R46PdyKkcdIRPvd9Q>.

10 Про об'єкти підвищеної небезпечності | від 18.01.2001 № 2245-III (rada.gov.ua).

Luhansk regions between 2014 and 2019 (in parentheses, the first figure refers to the objects of the government-controlled area, and the second, to the so-called “DPR” and “LPR”):

Site	January 2014	November 2017	November 2018	November 2019 (2020)
Operational mines	150	104 (29/75)	99 (24/75)	97 (22/75)
In drainage mode	14	17 (1/16)	14 (2/12)	14 (2/12)
Flooding	36	36 (1/35)	39 (1/38)	39 (1/38)
In the process of closure	100	70 (6/64)	70 (6/64)	70 (6/64)
De-registered following the completion of closure	0	0	5/0	2/0
Total	227	(37/190)	(33/189)	(31/189)

Prerequisites for the emergence of and increase in environmental risks.

As is well known, active hostilities have taken place and still continue in the military conflict in eastern Ukraine in areas with sustained and very intensive coal mining activities. Currently, of the 97 operating coal mines, more than 75 are located in territories not controlled by the Ukrainian government.¹¹ At the same time, the places of the greatest accumulation and intensity of coal production are found in the occupied territories: Donetsk, Makiivka, Horlivka, and Yenakiieve. Due to a combination of various factors (lack of effective leadership and modernization, gaps in legislation, corruption and political pressure factors in the region), the territory of the Donetsk coal basin has always been a zone of increased ecological risk. However, with the start of hostilities in April 2014, the risk of uncontrolled, large-scale pollution in the context of the specificity of the region’s coal mining has increased tenfold. It should be noted that the situation in which mining sites in eastern Ukraine find themselves due to the military conflict causes

great concern among environmental experts. This is primarily due to the scale of the threat to the environment, as well as the complexity of the problem, the difficulties of predicting and overcoming its consequences, and the potential transnational nature of its spread.

There are two main factors – direct consequences of the war in the Donbas – which negatively affect the condition of mines and related industries, and which can cause significant environmental damage:

1. **The hostilities themselves (directly).**
2. **The occupying regime in a territory with a considerable concentration of coal mining sites.**

The density of coal mining in the Donbas has led to many of these mines becoming a backdrop to *hostilities* for years of the military conflict. Thus, between 2014 and 2017, the territory of the “Butivka” mine, which is located on the border of Ukrainian Armed Forces-controlled Avdiivka and the village of Spartak (a suburb of Donetsk), under the

¹¹ <https://www.ukrinform.ua/rubric-ato/2663741-vugilni-sahti-na-okupovanomu-donbasi-stanovit-serjoznu-tehnogennu-zagrozu-ekspert.html>



control of militants of the so-called “DPR”, was hit hundreds of times with mortars and heavy artillery. Currently, the territory of the mine is completely destroyed, to such an extent that it cannot be restored, and the mine operation has been halted.¹² The “Zasiadka” mine, located in non-government-controlled territory in the Kyivskiy district of Donetsk, also fell into the battleground. According to reports from the media of the so-called “DPR”, the mine lost power due to massive artillery shelling by the AFU, as a result of which the facility’s employees had to be evacuated, and 200 miners were trapped underground for several days¹³. Also on the front line was the “Pivdenna” mine in Toretsk (formerly Dzerzhynsk). According to a witness¹⁴, in the summer of 2014 there were several mortar hits on the territory of the mine, from which two miners received shrapnel wounds. Later that year, another mine worker was killed by a landmine. Now the work at the mine is completely halted, and there is no access to it due to the proximity of the AFU. Also in 2014, the “Toretska” mine suffered shelling and damage to premises and equipment. Constant shelling led to production shutdowns, evacuations, and frequent power outage, as a result of which dozens of miners were underground in the dark for hours, without food or water. Since 2014, 5 of the 7 coal mines in Toretsk belonging to the “Toretskvuhillia” SOC have been closed, owing to the hostilities and the related risks to employees’ lives, as well as the risk of destruction of the mines themselves. In regard to the Luhansk region, the “Rodina” mine is located in the area of greatest risk, near to which there is a checkpoint where Ukrainian border guards and servicemen of the AFU serve. Periodic shelling is carried out from the side of

the village of “Zolote-5” by representatives of illegal armed groups of the so-called “LPR”¹⁵. At present, due to the proximity of hostilities and their consequences (permanent power outages), only 3 of the 7 mines of the SOC “Pervomaiskvuhillia” are partially operational.

The occupying regime, imposed by pro-Russian militants in the occupied territories has had an extremely negative impact on the coal industry as a whole. Approximately 60% of the total number of mines are completely closed or in the process of closure. The seizure and closure of mines has been haphazard and uncontrolled, and the dismantling of facilities has often consisted of simply sawing them into scrap metal, which is subsequently moved to the Russian Federation. This was the case with the “Nikanor Nova” mine in Zorynsk in the Luhansk region¹⁶, and at the “Abakumova” mine in Donetsk¹⁷. Maintaining mines in a working state has been unprofitable due to the high cost of coal and the lack of a market for it. The proximity of hostilities, causing power outages, destruction and making operational repairs impossible, has made operating most of the mines dangerous and sometimes physically impossible. Owing to this, the majority of the mines have ceased operations. However, the closure process of all coal mining facilities in non-government-controlled territories is being carried out with technological violations, and without complying with any requirements of the mine restructuring process. Consequently, practically abandoned mines are flooded uncontrollably with groundwater, and the condition of the underground mining sites is not monitored. There is therefore a high risk of subsidence and even sinkholes, the flooding of large areas, and methane leakages. These

12 https://uk.wikipedia.org/wiki/%D0%91%D0%BE%D1%97_%D0%B7%D0%B0_%D1%80%D0%B0%D0%B9%D0%BE%D0%BD_%D1%88%D0%B0%D1%85%D1%82%D0%B8_%C2%AB%D0%91%D1%83%D1%82%D1%96%D0%B2%D0%BA%D0%B0%C2%BB

13 <https://www.radiosvoboda.org/a/28270176.html>

14 Witness E001T.

15 <https://dpsu.gov.ua/news/Nezakonni-zbrojni-formuvannya-obstrilyvali-kontrolniy-post-SHahta-Rodina/>

16 https://news.liga.net/region_news/news/v-okkupirovannom-zorinske-oborudovanie-shahty-rejut-na-lom-i-vyvozyat-v-rf-pravozaschitniki.

17 <https://vchasnoua.com/donbass/57834-video-metall-idet-na-skrepy-boeviki-razvorovvayut-shakhtu-abakumova-v-donetske>

can in turn cause explosions, destruction and poisoning of the population, as well as a number of other threats of an ecological and socio-economic nature. In this context, the most serious problem is the lack of access to sites that pose a potential risk of environmental pollution. Despite numerous attempts and requests for specialists to be admitted to monitor dangerous facilities or to at least obtain information about them, the authorities of the so-called “DPR” and “LPR” have each time flatly denied any such opportunity to the Ukrainian side.

6.1 Principal risks and threats of an ecological nature associated with mine closures.

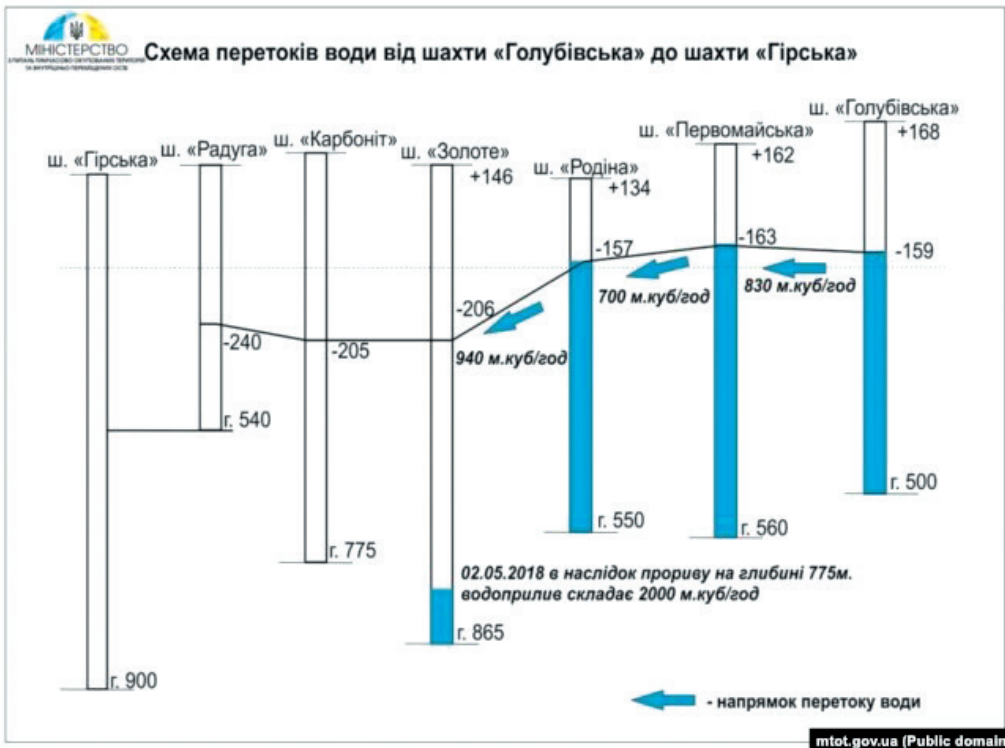
The hurried closure of mines which is currently taking place in the military conflict zone in eastern Ukraine and is caused by it, entails a number of risks to the environment. These occur, first and foremost, due to violations of the order and technologies of safe closure of coal mining enterprises. These violations, in turn, trigger processes such as the complete or partial flooding of mines, the halting of ventilation, changes in pressure within mines, changes in pressure around mine workings, an acceleration in weathering processes, and the improper disposal of slag heaps which are harmful to the environment. The principal risks are:

- ☑ The risk of underground flooding or flooding on the surface;
- ☑ The risk of mine water polluting groundwater and surface water;
- ☑ The risk of subsidence of earth on the surface, along with the destruction of buildings and infrastructure;
- ☑ The risk of man-made earthquakes;
- ☑ The risk of leakages and explosions of methane and other gases from the mines;
- ☑ The risk of the deterioration in the soil quality;
- ☑ The risk of runoff of hazardous substances from slag heaps to groundwater and surface water;
- ☑ The risk of gases from mines entering the atmosphere.

The risk of underground flooding or flooding on the surface.

Considering the fact that all of the mines are located in densely populated areas, a significant rise in the water level of the mines can cause surface flooding in large areas, including of residential buildings and farmland which are located above mines. In this context, the problem of the uncontrolled flooding of mines in the occupied territories is, once again, acute. As mentioned above, some mines have hydrological connections with each other and, therefore, mines located on different sides of the front line are connected. This is, for example, the case in Toretsk, where two mines, “Artema” and “Nova”, are interconnected and receive mine water from the “Pivdenna” mine which, in turn, is connected with the “Haharin” mine, located in occupied Horlivka. When this mine is flooded, conditions allow for the flow of water to adjacent mines, and from there, they threaten to flood part of the territory of Toretsk. Currently, there is no information about the rising water level in the “Haharin” mine, and as such, it is impossible to determine the degree of risk. At the same time, representatives of the military-civil administration of Toretsk repeatedly recorded flooding of residential buildings in Toretsk, the village of Pivnichne, the Samannyi district and the village of Dachne, in the period between spring and autumn 2020.¹⁸ Returning to the issue of the

¹⁸ Action plan of Toretsk MCA for the prevention or minimization of risks from mine closures – Toretsk, 2020, p.28.



The flow of water from “Holubivska” mine to “Hirska” mine.
Source: official website of the Ministry of Reintegration of Temporarily Occupied Territories

Image heading: Schema of water flow from “Holubivska” mine to “Hirska” mine

Key to image (from left to right): “Hirska” mine; “Raduha” mine; “Karbonit” mine; “Zolote” mine; “Rodina” mine; “Pervomaiska” mine; “Holubivska” mine.

Г – depth, М.куб/год – cubic meters per hour, 02.05.2018 owing to a breakthrough at a depth of 775m, the flow of water is 2,000 m³/hour “Напрямок перетоку води” – Direction of water flow

flooding of mines in the occupied part of the Donetsk region, the total lack of data on the mines of SOC “Artemvuhillia” (Horlivka) and SOC “Ordzhonikidzevuhillia” (Yenakiiv) must be noted. In the event of the level of mine water rising to the surface level¹⁹, it is possible that flooding processes would develop in part of the territories of the cities of Horlivka, Vuhlehirsk, Yenakiiv and Bunhe (Yunokomunarivsk). An even more serious situation has arisen in the “Pervomaiskvuhillia” SOC, located in Zolote in the Luhansk region. A number of mines there have adjacent underground faults, namely the “Karbonit”, “Zolote”, “Hirska” (government-controlled territory), “Pervomaiska”, “Holubovska” and “Rodina” (occupied territory) mines. It should be noted that the Zolote mine

is a water protection facility for the mines of the whole Pervomaiska group. For some time (2014 – 2016) the “Rodina”, “Pervomaiska” and “Holubovska” mines were working exclusively in drainage mode and were restricting the flow of mine water to the operational mines of the Pervomaiska group. However, due to constant power outages and shelling, the water pumping stopped. Instead, it accumulated in the workings of the mine and seeped through cracks in the rock, gradually forcing its course. In May 2018 there was an uncontrolled breakthrough of mine water from the flooded mines of “Rodina” and “Holubovska” to the side of the hydrologically connected “Zolote” mine. As a result, the rate of water flow at the Zolote mine increased to 2,000 cubic meters per hour

¹⁹ The surface level is the level of the ground on and from which blasting operations are carried out using explosives, in connection with the extraction of minerals in open-pit mining, in construction, for blasting concrete and reinforced concrete constructions, in cases of collapsed buildings, constructions and infrastructure. This includes the destruction of tanks by hydraulic blasting, the destruction of metalwork, explosion welding, ice blasting on reservoirs, stump uprooting and tree felling, in agricultural works, underwater works, and work in deep wells, among others (source: the Ministry of Energy and the Coal Industry of Ukraine, Order “On approval of technical rules for conducting blasting operations on the surface” of 18.07.2013 No. 469). There are several views on its depth and the danger of groundwater reaching the surface. Expert Y. O. Yakovliev argues that the critical water level is -250 meters (European standard), and that at this level water will go into the soil, washing away the rock and polluting the groundwater. SOC “Donetskheolohia” adheres to the view that the critical threshold for groundwater levels (and therefore the depth of the surface level) is -160m.

Затоплення шахт ДП «Первомайськвугілля»

131,2 млн.грн виділено Урядом в 2018р. для попередження затоплення шахт та виникнення техногенно-екологічної катастрофи



Schema of the flooding of “Pervomaiskvuhillia” SOC mines. Source: official website of the Ministry of Reintegration of Temporarily Occupied Territories

Image title: Flooding of the “Pervomaiskvuhillia” SOC mines
Image text:

131.2 million hryvnia were allocated by the Government in 2018 for flood prevention and technological-ecological disasters.

Mine names, left to right and top to bottom: Hirska; Karbonit; Zolote; Rodina; Pervomaiska; Holubivska.

(the inflow limit of the “Zolote” mine is 280m³/hr). To resolve this emergency and to avoid an emergency in the short term, additional pumps were installed at the mine and more than 131 million hryvnias were allocated from the reserve fund of the State budget in order to reduce the consequences of the disaster.

However, the measures taken have not entirely resolved the situation, and there is currently a trend of an increasing volume of incoming water. This will necessitate the installation of additional capacity at the enterprise, and the organization of processes of purification and storage of waste mine water in septic tanks.²⁰

OTHERWISE, ACCORDING TO SOME EXPERTS, STOPPING WATER PUMPING AT “PERVOMAISKA” AND “HOLUBIVSKA” MINES WILL LEAD TO THE RELEASE OF MINE WATER ABOVE GROUND LEVEL, AND FLOODING OF BUILT-UP AREAS WITH A POPULATION OF 80,000 PEOPLE (THE CITIES OF KIROVSK, PERVOMAISK, ZOLOTE, HIRSKIE, AND THE VILLAGE OF KARBONIT), AS WELL AS THE FLOODING OF AGRICULTURAL LANDS AND NATURAL LANDSCAPES (DEER TERRITORY, MEADOWS, FORESTS).²¹

Thanks to the installation of pumps, it was possible to temporarily stop the flooding of the Pervomaisk group of mines. Currently, water is pumped out of the “Zolote” mine from level 687 at the -534m mark, but the critical threshold for the water flow to the “Karbonit” mine is the -520m mark, meaning that there is only a reserve of 14 meters at the “Zolote” mine to contain a potential emergency.²²

Risk of groundwater and surface water pollution by mine water. Mine water has an extremely diverse chemical composition, and is unfit for drinking, as well as for use for technical, and even more so for domestic purposes, without pre-treatment. During the process of mining, water is exposed to various types of pollution and is characterized by increased mineralization, including with sulfates and chlorides, as well as high levels of iron and other heavy metals. Truth Hounds documenters took a sample of wastewater from the “Tsentralna” mine in Toretsk, and transferred it to the laboratory of the Siverskyi-Donets Basin Water Resources Department. The results of the water composition analysis can be viewed in the table below:

²⁰ Witness E002Z

²¹ https://www.osce.org/files/f/documents/6/3/362581_0.pdf?fbclid=IwAR3KIIZhLryLFuuV07Hef7t9W5SfmzXDLhHy96ek8p9NA7vorVSBFJm8zI

²² Summary analysis of the impact of coal mining facilities of the “Pervomaiskvuhillia” SOC on the environment, Kyiv, 2020, p. 8.

²³ <https://zakon.rada.gov.ua/laws/show/z0452-10#Text>



Indicator name	Tap drinking water (regulatory standard)²³	Waste mine water, Toretsk
Chlorides, mg/dm ³	<= 250	434,9
Sulfates, mg/dm ³	<= 250	851,5
Iron, mg/dm ³	<= 1,0	0,214
Manganese, mg/dm ³	<=0,05	0,025
Copper, mg/dm ³	<= 1,0	0,0003
Chromium, mg/dm ³	<= 0,05	0,0007
Zinc, mg/dm ³	<= 1,0	0,003

As can be seen from the table, if the quantity of metals is found to be within the norm with slightly high levels, the content of chlorides and sulfates demonstrates that this water cannot be released into reservoirs or open areas without undergoing prior treatment. The situation at various mining sites is complicated by the fact that after passing through the mine passages, groundwater collects not only the products of coal mining in which a particular facility specializes. Since the size of the depression funnels of flooded

mines is rather large²⁴, surface water and melt water, as well as sewage water from damaged storage sites, reach the coal mining wells. Leaching of wastewater from storage sites and drainage systems also occurs. The treatment of mine water and compliance with norms for their withdrawal are therefore a priority in coal mining in the context of environmental protection. Over the course of a year, approximately 4 million cubic meters of mine water are pumped out of the two operational mines of "Toretskvuhillia" alone.



Talia Svetlaya ответила Евгению

Евгений, никто там давно не качает. Вы давно уехали?

вчера в 21:46 [Ответить](#)



Евгений Михеенко ответил Talia

Talia, откуда сброс воды ? В таком большом количестве и с огромным содержанием железа

вчера в 21:47 [Ответить](#)



Talia Svetlaya ответила Евгению

Евгений, сама поднимается, нет там откачки, шахта закрыта полностью. Откачка была на Булавинке, но сейчас и там не качают. Должны были строить на Профинтерне. Но, деньги растащили и дела не будет скорее всего.

вчера в 21:56 [Ответить](#)

Screenshot from a page of a group on the social network "Vkontakte".

Translation of screenshot:

Talia Svetlaya: Yevgeniy, no pumping has been going on there for a long time.

Yevgeniy: Talia, where is the water coming from? So much and in such a great volume

Talia Svetlaya: It is coming up by itself, there is no pumping going on there, the mine is completely closed. There used to be pumping at Bulavinka, but there isn't even pumping there anymore. It should have been built at Profintern. But the money was stolen and it probably won't happen.

²⁴ Here: the characteristic of changes in soil around the bore with a steady inflow of groundwater, which have the shape of a funnel



Pond near the village of Standartne after the release of groundwater from the Bulavynka mine, May 2020. Photo from open sources

Despite the relatively proper drainage systems in these mines, the analysis of drinking water sources in the surrounding areas showed that in only 2 of the 11 sources the water meets the accepted standards. In other samples, the dry residue is significantly excessive, which indicates increased mineralization of drinking water²⁵. This situation can be extrapolated to the occupied territories, while the scale of the damage should be increased, as three times more mines are operated, drained or flooded along the front line than in government-controlled territory. The catastrophic nature of the situation in regard to the release of mine water can be perceived from the state of the reservoirs of the village of Standartne, near to Yenakiiv. Residents of Yenakiiv

claim that the source of the problem was non-functioning drainage in destroyed and flooded mines, including the “Bulavynka” mine²⁶. Contaminated water from this mine enters the Kryvyi Torets and subsequently the Siverskyi-Donets.

Due to the arbitrary flooding of mines in the non-government-controlled territory of the Luhansk region in the area of the village of Zolote, there is massive pollution of the Komyshuvakha River. As mentioned above, a large volume of water flows from the “Holubovska” and “Rodina” mines to the “Zolote” mine, which is located in territory controlled by the Ukrainian government. The water treatment capacity of “Zolote” cannot cope with the volume of incoming water. There

²⁵ Action plan of Toretsk MCA for the prevention or minimization of risks from mine closures – Toretsk, 2020, p. 25

²⁶ <https://v-variant.com.ua/article/kolohycheskaia-katastrofa-v-enakiivo-shakhtn-e-vod-otravlaiut-reky-y-stavky/>



Komyshuvakha River, village of Zolote, Luhansk region. Photo by Truth Hounds, April 7, 2021

Indicator name	Tap drinking water (regulatory standard)²⁸	Komyshuvakha River
Chlorides, mg/dm ³	<= 250	269,8
Sulfates, mg/dm ³	<= 250	1985,1
Iron, mg/dm ³	<= 1,0	0,148
Manganese, mg/dm ³	<=0,05	0,347
Nickel, mg/dm ³	<= 0,02	0,012
Zinc, mg/dm ³	<= 1,0	0,006

is, consequently, direct discharge into the local river.²⁷ As of April 2021, the Komyshuvakha River looked like this:

In order to ascertain the level of pollution of this river, Truth Hounds documenters took a water sample from it and transferred this to the laboratory of the Siverskyi-Donets Basin Department of Water Resources (Sloviansk). The results of the water analysis showed that its physical-chemical composition significantly

exceeds the maximum acceptable levels for such an environment.

It is important to bear in mind that the hydrographical specificity of the region is that virtually all untreated mine water, upon entering open areas, deans, reservoirs and rivers of the Siverskyi-Donets basin, then flows directly into the Siverskyi-Donets, the main river of the region. The polluted waters subsequently flow through the south of the Belgorod and Rostov regions of

²⁷ Witness E002Z

²⁸ <https://zakon.rada.gov.ua/laws/show/z0452-10#Text>



Sinkhole in Makiivka, photo from open sources



Freeze frame from material of the TV company "Oplot TV" of the so-called "DPR" from 29.05.2020³²



the Russian Federation, enter the Don River, and from there, the Sea of Azov. Thus, the pollution in question is trans-national in nature.

The risk of subsidence of surface soil with the destruction of buildings and infrastructure. As a result of intensive and long-term coal mining, almost the entire surface of the earth in the Donetsk and Luhansk regions has exploited space beneath it. In particular, the underground soil heaps of Donetska, Makiivska and Yenakiievaska industrial agglomerations are in such a state. In addition, the flooding of mines has an extremely negative effect on soil density, causing subsidence, landslides and even sinkholes. These problems can also be caused by the improper disposal of used materials and mass unauthorized coal mining at shallow depths. The gradual or sudden subsidence of the surface of earth can cause significant destruction of residential buildings, industrial and social infrastructure, roads and railways, bridges, underground communications, parts of the gas and water supply systems, and sewage systems.

ACCORDING TO SOME ESTIMATES, A TOTAL AREA OF 12,000 HECTARES OF THE SURFACE ARE THREATENED WITH SUBSIDENCE.²⁹

In 2016, the State Service for Geology and Subsoil of Ukraine³⁰ conducted research which showed that the Donetsk and Luhansk regions have the largest area of unauthorized mining sites in Ukraine, at almost 4,500 square kilometers. At the same time, there are 23 cities in the Donetsk region which are in the illegally exploited area (there is no data available for the Luhansk region), which is almost four times the average of other analogous regions of Ukraine. Monitoring of subsidence movements of the surface can be carried out thanks to satellite

images and geodesic soil analysis, in particular – and most importantly – in the temporarily occupied territories. However, this project is still not fully realized owing to a lack of funds. Nevertheless, some indicators have still been obtained. Thus, according to information from the Ministry for Reintegration of Temporarily Occupied Territories released in 2018, the following subsidence was recorded in cities in the Donetsk regions: 53cm around the mines in the Kyivskiyi district (Donetsk); 69cm in the Kalininskyyi district (Donetsk); up to 92cm in the Petrovskyyi district (Donetsk); 52cm near the “Shchehlovska” mine (Makiivka). According to the Minister for Temporarily Occupied Territories and Internally Displaced Persons at the time, Vadym Chernysh, this situation indicates that the surface of cities is actually collapsing.

THE MINISTRY ESTIMATES THE 25,000 CIVILIANS ARE AT RISK DUE TO SUBSIDENCE.³¹

It is possible to find out about further cases of subsidence in the occupied territories from open sources (as in the photo below).

In residential areas located in the government-controlled parts of Donetsk and Luhansk regions, hydrogeological surveys are conducted directly on the ground. These surveys determine displacements of the soil surface, primarily considering the condition of above-ground buildings. The data obtained during the survey of the village of Pivdenne, located near the mine of the same name, showed numerous cracks in the walls and foundations of residential buildings, as well as misshaping of door and window openings.³³ It should, however, be noted that since the beginning of the conflict, these surveys have not been systematic, and are not so much initiated by local authorities

29 <https://rubryka.com/ru/article/donbas-ekologiya/?fbclid=IwAR03EfxDzVfFmj96lvtznuPWy2a2t1S8NFjK3LROxmG-9KsSXFbu68GNqA>.

30 <https://www.geo.gov.ua/ekzogenni-geologichni-procesi/>

31 <https://uain.press/articles/ekologichna-sytuatsiya-na-donbasi-838351>

32 <https://www.youtube.com/watch?v=H9aMHwONGTA>

33 Action plan of Toretsk MCA for the prevention or minimization of risks from mine closures – Toretsk, 2020, p. 28.



A crack in the façade of a house in the village of Pivdenne, Donetsk region. Photo source via the link ³⁴

as by international support through sporadic projects..

Risk of man-made earthquakes. If water is not pumped out of mine wells, and is left as “wet conservation”, the submerged soils lose density and spread out. These phenomena can cause a sudden expulsion of water. Such hydraulic shocks can be accompanied by local, so-called “man-made” earthquakes. The intensity of these earthquakes can reach 4 – 5 points on the Richter scale. This phenomenon is mentioned in the State Service for Geology and Subsoil of Ukraine’s description of exogenous geological processes³⁵. Yevheniy Oleksandrovych Yakovliev, an academic and Doctor of Technological Sciences, has warned of the danger of man-made/technological earthquakes. He noted that the whole of the Donbas is on the verge of crisis due to rising groundwater, which can lead to seismic activity. He gave the following examples: “In

February 2018, in the “gray zone” in the village of Chyhari near Toretsk, the ground collapsed by 5 meters, and landslides damaged the water supply. In Toretsk itself, also in 2018, a large-scale mudslide was reported, which then flowed and damaged the defensive fortifications of the Ukrainian Army.”³⁶

As for the temporarily occupied territories, the residents of Makiivka and neighboring villages were able to bear witness to this situation. Thus, starting in 2018, messages from local residents about strong earthquakes of unknown origin began to appear periodically on social networks. These tremors damaged residential buildings and caused cracks in the ground and asphalt. The most recent tremors were felt by residents of the village of Obiednane, near Makiivka, on March 21, 2021.

It should be noted that there are 9 mines on the territory of the Makiivka agglomeration, 6 of which have been decommissioned and

³⁴ Action plan of Toretsk MCA for the prevention or minimization of risks from mine closures – Toretsk, 2020, p. 28.

³⁵ <https://www.geo.gov.ua/ekzogenni-geologichni-procesi/>

³⁶ <https://www.nas.gov.ua/UA/Messages/Pages/View.aspx?MessageID=7161>



Aftermath of an earthquake in Makiivka, photos from open sources

are in drainage or “wet conservation” mode. Local residents attribute the earthquakes to the shutting down of mines, and they complain of the lack of reaction on the part of local authorities and the deliberate silence surrounding the situation, including in the media.³⁷

The head of the so-called “DPR” reacted to the situation in 2019 by holding several meetings with the heads of the relevant “ministries” and services. A special commission was even set up to study the origin of the underground anomalies, and the work of the “Kalynivska-Skhidna” mine, associated with the unexplained tremors, was suspended.³⁸ However, the conclusions and results of the commission’s work have not been made public, and the shocks and the destruction caused by them still occur periodically.

Risk of the release and explosion of methane and other gases from mines.

A further consequence of mine flooding can be the uncontrolled escape of mine gases at the surface. This includes methane (explosive), carbon monoxide (highly toxic), and radon (radioactive). Radon, in particular, poses a threat to groundwater intakes.³⁹ Methane poses the greatest danger to the region’s residents, as it is difficult to detect due to its lack of odor and color, and its high flammability can provoke explosions and fires in places where it accumulates (basements, underground shelters and wells). At mining facilities, in normal conditions, teams of gas inspectors operate, checking the levels of gas in residential buildings located within the “zone of influence” of mines. However, with the closure of a mine, these inspections

37 <https://v-variant.com.ua/article/zhytely-makeevky-zhaluiutsia-na-zahadochn-e-zemletriasenyia-ot-podzemn-kh-tolchkov-rushatsia-doma/>

38 https://vk.com/wall-32205256?q=%D1%88%D0%B0%D1%85%D1%82%D0%B0%20%D0%B7%D0%B0%D0%BA%D1%80%D1%8B%D1%82%D0%B0&w=wall-32205256_1348634

39 https://www.osce.org/files/f/documents/6/3/362581_0.pdf?fbclid=IwAR3KIIZhLryLFuuV07Hef7t9W55fmzXDLhHy96ek8p9NA7vor-VSBFJm8zl



Screenshot from a group page for Makiivka on the social network "Vkontakte".

Translation:

Anonymous request. To the Makiivka City Emergency Administration, which wanted to spit on its citizens! People of Makiivka, how long will it last!? Earthquakes at Obiedinennyi (ed. Sovietskyi district of Makiivka) have become even stronger and more frequent, all of the walls are cracked, dishes and paintings fall down several times a day, the foundations of lots of houses are cracked – and no one cares! Shameful media, no they have no right to call themselves media, disgraceful local TV channels, newspapers, which are only suitable for miners' lunches, and bought radio channels, which not once in a whole year mentioned the problems at hand, NOT ONCE!

are no longer carried out, which increases the risk of explosions and fires in buildings.⁴⁰ Accumulations of methane in slag heaps leads to a risk of explosions, a risk which increases during hostilities. Due to the high content of hazardous and toxic substances in slag heaps, these explosions can inflict dual damage to the environment, to both the soil and the air..

One of the recorded cases of gas escaping to the surface is that of November 4, 2020. In one of the villages in occupied Horlivka it was reported that the soil was leaking gases and the ground was burning. Local residents believe that the combustion took place as a result of the gas escaping from abandoned and flooded mines. According to residents, this is not the first time that gas has escaped to the surface. Eyewitnesses also complain of suffering from severe headaches after being near the site of the gas leak. Representatives of the Ministry of Emergency Situations of the so-called "DPR" have been unable to assist or to explain the situation⁴¹.

Risk of runoff of hazardous substances from waste heaps to groundwater and

surface water. Given that slag (waste) heaps are an essential feature of mines, in the case of the cessation of operations, waste heaps must be extinguished and repurposed. Since a large volume of combustible materials remains in these heaps, they can smolder for decades. The Research Institute of Mountain-Rescue and Fire Safety reports that slag heaps in the Donetsk area alone emit 120 kilotons of pollutants per year, containing monoxide and carbon monoxide, sulfur oxide and other toxic substances.⁴² Proper reclamation will, firstly, prevent the occurrence of explosions and fires, and the consequential release of the products of combustion into the atmosphere, and secondly, prevent the leaching of toxic substances from waste heaps and their contamination of soils and water.

Risk of soil contamination. If mine water enters soil as a result of flooding or direct runoff into such terrain, the chemical composition of the soil is altered, increasing its salinity, contributing to its deterioration and the waterlogging of the surface.

Risk of radioactive and chemical

⁴⁰ Witness E003T

⁴¹ <https://dn.depo.ua/rus/donetsk/v-gorlivtsi-skarzhatsya-shcho-gaz-iz-zatoplenikh-shakht-vikhodit-na-poverkhnyu-i-gorit-20201111243292/amp>

⁴² Action plan of Toretsk MCA for the prevention or minimization of risks from mine closures – Toretsk, 2020, p.29



Site of underground gas leak, in Nyzhniy, Horlivka, November 4, 2020. Photo from open sources.

contamination associated with mine flooding in Donbas.

Radioactive contamination. No issue in the context of risks and threats to the environment in the conflict zone in eastern Ukraine has caused such alarm as the high probability of radioactive contamination. The issue centers around the “Yunyi Komunar” (“Yunkom”) mine, which is located near Yenakiiieve in the non-government-controlled area. At a depth of 937 meters in the mine well, there is the so-called “Klivazh” facility, which is a capsule which was formed by a controlled underground atomic explosion that took place in the mine in 1979. During the explosion, a capsule with walls that melted into glass was formed, in which water accumulated along with radioactive strontium, cesium and other elements. The explosion was experimental, and the “Yunkom” mine was one of most saturated with harmful gasses in the entire former USSR. Thus, according to physicists, the explosion would cause the pressure in the hillsides to

decrease, and the overall safety of production to increase.

According to official data, there were background levels of radiation in the mine facilities and the mine water for the observation period of 1979-2000. However, at the epicenter of the explosion, the radiation level is extremely high: 60 curies (due to highly radioactive plutonium-239 and americium-241).⁴³ The mine was operational until 2002, after which it was closed in the “dry conservation” mode with permanent drainage systems. Yet in April 2018, the authorities of the so-called “DPR” decided to stop pumping water from the mine. Thus, there is a risk of the glass capsule being destroyed, and the leaking of highly hazardous radioactive elements into surface waters. The rate of flooding of the mine is rather high: just two months after water pumping ceased, the level of mine water in the shaft of the mine increased by 157 meters.⁴⁴ Consequently, the region may become the site of an ecological disaster in the near future. As highlighted by International Human

43 https://www.ukrrudprom.ua/digest/Atomniy_vzriv_bez_sroka_davnosti.html

44 https://mru-journal.com.ua/index.php/mru/article/view/13/13?fbclid=IwAR2qKsdY9kciF9XZfuj_Orss3Ep5Cuu9eHevenf3AMzeDHK_Owp-2FuLqA9o



Waste heaps of the “Tsentralna” mine (Toretsk), with sulfur lakes at their base. Photo by Truth Hounds, April 9, 2021

Rights Community, as of March 1, 2020, there is confirmed data on the complete flooding of the “Klivazh” facility. The total concentration of radionuclides in the aquifers of the surrounding area, from a post at a distance of 5km from the site, was $20\text{-}34 \cdot 10^3$ Bq/kg. This means that low-level radioactive waters are already entering the drinking water level.⁴⁵

As before, the situation is significantly complicated by the fact that at present, there is no information on the increase in background radiation in the area surrounding the mine or in the Bulavin, Krynska and Mius Rivers, which flow nearby. The only sources of information are the representatives of the so-called “DPR”, who deny any changes in background radiation levels and the risks associated with the flooding of “Klivazh”. All attempts by the Ukrainian side to gain direct access to the site for data collection purposes, at least for representatives of the International Atomic Energy Agency to independently assess the situation, are met with an outright refusal. Despite the fact that, in the event of radiation entering the aforementioned

rivers and subsequently the Siverskyi-Donets, the radioactive damage will spread not only in Ukrainian lands but also in the southern part of the Rostov region of the RF,⁴⁶ officials of the so-called “DPR” continue to block any external intervention in the situation.

More positively, Ukraine is attempting to use its leverage to influence the situation. Thus, after the flooding of the “Yunkom” mine, the Donetsk Region Prosecutor’s Office entered information into the Unified Register of Pre-Trial Investigations on the grounds of a crime under Art. 441 (ecocide) of the Criminal Code of Ukraine. In a publication on its website from May 23, 2018, the following is noted: “It has been established that in April of this year, representatives of the so-called “DPR” took and announced the decision to cease water pumping from the “Yunkom” mine, located in the temporarily occupied territory, in the village of Bunhe (formerly Yunokomunarsk)”. According to the press office of the Prosecutor’s Office, “the occupying forces of the “DPR”, controlled by the Russian aggressor, understand that these

⁴⁵ <https://www.facebook.com/IHRCSMM/posts/3063102823807179>

⁴⁶ <https://www.pravda.com.ua/rus/news/2020/10/23/7270981/>

actions could cause an ecological disaster, consisting of the radioactive and chemical contamination of groundwater and surface water and, in turn, the pollution of the Sea of Azov”.⁴⁷

Chemical pollution. Mine “No.2-bis” is located in occupied Horlivka, and used to form part of the Mykytivskiy Mercury Plant. It was formerly used as a sedimentation tank for production. After the plant ceased operations, the mine was closed in “dry conservation”. The depth of the mine is approximately 450 meters, and the watercourse of the “Siverskyi Donets-Donbas” channel runs directly above it. This creates an additional danger, because in the event of an accident in the mine, mercury can leak not only into the surrounding environment, but also into drinking water, which would lead to an environmental and humanitarian disaster throughout the region. In 2018 information about the flooding of the mercury mine

appeared. This can lead to the “collapse” of the infrastructure, forcing out water along with mercury, and can also lead to the destruction of the concrete channel of the water supply.⁴⁸ As in other cases, information on the level of flooding in the mine at present is, unfortunately, lacking. The possibility of the territory of abandoned facilities being used for the storage of hazardous waste from the Russian Federation is also a cause for concern.⁴⁹

The “Oleksandr-Zakhid” mine is also located in the territory of occupied Horlivka. At various times, highly toxic waste from the industrial site (sedimentation tank) of the Horlivka Chemical Plant (Styrol) entered the bore. These chemicals included ammonia, mononitrochlorobenzene (also known as “blood poison” for its ability to affect human blood), and other substances which, when they reacted with mine radon, often caused serious injuries to and the deaths of miners. In relation to the mine’s situation, the Republican Academic Institute of Mining

47 https://don.gp.gov.ua/ua/news.html?_m=publications&_c=view&_t=rec&id=2298677

48 <https://www.delfi.lt/ru/news/live/kakoj-ekokoktejl-vojna-v-donbasse-prigotovila-ego-zhitelyam-i-sosedyam-v-rostovskoj-oblasti-rossii.d?id=82892585>

49 <https://www.facebook.com/dmitry.tymchuk/posts/1786378171490830>



Panorama of the “Yunkom” mine, photo from open sources



Dmitry Tymchuk
7 листопада 2018 р. · 🌐

Относительно «ртутной бомбы» и захоронения россиянами радиационных отходов в «ДНР»

Так, в апреле 2017 года жители г. Горловка, проживающие в поселке Бессарабка, стали свидетелями пребывания на территории «Никитовского ртутного комбината» «военных в химической защите с характерными знаками радиационной опасности».

В частности, по данным группы ИС, 24.04.2017 года к территории заброшенного «Никитовского ртутного комбината», со стороны поселка Ртутный, подъехали несколько КамАЗов с номерами:

- ДК 42-03,
- ДК 41-10,
- ДК 43-08,

после чего два десятка российских военнослужащих в форме химической защиты с указанными знаками радиационной опасности разгрузили бочки. Затем, используя массивные тележки, перевезли их на территорию заброшенного ртутного комбината.

По нашим данным, таким образом военнослужащие ВС РФ производили складирование и захоронение радиационных отходов, вывезенных с территории России.

По состоянию на начало ноября 2018 года так называемыми «властями ДНР» остановлено откачивание воды из горных выработок шахты «2-бис» и «Новая». Чуть ранее, в октябре с.г. были уволены все работники, обслуживавшие и эксплуатировавшие насосные установки. Данные действия «власти республики» комментировать не намерены, но вероятнее всего, причиной затопления выработок является банальное отсутствие финансирования.

Эксперты «ИС» акцентируют внимание на том, что затопление выработок шахты «2-бис» и «Новая» угрожает серьезными проблемами всему региону: кроме вопроса захоронения радиационных отходов из РФ, речь идет и о дальнейшем резком повышении содержании ртути в земле и воде.

Игнорирование оккупационными властями экологических проблем на временно оккупированных территориях Донбасса может свидетельствовать только об одном, - Москву не интересует судьба людей, которых она цинично использовала в угоду своим имперским амбициям.

Geology, Geomechanics, Geophysics and Mine Surveying (RANIMI), has noted that modern measurements of surface contamination have shown that the area of contamination was very small, as everything went 450 meters⁵⁰ down. However, there is little cause for celebration: since there is no drainage in the mine, it, like all of the others, is gradually filling with water, which transfers its toxic contents into the surface water level and soils.

Висновки:

THE MILITARY CONFLICT AND THE RELATED HOSTILITIES AND OCCUPYING REGIME ARE A DECISIVE FACTOR IN THE NEGATIVE IMPACT ON THE STATE OF COAL MINES IN EASTERN UKRAINE. FIRSTLY, THIS IS DUE TO THE UNPLANNED SHUTDOWN OF MANY MINING COMPANIES, RESULTING IN THE ABANDONED MINES LACKING CONTROL OVER WATER LEVELS, RATES OF SOIL SUBSIDENCE AND CONTROL OF GAS

Screenshot of a post by Dmitry Tymchuk on Facebook, November 7, 2018

Translation:

Regarding the “mercury bomb” and the disposal of radioactive waste by Russians in the “DPR”.

So, in April 2017 residents of Horlivka living in the village of Besarabka, witnessed the presence of “military personnel in chemical protection equipment with radiation hazard signs” on the territory of the Nikitovsky Mercury Plant.

In particular, according to the Information Resistance group, on 24.04.2017 several Kamaz with the following numberplates arrived in the territory of the abandoned Nikitovsky Mercury Plant, from the side of the abandoned village of Rtutnyi:

- DK 42-03
- DK 41-10
- DK 43-08

LEVELS IN THE AREAS ADJACENT TO THE MINES AND OTHER ENVIRONMENTALLY HAZARDOUS PROCESSES. THE SITUATION IS COMPLICATED BY THE LACK OF ACCESS TO SOME FACILITIES DUE TO THE LOCATION OF AFU POSITIONS OR THESE FACILITIES BEING LOCATED IN OCCUPIED TERRITORIES. THE LACK OF SUFFICIENT INFORMATION ON NON-GOVERNMENT-CONTROLLED MINES MAKES IT IMPOSSIBLE TO INFLUENCE PROCESSES WHICH POTENTIALLY POSE A THREAT TO THE ENVIRONMENT. ALL OF THESE FACTORS COMBINED CREATE A NUMBER OF RISKS OF TRANS-NATIONAL EMERGENCIES FOR THE REGION’S (AND NOT ONLY UKRAINE’S) NATURAL ENVIRONMENT. SOME OF THESE RISKS REQUIRE IMMEDIATE INTERVENTION IN ORDER TO AVOID A FULL-SCALE ECOLOGICAL DISASTER.

⁵⁰ <https://www.delfi.lt/ru/news/live/kakoj-ekokoktejl-vojna-v-donbasse-prigotovila-ego-zhitelyam-i-sosedyam-v-rostovskoj-oblasti-ros-sii.d?id=82892585>



Example of mine restructuring: "From 2013 to 2021", "Artema" mine, Toretzk



7 | Impact of the military conflict on water supply, the sewage system, the electricity supply, and related risks to the environment.

Through the course of the hostilities, water, gas and electricity infrastructure has been constantly damaged due to the density of their networks and their proximity to the line of delimitation. At times, this infrastructure becomes a target for shelling, as they are used by the military in order to set up firing points or for the placement of military units. Direct impact and consequential damage or destruction of these sites poses the following ecological threats:

- ☑ Emissions of liquid chlorine, causing air pollution;
- ☑ The release of sewage and untreated industrial waters into reservoirs and rivers;
- ☑ Ceasing of operations of metallurgical, coal and chemical industries owing to a lack of power

WATER:

As in many analogous cases, water infrastructure facilities in the Donetsk and Luhansk regions are located in both the government-controlled and temporarily occupied territories, and some are in the so-called gray zone. This makes it impossible to monitor their condition in order to take measures to prevent emergencies, and in the event that such situations arise, it makes it impossible

to quickly locate and eliminate the risk. The presence of active hostilities significantly increased the probability of accidents. Of particular concern is liquid chlorine, which is used for water purification. It is stored under pressure in tanks at filtration stations such as “Donetska”, “Verkhokalmiuska”, “Starokrymska No. 1, 2”, “Horlivska No. 1, 2”, as well as “Zakhidniy Filtrualniy Stantsii” and “Popasnianskiy Raioniy Vodokanal” MOC. Experts warn that the uncontrolled release of liquid chlorine into the atmosphere is possible, due to damage to the pressurized containers in which it is stored. This would lead to environmental pollution and human poisoning. It should be noted that on interaction with oxygen, one kilogram of liquid chlorine is converted into 315 liters of gaseous chlorine, which is quickly carried away by the wind.

TAKING INTO ACCOUNT THE SPECIFICITIES OF EACH OF THE FILTRATION STATIONS (APPROXIMATELY 250 TONS OF CHLORINE ARE STORED AT THE “DONETSKA” FILTRATION STATION ALONE),⁵¹ IN THE EVENT OF THE LEAKING OF LIQUID CHLORINE INTO THE ATMOSPHERE, THE AREA OF POSSIBLE CHEMICAL CONTAMINATION WOULD RANGE FROM 2 SQUARE KILOMETERS TO 30 SQUARE KILOMETERS. DEPENDING ON THE WIND DIRECTION, THE NUMBER OF PEOPLE

⁵¹ <https://www.osce.org/files/f/documents/1/2/405497.pdf>.



Aftermath of the shelling of the “Hirska” pumping station in February 2017. Photos by Truth Hounds, February 2017

WITHIN THE PROJECTED AREA OF CHEMICAL CONTAMINATION FROM AN ACCIDENT IN CHLORINE STORAGE CAN BE FROM 300 TO 90,000⁵².

Moreover, in the event of a chlorine leakage, the consequential disruption of the water treatment process would leave 3 million people without drinking water. This would considerably complicate the humanitarian and sanitary-epidemiological situation in the region, and would create preconditions for the deterioration of the socio-economic situation of the region.⁵³

The high level of vulnerability of the water supply and the sewage systems in the frontline zone is evidenced by the fact that in the period from July 2014 to the end of December 2016, 188 incidents related to military actions which had negative consequences for the functioning of “Kompaniia Voda Donbasu” MOC, including relating to environmental damage, were recorded by humanitarian monitoring organizations (data sources: UNICEF, WASH Cluster, INSO, Krasnoarmiyske Regional Production Department of “Donbas Water Company” MOC). Therefore, as a result of shelling by the so-called “DPR” in February 2017, the facilities of the

filtration station suffered significant damage, including to the chlorine tank. On November 5, 2017, the Verkhokalmiuska filtration station, which provides drinking water for 800,000 people and stores 100 tons of chlorine gas, was also damaged by numerous shells.⁵⁴ In the view of experts, the possible release of toxic gases and the destruction of water supply facilities would have catastrophic consequences for the settlements in Donetsk, Makiivka and Avdiika.⁵⁵ Truth Hounds documenters have established the fact of the repeated and, based on the circumstances of the incidents, targeted shelling of the pumping station of “Popasnianskyi Raionniy Vodokanal” MOC, located near the village of Zolote-2 in the Luhansk region. These shellings occurred repeatedly between 2015 and 2017 and were carried out from the side of the non-government-controlled village of Mykhailivka.⁵⁶ Due to the shelling, the technical buildings of the facility were damaged. Since the tanks of the plant’s technical facilities contained an aqueous solution of chlorine, which is used to disinfect water, damage to these tanks could cause chlorine to leak into drinking water and the environment..

52 <https://deis.menr.gov.ua/lib/files/zvitrv.pdf>.

53 Ibid.

54 <https://www.mil.gov.ua/news/2017/02/24/kerivnicztvo-doneczkoi-filtruvalnoi-stanczii-pripinilo-robotu-ale-voda-nadhodit-do-naselelnya-v-shtatnomu-rezhimi/>

55 <http://khpg.org/1510756876>

56 Witness E004Z



Satellite image of the pumping station near the village of Shumy. Trenches nearby are clearly visible, which are likely to be fortifications of illegal armed groups.

The last recorded shelling of a water supply facility took place on April 6, 2021, resulting in the loss of power to the pumping station of the first elevation of the “Pivdenodonbaska” water supply, located in the “gray zone” between the villages of Vasylivka and Kruta Balka. More than 250,000 people from the Volnovaskyi and Pokrovskiyi areas of the Donetsk region were left without water.⁵⁷

In some cases, these incidents occur due to the proximity of the sites to military positions, which legitimizes targeting the infrastructure as a military target. This poses a risk not only directly to the site’s equipment and personnel, but also poses a much wider threat. For example, in the case of the “Donetska” filtration station, which provides drinking water to the cities of Avdiivka and Yasnuvata (non-government-controlled territory), positions of the AFU are found at a distance of 170 meters, and positions of the so-called “DPR” are at a distance of 300-400 meters. This is a very small distance, which poses a threat to the station’s operations. As the Special Representative of the OSCE in the Trilateral Contact Group, Ambassador Martin Sajdik, stated, “a direct or near hit of only one of the 900 kg bottles of highly toxic chlorine

gas stored at the Filtration Station for water treatment could kill people within a 200 m radius, including the staff of the facility, and seriously disrupt the supply of water to almost 350,000 people on both the sides of the line of contact.”⁵⁸ As well as that, according to the press service of the 10th Mountain Assault Brigade of the AFU, representatives of the so-called “DPR” armed forces set up positions and firing points precisely at the pumping station southeast of the village of Shumy in the Donetsk region.⁵⁹ The communication emphasizes that facilities such as a pumping situation cannot be used as military sites, and that doing so violates international humanitarian law. Nevertheless, despite the facility’s status and the likelihood of the environmental and humanitarian situation being worsened due to damage to the station’s technical facilities in the event of impact, the so-called “DPR” military not only set up a position there, but also conduct constant targeted fire from it, provoking retaliatory fire and endangering the environment and human health.⁶⁰

The situation in regard to the condition of sewage treatment plants which are (or were) at a dangerous distance to the line of delimitation,

⁵⁷ <https://dn.gov.ua/ua/news/fahivci-provodyat-pidgotovku-do-zapusku-nasosnoyi-stanciyi-pershogo-pidjomu-pivdenodonbaskogo-vodo-provodu>

⁵⁸ <https://www.osce.org/chairmanship/354741>

⁵⁹ <https://www.facebook.com/watch/?ref=external&v=724719858208292>

⁶⁰ <https://www.facebook.com/10brygada/videos/191658789340166>



Destroyed dam near the village of Nyzhnia Vilkhova, photo by Truth Hounds, 2019



Sewage leakage from a collection site near the "Maiorske" checkpoint in November 2019. Photo by Truth Hounds



A hole in a dam near the village of Verkhnia Vilkhova, photo by Truth Hounds, November 2019.

is hazardous. Their condition threatens to pollute the natural environment with untreated wastewater, and to provoke a deterioration in the sanitary and epidemiological situation for the population. For example, sewage collection buildings near the “Maiorske” checkpoint have been abandoned and have not functioned properly since 2014. As a result, sewage masses flow directly into the “Pesky-2” reservoir, and from a natural ravine, fall on the fields. Truth Hounds documenters found a box of military ammunition, as well as cartridge cases from 7.62 AKM ammunition and the cover of a military identity card on the territory of the abandoned collection site. They also documented traces of shelling with unidentified weapons on the building from the side of non-government-controlled Horlivka. All of this indicates that military personnel have been present on the facility’s territory, turning the sewage treatment plant into a legal military target and could cause damage to them..

Two dams on the Luhansk River, which flows near to the villages of Verkhnia Vilkhova

and Nyzhnia Vilkhova, were also damaged by shelling.

According to an eyewitness, shells hit the barricades in the summer of 2014 and winter of 2015, which created a flooding risk for residential buildings. Truth Hounds documenters visited two damaged dams in November 2019 and verified that this threat still existed, because floor holes had not been fully repaired. The place where an artillery shell hit one of the earth dams was filled with bags of earth, which are almost at the water level and seep into the water. Downstream, below the dam, there is a pool of water, the area around which is densely built up with the houses of the residents of Vilkhova. In the event of a dam breach, several dozen households will be flooded.

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A shell from a BM-21 “Grad”, which destroyed the earth dam near the village of Nyzhnia Vilkhova in February 2015. Photo by Truth Hounds, November 2019.

hit one of the earth dams was filled with bags of earth, which are almost at the water level and seep into the water. Downstream, below the dam, there is a pool of water, the area around which is densely built up with the houses of the residents of Vilkhova. In the event of a dam breach, several dozen households will be flooded.

In June 2017, damage to the buildings of the water treatment facilities of Dokuchaievsk in the Donetsk region led to the treatment and decontamination of the city’s sewage being halted, and caused environmental pollution.⁶² As a result, the city went as far as to impose a state of emergency..

ELECTRICITY

Power lines are very vulnerable to attack due to the open nature of the locations where hostilities are taking place, and their high

density. Since the beginning of the military conflict, high-voltage power lines near to the front line have repeatedly been damaged, resulting in power outages in residential areas, industrial plants and infrastructure facilities. For example, power lines near to the non-government-controlled areas of Makiivka and Yasynuvata provide power to Avdiivka and, importantly, to the Avdiivskiy Coke Plant and the DFS. These sites are forced to cease operations when the electricity or water supply is cut off. This was the case, for instance, on January 30, 2017, when the cable supplying power to the two aforementioned companies was cut off as a result of shelling from the so-called “DPR” forces.⁶³ As a result, they immediately lost power and had to begin emergency conservation processes for hazardous materials. In addition, all residents of the city of at least 30,000 were left without water, heating and electrical light in the severe cold of winter. Furthermore, coal mining companies being disconnected from the power supply owing to damage from shelling has led to the shutdown of mine drainage systems and, in some cases, to the complete flooding of mines. As a result of constant power outages due to shelling, the drainage was stopped at the “Rodina”, “Pervomaiska” and “Holubovska” mines (Zolote-5 village, non-government-controlled territory). This caused a man-made accident of groundwater breaking through at the “Zolote” mine, putting large residential areas and lands at threat of flooding⁶⁴.

SPECIAL INDUSTRIAL INFRASTRUCTURE FACILITIES

The Toliatti – Horlivka – Odesa ammonia pipeline poses a potential threat to the environment and to human life. This is a unique object of the chemical complex’s transport infrastructure, which is part of the main ammonia pipeline from the city Toliatti (RF) to the city of Yuzhne (Odesa region, Ukraine). The

62 <https://novosti.dn.ua/news/271165-dnr-v-dokuchaevske-yz-za-obstrela-ostanovleny-ochystnye-sooruzhenyya>

63 <https://www.epravda.com.ua/rus/news/2017/01/30/619249/>.

64 Summary analysis of the impact on “Pervomaiskvuhillia” SOC coal plants on the environment, Kyiv, 2020, p. 8



Open section of the “Toliatti-Odesa” ammonia pipeline in the Donetsk region near the “Maiorske” EEC. Photo by Truth Hounds, November 2019

ammonia pipeline passes through the territory of 8 regions of Ukraine, including Donetsk. The branch from the main pipe to the “Stirol” plan is called the Horlivka section, and it runs through the occupied territories. According to the State Emergency Service of Ukraine, the facility is bordering on safe operation. Despite the availability of automatic control systems, the risk of emergencies remains high. Since the ammonia pipeline is in close proximity to the conflict zone, there is a risk of damage from military action or sabotage.

THE STATE EMERGENCY SERVICE OF UKRAINE ESTIMATES THAT BETWEEN 200 AND 15,000 PEOPLE MAY BE IN THE AFFECTED AREA.⁶⁵

Thanks to an eyewitness, Truth Hounds documenters recorded the circumstances of

the damage to the ammonia pipeline owing to the shelling that took place before the war near the village of Oleksandro-Kalynove. According to the eyewitness, the ammonia pipeline, which runs 1km from the center of the village, was damaged, and a small hole was made in the pipe. Although the pipeline was not at a high pressure at the time, vegetation died at the site of the ammonia leak, and people nearby fell ill.⁶⁶ It should be noted that at present, the movement of ammonia through the pipe passing through non-government-controlled territory is completely blocked. According to the acting Director of the “Ukrkhimtransamiak” SOC, Valentyna Shlikhta, part of the ammonia pipeline in the non-government-controlled territories is completely free of ammonia and it does not pose any threat.⁶⁷

⁶⁵ <https://www.dsns.gov.ua/files/2017/8/18/Analit%20dopovid/analit%20oglad.pdf>

⁶⁶ Witness E006A

⁶⁷ <https://www.radiosvoboda.org/a/donbass-realii/29523625.html>



8 | Risks to the environment from the shelling of industrial sites.

A principal danger in the context of the conflict relates to the possibility of environmental pollution in the event of serious incidents and accidents at industrial sites and other enterprises in the region. Prior to the conflict, approximately 4,500 potentially dangerous facilities were located in Donetsk and Luhansk regions.⁶⁸ During the conflict, many industrial and agricultural facilities in the region which have the status of environmentally hazardous industries were damaged or were on the verge of a major accident. These include the Yasynivskiy, Avdiivskiy and Yenakiivskiy coke plants, the Yenakiivskiy, Makiivskiy and Donetskiy metallurgical plants, the Toretsky Ferroalloy Plant, the Alchevskiy Metallurgical Plant, the Lysychanskiy Oil Refinery, the Donetsk State Chemical Plant, the Sievierodonetskiy “Azot” plant and the Horlivka “Styrol”, Sloviansk, Luhansk, Vuhlehirsk and Mironivskiy thermal power plants. The OSCE estimates that between 2014 and 2017, more than 500 cases of violations of protocols and emergencies were recorded at plants in the region,⁶⁹ some of which posed potential danger to the population and environment. An ecological threat is also posed by tailings ponds, gold and sludge accumulators, and liquid industrial waste storage sites, such as slag and waste heaps, and raw material warehouses located on the territories of enterprises.

Out of all the industrial sites in the region, the Avdiivska Coke Plant has suffered the most damage. It has been reported that between 2015 and 2017, the plant ceased operations 13 times, more than 320 shells exploded on its

territory, nine workers were killed, and more than 50 people were injured. On February 10, 2015 the Avdiivka Coke Plant caught fire as a result of shelling. Three teams from the Ministry of Emergency Situations were extinguishing the fire for more than five hours. The intensity of the shelling and the constant power outages led to the Avdiivka Coke Plant being placed in a non-operational state of conservation. The situation changed only in May 2017, when the Avdiivka Coke Plant was connected to alternative, new high-voltage power lines, which made it possible for all units of the plant to operate.

It is also important to mention the attack on the Lysychanskiy Oil Refinery, which occurred in July 2014. A fire broke out on the plant's territory due to the shelling. According to the then-representative of the Lysychansk City Council, a 50,000-ton oil sludge storage tank, two 20-ton gasoline tanks and a sulfur storage warehouse were set on fire.⁷⁰ Witnesses also report that a tank was punctured on the plant's territory, technological equipment caught fire, and there were oil leakages, meaning that it was impossible to extinguish the fire quickly.⁷¹ The same witnesses claim that representatives of the military of the so-called “DPR” were firing from the plant's territory, which was occupied the day before. Rescuers were only able to prevent the fire from spreading further, having to allow the flames to subside on their own. At present, there is no information available on the damage caused.

In the immediate vicinity of the front line is a phenol plant⁷² in the village of Novhorodske in

68 https://www.osce.org/files/f/documents/6/3/362581_0.pdf?fbclid=IwAR3KIIZhLryLFuuV07Hef7t9W5SfzmzXDLhHy96ek8p9NA7vorVSBFJm8zl

69 Ibid

70 https://lb.ua/news/2014/07/18/273311_gorit_lisichanskiy_npz.html

71 Witness E007L

72 Sludge is a waste product, composed of dust and the smallest particles, found in sediment form during the washing of ores. Sludge accumulators are open air tanks: after a certain amount of sludge accumulates in them, they are preserved and the sludge is fed into other accumulators

the Donetsk region. In July 2017, militants of the so-called “DPR” fired at the sludge storage at the plant,⁷³ as a result of which the dam⁷⁴ wall was damaged, and landslides occurred. For a long time, representatives of the so-called “DPR” did not give any guarantee of a ceasefire for repairs to be carried out to the dam. This created the threat of sludge masses breaking through, and the toxic liquid contaminating groundwater, and subsequently the Kryvyi Torets River, which could have caused a large-scale environmental disaster. The facility is now undergoing repairs, but the threat of shelling still exists. The Bakhmut Agrarian Union, an agrarian farm property, also frequently suffers shelling. In December 2016, units of the AFU were located in the vicinity of the facility, which is located 2km northwest of the village of Novoluhanske, and before that was in the “gray zone”. Since then, several dozen shells have exploded on the facility’s territory, resulting in casualties among the personnel, and destroying the boundary fence and hitting the mirror of the manure sedimentation tank. Wild boar, which are often carriers of swine flu, can enter the site through the destroyed fence. The base of the sedimentation tank is lined with a waterproofing layer of polyethylene. If debris from the explosion has damaged it, waste products from the pigs will have begun seeping into the soil. It is only possible to conduct an inspection of the sedimentation tank if it is completely emptied of its contents, but it is almost overflowing owing to it being impossible to take manure to the fields. Ploughing at the farm was stopped due to the fighting and landmines.

On the topic of industrial facilities located in the non-government-controlled territory, the greatest threat is posed by sites located in and near to the city of Horlivka. Many damaged critical infrastructure facilities are concentrated there, the lack of repair work or the improper operation of which can have catastrophic consequences. These are, Horlivka Coke Plant, Horlivka Chemical Plant, and Mykytivskyi Mercury Plant, among others. All of these plants are sources of a great deal of risk, not only regionally but also trans-nationally. For example, the chemical waste storage facility at the chemical plant is in a critical condition, holding approximately 11.6 tons of waste, and it is already contaminating the surrounding soils and water with highly toxic substances. The hostilities caused the mercury plant to cease operations, resulting in mercury pollution from thousands of unused lamps and industrial waste. It is equally important to note another potential source of radioactive pollution, the radioactive waste landfill located near Donetsk. Due to a lack of data and access to the sites for monitoring, Ukraine is unable to fully assess the state of these facilities and the associated ecological risks. At the same time, according to the representatives of the so-called “DPR”, monitoring of these facilities is not even carried out by the occupying regime. In a speech, the “Minister” for the Environment of the self-proclaimed republic, Serhiy Kazakov stated the following: “There is a monitoring problem. It is impossible to take samples and study the condition of an environmentally hazardous object which is under fire. But Horlivka urgently needs to be studied. The question is, how?”⁷⁵

73 <https://www.facebook.com/pressjfo.news/posts/424129041413051>

74 <https://rg.ru/2016/07/27/obstrely-donbassa-stali-grozit-ekologicheskoj-katastrofoj.html>

75 <https://deis.menr.gov.ua/lib/?showarticle/ua/9>



9 | Forest fires resulting from the military conflict.

As a consequence of the conflict in eastern Ukraine, a large part of forest and plantation forests has been lost: ForestWatch estimates that in 2014 alone, 479 hectares of forest were completely lost in the conflict zone. The greatest risks to plantation forests in eastern Ukraine are forest fires caused by ammunition explosions or arson related to military tactics.

In the summer of 2014, the AFU forced out separatist forces from the north of the Luhansk region. As a result of intense fighting, dozens of hectares of forest near the city of Kreminna were burned. Forests near the city of Lyman in the Donetsk region also suffered significant damage from fire.

During all of the years of hostilities, the number and scale of forest fires in the region have been significant, and are increasing. However, the most intense fire with the most serious consequences occurred in the Luhansk region in autumn 2020.

Fires broke out from September 30 and October 1, 2020, in the ecosystems of the Luhansk region (forests, plantations, steppes), which took a week to extinguish. The fire spread to 20,000 hectares. The fires were located in the Stanychno-Luhansk, Novoaidarsk and Sievierodonetsk areas. 150 people were evacuated during the fires. 19 people were injured due to the fires, and 11 died.⁷⁶ A total of 32 settlements in these areas were affected. The information available about fires in non-government-controlled territories is fragmentary, unsystematic and is found in large part on social networks or blogs. Fires in the

Luhansk region in 2020 were unprecedented. The situation was complicated by hurricane-force winds, low humidity even for the steppe climate, as well as their proximity to the line of delimitation. Therefore, together with the abnormal heat caused by global warming, war-induced changes to local ecosystems, and the human factor, the 2020 fires in the region caused massive burning of soils, plantations, and irreparable harm to the population. Truth Hounds documenters visited the areas most affected by the fires, talked to local residents, and recorded the ecological and social damage. The first information about the fires was reported on September 30 on social networks. Official statements appeared on October 5, 2020, on the website of the State Emergency Service of Ukraine, and on October 9, there appeared information on the complete extinguishment of the fires. During the week of the fires, the most dangerous centers of the fire were those located beyond the line of delimitation, as well as the line of plantations around Sievierodonetsk. On October 1, the fire engulfed the "Stantsia Luhanska" EEC, the only checkpoint across the line of contact in the Luhansk region.⁷⁷

In the non-government-controlled territories, the fires were quite far from the line of delimitation. The information resources of the so-called "LPR" mark the centers of the fires as being in the southern part of the non-government-controlled region of Luhansk, as well as two being near Luhansk.⁷⁸ Personnel of the State Emergency Service of the Luhansk, Donetsk, Kharkiv, Dnipro and Poltava regions

⁷⁶ <https://www.dsns.gov.ua/ua/Nadzvichayni-podiyi/114930.html>.

⁷⁷ https://www.youtube.com/watch?v=ZpWa6YTRJs8&feature=emb_title

⁷⁸ https://www.youtube.com/watch?time_continue=5&v=Ncg88GDhSjw&feature=emb_title; https://www.youtube.com/watch?v=AxzVZo-i7co0&feature=emb_title; <https://t.me/lugopeerativny/45>; https://t.me/medvedev_note/635



Satellite image of the fires in the Luhansk region, October 2020.

were deployed to extinguish the fires in the territories controlled by Ukraine, as well as equipment and personnel from the National Police of the Luhansk region, and the AFU.

The wind became particularly dangerous, blowing in the direction of Sievierodonetsk: the fires from the villages of Syrotyne, Voronovo, Borivske and Smolianynove were spreading straight in the direction of the “Azot” plant. According to information provided by the leadership of the plant, only dry grasses caught fire on its territory. Nevertheless, local residents claim that the fire engulfed the chlorine plant, the paint warehouse and the outhouses where antiseptics were stored.⁷⁹ If this is the case, then the air, already polluted by emissions from “Azot”, additionally has a high content of formaldehyde, phenol, hydrogen fluoride, ammonia, nitrogen dioxide, and carbon monoxide. However, the National Ecological Council of Ukraine has remained silent on the topic of the consequences

of these fires, noting only damage from carbon monoxide and nitrous oxide (products of combustion), as well as the negative impact on the ecosystem. Representatives of the executive branch of government are silent about the causes of the fires. Instead, they were voiced by the military, declaring that the causes were “hostile armed provocations with the use of tracer ammunition”. Their special feature is that they contain an incendiary mixture, meaning that they are often used for arson. The military attributed the fires in areas close to the line of delimitation to the use of these bullets by the enemy: the tracer ammunition ignited the dry areas, causing fire to break out. Arson from the “LPR” side was also reported by the “Return Alive” Foundation (“Povernys zhyvym”), from a video given to them by the Ukrainian military recording it.⁸⁰ The same version of events is supported by the head of the Stanychno-Luhansk district state administration, Yuriy Zolkin.

79 <https://twitter.com/YuliaUtara889/status/1312031944096526337>

80 <https://www.facebook.com/backandalive/videos/630591714487837/>



*Aftermath of forest fires in 2020, Sievierodonetsk-Novaidar highway, Luhansk region.
Photo by Truth Hounds, May 6, 2021*

At the same time, soldiers from the 24th Mechanized Brigade, stationed in Novoluhansk (Donetsk region) additionally reported an arson attempt and their positions.⁸¹ The location of the fire – just beyond the line of delimitation – is in favor of the theory of arson by the “LPR”, as is the absence of fires in neighboring areas, controlled by the “LPR”. The existence of landmines along the front line is also relevant here. Landmines only exacerbated the fires which were already being spread by hurricane-force dry winds.

The territory of the Luhansk region is still in the process of recovering from the active phase of the war. Soils and forests sustained serious damage from the hostilities. Soil fertility has fallen by several points since 2014 as a result of the contamination of the land by the products of exploded shells. It takes decades to restore damaged forest plantations and forests. All of this is compounded by global warming

which, in Ukraine, according to the Ministry of Environmental Protection and Natural Resources, is occurring faster than the world average.⁸²

The average temperature in eastern Ukraine will increase 1.4 times over the next ten years, and this process has already begun. The scorching summer in the Ukrainian steppe will become even harsher, which will negatively affect not only soil fertility, but also local ecosystems, flora and fauna. The winds which already characterize the steppe of the Luhansk region will only contribute to the spread of forest fires. At the same time, more than half the region’s groundwater is already depleted⁸³.

81 <https://tsn.ua/video/video-novini/u-doneckiy-oblasti-zaynyalisya-poziciyi-nashih-zahisnikiv.html>.

82 <https://mepr.gov.ua/news/35246.html>.

83 According to data from the State Service for Geology and Subsoil of Ukraine



*Aftermath of forest fires in 2020: Smrotyne, Voronove, Muratove, in Luhansk region.
Photos by Truth Hounds, October 2020.*



10 | Threats to protected nature, as well as ordinary flora and fauna, from the military conflict

The role of war in ecology also manifests itself in the danger faced by “natural museums”. In the case of Ukraine, the front line has divided the territories of nature reserves, seriously impacting their condition as a whole, including rare species of birds, animals and plants. In total, there are 152 nature reserve sites in the Ukraine-controlled territory of the Donetsk and Luhansk regions. These include the Luhansk Nature Reserve of the National Academy of Sciences of Ukraine; the “Meotyda” and “Sviati Hory” National Parks, the “Kreidova Flora” Reserve, the “Kramatorskyi”, “Donetskyi Kriazh”, “Kleban-Byk”, “Zuivskyi” and “Slovianskyi Kurort” regional landscape parks, among others. In the temporarily occupied territories in the Donetsk and Luhansk regions, there are 106 territories and objects of national and local importance which are part of the Nature Reserve Fund. This includes the “Provalskyi Steppe” part of the Luhansk Nature Reserve, part of the “Meotyda” National Park, the “Donetskyi Kriazh” Landscape Park, the “Khomutovskyi Steppe”, the “Kalmiuske” Reserve of the USNR, the “Rozdilnianskyi” Reserve, the “Zuievskyi” Regional Landscape Park, and the “Kryvokoskyi Estuary” Wetlands of International Importance. All forestry land along the line of delimitation has also been damaged by the war.⁸⁴

Although the military conflict is a threat to all nature, local flora and fauna are specially protected in isolated nature reserves, and special attention is paid to the preservation of the local species found in the Red Book

of Ukraine (rare and endangered species), as well as precautionary measures against their extinction from the region. These places are essentially museums of the natural history of the region. Direct military intervention on the territory of these reserves will not only destroy these sites, but will also have a serious impact on the further development of the region’s nature.

Thus, representatives of the “Trokhizbenskyi Steppe” branch of the Luhansk Nature Reserve have stated that, despite the fact that the territory was shelled in 2015, it still does not have a certificate that its territory is de-mined. In addition, the “Trokhizbenskyi Steppe” became a location at which self-propelled artillery units were based in 2014 and 2015, positions of the AFU were dug there, and reserve employees could not get there. At present, operations remain suspended at the reserve, due to the fact that it is occasionally used as a site for military exercises of the AFU. Employees of the nature reserve complain that due to landmines, it is impossible to carry out land reclamation.

The “Stantsia Luhanska” part of the Luhansk Nature Reserve was also badly affected. In 2014, security personnel of the so-called “LPR” seized working equipment, as well as cars from the personnel. In summer 2014, air and artillery strikes also hit the reserve. Currently, AFU positions are located on the territory of “Stantsia Luhanska”, meaning that employees of the reserve are unable to assess the condition of the nature reserve.



Targets left after the shootings on the territory of the «Trokhizbenskyi Steppe» reserve, photo by Truth Hounds,

The “Kreidova Flora” Nature Reserve came under fire in 2014 and 2015. Craters still remain at the sites of numerous hits, and trenches have been preserved. The reserve has now been de-mined, and it is in working order, with the natural environment starting to return to its former state. However, the condition of the soil after the shelling is still in question. The documenters sampled the soil from several craters to analyze its chemical composition. The results of the analyses reveal the presence of heavy metals, as well as an acute excess of the maximum allowable concentration of some of them,⁸⁵ and a high level of sulfate salinity (see table below). For some heavy metals, such as titanium, there is not even any set maximum allowable concentration, as they should not be

present in soil at all under normal conditions. It is worth noting that titanium-based alloys with vanadium additives are used in aviation and missile technology.⁸⁶

It is important to add that during the documentation work, we often heard from witnesses that the soil in the gardens or orchards is damaged from being hit by shells, which affects the quality of crops.

“After shelling, the soil is dead. After the projectile in the winter, all of the vegetables had to be thrown away in the summer. The apricots were small and wrinkled.”

The case of the “Meotyda” National Park, located on the Bilosaraiskyi Spit on the Sea of

⁸⁵ <https://ips.ligazakon.net/document/view/re35005?an=154>

⁸⁶ http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_Cover_Ukrainian.pdf



Indicator	Titanium (Ti)	Lead (Pb)	Cadmium (Cd)	Strontium (Sr)	SO₄²⁻	- H₂O
	мг/кг			%		
Maximum allowable concentration	-	20	1,5	-	160	
Soil sample	3340	21,3	<10	65	730	16,28

Azov, is also of note. Part of the park, “Kryva Kosa”, where the park administration was located before the conflict, is now an area controlled by the so-called “DPR”. The seizure and looting of the park administration by armed members of the so-called “DPR”, and the later deployment of military equipment (including the “fleet” of the so-called “DPR”) and carrying out of military exercises, as well as unregulated fishing and hunting in the area, has had a very negative impact on the region’s bird population. Truth Hounds documenters discovered that as a result of these actions, the Sandwich tern population has decreased tenfold (from 50,000 to 5,000), and the only colony of the Dalmatian pelican on the coast has disappeared altogether.⁸⁷ In regard to the territory of the park controlled by the Ukrainian government, the number of visitors, including poachers, has decreased significantly due to the presence of the military and the establishment of a zone of enhanced border protection. This has contributed to the increased reproductive rates of many bird species, as well as animals including wolves, jackals, foxes, moose and boars. Park officials

have reported new bird colonies appearing on the coast, as they had been forced to leave the park due to the adverse conditions.⁸⁸

Of course, military actions have a negative impact on the flora and fauna of not only of protected areas, but also of the entire region. Evidence suggests that if, for instance, there is increased background sound from explosions and shooting, this negatively affects the natural balance. This changes the usual patterns of animal behavior. City dwellers report the appearance of wild animals and birds in their residential areas.⁸⁹ This poses a danger not only to the development of the fauna but also to the safety of local residents. Deforestation of forests and forest belts has caused the migration of birds and animals, and this has significantly intensified since the beginning of the conflict. On the other hand, the moratorium on hunting which was imposed at the beginning of the military conflict has led to a significant increase in wild animal and bird populations, such as pheasants, partridges, hares, roe deer and wild boar.

⁸⁷ Witness E008M

⁸⁸ Witness E009M

⁸⁹ Witness E010T

11 | How can war crimes against the environment be qualified under Art. 438 of the CCU?

Given that until recently, Ukrainian law enforcement officers did not practice applying Art. 438 of the Criminal Code, an illegal act as specific as a war crime against the environment will raise many questions when being qualified. An analysis of international agreements that can be used for qualification under Art. 438 of the CCU provides a fairly wide range of qualifying features, the approach to the choice of which should take into account the particularities of the armed conflict in eastern Ukraine, which is by nature atypical and shows signs of hybridity.

Focusing on the Rome Statute unfortunately narrows the possibility of criminalizing acts which cause (or may cause) harm to the environment. This is in particular due to the active component of the material element of the crime, defined by the form of an attack on an object or other acts of violence against it. In addition, there is a mandatory requirement to prove the obvious disproportionality of the damage to the expected military advantage. The damage must also be widespread, long-term and serious. We recall that the specification or quantitative indicators of these features are absent, or their definitions very generalized, in IHL. Using the information gathered and analyzed by Truth Hounds, very few incidents have occurred through the course of the conflict which possess all the qualifying elements (including mental and contextual), and may be qualified as war crimes against the environment. Among them, in our opinion, are the shelling of the Avdiivka Coke Plant, which caused repeated serious damage, the

shelling of the Lysychansk Oil Refinery, which led to fires lasting several days on its territory, arson of dry landscapes in the Luhansk region, which caused the destruction of forests and fire at the “Azot” plant. However, this is only a preliminary assessment, and a thorough investigation is required, as well as, most importantly, the establishment of the fact that the damage is simultaneously widespread, long-term and serious. The latter can only be determined through comprehensive and long-term monitoring of the environment and the identification of clear causal links. In regard to the other incidents and facts presented in this report, it is doubtful that they can be defined as war crimes as defined by the Rome Statute.

The threshold of proof under the Rome Statute is evidently rather high. There is, however, an alternative possibility of determining the qualifying features of a war crime against the environment under Article 438 of the CCU, as the latter refers to various treaties of IHL. These include, in particular, the ENMOD Convention. Based on its position in the process of establishing qualifications for a war crime against the environment, it is necessary to prove not the simultaneous existence of widespread, long-term and serious consequences, but rather the presence of at least one of them. This significantly decreases the evidence requirement of the investigation. One important aspect is attempting to specify the scope of these characteristics of damage. Thus, effects are considered: 1) broad, when they cover a space of several hundred square kilometers; 2) long term, when they last for



several months or one season (recalling that in the preamble to AP I, a period of several decades is indicated); 3) serious, when they lead to serious or significant damage to human health, natural and economic resources, and other assets.⁹⁰ In addition, the material element of the act does not contain an alternative active component (meaning, not limiting the act to a form such as an attack), but is defined as the “military or any other hostile use of environmental modification techniques (...) as the means of destruction, damage or injury to any other State Party”. If military use is more or less evident, then hostile use can be interpreted as “criminally negligent”, and the refusal of external monitoring and evaluation can be regarded as deliberately impacting negatively on natural processes. Furthermore, if we refer to the norm of customary law, which is the prohibition of the use of methods and means of warfare that are aimed at or may harm the environment, then in accordance with the body of customary law of the International Committee of the Red Cross, this rule is absolute (Norm 45). This means that if there is widespread, long-term and serious damage to the environment, or if it is used as a weapon, there is no sense in establishing whether such actions or their results can be justified by military necessity.⁹¹ Also applicable for the qualification of a war crime against the environment is the norm enshrined in Art. 56 of AP I, which prohibits the placement of military facilities near potentially high-risk facilities or structures (dams, dykes, nuclear power plants). Moreover, for the qualification of acts under Art. 438, the provisions of Protocol III on the Prohibition or Restriction on the Use of Incendiary Weapons of 1980 may be used. This document prohibits turning forests or other vegetation into targets of incendiary weapons.

Thus, from the above, it can be concluded that actions such as the placing of firing points and positions of the armed forces of the so-called “DPR” on the territory of the Lysychanskyi Oil Refinery and pumping station near the village of Shumy, the flooding of mines and the consequential water and river pollution and the salinization of soils, the improper maintenance of chemical industrial facilities causing chemical pollution of the environment, the intentional flooding of a facility of radioactive hazard (at the “Yunkom” mine) where there is a risk of contamination, and, above all, the absolute denial of admission for monitoring purposes to what is likely an emergency situation – and all of this in the context of an international armed conflict – may well constitute a war crime under Art. 438 of the CCU, as a serious violation of IHL. This is, namely, a violation of Art. 35, Art. 53, and Art. 56 of AP I to the Geneva Conventions, as well as the provisions of the ENMOD Convention. However, the missing link in the process of proof should be kept in mind: this is the presence of environmental damage, which is characterized by the severity, duration or broadness (in the sense of prevalence of territories) of its consequences. We emphasize that this relates to alternatives, rather than a combination of them. Due to the lack of specific criteria, careful and comprehensive monitoring of the environment in the region is needed in order to create an evidence base to prove a sufficient level of environmental damage. This should be implemented at least in government-controlled areas. This is because, even if not at the present moment, in the future we can hope for a thorough legal assessment and prosecution of the actions of those who have harmed mankind not only with weapons, but also by turning nature against him.

90 <https://ihl-databases.icrc.org/applic/ihl/ihl.nsf/COM/470-750044?OpenDocument>.

91 https://ihl-databases.icrc.org/customary-ihl/eng/docs/v1_rul_rule45?fbclid=IwAR1hwybk7T3QLBSw99x8RbSVSMLxnajZN7Uqyz-3RQ9bqZM_St_Vmfj3sqk

12 | International legal liability for environmental damage in the context of military conflict

As war crimes against the environment are listed as war crimes under the Rome Statute, such cases may be assessed by the International Criminal Court. The jurisdiction of the court extends to individuals accused of committing war crimes. However, given the high threshold of proof required, and the lack of international jurisprudence to investigate this type of crime, it seems unlikely that charges for war crimes against the environment are to be very numerous.

Nevertheless, crimes against the environment may constitute the material element of other crimes, such as genocide, crimes against humanity, and other war crimes. In the 2009 case of the Prosecutor v. Omar al Bashir, the ICC did not deny the link between environmental degradation and the crime of genocide.⁹²

Article 91 of AP I to the Geneva Conventions emphasizes that a Party which violates the provisions of these conventions or the Protocol must reimburse damages if there are grounds for doing so. This provision therefore provides the basis for the international legal responsibility of states. One of the mechanisms for administering justice in this case is filing a

lawsuit against the offending state with the UN International Court of Justice, as with a special international body. A more effective way to resolve disputes, however, may be participation in arbitration and conciliation commissions, or negotiations, for example.

In regard to the mechanisms for prosecution provided for in the ENMOD Convention, it stipulates that any State Party which finds that another State Party is acting in breach of its obligations under the Convention may file a complaint with the UN Security Council. On the basis of such a complaint, the Security Council has the right to initiate an investigation. However, given the Russian Federation's right of veto as a permanent member of the UN Security Council, the mechanisms of bringing the RF to justice seem unpromising. As well as that, it provides for the establishment of an expert advisory committee with the function of conducting a factual investigation of the circumstances of each case.

⁹² <https://helsinki.org.ua/wp-content/uploads/2017/06/Na-mezhi-vyzhyvannya.pdf>



CONCLUSIONS AND RECOMMENDATIONSII

Having analyzed and summarized the facts of the whole picture, we can conclude that the constant hostilities and the regime of closed occupation in Donbas has already led to serious environmental damage. The consequences of this will have to be fought against for a long time to come, with the use of a great deal of resources. It can also be stated that the situation is deteriorating and is becoming trans-national in nature. Based on the information provided in the report, Truth Hounds addresses a wide range of participants in the pool of questions covered with the following recommendations:

- 1. The Verkhovna Rada of Ukraine: to ratify the Rome Statute.**
- 2. The relevant ministries and State services:**
 - to develop and approve methods for documenting and calculating environmental damage caused by hostilities;
 - to introduce a modern, centralized network for environmental monitoring, taking into account the particularities of access to facilities and the further use of data obtained on the following types of facilities: a) in areas where hostiles are / were conducted; b) in areas affected by high-risk facilities and sites that are sources of potential man-made emergencies; c) critical infrastructure facilities, in particular water supply facilities for the further use of monitoring data as evidence of environmental damage by representatives of the self-proclaimed republics and the RF, under whose effective control they are;
 - develop a comprehensive program for the adequate conservation of environmentally hazardous facilities (including in the non-government-controlled territories) and the restoration of the environment.
- 3. Prosecuting bodies and other law enforcement agencies: to use the array of available evidence and, if necessary, to implement the practice of the proper qualification of war crimes against the environment.**
- 4. Local authorities: to implement the State program in order to increase the level of preparedness of communities located in**

the vicinity of the line of delimitation and near high-risk facilities in the Luhansk and Donetsk regions to emergencies of a natural and man-made nature that may occur in these territories as a result of hostilities.

5. The leadership of the AFU:

- to organize the withdrawal (in the absence of military necessity) of military positions and points of engagement from infrastructure and industrial facilities, the damage of which may pose a threat to the environment;
- to assess the level of readiness of units of the armed forces located near to critical infrastructure facilities and large industrial facilities to respond to emergencies of a man-made nature. If necessary, to conduct personnel training and provide the necessary logistical support to respond to emergencies

6. The international community: to increase pressure on the self-proclaimed republics of the so-called “LPR” and “DPR”, as well as the Russian Federation, in order to ensure access to potential environmental hazards located in the temporarily occupied parts of the Donetsk and Luhansk regions, first and foremost so that IAEA representatives may conduct an audit of facilities with high levels of radiation, including by emphasizing that the pollution will be trans-national in nature and will threaten the environment of Russia itself.

7. Non-governmental organizations: to continue to actively monitor the environmental situation in the war zone in eastern Ukraine, and to promote the dissemination of full and accurate information on its current condition.