



# ASSESSING ENVIRONMENTAL IMPACTS OF ARMED CONFLICT: THE CASE OF EASTERN UKRAINE



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## PREFACE

The tragic conflict in Eastern Ukraine has been ongoing ever since initial hostilities began in spring 2014. Violations of international humanitarian law, which applies in the situation of both non-international and international armed conflict<sup>1</sup>, have characterized the hostilities and affected the lives of thousands of people in the region. Organizations such as the United Nations Human Rights Monitoring Mission in Ukraine, OSCE Special Monitoring Mission, Truth Hounds, Amnesty International, among others have been instrumental in collecting a robust data set documenting these violations. This work provides ground for holding perpetrators to account, including for alleged war crimes. Many documenting efforts has focused on crimes such as illegal detention and kidnapping, torture, extrajudicial killings and shelling of civilian objects. There has been growing recognition by the international community, however, that the definition of war crimes in their traditional sense has failed to take into account the lasting impact of attacks on environmental infrastructure by military forces. These attacks can expose the environment to significant harm and consequently people who live within it. In May 2016, the United Nations passed a joint resolution “Protection of the environment in areas affected by armed conflict”<sup>2</sup>. The resolution called for all Member States to continue to support the development and implementation of programs, projects and policies aimed at preventing or reducing the impacts of armed conflicts on the natural environment<sup>3</sup>. The International Criminal Court has also recognized the need to address this aspect of conflict situations in the process of case selection and prioritization, stating that “the Office will give particular consideration to prosecuting Rome Statute crimes that are committed by means of, or that result in, inter alia, the destruction of the environment, the illegal exploitation of natural resources or the illegal dispossession of land”<sup>4</sup>. The Donbas region has historically been the heart of the industrial sector for Ukraine. Over 1,160 industrial enterprises could be found in the region before the start of the conflict in 2014<sup>5</sup>. These enterprises belong to mining, metallurgical, chemical and oil refinishing industries, power industries, among

others. In addition, the region is traversed by 1,230 kilometers of oil, gas, and ammonia pipelines<sup>6</sup>. It is no surprise that before the conflict this region was one of the most polluted in Ukraine<sup>7</sup>. The conflict has made both positive and negative impacts with regards to the environment. Due to the volatile situation in the region many of these industries have stopped their operations dramatically altering the content and risk of environmental hazards. On the other hand, maintenance of these facilities have also stopped leading to an increasing the risk of catastrophic failure. Moreover, continuous shelling in the area exposes these facilities to serious environmental risks. As a result of these dangers there been a handful of reports trying to identify and raise awareness both nationally and internationally of the environmental impacts of the armed conflict in Eastern Ukraine<sup>8</sup>. These reports, however, aimed to quantify the environmental effects of the war through point source data and measurements. Much of the data collected was recycled from other reports and failed to obtain first person accounts of the problems along with factual evidence deriving from local citizens who have documented the vast majority of environmental incidence through the use of social media by posting first-person accounts, videos, and images<sup>9</sup>. First-person accounts cannot be the sole means to verify incidences, but prove as a useful starting point in fact finding and can be further verified through data triangulation techniques such as the use of supplementary primary and secondary source materials. According to a 2017 report by the Ministry of Ecology and Natural Resources of Ukraine “the recent positive changes still lack a systemic, long-term approach, which requires a comprehensive analysis of the environmental situation and environmental protection needs in the conflict zone”. They recommend for researchers to systematize data on the environmental situation and sources of hazards in the area of conflict and to distribute the data to decision makers, as well as, to take an inventory of the gaps in information and to fill those gaps<sup>10</sup>. The authors of this document sought to contribute to the literature gap by providing a situational perspective through an in depth analysis of specific sites affected by the war. The purpose was to identify the direct and indirect actions

<sup>1</sup> ICC, Office of the Prosecutor, Report on Preliminary Examination Activities 2017, p. 22, available at: [https://www.icc-cpi.int/itemsDocuments/2017-PE-rep/2017-otp-rep-PE\\_ENG.pdf](https://www.icc-cpi.int/itemsDocuments/2017-PE-rep/2017-otp-rep-PE_ENG.pdf).

<sup>2</sup> United Nations Environment Assembly of the United Nations Environment Programme, Protection of the environment in areas affected by armed conflict, UNEP/EA.2/Res.15. Available at: [https://wedocs.unep.org/bitstream/handle/20.500.11822/11189/K1607252\\_UNEPEA2\\_RES15E.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/11189/K1607252_UNEPEA2_RES15E.pdf?sequence=1&isAllowed=y)

<sup>3</sup> *Ibid*, para 9.

<sup>4</sup> ICC, Office of the Prosecutor, Policy Paper on Case Selection and Prioritization, para. 41. Available at: [https://www.icc-cpi.int/itemsDocuments/20160915\\_OTP-Policy\\_Case-Selection\\_Eng.pdf](https://www.icc-cpi.int/itemsDocuments/20160915_OTP-Policy_Case-Selection_Eng.pdf)

<sup>5</sup> ICO Environment-People-Law, Military Conflict in Eastern Ukraine — Civilization Challenges to Humanity, 2015, p. 51. Available at: [http://epl.org.ua/wp-content/uploads/2015/07/1817\\_WEB\\_EPL\\_Posibnuk\\_ATO\\_English.pdf](http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_English.pdf)

<sup>6</sup> EU Delegation to Ukraine, United Nations in Ukraine, World Bank Group, Ukraine: Recovery and Peacebuilding Assessment, March 2015, Vol. 2, p. 12, available at: [http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace\\_A4\\_Vol2\\_Eng\\_rev4.pdf](http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace_A4_Vol2_Eng_rev4.pdf)

<sup>7</sup> ICO Environment-People-Law, Military Conflict in Eastern Ukraine — Civilization Challenges to Humanity, 2015, p. 51. Available at: [http://epl.org.ua/wp-content/uploads/2015/07/1817\\_WEB\\_EPL\\_Posibnuk\\_ATO\\_English.pdf](http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_English.pdf)

<sup>8</sup> See, for example, OSCE, Assessment of Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, available at: <https://www.osce.org/project-coordinator-in-ukraine/362566>; Ministry of Ecology and Natural Resources of Ukraine, Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, available at: <https://menr.gov.ua/files/images/news/24012018/Environmental%20Damage%20in%20Eastern%20Ukraine%20and%20Recovery%20Priorities.pdf>

<sup>9</sup> See, for example, Toxic Remnants of War, Monitoring the monitors studying the Ukraine conflict’s environmental impact, available at: <http://www.toxicremnantsofwar.info/monitoring-the-monitors-studying-the-ukraine-conflicts-environmental-impact/>

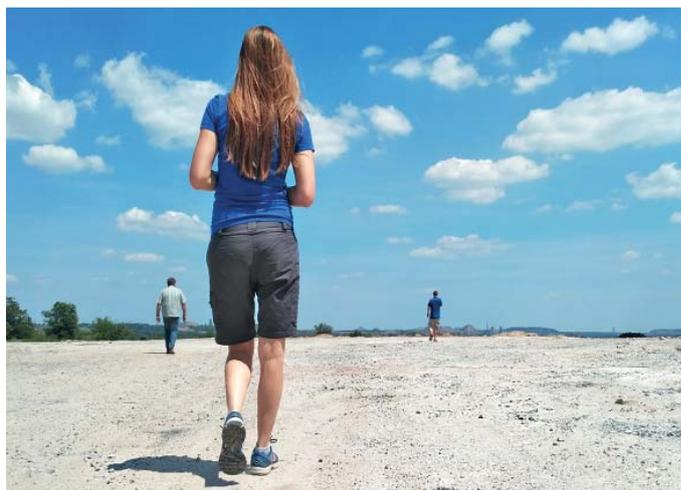
<sup>10</sup> Ministry of Ecology and Natural Resources of Ukraine, Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, p. 8, available at: <https://menr.gov.ua/files/images/news/24012018/Environmental%20Damage%20in%20Eastern%20Ukraine%20and%20Recovery%20Priorities.pdf>

that have resulted in environmental hazards, and more specifically, use concrete examples to illustrate their practical implications. Moreover, the researchers sought to identify the root causes of environmental deterioration in the conflict area in order to identify means to mitigate risks. The authors hope that the findings resulting from this research can be used as an index for researchers investigating the environmental impacts of the war not only in Eastern Ukraine, but in other conflicts areas around the world. The authors also hope that this report will be a wake-up call for the international community, the government of Ukraine, and other interested parties about the seriousness of the war and its impacts on the environment. After the end of hostilities, the region will need to develop and internal migrants will seek the right of return. It's necessary that these areas maintain their ecological integrity for the well-being of vulnerable populations living near the front line and also to provide an inhabitable environment for those who seek to return.

The research was conducted by gathering both primary and secondary source materials. Primary source materials included audio and visual files collected on site in eleven settlements and areas of Donbas in close vicinity to the contact line. The data includes semi-structured open ended interviews with twenty key informants, videos, real time social media posts, and legal documents. Informants included government officials, emergency services personnel, civil servants, local activists and community members. Due to the sensitive nature of the topic the names and positions of the informants will be held strictly confidential. Secondary source materials included media reports, policy briefs, and government reports.

This report is both timely and relevant as the environmental impacts of the war continue to materialize and other potential hazards have the opportunity to be mitigated if immediate action is taken. We hope that the policy recommendations and data collected will lead to concrete steps by the government, the international community, donor organizations, civil society, and other stakeholders to help mitigate the environmental impacts of the hostilities in the East. We also hope that the findings illustrating the environmental impacts in the area of conflict will be considered in the process of qualification of violations in Eastern Ukraine, including national judiciary proceedings and relevant international tribunals. We would like to thank the lead author Brendan Duprey, PhD and supporting author Olena Bondarenko, as well as, the contributors and field researchers of the 'Truth Hounds' Roman Avramenko, Alex Perepölov and Halyna Oliinykova for the immense work they put into completing this report.

As Stephen O'Brien, UN Under-Secretary-General for Humanitarian Affairs and Emergency Relief Coordinator said, "Protecting the environment during conflicts is critical to protecting human health and



also the ability of communities and nations to recover after crises"<sup>11</sup>. In the words of Erik Solheim, head of UN Environment, "Effectively protecting the environment against the horrors of armed conflict and supporting equitable governance of natural resources is an important step on the path to development, prosperity, and sustainable peace"<sup>12</sup>.

### SUMMARY OF REPORT

The research uncovered both direct and indirect actions taken due to the war that have resulted in environmental impacts in the region of Donetsk. Direct actions resulting in environmental alteration in the area of conflict are defined as "direct cause and effect relationship between hostilities with an environmental alteration". Indirect actions resulting in environmental alteration in the area of conflict are defined as "actions taken as a result of the hostilities that do not result in immediate environmental alteration, but indirectly influence the environmental quality of the area". Direct actions resulting in environmental impact were split into two primary categories. While these categories do not present an exhaustive list of the impacts it provides the most accurate reflection of the impacts deriving from our interviews and other data collected.

**First**, there is the direct action of shelling by parties to the conflict that resulted in environmental impacts. Shelling resulted in:

- a) Fires in forests and fields;
- b) Impact of shelling on the utility services provision;
- c) Shelling damage to industrial objects and hazardous sites.

(e.g. *Avdiivka coke plant, Bakhmut Agrarian Union's pig farm, phenol plant in Novhorodske*) including but not limited to: breakage due to structural damage to tailing ponds, fires in tailing ponds resulting from shelling, damage to other critical infrastructure, ground subsidence due to collapse of coal mines, air pollution and soil pollution.

<sup>11</sup> UNEP, Environment is the 'silent casualty' of armed conflict, 6 November 2016, available at: [https://reliefweb.int/sites/reliefweb.int/files/resources/Environment%20is%20the%20%27silent%20casualty%27of%20armed%20conflict\\_EN.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/Environment%20is%20the%20%27silent%20casualty%27of%20armed%20conflict_EN.pdf)

<sup>12</sup> UNEP, Environment is the 'silent casualty' of armed conflict, 6 November 2016, available at: [https://reliefweb.int/sites/reliefweb.int/files/resources/Environment%20is%20the%20%27silent%20casualty%27of%20armed%20conflict\\_EN.pdf](https://reliefweb.int/sites/reliefweb.int/files/resources/Environment%20is%20the%20%27silent%20casualty%27of%20armed%20conflict_EN.pdf)

**Secondly**, the creation of military positions that cause destruction to agricultural lands, nature reserves and other areas due to trenches, waste disposal and military installations.

**Indirect actions taken as a result of the war** causing environmental impacts are more elusive, but nonetheless pose a serious problem in regards to the effective management and protection of high risk sites. These include:

- a) Maintenance in the grey zone
- b) Weak environmental oversight and poor maintenance of facilities
- c) Moratorium on environmental inspections
- d) Ban on hunting: an increase in wild animal populations
- e) Legislation in the grey zone: tax cuts leading to curtailment of environmental programs by local governments.



### RECOMMENDATIONS

The environmental risks in the region are significant and immediate measures by all interested parties must be undertaken in order to avoid the catastrophic consequences posed by future environmental damages. Failure to mitigate these risks can cause long term damage to the ecological integrity of the region, transboundary pollution, and most importantly pose serious health implications for vulnerable populations caught in the middle of the conflict. Our recommendations were split into four groups with measures aimed for each party.

#### 1. For Militants

- a) Immediate ceasefire for the inspection and maintenance of facilities that are at high risk for catastrophic failure;
- b) Creation of a green corridor for regular inspections of tailing ponds and other industrial facilities that are located in the area between the two forces.

#### 2. For the Government of Ukraine

- a. Create a national environmental fund for the monitoring, upkeep, and protection of high risk sites;

- b. Create a joint committee between the Ministries of Defence and of Ecology and Natural Resources of Ukraine for the monitoring, upkeep, and protection of vulnerable industries;
- c. Develop a national strategy on how to address environmental impacts of the war in Eastern Ukraine;
- d. Develop a sustainable operations handbook for military officials and personnel and conduct trainings for its implementation;
- e. Utilize the methodology applied in this study for extensive and regular research throughout the region.

#### 3. For NGOs

- a) Conduct regular and extensive field research to investigate the status of known environmental hazards and high risk facilities to monitor their status;
- b) Conduct regular and extensive field research to identify unknown environmental hazards;
- c) Fundraise for the implementation of mitigation strategies in the region;
- d) Fundraise for the implementation of awareness raising and capacity building activities for business owners, municipal officials, civil society representatives, and UN officials.

#### 4. For Donors / International community

- a) Financial support for follow-up work associated with monitoring and documenting environmental crimes and potential hazards associated with the war not only in the region of conflict, but also in annexed Crimea;
- b) Support a training program for local representatives and monitors to identify and regularly update a list of sources of environmental pollution and hazards in the region;
- c) Provide funds for the development of a database for continuously monitoring environmental incidents in the region<sup>13</sup>; Donors must provide financial support for the creation of a strategy for mitigation of risks, addressing the impacts of hostilities on the environment, and sustainable recovery of affected area;
- d) Donors must provide implementation of awareness raising and capacity building activities for business owners, municipal officials, civil society representatives, and UN officials.

### PART 1.1: ENVIRONMENTAL IMPACTS DUE TO SHELLING

In 2015, Minsk II called for an immediate full ceasefire in particular districts in the Donetsk and Luhansk regions of Ukraine. It is well known however, that artillery shelling occurs on both sides of the conflict on a daily basis. These violations of the Minsk agreement pose a significant risk to industrial infrastructure, tailing ponds, nature reserves, rivers, as well as, forests and fields located in the areas of hostilities. While the impact of the contents found within artillery shells on the environment are minimal, the risk of damage to critical infrastructure such as water

<sup>13</sup> The OSCE Parliamentary Assembly called on OSCE to establish a system of ecological monitoring of war-torn and occupied territories to assess the disruptive and disastrous consequences of conflicts on the environment and consequently formulate recommendations in line with the OSCE principle of comprehensive security. See Berlin Declaration and Resolutions adopted by the OSCE Parliamentary Assembly at the 27th Annual Session, available at: <https://www.oscepa.org/documents/all-documents/annual-sessions/2018-berlin/declaration-26/3742-berlin-declaration-eng/file>.



Many industrial sites are linked to the tributaries of the Dnipro and the Siverskyi Donets rivers, and contamination from tailing ponds and mines has the potential to endanger major residential compounds downstream and enter the Azov and Black Sea  
 Image source: [https://en.wikipedia.org/wiki/List\\_of\\_longest\\_rivers\\_of\\_Ukraine#/media/File:Hydrographic\\_zoning\\_Ukraine.jpg](https://en.wikipedia.org/wiki/List_of_longest_rivers_of_Ukraine#/media/File:Hydrographic_zoning_Ukraine.jpg)

filtration plants, industrial facilities, and tailing ponds due to explosions pose immediate risk to the communities living in the area of hostilities<sup>14</sup>. Moreover, intentional shelling of agricultural lands, nature reserves, and forests have resulted in large scale fires damaging critical ecosystems and threatening livelihoods of those that use their services<sup>15</sup>. Our field work uncovered continued shelling of several locations in the Donbas region as late as August 2018 illustrating that these risks have not been mitigated by parties to the conflict or the international community. In fact, the research uncovered a further deterioration of the environmental quality, thus illustrating a need for immediate actions.

**A) FIRES IN FORESTS AND FIELDS CAUSED BY SHELLING**

More than 80% of fires in the conflict region from June-September 2014 occurred in steppe, forests, and agricultural lands. According to estimates by the Ministry of Ecology and Natural Resources of Ukraine, fires affected 17% of the forests and 24% of the steppes in the conflict region<sup>16</sup>. Moreover, agricultural lands and grasslands in the area of Luhansk and Donetsk have also been affected. These areas not only provide essential habitat for a host of endemic and endangered species, but also provide an important source of livelihood for local people. Our research uncovered the following incidents of fire related to hostilities in the area.

**Identified incidents:**

Among other sources of fire, a witness mentioned tracer bullets, hot shells and rockets landing in the forests and fields near Toretsk (ET01). Massive forest fire occurred due to massive ‘BM-21 GRAD’ shelling in June 2014 near village Koleskykivka of Luhansk region (0205K844). Other fires were caused by incendiary shells and tracer bullets between August 2017 and September 2017 (ET04). In summer 2017, wildfires spread to residential areas in Novhorodske (some of them caused by munition among other factors) (ET01).

**B) IMPACT OF SHELLING ON THE PROVISION OF UTILITY SERVICES**

**i. Water**

Access to clean drinking water is a human right<sup>17</sup>. The hostilities have created a situation where local residents often lack clean and accessible drinking water. Shelling of water lines have shut off access to safe drinking water for months in several municipalities. Moreover, according to the OSCE water quality has also been an issue because water pipes are oftentimes buried alongside sewage pipes and can create cross-contamination. Chlorine is frequently unavailable to local governments to disinfect contaminated water sources due to a lack of funding and risk of damaging the storage reservoirs<sup>18</sup>. Addi-

<sup>14</sup> OSCE, Assessment of Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, available at: <https://www.osce.org/project-coordinator-in-ukraine/362566>.  
<sup>15</sup> ICO Environment-People-Law, Military Conflict in Eastern Ukraine — Civilization Challenges to Humanity, 2015, p. 85. Available at: [http://epl.org.ua/wp-content/uploads/2015/07/1817\\_WEB\\_EPL\\_Posibnuk\\_ATO\\_English.pdf](http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_English.pdf)  
<sup>16</sup> OSCE, Assessment of Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, p. 61, available at: <https://www.osce.org/project-coordinator-in-ukraine/362566>.  
<sup>17</sup> Resolution 64/292 The human right to water and sanitation, adopted by the UN General Assembly on 28 July 2010. Available at: [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/RES/64/292](http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/64/292)



tionally, many sites are linked to the tributaries of the Dnipro and the Siverskyi Donets rivers, and contamination from tailing ponds and mines has the potential to endanger major residential compounds downstream and enter the Azov and Black Sea.

### **Identified incidents:**

Due to waterline damage in Sloviansk in 2014, the phenol plant was cut off from industrial water, and the plant got permission to take water for industrial needs from the Siverskyi Donets — Donbas canal (ET03)

In 2014, the water line supplying Novhorodske (at the end of the line) was damaged during hostilities in Sloviansk<sup>19</sup>. For two months, Novhorodske was left without water supply from the water line (2nd Donetsk waterline) (ET01) There was an additional shelling on 18 December 2017 in Novoluhanske and there was no water after the shelling (EN01, EN03). The water supply to Avdiivka, Lastochkine, Orlivka, Verkhnotoretske was cut off because of shelling of the Donetsk filtration station from: July — November 2014; January — April 2015. In addition, once or twice a month the water supply stopped after the shelling of the filtration station. In 2018, the water supply stopped five times already for a total of 16 days (EA02).

In Toretsk, due to shelling the water supply was cut two times, approximately one month long each, in December 2016 and August 2017. Because of the lack of water, people pumped water out of heating batteries in their households which caused problems with the central heating system (in December) (ET04)

In 2014, in Avdiivka you could drink the water, but now most of the town buys water due to water scarcity (EA04).

### **ii. Electricity**

In the Donbas region in 2015, shelling had already produced extensive damage to the electricity systems including power genera-

tion, as well as, transmission and distribution lines. For example, the power facility of Sloviansk suffered damages to the transmission lines and transformer creating damages exceeding US \$21 million. All three power distribution companies also experienced severe damages costing over US \$10 million to repair<sup>20</sup>. Moreover, a 2015 report found decreased functionality of essential water pipes and pumps due to power shortages caused by the shelling of electrical systems<sup>21</sup>. For example, coal mines use electricity for the water pumps that are used to prevent coal mines from flooding. Without electricity, the risk of mine flooding poses risk to the environment and communities<sup>22</sup>. Lack of electricity provides significant hardship for local populations including access to warm water for bathing, heating and for cooking food.

### **Identified incidents:**

The city of Avdiivka has recurring issues with the stability of their electrical supply and was left without electricity due to hostilities (EA01). For example, on 21 April 2017 transmission line “Makiivka-Avdiivka Coke Plant” was partially damaged in the adjacent area, leaving a part of the city of Avdiivka without a supply of electricity<sup>23</sup>. As reported by a witness, following a massive shelling on 18 December 2017 in Novoluhanske, there were power outages (EN01) for up to three days (EN04). Media reports also suggest that half of the residential buildings were left without power supply due to the shelling<sup>24</sup>.

### **iii. Gas Pipes**

Natural gas is used both by heavy industry and by households in the Donbas region. It is used for heating, cooking and electricity generation. Fighting also has disrupted gas supplies used for the Kramatorsk-Donetsk-Mariupol metallurgy plant. In 2015, a direct hit from

<sup>18</sup> OSCE Special Monitoring Mission to Ukraine, Access to water in conflict-affected areas of Donetsk and Luhansk regions, September 2015, p.5. available at: <https://www.osce.org/ukraine-smm/183151?download=true>

<sup>19</sup> Communal Enterprise Voda Donbassa (Water of Donbas), Vtoroj Donetskij Vodoprovod [Second Donetsk Pipeline], available at: <http://www.voda.dn.ua/nashi-ob-ekty/khronika-vosstanovleniya-nashikh-ob-ektov/vtoroj-donetskij-vodoprovod>

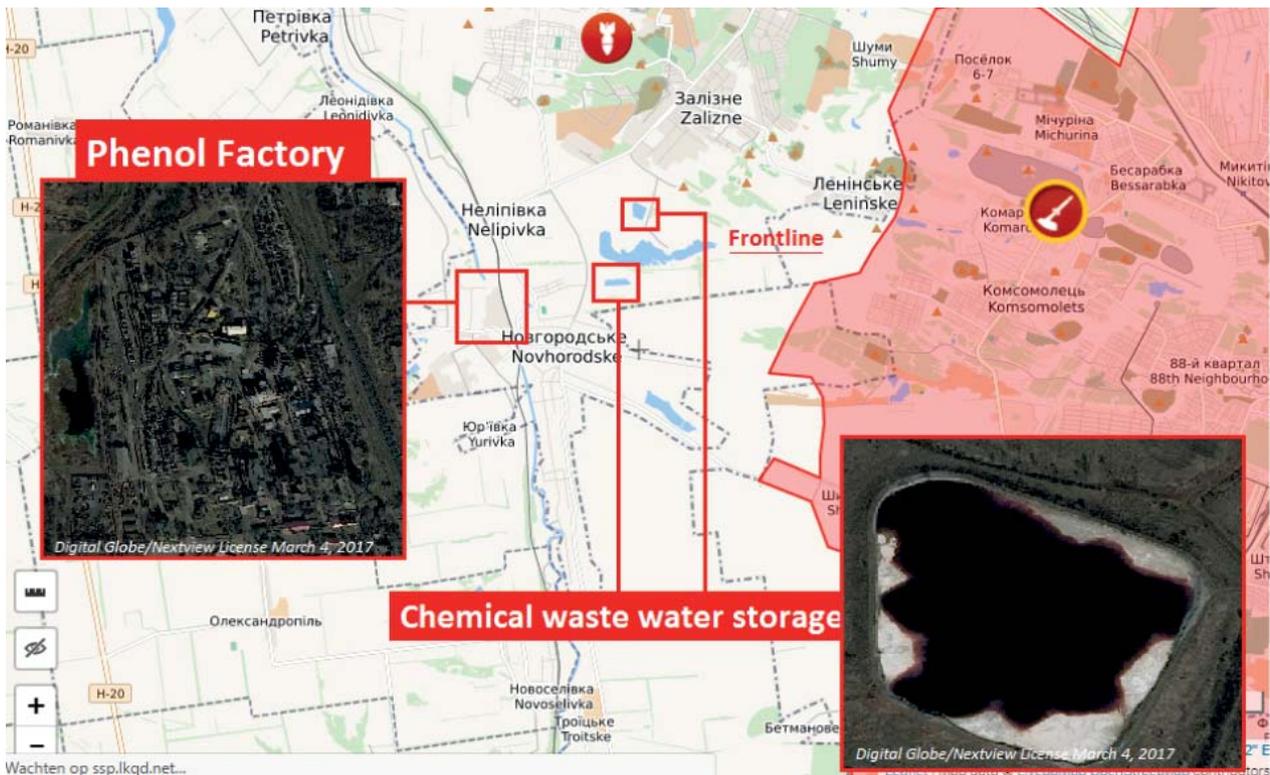
<sup>20</sup> EU Delegation to Ukraine, United Nations in Ukraine, World Bank Group, Ukraine: Recovery and Peacebuilding Assessment, March 2015, Vol. 2, p. 17, available at: [http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace\\_A4\\_Vol2\\_Eng\\_rev4.pdf](http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace_A4_Vol2_Eng_rev4.pdf)

<sup>21</sup> OSCE Special Monitoring Mission to Ukraine, Access to water in conflict-affected areas of Donetsk and Luhansk regions, September 2015, p.5. Available at: <https://www.osce.org/ukraine-smm/183151?download=true>.

<sup>22</sup> The Toxic Remnants of War Project, New data on Ukraine conflict's environmental risks supports calls for comprehensive assessment, available at: <http://www.toxicremnantsofwar.info/new-data-on-ukraine-conflicts-environmental-risks-supports-calls-for-comprehensive-assessment/>

<sup>23</sup> Channel 5. Avdiivka dosi bez svitla: boiovyky ne daiut harantii bezpeky dlia remontnykiv – STsKK [Avdiivka remains without electricity supply: the militants do not guarantee safety of repair crew — JCCC], 22 April 2017. Available at: <https://www.5.ua/regiony/avdiivka-dosi-bez-svitla-boiovyky-ne-daiut-harantii-bezpeky-dlia-remontnykiv-stskk-143840.html>

<sup>24</sup> Korrespondent.net, Obstrel Novoluhanskoho: povrezhdeny 47 domov [Shelling of Novoluhanske: 47 houses damaged], 19 December 2017, available at: <https://korrespondent.net/ukraine/3919532-obstrel-novoluhanskoho-povrezhdeny-47-domov>



Wachten op ssp.lkqd.net...  
 Phenol Plant Inkor & Co., located in Novhorods'ke  
 Location of research: source: <https://www.bellingcat.com/news/uk-and-europe/2017/03/30/donbas-ticking-toxic-time-bomb/>

an artillery shell almost stopped the plant operations<sup>25</sup>. Local people are deleteriously impacted due to cuts in gas supplies used to provide themselves with basic services.

**Identified incidents:**

On 18 December 2017 there was damage to gas pipes due to shelling in Novoluhanske (EN01)<sup>26</sup>. Because of the hostilities, the gas pipeline was attacked (EA01). As a result, the old part of the city, where people used gas for heating, had been left without heating for over eight months. The pipeline was attacked on 7 June 2017, and at the time of interview the issue had not been resolved<sup>27</sup>.

**C) SHELLING DAMAGE TO INDUSTRIAL OBJECTS AND HAZARDOUS SITES**

(e.g. Avdiivka coke plant, Bakhmut Agrarian Union's pig farm, phenol plant in Novhorodske) including but not limited to: breakage due to structural damage to tailing ponds and fires in tailing ponds, damage to other critical infrastructure, ground subsidence due to collapse of mines, air pollution and soil pollution).

<sup>28 29 30</sup> Many industrial sites of Donbas, including toxic sludge tailing ponds, are located in the immediate vicinity to the front line and in some cases in the area between the two forces. With persistent shelling on both sides of the conflict the risks of an accident that results in catastrophic failure at one of these plants are very real. Moreover, sites in desperate need of maintenance cannot be accessed as both sides fear that cease fire would be used as a ruse to gain territorial advantage. With companies and local municipalities faced with serious financial restraints basic maintenance work on pipes and other infrastructure are also lacking, thus adding further risks.

**Identified incidents:**

*Shelling of tailing pond (Phenol plant in Novhorodske):* One of the phenol plant's tailing ponds closer to Novhorodske, contains oily substances, when there are shelling, it is difficult to put the fire out. In August 2014, there was also a fire in the tailing pond due to shelling (ET03). There were also fires in the tailing ponds in 2016 and 2017 due to shelling (ET04) (ET01). After our interview, the phenol plant tailing

<sup>25</sup> The Toxic Remnants of War Project, New data on Ukraine conflict's environmental risks supports calls for comprehensive assessment, available at: <http://www.toxicremnantsofwar.info/new-data-on-ukraine-conflicts-environmental-risks-supports-calls-for-comprehensive-assessment/>

<sup>26</sup> Korrespondent.net, Obstrel Novoluhanskoho: povrezhdeny 47 domov [Shelling of Novoluhanske: 47 houses damaged], 19 December 2017, available at: <https://korrespondent.net/ukraine/3919532-obstrel-novoluhanskoho-povrezhdeny-47-domov>

<sup>27</sup> Gordon.ua, Zhytel Avdiivky: Misto deviat misiatsiv bez hazu. My prosymo Kabmin zminyty taryfy na elektroenerhiu. Spodivaiemosia, nas ne proihnoruiut [Avdiivka resident: the city has been without gas supply for nine months. We are asking the Cabinet of Ministers to change the electricity tariffs. We hope they will not ignore us], 29 March 2018, available at: <https://gordonua.com/ukr/news/society/zhytel-avdiivki-misto-dev-jat-misjatsiv-bez-gazu-mi-prosimo-kabmin-zminiti-tarif-na-elektroenergiju-spodivajemosja-nas-ne-proignorujut-238924.html>

<sup>28</sup> ICO Environment-People-Law, Military Conflict in Eastern Ukraine — Civilization Challenges to Humanity, 2015, p. 51. Available at: [http://epl.org.ua/wp-content/uploads/2015/07/1817\\_WEB\\_EPL\\_Posibnuk\\_ATO\\_English.pdf](http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_English.pdf)

<sup>29</sup> EU Delegation to Ukraine, United Nations in Ukraine, World Bank Group, Ukraine: Recovery and Peacebuilding Assessment, March 2015, Vol. 2, p. 12, available at: [http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace\\_A4\\_Vol2\\_Eng\\_rev4.pdf](http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace_A4_Vol2_Eng_rev4.pdf)

<sup>30</sup> ICO Environment-People-Law, Military Conflict in Eastern Ukraine — Civilization Challenges to Humanity, 2015. Available at: [http://epl.org.ua/wp-content/uploads/2015/07/1817\\_WEB\\_EPL\\_Posibnuk\\_ATO\\_English.pdf](http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_English.pdf)



pond was shelled on 26 July 2018<sup>31</sup>. A shell explosion was recorded in the tailing pond reservoir. There has been no access to assess the damages. The UN Office for the Coordination of Humanitarian Affairs (OCHA) stated that: “If hostilities continue, we may also be faced with a serious environmental crisis. Damage to the Phenol plant near Novhorodske village means that waste chemicals, including deadly sulfuric acid and formaldehyde, are now at critical levels. Leakage into the surrounding land and the Siversky Donets River would have disastrous humanitarian consequences in a highly industrialized part of Europe. Similarly, there is a real risk at present that damage to water facilities could have further deadly consequences for the population living in the surrounding areas, with the potential leak of chlorine gas which is routinely stored at such facilities”<sup>32</sup>.

*Shelling of tailing pond for pig slurry (Bakhmut Agrarian Union, BAS):* The Bakhmut Agrarian Union, near the town of Novoluhanske, is a giant livestock facility with 90,000 pigs and a huge reservoir of one million liters of animal waste, which contains high levels of nitrates, ammonia, and antibiotics. Damage to the facility, which has already been targeted by shelling, could release the waste into nearby rivers<sup>33</sup>. In the village of Kodema, one cow died, seven got sick because of dirty water in the river Kodemka polluted by sewage leakage (ammonium) from the pig farm after shelling; the river pollution lasted for month (EK01). Animal waste at the enterprise are utilized by diluting the effluent with water, which is then used to irrigate the fields. As of summer 2018, the pond was almost 85% full (the height of the dam is 12 m, the height of the filling is 10.3 m). If there is another breakage of the dam effluents will most likely reach the settlements of

Travneve, Kodema, Zaitseve and could enter the river Bakhmutka, which flows into the Siversky Donets. This would be an ecological catastrophe<sup>34</sup>. On 29 August 2018, following an agreement, the workers have started repairing the damaged dam on the pig slurry<sup>35</sup>. Water crisis in Toretsk: On 15 October, 2018, due to a new damage to the Horlivka-Toretsk water conduit, the supply of water to the city of Toretsk and villages Zalizne, Pivdenne, Shcherbynivka was interrupted. These settlements receive water through the damaged conduit “Horlivka –Toretsk” from the Horlivka filter station No. 2. The waterway had been damaged before by fighting. After repairing the damage in 2017, the servicing company identified new leakage and filed a request for approval of the repair work<sup>36</sup>. Thousands of residents in Toretsk remained without centralized water supply for ten days. In the meantime, they received support in the form of water brought by humanitarian organizations and state authorities. The servicing company “Voda Donbasa” asked for the “silence” regime to organize repair work, however, only on 22 October the regime was approved and safety guarantees were provided by the parties. On the following day, however, 23 October, a repair crew vehicle hit a landmine on the way to the breakage site. Two staff were injured in an incident<sup>37</sup>. On the evening of the same day, water supply to Toretsk was restored by the repair crew<sup>38</sup>.

### **i. Damage to mines including flooding, collapse and damage to mine facilities**

Mines Pivnichna and Pivdenna that belong to Toretskugol State Enterprise and located in Toretsk and surrounding villages have

<sup>31</sup> Korrespondent, *Toretskyi fenolnyi zavod popal pod obstrel – STsKK [Toretsk Phenol Plant under Shelling — JCCC]* <https://korrespondent.net/ukraine/3994225-toretskyi-fenolnyi-zavod-popal-pod-obstrel-stskk>

<sup>32</sup> Toxic Remnants of War Network, *New data on Ukraine conflict’s environmental risks supports calls for comprehensive assessment*, March 13, 2017, available at: <http://www.trwn.org/new-data-on-ukraine-conflicts-environmental-risks-supports-calls-for-comprehensive-assessment/>

<sup>33</sup> Toxic Remnants of War Network, *New data on Ukraine conflict’s environmental risks supports calls for comprehensive assessment*, March 13, 2017, available at: <http://www.trwn.org/new-data-on-ukraine-conflicts-environmental-risks-supports-calls-for-comprehensive-assessment/>

<sup>34</sup> New Security Beat, *A Ukrainian Stand-Off: The Toxic Consequences of Armed Conflict in Donbass*, March 7, 2018, available at: <https://www.newsecuritybeat.org/2018/05/ukrainian-stand-off-toxic-consequences-armed-conflict-donbass/>

<sup>35</sup> LB.ua, *V Novoluhanskom nachaly remont damby otstoinyky svynofermy «Bakhmutskyi ahrarnyi soiuz» [Repairs begin at the Bakhmut Agrarian Unit farm in Novoluhanske]*, 30 August, 2018, available at: [https://lb.ua/society/2018/08/30/406292\\_v\\_novoluhanskom\\_nachali\\_remont\\_dambi.html](https://lb.ua/society/2018/08/30/406292_v_novoluhanskom_nachali_remont_dambi.html)

<sup>36</sup> Ibid.

<sup>37</sup> Voda Donbassa, *Ostanovlena podacha vody horodu Toretsku [Water supply to Toretsk stopped]*, 15 October 2018, available at: <http://voda.dn.ua/novosti/content-elements/novosti-kompanii/2015-ostanovlena-podacha-vody-gorodu-toretsku>

<sup>38</sup> Toretsk Military-Civil Administration, *Informatsiia stosovno provedennia remontnykh robot vodohonu Horlivka-Toretsk [Information on repairs of Horlivka-Toretsk pipeline]*, available at: <http://www.toretsk-vca.gov.ua/novini/2629-informatsiya-stosovno-provedennya-remontnykh-robot-vodogonu-gorlivka-toretsk>

<sup>39</sup> Toretsk Military-Civil Administration, *Remontna bryhada Chasoviarskoho RVU KP «Voda Donbasu» zavershyla remontni roboty z vidnovlennia vodohonu Horlivka-Toretsk [Repair crew of Chasiv Yar repair unit of Voda Donbassa Communal Enterprise has finished repairs of Horlivka-Toretsk pipeline]*, available at: <http://www.toretsk-vca.gov.ua/novini/2630-remontna-brigada-chasovyarskogo-rvu-kp-voda-donbasu-zavershila-remontni-roboti-z-vidnovlennya-vodogonu-gorlivka-toretsk>



been under shelling. In spring 2018, a cable at Pivnichna mine was broken (possibly, due to shelling, however, there was no official inquiry) and for one day the pumps were out of order. There is only one cable, and another breakage would lead to flooding of the mine, and there is a settlement located directly above the mine (ET02).

Two mines in Toretsk area (Pivnichna and Pivdenna) were shut down (due to economic reasons). Pivnichna is under conservation process (maintained) and the conservation has been completed at Pivdenna (no maintenance there). Both mines were heavily shelled, especially Pivdenna. The power station and management buildings were damaged by regular shelling since 2014. There were attempts to repair the damage in 2015. At Pivdenna mine, ventilation and water pumping stopped in 2017 (ET02). The ground over Pivdenna mine subsided due to vibrations during shelling, which can lead to collapses<sup>39</sup>. Houses in the village of Shumy have started subsiding approximately in spring 2018 (ET02). After the interviews, a massive shelling of the area (Toretsk, Pivdenna mine) took place on 25 August 2018<sup>40</sup>.

## ii. Shelling of industrial objects

*Avdiivskiy koksohimichnyi zavod (Avdiivka Coke and Chemical Plant).*

The largest Coke plant in Europe experienced shelling since 2015. Up until June 2018, more than 320 shells have hit the coke plant (EA07). Fortunately they didn't hit the unit that has high risk production. For three months the town had no heating because the plant was hit. This is because 1,300 of 5,000 houses in the community have gas heating and the plant was not able to produce gas due to shelling (EA01). In 2015, a shell hit the benzol tank. The result was that 100 tons of benzol was burnt and entered the atmosphere (EA07). It also resulted in emission of coke gas with high concentrations of benzene, toluene, naphtha-

lene, hydrogen sulfide, mercaptan, hydrocyanic acid, and ammonia<sup>41</sup>. At the plant, two water pipes were damaged by shelling. Water shortage causes increase of benzol ejection into atmosphere (EA07). On the night of 22 July 2015 the plant was shelled, causing a fire. According to the Environment-People-Law (EPL) report witnesses complained about a very strong odour in the town. More than 10 shells exploded on the night of November 29, 2015. The shells hit various damage repair shops and also the benzene storage. According to the report, when the hostilities broke out, the director of the plant remove all hazardous chemicals, including benzene and chlorine, from the premises, thus reducing the environmental threat. Shelling also damages power lines and transformer substations. Power outages could lead to massive discharge of untreated wastewater, containing a variety of such polluting chemicals as ammonia, phenols, resins, thiocyanates, and others<sup>42</sup>.

## D) DAMAGE TO NATURAL HERITAGE SITES CAUSED BY SHELLING

According to the EPL report over half of protected sites of the Luhansk region and about a third of the sites of the Donetsk region (by their number) have been in the area of the hostilities. They include the nature reserves of Luhanskyi and Ukrainskyi Stepovy as well as parks like Sviati Hory and Meotyda<sup>43</sup>. Being in the crossfire of the hostilities poses shelling risks such as fires and pollution. Moreover, construction of fortifications and trenches damage the biodiversity and plant systems. There has been extensive damage to natural resources including steppe grasslands, forests, protected areas, and cultivated fields, both directly from military activity and indirectly from an inability to execute environmental management interventions. A satellite-based study done in 2015 estimates that around 2,970 square kilometers or 17 % of the vegetation cover in the conflict-affected zone has been impacted by fire outbreaks<sup>44</sup>. After four additional years of the conflict this number has also increased.

<sup>39</sup> 24 TV, Ekolohycheskaia problema na Donbasse: poselok nachal provalyvatsia pod zemliu: vydeo [Environmental issue in Donbas: a village started collapsing under the ground: video], 5 February 2018, available at: [https://24tv.ua/ru/jekologicheskaja\\_problema\\_na\\_donbasse\\_poselok\\_nachal\\_provalivatsja\\_pod\\_zemlju\\_video\\_n922807](https://24tv.ua/ru/jekologicheskaja_problema_na_donbasse_poselok_nachal_provalivatsja_pod_zemlju_video_n922807)

<sup>40</sup> Donbass.live, Donbass lykhoradyt: obstrely Severnoho, shakhty Yuzhnoi y Toretska [Donbas on fire: shellings of Severnoe, Yuzhnaya mine near Toretsk], 25 August 2018, available at: <https://donbass.live/2018/08/25/donbass-lyxoradyt-obstrel-severnogo-yuzhnoj-y-toreczk-bez-vod/>

<sup>41</sup> OSCE, Assessment of Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, p. 39, available at: <https://www.osce.org/project-coordinator-in-ukraine/362566>

<sup>42</sup> ICO Environment-People-Law, Military Conflict in Eastern Ukraine — Civilization Challenges to Humanity, 2015, p. 96-97. Available at: [http://epl.org.ua/wp-content/uploads/2015/07/1817\\_WEB\\_EPL\\_Posibnuk\\_ATO\\_English.pdf](http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_English.pdf)

<sup>43</sup> Ibid, p. 99.

<sup>44</sup> EU Delegation to Ukraine, United Nations in Ukraine, World Bank Group, Ukraine: Recovery and Peacebuilding Assessment, March 2015, Vol. 2, p. 19, available at: [http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace\\_A4\\_Vol2\\_Eng\\_rev4.pdf](http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace_A4_Vol2_Eng_rev4.pdf)



## i. Fires in forests and fields caused by shelling

Kreidova Flora (natural heritage site): In Kreidova Flora, a natural reserve in Donetsk region, from 7th to 30th June 2014 there were massive shelling and fires destroying endemic species of plants, for instance *Pinus sylvestris* L. var. *cretacea* Kalen. (EM01). The reserve overall has 27 species of plants in the Red Book of Ukraine, 21 endemic species, and 6 species in the European Red List<sup>45</sup>. Damage caused by shelling will have a lasting impact as the species require years, even decades to grow back. In addition to 15 hectares of the reserve, 5 hectares of forest burned around Lyman city (EM01)<sup>46</sup>.

## ii. Impact of shelling on soils and ecosystems

The results of soil studies indicate a significant content of heavy metals at the site of breakdowns of projectiles. Thus, the concentration of titanium in a soil sample at the site of the rupture of a projectile on the territory of the steppe reserve "Kreidova flora" is 150 times higher than the background concentration of this metal. The concentration of vanadium in the same sample is 100 mg/kg while in the baseline sampling there was no indication of vanadium in the soil. The tests showed a 2.3-fold increase of sulphate concentration, 1.3 times higher concentration of lead and 1.5 times higher concentration of cadmium. High concentrations of most metals are toxic, causing sometimes irreversible damage, which leads to functional disorders first in the environment and then in the human body. Cadmium and its compounds are extremely toxic, even at low concentrations, and also bio-accumulate in organisms and ecosystems.

## E) IMPACT OF THE SHELLING ON AIR QUALITY

The direct impacts of shelling on air quality are not oftentimes significant. A government report found in 2014, from two automated monitoring stations in the town of Shchastia, no significant increase in the concentration of pollutants during hostilities<sup>47</sup>. Moreover, the

change in air quality as a result of shelling is a point source pollutant and only felt in the immediate vicinity of the point of impact to where the shell fell. Therefore, the impacts are felt in the immediate aftermath of the shelling and difficult to monitor. The primary danger lies however, in air pollution that can be caused due to explosions at industrial facilities as a result of shelling.

In Novoluhanske, residents reported that after shelling the air was filled with soot, fumes, and they had difficulties breathing (EN04). There have indeed been reports of increased levels of toxic substances in the air in the area of hostilities (SO<sub>2</sub>, NO<sub>x</sub>, CO)<sup>48,49</sup>. One kilogram of explosives forms several tens of cubic meters of toxic gases (SO<sub>2</sub>, NO<sub>x</sub>, CO), among which there are also underoxidized organic compounds. The gases can cause prolonged illness, which will manifest in the form of coughing, impeded breathing, weakness; toxic substances in the blood also poison human body<sup>50</sup>.

## PART 1.2. ENVIRONMENTAL IMPACTS DUE TO THE PLACEMENT OF MILITARY POSITIONS

Military positions cause destruction to agricultural lands, nature reserves and other areas due to trenches, waste disposal, military installations, among others. Construction of fortifications and trenches damage the biodiversity and plant systems<sup>51</sup>.

Our team directly observed damage to biodiversity caused by military trenches, uncontrolled timber extraction for fortifications, spent shell casings, residual military equipment, as well as, tripwire and grenades.

*In Kreidova Flora, the following type of damages were recorded in the territory of the park:*

- Fires and impact craters caused by shelling
- Trenches (dugouts) and berms created by military positions were based at the site. When the troops were deployed from

<sup>45</sup> Lymanskyi, S. Kreidova Flora: About the reserve, available at: <http://pryroda.in.ua/creidoshyl/pro-zapovidnyk>

<sup>46</sup> Report on damages provided to the fact-finding mission in June 2018 by Sergiy Limanskyi, Director of Kreidova Flora. On file with the authors.

<sup>47</sup> OSCE, Assessment of Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, p. 40, available at: <https://www.osce.org/project-coordinator-in-ukraine/362566>

<sup>48</sup> Kravchenko et. al., The Study on the Impact of Hostilities on Environment in Eastern Ukraine, 2015, available at: [http://www.irbis-nbu.gov.ua/cgi-bin/irbis\\_nbu/cgibin/irbis\\_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE\\_FILE\\_DOWNLOAD=1&image\\_file\\_name=PDF/Skhid\\_2015\\_2\\_23.pdf](http://www.irbis-nbu.gov.ua/cgi-bin/irbis_nbu/cgibin/irbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&image_file_name=PDF/Skhid_2015_2_23.pdf)

<sup>49</sup> ICO Environment-People-Law, Military Conflict in Eastern Ukraine — Civilization Challenges to Humanity, 2015, p. 66. Available at: [http://epl.org.ua/wp-content/uploads/2015/07/1817\\_WEB\\_EPL\\_Posibnuk\\_ATO\\_English.pdf](http://epl.org.ua/wp-content/uploads/2015/07/1817_WEB_EPL_Posibnuk_ATO_English.pdf)

<sup>50</sup> Environment-People-Law, How should a civilian protect him/herself from toxic gases during shelling?, 26 January 2016, available at: <http://epl.org.ua/environment/yak-vriatuvatysia-vid-toksychnykh-haziv-pid-chas-obstriliv/>

<sup>51</sup> EU Delegation to Ukraine, United Nations in Ukraine, World Bank Group, Ukraine: Recovery and Peacebuilding Assessment, March 2015, Vol. 2, p. 19, available at: [http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace\\_A4\\_Vol2\\_Eng\\_rev4.pdf](http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace_A4_Vol2_Eng_rev4.pdf)



- both sides: area of trenches — 1247 square meters, area covered by berms — 1847 square meters;
- c) Litter left by military positions — total area where litter was found equals 15 hectares;
- d) Damage to soil layers due to Armored Personnel Carrier tracks — 992 square meters;
- e) Up to 200 trees with a diameter of 4 to 36 cm were cut in the park for the arrangement of dugout or damaged by explosions resulting from shelling (EM01)<sup>52</sup>.

## PART 2. INDIRECT ACTIONS LEADING TO ENVIRONMENTAL IMPACTS

### A) MAINTENANCE IN THE GREY ZONE

There are several facilities which are located in the area between the two contact points. Many of these facilities have undergone little to no maintenance or inspections due to the need of a cease fire between the two forces for inspectors to enter. The risk to their lives is too dangerous to do so without a ceasefire. Oftentimes is a lack of trust between the two forces and each side is concerned maintenance checks will be used as a ruse to establish new military positions and to gain territorial advantage over the other side. Given the hazardous nature of many of these facilities and the risk of catastrophic failure due to lack of maintenance, or due to the impact of shelling, it is critical to gain a better understanding of the risks and means for joint cooperation between the two forces. Below are just a few illustrative examples of the hazards.

#### **Hazards identified:**

##### *Donetsk filtering station*

Donetsk filtering station, providing water to Avdiivka and nearby villages, as well as partly Donetsk and Yasinuvata, was first stopped due to shelling on July 30, 2014<sup>53</sup>.

Donetsk filtering station in “grey zone” is under constant shelling — the city of Avdiivka is left without water regularly, almost

once a month (EA01). On May 17, 2018, as a result of damage from shelling work at the Donetsk filtering station was suspended. Moreover, on June 8 there was a decision to remove four tons of chlorine from the station to protect against a potential chlorine spill<sup>54 55</sup>. Health risks associated with different levels of exposure to chlorine could result in irritation to the mucus membranes (1-3 ppm), pulmonary symptoms (15 ppm) or even death (430 ppm)<sup>56</sup>. From May-June 2018, there were at least three incidents like these, and people in the city were left without water up to a week (EA01).

##### *Research and Production company Inkor & Co. (Phenol Plant)*

Phenol plant staff are not allowed to perform regular maintenance of the tailing ponds. OSCE restricts maintenance since separatists claim that under the cover of tailing ponds maintenance Ukrainian military forces establish new firing positions (ET01). The threat of shelling prevented monitoring of a tailing pond (3rd degree) of the phenol plant (contains acidic slurry) in Novhorodske (ET01). Before the conflict, a group of experts took soil, water and air samples. Until 2017, there was no access to the tailing pond, only in 2017, for several months, following an agreement, it was possible to access the site and reinforce the dam. The danger also lies in the overflowing risk when the water level increases, and the contents of the tailing pond can leak into the water supply. Regular maintenance and pumping require direct participation of maintenance crews. Otherwise, the danger of overflowing increases. The tailing pond is also surrounded by small rivers, it is located in the basin of the Kryvyi Torets river. If phenol leaks into the water, it can pose a significant threat to the people living not only in Novhorodske, but also in other areas using the water from the polluted water sources. However, despite a preliminary maintenance plan, at the time of the interview, there has been no permit issued (ET01). Lack of maintenance may cause the Kryvyi Torets and Siverskiy Donets

<sup>52</sup> Report on damages provided to the fact-finding mission in June 2018 by Sergiy Limanskiy, Director of Kreidova Flora. On file with the authors.

<sup>53</sup> Voda Donbassa, Donetsk Filtering Station, available at: <http://www.voda.dn.ua/nashi-ob-ekty/khronika-vosstanovleniya-nashikh-ob-ektov/donetskaya-filtrovalnaya-stantsiya>

<sup>54</sup> Gordon.ua, S Donetskoi fyltrovalnoi stantsyy reshly vyvezty khlor [Decision made to remove chlorine from Donetsk Filtering Station], 8 June, 2018, available at: <https://gordonua.com/news/war/s-doneckoy-filtrovalnoy-stancii-reshili-vyvezti-hlor-250067.html>

<sup>55</sup> Hromadske, Zahrozy mistsevym vid rozlyvu khloru na Donetskii filtruvalnii stantsii ne isnuie — Voda Donbasu [No threat to locals from the chlorine leak in Donetsk Filtering Station — Voda Donbassa], 15 June 2018, available at: <https://hromadske.ua/posts/zahrozy-mistsevym-vid-rozlyvu-khloru-na-donetskii-filtruvalnii-stantsii-ne-isnuie-voda-donbasu>

<sup>56</sup> Bellingcat, Water Filtration Plants and Risks of a Chlorine Mass-Casualty Event in Donetsk, 10 March 2017, available at: <https://www.bellingcat.com/resources/case-studies/2017/03/10/water-filtration-plants-risks-chlorine-mass-casualty-event-donetsk/>



rivers' contamination with wastes from tailing ponds (ET03). Since 2014 it has not been possible to take soil and water samples in tailing ponds area (ET03).

#### *Bakhmut Agrarian Union farm (Novoluhanske)*

The purification facilities of the pig complex are in the 'grey zone', the irrigation system must be cleaned, and the settling tank is overcrowded. The facilities were damaged and untreated sewage leaked into the Kodema river. As a result, rates of ammonia in the river were twenty times higher than average resulting in the death of one cow<sup>57</sup>. On August 29, 2018, following an agreement, the workers have started repairing the damaged dam on the pig slurry<sup>58</sup>.

#### *Coal Mines in Toretsk area (Toretskvuhillia (Toretsk Coal) and other enterprises)*

The mining town of Toretsk is, in fact, a satellite town of separatist-held Horlivka. It is one of the most revealing examples: many local mines are connected by underground corridors with the mines controlled by the self-proclaimed "Donetsk People's Republic." In Toretsk there are working mines, mines that have long closed, and those that shut down during the war<sup>59</sup>.

Several mines in Toretsk have ceased pumping excess water from the mines due to financial constraints and ongoing military hostilities. According to the OSCE flooding could result in subsidence of the surrounding area, rendering buildings unusable, engineering and communication infrastructure – gas lines, sewage and water supply systems – inoperative, and polluting surface and groundwater with iron, chlorides, sulfates, other mineral salts and heavy metals<sup>60</sup>.

As reported by witnesses, mines in Toretsk are connected to the mines in occupied Horlivka by underwater passages and could be flooded. Due to the lack of ventilation or pumping at the Pivden-

na mine it too overflowed with water, flowing to Gagarina mine (non-government controlled areas), which also is not being pumped. Existing mines (Pivnivhna, Nova, Tsentralna) will not be able to manage the water level, which can cause flooding (ET02).

## **B) WEAK ENVIRONMENTAL OVERSIGHT AND POOR MAINTENANCE OF FACILITIES**

Due to the weak environmental governance existing in the region, lack of funding for maintenance and upkeep, along with ongoing hostilities in areas in need of maintenance, many sites have faced neglect and the dangers posed by these facilities are accumulating as the conflict continues. Our interviews uncovered evidence of environmental neglect and its impacts.

### **Hazards and incidents identified:**

#### *Mine slurry pipeline in Toretsk*

A mine slurry pipeline of the coal processing plant broke on February 2, 2018, 1500 km<sup>2</sup> of land were contaminated. Slurry pulp was spilled on a total area of 1364 square meters, including on land plots where the defensive fortifications of the Armed Forces of Ukraine were located<sup>61</sup>. The slurry pipeline is outdated, broken and badly repaired at several points. In winter it is heated by burning of tires next to it for liquid wastes not to freeze (ET04, ET02)<sup>62</sup>.

## **C) MORATORIUM ON ENVIRONMENTAL INSPECTIONS**

The moratorium on regular and ad hoc inspections was introduced by the Law of Ukraine "On temporary measures in the area of the anti-terrorist operation"<sup>63</sup>. In addition, over the past few years, a moratorium on business checks has been launched in Ukraine, designed to reduce administrative pressure on entrepreneurs. This area-specific moratorium does not apply to ad hoc inspections of "high risk" enterprises. The geographical scope of the moratorium is defined by the

<sup>57</sup> Bakhmut media portal, Zahriaznenye Bakhmutky otkhodamy svynokompleksa khotiat predupredit [Attempts to prevent contamination of Bakhmutks from the pig complex waste] <https://bahmut.in.ua/novosti/v-artemovske/978-zagryaznenie-bakhmutki-otkhodami-svinokompleksa-khotyat-predupredit>

<sup>58</sup> B.ua, V Novoluhanskom nachaly remont damby otstoinyka svynoferry «Bakhmutskiyi ahraryni soiuz» [Repairs begin at the Bakhmut Agrarian Unit farm in Novoluhanske], 30 August, 2018, available at: [https://lb.ua/society/2018/08/30/406292\\_v\\_novoluganskom\\_nachali\\_remont\\_dambi.html](https://lb.ua/society/2018/08/30/406292_v_novoluganskom_nachali_remont_dambi.html).

<sup>59</sup> Hromadske, Donbas: the New Exclusion Zone, available at: [https://en.hromadske.ua/special/exclusion\\_zone\\_donbas](https://en.hromadske.ua/special/exclusion_zone_donbas)

<sup>60</sup> OSCE, Assessment of Environmental Damage and Recovery Priorities in Eastern Ukraine, 2017, p. 45, available at: <https://www.osce.org/project-coordinator-in-ukraine/362566>

<sup>61</sup> Korrespondent, Ukreplenya VSU popaly v zonu zahriazneniya na Donbasse [AFU fortifications in the contamination zone in Donbas], 21 February 2018, available at: <https://korrespondent.net/ukraine/3943363-ukreplenya-vsu-popaly-v-zonu-zahriazneniya-na-donbasse>

<sup>62</sup> Ibid.

<sup>63</sup> Law of Ukraine 1669-VII, 2 September 2014, "On temporary measures in the area of the anti-terrorist operation" available at: <http://zakon.rada.gov.ua/laws/show/1669-18>



Cabinet of Ministers Decree which is regularly updated<sup>64</sup>. However, according to the Minister of Ecology, in the process of liberalizing the conditions for doing business there are situations where unscrupulous business entities are covered by the current law, forgetting about the environment and the threats that their activities make for the lives and health of citizens<sup>65</sup>.

Moratorium on inspections also leads to the lack of regulatory oversight (ET02). Since checkups of businesses are suspended in war zone, enterprises can increase emissions unlimitedly (ET04). Weak oversight leads to illegal activities such as coal mining in the national parks, logging, and improper waste disposal. One of the biggest consequences of the war is the deterioration of environmental governance systems and environmental oversight. Most of the government agencies in charge of collecting data on environmental pollution and enforcing environmental regulations are dysfunctional and much of environmental data has been lost. State Environmental Inspectorate has suspended its inspections of industrial facilities. Luhansk and Donetsk environmental and forestry authorities had to relocate staff causing a dramatic loss of personnel and expertise. This lack of oversight has encouraged the rise of illegal activities such as waste disposal, deforestation and illegal mining as an organized businesses which are controlled by criminal networks. Moreover, many of these activities such as waste disposal and timber extraction are also conducted by local citizens with no other choice as electricity and heating cease and waste disposal services slow due to hostilities and lack of funds. There have also been reports of the transportation of illegal substances<sup>66</sup>.

#### **Examples of abuse of regulatory framework deficiencies:**

*Illegal waste dumping in the triangle of death area<sup>67</sup>.*

In the suburb of Kostiantynivka, near the village of Chervone, an ecological “triangle of death” was formed from the waste brought from Kramatorsk (the products of alcohol production “Atopaz” Ltd), the nearby veterinary plant, and a tailing pond of the water supply

system. When the impurities were joined, a chemical reaction began. Officials referred to the moratorium on inspections in the Joint Forces Operation zone until the point when criminal cases was launched to investigate these crimes.

#### *Illegal pit near Toretsk*

There is an illegal pit (St. Matrona mine, private). It was connected to the grid 2017, after inspections they changed its name, management personnel and they manipulated documentation for the mine. It is an ecological risk not only on its own, but also because it is located near a landscape park Kleban-Byk (ET02).

#### **D) BAN ON HUNTING: AN INCREASE IN WILD ANIMAL POPULATIONS**

Hunting has historically played a role in maintaining control over the wildlife populations in Donbas and the tradition has existed for hundreds of years. As a result of the hostilities, hunting bans have been enacted in order to differentiate between fighting forces and local citizens. The unintended result has been a ‘rewilding’ of the area as less animals are hunted and species with little to no natural predators begin to flourish.

In 2013 local hunting associations used to pay for rabies control programs where oral vaccines were dropped off for wild animals. Since the hostilities this program has stopped there has been an increase in rabies and four people in the district of Urzuf were infected by wolves<sup>68</sup>.

There have been significant increase of wolves and wild boars in the town area, wolves were also noticed in residential districts (ET04). With hunting banned wolf populations have increased and wolves in search of food move closer to residential houses and walk around the territory of villages. There have also been reported incidents wolves killing domestic animals<sup>69</sup>. The has begun state taking steps to remedy the situation – on 5 October 5, 2017, Donetsk regional administration reported that due to increased number of attacks by wolves

<sup>64</sup> Cabinet of Ministers Decree no. 1275-p, 2 December 2015, available at: <http://zakon.rada.gov.ua/laws/show/1275-2015-%D1%80>.

<sup>65</sup> Glavcom, Semerak: Minprirody vystupaie za vidnovlennia ekolohichnykh perevirok na pidpriemstvakh [Semerak: the Ministry of Environment support restoration of environmental inspections of enterprises], 5 September 2018, available at: <https://glavcom.ua/news/semerak-minprirodi-vistupaje-za-vidnovlennya-ekologichnih-perevirok-na-pidpriemstvah-525401.html>

<sup>66</sup> EU Delegation to Ukraine, United Nations in Ukraine, World Bank Group, Ukraine: Recovery and Peacebuilding Assessment, March 2015, Vol. 2, p. 19, available at: [http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace\\_A4\\_Vol2\\_Eng\\_rev4.pdf](http://www.un.org.ua/images/documents/3738/UkraineRecoveryPeace_A4_Vol2_Eng_rev4.pdf)

<sup>67</sup> <https://www.facebook.com/pechenegy/posts/1546449612044477>

<sup>68</sup> Politico, All wild on Ukraine's eastern front, available at: <https://www.politico.eu/article/ukraine-border-war-wildlife-all-wild-on-the-eastern-front/>

<sup>69</sup> Depo Donbas, Na Donechchyni katastrofichna sytuatsiia z vovkami: napadaiut navit vden [Situation with wolves is critical in Donetsk region: they attack even at night], 27 September 2016, available at: <https://dn.depo.ua/ukr/dn/na-donechchini-katastrofichna-situatsiya-z-vovkami-napadayut-27092016174500>



special groups involving the military, the police and professional hunters were tasked with organizing regulation of the population of wild animals in the region<sup>70</sup>.

### E) LEGISLATION IN THE “GREY ZONE”: TAX CUTS LEADING TO CURTAILMENT OF ENVIRONMENTAL PROGRAMS BY LOCAL GOVERNMENTS

The Law on Amendments to the Tax Code of Ukraine, aimed at improving investment climate in Ukraine, has introduced exemptions on local taxes in the area of anti-terrorist operation, which has had negative impact on the local budgets in the grey zone, as reported by the local officials<sup>71</sup>.



*Legislation on tax cuts:* Due to the lack of funds in the local budget in Novhorodske, according to witness, the local authorities did not purchase purification tablets for the local well (ET01). During summertime, it is difficult to fund purification measures though they are necessary to prevent the growth of bacteria. The tax cuts are man-

dated by the Law investment climate, which relieves companies from local tax payments, which results in the lack of funds for cities located in the area of hostilities.

The law eliminated local budget taxes (land tax and rent for state and communal land plots) for land plots located in the temporarily occupied territory and / or territory of settlements located on the contact line and owned or used, including on lease terms, for individuals or legal entities, from April 14, 2014 until December 31, the year in which the counter-terrorist operation was completed.

For example, in Avdiivka, thirty percent of local budget was comprised of local taxes, thus the legislation left the local administration with reduced resources to fund the functioning of vital infrastructure in the city on the frontline<sup>72</sup>.

### CONCLUSIONS

The findings are significant and provide a comprehensive overview of the direct and indirect actions that are leading to a deterioration of the environmental quality in the region. Moreover, this report provides concrete evidence of environmental crimes that have been supported through evidence resulting from photographs, interviews with informants, and in the field observations. The aim of this report was to be short, clear and concise with regards to the key issues connected to environmental protection in the area of hostilities. The authors and field researchers also obtained first-hand accounts through field observations and local feedback. We hope that this report will serve as a strong basis not only for further field research, but for concrete actions by policy makers, parties to the conflict, donors and the international community. While the results are aimed to inform decision making in Ukraine it is the hope of the authors that they can further contribute to the understanding of war and its impacts on the environment, and most importantly, the people who live within it<sup>73</sup>.

<sup>70</sup> Anti-Crisis Media Center, U Donetskii oblasti dozvoliat vidstril dykykh tvaryn [Wild animal control measures to be permitted in Donetsk region], 5 October 2017, available at: <http://xn--80aug4b.xn--j1amh/u-donetskiy-oblasti-dozvoliat-vidstril-dikih-tvarin/>

<sup>71</sup> The Law on Amendments to the Tax Code of Ukraine on improving investment climate in Ukraine, 1797-VIII, 21 December 2016, available at: [http://w1.c1.rada.gov.ua/pls/zweb2/webproc4\\_1?pf3511=60443](http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=60443)

<sup>72</sup> DW, Opodatkuvannia v «sirii zoni»: pidtrymka pereselentsiv chy krakh dlia mistsevykh biudzhetyv [Taxation in the grey zone: support for IDPs or disaster for local budgets], 24 January 2017

<sup>73</sup> The OSCE Parliamentary Assembly called on OSCE to establish a system of ecological monitoring of war-torn and occupied territories to assess the disruptive and disastrous consequences of conflicts on the environment and consequently formulate recommendations in line with the OSCE principle of comprehensive security. See Berlin Declaration and Resolutions adopted by the OSCE Parliamentary Assembly at the 27th Annual Session, available at: <https://www.oscepa.org/documents/all-documents/annual-sessions/2018-berlin/declaration-26/3742-berlin-declaration-eng/file>