

Independent Terminal Evaluation

Horlivka Chemical Plant Remediation

Project No.: EE/UKR/11/006, TE/UKR/11/005
UNIDO SAP ID: 100025



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UNITED NATIONS
INDUSTRIAL DEVELOPMENT
ORGANIZATION

Independent Terminal Evaluation

of the UNIDO Project

“Horlivka Chemical Plant Remediation”

Project No: 100025 (EE/UKR/11/006, TE/UKR/11/005)

*Project Technical Execution by Pure Earth
(formerly Blacksmith Institute)*

EVALUATION REPORT

NOVEMBER 2015

A Report for UNIDO

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*Project co-financed by the European Union and the
Swedish International Development Cooperation Agency,
with further co-financing from ICCA and Blacksmith
Institute*



*Technical Execution by Pure Earth
(Blacksmith Institute)*



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Reader Orientation

When reading this report, please note that Pure Earth and Blacksmith Institute are used interchangeably to reference Pure Earth (formerly Blacksmith Institute). However, as the Executing Agency’s name was Blacksmith Institute at the time of contracting for this project, this is the name that is predominantly used for the purpose of this evaluation reporting.

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Disclaimer

The views expressed in this report are those compiled by the author and reflect a best effort to compile and cross-analysis different sources of data and information about the project. The views expressed in this report do not necessarily represent the views of UNIDO, the EC or Pure Earth. Any errors of factor or in assessment are the responsibility of the evaluation consultant.

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Glossary

EC	European Commission
EQ	Evaluation Question
EU	European Union
EUD	European Union Delegation to the Ukraine
ICCA	International Council of Chemical Associations
MoEDT	Ministry of Economic Development and Trade
MENRU	Ministry of Ecology and Natural Resources of Ukraine
MNCB	Mononitrochlorobenzene
ProDoc	Project Document
SDG(s)	Sustainable Development Goal(s)
SEPA	Swedish Environmental Protection Agency / Naturvårdsverket
Sida	Swedish International Development Cooperation Agency
TAP	Toxic Action Plan
ToR	Terms of Reference
TNT	Trinitrotoluene
TSIP	Toxic Sites Identification Programme
UNDP	United Nations Development Programme
UNEG	United Nations Evaluation Group
UNEP	United Nations Environmental Programme
UNIDO	United Nations Industrial Development Organisation
WB	World Bank
WHO	World Health Organisation

1. EXECUTIVE SUMMARY

1.1 Project Background and Objectives

This document comprises the evaluation report from the project “*Independent Evaluation of the UNIDO Project “Horlivka Chemical Plant Remediation”*”. The objective of the project is to assist the Government of Ukraine to urgently, holistically and safely address the issue of the toxic pollutions causes and the human health effects that are caused by the presence of trinitrotoluene (TNT), an explosive and poisonous toxin and well-known carcinogen, at the Horlivka Chemical Plant, a former chemical and explosives production facility and now abandoned industrial site located in the city of Horlivka in the Donetsk region of Ukraine.

The Horlivka Chemical Plant location poses significant and immediate threats to the health of the local population, with thousands of tons of mononitrochlorobenzene (MNCB), a blood toxin, and around 30 tons of TNT, which is an explosive and poisonous toxin and well-known carcinogen. These poisonous toxins pose significant risks, with the possibility that an accidental explosion of the TNT could release large amounts of the MNCB into the air and thus affect the entire population of 260,000 inhabitants in the town. The site has already been identified by the Blacksmith Institute as a highly-toxic site. MENRU has acknowledged the urgency of addressing the environmental and safety threat posed by the site.

Specifically, the original project aimed at completing the following outputs: i) Output 1: Finalising remediation plan details with the Ministry and contractor, stakeholder group input and participation; ii) Output 2: Setting up properly the project site and training project personnel in order to ensure safety during the remediation process; and iii) Output 3: Removing TNT and associated refining acids from above and underground pipes, tanks and equipment, and neutralising TNT. As per the ProDoc, these outputs were to be attained through a series of activities which were identified as: i) O1: The verification of the proposed remediation technique and agreement with designated ministries; ii) O2: Infrastructure setup and site preparation; and personnel management and health/safety training; and iii) O3: The removal of TNT and acids from above piping, equipment and above ground tanks and the disposal of TNT from these locations (*Phase I of the original plan*); the removal and disposal of TNT from underground tanks (*Phase II of the original plan*); and the testing of soil and groundwater for contamination. The expected outcome from the project was the removal and disposal of 30 tons of TNT from above ground and below ground pipes and equipment excluding the remediation of the soil and groundwater, thus ensuring the elimination of any risk of explosion and toxic exposure at the site and near city of Horlivka. From this, the anticipated outcome was an increased improvement of health, safety and environmental standards in the city of Horlivka.

The project ran from January 2012 to November 2015 (a duration of 47 months or just under 4 years), following a number of extensions of the project by the donors. The project has been funded through grants from the European Commission (EC) and the Swedish International Development Cooperation Agency (Sida), amounting to EUR 400,000 total (with the EC and Sida each contributing EUR 200,000), and was contracted to the United Nations Industrial Development Organisation (UNIDO) with the Blacksmith Institute (now renamed as Pure Earth) responsible for technical execution. Of the total EUR 636,000 grant financing, EUR 25,074 (7%) was allocated to UNIDO as a management fee, with the rest allocated to the Blacksmith Institute. Blacksmith Institute also

contributed EUR 56,000 in financing to the project and the International Council of Chemical Associations (ICCA) contributed EUR 180,000. Thus, the total project financing was EUR 636,000.

About the evaluation

An independent terminal evaluation for this project was foreseen as part of the budgeted Monitoring and Evaluation Plan in the project document, with the purpose of conducting a systematic and independent assessment of the project in line with both UNIDO policies and donor policies. The evaluation work was carried out during October-November 2015 and comprised three core work phases: desk and documentation review (October 2015); field interview programme UNIDO HQ in Vienna and in Kiev (October-November 2015), as well as additional stakeholder telephone interviews (November 2015). Finally, the third evaluation phase comprised of the analysis of the data and findings and the development of the draft evaluation report.

1.2 Evaluation Findings and Conclusions

Regarding **project relevance**, the Horlivka Chemical Plant Remediation Project was *highly relevant at a number of levels*. Firstly, within the broader sustainable development context, the project addresses the potential long-term environmental and health problems related to having highly dangerous chemicals in a disused industrial facility adjacent to a large population centre. The project is relevant to the *EC’s Global Public Goods and Challenges operational programme* and its strategies, which as a financing instrument for development cooperation aims to support inclusive and effective sustainable development, including in the area of environment. It is also consistent with EC funding for toxic pollution remediation, such as the EC’s funding for UNIDO and Blacksmith Institute under the *Reduction of Toxic Pollution Threatening the Environment and Health of Vulnerable Communities*.

Regarding *relevance to EU policy objectives* for the Ukraine, the project is consistent with the EU’s work in Ukraine in the area of water, and energy, and environmental protection. The project is also relevant to Ukraine-EU relations and partnership priorities, with for example the Preamble to the Ukraine-EU Association Agreement also mentioning the joint commitment of both the Ukraine and the EU to enhance cooperation in the field of environmental protection and to the principles of sustainable development.

Regarding *relevance to Sweden’s development priorities*, the project is relevant to the Swedish International Development Agency’s (Sida) work in the fields of sustainable societal development, environment and climate, and health. For example, a core goal of Sida’s work is the strengthening of institutional capacity in environmental management and environmental institutions, as institutional capacities in environmental management and environmental institutions are often weak in Sida’s partner countries, with these weak institutional capacities resulting in environmental degradation and an aggravated situation for many people living in poverty.

The project is also *relevant to UNIDO’s mandate and thematic priorities*, in particular UNIDO’s commitment to energy and environmental concerns including the promotion of sustainable patterns of industrial consumption and production, as well as being consistent with UNIDO’s work in the above-mentioned EC-funded project *Reduction of Toxic Pollution Threatening the Environment and Health of Vulnerable Communities*. The project is also relevant to national policy, as can be evidenced by the commitment in the National Toxic Action Plan to the further clean-up of the Horlivka Chemical

Plant, in addition to the clear interest from Horlivka municipality and local citizens in seeing the TNT extracted and removed from the site.

Regarding overall **project efficiency**, the evaluation findings show satisfactory performance with regard to efficiency. The project technical management was quite streamlined and was supported by experienced technical advisors from Blacksmith. Regarding **contract and project management**, the contract management from UNIDO was efficient and responsible, allowing the technical implementer Blacksmith to communicate directly with project stakeholder on technical issues which was a practical approach and avoided unnecessary slowing down of communication. The **project management** from Blacksmith was also efficient, with the project overall being a well-managed project, and with both key donors and UNIDO appreciating the proactive flow of communication from Blacksmith. It should be noted that the time lost with government-related issues and the Ukraine-Russia hostilities have been extremely costly to the safe removal of the TNT at the Horlivka plant. Risk assessment and management could not have been expected to identify these political issues, though it is worth reflecting on whether risk-management could have included a fast-tracked project response or contingency plan to allow for more rapid cleaning completion and TNT removal in the case of a perceived risk or threat in the wider environment. The project was also relatively efficient in the use of local contractors, even if the quality did vary at times.

Regarding **project effectiveness and the extent to which the project achieved its aims**, the project has recorded partial achievement of its target outputs and results. As previously stated, the objective of the project was to improve the environment, health and safety of Horlivka’s population. As per the ProDoc, indicators for this objective aimed to show changes in ambient and exposure levels, a minimum of 20 tons of TNT removed and disposed, and the superficies of remediated area at the site. Some of the core results included the safety training of project personnel, the securing of the site, and the excavation and dismantling of 48 tons of waste material (approximately 5 tons of pure TNT and 43 tons of mixed materials containing TNT and acids) from buildings and underground emergency tanks at the Horlivka Chemical Plant. Following the dramatic change in the regional political situation and the outbreak of hostilities in Eastern Ukraine, the project did not however achieve its aim of disposing the TNT and acids. Thus, the project was effective in fulfilling most of its outputs except for the disposal of TNT from the site – local stakeholders had been involved in the project, the project site was properly set up and personnel were properly trained, and 48 tons of waste materials were excavated and dismantled from buildings and underground emergency tanks at the Horlivka Chemical Plant.

The project has undoubtedly been negatively impacted by the current conflict in Ukraine, with reported entry into the site of anti-government militia. In the absence of confirmed reports as to whether the TNT stored at the site remains, it is possible that it still does, though with the strong risk of an attendant explosion and its continued threat to the nearby town and its citizens. The explosion risk from the site can in part be gauged from numerous explosions at industrial sites in Eastern Ukraine before and during the hostilities, including the explosion at the Donetsk State Enterprise Chemical Plant where project partners had planned to have the TNT from the project site incinerated. Beyond the chemical and explosion risk from the TNT that remains on the site, a wider environmental risk also exists from the polluted ground water, with an initial environmental assessment carried out by Blacksmith institute showing relatively extensive contamination of soil and groundwater around the TNT production buildings. This contamination will need further assessment

as it could over time pose a threat, even if it is located at some distance to the nearest public drinking water sources.

Regarding the development **impact and sustainability**, it is difficult to determine the impact and sustainability of the project, given the current status of the regional conflict and the difficulty of returning to the project site safely. However, the support by local Ukrainian officials in completing the project shows an increase in support and commitment to the project that could potentially continue should the political climate improve.

With regard to **lessons learned**, it may be worth considering the identification of alternative responses in light of potential risks. First, much time was lost dealing with government-related issues that cost the project valuable time, which could have been used to ensure the safe disposal of the TNT. The issues of payment and permit expiration resulted in an unanticipated delay that left the project months behind. To the extent that Ukrainian government bureaucracy and often lack of interest was behind these delays, the implementation experience raises some questions about the real interest in, and commitment to, environmental protection and safety. Second, one could not have reasonably expected to identify the international instability in Ukraine that resulted in the armed conflict affecting the area around the Horlivka Chemical Plant. Nevertheless, it is worth asking whether risk management could have reasonably included a fast-tracked project response (e.g. to the cleaning completion and TNT removal) in the case of a perceived risk to the project site, and in this case having at least a back-up contingency plan for a second incineration option outside of Eastern Ukraine. Moreover, a more straightforward risk management/contingency option could have been a plan to move the TNT to a secure ‘holding site’, in order to remove the TNT threat from Horlivka and to buy time while a new incineration solution was being identified.

1.3 Evaluation Recommendations

A first recommendation is to **return post-conflict (should the political situation improve and the safety of project staff be guaranteed) to assess the situation of the site and where necessary to complete the removal of any TNT remaining on the site (R1)**. A second recommendation is to **conduct an impact assessment in regards to the issue of soil and groundwater contamination**, and, as recommended by Blacksmith, to utilise the remaining project funds to reduce the risk of contaminated soil and groundwater at the site **(R2)**.

A third recommendation is to **consider what learning can be distilled from the project implementation experience, and in particular for future projects focussed on the removal of dangerous chemicals to include a specific contingency plan for an accelerated removal of such chemicals in the event of an adverse change in the wider implementation context/environment (R3)**. A final recommendation is that **the project implementation experience be presented to the national government**, specifically MENRU, and that MENRU should be asked for its views on whether and how the various bureaucratic delays contributed to the failure to remove the TNT before the advent of hostilities in Eastern Ukraine, as well as how it would propose to review and improve procedures to avoid such delays in the future, for example through a streamlined administration and permit process such as a one-stop shop **(R4)**.

PART I – ABOUT THE EVALUATION

2. EVALUATION & PROJECT OVERVIEW



Section Guide

This section provides an overview of the following:

- *The background context and intervention rationale for the project (Section 2.1)*
- *The project overview (Section 2.2)*
- *The evaluation objectives and approach (Section 2.3)*
- *The evaluation management (Section 2.4)*

This document comprises the draft evaluation report of the *Horlivka Chemical Plant Remediation Project*.

2.1 Horlivka Chemical Plant Remediation - Background Context

The Horlivka Chemical Plant is a former chemical and explosives production facility and now an abandoned industrial site located in the city of Horlivka in the Donetsk region of Ukraine. The Horlivka Chemical Plant location poses significant and immediate threats to the health of the local population, with thousands of tons of mononitrochlorobenzene (MNCB), a blood toxin, and around 30 tons of trinitrotoluene (TNT), an explosive and poisonous toxin and well-known carcinogen. These poisonous toxins pose significant risks, with the possibility that an accidental explosion of the TNT could release large amounts of the MNCB into the air and thus affect the entire population in the town (260,000 inhabitants).

Given this threat, the Ministry of Ecology and Natural Resources of Ukraine (MENRU) had acknowledged the risk that this abandoned industrial site poses to the citizens of the city of Horlivka and has made this remediation task a priority.

2.2 Horlivka Chemical Plant Remediation Project - Overview

Given the danger posed by the Horlivka Chemical Plant on the entire population of the city of Horlivka, the project aimed to address the toxic pollution and its human health effects caused by the presence of TNT at this former chemical and explosives production facility.

The over-arching *Horlivka Chemical Plant Remediation Project* goal is to assist the Government of Ukraine to urgently, holistically and safely address the issue of the toxic pollutions causes and its human health effects that are caused at the Horlivka Chemical Plant. The project ran from January 2012 to end 20 November 2015 (a duration of 3 years and 11 months), while all project activities were reported in the project reports to have been completed by the end of April 2015. The project is

funded through European Commission and Sida grants amounting to EUR 400,000 (EUR 200,000 from each party) and is contracted to UNIDO with the Blacksmith Institute (now renamed as Pure Earth) responsible for technical implementation. Of the total EUR 400,000 grant financing, EUR 25,074 (7%) is allocated to UNIDO as a management fee, with the rest allocated to the Blacksmith Institute, while Blacksmith Institute also provided co-financing of EUR 56,000 and ICCA provided co-financing of EUR 180,000.

The table below sets out a summary project factsheet:

Table 2.1 – Project Factsheet

Project Title	<i>Horlivka Chemical Plant Remediation</i>
UNIDO ID (SAP Number)	Project No: 100025 (TE/UKR/11/005, EE/UKR/11/006)
Country(ies)	Ukraine
Implementing Agency	UNIDO
Project Executing Partner	Blacksmith Institute
Project Implementation Start Date	January 2012
Project Duration (Months)	47
EC Financing Contribution	EUR 200,000
Sida Financing Contribution	EUR 200,000
UNIDO Management Fee	EUR 25,074
Counterpart Inputs - Co-financing	EUR 56,000 (Blacksmith Institute)
	EUR 180,000 (ICCA)

(Source: Project document)

The project aimed at completing three outputs:

- i) Output 1: Finalising remediation plan details with the Ministry and contractor, stakeholder group input and participation;
- ii) Output 2: Setting up properly the project site and training project personnel in order to ensure safety during the remediation process; and,
- iii) Output 3: Removing TNT and associated refining acids from above and underground pipes, tanks and equipment, and neutralising TNT.

Each output was to be attained through a series of activities, including:

- i) O1: The verification of the proposed remediation technique and agreement with designated ministries;
- ii) O2: Infrastructure setup and site preparation; and personnel management and health/safety training;
- iii) O3: The removal of TNT and acids from above piping, equipment and above ground tanks and the disposal of TNT from these locations (*Phase One*); the removal and disposal of TNT from underground tanks (*Phase Two and Three*); and the testing of soil and groundwater for contamination.

Within this framework, the specific objectives of this project were threefold, as set out in the table below:

Table 1.1. - Overview Project’s Specific Objectives

SO	Summary	Specific Objective
SO1	Finalising remediation plan details with Ministry and contractor, stakeholder group input and participation	1.1 Verification of the proposed remediation technique and agreement with the MENRU and the Ministry of Economic Development and Trade (MoEDT) of Ukraine; 1.2 Formally organise and convene stakeholder group.
SO2	Project site properly set and project personnel trained to ensure safety during remediation process	2.1 Infrastructure setup and site preparation; 2.2 Personnel Management and Health/Safety training.
SO3	Dispose of TNT and acids from piping, equipment and above ground tanks	3.1 Remove TNT and acids from piping, equipment and above ground tanks; 3.2 Dispose of TNT from pipes, equipment, and above ground tanks; 3.3 Remove TNT from underground tanks; 3.4 Dispose of TNT from underground tanks; 3.5 Testing of soil and groundwater for contamination.

Regarding **project implementation arrangements**, the implementing agency for this project has been UNIDO, with the Blacksmith Institute as the main executing partner agency. The latter signed a contract¹ in February 2012 with UNIDO for the complete execution of the project, against which UNIDO paid the Blacksmith Institute (the Contractor) EUR 332,430 for the full and proper performance of its obligations under this contract. This amount covers all of the contractor’s expenses, including but not limited to provision of equipment, services and personnel costs. UNIDO has thus played a coordinating, monitoring and reporting role to the project donors—the European Commission and Sida—while Blacksmith Institute was responsible for the provision of technical expertise, project stakeholder coordination and management of in-country pilot project.

2.3 Evaluation Objectives and Approach

An independent terminal evaluation for this project was foreseen as part of the Budgeted Monitoring and Evaluation Plan in the project document, with the purpose of conducting a systematic and independent assessment of the project in line with UNIDO, the EC and Sida Evaluation policies.

Regarding **evaluation objectives**, the evaluation’s main objectives were to assess the project’s performance in terms of relevance, effectiveness, efficiency, sustainability and impact. Additionally, the evaluation has sought to draw lessons and develop recommendations for UNIDO and the EC that may help for improving the selection and enhancing the design and implementation of similar future projects. The assessment has been undertaken in accordance with the provisions contained in the Project Document (ProDoc). The assessment has been conducted in line with the norms, standards and ethical principles of the United Nations Evaluation Group (UNEG)².

¹ Blacksmith Institute and UNIDO. “Contract Number 16002517”. 28 February 2012.

² UNEG. “Standards for Evaluation in the UN System”. April 2005. <http://www.unevaluation.org/document/detail/22>.

The evaluation took place during October and November 2015 and involved desk research, field missions, and a limited number of telephone interviews. The desk research phase included a review of relevant project documents, as well as wider international policy and initiatives in the area of pollution and development. The field work conducted included missions to UNIDO Headquarters in Vienna, as well as field missions to Kiev. However, due to the current situation in Eastern Ukraine, UNIDO deemed it not safe to visit the Horlivka project site itself.

2.4 Evaluation Management

Regarding **evaluation management**, the evaluation is under the management of UNIDO, and as per the ToR the evaluator has worked independently, reporting to UNIDO counterparts throughout the evaluation exercise, in particular the UNIDO Office for Independent Evaluation (EVA) on the conduct of the evaluation and methodological issues. This has included briefing and liaison meetings with UNIDO staff at UNIDO Headquarters in Vienna.

2.5 Evaluation Limitations

Regarding **evaluation limitations**, the evaluation faced a number of limitations. One limitation concerned the difficulty in interpreting information from Ukrainian staff and officials, as well as documentation, given the lack of available resources for translating. Another limitation was the inability to carry out a visit to the project site in Horlivka, due the current security situation in Eastern Ukraine making the Horlivka plant site unsafe to visit, and the related constraint of not being able to carry out interviews with some former of the project team and the municipality.

UNEG. “Norms for Evaluation in the UN System”. April 2005. <http://www.uneval.org/document/detail/21>.

UNEG. “UNEG Ethical Guidelines for Evaluation”. March 2008, <http://www.unevaluation.org/document/detail/102>.

3. COUNTRY OVERVIEW



Section Guide

This section provides an overview of the following:

- *The country context with regard to toxic pollution (Section 3.1)*
- *The Horlivka remediation project in relation to the national context (Section 3.2)*

3.1 Country Context – Toxic Pollution in the Ukraine

Toxic chemical waste and its potential effects on nearby populations remains an important pollution issue. The country does not have a sector policy for hazardous waste, although it has developed a budget as of 2011 for eliminating such obsolete fertilisers. Nevertheless, the elimination plan remains rather ad-hoc and a more systematic approach has yet to be developed.

Through the EC-funded Global Inventory project, which was implemented by UNIDO and executed by Blacksmith Institute, the Horlivka Chemical Plant site had already been identified as one of the worst polluted and contaminated sites. The Global Inventory project, which identifies and prioritises polluted industrial sites around the world, found that the Horlivka Chemical Plant could potentially harm a significant amount of the population surrounding the plant site.

In addition to the Horlivka site the Donetsk and Luhansk regions also currently contain 5 of the 10 worst polluting enterprises in the Ukraine:

1. Open Joint Stock Company “Illich Marioupol’ Metallurgic Complex”, Mariupil’
2. Open Joint Stock Company “Azovstal”, Mariupil’
3. “Starobeshivska heating plant” of Open Joint Stock Company “Donbasenergo”, Novyi Svit
4. Open Joint Stock Company “Alchevskyi Metallurgic Complex”, Alchevsk
5. Open Joint Stock Company “Lysychanska soda”, Lysychansk³.

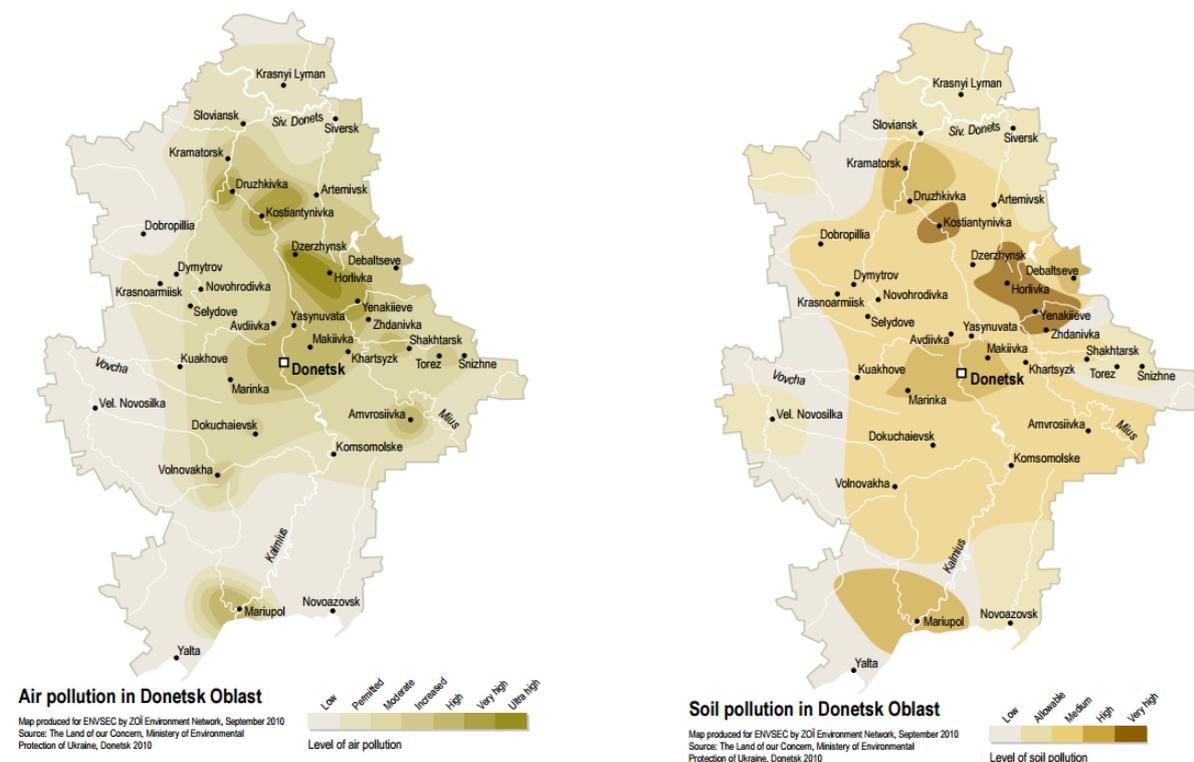
With the onset of the conflict, the environmental risk posed by these companies and other polluting sites has increased. For example, on 27 July 2014, the “Styrol” plant, which produces 3% of the world’s production of ammonia, was mined by militants; on 18 January 2015, this same plant was bombed. The dangers of such large amounts of stored ammonium also posed a threat before the onset of the crisis, as accidents at the plant had led to known casualties. Another example is the “Azot” chemical enterprise in Severodonetsk that is one of the largest of its kind in Europe. If hit by a bomb, the explosion would cause environmental catastrophes beyond Ukraine. Another example is the “Zasyadko” mine located in the Donetsk region that used to produce 4 million tons of coal

³ Pure Earth. “Environment and the war: general overview” Ecological situation in Eastern Ukraine.

annually, though had experienced various accidents at the mine⁴. During one such accident in March 2015, a release of methane and its explosion led to the death of 33 individuals working underground.

Numerous other mines within the country continue to pose a risk to citizens, with pollution risks including contaminated waters polluted from rocks containing heavy metals such as molybdenum, vanadium and others. Experts believe that if these mines continue to flood, the region could become a swamp. Hazardous wastes in the Donetsk region and Luhansk region still remain problematic. The wastes in this region are extremely dangerous, given their classification as class IV hazard (which also includes mining wastes). The burning of these wastes could release these toxic chemicals into the air. Furthermore, bombing or shelling this waste could emit radioactive elements, which in larger amounts could result in combustion.

The maps below show the dangers of air pollution and soil pollution that is prevalent in the Donetsk Oblast region of Ukraine.⁵ From the images, one sees that city of Horlivka has the worst air pollution and soil pollution in the region.



Source: Zoi (2015)

Source: Zoi (2015)

Given the military operations underway, there is an increased risk of operations affecting flora, fauna, water quality, and air and soil quality. The resulting coverage of steel fragments and tons of chemicals causes the oxidation of surrounding soil and plant life, while fauna move out of previous

⁴ Zoi. “The Ukraine conflict’s legacy of environmental damage and pollutants.” Sustainable Security. 21 April 2015. <http://sustainablesecurity.org/2015/04/21/the-ukraine-conflicts-legacy-of-environmental-damage-and-pollutants-2/>

⁵ Zoi Environment Network. “Coalland – Faces of Donetsk”. 2011. p. 32. http://www.zoinet.org/web/sites/default/files/publications/coalland_screen.pdf.

habited areas and pests begin to enter forestry and agriculture. The result of military actions increases the risks to water quality as a result of damaged water pipes and sewage systems; this damaging of water treatment plants could lead to a greater threat of hazardous wastes entering water.

In the Luhansk region, this has become a serious concern, as thefts of water sanitation equipment has led to water pollution. Those mining and sewage waters containing hazardous chemicals could penetrate into wells and other water bodies that could remain for hundreds of years and cause significant health problems. Regarding the impact of air and soil quality, military actions and shelling destroys fertile soil, making the area soil toxic and unsuitable for agricultural use or cattle raising and making the soil a potential health threat to local residents for hundreds of years. The lack of environmental controls in the Donetsk and Luhansk regions (as well as the absence of regulatory bodies and currently the attacks), does not allow for an objective assessment of the damage caused to the environment by the armed confrontation.

3.2 Horlivka Chemical Plant Remediation Project in the National Context

Given the country context, the Horlivka Chemical Plant remediation project signifies a step in the right direction towards fixing the significant damage caused by years of industrial development and conflict. Before the onset of the project, the site was already acknowledged as being dangerous and identified as one of the most polluted sites. Located very close to the city of Horlivka in the Donetsk region, the Horlivka Chemical Plant site poses significant and immediate threats to the health of the local population. These poisonous toxins pose significant risks, with the possibility that an accidental explosion of the TNT could release large amounts of the MNCB into the air and thus affect the entire population of some 260,000 inhabitants in the town.

While abandoned at the beginning of the project, the Horlivka Chemical Plant was previously a military based and shrouded in secrecy, particularly during the Soviet regime, for residents in the city of Horlivka. It was also noted that local officials were not certain what the plant used to produce; however, the TNT and MNCB at the site poses significant risks to the citizens of Horlivka, especially given the site’s central location in the city. The recording of deaths and disappearances of miners from the Horlivka Chemical Plant further supports the need for immediate action to protect the surrounding populations. At the onset of the contract, MENRU had acknowledged the urgency of the project and the necessity to solve the toxic pollution problem at the Horlivka Chemical Plant. The further pledging of support by the Horlivka Mayor’s office has shown the commitment and understanding by the local governmental authorities of the need to continue pursuing toxic remediation projects like the Horlivka Chemical Plant.

PART II – EVALUATION FINDINGS

4. PROJECT DESIGN



Section Guide

This section provides an overview of the following:

- *Clarity, consistency and logic of the project design (Section 4.1)*
- *Realistic elements and smart elements of the project design (4.2)*
- *Overall quality of the project design (4.3)*

4.1 Project Design - Clarity, Consistency, and Logic

Regarding **clarity and consistency of the project design**, the Project Document identifies clearly the project’s outputs and activities, as well as the project’s phases for removing and disposing of TNT. The context is clearly stated and outlined, providing a relatively clear overview of the core phases and critical work tasks.

Regarding the project design’s **logic**, the work programme comprised a series of logical phases following initial site review and assessment, support training of local site staff and project management, followed by decision-making on the technical approach to site remediation, and in particular TNT extraction, clean-up and removal.

4.2 Project Design - Realistic Elements and Smart Elements

The project was **realistic** in that no major assumptions were made with regard to the support of the local community, even if it had been made clear that Horlivka municipality was supportive of the project and conscious of the threat posed by the state of the plant site. Secondly, the project also did not make any major assumptions about a wider remediation of the plant beyond the removal of specific dangerous chemicals and toxins. While such a wider plan would at one level have been welcomed, it would have likely not been realistic both in terms of the environmental commitment level of the local municipality, as well as the wider level of priority given to full restoration of industrial sites in Eastern Ukraine and more generally across the country. Moreover, it is likely that Horlivka municipality would not have had the resources to support such a wider restoration and greening of the site.

4.3 Project Design – Overall Quality

Overall, the quality of the project design can be considered to be generally satisfactory. The quality of the project design could indeed have been further strengthened if a fuller analysis of the exact

state and level of chemical storage and chemical pollution could have been identified in the project formulation document (ProDoc), as well as if the different technical options could have been analysed in advance. However, this would for the most part have been impractical for a number of reasons. Firstly, Blacksmith struggled with a lack of full disclosure of data, as well as sometimes conflicting data, during the project formulation work (see also Section 6 on *Implementation – Efficiency and Effectiveness*). Similarly, the high level of bureaucracy in the Ukraine and the often-seen gap between what the law requires compared to law enforcement and what is allowed also meant that it would be quite difficult to do a full feasibility analysis of options such as composting in advance of the project, as well as further riving up formulation costs by seeking to add technical and regulatory options analysis work that one could also reasonably expect to be part of the logical work flow of the project. Thus, for these reasons, the project design can broadly be considered to be satisfactory.

It is worth noting that while the risks identified for the project in the ProDoc were more general in scope covering the risk of explosion, the Sida assessment went beyond this. In the Sida assessment, risks, mitigation measures and responsible parties addressed: 1) accidents, 2) corruption, 3) lack of coordination, 4) lack of funding, 5) deviation from project schedule, 6) potential commercial third-party gains from the land clean-up, and 7) reputational risk. It is possible that Blacksmith only covered the risk of explosions in the Project Document, labelling this as a top risk.

Regarding the extent to which the project has been formulated with the participation of national counterpart and/or target beneficiaries and relevant country representatives, the evaluation findings show that the project design benefitted from consultations with the national government, and in particular Horlivka municipality and local stakeholders. Additionally, the primary donors EC and Sida displayed a good concern for optimising use of public funds through their efforts to obtain a clear undertaking from Horlivka municipality that the remediated Horlivka plant site would not be sold to commercial organisations afterwards.

5. PROJECT RELEVANCE



Section Guide

This section provides an overview of the following:

- *Relevance of the project to the National Development Context (Section 5.1)*
- *Relevance of the project to EU Policies and Programmes Priorities (Section 5.2)*
- *Relevance of the project to Sweden’s Development Policies and Programmes (Section 5.3)*
- *Relevance of the project to UNIDO Mission and Policies (Section 5.4)*
- *Extent of Participatory project identification process (Section 5.5)*

5.1 Relevance to Ukraine’s National Development Context

Regarding the **extent to which the project was relevant to national development, environmental priorities and target groups in Ukraine**, the evaluation finding show that the project is clearly relevant to the national context, with the country facing a considerable challenge regarding industrial and toxic pollution, as discussed in Section 4. The project’s relevance to the national context, and to the Ministry of Ecology and Natural Resources of Ukraine (MENRU) in particular, can be seen in that MENRU had allocated USD 7.5 million for the destruction of MNCB but lacked both funding and technical knowledge to remove TNT, and that this project allowed MENRU to address this need. **MENRU has noted the seriousness of the situation and considers the resolution of the toxin pollution at the Horlivka Chemical Plant is a priority-driven tasks for Ukraine within the next few years.**

The project has also been relevant to the key target groups, with the clean-up actions in particular bringing the most direct positive impact in terms of the reduced risk exposure of the local community in the immediate vicinity of the Horlivka Chemical Plant, but also in the wider surrounding areas. The local community has noted the dangers of the Horlivka Chemical Plant and the stored TNT for decades.

While local and regional governments and civil society environmental protection organisations have tried to find solutions for the problem, no solutions have been created. Given the lack of financing and the unstable political situation, proper toxic chemical remediation has been impossible. The deterioration of the site’s facilities has had a negative environmental impact, with increasing temperatures in the summer increasing the risk of a chemical reaction and explosion of the poorly-stored chemicals still on site. Given that MNCB has also been noted at the project site, the clean-up of the Horlivka Chemical Plant is ever more important. This delicate situation is also exacerbated by the close proximity of Stiroil Enterprise, a functioning chemical factory that uses explosive nitrogen in its production. For the Horlivka municipality, the remediation of the plant would help it advance its plans to convert the plant area into an industry and business park.

5.2 Relevance to EU Policy and Development Priorities

Regarding the **extent to which the project was relevant to EU’s operational programme strategies and to UNIDO’s thematic priorities**, the project is quite relevant to EU policy objectives in Ukraine, particularly regarding the EU’s work in Ukraine in the area of water, energy, and environmental protection. The project is also relevant to Ukraine-EU relations and partnership priorities, with for example the Preamble to the Ukraine-EU Association Agreement also mentioning the joint commitment of both the Ukraine and the EU to enhance cooperation in the field of environmental protection and to the principles of sustainable development.

It should also be noted that the Horlivka site was identified during the EC-funded Global Inventory project which was implemented by UNIDO and executed in collaboration with the Blacksmith Institute 2008-2010. As mentioned earlier, the objective of that project was identifying and prioritizing polluted industrial sites around the world using a ranking method developed by the Blacksmith Institute. The Horlivka plant was assessed and ranked among the worst sites in terms of pollution and contamination hazard with the potential to harm large surrounding populations.

5.3 Relevance to Sweden’s Development Policies and Programmes

Sweden’s Strategy for Development Cooperation in Ukraine 2009-2013 focuses on EU integration in the areas of democratic governance, human rights, environmental protection and the sustainable use of natural resources. This project relates particularly to environmental protection and the commitment to achieve reduced pollution to air, ground and water. The Association Agreement negotiations also include the EU directive on wastes, which also includes hazardous wastes. Legal harmonization in this area is included in the support programme for 2010-2013 financed by Sida and implemented by Naturvårdsverket/SEPA.

5.4 Relevance to UNIDO Mission and Policies

The project is also relevant to UNIDO’s thematic priorities, in that it is relevant to UNIDO’s mandate, objectives and outcomes as defined in the Programme & Budget and core competencies. In particular, it is relevant to UNIDO’s mandate to eradicate poverty through inclusive and sustainable industrial development, as pollution weighs mostly on poor communities and hinders their development. It is also relevant to the work programmes from 2012 to 2015, concentrated mostly on projects removing pollutants and ODS (ozone-depleting substances) from the environment and shifting industrial production to more environmentally-friendly materials. Moreover, at a broader level, the project’s work in cleaning polluted sites (for example legacy industrial sites or live industrial sites) and promoting new policies and commitments to tackle environmental damage from industrial activity fits well with UNIDO’s commitment to fostering sustainable industrial development. As the project has progressed, the evaluation has also noted an **increasing relevance to some of UNIDO’s sector and global programmes and initiatives**.

5.5 Participatory Identification Processes

The **extent to which a participatory project identification process was instrumental in selecting problem areas and national counterparts** is difficult to assess precisely. However, Blacksmith had

carried out some earlier work on other chemicals in Horlivka and this led to their being asked by the municipality to provide support for a site clean-up.

6. PROJECT EFFICIENCY AND EFFECTIVENESS



Section Guide

This section provides an overview of the following:

- *Summary review of the Horlivka Chemical Plan (Section 6.1)*
- *Project Implementation – Key Challenges Experienced (Section 6.2)*
- *Project Implementation – Achievement of Project Objectives (Section 6.3)*
- *Project Efficiency – Contract Management and Project Management (6.4)*

6.1 Project Implementation – Summary Review of Horlivka Chemical Plant Remediation

As outlined in the Project Document, the project aimed to assist the Government of Ukraine with addressing the issue of toxic pollution and its human health effects at the Horlivka Chemical Plant through the implementation of a two-phase project. The plan initially sought to complete the removal TNT and associated refining acids from above ground pipes and equipment during Phase 1 and then to dispose of the TNT, while Phase II sought to remove and dispose of TNT from underground storage tanks. At the end of Phase II, an initial testing of contaminated soil and groundwater was scheduled in order to possibly begin a third phase of the project with the focus on soil and groundwater remediation (though with no future funding identified).

First, it is important to note that Blacksmith had begun working shortly after signing its contract with UNIDO in March 2012 to establish working relationships with Ukrainian governmental officials and entities in order to address the issue of toxic pollution at the Horlivka Chemical Plant. However, the process of making connections with government officials and getting the proper permits according to the original project work programme took longer than planned. The identified plans and permits that the Makeyevka State Design Institute designed and that UNIDO and Blacksmith had identified were not able to be immediately released as planned. Given bureaucratic and regulatory issues, the project was delayed into the summer of 2013, given the old permit expiring 31 December 2012. This required the Blacksmith Institute to produce a new plan and permit and to hire those specialised subcontractors that had the technical capacity and legal authority to conduct the remediation of explosives in Ukraine. Blacksmith, through its contracted intermediary Environmental Group Pechenegy, entered into a contract with Spivdruzhnist, which could manage the physical activities of the project’s TNT removal and disposal, and “Donspetsresurs”, which could provide the local labour. After acquiring a new and revised remediation plan created by Makeevka, which Blacksmith paid for not from UNIDO funding, the Blacksmith Institute received all the permits to implement the project in early September 2013.

In the new altered remediation plan, Phase 1 covered the preparation of the site, while Phase 2 and Phase 3 addressed those TNT production materials in buildings 4b, 7a, and 37b, and in the emergency tanks near building 4b.

During Phase 1 the project site was prepared for the remediation work, with representatives from the Blacksmith Institute confirming the completion of this phase during their visit to the site when they met with a variety of project stakeholders between 14th and 18th October 2013. During this phase, project personnel were provided with explosives safety training, while debris and non-hazardous construction waste was cleared from the project site. Fences and signs were installed; guards were provided for securing the hazardous materials; roads, access routes, water tanks, utilities, and storage facilities were installed; and walls were demolished in order to allow heavy machinery to remove TNT equipment.

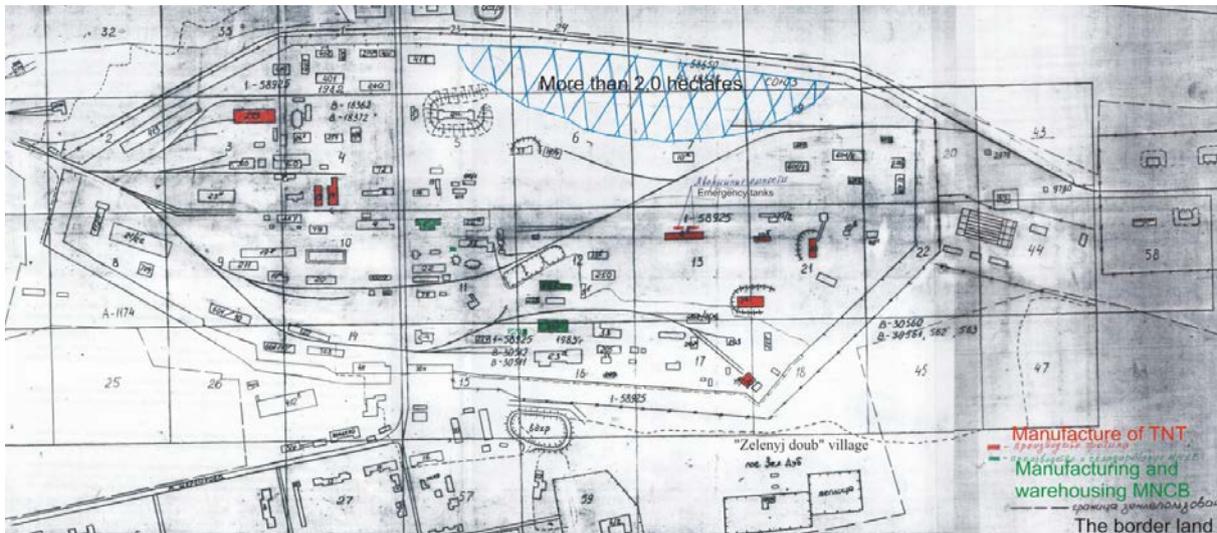
In addition to these activities, representatives from Blacksmith Institute finalised the design of an environmental assessment programme and reviewed hydrological and geological data for understanding underground site characteristics. To this effect, after delays, Phase 1 completed Output 1 from the ProDoc, which focused on finalising the remediation plan details with the Ministry and contractors (Activity 1.1), as well as stakeholder organisation and convening (Activity 1.2). Phase 1 from the amended plan also completed Output 2 from the ProDoc, which focused on the project site setup (Activity 2.1) and the safety training of project personnel (Activity 2.2).

Phase 3 addressed those TNT production materials and wastes around buildings 7a and 37b, and was completed before Phase 2 due to technical considerations such as severe weather. All drying and flaking TNT equipment was dismantled, removed and washed from building 37b, with those remnants of TNT remaining collected and stored in plastic drums in a temporary and secure storage facility. In building 7a, all TNT equipment and piping was dismantled, removed, and cleaned (through physical cleaning, steam cleaning and flame cleaning). TNT production products were collected, packaged and warehoused in a temporary secure storage facility, while all acidic wastewater was collected and neutralised.

During **Phase 2**, those TNT and other production materials from 4b and the emergency tanks were addressed. In building 4b, all equipment, debris, contaminated dirt and sludge was cleared from the building and all contaminated materials stored in the temporary TNT storage facility. A cleaning area outside of 4b was constructed (for physical, steam and flame cleaning), as well as an acid water neutralisation system. Before removing acidic mud and TNT materials found inside, emergency tanks near site 4b were excavated, inspected, evaluated, and sampled. Upon completion of this task, the Research and Production Enterprise, “Zarya,” conducted in Rubenzhoe city an analysis of the neutralised wastewater in order to ensure that no TNT traces remained.

One of the Blacksmith technical advisors confirmed his general satisfaction with the quality of the work carried out in removing the TNT. As far as the quality of the work, it was considered that the TNT had been removed quite well and done quickly, and that the work process was helped somewhat by much of the TNT being located in the underground collection tank and where a lot of the TNT had turned to sludge and solidified but was still wet. Thus, this tank did not represent the same remove risk as the pipes. The overall result was that the removal work was less onerous and somewhat less risky than as estimated by Makeevsky Institute.

The image below shows those buildings identified as containing remnant TNT and MNCB materials.



The photo above shows the Horlivka Chemical Plant Plan with those buildings that manufactured TNT in red & those that manufactured & warehoused MNCB in green. Buildings identified for this project are located on the right side of the photo.

Source: Pure Earth

Through the completion of these two phases the project has somewhat effectively implemented Output 3, which focuses on the removal of TNT and associated refining acids from above and underground pipes, tanks and equipment (Activities 3.1 and 3.3 from the ProDoc), as well as the neutralisation of acids. In early April 2014, at the end of these two project phases, some 48 tons of waste material (consisting of 5 tons of pure TNT and 43 tons of mixed material containing TNT and acids) were removed from buildings 4a, 7a, and 37b, and the emergency tanks near building 4b. However, because of the rising conflict in Eastern Ukraine, Blacksmith was unable to complete the remaining tasks in Phases 2 and 3 concerning the disposal of TNT and associated acids. Though Blacksmith placed arm guards at the project site to secure the packaged waste, the site was abandoned on 31 May 2014, given that the site had become unsafe for personnel to even enter. Since then, very little information regarding the status of the packaged waste and project site is known.

Regarding environmental risk, this was a key part of the risk beyond the explosion risk. The environmental risk related to possible groundwater pollution could not be fully investigated until the explosion risk had been addressed. Feedback from the Blacksmith Technical Advisor that had carried out the environmental assessment work showed that the risk of ground water pollution has been the biggest area of concern. The tests carried out by the team showed high benzene concentration, with wells number 5, 6, and 7 showing benzene concentration levels of 393 benzene parts per billion (ppb) (well no 5), 489 benzene ppb (well no 6), and 621 benzene ppb (well no 7) – in contrast for example with the US legal limit which is 5 ppb. The high readings obtained initially led the Blacksmith Technical Advisor to think that the concentration levels had been misidentified, but the readings were duly confirmed. While there is a need to re-assess the groundwater at the site, and do a wider set of sampling, the feedback from the technical advisor was a priori that the site represents a continued threat to both ground water and surface water, especially on the south side of the site (where there is also housing).

6.2 Project Implementation – Key Challenges

As can be inferred from the previous section, implementation of the project was beset by significant challenges and delays.

The most important challenges and delays experienced are described below:

- **Challenge in obtaining and verifying information as to the exact environmental and pollution state of Horlivka:** Field interviews showed that a key challenge that the Blacksmith Institute faced was obtaining reliable information on exact environmental and pollution state of the Horlivka Chemical Plant site. This was a challenge both during the project formulation and during implementation. During project formulation, Blacksmith often struggled with conflicting accounts of the amount of TNT on the site, while it also received varying estimates of the level of production at the site before it closed operations. Regarding lack of records, there was no written record of the work done by an earlier contractor that had been hired to clean the plant’s pipes and equipment, and thus it was not clear how good of a job had been done; as a result, this had to be re-assessed by Blacksmith during the project implementation. Another example of this challenge during project implementation was Blacksmith only becoming aware after project launch that landfills for chemical disposal had been created, and that these were not done to proper standards. Obtaining information about the site was further complicated by its status as a classified site, given its role in the military-industrial complex in the Former Soviet Union. This also made locals very reluctant to provide information about the site, as under the former Soviet system they could have risked their lives in providing information regarding a classified site to Americans (or at least a US-headquartered organisation). Another complicating factor was that Horlivka municipality was reluctant to provide too much information on the pollution and safety risk of the plant, as it was concerned it might scare local residents.
- **Challenge with national government bureaucracy and unclear regulatory and legal framework:** Related to the challenge regarding permit-related delays was the wider challenge of government bureaucracy. There were also instances where different government institutions had overlapping responsibilities and a varied and unpredictable approach to interpreting their own laws and regulations, with Ukrainian government officials sometimes ignoring their own regulations when it suited them. The unclear regulatory and legislative framework and Ukraine’s lack of a clear policy framework for hazardous waste created another delay, as it transpired that the project’s favoured TNT disposal option of TNT composting (which has been assessed as being the most cost effective and safe way to deal with the TNT) ran into regulatory and legal issues, such that the project had to change approach and go for incineration. The national government also contributed to the delay in identifying one subcontractor, where a proposed subcontractor was rejected by the Government and the project team was asked to select another contractor that had an inferior performance record.
- **Challenge with the project plans and permits:** Soon after entering into a contract with UNIDO in March 2012, Blacksmith Institute started working with the Makeyevka State Design Institute. The Makeyevka Institute had detailed project plans and permits; however, given that the relevant

Ministry was dissolved before the Makeyevka Institute had been paid, the plans could not be released. Since the project could not be carried out forward as planned, this created a significant delay in implementation. Blacksmith, the Makeyevka Institute, and the Mayor’s Office of the City of Horlivka worked to resolve the payment issue before the permits expired on 31 December 2012. The wider challenge of government bureaucracy also complicated this task, given instances where different government institutions had overlapping responsibilities and a varied and unpredictable approach to interpreting their own laws and regulations, with Ukrainian government officials sometimes ignoring their own regulations when it suited them. This was further complicated when a court covering the Horlivka Plant’s bankruptcy proceedings ordered large pieces of equipment containing TNT to be sold off. Because of this, the plans and permits were no longer accurate and thus made it impossible to start working on the project before the beginning of 2013.

Because of this, Blacksmith worked to find new contractors and resolve remaining regulatory and bureaucratic hurdles that resulted in the project’s implementation delays. While working on this challenge, some equipment and TNT had disappeared from the project site. With an amended plan completed in July 2013, Blacksmith entered into a contract on 23 September 2013 with Pechenegy, who worked as an intermediary between Blacksmith on one side and Spivdruzhnist and Donspetsresurs on the other. Under this contract with Pechenegy, Blacksmith was anticipated to finish the scope of the project phases by 19 December 2013. The project did not begin Phase 1 until 1 October 2013. *Overall, this challenge led to a delay of approximately 14 months compared with the initial project plan.*

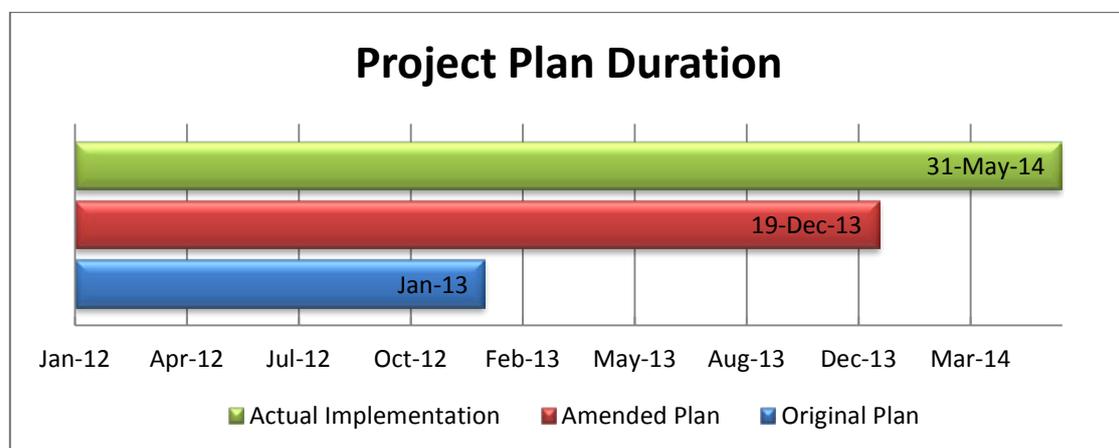
- **Challenge with switching phases 2 and 3 of the amended project:** Given technical considerations, including weather, Phase 3 (the removal of TNT and other refining acids from above-ground equipment) was completed before Phase 2 (the removal of TNT from underground tanks). While the original plan allocated 3 months for these activities, the implementation of the amended plan took 4 months to complete partially both of these phases. It is certainly possible that those delays from the first challenge regarding plans and permits resulted in the swapping of the activities, as Phase 2 could be completed in colder weather. The original plan first scheduled the removal and composting of TNT from above-ground equipment (Amended plan: Phase 3) during the spring of 2012 and the removal and composting of TNT from underground equipment (Amended plan: Phase 2) during summer 2012; however, the implemented amended plan carried out Phases 3 and 2 between November 2013 and March 2014. Given available data, it is uncertain whether or not this led to delays compared to the initial project plan’s timing; however, the switching of Phases 2 and 3 can be seen as a challenge, as this change was a result of technical constraints not considered the amended project plan.
- **Challenge with the armed conflict in Eastern Ukraine:** While Phases 3 and 2 of the amended project plan were underway the armed conflict in Eastern Ukraine began to unfold, with the city of Horlivka entering under the control of anti-government militia. At this point (end of April 2014), 48 tons of waste material (consisting of 5 tons of pure TNT and 43 tons of mixed materials containing TNT and acids) had been removed from buildings and those emergency tanks, and the waste materials had been temporarily and safely stored on site. With rising tension in the region, guards were positioned on the project site to secure the packaged waste. The site was abandoned on 31 May 2014 as a result of the area becoming unsafe for personnel to even enter.

Since this date project personnel have not been able to enter the site and check the status of the packaged waste. The current status of the project site and the packaged waste remains unknown. However, sources had indicated that the site had been entered by anti-government militia and that the site had been potentially used as a training camp. It has also been noted that the separatists may have taken some of the clean TNT (approximately 17 tonnes) and left the unclean TNT. Nevertheless, the current state of the packaged waste remains uncertain, as there has been no news since whether or not the materials have been removed or the site disturbed. The explosion of the Donetsk State Enterprise Chemical Plant, where the project planned to utilise its facilities for incinerating the TNT waste, in September 2014 further added to the uncertainty of the project’s future status. With the results from Blacksmith’s environmental assessment conducted in October 2013 showing significant contamination of soil and groundwater around the TNT production buildings, the damage or disturbance of the Horlivka Chemical Plant remains even more uncertain.

The issues with the armed conflict in Eastern Ukraine led to the Phases 2 and 3 of the amended project plan not being completed, and blocked the overall completion of the project as a whole. This challenge led to a delay of at least 5 months until project reporting was suspended and the project put on hold, before being closed on 20 November 2015.

The chart below summarises the project plan durations according to the original plan, the amended plan, and the implemented amended plan.

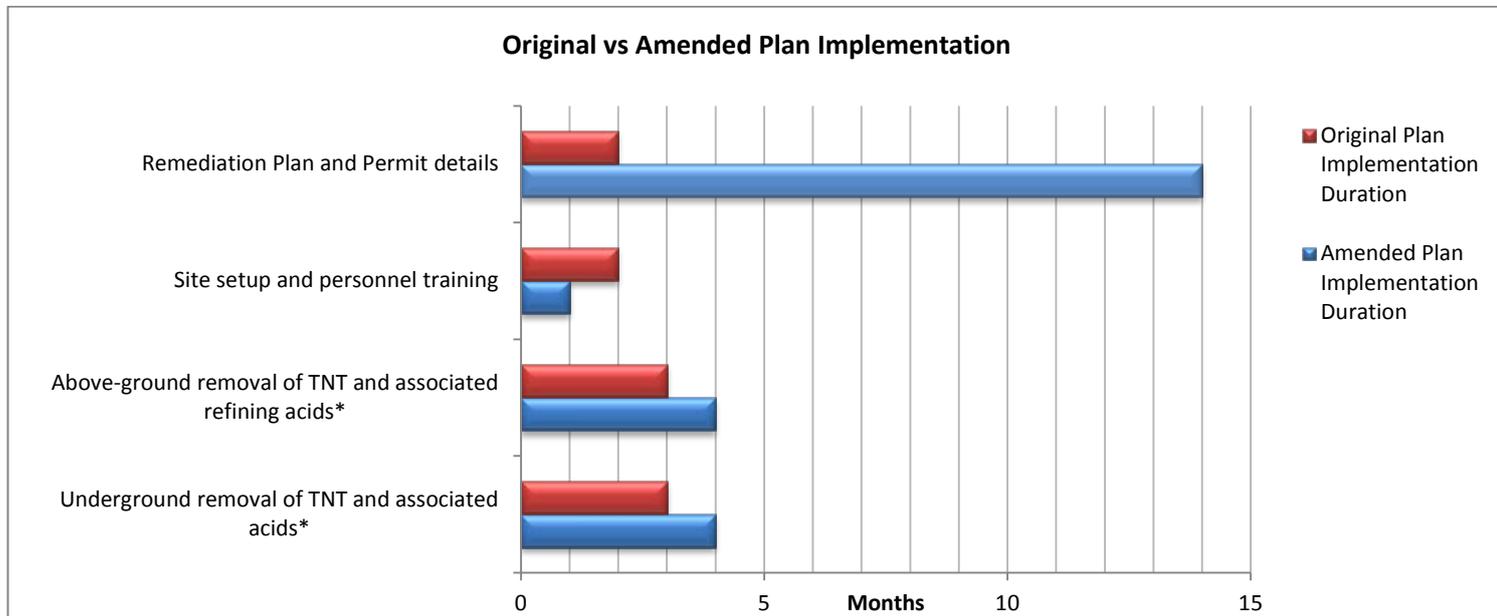
Figure 6.1 – Comparison Planned Implementation with Actual Implementation Duration



As the graph above shows, the duration given for implementing the project continued to expand as a result of original delays and issues. The **original plan** was meant to be completed in 12 months, starting in January 2012 and finishing in January 2013. The foreseen duration of the project would have allowed the plan to be completed on time; however, work was not able to commence until October 2013, given that those delays stemming from the issues of payment, the expiration of the plans, and the formulation of new plans resulted in significant time loss. The **amended plan**, which was signed 23 September 2013, was anticipated to complete all tasks by 19 December 2013. With this new plan, the project would have been completed in about 23 months from the inception of the project. However, the **actual implementation** of the amended plan mostly completed the project by

31 May 2014, or about 29 months since the inception of the project. In comparison, the implemented amended plan (excluding the final removal and incineration of the TNT) took about 17 months longer than the original plan anticipated, and about 5 months longer than the anticipated amended plan. The table below summarises the core timeline of the project’s implementation:

Figure 6.2 – Comparison Original Plan and Amended Plan Implementation

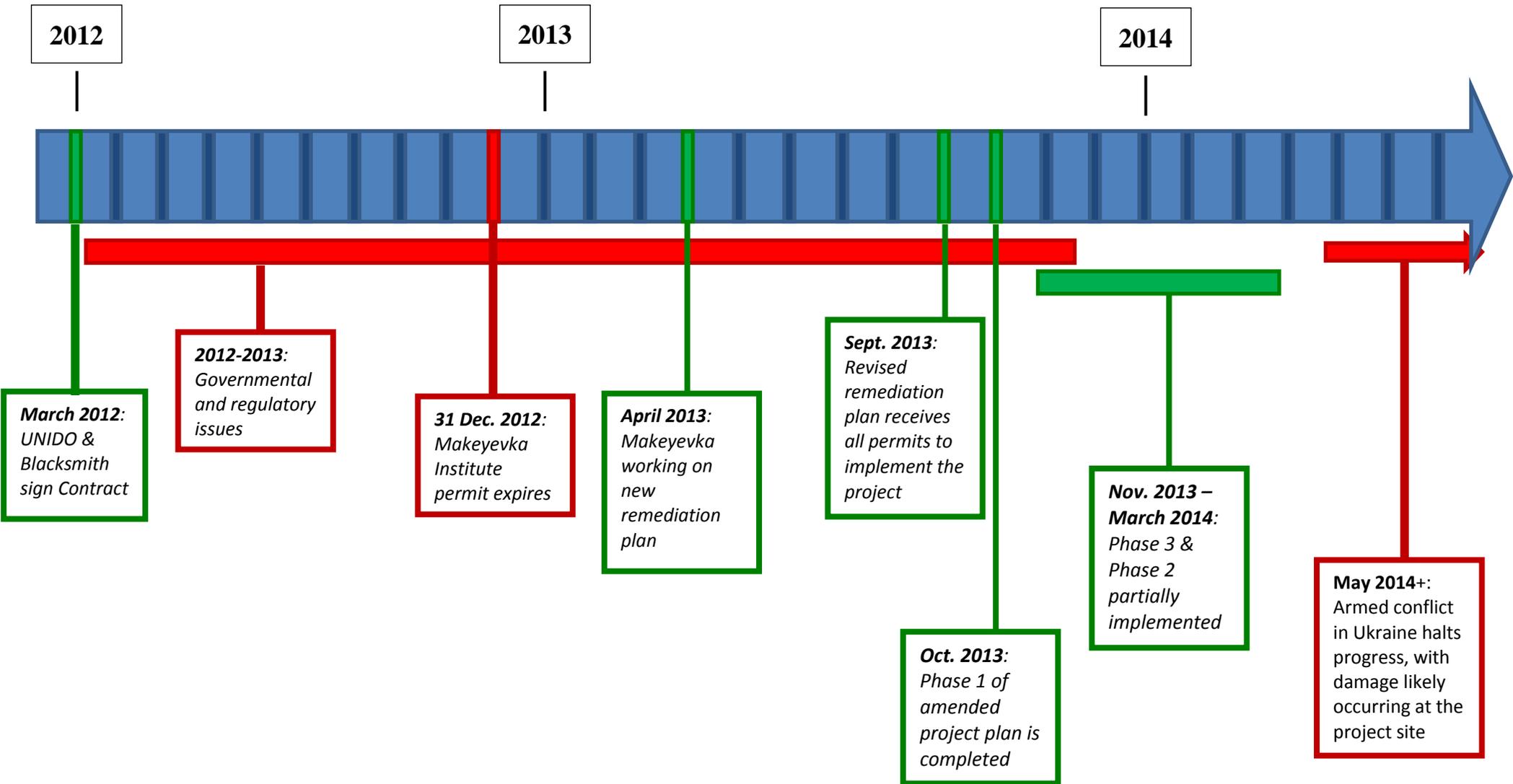


Note: The above chart visualises the duration in months for implementing those core phases/outcomes in both the original plan and implemented amended plan. Given the lack of sufficient data on the amended plan implementation schedule, the actual implementation of the amended plan is utilised. The asterisk signifies those activities that were completed within the same month duration and had progressed until the Ukrainian conflict halted safe entry in to the project site and, consequently, resulted in these tasks not being completed.

From the graph above, one can visualise the outlined months allocated for completing tasks in both the original plan and in the actual implemented amended plan. Given that insufficient data was available regarding a breakdown of the amended plan implementation schedule, the actual implementation of the amended plan was considered. The original plan had allocated ten months for the completion of the project, while the implemented amended plan took 23 months for its partial completion. As the graph further outlines, the activity concerning **the remediation plan and permit details** differed the most from the actual time taken to implement the amended plan and the original plan. While originally the plan allocated 2 months for completing this activity, payment issues and bureaucratic delays resulted in this activity taking 14 months to complete. In the implemented amended plan, the **site setup and personnel training** took shorter than the original plan outlined. Regarding the removal of **above-ground TNT waste materials and underground TNT waste materials**, the original plan had allocated 3 months each for these activities, while the implemented amended plan completed these two activities within the same 4 month period.

The diagram overleaf summarises the principal challenges and related time delays. As can be seen, the total cumulative time resulting from the delays far exceeds the actual time during which technical implementation of the project actually took place.

Figure 6.3 – Overview Principal Implementation Challenges and Delays



The table below provides a more detailed account of the principal challenges and delays that were experienced during the project’s implementation.

Table 6.1 – Timeline of Principal Project Activities and Challenges/Delays Encountered

Timing	Timeline of Principal Project Activities and Challenges/Delays Encountered
FIRST REPORTING PERIOD (1 April 2012 – 31 March 2013)	
March 2012:	- UNIDO signs a contract with Blacksmith Institute regarding the Horlivka Project.
2012:	- Blacksmith Institute, Makeyevka Institute, and Mayor’s office of City of Horlivka work to resolve payment issues for Makeyevka’s design work, lobbying ministries.
Spring & Summer 2012:	- Blacksmith Institute trying to resolve Makeyevka’s payment issue in time to implement TNT removal before the expiration of the permits.
Sept 2012	- The court in charge of the Horlivka Plant’s bankruptcy charges orders large equipment with TNT to be immediately sold; this consequently changes the Makeyevka plans and permits, making them no longer valid.
Nov 2012	- Horlivka Mayor’s Office and Makeyevka Institute write a letter to the Blacksmith Institute, UNIDO, Sida and EC Delegation requesting continued commitment on the project.
	- A MoU is drafted by Blacksmith, Mayor’s Office & Makeyevka Institute outlining a timeline and responsibilities to ensure implementation before the end of 2013. - Blacksmith pays Makeyevka Institute’s fee for drafting a new plan and ensuring quick completion.
31 Dec 2012	- Makeyevka Institute’s permits expire.
Feb 2013	- Blacksmith staff visit Horlivka to inspect the site, conduct a press conference & sign the MOU.
March 2013+	- Blacksmith staff visit the site multiple times, gathering information and building relations.
April 2013	- Makeyevka works on a revised remediation plan while Blacksmith prepares with local contractors.
SECOND REPORTING PERIOD (1 APRIL 2013 – 30 SEPTEMBER 2013)	
	- Blacksmith Institute still works to resolve remaining bureaucratic and regulatory hurdles.
Spring 2013	- Donetsk Chemical Plant (Blacksmith’s previous contractor for TNT removal) declines to work on the Horlivka Chemical Project.
Summer 2013	- Blacksmith works to identify new contractors for TNT removal, identifying the company, “Spivdruzhnist.” through the Environmental Group Pechenegy, Blacksmith works with “Spivdruzhnist” to manage the activities at site and “Donspetsresurs” to provide local labour.
July 2013	- Makeyevka completes revised plan, which Blacksmith pays for the design work. It is sent to the permitting authorities for review after the technical team approves the plan.
Sept 2013	- The revised remediation plan receives all permits necessary to begin work.
	- Blacksmith personnel visit Horlivka site.
23 Sept 2013	- Blacksmith enters into a contract with Pechenegy to complete the work.
25 Sept 2013	- Pechenegy enters into a contract with Spivdruzhnist to complete the work.

Timing	Timeline of Principal Project Activities and Challenges/Delays Encountered
THIRD REPORTING PERIOD (1 OCTOBER 2013 – 31 OCTOBER 2013)	
October 2013	- Activities from the amended project plan from Phase 1 are completed. These include: Personnel training, site preparation, security implementation, utility and facility installation, and wall demolition.
14-18 Oct 2013	- Blacksmith personnel visit the site to confirm Phase 1 completion and design an environmental assessment program.
FOURTH REPORTING PERIOD (1 APRIL 2013 – 31 MARCH 2014)	
1 Nov 2013 – 31 March 2014	<ul style="list-style-type: none"> - Activities from the amended project plan from Phases 2 & 3 are completed, but Phase 3 before Phase 2 given technical considerations like severe weather. - Phase 3, Building 37b activities include: the dismantling and extraction of TNT; the cleaning of equipment and piping; and the collection, packaging and warehousing of TNT products. - Phase 3, Building 7a activities include: the dismantling, removal, and nitric product removal from all equipment and piping; the cleaning of equipment and piping; the collection, packaging and warehousing of TNT production products; and the neutralisation of acid water. - Phase 2, Building 4b and Emergency Tanks activities include: the clearing of equipment, debris and contaminated materials; the construction of a cleaning area; the completion of an acid water neutralisation system; the excavation, sampling, opening, and removal of emergency tanks; the removal of acidic mud and TNT materials from tanks; and the isolation and storage of TNT materials in a temporary storage facility. - Additional activities include: The neutralisation of wastewater by “Zarya” enterprise.
FIFTH REPORTING PERIOD (31 MARCH 2014 – 30 AUGUST 2014)	
April 2014	- Situation significantly deteriorates: Ukraine armed conflict escalates, with city officials removed and movement around the Horlivka site dangerous. Armed guards are stationed to ensure the security of packaged waste materials.
31 May 2014	- Conflict in the region makes it unsafe for security personnel to enter the site safely. Personnel associated with the project have not entered the site since.
June – Sep 2014	<ul style="list-style-type: none"> - Given the rise of conflict between governmental and anti-governmental militia, the project site is deemed to have been potentially damaged or disturbed. It is possible that TNT has been removed from the site by the militia. - The Donetsk State Enterprise Chemical Plant, where TNT was meant to be incinerated, experiences a large explosion; however, the extent of the damage is unknown. - Environmental assessment shows extensive contamination of soil and groundwater around TNT production buildings.

6.3 Project Effectiveness - Achievement of Outcomes

This section considers the overall level of achievement of the project objectives and targeted outcomes.

Target Outcome 1: Phase 1 of Amended Plan Completed: From the amended project plan, Phase 1 targeted the training of personnel, the clearing of the project site, and the installation of security,

equipment and facilities. These tasks were completed during the month of October 2013. More specifically, Blacksmith Institute completed the following activities:

1. Explosives safety training for project personnel;
2. Debris and non-hazardous construction waste clearing;
3. Fence and signing installation;
4. Provision of on-sight guards for security and safety of materials;
5. Road and access route installation;
6. Water tanks installation;
7. Storage facility creation;
8. Utilities installation;
9. Neutralisation facilities; and,
10. Wall demolishing.



Local project personnel receiving explosives safety training (Source: Pure Earth)



Photo of TNT nitration building (Source: Pure Earth)

Phase 1 of the amended plan for the project was effective in completing all those tasks designated within a period of one month. This was further ensured through the visit of Blacksmith personnel, who visited the Horlivka site during the week of 14 October 2013. All targeted activities for this phase had been met. Beyond these activities, Blacksmith personnel also finalised the design of an environmental assessment programme, which includes 7 new water-sampling wells, 3 surface watering-sample points, and soil sampling at multiple depths at each well.

Target Outcome 2: Phase 2 of Amended Plan Completed: In Phase 2 of the amended project plan, the technological works on the disposal of explosive residues of TNT production in building 4B, constructions 4B/1 and 4B/2, and emergency tanks AP1 and AP2, was addressed. Particularly, this task sought to remove and dispose of those TNT waste materials from building 4B and those underground tanks. Activities during Phase 2 involved:

- Acid water neutralisation;
- TNT cleaning from equipment in building 4B;
- Tray clearing from emergency drains from TNT;
- Storing of TNT in a temporary warehouse storage facility;
- Sending of waste materials collected during water purification process to the incineration site;
- Transporting of acid water to neutralisation tanks;
- Disposal (burning) of waste materials gathered during the process of water purification;

- Unloading of acid water from emergency tanks and sending to neutralise in water treatment;
- Unloading of solid nitro-products from emergency tanks;
- Dismantling underground pipelines and cleaning them;
- Storage of nitro-products in temporary storage facilities;
- Cleaning of emergency tanks at site 7a;
- Expanding the emergency TNT tank pits;
- Floating and then lifting of tanks; and,
- Incineration of waste materials and other solid particles gathered during water purification process.



Groundwater around emergency tank
(Source: Pure Earth)



Emergency tank interior after cleaning
(Source: Pure Earth)

As noted above, Phase 2 was completed after Phase 3, given technical considerations. Despite this, all activities were completed by 31 March 2014, excluding those activities concerning the disposal of TNT and waste materials. The project partners had planned to have the TNT from the project site incinerated at the Donetsk State Enterprise Chemical Plant. However, the final disposal of the TNT did not occur as a result of the rising conflict in the Eastern Ukraine. In April 2014, armed guards had been placed at the project site to ensure the security of the packaged waste materials until 31 May 2014, when the project site area was too unsafe for personnel to enter the site. It is uncertain whether or not plans were considered by Blacksmith Institute during the month of April 2014 to consider the disposal of the TNT in another location that was not currently in the conflict zone.

Target Outcome 3: Phase 3 of Amended Plan Completed: During Phase 3 of the amended project plan, the technological works on the disposition of explosive residues of TNT production in buildings 7a and 37b were addressed. In particular, this task sought to remove and dispose of those TNT waste materials from those identified above-ground equipment and buildings. Activities during Phase 3 involved:

- Washing and dismantling of equipment;
- Storing waste materials in temporary storage facilities;
- Cleaning equipment;
- Sending waste materials collected during the water purification process to the incinerator;
- Sending wastewater for neutralisation;
- Disconnecting equipment from process lines;
- Cleaning and extraction of TNT from equipment;

- Collecting, packaging and sending of hazardous materials for disposal; and,
- Sending waste materials collected during the water purification process to the incinerator.



Barrels of TNT waste
(Source: Pure Earth)



TNT washing building after equipment removal
(Source: Pure Earth)

As noted above, Phase 2 was completed after Phase 3, given technical considerations, and all activities were completed by 31 March 2014, excluding those activities concerning the removal and incinerating of TNT and waste materials. Given the above-mentioned issues rising from the conflict in the Eastern Ukraine, the final removal and disposal of TNT was not completed. Overall, the advent of the Eastern Ukrainian hostilities had had a significant impact on the degree of achievement of the project objectives, with the final result being that the amended project plan could not fully be completed, particularly Phases 2 and 3. The table below summarises the overall degree of achievement of the project objectives and outcomes (for a full list of activities, see Annex):

	Activities Overview	Status
Phase 1:	The General Construction works of preparatory period	Completed 1 Oct 2013 – 10 Oct 2013
Phase 2:	The technological works on the disposition of explosive residues of TNT production in the building 4B and constructions 4B/1, 4B/2 (emergency tanks AP1, AP2).	Partially Completed * (after Phase 3) 1 Nov 2013 – 31 March 2014 * TNT was not disposed of, given the Ukrainian conflict developing
Phase 3:	The technological works on the disposition of explosive residues of TNT production in the buildings 7a and 37B	Partially Completed * (before Phase 2) 1 Nov 2013 – 31 March 2014 * TNT was not disposed of, given the Ukrainian conflict developing

6.4 Project Efficiency - Contract Management and Project Management

Regarding overall **project efficiency**, the evaluation finding show satisfactory performance with regard to efficiency. Strong elements have been the use of a local partner that Blacksmith had worked with in the past in order to deal more efficiently with liaising with the various government authorities on issues such as permits. However, it should be noted that the time lost with government-related issues and the current conflict in Ukraine hostilities have been extremely costly to the safe disposal of TNT. Risk assessment and management could not have been expected to identify these political issues, although it is worth reflecting on whether risk-management could have

included a fast-tracked project response/contingency plan to allow for more rapid cleaning completion and TNT removal in the case of a perceived risk/threat in the wider environment. The project was also relatively efficient in the use of local contractors, even if the quality did vary at times.

Regarding **contract and project management**, the evaluation findings also showed that the contract management from UNIDO was professional and highly responsive when issues arose. The executing agency Blacksmith also confirmed their satisfaction with UNIDO’s contract management performance, and it was particularly appreciated that UNIDO did not seek to micro-manage the project, even if it did discuss all technical reports and milestones with Blacksmith. UNIDO’s role in project and contract management and administration was also quite efficient, all the more so given the limited contract management fee for UNIDO. It would however have been helpful if UNIDO’s contract management plan had budgeted for 1-2 trips to the Ukraine for the UNIDO contract manager, all the more given the proximity of the Ukraine to UNIDO HQ. Some country and site visits would have made sense for having a better and more visceral sense of the site and the views of local stakeholders, all the more relevant as none of the donor personnel had visited the site during the project implementation. The contract management approach taken by UNIDO of allowing the technical implementer Blacksmith to communicate directly with project stakeholder on technical issues was also a practical approach and helped avoid unnecessary slowing down of communication or creating unnecessary inefficiencies in the project communication. An example of Blacksmith’s proactive approach and troubleshooting was their role in going out and identifying third-party donor funds to pay the Makeyevka Institute to develop a new plan. Interviews with project stakeholders showed that UNIDO’s contract management was considered satisfactory by the EC, Sida and Blacksmith, while the EC and Sida expressed appreciation that a contracting solution had been available via UNIDO. Regarding **working relationships between the project team and the Ukrainian authorities**, various stakeholders confirmed that the project team enjoyed a good working relationship with the Mayor and the city in general, in contrast to the relative lack of interest and collaboration from the national government.

Regarding the **technical project management** from Blacksmith, the findings show that this was overall a well-managed project. Both of the donors and UNIDO also appreciated the proactive flow of communication from Blacksmith, including the provision of photographic material which helped non-technical project officers to understand the pollution and risk of the Horlivka plant site, as well as what was involved in the remediation operation. Blacksmith’s prior experience of working in the Ukraine also brought some benefits and efficiencies, in that it was able to ask a past partner to take charge of the time-consuming and bureaucratic work of co-ordinating with government authorities to expedite approvals and permitting. Regarding the **project reporting**, this was mentioned on the whole satisfactory. While at times the progress reports could have been more detailed, they were supplemented with other documentation made available online, such as technical report and photographic materials.

7. PROJECT IMPACT & SUSTAINABILITY



Section Guide

This section considers the impact of the project and its prospects for sustained impact beyond the contract end.

The changed political situation in Eastern Ukraine has dramatically limited the project’s impact prospects and for the foreseeable future has at best put potential impacts ‘on hold’. Moreover, as it has made a field visit impossible, it is difficult to assess impact in general.

On a positive note, the Horlivka site clean-up with regard to TNT extraction has been completed and thus at one level the potential of significant negative impact in terms of explosions or pollution risks to local citizens has been reduced. There is likely to also have been at least some initial positive impact in that citizens understanding that the chemical pollution and explosion threat was being addressed, as well as some impact on the municipality in seeing the TNT extraction and clean-up progress and that such sites could be cleaned up and made safer for the planned municipal industry park that was foreseen for the site.

On the negative side, the TNT extraction and clean-up has occurred in a political security environment that is now much more volatile. Should the TNT still be stored on the site, the current security situation makes it more of a danger to the local community now than at any time prior to the project launch. The recent explosions at other industrial plant sites in Eastern Ukraine underline the threat posed should TNT still be on the site.

However, the entry of anti-government militia may have negatively impacted the project site. It is possible that TNT was removed from the project site, or that the site was damaged or disturbed during the conflict. An environmental assessment by Blacksmith Institute showed extensive contamination of soil and groundwater around TNT production buildings. Feedback from Blacksmith technical advisors suggests that groundwater pollution levels would need to be re-assessed if the political and security situation made it safe to do so. While it is thought that the groundwater pollution does not likely pose any short-term or medium-term threat to Horlivka’s municipal water supply, this should be verified and confirmed.

Regarding sustainability, the prospects for sustained impact are likely to be quite limited, unless the TNT has already been removed entirely from the site and safely disposed of. However, a significant improvement in the political and security situation such that Blacksmith project staff could return safely to the site would of course improve the prospects for ensuring a sustained impact.

8. LESSONS LEARNED AND POINTS FOR REFLECTION



Section Guide

This section considers the lessons learned/points for reflection from the project implementation experience.

With regard to lessons learned, it is difficult to identify or formulate clear lessons in a project where the field work could not include a visit to the project site or interviews with key projects staff in Horlivka, nor with representatives of Horlivka municipality. However, some points have been identified, which are set out below more as *points for consideration or reflection* rather than ‘lessons learned’.

Learning/Reflection Point #1: Distilling learning and lessons from the implementation challenges and related delays experienced by the project with regard to national government bureaucracy

One point for reflection is the time lost dealing with government-related issues, which cost the project valuable time that could have been used to ensure the safe removal of the TNT. The issues of payment and permit expiration resulted in an unanticipated delay that left the project months behind. While few could have predicted how the political context would evolve, the fact is that the delays created by bureaucratic and contractual hurdles have directly contributed to a situation whereby TNT was still stored in the Horlivka plan when hostilities broke out, and suggests safety of citizens from dangerous chemicals is a low priority for the government.

Not only does this raise uncomfortable questions regarding the national government, but it also raises concerns about future chemical remediation projects in the country and whether the legal, regulatory and bureaucratic framework further increases the implementation risk of such projects. There might well be real value in the project funding agencies (EC and Sida) and Blacksmith seeking to present the evaluation findings/project implementation experience to relevant national government counterparts and asking for their views, not to mention considering if some kind of fast track administrative project or one-stop office could be put in place to avoid a repetition of this project’s experience. In particular, if the EC, Sida, UNIDO or Blacksmith (or other organisations for that matter) were contemplating doing further work on existing or former industrial sites and/or toxic pollution sites, having a streamlined government process such as a ‘one-stop shop’ for obtaining permits etc. would make a significant difference to project efficiency and reduce delays.

No doubt, wider government culture and other factors, such as the transfer of responsibilities to a new ministry and the wider bureaucratic culture, have been contributory factors to the project’s implementation experience. Stakeholder interview feedback from Sida during the field interviews identified more general challenges related to staff capacity limitations and staff turnover at the Ministry of Ecology & Natural Resources. Unfortunately, this project’s experience shows that these

organisational challenges produce negative consequences and very negative consequences in the case where any TNT still at the site were to explode and cause loss of life.

Learning/Reflection Point #2: Review contingency planning for such projects

A second point of reflection relates to contingency planning. Risk management or a risk assessment could not reasonably have been expected to identify the political change in Ukraine in regards to the armed conflict. First, it should be pointed out that this learning/point for reflection relates in particular to future contingency planning, as stakeholder feedback showed that the outbreak of violence was quite rapid, and the only warning sign (if it could even be called this) was a change in the mood onsite during the preceding weeks. However, at a general level, risk management planning could have reasonably included a fast-tracked project response (e.g. to the cleaning completion and TNT removal) in the case of a perceived risk to the project site. Secondly, having had a second incineration option for TNT outside of Eastern Ukraine would have possibly made a difference had the situation unfolded somewhat differently (and presented the project team with a slightly simplified problem where ‘only’ the source TNT site [Horlivka] was in the conflict area, and not both the source site and the incineration site. Moreover, contingency planning (or a rapid response) could have included moving the TNT to a secure ‘holding site’ and thereby buy time while a new incineration solution/location outside of Eastern Ukraine was being identified. Thirdly, with regard to any future chemical plant remediation or wider toxic pollution remediation foreseen by the project stakeholders in the Ukraine, the project formulation documents and work plan and time plan and risk management should be reviewed based upon the experience of the Horlivka project.

PART III – EVALUATION FINDINGS LEARNING, CONCLUSIONS & RECOMMENDATIONS

9. EVALUATION CONCLUSIONS & RECOMMENDATIONS



Section Guide

This section sets out the evaluation conclusions and recommendations:

- *Section 9.1 sets out the evaluation conclusions*
- *Section 9.2 sets out the evaluation recommendations*

This section sets out the preliminary evaluation conclusions and recommendations.

9.1 Evaluation Conclusions

Regarding project relevance, the *Horlivka Chemical Plant Remediation* project was highly relevant at a number of levels. Firstly, within the broader sustainable development context, the project addresses the potential long-term environmental and health problems related to having highly dangerous chemicals in a disused industrial facility adjacent to a large population centre. The project is relevant to the *EC’s Global Public Goods and Challenges operational programme* and its strategies, which as a financing instrument for development cooperation aims to support inclusive and effective sustainable development, including in the area of environment. It is also consistent with EC funding for toxic pollution remediation, such as the EC’s funding for UNIDO and Blacksmith Institute under the *Reduction of Toxic Pollution Threatening the Environment and Health of Vulnerable Communities*. The project is also relevant to the EU’s policy objectives in Ukraine, particularly in regarding the EU’s work in Ukraine in the area of water, energy, and environmental protection. The project is also relevant to Ukraine-EU relations and partnership priorities, with for example the Preamble to the Ukraine-EU Association Agreement also mentioning the joint commitment of both the Ukraine and the EU to enhance cooperation in the field of environmental protection and to the principles of sustainable development.

Regarding *relevance to Sweden’s development priorities*, the project is relevant to the Swedish International Development Agency’s (Sida’s) work in the fields of sustainable societal development, environment and climate, and health. For example, a core goal of Sida’s work is strengthened institutional capacity in environmental management and environmental institutions, as institutional capacities in environmental management and environmental institutions are often weak in Sida’s partner countries, which results in environmental degradation and an aggravated situation for many people living in poverty.

The project is also relevant to UNIDO’s mandate and thematic priorities, in particular UNIDO’s commitment to energy and environmental concerns including the promotion of sustainable patterns of industrial consumption and production, as well as being consistent with UNIDO’s work in the

above-mentioned EC-funded project *Reduction of Toxic Pollution Threatening the Environment and Health of Vulnerable Communities*. The project is also relevant to national policy, as can be evidenced in the commitment in the National Toxic Action Plan to the further clean-up of the Horlivka Chemical Plant, in addition to the clear interest from Horlivka municipality and local citizens in seeing the TNT extracted and removed from the site.

Regarding overall **project efficiency**, the evaluation findings show satisfactory performance with regard to efficiency. The project technical management was quite streamlined, and was supported by experienced technical advisors from Blacksmith. Regarding **contract and project management**, the contract management from UNIDO was efficient and responsible, and also allowed the technical implementer Blacksmith to communicate directly with project stakeholder on technical issues which was a practical approach and avoided unnecessary slowing down of communication. The **project management** from Blacksmith was also efficient, with the project overall being a well-managed project, and with both key donors and UNIDO appreciating the proactive flow of communication from Blacksmith.

However, it should be noted that the time lost with government-related issues and the Ukraine-Russia hostilities have been extremely costly to the safe disposal of the TNT at the Horlivka Chemical Plant. Risk assessment and management could not have been expected to identify these political issues, though it is worth reflecting on whether risk-management could have included a fast-tracked project response/contingency plan to allow for more rapid cleaning completion and TNT disposal in the case of a perceived risk/threat in the wider environment. The project was also relatively efficient in the use of local contractors, even if the quality did vary at times.

Regarding **project effectiveness and the extent to which the project achieved its aims**, the project has recorded partial achievement of its target outputs and results. As previously stated, the objective of the project was to improve the environment, health and safety of Horlivka’s population. Indicators for this objective aimed to show changes in ambient and exposure levels, a minimum of 20 tons of TNT removed and disposed, and the superficies of remediated area at the site. Some of the core results included the safety training of project personnel, the securing of the site, and the excavation and dismantling of 48 tons of waste material (approximately 5 tons of pure TNT and 43 tons of mixed materials containing TNT and acids) from buildings and underground emergency tanks at the Horlivka Chemical Plant. Following the dramatic change in the regional political situation and the outbreak of hostilities in Eastern Ukraine, the project did not however achieve its aim of disposing of the TNT and waste materials. Thus, the project was effective in fulfilling most of its outputs *except* for the disposal of TNT from the site – local stakeholders were involved in the project, the project site was properly set up and personnel properly trained, and 48 tons of waste materials were excavated and dismantled from buildings and underground emergency tanks at the Horlivka Chemical Plant.

In addition to the dismantling of the plant’s buildings by the local government, the project has of course been negatively impacted by the Russia-Ukraine hostilities, with reported entry into the site of anti-government militia. In the absence of confirmed reports as to whether the TNT stored at the site remains onsite, one can only assume that at least part of it does, with the attendant explosion risk and threat to the nearby town and its citizens. The explosion risk from the site can in part be gauged from numerous explosions at industrial sites in Eastern Ukraine before and during the hostilities, including the explosion at the Donetsk State Enterprise Chemical Plant where project

partners had planned to have the TNT from the project site incinerated. Beyond the chemical and explosion risk from the TNT that remains on the site, a wider environmental risk also exists from the polluted ground water, with an initial environmental assessment carried out by Blacksmith institute showing relatively extensive contamination of soil and groundwater around the TNT production buildings. This contamination will need further assessment as it could over time pose a threat, even if it is located at some distance to the nearest public drinking water sources.

Regarding the development **impact and sustainability**, it is difficult to determine the impact and sustainability of the project, given the current difficulty of returning to the project site. The support by local Ukrainian officials in completing the project shows an increase in support and commitment to the project that could potentially continue should the political climate improve.

With regard to **lessons learned**, it may be worth considering the identification of alternative responses in light of potential risks. Firstly, much time was lost dealing with government-related issues that cost the project valuable time, which could have been used to ensure the safe removal of the TNT. The issues of payment and permit expiration resulted in an unanticipated delay that left the project months behind. To the extent that Ukrainian government bureaucracy and often lack of interest was behind these delays, the implementation experience raises some questions about the real interest in, and commitment to, environmental protection and safety. Secondly, one could not have reasonably expected to identify the international instability in Ukraine that resulted in the armed conflict affecting the area around the Horlivka Chemical Plant. Nevertheless, it is worth asking whether risk management could have reasonably included a fast-tracked project response (e.g. to the cleaning completion and TNT removal) in the case of a perceived risk to the project site, or a contingency plan to move the TNT to a secure ‘holding site’, in order to remove the TNT threat from Horlivka and to buy time while a new incineration solution was being identified.

9.2 Evaluation Recommendations

A first recommendation is to **return post-conflict (should the political situation improve and the safety of project staff be guaranteed) to assess the situation of the site and where necessary complete removal of any TNT remaining on the site (R1)**. A second recommendation is to **conduct an impact assessment in regards to the issue of soil and groundwater contamination**, and, as recommended by Blacksmith, to utilise the remaining project funds to reduce the risk of contaminated soil and groundwater at the site **(R2)**.

A third recommendation is to **consider what learning can be distilled from the project implementation experience, and in particular for future projects focussed on the removal of dangerous chemicals to include a specific contingency plan for an accelerated removal of such chemicals in the event of an adverse change in the wider implementation context/environment (R3)**. A final recommendation is that the project implementation experience be presented to the national government, specifically MENRU, and that MENRU be asked for its views on how the various bureaucratic delays contributed to the failure to remove the TNT before the advent of hostilities in Eastern Ukraine, and how it would propose to review and improve procedures to avoid such delays in the future, for example through a streamlined administration and permit process such as a one-stop shop **(R4)**.

10. ANNEXES

10.1 Annex 1: List of Interviewees

No.	Name	Organisation
1	Jerome Stucki	UNIDO
2	Elizabeth Mueller	UNIDO
3	Jean-Francois Moret	Delegation of the European Union to Ukraine
4	Christine Danielsson	Swedish International Development Agency (Sida) Ukraine
5	Javier Guarnizo	UNIDO Office for Independent Evaluation
6	Drew McCartor	Blacksmith Institute (Pure Earth)
7	Sergei Shaporenko	Onsite Technical and Project Manager
8	John Keith	Blacksmith Institute (Pure Earth) Technical Advisor
9	Barbara Jones	Blacksmith Institute (Pure Earth) Technical Advisor

10.2 Annex 2: Evaluation Bibliography

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19. Pure Earth. “Emergency Tank Coil Pipe Diagram (fragment 2)”. Photo.
20. Pure Earth. “Emergency Tank Cross Section Drawing 1”. Photo.
21. Pure Earth. “Emergency Tank Cross Section Drawing 1 (small)”. Photo.
22. Pure Earth. “Emergency Tank Diagrams”.
23. Pure Earth. “Emergency Tank Drawing 1”. Photo.
24. Pure Earth. “Emergency Tank Drawing 2”. Photo.
25. Pure Earth. “Emergency Underground TNT Tank Drawing 2 (small)”. Photo.
26. Pure Earth. “Emergency Underground TNT Tank Drawing 1 (small)”. Photo.
27. Pure Earth. “List of equipment to be cleaned in the production of TNT SE ‘GHZ’”.
28. Pure Earth. “Gorlovsky chemical plant (Location of drilling monitoring wells)”. Photo.
29. Pure Earth. “Gorlovka City Map (small file)”. Photo.
30. Pure Earth. “MNCB Processing Waste in Equipment and Piping”.
31. Pure Earth. “MNCB Waste Dumps Map”. Photo.
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10.3 Annex 3: Evaluation Terms of Reference

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Horlivka Chemical Plant remediation

Project Country:	Ukraine
Donor:	European Union delegation in Ukraine and Swedish International Development Cooperation Agency (SIDA)
Executing Agency:	The United Nations Industrial Development Organization (UNIDO) with its executing partner, the Blacksmith Institute
Counterparts/ Partners:	Ministry of Ecology and Natural Resources

I. BACKGROUND

Horlivka Chemical Plant in Ukraine

The Horlivka Chemical Plant, located in the City of Horlivka in the Donetsk region of Ukraine is an abandoned industrial site that is highly polluted and poses a significant and immediate threat to the health of the local population. A former chemical and explosives production facility, the site contains thousands of tons of inadequately stored toxic chemicals that are leaking into soil and groundwater, primarily the blood toxin mononitrochlorobenzene (MNCB). 30 tons of trinitrotoluene (TNT), an explosive and poisonous toxin and carcinogen, are stored in flooded underground tanks and within the piping of the Plant. The site buildings house other highly toxic substances, mainly acids that are used in TNT and MNCB production. The TNT stored at the site presents a magnified risk, as an accidental explosion could directly release enormous amounts of MNCB into the air affecting the entire neighbouring population.

Project description

The Ministry of Ecology and Natural Resources of Ukraine acknowledges the urgency and seriousness of the situation and considers that solving the problem of toxin pollution at the Horlivka Chemical Plant is one of the most priority driven tasks of Ukraine. The main objective of the project is thus to assist the Government of Ukraine to urgently, comprehensively and safely address the issue of toxic pollution and its human health effects caused by the presence of TNT at the Horlivka Chemical Plant. This will be done through the implementation of remediation solutions together with the Blacksmith Institute. UNIDO and its implementation partner have considerable experience in implementing a variety of pollution reduction and remediation/clean-up projects in various countries. In this context, the project is designed to ensure the achievement of the following main outcome and outputs:

Outcome 1: Risk of TNT explosion is eliminated and toxic pollution at the site is reduced:

- Output 1.1: Finalize remediation plan details with Ministry and contractor as well as other stakeholder group input and participation;
- Output 1.2: Project site properly set and project personnel trained to ensure safety during the remediation process; and,
- Output 1.3: TNT and associated refining acids removed from above and underground pipes, tanks and equipment, and neutralizing TNT.

Budget Information

Project Total	EUR 375,180
Support Cost (7% EU; 7% SIDA)	EUR 24,820
Grand Total	EUR 400,000
Counterpart Contribution (in kind)	EUR 236,000 (equivalent)

II. EVALUATION PURPOSE

The purpose of the evaluation is to assess the:

1. Project relevance with regard to priorities and policies of the Government of Ukraine, and UNIDO;
2. Project effectiveness in terms of the outputs produced and outcomes achieved as compared to those planned;
3. Efficiency of implementation: quantity, quality, cost and timeliness of UNIDO and counterpart inputs and activities;
4. Prospects for development impact; and
5. Long-term sustainability of the support mechanisms results and benefits.

The evaluation should provide the necessary analytical basis and make recommendations to the Government of Ukraine, the donor and UNIDO.

The evaluation should also draw lessons of wider applicability for replication of the experience gained in the project in other interventions.

Key question of the final evaluation is to what extent the project has achieved the expected results, i.e. to what extent has the project eliminated the risk of TNT explosion and reduced toxic pollution at the site.

III. SCOPE AND METHODOLOGY OF THE EVALUATION

The evaluation will be carried out in accordance to agreed evaluation standards and requirements. More specifically, it will fully respect the principles laid down in the “UN Norms and Standards for Evaluation” and Evaluation Policies of UNIDO.⁶

The evaluation shall determine as systematically and objectively as possible the relevance, efficiency, effectiveness, achievements (outputs, prospects for achieving expected outcomes and impact) and sustainability of the project. To this end, the evaluation will assess the achievements of the project against its key objectives, as set out in the project document and the inception report, including a review of the relevance of the objectives and of the design. It will also identify factors that have facilitated or impeded the achievement of planned objectives.

While maintaining independence, the evaluation will be carried out based on a participatory approach, which seeks the views and assessments of all relevant and involved parties.

Given the security issues and limitations to physically access the project site, the evaluation will contact key stakeholders at the project site only through telephone/skype and e-mail. Field

⁶ All documents are available on the website of UN Evaluation Group: <http://www.uneval.org/>

mission is expected to be limited to Kiev for interviewing government counterparts and donors representatives.

IV. EVALUATION QUESTIONS

This terminal evaluation will address the following issues:

Project relevance

- The extent to which the project remains relevant to UNIDO, Government, national programmes, counterparts, target groups and beneficiaries.)

Project identification and formulation

- The extent to which a participatory project identification process was applied in selecting problem areas and counterparts requiring technical cooperation support;
- Relevance of the project to development priorities and needs;
- Clarity and realism of the project’s development and immediate objectives, including specification of targets and identification of beneficiaries and prospects for sustainability.
- Clarity and logical consistency between inputs, activities, outputs and progress towards achievement of objectives (quality, quantity and time-frame);
- Realism and clarity in the specification of prior obligations and prerequisites (assumptions and risks);
- Realism and clarity of external institutional relationships, and in the managerial and institutional framework for implementation and the work plan; and,
- Likely cost-effectiveness of the project design.

Project ownership

- The extent to which the project was formulated with the participation of national counterpart and/or target beneficiaries;
- The extent to which counterparts have been appropriately involved and have been participating in the identification of their critical problem areas, in the development of technical cooperation strategies and in the implementation of the project approach;
- The extent to which counterpart contributions and other inputs have been received from the Government as compared to the project document work plan, and the extent to which the project’s follow-up is integrated into Government budgets and work plans;
- The extent to which identified counterparts (government and private sector) have supported the project into carrying out the planned activities; and,
- The extent to which ownership of project’s results / contributions has been transferred to relevant national counterparts for future sustainability.

Project coordination and management

- The extent to which the national management and overall field coordination mechanisms of the project have been efficient and effective;
- The extent to which the UNIDO based management, coordination, quality control and input delivery mechanisms have been efficient and effective;

- The extent to which monitoring and self-evaluation have been carried out effectively, based on indicators for outputs, outcomes and objectives and using that information for project steering and adaptive management;
- The extent to which changes in planning documents during implementation have been approved and documented;
- The extent to which the steering committee had provided the required support and anticipated follow up on the project’s implementation and achievements; and,
- The extent to which synergy benefits can be found in relation to other UNIDO and UN activities in the country.
- The extent to which changes in the project context (security), has affected the project efficiency and effectiveness in terms of expected results.

Efficiency of Implementation

Efficiency and adequacy of project implementation including:

- Availability of funds as compared to the provisional budget (donor and national contribution);
- The quality and timeliness of inputs delivered by UNIDO (expertise, training, equipment, methodologies, etc.) and the Government as compared to the work plan(s);
- Managerial and work efficiency;
- Implementation challenges and difficulties;
- Adequacy of monitoring and reporting; and,
- The extent of national support and commitment and the quality and quantity of administrative and technical support by UNIDO and the Government.

Effectiveness and Project Results

- Full and systematic assessment of outputs produced to date (quantity and quality as compared with work plan and progress towards achieving the immediate objectives);
- Quality of outputs produced and how target beneficiaries use these outputs, with particular attention possibility of replication; and,
- Outcomes, which have occurred or which are likely to happen through utilization of outputs.

Prospects to achieve expected outcomes, impact and sustainability

Prospects to achieve expected outcomes and impact and prospects for sustaining the project’s results by beneficiaries and host institutions after termination of the project, and identification of developmental changes (economic, environmental, social) that are likely to occur as a result of the intervention, and how far they are sustainable.

Cost-effectiveness of the Project

Assess whether the project’s approach represented the best use of given resources for achieving the planned objectives.

Gender and Environmental Sustainability

The extent to which gender aspects have been mainstreamed and implemented in the project. The extent to which considerations to environmental sustainability were taken into account during the project lifecycle.

Specific evaluation questions for Outcome (1): Eliminating the risk of TNT explosion and reducing toxic pollution at the site

- Was the proposed remediation technique determined and agreed with the Ministry?
- Has a stakeholder group been established with meetings held every month as stipulated in the project document?
- To what extent has the stakeholder group ensured buy-in and facilitated project activities?
- How would the role of the stakeholder group be sustained after project lifetime?
- To what extent had the role of national counterparts supported the implementation of the project’s outputs?
- To what extent was site safety assured and how many training sessions were conducted for workers on the safe disposing of TNT and site security?
- To what extent was site infrastructure, e.g. proper utilities, platforms etc, set-up?
- To what extent was TNT and other acids removed from pipes, equipment and above ground tanks in a safe manner?
- How many tons of TNT and liters of acids were removed, neutralized and disposed of in total?
- How was the option for disposing of the TNT identified and applied?
- To what extent were the results of the soil and groundwater samples used to develop detailed remediation designs to be continued after the project end?
- How many samples of soil and groundwater were assessed?

V. EVALUATION TEAM

The evaluation team will consist of one International Evaluation Consultant with extensive experience in conducting evaluations to design, supervise, guide the evaluation and formulate the evaluation report and related documents. The international evaluation consultant must have the necessary technical competence and experience to assess the quality of technical assistance provided to project counterparts/beneficiaries.

The International Evaluation Consultant will be responsible for elaboration of an evaluation plan, including the design and carry out, as needed, the field surveys/interviews that are restricted to Kiev due to the current security situation; analysis of survey results; gathering of complementary information from project staff, collaborators and stakeholders through the relevant means; and preparing PowerPoint presentation of conclusions and recommendations as well as a final evaluation report.

The international evaluation consultant will be contracted by UNIDO. The tasks are specified in the job description, attached to this ToR as Annex 2.

The UNIDO Office for Independent Evaluation will be responsible for the quality control of the evaluation process and report. They will provide inputs regarding findings, lessons learned and recommendations from other evaluations, ensuring that the evaluation report is in compliance with established evaluation norms and standards and useful for organizational learning of all parties.

UNIDO will logistically and administratively support the international evaluation consultant to the extent possible. However, it should be understood that international evaluator is responsible for its own arrangements for transport, lodging, security etc.

VI. EVALUATION SCHEDULE AND MAIN TASKS

The final evaluation is scheduled to take place in the beginning of November 2015, including a briefing in Vienna, followed by a field visit to Kiev that should take place before 20 November 2015. At the end of the field mission, there will be a presentation of preliminary findings by the international evaluation consultant to stakeholders involved in this project in Kiev.

After the field mission, the evaluation team leader will come to UNIDO HQ for debriefing and a presentation of the preliminary findings.

The draft final evaluation report will be submitted one week after the end of the mission. After quality review of the draft evaluation report by UNIDO Office for Independent Evaluation and the Project Manager, the final evaluation report should be delivered.

VII. CONSULTATIONS AND LIAISON

A proposed list of Government officials, private sector representatives and other relevant individuals will be provided by the Project Manager.

The international evaluation consultant will maintain close liaison with the representatives of UNIDO, other UN agencies as well as with the concerned national agencies and with national and international project staff. The evaluation consultant is free to discuss with the authorities concerned anything relevant to its assignment. However, it is not authorized to make any commitments on behalf of the Government, the donor or UNIDO.

VII. LANGUAGE REQUIREMENTS

Local interviews and surveys as well as telephone interviews should be conducted in English. All data, documents and interview reports must be in English.

IX. DELIVERABLES AND REPORTING

The main documents to be delivered by the senior international evaluation consultant are:

1. Brief inception report;
2. Draft evaluation report;
3. Final evaluation report; and,
4. PowerPoint presentation debriefing on the process, findings, and recommendations.

The reporting language will be English. The executive summary, recommendations and lessons learned shall be an important part of the presentations to be prepared for debriefing sessions in Kiev and Vienna.

Draft reports submitted to UNIDO Office for Independent Evaluation are shared with the corresponding Project Managers and National Project Director for initial review and consultation. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks agreement on the findings and recommendations. The evaluators will take the comments into consideration in preparing the final version of the report.

The evaluation will be subject to quality assessments by UNIDO Office for Independent Evaluation. These apply evaluation quality assessment criteria and are used as a tool for providing structured feedback. The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality (see Annex 4).

ANNEX 1: TABLE OF CONTENTS FOR THE EVALUATION REPORT

Template of in-depth evaluation reports

I. Executive summary

- Must be self-explanatory
- Not more than five pages focusing on the most important findings and recommendations
- Overview showing strengths and weaknesses of the project

II. Introduction

- Information on the evaluation: why, when, by whom, etc.
- Information sources and availability of information
- Methodological remarks and validity of the findings
- Project summary (“fact sheet”, including project structure, objectives, donors, counterparts, timing, cost, etc)

III. Country and project context

This chapter provides evidence for the assessment under chapter IV (in particular relevance and sustainability):

- Brief description including history and previous cooperation
- Project specific framework conditions; situation of the country; major changes over project duration
- Positioning of the project (other initiatives of government, other donors, private sector, etc.)
- Counterpart organization(s); (changes in the) situation of the relevant institutions and counterparts in terms of mandate, scope of cooperation, etc.

IV. Project Planning

This chapter describes the planning process as far as relevant to the assessment under chapter IV:

- Project identification (stakeholder involvement, needs of target groups analysed, depth of analysis, etc.)
- Project formulation (stakeholder involvement, quality of project document, coherence of intervention logic, etc.)
- Description of the underlying intervention theory (causal chain: inputs-activities-outputs-outcomes)
- Funds mobilization

V. Project Implementation

This chapter describes what has been done and provides evidence for the assessment under chapter IV:

- Financial implementation (overview of expenditures, changes in approach reflected by budget revisions, etc.)
- Management (in particular monitoring, self assessment, adaptation to changed circumstances, etc.)
- Outputs (inputs used and activities carried out to produce project outputs)
- Outcome, impact (what changes at the level of target groups could be observed, refer to outcome indicators in project document if any)
- Types of collaboration that took place with different counterparts and stakeholders

VI. Assessment

The assessment is based on the analysis carried out in chapter II, III and IV. It assesses the underlying intervention theory (causal chain: inputs-activities-outputs-outcomes). Did it prove to be plausible and realistic? Has it changed during implementation? This chapter includes the following aspects:

- Relevance (evolution of relevance over time: relevance to UNIDO, Government, counterparts, target groups)
- Ownership
- Efficiency (quality of management, quality of inputs, were outputs produced as planned? Were synergies with other initiatives sufficiently exploited? Did UNIDO draw on relevant in-house and external expertise? Was management results oriented? Was the planning process flexible to accommodate country based changes?)
- Effectiveness and impact (assessment of outcomes and impact, reaching target groups)
- Sustainability
- If applicable: overview table showing performance by outcomes/outputs

VII. Issues with regard to a possible next phase

- Assessment, in the light of the evaluation, of proposals put forward for a possible next phase
- Recommendations on how to proceed under a possible next phase, overall focus, outputs, activities, budgets, etc.
- Recommendations on how to capitalize on the achieved result and possibility of replication for broader benefit / impact

VIII. Recommendations

- Recommendations must be based on evaluation findings
- The implementation of the recommendations must be verifiable (indicate means of verification)
- Recommendations must be actionable; addressed to a specific officer, group or entity who can act on it; have a proposed timeline for implementation
- Recommendations should be structured by addressees:
 - UNIDO
 - Government and/or Counterpart Organizations
 - Donor

IX. Lessons learned

- Lessons learned must be of wider applicability beyond the evaluated project but must be based on findings and conclusions of the evaluation

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

**Independent Evaluation of the UNIDO Project
“Horlivka Chemical Plant Remediation” Project No: 100025 (TE/UKR/11/005,
EE/UKR/11/006)**

Title:	International Evaluation Consultant
Main Duty Station and Location:	Home-based
Mission/s to:	Kiev and Vienna
Start of Contract (EOD):	21 October 2015
End of Contract (COB):	20 November 2015
Number of Working Days:	20 days

ORGANIZATIONAL CONTEXT

The Office for Independent Evaluation is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes.

PROJECT CONTEXT

See evaluation terms of reference (attached).

The senior international evaluation consultant will act as a team leader in this project evaluation according to the terms of reference. She/he will be responsible for the preparation of the evaluation report, including the coordination of inputs from other team members. This concerns in particular the overall assessment of evaluation issues in section IV of the TOR. The team leader will perform the following tasks:

MAIN DUTIES	Concrete/ measurable Outputs to be achieved	Expected duration	Location
Review project documentation and relevant country background information (national policies and strategies, UN strategies and general economic data...); determine key data to collect in the field and prepare key instruments (questionnaires, surveys, logic models...) to collect these data through interviews and/or surveys and prior the to field missions.	Lisa of detailed evaluation questions to be clarified; questionnaires/ interview guide; logic models; list of key data to collect, draft list of stakeholders to interview during the field missions.	4 days	Home-based
Briefing with the UNIDO Office for Independent Evaluation, project managers and other key stakeholders from UNIDO HQ. Preparation of the Inception Report.	Interview notes, detailed evaluation schedule and list of stakeholders to interview during the field mission.	2 days	Home-based and UNIDO HQ in Vienna
Conduct interviews of project counterparts/beneficiaries, the UNIDO project personnel and of any other relevant institutions/individuals in accordance with the evaluation terms of reference. Analyse the information received from interviews.	Key evaluation’s initial findings, draft conclusions and recommendations to stakeholders in the country at the end of the missions.	5 days	Kiev, Ukraine

Present overall findings and recommendations to the stakeholders at UNIDO HQ (incl. travel).	Presentation slides, feedback from stakeholders obtained and discussed	2 days	Vienna, UNIDO HQs
Prepare the evaluation report and PowerPoint presentation according to the TOR. Coordinate the inputs from the National Consultant and combine with her/his own inputs into the draft evaluation report.	Draft evaluation report and PowerPoint presentation	5 days	Home-based
Revise the draft project evaluation reports based on comments from UNIDO Office for Independent Evaluation and stakeholders and edit the language and form of the final version according to UNIDO standards.	Final evaluation report and PowerPoint presentation	2 days	Home-based
Total		20 days	

REQUIRED COMPETENCIES

Core values:

1. Integrity
2. Professionalism
3. Respect for diversity

Core competencies:

1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation
6. Organizational development and innovation

Managerial competencies (as applicable):

1. Strategy and direction
2. Managing people and performance
3. Judgement and decision making
4. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree preferably in environmental sciences, engineering, developmental studies or related disciplines.

Technical and Functional Experience:

- A minimum of ten years practical experience in the field of development projects, including evaluation experience at the international level involving technical cooperation in developing countries.
- Exposure to the needs, conditions and problems in developing countries.
- Proven experience in monitoring and evaluation.
- Preferably previous experience with projects dealing with remediation of contaminated sites.

- Languages: Fluency in written and spoken English is required.
- Absence of Conflict of Interest: According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the Office for Independent Evaluation.