

# REMOVING THE THREATS OF OBSOLETE PESTICIDES IN MOLDOVA

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## Summary

Since 2011, DEKONTA has been responsible to dispose approximately 752 tonnes of obsolete pesticides (and pesticides contaminated materials) from eight different warehouses in Moldova (Gradinita, Ciobalaccia, Clocusna, Pascani, Singerei, Oliscani, Pelivan and Paupati). The obsolete pesticides have been repacked into appropriate containers and transported abroad for final disposal in incineration facilities in Europe.

In this paper, it will be presented the process of safeguarding illustrating the challenges encountered and lessons learned from the implemented projects in Moldova.

## Keywords

Persistent Organic Pollutants (POPs), Moldova, Contaminated Sites, Safeguarding, Disposal

## Introduction

For decades, pesticides have been used worldwide as a mean to increase agricultural output, fight pests and control tropical diseases. Now, obsolete, these chemicals are highly toxic, highly dangerous substances that pose a direct threat to human health. In Moldova, it is not uncommon for local residents to use the dismantled warehouses as building materials for their own sheds, houses and fences and even re-use obsolete pesticides for agriculture. It is clear that obsolete pesticides lying out in the open or in ruined stores can easily pollute the environment and are a risk to human health. For this reason, Moldovan authorities with the co-operation of international donors like FAO, NATO, the Czech Government and others, have implemented several projects with the aim to remove this threat from the environment.

Since 2011, DEKONTA has been co-operating with the Moldavian authorities and has removed 752 tonnes of obsolete pesticide waste from several pesticides storehouses in the country.

## Project Activities

DEKONTA's approach for the implementation of the projects was divided in six main phases: health and safety plan elaboration, inventory, safeguarding, transportation, disposal and site hand-over.

A summarized description of the phases is illustrated in the flowchart below.

Project	Amount (t)	Summary
Remediation of environmental burdens caused by pesticides in Moldova	202	<ul style="list-style-type: none"><li>• Gradinita, Ciobalaccia and Clocusna storehouses</li><li>• Disposed in Germany</li></ul>
Remediation of environmental burdens caused by pesticides in Moldova II	250	<ul style="list-style-type: none"><li>• Singerei, Oniscani, Pelivan, Papauti storehouses</li><li>• Disposed in Germany</li></ul>
Safeguarding and Disposal of hazardous chemical waste in Moldova	300 (estimated)	<ul style="list-style-type: none"><li>• Pascani storehouse</li><li>• Project is running</li><li>• To be disposed in Poland</li></ul>

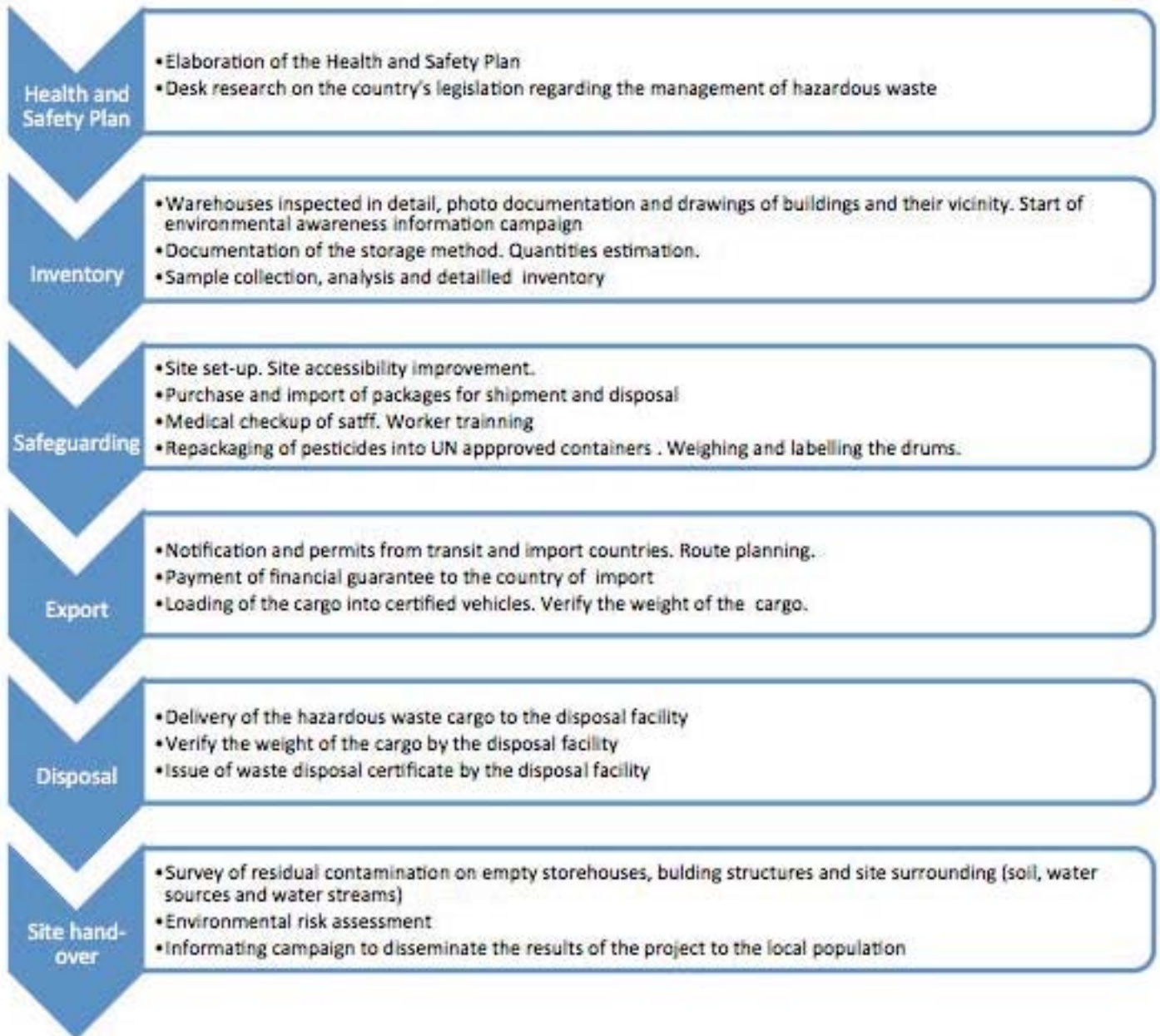


Figure 1 - Main phases of the projects

## Pesticides Analysis

The results of qualitative analyses of pesticide samples and contaminated debris indicate presence of a wide spectrum of substances. The most represented pesticides in solid matrices include trifluralin,  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  - HCH, atrazine, carboxin, proparil (DCPA), diazinon, diphenamid, chlorobenzilat / chloropropylat / etoxinol, mefenoxam / metalaxyl, prometryn, propazine, simazine / triazine, sulfotep and triadimefon. Acetochlor, metochlor and atrazine, dimethachlor, propazine, simazine/triazine, terbutylazine and 2,4,D were found in liquid matrices.

According to the origin and properties, the wastes were classified into three codes according to the European catalogue of wastes (Decision of the Commission 2000/532/EC)

and at the same time the wastes were classified into three classes of hazardous character according to the European Agreement Concerning the International Carriage of Dangerous Goods by Road, the so-called ADR. The list of wastes and their classification is synoptically stated in the following table.

Waste code	Waste designation	characteristic of risk	UN number	Name	Class of hazard-ousness	Packing group
02 01 08	Agrochemical wastes containing dangerous substances	Toxicity	2588	pesticide, solid, toxic, unspecified	6.1	II
			2902	pesticide, liquid, toxic, unspecified	6.1	II
15 01 10	Containers containing the rest of dangerous substances or contaminated containers	Ecotoxicity	3077	environmentally hazardous substance, solid, unspecified.	9	III
19 13 01	Soil remediation solid wastes containing dangerous substances	Ecotoxicity	3077	environmentally hazardous substance, solid, unspecified.	9	III

Table 1 - List of wastes and their classification

## Main Challenges and Lessons Learned

The implementation of these projects proved to be challenging. The main challenges encountered were:

- Lack of information regarding the pesticides stored in the storehouses. Storehouses in very poor conditions.
- Presence of strong oxidizers in the storehouses. Permanent risk of fire.
- Routes for the transportation of the pesticides should be planned considering the countries of transit/import. Some authorities are quicker to approve the movement of the waste through/to their territory.
- Maritime transportation companies may refuse to transport the waste in their vessels.

The lessons learned from these projects were:

- Insisting on maximal safe conditions during the work. The presence of unknown substances and poses a constant threat for the safety of the workers.
- Strict usage of PPE and safety equipment at the site. Due to the uncertainties regarding the identities of the chemicals present at the site, DEKONTA's approach is to be one step ahead and use more PPE than the minimum required.
- Detailed analysis in the field, cross analysis (Raman spectography and RTG) for the identification of unknown chemicals.
- Elemental analysis of every drum for presence of limiting elements regarding incineration limits.
- Close cooperation with analytical laboratory - identification of all chemicals including the metabolites of pesticides, specific pesticides that were tested in Moldova during the Soviet times

## Conclusion

The projects had very positive impact in the condition of the environment. The most benefitted group of these projects were the workers who move directly around the premises of pesticide warehouses, people who live in the surroundings of pesticide warehouses and the inhabitants of respective districts, who could be adversely affected by collected toxic substances, due to flue dust particles, improper handling, escape of liquids and etc.

As the direct benefits in the social sphere we can see the opportunity of an additional income of local inhabitants from auxiliary works associated with removal of wastes. These concerned miscellaneous small repairs (of warehouses, tools and equipment, vehicles), transport of material, manual help when loading and unloading goods, guarding of buildings, forklift operation, etc.

It is also necessary to mention that repackaging and disposal of the obsolete pesticides only removes the source of the contamination. It is common that residual contamination remains at the site (contaminated building structures, soil, water bodies and etc.) and it should also be addressed in future projects. As an example, soil samples (soil probes, surface soil) collected from the Oniscani site after the pesticides repackaging activities have been completed revealed concentrations above 50 mg/kg in soil, i.e. the level when materials are classified as hazardous waste according to the Moldavian regulations.

For these reasons, a comprehensive information campaign to raise awareness must be carried out until further projects addressing residual contamination are implemented. Situations were locals perceive the old storehouses, now empty of pesticides, as safe are not uncommon. In many cases building materials are at risk of being removed from the site and used as building material for houses or stables.

## References

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