

Inception report Tajikistan

Draft, August 17th, 2009

Inception report Tajikistan

**Obsolete pesticides technical study in Kyrgyz Republic,
Republic of Tajikistan and the Republic of Uzbekistan**

World Bank project 100020592

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Responsibility

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Colophon

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Contents

Responsibility and Colophon	5
0 Summary	11
1 Introduction	13
1.1 The World Bank project.....	13
1.1.1 Expression of Interest.....	13
1.1.2 The Tauw Consortium.....	13
1.1.3 Request for Proposal and contract.....	15
1.2 Objectives.....	15
1.2.1 Project.....	15
1.2.2 Inception mission.....	15
1.3 Content of report.....	16
2 Background information	17
2.1 Introduction.....	17
2.2 TOR and proposal.....	18
2.2.1 Step 1: Training of locals in inventory of obsolete pesticides.....	18
2.2.2 Step 2: Inventory, characterization and prioritization of obsolete pesticide containing sites.....	19
2.3 Step 3: Risk assessment for priority site.....	20
2.3.1 Step 4: Identification and feasibility assessment of safeguarding, transport and elimination/disposal options of identified stocks and other contaminated wastes.....	21
2.3.2 Step 5: Feasibility of in situ site remediation and/or containment alternatives for highly contaminated burial site in Vakhsh.....	23
3 Inception mission	27
3.1 Program.....	27
3.2 Meetings.....	29
3.3 Stakeholder Meeting.....	30
3.3.1 Introduction.....	30
3.3.2 NIP of the Republic of Tajikistan.....	31
3.3.3 The World Bank project 100020592.....	31
3.3.4 Online project platform.....	32
3.3.5 Evaluation of the inception mission.....	32
3.3.6 Discussion.....	32

Draft

Reference R003-464077BFF-beb-V01

3.4	Evaluation of meetings with Tajik stakeholders.....	33
4	Obsolete pesticides stocks and stockpiles	35
4.1	Introduction.....	35
4.2	Obsolete pesticides	37
4.2.1	Site information Paiskambe 1 and 2.....	37
4.2.2	Site information Sadvinsovkhoz	40
4.2.3	Site information Kulyab	42
4.2.4	Site information Zargar	43
4.2.5	Site information Oikamar.....	46
4.2.6	Site information Kurgantuba 1	48
4.2.7	Site information Kurgantuba 2	51
4.3	Evaluation.....	53
5	Vakhsh burial site.....	55
5.1	General introduction	55
5.2	Site introduction.....	55
5.2.1	Specific site introduction.....	58
5.3	Assessment.....	63
5.4	Actions already executed	64
6	Next steps stocks and stockpiles	69
6.1	Program training and workshop	69
6.1.1	Inventory training	69
6.1.2	Stakeholder workshop	71
6.2	Inventory and soil survey training.....	71
6.3	Risk assessment training.....	72
6.4	Field tests training	73
6.5	Identification and feasibility assessment for management of POP and wastes	76
6.6	Stakeholders input.....	76
7	Next steps Vakhsh burial site	79
7.1	Need for additional information	79
7.2	Further actions and planning.....	79
7.3	Health and safety	80
7.4	Risk assessment	80
7.4.1	Introduction.....	80
7.4.2	Two-zone approach for the centre and periphery of the burial sites	81

Draft

Reference R003-4640777BFF-beb-V01

7.5	Conceptual site model and reporting.....	82
7.6	Development of remediation alternatives	83
7.7	Stakeholders input.....	87

Appendices

1. Questionnaire
2. HSE Plan

Draft

Reference R003-464077BFF-beb-V01

0 Summary

The Tauw Consortium, referred as TC (Tauw bv, Milieukontakt International, International HCH and Pesticides Association, Witteveen+Bos Environmental Consultants and Green Cross, Switzerland) was selected by the World Bank in May 2009 to execute a project called: *The obsolete pesticides technical study in the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan*. Together the TC forms a strong OP, POP and hazardous chemicals team that have cooperated in different combinations in many projects in Central Asia and elsewhere in the world.

In this project the TC will:

1. Train locals in inventory of obsolete pesticides
2. Make an inventory, characterization and prioritization of limited number obsolete pesticides containing sites
3. Assess the risks for priority sites
4. Identify and make a feasibility assessment of safeguarding, transport and elimination/disposal options of identified stocks and other contaminated wastes
5. Assess the feasibility of in and/or ex situ site remediation and/or containment alternatives for the highly contaminated burial site in Vakhsh

In order to make a good start with the project and gather all data the TC organized an inception to Tajikistan. This inception report describes the first impressions of the different experts of the TC. The report will be reviewed by Tajik stakeholders.

During the inception mission the eight OP and POPs stockpiles in the Kathlon region were visited. According to the Tajik NIP, significant amount of OP and POPs were already moved to the Vashk dumpsite in recent years. This state of affairs was confirmed by the TC during the inception mission. The soil of the storages, however, is at several stores seriously contaminated and the TC recommends including soil survey training in the inventory training program to assess possible risks and incorporate soil remediation in the design of the clean-up program of the stock and stock piles.

TC visited also the Vakhsh burial site. It was observed that waste miners come regularly to the site to dig up OPs for their own use and/or for selling. Consequently OPs are entering directly into the environment. This is extremely dangerous for public health and the environment. Re-installment of the site management and fencing the site to prevent access would reduce the involved risks significantly. In the short run only the establishment of a "armed guarding unit" could avoid further unpermitted access, digging and selling.

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Dust and vapours from the site can affect the population of Vakhsh and surrounding villages, but risks have to be studied in further detail. Cattle can be affected directly when entering the site and drinking standing water. Thus contaminations directly enter our food chain. To minimize infiltration it is recommended filling up the holes on short notice. Rainwater runoff from the burial site causes a mayor risk to the environment and public health. Diversion of the storm water runoff on short notice is also recommended.

Preparations for inventory training (October 2009) are in full swing. The training includes instruction on inventory and risks assessment using the newly developed and internet based FAO Pesticide Stock Management System (PSMS). Training will be given as well on how to identify non hazardous agrochemicals with simple field tests. With such field tests teams will be able to work more efficiently in the repackaging phase and avoid expensive transportation and storage of non hazardous agrochemicals.

In the report options for the rehabilitation of the burial sites are outlined. Feasible options for repackaging, safeguarding, transport, temporary storage, destruction of OB and different soil remediation possibilities for the stock and stockpiles will be assessed later in the project. It is however recommended to design a coherent regional approach for the clean-up campaign of the stock and stockpiles and the rehabilitation of the dumpsite. To work on a permanent solution it is suggested to establish a Central Asian Environmental Training Centre at the Vakhsh burial site. At this CAETC the rehabilitation of the dumpsite can be implemented with all kind of related environmental training programs. Such centre can play a role in the permanent environmental and sustainable destruction of POPs from the burial site and the region in line with the Stockholm Convention. In this way proper management of the whole site is guaranteed. For Vakhsh and the whole of Tajikistan it means an economical and social incentive.

1 Introduction

A review of the steps taken by World Bank and the Tauw Consortium from the Expression of Interest to the commissioning of the Tauw Consortium for the obsolete pesticides technical study in the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan are presented in this first chapter of the Tajikistan Inception Mission Report. The objectives of this technical study and the objectives of the inception mission for the Republic of Tajikistan are also described in this chapter. The last paragraph of this chapter is a guideline for reading this Inception Mission Report.

1.1 The World Bank project

1.1.1 Expression of Interest

The World Bank has received financing from the Canada Persistent Organic Pollutants Fund, through the Canadian International Development Agency (CIDA) on behalf of the Government of Canada for the POPs Pesticides Inventory and Risk Assessment. The World Bank applied a portion of funds to eligible payments under the contract for which an Expression of Interest and after short listing a Request for Proposals was issued.

This World Bank project is called 'The Obsolete pesticides technical study in the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan' and has the World Bank project number 100020529. Together with eight other companies the Tauw Consortium was short listed, invited to tender and selected for this World Bank project.

1.1.2 The Tauw Consortium

The Tauw Group Environmental Consultants, The Netherlands, has been assigned the project in association with the following organizations:

- Milieukontakt International
- Witteveen+Bos Environmental Consultants, the Netherlands
- Green Cross, Switzerland
- International HCH and Pesticides Association, Denmark

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Tauw, the leading partner, is an international environmental consultant specialized in contaminated land and waste management. Since 2000 the company is actively involved in Obsolete Pesticides Management and was one of the founders of IHPA. The company was founded in 1928 and now has offices in Belgium, France, Germany, Italy, Spain and Brazil. Tauw is founding member of the environmental consultancy association Cat Alliance and through this alliance active in environmental projects world wide.

Milieukontakt International is an environmental NGO with head office in Amsterdam, the Netherlands. The organization was founded in 1988 and is active since then in building capacities, involving citizens and solving environmental problems. Milieukontakt works mainly in Eastern Europe and Central Asia.

Witteveen+Bos provides consultancy and engineering services for projects in the following areas: water, infrastructure, environment and economics. A multidisciplinary project approach characterizes the way of working. Since 1980 the company is involved in environmental site assessment and remediation. The company was founded in 1946 and now has (project) offices in the Netherlands, Indonesia, Kazakhstan (three sub-offices), Russia, Latvia, Serbia and Rumania. For their 800 employees partnership is the key word: partnership with their clients and with the company. Witteveen+Bos is member of Netherlands Engineering Consultants (NeDeCo) and through this organization active in environmental and engineering projects worldwide.

The International HCH & Pesticides Association (IHPA) is an independent and non-political network of committed individuals that wants to draw international attention to the world-wide problems related to the production and use of HCH and other obsolete pesticides and associated risks for human health and the environment. The IHPA was founded in July 1998 with the aim of facilitating and promoting international co-operation and the exchange of experiences within management of pollution problems related to the production and use of HCH and other unwanted pesticides worldwide. Since September 2002, the IHPA has been officially registered as a Foundation in The Netherlands. The IHPA has made the commitment to use all its strength and know how to contribute actively to the solution of problems related to the production and use of HCH and other obsolete pesticides in Central European and EECCA (Eastern European, Caucasus and Central Asia) Countries.

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Green Cross Switzerland, one of the founding members of Green Cross International, addresses the resolution of damage caused by industrial and military disasters, facilitates broad stakeholder involvement in demilitarization projects, and deals with polluted waters and remediation options in Eastern Europe, Asia and Africa as well as the mediation of conflicts around water as a natural resource. Green Cross Switzerland has been strongly involved since 1995 in the FSU and has been a key player in facilitating chemical weapons destruction in Russia. Green Cross Switzerland has currently about 45,000 members and regular donors.

1.1.3 Request for Proposal and contract

The World Bank invited the Tauw Consortium to provide the consulting services for: Persistent Organic Pollutants (POPs) Pesticides Technical Study in the Kyrgyz Republic, the Republic of Tajikistan and the Republic of Uzbekistan on March 23rd 2009. The details were provided on the World Bank eConsult website page.

The technical scores were released on eConsult on May 2nd, 2009. The Tauw Consortium had the highest score

1.2 Objectives

1.2.1 Project

The objectives of the obsolete pesticides technical study in the Republic of Tajikistan are:

- To identify and demonstrate environmentally-sound and cost-effective policies, procedures and techniques for safe management, storage and disposal of obsolete pesticides and POPs
- To assist Tajikistan in protecting the environment and human health by safely managing:
 - Stockpiles of Persistent Organic Pollutants (POPs) and sites contaminated with these materials in the Khatlon Oblast
 - The burial site in Vakhsh in the Khatlon Oblast
- To assist Tajikistan to meet its obligations under the Stockholm Convention so it can contribute to global efforts to control toxic chemicals, in particular eliminate POPs

1.2.2 Inception mission

The objectives of the inception mission to Tajikistan are:

- To provide a good basis for the obsolete pesticides technical study
- To gather the necessary data to start the project
- To meet with different stakeholders
- To obtain input from the different stakeholders
- To establish good relation with all the stakeholders

- To visit the priority site, the burial site in Vakhsh, gather information and carry out sampling in order to set up a conceptual model concerning the presence of contaminated soil and obsolete pesticides in the burial sites in such a way that the three most applicable remediation strategies can be proposed
- To visit representative stores and stockpiles of obsolete pesticides in the Khatlon region to form an idea concerning the presence of contaminated soil, building materials and obsolete pesticides in stores and stockpiles to be able to make a tailor made training program for the inventory training of stores and stockpiles

1.3 Content of report

Chapter 1 and 2 are the introduction to the project.

This chapter 1 informs the reader about the phase prior to the World Bank commissioning this project. Chapter 2 gives a summary of the Terms of Reference (TOR) and the Tauw Consortium approach. Each step of the project is summarized, for more detailed information on the TOR and the Tauw Consortium proposal we refer to our project website <http://obsoletepesticides.net>. Chapter 1 and 2 are written for the reader who has no knowledge of the tender document and the Tauw consortium approach of the project.

Chapter 2, 3 and 4 present all the facts and findings of our inception mission.

The inception mission itself, including the inception program, the summarized minutes of meeting and evaluations are described in chapter 3. We present the inception program, the findings thereof and a list of all the stakeholders. In chapter 4 descriptions of seven visited stores are presented. The last paragraph is an evaluation of our visits and a recommendation to adapt the training program. The Vakhsh burial site which is also located in the Vakhsh District in Khatlon Oblast is described in chapter 5. The site and its surrounding and an assessment of the risk are elaborated in this chapter. The last paragraph describes the already carried out survey activities.

The next steps in the project are described in the last the chapters 6 and 7.

Chapter 6 deals with the steps for the stock and stockpiles. Chapter 7 is used to describe the next steps for the burial site in Vakhsh. In the first paragraph of chapter 6 we have given the details of the training and stakeholders workshop which is scheduled in October 2009. The next four paragraphs contain the most important aspects of the training. The last paragraph summarizes the stakeholders input. Chapter 7 summarizes the needed information to complete the Conceptual Site Model (CSM) of the burial site, gives details about the risk assessment and describes the first steps in developing the alternatives for the rehabilitation of the burial site. The last paragraph summarizes the stakeholders input for the survey of the burial site.

2 Background information

In order to inform the reader about the background of this World Bank project the Terms of Reference (TOR) and the Tauw Consortium proposal are summarized in this chapter. References are made to next chapters for the results obtained so far and an adaptation of work scope based on these results.

2.1 Introduction

The proposal is a joint effort of a multi-stakeholder consortium of internationally oriented NGOs and environmental engineering consultants from the Netherlands, Switzerland, Denmark, Kyrgyzstan, Tajikistan and Uzbekistan that all have their own technical and managerial experience and capabilities to:

- Identify and demonstrate environmentally-sound and cost-effective policies, procedures and techniques for safe management, storage and disposal of obsolete pesticides and POPs
- To protect the environment and human health by safely managing stockpiles of Persistent Organic Pollutants (POPs) and sites contaminated with these materials
- To help the Central Asian countries mentioned above to meet their obligations under the Stockholm Convention so they can contribute to global efforts to control and or eliminate toxic chemicals, in particular POPs

Together the consortium partners form a strong team that has cooperated in different combinations in many other projects amongst others in Central Asia. We strengthen each others role and share the willingness to address the acute problems for human health and the environment of obsolete pesticides and other hazardous chemicals.

This project is divided in the following five steps:

1. Training local people to make an inventory of obsolete stock and stockpiles in the Khatlon Oblast
2. Inventory, characterization and prioritization of obsolete pesticide containing stock and stockpiles in the Khatlon Oblast
3. Risk assessment of the priority burial site, the Vakhsh burial site in the Khatlon Oblast
4. Identification and feasibility assessment of safeguarding, transport and elimination/disposal options of identified stocks and other contaminated wastes from the stock and stockpiles in the Khatlon Oblast
5. Feasibility study of in situ site remediation and or containment alternatives for the highly contaminated Vakhsh burial site

The five steps for the Republic of Tajikistan are summarized below. For more detailed information on each step of the project we refer to the website mentioned above.

2.2 TOR and proposal

2.2.1 Step 1: Training of locals in inventory of obsolete pesticides

Objectives

The objectives of this step are **theoretical** knowledge transfer on making a:

1. Safe and good inventory, characterization and prioritization of obsolete pesticides stockpiles in the Khatlon Oblast
2. Safe and good inventory, characterization of the priority pesticide burial site in Vakhsh

Step 1.1 Inception Mission

Tauw organized an inception mission to the Republic of Tajikistan to meet all stakeholders and initiate the project. The required input from the different stakeholders is requested prior to the inception mission by sending questionnaires to the stakeholders (appendix 1). Field visits are included in the inception program. The first findings from the field visits will be summarized in chapter 3 of this inception report.

Step 1.2 Selection of trainees for the training program

During the inception mission the identification of a team of ten persons to be trained on making an inventory, characterization and prioritization of obsolete pesticide containing sites is started. The results will be discussed in chapter 3.

Step 1.3 Inventory classroom training

Tauw experts will give one week classroom training on how to carry out safe and proper inventories of obsolete pesticides stockpiles. Besides this, examples will be shown of stockpiles and all the relevant issues will be addressed. The classroom training program presented in aforementioned proposal will be adapted based on the results of the inception mission and will be discussed in chapter 4 of this report.

Step 1.4 Specific identification field tests

Tauw will set up tailor made kits of simple field tests to support making an inventory. These simple field test kits will be adapted to the situation in the Khatlon Oblast. Chapter 3 will explain why and how the tests will be adapted to the specific situation in the Khatlon Oblast. During the classroom training the concept of these simple tests will be explained.

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Step 1.5 The FAO Pesticides Stock Management System

Access to the FAO online tool PSMS for Tajikistan will be purchased. Tauw introduced PSMS to Mr. Abdusalim Juraev, the Focal Point of the Stockholm Convention and suggested that he would be the administrator of the PSMS in the future. Information given and the response on the proposal will be discussed in chapter 3. The local team will be trained in using PSMS for storing the inventory data and two local persons will be trained to add (upload) and validate data in PSMS.

Step 1.5 Training materials

Samples of Personal Protective Equipment (PPE), PSMS, the available local guidelines and documents and the tailor made training modules will be provided and used in the training.

Step 1.7 Presentation results inception

A one day workshop to present the inception report to country stakeholders and World Bank representatives in each country will be organized during training session.

2.2.2 Step 2: Inventory, characterization and prioritization of obsolete pesticide containing sites

Objectives

The objective of this step is **practical** knowledge transfer concerning:

1. Safe and good inventory, characterization and prioritization of obsolete pesticides stocks and stockpiles in the Khatlon Oblast
2. Safe and good inventory, characterization of the priority burial site in Vakhsh

Step 2.1 Inventory on the job training

The on the job training program will be adapted according to the results of the inception mission if necessary. The program is discussed in chapter 4 of this report.

Step 2.2 Specific identification field tests

Part of the on the job training is using the tailor made field test kits to support identification and characterization.

Step 2.3 The FAO Pesticides Stock Management System (PSMS)

The PSMS forms will be used for the inventory and data from the paper forms will be uploaded in PSMS and validated on a daily basis by specially assigned trainees.

Step 2.4 Training materials

All applicable PPE, for each trainee (including the trainers) will be provided. A safe, environmentally friendly and clean behavior will be monitored and evaluated.

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Step 2.5 Exam

After the training each participant will be asked to take an exam.

Deliverables

An interim report (English and Russian) will cover:

1. The results of the inventories
2. The results of the PSMS risk assessment

2.3 Step 3: Risk assessment for priority site

Objectives

The objectives of this step are to increase professional knowledge, skills and environmental awareness of the governmental officials which are in charge of the implementation of the POPs program and to provide the results of a risk assessment for the Vakhsh burial site. The risk assessment will be carried out to establish possible risks for human health, migration and the environment.

Step 3.1 Inception mission

The Vakhsh burial site was visited and site specific information was gathered. The first approach of the Conceptual Site Model was set up and presented in chapter 5 of this report.

Step 3.2 Conceptual Site Model

Based on step 3.1 and the additional information from desktop studies to be performed a draft Conceptual Site Model will be prepared of the Vakhsh burial site.

Step 3.3 Field investigation plan

A field investigation plan is/will be set up containing the documents mentioned below:

1. Quality Assurance and control plan
2. Health and Safety Plan (HASP)
3. Sampling plan

The sampling approach for the Vakhsh burial site is adapted to the site specific situation and elaborated in chapter 5.

Step 3.4 Chemical analysis

The analysis program for the Vakhsh burial site is adapted to the site specific situation and elaborated in chapter 5.

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Step 3.5 Detailed site survey and desktop study

The outputs of this step are:

1. Map of the Vakhsh burial site and its direct surroundings
2. Photo report of the Vakhsh burial site and its direct surroundings
3. Description of the Vakhsh burial site characterization
4. Description of historical review of Vakhsh burial site operations
5. Assessment of presence, extent and nature of POPs waste (logbooks information)
6. Assessment of local geological, (geo)hydrological and atmospheric conditions
7. Regional land use and population data and a brief description of the regional flora and fauna
8. Socio-economic conditions in the broader vicinity of the Vakhsh burial site

All outputs including the results from the steps 3.3 and 3.4 will be presented in a preliminary site assessment report. This report will be structured around the source, path, receptor approach and the Conceptual Site Model evolving from this approach.

Step 3.6 Risk assessment

After the preliminary site assessment report is prepared, a specialist will assess the risks in a preliminary assessment. The preliminary risk assessment report will clearly describe:

1. The input used for the computer models
2. The identified local source, path and receptors relations (Conceptual Site Model)
3. The remaining uncertainties

Deliverables

1. Desktop study report
2. Draft Conceptual Site Model in the inception phase
3. Field investigation plan with associated Health and Safety Plan and Quality Assurance and Control Plan
4. Field investigation report with drill logs and analytical results
5. (Draft) preliminary site assessment report
6. (Final) preliminary risk assessment report

2.3.1 Step 4: Identification and feasibility assessment of safeguarding, transport and elimination/disposal options of identified stocks and other contaminated wastes

Objectives

The objectives of this step are to provide the local authorities with a feasible clean-up plan for the designated stocks and stockpiles of the Khatlon Oblast.

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Step 4.1 Repackaging plan

We will design a feasible repackaging campaign for the obsolete pesticides and POPs at the stocks and stockpiles and warehouses containing:

- The volumes to be repacked
- The tools and equipment needed
- The repackaging materials needed per site
- The planning of the repackaging campaign
- A cost estimates for the repackaging

Step 4.2 A generic remediation strategy

The possibilities concerning the remediation of the contaminated soil around the stock and stockpiles will be reported. The report includes:

1. The estimated amount and degree of contaminated soil
2. Assess the most suitable and local appropriated soil remediation option

Step 4.3 Guidelines for transport, renovation/building store and storage

These guidelines include:

1. Standardized environmental and technical preconditions for transport
2. PSMS-Risk assessment of three possible temporary storages to select the best temporary storage
3. Standardized environmental and technical preconditions for temporary storage building for the repacked obsolete pesticides
4. Standardized drawing and layouts of a temporary storage building
5. Costs estimate for renovation/building of the selected temporary storage building

Step 4.4 Advise governments concerning destruction of the repacked obsolete pesticides

Governments will be advised concerning the most environmental friendly way of destruction of the repacked obsolete pesticides including:

1. Description of maximum three different destruction options
2. Risk assessments of the two most feasible options for destruction

Deliverables

Draft clean-up plan for the critical sites (English and Russian) containing:

1. Repackaging plan (How to repack, transport and store POPs and the obsolete pesticides)
2. A feasibility assessment of the destruction/elimination/disposal of the POPs and obsolete pesticides
3. Standard building/renovation plan for the temporary storage building

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4. An generic remediation strategy of the contaminated soil around the stores
 - An estimate quantity of contaminated soil
 - A feasibility assessment of the elimination/disposal of the contaminated soil

2.3.2 Step 5: Feasibility of in situ site remediation and/or containment alternatives for highly contaminated burial site in Vakhsh

The objectives of this step are to establish:

1. Remedial alternatives for the priority burial sites in Vakhsh
2. Assess the feasibility of the proposed alternatives
3. Identify:
 - Stakeholders important for future public consultation
 - Issues important for future public consultation
 - Potential impacts of the proposed alternatives
 - Essential knowledge gaps
4. Recommendation on further study

Step 5.1 Remedial alternative development

For the Vakhsh burial site the following remedial alternatives will be developed:

1. Baseline (complete excavation and ex-situ treatment)
2. In-situ remediation
3. Containment
4. Combination of removal, in-situ and containment

Aspects like cost, safety, durability, sustainability and carbon footprint will be discussed in such a way that they can be compared. All the alternatives will be risk based meaning that each alternative will take a way as much as possible the identified risks at step 3. For this feasibility study we will not conduct additional field tests and/or (lab) analysis but use the data from step 3.

Step 5.2 Multi criteria evaluation

For the multi criteria evaluation we propose to use the REC (risk reduction, environmental merit and cost) method. With this method the reduction of the following aspects are identified and compared between the four remedial alternatives (step 5.1) in a structured tabular format:

1. **Risk reduction**
2. **Environmental merit**
3. **Costs**

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Step 5.3 Project meeting

A short memo of each site in which the proposed alternatives are described. This memo will be discussed with the client in a regular project meeting. In the meeting it is decided:

1. To go forward with the proposed alternatives
2. To change one of the alternatives
3. To leave one of the alternatives out in favor of another identified alternative

Step 5.4 Reporting

For the Vakhsh site a draft report on the selected remedial alternative will be written in this step.

The report contains:

1. Objectives and remediation targets of the individual risk based four alternatives
2. Technical description of the proposed interventions at a pre-design level
3. In-situ or ex-situ treatment processes
4. An overview drawing and relevant cross sections
5. Issues with regards to site management, operation and maintenance
6. The planning and milestones when certain targets/objectives will be achieved
7. The planning of potential after care programs and environmental monitoring
8. A costs estimate at pre-design level
9. Environmental impact and footprint of the alternative
10. Regulatory constraints and requirements of the subject alternative
11. Summary of the selection process and outcome

Step 5.5 Costs estimate

The cost estimate for the post appropriate remedial action (selected alternative) Tauw will provide, is within the range of limits, which are normally applied for a preliminary design and final design.

Step 5.6 Follow-up recommendation

Tauw will elaborate on the below presented issues in the frame work of future implementation of the remediation

1. Identify the different groups that need to be consulted in future
2. Identified lacks of knowledge and remaining risks when remediation is carried out
3. Recommendations on issues that need to be addressed in future studies

Deliverables

1. Memo in which the proposed method for multi-criteria evaluation is elaborated
2. Memo for each of the four priority sites identifying the proper alternatives for remedial action
3. Minutes of meeting with the client



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4. Draft feasibility report
5. Final feasibility report

The final report will also be made available in English, Russian and Tajik respectively.

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3 Inception mission

In this chapter we present in three different subparagraphs the inception program, the carried out activities and the meetings held. The next chapter contains the evaluation of the inception mission.

3.1 Program

Thursday, June 11th, 2009

Arrival of Wouter Pronk and Indira Zhakipova

Meetings with:

- Mr. Abdusalim Juraev, Focal Point Stockholm Convention
- Ludmila Bobritskaya, Centre for the implementation of the Stockholm Convention

Friday, June 12th, 2009

Field visit to the Vakhsh burial site in the Khatlon region.

Meetings with:

- Mr. Khursandmurod Zikirov, Chairman of the State Committee for Environmental Protection & Forestry
- Mr. Abdusalim Juraev, Focal Point for the Stockholm Convention

Tuesday, June 16th, 2009

Arrival of Berto Collet

Wednesday, June 17th, 2009

- Arrival Marten van der Wijk and Boudewijn Fokke
- Preparation field visits to the Vakhsh burial site and the obsolete pesticide stores in the Khatlon region.
- Meetings with:
 - Mr. Khursandmurod Zikirov, Chairman of State Committee for Environmental Protection & Forestry
 - Mr. Abdusalim Juraev, Focal Point for the Stockholm Convention
 - Mr. Vohidov Abdumavlon Abdurazokovich of the Government Agency of Plant protection and Chemicals under Ministry of Agriculture
 - Mr. Bozorov Boinazar of the Ministry of Agriculture

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Reference R003-4640777BFF-beb-V01

Thursday, June 18th, 2009

- Travel to Khatlon region; Kurbonali Partoev, Berto Collet, Marten van der Wijk and Boudewijn Fokke
- Received by Mr. Khasanov, Head of the Plant Protection and Agro-Chemicals in the Khatlon Oblast
- Site visits Vakhsh burial site
 - Interview with former burial site managers/administrators
 - Interview selected stakeholders
 - Soil sampling
- Site visits obsolete pesticide stores in the Vakhsh Oblast in the Khatlon district to the following stores:
 - Paiskambe 1
 - Paiskambe 2
 - Sadvinsovkhoz
 - Kulyab
 - Zargar (Bakhtar district)
- Site visits obsolete pesticide stores in the Vakhsh Oblast in the Bakhtar district to the following store:
 - Oikamar

Friday, June 19th, 2009

- Meeting with:
 - Mr. Shodmonov Pirnazar, Head of sanitary and Hygiene department of the Ministry of Health
 - Mr. Focal Abdusalim Juraev, Focal Point Stockholm Convention
 - Mr. Khursandmurod Zikirov, Chairman of the Committee on Environmental protection

Saturday, June 20th, 2009

- Departure Marten van der Wijk
- Travel to Khatlon district; Kurbonali Partoev, Berto Collet and Boudewijn Fokke
- Received by Mr. Khasanov, Head of the Plant Protection and Agro-Chemicals in the Khatlon Oblast
- Site visits obsolete pesticide stores in the Vakhsh Oblast in the Khatlon district to the following stores:
 - Kurgantuba 1
 - Kurgantuba 1

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Reference R003-4640777BFF-beb-V01

- Site visits Vakhsh burial site
 - Interview with former burial site engineer
 - Soil sampling subsurface (maximum depth 2 meters)
 - Surface water sampling

Sunday, June 21st, 2009 day off

Monday, June 22nd, 2009

- Preparation stakeholders meeting at the World Bank office in Dushanbe
- Stakeholders meeting at the World Bank office in Dushanbe
 - Informing about project
 - Feedback of site visits of the stocks and stockpiles in the Khatlon region
 - Feedback on visit burial site Vakhsh
 - Evaluation on findings
 - Discussion
 - Evaluation and closure

Tuesday, June 23rd, 2009

Departure of Berto Collet and Boudewijn Fokke.

3.2 Meetings

Organization: State Committee for Environmental Protection & Forestry.

Contact person: Mr. Khursandmurod Zikirov (Chairman) Mr. Abdusalim Juraev (Focal point for the Stockholm Convention).

Total number of Staff: 500.

Number of staff involved With OP: National level: 4 people involved with the implementation of the Stockholm Convention (Center for the implementation of the Stockholm Convention in Tajikistan. This Center has an independent juridical status).
Local level: 50 (1 person in all 50 local Committee branches).

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Reference R003-4640777BFF-beb-V01

Cooperation with other Stakeholders

in the field of OP:

Ministry of Agriculture, Ministry of Health Care,
Department of Sanitary and Epidemiological Control,
Department of Protection of Plants and chemicalization,
Quarantine and Plant Protection, Ministry of Emergency
Situations of RT, Arhus Center, Republican Tropical
Center, Oblast, district organizations and environmental
NGOs.

Knowledge about the project

Mr. Zikirov and Mr. Juraev are fully informed on all project details.

Expectations

Mr. Zikirov is happy that his Committee will cooperate with the Dutch Experts in this project. He really finds it very important to solve the environmental and health problems of his country. According to Mr. Abdusalim Juraev Tajikistan needs 12 million Euro to clean up the Tajik obsolete pesticides stocks. The technical study could be an important starting point to start with this immense task.

Recommendations

Apart from the priority dumpsite in the Kathlon region it will be important to focus on the Bazhki Polygon and to design sound rehabilitation and or isolation plans for OP dumpsites.

In every region of Tajikistan there is at least one central store available that is still governmental property and can be used for intermediate storing of around 300 tons of local obsolete pesticides stocks. The existence of these stores should be involved in the inventory.

It will be very important to work with people from teams that already earlier have been involved in international obsolete pesticides projects. This in order to make use of the knowledge and experience that is already available in the country.

3.3 Stakeholder Meeting

3.3.1 Introduction

The meeting was arranged at the World Bank office in Dushanbe on June 22nd, 2009. During the whole meeting the translation was done by Mrs. Veronika Grushevskaya from English into Russian and Russian into English.

The meeting was opened by the chairman Mr. Abdusalim Juraev, the National Coordinator of the Stockholm Convention on POP's in the Republic of Tajikistan.

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Reference R003-4640777BFF-beb-V01

First all the participants introduced themselves and gave a short review on their involvement in the obsolete pesticides program in the Republic of Tajikistan. The participants are listed in table 3.1.

3.3.2 NIP of the Republic of Tajikistan

Mr. Abdusalim Juraev gave a presentation in which he explained how Tajikistan developed its National Implementation Plan under the Stockholm Convention on Persistent Organic Pollutants. The second part of the presentation by Mr. Abdusalim Juraev was the elaboration on the project carried out and still to be carried out. Furthermore a short explanation of the World Bank project 'OBSOLETE PESTICIDES TECHNICAL STUDY IN THE REPUBLIC OF TAJIKISTAN' was given.

For reference the short term goals of the Tajik NIP are:

First stage of NIP realization (2008-2013) Tajikistan plans:

- To elaborate a legislative and normative base in the sphere of POPs management
- Conduct measures on eradication of malaria pestholes by means of POPs free preparations
- Make an inventory of POPs wastes (obsolete and forbidden pesticides, including POPs and PCB containing ones) and complete assessment of uPOPs (dioxins and furans)
- Build capacity in the sphere of appropriate management of medical wastes
- Decommission of PCB and PCB-containing electrotechnical equipment
- Establish a POP monitoring system in the framework of the National Environmental Monitoring System
- Prepare a technical-economical assessment for determination of a optimal method of removal/elimination of POPs wastes and pesticides and soils mixtures
- Elaborate a technical economical assessment for conducting of works on appropriate remediation or liquidation of Kanibadamski ans Vashski pesticides burial places
- Public awareness raising on the POPs situation in the Republic of Tajikistan

All work under the Technical Study has to be in line with these short term and the more longer term goals of the Tajik NIP.

After a discussion on the stakeholders involvement in the current project Mr. Abdusalim Juraev invited Boudewijn Fokke to present the World Bank project.

3.3.3 The World Bank project 100020592

The first part of the presentation was a short introduction of the project. It was explained that the project is divided in 5 steps. Step 1, 2 and 4 concern the obsolete pesticide stores and stockpiles. Step 3 and 5 are focused on the Vakhsh burial site.

3.3.4 Online project platform

The project has its own project website. The address of the website for external use is:

<http://obsoletepesticides.net/>

3.3.5 Evaluation of the inception mission

The second part of the presentation contained the evaluation of the inception mission. In this part the following issues were presented and discussed:

- Finding after meetings with the different stakeholders
- Information gathered during the site visits of the stock and stockpiles on June 18th and 20th, 2009 in Khatlon Oblast
- Information gathered at the Vakhsh burial site
- The proposed stakeholders involvement
- The planning of the inventory training
- The selection of the participants for the inventory training

For the selection of participants for the above mentioned training Mr. Abdusalim Juraev and Mr. Kurbonali Partoev will select the 10 persons for the inventory training.

The training itself is planned in October 2009. Details about the exact date of the training are described in chapter 6.1. The presentation will be placed on the above mentioned project website.

3.3.6 Discussion

After the presentation a discussion about participation of the different stakeholders in this project and the different rehabilitation options of the burial site were discussed. The Tauw Consortium announced to inform Tajik stakeholders in a later stadium about possible tasks, deliverables, planning and the refunding of costs and expenses made for assisting the project team.

The input of the stakeholders for the stockpiles is listed in chapter 6.6 and for the burial site it is given in chapter 7.7.

Mr. Abdusalim Juraev asked Mrs. Takhmina Jumaeva representative of Mr. Bobojon Yatimov from the World Bank to have a short discussion about the involvement of the Committee of the Stockholm Convention in this project and if there is any budget to maintain and develop the Tajik Centre for the Implementation of the Stockholm Convention. Mrs. Takhmina Jumaeva promised to discuss this matter with her colleague Mr. Bobojon Yatimov and provide Mr. Abdusalim Juraev with an answer about the World Bank possibilities to support the Tajik Centre for the Implementation of the Stockholm Convention. Mr. Abdusalim Juraev proposed to plan a meeting with the World Bank to discuss about involvement of the Centre for the implementation of the Stockholm Convention. This to see if there is any possibility of budget for the Centre within the project costs.

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Reference R003-4640777BFF-beb-V01

Table 3.1 Participants stakeholders meeting

Name	Organization
1. Abdusalim Juraev Shoevc	Committee on environment protection National coordinator Stockholm Convention
2. Takhmina Jumaeva	World Bank
3. Bozorov Boinazar	Ministry of Agriculture
4. Firuz Abdulloevich Davlatov	Ministry of Health
5. Shomonov Pirnazar	State of sanitary and epidemiology
6. Marielle Leseur	OSCE
7. Alixhonova Tatiana	NGO Ecology Club
8. Soidora Hoxima Saidovna	Ministry of Emergency
9. Burkhanova Muazama	NGO Foundation to Support Civil Initiatives
10. Berdiev Pulat	Ministry of Agriculture Plant protection and chemicals
11. Simakin Nikoloya Vasilervich	Center for implementation Stockholm Convention
12. Bobritskaya Lydmila Sergevna	Center for implementation Stockholm Convention
13. Kurbonali Partoev	NGO Cooperation for Development, local representative of Milieukontakt
14. Berto Collet	Tauw bv
15. Boudewijn Fokke	Tauw bv

3.4 Evaluation of meetings with Tajik stakeholders

After the discussions with Tajik stakeholders the Tauw Consortium concluded that possibilities for constructive cooperation on obsolete pesticides problems with representatives from the Tajik State Committee for Environmental Protection & Forestry and other Tajik stakeholders are good.

It is however important to state that Tajik stakeholders were expecting from the current World Bank project some support for the maintenance of their Center for Implementation of the Stockholm Convention. The Tauw Consortium did not count with such expectations, because such things were not mentioned in the TOR.

In trainings and when occasionally local experts will be needed the Tauw consortium will work as much as possible with relevant Tajik experts that already earlier have been involved in international obsolete pesticides projects. This in order to make use of the knowledge and experience that is already available in the country. During the meetings the Tauw Consortium agreed with Mr. Abdusalim Juraev from the State Committee for Environmental Protection & Forestry that he will suggest in close cooperation with Mr. Kurbonali Partoev a group of ten candidates from a multi stakeholder background to take part in the inventory training. The needed input for the next steps of local expert is discussed in chapter 6.7 and 7.7.

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Reference R003-4640777BFF-beb-V01

4 Obsolete pesticides stocks and stockpiles

This chapter describes the situation in the obsolete pesticides stocks and stockpiles visited by the project representatives during the inception mission. Each description gives information about the location, the waste encountered and identified risks. To give a better understanding of the location and names of the sites we have given an overview the regional organization in the introduction and some basic information on the Khatlon Oblast.

4.1 Introduction

The objective of visiting these stores and stockpiles during the inception is to get an idea about circumstances of the obsolete pesticides in an around former pesticides store in the Khatlon Oblast. The information gathered will be used to adapt the inventory training to the situation in the Khatlon Oblast.

Tajikistan is divided into the following three Oblasts:

1. Khatlon Oblast in the South
2. Shugd Oblast in the North West
3. Badakhshon Oblast in the North East

Like all Oblasts in Tajikistan, the Kathlon Oblast is divided into 24 districts. These districts are presented in table 4.1.

Table 4.1 The 24 districts in Khatlon Oblast

Name of District	Name of District	Name of District
Baljuvon	Kulob	Farkhor
Bokhtar	Qabodiyon	Temurmalik
Vakhsh	Qumsangir	Khovaling
Vose	Muminobod	Khuroson
Danghara	Norak	Dzhami
Yovon	Nosiri Khirav	Jiikul
Rumi	Panj	Shahrtuz
Hamadoni	Sarband	Shuro-obod

Each district is again divided in clusters and a cluster consists of several villages. The name of the village will be used for identification of the stocks and stockpiles with obsolete stocks and stockpiles. The capital of the Khatlon Oblast is Qurghonteppa, the area of Khatlon is 24,800 km². The Khatlon Oblast is one of the most densely populated Oblasts of Tajikistan and has a population of 2,579,300. This results in a population density of 104.4 inhabitants per km².

During the Soviet era, Khatlon became one of the two main cotton regions in Tajikistan. The other one is in Sughd (Leninabad). Collectivization of agriculture was implemented in the early 1930s, to expand the extent of cotton cultivation in Tajikistan as a whole, with particular emphasis on the southern part of the republic. The process included substantial expansion of the irrigation network, and resettlement of mountain peoples and people from Uzbekistan to the lowlands.

The information gathered during the inception and presented in this inception report will help compiling the specific content of modules and teaching materials for the inventory class room and on the job training in such a way that the training is well adapted to the regional situation. The data gathered at the stocks and stockpiles is presented in the format as given below.

Information on stocks and stockpiles

1. Site number : Each store or stockpile gets an unique number
2. Name of the site : Each store or stockpile is given the name of the village where it is located
3. District : The district where the store or stockpile is located
4. GPS coordinates : The recorded x-, y- and z-coordinates with GPS if available
5. Distance to Dushanbe : Distance to the capital of the country in kilometers
6. Accessibility : Information is given about the road to the site and entrance of the site
7. Owner of site : The name of the organization, company or person owning the site
8. Date of visit :
9. Site description : Information about the physiographic position, the nearest possible receptors, the surrounding land use and the quality of the building are discussed briefly
10. Amounts : The identified quantities of obsolete pesticides, empty packaging and contaminated soil and materials
11. Risk : A brief qualitative description of the risks for the environment, livestock and human briefly

4.2 Obsolete pesticides

4.2.1 Site information Paiskambe 1 and 2

1. Site number : 1 and 2
2. Name of the site : Paiskambe 1 and 2
3. District : Vakhsh
4. GPS coordinates : Not recorded
5. Distance to Dushanbe : Around 150 km
6. Accessibility : Very good just 100 meters from a regional bituminous road
7. Owner of site : The store keeper is Mr. Uldesh Usupov and his phone number is 935 28 7105
8. Date of visit : June 18th, 2009
9. Site description

The site is owned by a farmer's organization and is located around 50 m south of a market place on the old airstrip. At the market place several bakers' ovens are present. Twice a week they make bread at market days. The land around the store is flat and in agricultural use for cultivation of rice and cotton. South of the airstrip/market is an irrigation channel and wet rice fields. East of the stores there are cotton fields, at the North there is a compound and a large irrigation channel and beyond the channel the village. At the West side is the regional road. The airstrip was used by air spraying aircraft for spraying the cotton fields by the Tajik plant protection institute. At this site there are two stores, the Paiskambe 1 store which was used for the storage of pesticides and the Paiskambe 2 store (see below). This second store is and was used for the storage of fertilizers. It seems that the Paiskambe 1 store is not in use anymore for storage of pesticides but only contains some obsolete agrochemicals. Although our visit was announced there was now key of the padlock of the entrance gate. Therefore we could not enter this Paiskambe 1 and verify the information of the people. During our visit farmers were loading fertilizers from the Paiskambe 2 store. The farmers allowed us to enter this store and besides the new fertilizers this store had obsolete pesticides. The sort and quantities are presented in table 4.1.

The stores are in a moderate to good condition. The roofs and walls are not damaged and inside the stores it seems dry.

Between the market place at the old airstrip and the store is a kind of basin which was used for mixing pesticides (figure 4.1 situation sketch and photo figure 4.2) in the old days. People have the suspicion that the basin is filled with contaminated soil. At a distance of 50 meters south of the stores an extended family is living in a compound. An irrigation channel with a dike is located just adjacent to this home.

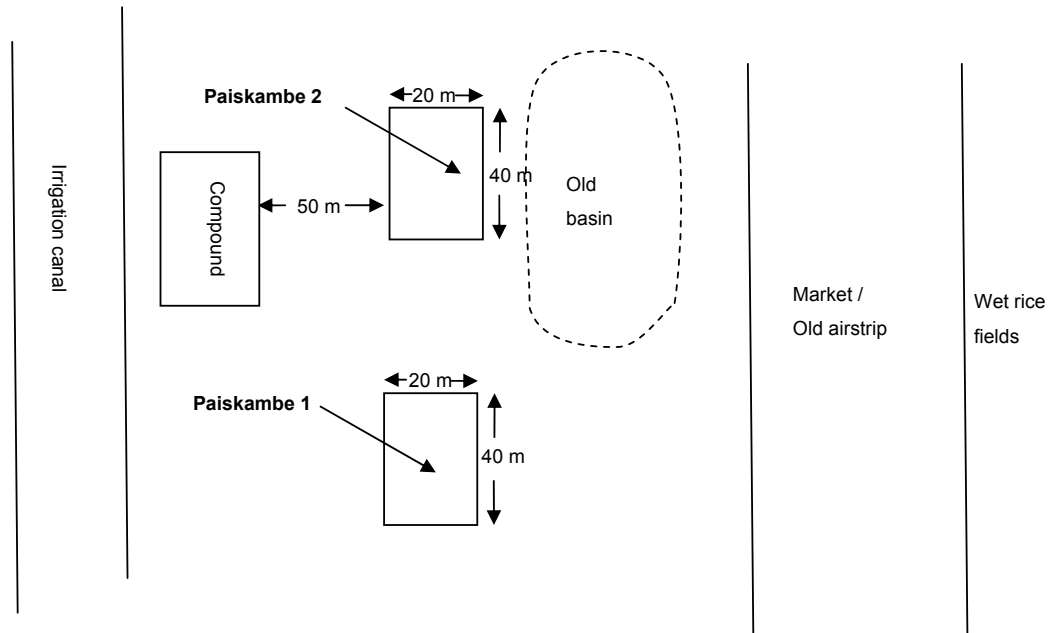


Figure 4.1 Situation sketch store 1 an 2 Paiskambe



Figure 4.2 Old basin and obsolete pesticides in Paiskambe 2

10. Amounts

In table 4.2 a rough estimate of the amount of obsolete pesticides is given. A more detailed estimation will be made during the on the job inventory training.

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Reference R003-4640777BFF-beb-V01

Table 4.2 Estimated amounts of obsolete pesticides in and around store 1 and 2 Paiskambe

Paiskambe 1	Powders kg	Liquids liter	Contaminated soil m³	Material m³	Contaminated empty packaging m³
In front near entrance	10 m ³ sulfur in bags	-	-	-	-
Inside store	3 m ³ unknown mixed obsolete pesticides	-	-	-	-
Paiskambe 2					
Left middle of store	1 m ³ Vitavak	-	-	-	-
Back of store (see photo 4.2)	0,5 m ³ unknown obsolete pesticides	-	-	-	-
Right hand side at the back	5 m ³ unknown obsolete pesticides mixed with DDT	-	-	-	-
Back of store	0,5 m ³ unknown obsolete pesticides	-	-	-	-
In front at the right hand side	2 m ³ unknown obsolete pesticides	-	-	-	-
In the former basin	-	-	500-1.000	-	-

11. Potential risks

Environment

The two stores contain a limited amount of unknown obsolete pesticides, although it cannot be excluded that in the obsolete pesticides store (Paiskambe 1) more pesticides are present than could be seen from the outside. If the stores are not used, migration of pesticides out of the stores is almost excluded, but during our visit people were loading fertilizers and the tractor with trailer was driving over the dispersed unknown powders. Limited amounts of obsolete pesticides may have spread in the environment due to the activities in these stores.

The suspected contaminated soil at the former basin can cause leaching and dispersal of the contamination into the environment due to infiltrating rainwater and wind erosion. As the area is flat severe runoff around the stores does not take place.

Erosion phenomena's were not observed in the direct vicinity of these stores and basin.

Livestock

Livestock cannot enter the stores because both stores are properly locked and therefore livestock does not come into direct contact with the obsolete pesticides in the store. However in the surrounding area, livestock roaming around these stores especially at the former basin can come into direct contact with the contaminated soil.

Human health

People are exposed to the obsolete pesticides when they are inside these stores. Men and children were loading fertilizers inside the store 2 at the time of the visit. Although not confirmed the suspected contaminated soil in the basin close to the market can form a threat for people present at the market place and the people living near the basin.

4.2.2 Site information Sadvinsovkhoz

1. Site number : 3
2. Name of the site : Sadvinsovkhoz
3. District : Vakhsh
4. GPS coordinates : Not recorded
5. Distance to Dushanbe : Around 150 km
6. Accessibility : Good adjacent the a bituminous road
7. Owner of site : Cooperation of 50 farmers
8. Date of visit : June 18th, 2009
9. Site description

The store is located at the outskirts of the village Sadvinsovkhoz. The surrounding land is in agricultural use as pasture and orchard. This store was used from 1967 till 1995 for the storage of fertilizers and pesticides. The obsolete pesticides present in 1995 were brought to a dumpsite. The larger part was used for fertilizers the smaller building annex to the main building was used for pesticides. The old fertilizer store is now used for the storage of agriculture tools, manure, fuel and fodder (see figure 4.4). According to information from local people obsolete pesticides were buried inside this fertilizer store. This can only be verified by soil drilling or digging at the suspected location inside the fertilizer store. The smaller annex, the former pesticides store, is now used as a stable for cattle. Six empty drums are the evidence of the former presence of obsolete pesticides in this store. The wooden floor, the walls and the soil under this floor, are contaminated with pesticides. An unpleasant smell was observed inside the annex building. The whole building, the former fertilizer and pesticides store, is dilapidated. The soil in front of the old stable is most likely contaminated.

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Reference R003-4640777BFF-beb-V01

10. Amounts stored

In table 4.3 a rough estimate of the amount of obsolete pesticides is given. A more detailed estimation will be made during the on the job inventory training.

Table 4.3 Estimated amounts of obsolete pesticides in and around store 3 Sadvinsovkhoz

Place	Powders kg	Liquids Liter	Contaminated soil m ³	Material m ³	Contaminated empty packaging m ³
Inside annex building	-	-	10 - 15 m ³	Contaminated wooden floor and bricks total around 5 m ³	6 drums of 30 liters
In front of annex building	-	-	Estimated minimum quantity 5 m ³	-	-

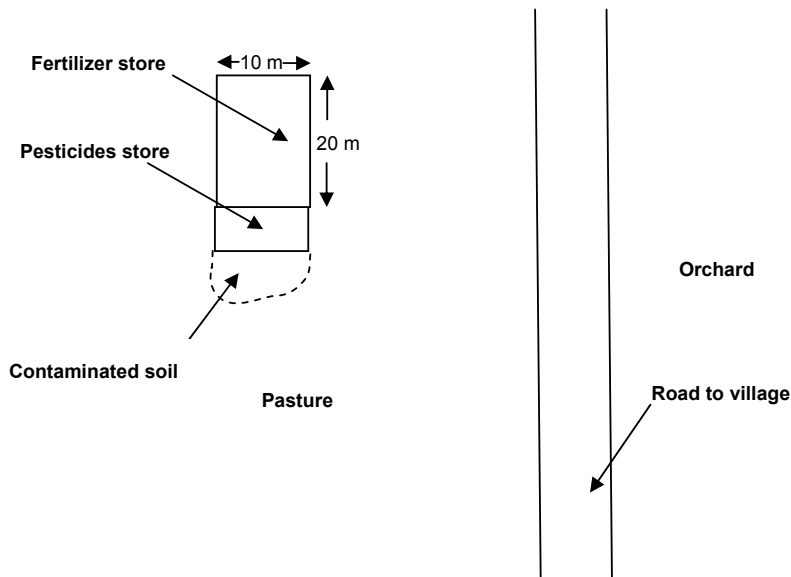


Figure 4.3 Situation sketch store 3 Sadvinsovkhoz

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Reference R003-4640777BFF-beb-V01



Figure 4.4 Storage of fodder in old fertilizer store and pasure with former pesticide store

11. Potential risks

Environment

The threat to the environment is limited because of there are no obsolete pesticides in the store accept for the 6 empty drums. The soil contamination in- and outside the store may migrate to the surrounding area due to leaching, surface water run off and wind erosion.

Livestock

Cattle using the annex building as stable have direct contact with contaminated soil and material in and outside the building.

Human health

The people taking care of the cattle come into direct contact with the contaminated soil and will inhale vapors and particles present inside the annex building. They might also be in contact via contaminated animal products (milk, meat).

4.2.3 Site information Kulyab

1. Site number : 4
2. Name of the site : Kulyab
3. District : Vakhsh
4. GPS coordinates : Not recorded
5. Distance to Dushanbe : Around .km
6. Accessibility : Good direct along a bituminous road
7. Owner of site : Private
8. Date of visit : June 18th, 2009

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Reference R003-4640777BFF-beb-V01

9. Site description

This former store is located in the village Kulyab. Access to this former store was not given by the people present at the site. The people said that there were no obsolete pesticides at this former distribution centre of pesticides and fertilizers.

Although asked several times no additional information was given.

4.2.4 Site information Zargar

1. Site number : 5
2. Name of the site : Zargar (Bakhtar district)
3. District : Vakhsh
4. GPS coordinates : Not recorded
5. Distance to Dushanbe : Around .km
6. Accessibility : Good store is connected to main road through well maintained dirt access road
7. Owner of site : Associated farmers
8. Date of visit : June 18th, 2009
9. Site description

This site is located in the center of flat agricultural area where cotton and fruits are grown. Near the store there were also two lorries parked loaded with beehives. In the past, the pesticides store was part of a large communal farm. Next to this store there is a well maintained cattle farm, the farmer is using the old fertilizers storage as barns. The old pesticide storage building is situated around 50 meters outside the farm. The pesticides store is collapsed; it has neither doors, nor windows nor frames. The roof seems still intact. The store has several different compartments with separate entrances. Inside the compartments are remains and empty packaging of pesticides on the floor, in the first compartment pesticides have been burned. Inside this compartment a strong smell was observed and it can only be entered with adequate respiratory protection. The area around the pesticides store is flat and no signs of erosion were observed. The soil is contaminated in front of the store and along the side where all the entrances are, there is not much vegetation growing on this contaminated soil in front of the entrances. People and cattle can freely enter the store and come into direct contact with the obsolete pesticides. Cow dung was observed around and inside the store.

10. Amounts stored

In table 4.4 a rough estimate of the amount of obsolete pesticides is given. A more detailed estimation will be made during the on the job inventory training.

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Reference R003-4640777BFF-beb-V01

Table 4.4 Estimated amounts of obsolete pesticides in and around store 5 Zargar

Place	Powders kg	Liquids liter	Contaminated soil m ³	Material m ³	Contaminated empty packaging m ³
Compartment in front	Pesticides 0,5 m ³	-	-	Burned wood and	-
Rest of the store	Mixed obsolete pesticides on floor minimum 1 m ³	-	-	Contaminated waste on the floor	Empty bags 0,5 m ³
Outside	-	-	Minimum of 5-10 m ³	-	-

11. Potential risks

Environment

The pesticides in the old store are being dispersed outside and have contaminated the soil, due to infiltration of the rainwater and melting water the contaminants will further spread into the soil. Wind will also transport contaminated soil and this soil will be deposited down wind. The amount of obsolete pesticides inside the store is limited, but especially the burned pesticides in the first compartment are most likely very toxic and these contaminants will ultimately end up in the environment.

Livestock

Livestock can freely enter the side and it is not excluded that farmers are using this store as shelter for their cattle in winter. Livestock do come into contact with these obsolete pesticides. Animal products might be contaminated as well.

Human health

If people enter the store they will come into direct contact with these obsolete pesticides. But due to wind erosion and dispersal and leaching of contaminated soil down gradient in the direction of the drainage people might get into contact with these contaminants.

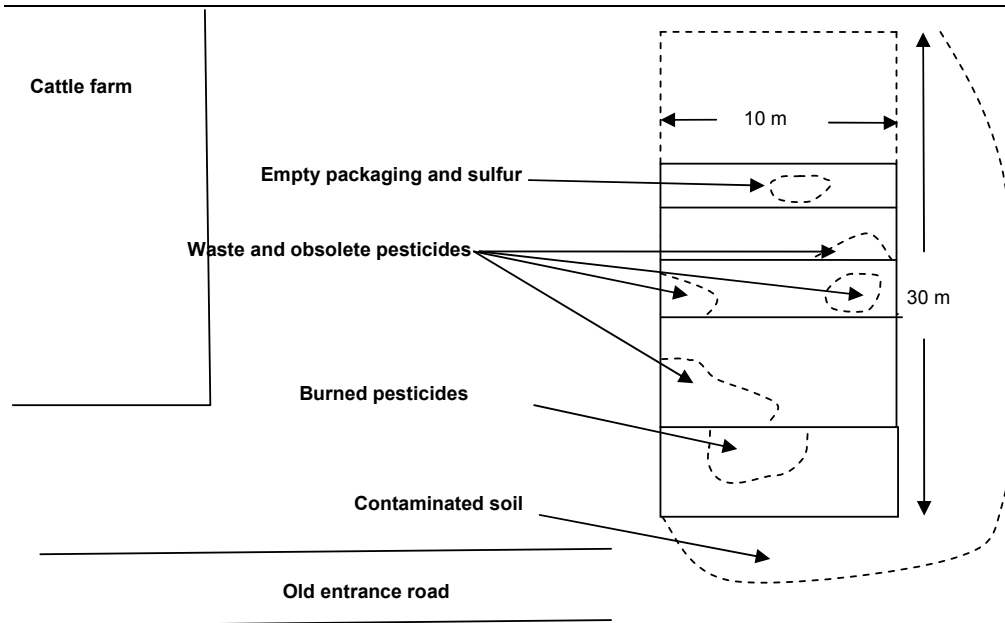


Figure 4.2 Situation sketch store 5 Zargar



Figure 4.5 Old pesticide store Argar and the burned pesticides inside

4.2.5 Site information Oikamar

1. Site number : 6
2. Name of the site : Oikamar
3. District : Khuroson
4. GPS coordinates : 38.030,300 N and 068.42,00 E and altitude above Baltic sea level is 510 meters
5. Distance to Dushanbe : Around 80 km
6. Accessibility : Near to the high way from Dushanbe in southern direction on the right hand side
7. Owner of site : Private
8. Date of visit : June 18th and 20th, 2009
9. Site description

Large quantities of fertilizers and pesticides were stored 4 large storage buildings from 1950 till 1993. The site was a regional distribution centre of pesticides and fertilizer. In 1983 a fire destroyed one of the stores and after the fire was extinguished the remains (> 1,000 tons) were buried in two pits at the site. The pits are lined with concrete and are each 12 meters wide, 40 meters long and 3-6 meter deep. The depth could not be verified.

This former distribution centre is sold, privatized and people have built living quarters and stables at the location of two former stores. One store is demolished except for the foundation and one is in use as stable for cattle. The burial site shows sinkholes and cracks (see photo 4,6) and is just adjacent a pond where children bathe and which is used for drinking water supply. Occasionally children do complain about smell of pesticides at the burial site. The pond will most likely be used for providing water for the cattle. The farmer spoken, had complains about smell and suspected that some cattle were sick because of the contamination present at the site.

10. Amounts stored

In table 4.5 a rough estimate of the amount of obsolete pesticides (waste) is given. A more detailed estimation will be made during the on the job inventory training.

Table 4.5 Estimated amounts of obsolete pesticides in and around store 6 Oikamar

Place	Powders kg	Liquids Liter	Contaminated soil M ³	Material m ³	Contaminated empty packaging m ³
Burial site			?	> 3,000 m ³	

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Reference R003-4640777BFF-beb-V01

11. Potential risks

Environment, Livestock and Human health

The families living at this compound are directly exposed to the contaminants via several exposure routes. Via leaching with rain- or melt water the contaminants will migrate into the surface of the pond (see photo 4.6) and in the direction of the groundwater. Children are playing in the pond and rooming around; the surface water also is used as drinking water for humans and cattle. The risk for the environment, livestock and humans is probably acute due to the use of the surface water in the pond adjacent to the two pits with buried burned pesticides and waste. The surface water was sampled and the water sample was analyzed to verify if the suspicion of the presence of pesticides. The results will be reported in the next report.

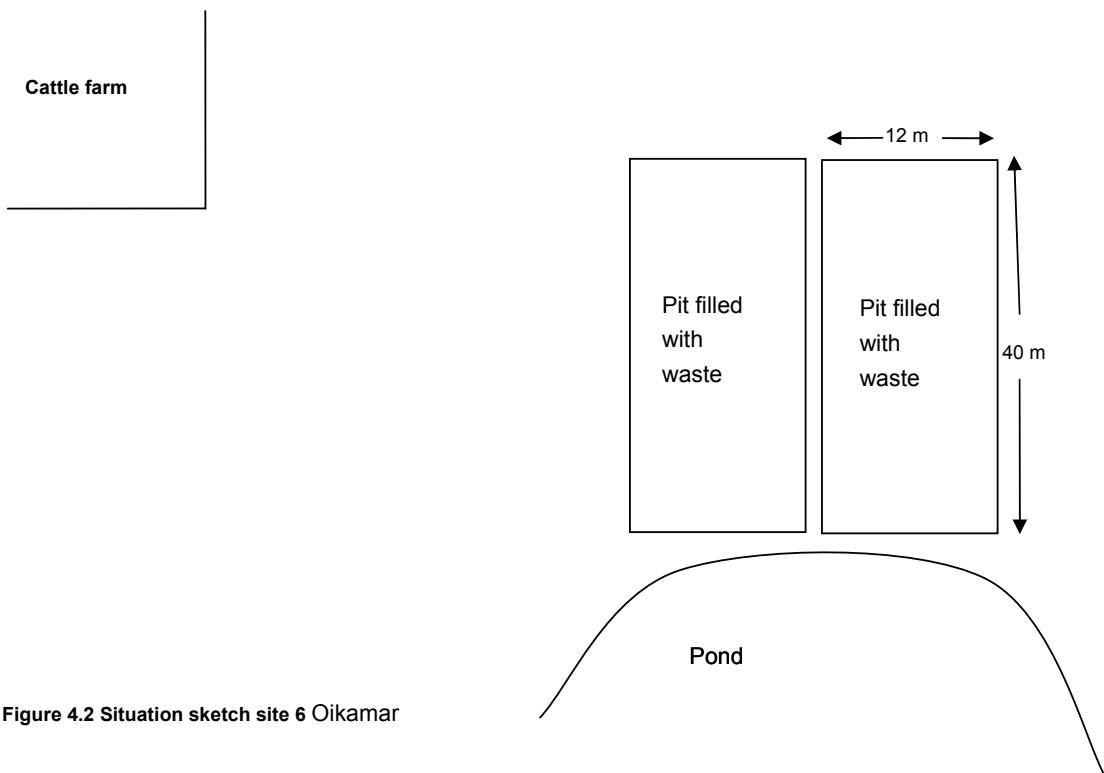


Figure 4.2 Situation sketch site 6 Oikamar

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Reference R003-4640777BFF-beb-V01



Figure 4.6 Pond with children playing adjacent to the two waste pits and sinkhole in waste dumped waste

4.2.6 Site information Kurgantuba 1

1. Site number : 7
2. Name of the site : Kurgantuba 1
3. District : Vakhsh
4. GPS coordinates : 42° 30' 08" N and 78° 29' 07" E
5. Distance to Dushanbe : Around 120 km
6. Accessibility : Asphalt road/last part unpaved road
7. Owner of site : Private
8. Date of visit : June 20th, 2009
9. Site description

This site is part of the former central storage in the Vakhsh region named Kurgantuba. At this part of the site there are eight places where pesticides were stored. Two sheds are still in quite reasonable condition and have concrete floors. At two other places the sheds are partly demolished in these sheds pesticides are buried in two concrete basins. It's not clear if the basins have a concrete floor. There are also drums with pesticides in these sheds. Connected to these sheds there is a newly constructed house where a young family is living. They are complaining about the pesticide smell. Furthermore there are three former above ground storage tanks. In the past these tanks were used for the storage of fuel, now they are partly filled with pesticides. Next to the home of the young family there are two rooms with a concrete floor used for storage. In these rooms there is also some small amount of pesticides stored. There is a room used for mixing of pesticides with a metal drum with pesticides. For an overview of the different storage places see the pictures of figures 4.7 and 4.9.

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Reference R003-4640777BFF-beb-V01



Figure 4.7 F Right shed 1 and above ground tanks at the back shed 2 and overview of the room where pesticide mixing took place



Figure 4.8 Overview shed 3 and 4 at the back left and overview backside storage room 1 and 2

10. Amounts stored

In table 4.6 a rough estimate of the amount of pesticides of each place is given. A more detailed estimation will be made during the inventory on the job training.

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Table 4.6 Estimated amounts of obsolete pesticides in and around store 7 Kurgantuba 1

Place	Powders kg	Liquids liter	Contaminated soil M ³	Material m ³	Contaminated empty packaging m ³
Shed 1		30 liters		3 above ground tanks	13 barrels 150 liters 5 barrels 200 liters
Shed 2					
Shed 3 near house					
Shed 4 near house					
Room 1 near house					
Room 2 near house					
Mixing room					

11. Potential risks

Environment

The obsolete pesticides are either in containers, damaged packaging or damaged containers or without packaging. The pesticides are lying around at different places as shown on the pictures. The pesticides in the open air form a direct threat to the environment. The obsolete pesticides will be washed out by melting water and rain water and the water will infiltrate in the soil. It's not clear if pesticides have already polluted the shallow groundwater. Dust contaminated with pesticides will be transported by wind and deposited elsewhere.

Livestock

This part of the central storage is not in use and it is not likely that cattle will be present at this part. There are no direct risks for cattle on the site itself. But there are risks for direct contact with other livestock and animals (dogs, birds et cetera) because they can enter freely this site.

Human health

The people who are living near the storage places especially near the partly demolished sheds are in direct contact with the pesticides. Adults and children working and playing near and on this site will inhale vapors, dust polluted with obsolete pesticides and ingest contaminated soil and pesticide dust. The people are complaining about the smell especially during hot days. Also the other storage rooms are directly connected with the living house see picture 4.9.

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Reference R003-4640777BFF-beb-V01



Figure 4.9 Overview of shed 4 with the owner of the living house next to the shed

4.2.7 Site information Kurgantuba 2

1. Site number : 8
2. Name of the site : Kurgantuba 2
3. District : Vakhsh
4. GPS coordinates : 42° 20' 51" N and 78° 01' 50" E
5. Distance to Dushanbe : Around 120 km
6. Accessibility : Asphalt road/last part unpaved road
7. Owner of site : Private
8. Date of visit : June 20th, 2009
9. Site description

This site is the second part of the former central storage named Kurgantuba 2. This second part has one room in good condition with a concrete floor where obsolete pesticides are stored in original packaging (big quantity of DDT) and other pesticides. Next to this room there is a shed in bad condition; here pesticides spread on the floor are visible. Also equipment for the preparation of pesticides is stored here. At another place at this site there are two rooms for the storage of new pesticides. A big quantity of the pesticides was donated by FAO including spraying equipment and personal protection equipment. For an overview of the different storage places see pictures of figure 4.10 and 4.11. Contaminated empty packaging was spread over the entire site.

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Figure 4.10 Overview of the room with big quantity of DDT and of the shed the wall at the back is completely gone

10. Amount stored

In table 4.7 a rough estimate of the amount of pesticides of each place is given. A more detailed estimation will be made during the inventory on the job training.



Figure 4.11 Overview of the other room with new pesticides

Table 4.7 Estimated amounts of obsolete pesticides in and around store 8 Kurgantuba

Place	Powders kg	Liquids liter	Contaminated soil m ³	Contaminated empty packaging m ³
Room (big quantity DDT)				
Shed				
Room 1 new pesticides				
Room 2 new pesticides				
Outside				

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Reference R003-4640777BFF-beb-V01

11. Potential risks

Environment

The shed is in a bad condition the wall at the back is completely gone. Rain, snow and wind can freely enter the building. Dispersion, leaching and migration of obsolete pesticides in the surrounding environment will take place.

Most likely the soil is already polluted due to spreading of the obsolete pesticides.

Livestock

This part of the central storage is not in use and it is not likely that cattle will be walking around on the site. There are no direct risks for cattle on the site itself. But there are risks for direct contact with other livestock and animals (dogs, birds et cetera) because they can enter freely this site.

Human health

People working at the site will inhale dust particles polluted with obsolete pesticides and vapors.

People also use empty contaminated drums at the site for different purposes e.g. they build a shower with an old tank and some drums see picture 4.12.

4.3 Evaluation

According to the Tajik National Implementation Plan significant amounts of OPs and POPs from the Kathlon region are already moved to the Vashk dumpsite in recent years. Consequently in a lot of old storages there are no or very limited amounts of OPs and POPs to be found. This situation was confirmed during the inception mission site visits. In five of the eight OPs storages that were visited no or very limited amounts of OPs were left. The soil of all these storages however is seriously contaminated. Consequently the Tauw Consortium recommends extending the inventory in the Kathlon region with a soil survey training at the involved stores, in order to identify the possible risks and design a sound solution to eliminate the acute risks for public health and the environment.

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Reference R003-4640777BFF-beb-V01



Figure 4.12 Shower partly constructed from empty drums / tanks used to store pesticides

5 Vakhsh burial site

5.1 General introduction

During the inception mission the Vakhsh burial site has been visited on June 18th and 20th, 2009.

On June 18th the site was visited by the following persons:

- Mr. Dostiev Saidkul Huseinovish, Director of the Vakhsh burial site
- Mr. Kadirov Movon Hanonovich, Deputy Head of the Plant Protection and Agro-Chemicals in the Khatlon Oblast
- Mrs. Ludmila Bobritskaya, Centre for the implementation of the Stockholm Convention
- Mr. Berto Collet, International Team member
- Mr. Marten van der Wijk, International Team member

During the first site visit the burial site and its direct surrounding are inspected during a walk along the perimeters of the site. During the site inspection the local stakeholders were interviewed with regards to former operations and the local conditions. After this inspection the international team members have taken 7 products samples from the different pits, wearing their full set of PPE. Also topsoil and sediment samples were taken outside the perimeter of the site.

On June 20th, 2009 the site was visited for a second time and an interview with a former site engineer/operator was held. This time the site was visited by:

- Mr. Abdusalim Juraev, Focal Point Stockholm Convention
- Mr. Khasanov, Head of the Plant Protection and Agro-Chemicals in the Khatlon oblast
- Mr. Dostiev Saidkul Huseinovish, Director of the Vakhsh burial site
- Mr. Kurbonali Partoev, National Team member
- Mr. Berto Collet, International Team member
- Mr. Boudewijn Fokke, International Team member

After an interview with the former site engineer the burial site was visited again on June 20th, 2009. Based on the evaluation of the preliminary results as obtained on June 18th, 2009 a couple of additional soil samples are taken during the site visit as well as a surface water sample down gradient of the site.

5.2 Site introduction

The burial site is situated approximately 5 kilometers east of the city of Vakhsh. The city of Vakhsh is one of the major cities in the Khatlon region in the south-western part of Tajikistan. The city is situated around 40 kilometers north of the border with Afghanistan. Geographically the area is located in the valley of the Vakhsh River, one of the major trans border rivers of Tajikistan.

Table 5.1 contains site specific data for the Vakhsh burial site.

Table 5.1 Site specific data

Name of the site	Vakhsh burial site
Oblast	Kathlon
District	Vakhsh
GPS coordinates	37° 42' 51.77" N and 68° 54' 54.52" E
Distance to Dushanbe	Around 120 km by road
Accessibility	Asphalt road last 400 meters good accessible dirt road
Owner of the site	Local authority of Vakhsh
Date of visit	June 18 th and 20 th , 2009

Extensive agricultural production in irrigated plains of the Vakhsh River in Soviet times and the neglect of environmental concern, combined with poor environmental awareness and planning, created a major environmental hotspot at the burial site, making it a legacy of the past. This legacy can be hardly dealt with, in the current situation of post civil war devastation and economic hardships. Huge amounts of obsolete and banned pesticides were dumped 5 km from the city of Vakhsh (approximately 20,000 inhabitants) in cattle raising area and a few kilometers upstream of an agricultural area with irrigation channels which eventually drain to the Vakhsh river system. The dumping started in 1973 and it continued to 1990 when disposal was definitely held.

The regional position of the Vakhsh burial site is presented in figure 5.1. In this figure the position of the burial site relative to the city of Vakhsh and the irrigated area to the west can also be observed. The position of the burial site is presented as a blue line indicating the perimeter of the site, just east of the last 'H' in the name Vakhsh.

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Figure 5.1 Regional position of the burial site

Although the Vakhsh dump site is at present completely unmanaged with only very limited control by local institutions, there is evidence that the site was constructed on the basis of a design which addressed the main forces (surface runoff and erosion) threatening structural integrity of the site. An interview with the former site engineer made however clear that site operations were quite opportunistic aiming at volume reduction through burning and crushing of the drums and bags. It is clear that the site was fenced and that a security guard was on duty until 1990. Although effective management has ceased at present, the former director and 2 of his employees are still considered to be responsible for the site.

After the collapse of the Soviet Union, efforts to secure the site ended, the fences were stolen and local people (and their herds) could easily enter the dump site. From the measures to control surface water run off, the terraces on the slopes above the burial site are still present. Although the trees are gone and degradation of the terraces has started. All efforts and inputs to start a forestation on these slopes have ceased to exist.

At present the Vakhsh burial site has assumed a top priority for the response action in the National Environmental Action Plan and in the context of preparatory activities under the POPs Stockholm Convention on Persistent Organic Pollutants (POP). Given the absence of monitoring and correct management of wastes, a considerable potential exist for spreading of contamination away from the designated area towards the direct surroundings and in habited areas.

5.2.1 Specific site introduction

The burial site is situated on the floor of a small dry valley just left and right of the midstream. The entrance to the valley corresponds with the entrance of the burial site. The watershed area of this small valley is approximately 55 hectares. The lowest 6.5 hectares of the valley floor are covered partly by the burial site.

The small valley is part of a dendrite drainage system of interconnected valleys. The valley floor is located at approximately a height of 475 meter and the ridges of the surrounding hills at approximately 520 meter. The dendrite system slopes in a southern direction towards a small tributary of the Vakhsh River. The plain of this river is situated at a height of approximately 425 meter. The distance between the valley where the burial site is situated and this river plain is around 7 kilometers. From aerial photo's it can be observed that in the last 3.5 kilometers of the valley system a small stream of surface water is present which enters the small river to the South.

The hills where the burial site is situated were scarcely vegetated with grass type vegetation. Almost no shrubs or trees were observed. The top soil consists of löss deposits. During the site visits evidence of different types progressive surface run-off were observed such as sheet erosion and the first evidences of gully erosion (in a gully just above the upper end of the burial site). The annual precipitation is approximately 400 mm and it is anticipated that this quantity is concentrated during relatively short periods of intense rainfall (has to be confirmed, as well as the annual distribution). During the site visit in June almost all vegetation was severely impacted due to the lack of water (dry period) and the topsoil was susceptible to wind erosion.

Given the slope of the hills, the lack of vegetation and the type of topsoil it is anticipated that the intense rain storms will result in a surface runoff through the dry valleys of the dendrite valleys in the direction of the small river to the South. An observed sediment layer on the valley floor downstream of the burial site indicates that this surface runoff indeed occurs from time to time.

Although we don't have the access to detailed geological information at the moment we obtained oral information during the site visits that in the direct surrounding of the burial site a thick layer of löss was observed during a drilling and that in the top 60 meters no groundwater was observed. During the first site visit we were informed that a groundwater well at approximately 2 kilometers distance is present. The details of this well can provide more exact knowledge about the local geological circumstances.

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During the dry hot summer period the topsoil is susceptible to wind erosion. During the site visits small twisters were observed which picked up dust from the topsoil. It is also known that in the south of Tajikistan sand storms occur. Exact information with regards to wind patterns and force need to be assessed in more detail. Although local people indicated that a prevailing wind at the burial site is directed to the city of Vakhsh.

In figure 5.2 the local position of the burial site in relation to the dendrite valley system and the small river to the South is presented.



Figure 5.2 Local position of the burial site

As described before the burial site is situated at the floor of a narrow dry valley. The burial site consists of a total of 51 trenches. Each trench has a length varying between approximately 20 and 30 meters. The depth of the trenches varies between 2 and 3 meters. The width of the trench is normally between 4 and 5 meters. The total volume of the trenches is roughly estimated between 10,000 and 20,000 m³. The trenches are present in an area of approximately 100 by 800 meters. The position of the burial site and the trenches is presented in figure 5.3.



Figure 5.3 Position of the burial sites and the trenches

In figure 5.3 the position of the burial in relation to the watershed is also presented. Also the earlier discussed terraces on the slopes of the hills alongside the burial side can be observed. But most important it can be observed in this figure that the trenches were subject to intense digging. This digging is illegal and related to the selling of pesticides on the regional and world market.

During the first site visit it was observed that the trenches in general don't have concrete side walls or tops. Only in two trenches concrete structures were observed. Originally the pesticides in the trenches were covered with a top layer of 1 meters of soil. The intense digging has resulted in open pits where storm water runoff can accumulate. In the open pits quantities of pure pesticides as well as soil impacted by pesticides was observed.

In figure 5.4 a photo overviewing the burial site is presented.

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Figure 5.4 Photo of the total burial site

In the TOR it was mentioned that the burial site contains between 3,000 and 7,500 tons of obsolete pesticides. The NIP mentions a quantity of 7,500 tonnes. During the site visits a total amount of 9,500 tonnes was mentioned to be present. Given the anticipated volume of the trenches a quantity between 7,500 and 9,500 tonnes sounds realistic although needs to be confirmed. It has also to be assessed what quantity of pesticides is still present, after the illegal digging.

During an earlier investigation 20 types of pesticides were identified in the soils, including six POP pesticides. During the visual inspection of the trenches different observations were made of original packaging of the buried obsolete pesticides. In figure 5.5 these observations are presented. The presence of the pesticides in the open air also results in a distinct pesticide smell.

Based on these observations the presence of the following pesticides is confirmed positively:

- DDT
- P4
- Alepon
- Kotoran

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Figure 5.5 Six photo's presenting observed original pesticide packaging

During the site visits the director of the burial site indicated that approximately 3,000 tonnes of DDT was buried in three to five dedicated trenches. Observation by the international team members confirmed this information. In general pesticides are buried in separated batches. Although due to the digging and former operations mixing of batches can't be ruled out.

Although the arid hill sides were sparsely vegetated during the site visits in June the area around the burial sites is used for cattle (cows and sheep) grazing. In the area a cattle head of 20,000 pieces is present. At a distances of approximately 1,500 meters several larger farms can be observed, also there is evidence that in the area watering points for the animals are present.

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In how far the cattle farming is organized on individual or collective basis is not clear yet. During the site visits a farmer was observed with a flock of approximately 50 cows on the edge of the burial site. Also footprint evidence was observed that cattle is passing the burial site itself. Local stakeholders confirmed that the cows are drinking from time to time also accumulated rainwater from the open pitches. The remains of a dead cow were observed at the perimeter of the burial site. It is not clear yet if the trespassing of the burial site is limited to an exclusive herd or that multiple herds are trespassing the burial site.

Although the semi-arid surrounding of the burial site did not show a abundant flora and fauna, observations of foxes, vultures and lizards as well as observed digging activities of rodents and other small animals are indications that pesticides can enter the surrounding environment through this food chain as well.

In general it can be concluded that the illegal digging, re-use and re-sale of pesticides expose the rural population to a significant health risk and creates even more favorable conditions for pollutant transfer into the environment. The burial site is a significant hot spots site were due to the digging direct contact with the pesticides is possible on a large scale.

5.3 Assessment

As observed pesticide powder is entering the environment directly due to the digging and opening up of the original packaging. From the observation it is clear that obsolete pesticides are entering the environment and the food chain. The exposure to the environment will increase if adequate actions are not on short notices taken.

Given the observations thus far it is clear that at the burial site pesticides causing a toxicological effect and / or carcinogenic effect are present. These risks for humans are related to: dermal contact, ingestion of contaminated soil and to dust inhalation. These risks can be significantly reduced by preventing the access to the dump site to humans. Fencing will also block the entrance for the cattle and prevent in this way indirect contaminations to humans (food chain).

Dust and vapors originating from the burial site can also effect the population of Vakhsh and surrounding villages. Which areas can be affected by dust and vapor emissions and related toxic and carcinogenic effects has to be studied in more detail. Earlier studies on the comparable Kanibadam burial site suggest however that those effects can cover areas several kilometers from the burial site itself.

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It is clear that a potential cattle herd of 20,000 pieces can be affected by the burial site. Direct contact with the pesticides at the burial site is the most significant cause for risk, but is most likely limited to a much smaller amount of cattle. Apart from direct contact, herd trespassing the burial site can also use accumulated rain water in the open trenches as drinking water. Contamination can by the cattle enter the food chain or may even cause direct death of cattle.

As long as direct contact possibilities exist pesticides can also enter the environment, via the food chain of the local wildlife.

Due to the thick unsaturated layer and the presence of löss it is anticipated that the groundwater quality is not affected by the burial site. Although the actual groundwater level in the region has to be checked on the basis of existing ground water wells. It may be clear that accumulated rain water in the open ditches enhance infiltration of this rain water to the subsoil. To minimize this infiltration it is recommended to fill up the holes on short notices as well as surfacing of the terrain.

Apart from direct contact possibilities of humans and live stock it is clear that rainwater runoff from the burial sites introduce a major risk to the environment by spreading of contaminated water and sediment to the lower parts of the dendrite valley system and eventually the river and irrigation systems down gradient of the valleys. Evidence of continuous surface runoff effects have been observed along the complete longitude of the dendrite valley system. Due to this spreading indirect contact with contaminations can occur in a potentially significant larger area (cattle farms, irrigation and river system down gradient). Diversion of storm water runoff is recommended on short notice.

5.4 Actions already executed

During the inception mission the site was visited and inspected on June 18th and 20th, 2009.

During both days national and local stakeholders have been co-visiting the sites. During the site visits oral information has been transferred. This information has been included in this inception report. No digital or hardcopy information has been obtained thus far.

During the site visits a photo inspection of the site was conducted along a visual inspection of the trenches and the burial site. During the visual inspection a total of seven soil samples have been taken from the pesticide products in the different trenches. This inspection has been carried out in accordance with the draft HSE Plan. See appendix 2 for the HSE Plan.

After the visual inspection of the burial site a total of seven top soil samples have been taken on the slopes outside the perimeter of the burial sites to assess the first impact of wind blown erosion.

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In the area down gradient of the burial site a total of six soil samples have been taken to assess the effect of spreading by storm water runoff and related sediment erosion.

Approximately 4 kilometers down gradient of the burial site a surface water sample is taken in the small stream present at the local valley floor.

In figures 5.6 to 5.9 the positions of the different sampling points are presented.



Figure 5.6 Position of the sampling points

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Figure 5.7 Position of soil samples around burial site



Figure 5.8 Position of sediment samples down gradient of the burial site (2 sediment samples more down gradient are not included on this map)

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Figure 5.9 Position of surface water sample

A total of six pesticide samples, one water sample and nine soil samples have been sent to the Moldavian lab for analysis. The remaining samples are available for additional analysis on physical and environmental parameters.

A sample taken from standing water at the burial site was taken earlier by Mr. Kurbonali. This sample is also sent to the lab for analysis.

With the first analytical results step 3.2 and 3.3 (drafting of field investigation plan) of the project can be finalized. And remaining field activities implemented.

In addition two bulk samples and two undisturbed soil samples from the topsoil are taken to be used in future for the assessment of the erodibility of the soil.

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6 Next steps stocks and stockpiles

The next steps (1 and 2 of the project), the training and workshop are described in this chapter (especially in the paragraphs 6.1 till 6.4). The description includes the adapted timeframe of the training and workshop, a summary of the most important issue to be addressed in the training and needed input of the stakeholders.

6.1 Program training and workshop

6.1.1 Inventory training

The program and adapted planning for the training and workshop in Tajikistan is summarized below.

First week Inventory classroom training TJ

- Day 1: Monday (05-10-2009) (Berto and Kurbonali)
 - Opening and introduction for trainees and stakeholders Module 1
 - Introduction to Stockholm Convention for trainees and stakeholders Module 1
 - Classroom training Health and Environmental hazards Module 2
- Day 2: Tuesday (06-10-2009) (Berto and Kurbonali)
 - Classroom training inventory process Module 3
 - Classroom training Personal Protection Equipment theoretical Module 4
- Day 3: Wednesday (07-10-2009) (Berto and Kurbonali)
 - Classroom training Personal Protection Equipment theoretical Module 4
 - Classroom training Introduction PSMS Module 3 a and b
- Day 4: Thursday (08-10-2009) (Berto and Kurbonali)
 - Classroom training Exercise PSMS forms Module 3 a and b
 - Classroom training introduction to field tests Module 3C
- Day 5 Friday (09-10-2009) (Berto, Kurbonali, Wouter and Boudewijn)
 - **Presentation results inception mission to trainees and stakeholders**
 - **Workshop for whole group including interested stakeholders:**
 - **Inventory and use PSMS**
 - **Environmental risk assessment**
 - **Field tests training**
 - **Soil survey training**
 - **Clean up strategy**
 - **Regional approach**

Second week Inventory training on the job TJ

- Day 6 Monday (12-10-2009) (Berto and Kurbonali)
 - Classroom training introduction on soil survey at stores and dumpsites
- Day 7 Tuesday (13-10-2009) (Berto and Kurbonali)
 - With whole group visits representative stores in Khatlon region for group training on the job EH&S, inventory, PSMS, obsolete pesticide sampling and field tests
- Day 8 Wednesday (14-10-2009) (Berto and Kurbonali)
 - Five teams have training on the job on EH&S, inventory, PSMS, obsolete pesticide sampling and field tests at stores in Khatlon region
- Day 9 Thursday (15-10-2009) (Berto and Kurbonali)
 - Five teams have training on the job on EH&S, inventory, PSMS, obsolete pesticide sampling and field tests at stores in Khatlon region
- Day 10 Friday (16-10-2009) (Berto and Kurbonali)
 - Five teams have training on the job on EH&S, inventory, PSMS, obsolete pesticide sampling and field tests at stores in Khatlon region

Module 5

Third week Inventory training on the job TJ

- Day 11 Monday (19-10-2009) (Berto and Kurbonali)
 - Evaluation on inventory training and results on field forms
 - Evaluation on uploading data inventory from filed forms in PSMS
 - Evaluation on field tests training
 - Evaluation on results environmental risk assessment
- Day 12 Tuesday (20-10-2009) (Berto and Kurbonali)
 - Whole group site visits representative stores in Khatlon region for group training on soil survey (making soil observations, soil description, soil sampling and mapping)
- Day 13 Wednesday (21-10-2009) (Berto and Kurbonali)
 - Five teams have training on the job on soil survey at stores in Khatlon region (making soil observations, soil description, soil sampling and mapping)
- Day 14 Thursday (22-10-2009) (Berto and Kurbonali)
 - Whole group site visit Vakhsh dumpsite or group training on soil survey (making soil observations, soil description, soil sampling and mapping)
 - Evaluation of training and presentation of the Certificate to participants (Berto, Kurbonali and Minister of Environment Protection of RT)
- Day 15 Friday (23-10-2009) (Berto and Kurbonali)
 - Whole group site visit Vakhsh dumpsite or group training on soil survey (making soil observations, soil description, soil sampling and mapping)
 - Evaluation of training and presentation of the Certificate to participants (Berto, Kurbonali and Minister of Environment Protection of RT)

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6.1.2 Stakeholder workshop

The objectives for the Stakeholder workshop in Dushambe on Friday October 9th 2009

In order to make a good start with the project and gather all data the Tauw consortium organized an inception to Tajikistan (for the program see chapter 3). Representatives met with Tajik governmental and non-governmental stakeholders. Visits were made to obsolete pesticides stock and burial sites in the country. This, in order to have a clear picture of the obsolete pesticides problems Tajikistan is facing. This inception report describes the first impressions of the different experts of the Tauw consortium.

The inception report will be presented to Tajik stakeholders in a DRAFT version (A Russian translated version will be sent to Tajik stakeholders prior to the workshop). The Tauw Consortium wants to verify with Tajik stakeholders whether this impressions and first description of the problems around obsolete pesticides are correct. During the stakeholder workshop the Tauw consortium will present the report and discuss its outcomes. Tajik Stakeholders will be invited to review the report and if necessary suggest corrections and improvements.

As a final step the Tauw consortium will include the comments, corrections and recommendations from Tajik stakeholders and publish a final version of the report.

6.2 Inventory and soil survey training

Conclusions made on the basis of the inception mission are: that limited amounts of obsolete pesticides are present in the stores of the Khatlon Oblast, but there are significant quantities of residual pollution (soil and building materials). Therefore the scope of the training with respect to the residual pollution (soil and building materials) is adapted. A soil survey module is tailor made and training comprises lecture on the following issues:

- Migration/transport of contamination
 - Infiltration in soil
 - Migration in groundwater
 - Dispersion by wind
- Risks due to contamination
 - Exposure points
 - Concentration
 - Exposure routes
- Reducing risks
 - Soil survey at contaminated sites
 - Identifying contaminated topsoil
 - Topsoil survey strategy
- The decision: relative soil quality
- Care for the rest of the site

- Follow-up measures - remediation:
 - Guidelines for removal of soil
 - Field approach remediation
 - Follow-up measures
 - Future excavation

The future clean-up program will include repackaging of obsolete pesticides but also site specific soil (topsoil) remediation. The future repackaging and the soil remediation should be focused on the risk reduction in an appropriated and sustainable way.

6.3 Risk assessment training

The training will include the analysis of risks of the pesticide stores using the FAO online tool PSMS. The risk analysis can be used as a tool for store prioritization. This can imply pinpointing the store with the highest environmental risk or the highest hazard posed by the materials in the store. Another aim of the risk analysis can be the selection of an Intermediate Collection Centre (ICC) for the collection of repacked OPs (preferably a store with low environmental risk).

In order to facilitate the understanding of the results of the risk analysis, some of the basic principles of the risk analysis with PSMS are briefly explained.

With PSMS a risk analysis stores is based on two risk factors the:

- F_e The risk factor for the environmental
- F_p The risk factor for the hazard posed by materials

The risk factor F_e for the environmental conditions reflexes e.g. the conditions of the store and distance to nearest settlement etc. The risk factor F_p for the hazard posed by materials reflexes the hazard posed by materials such as the pesticides and the contaminated soil in the store. Factor F_p is determined by the amount of pesticide and the toxicity of the pesticides stored. If a high percentage of the pesticides cannot be identified, F_p is mainly determined by the amount of pesticides (and contaminated soil) in the store. This is because the same (worst-case) toxicity is assumed for unknown pesticides during risk analysis with PSMS.

During the risk analysis with PSMS the F_p scores of the individual stores are expressed in relation to the highest value for F_p encountered during the inventory. This implies that a comparison of risk scores can be strongly determined by the amount of pesticides in the individual stores. This means that it can be necessary to treat some of the stores as outliers in order to come to a more balanced outcome of the risk analysis.

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It has to be noted that the risk analysis in PSMS is carried out per individual store (and not per site, which might comprise several stores) and therefore the results of the risk analysis might not be plausible at first sight. The results of a store assessed with PSMS is relative, the stores will be ranked in relation to risk of the other stores.

The main aim of the training is to train local people in Tajikistan in order to address risks of OP stocks adequately. The inventory of the stocks aims at safe repackaging and disposal of the pesticides. In this context PSMS can be a useful tool, as important information required for repackaging is collected in a uniform manner and the information collected can be used for other aspects of pesticide stock management (registration, movement, stock checking et cetera). PSMS provides a quick screening tool for comparison of environmental risks and pesticide-related hazards.

However the results of the risk analysis should be interpreted with some care (e.g. the fact that a store is not assigned a 'critical' score, does not imply that the pesticides do not need to be repacked and disposed).

PSMS is not set up for a site specific risk assessment, where risks to soil, groundwater and humans are assessed in detail. As PSMS is a quick screening tool, it has limitations. The treatment of outliers affects risk scores. It has to be noted that the risk of some sites like landfill sites cannot be assessed with PSMS.

6.4 Field tests training

During inventory campaigns of obsolete pesticides¹, often the questions arise if a quantity of a substance indeed is an obsolete pesticide - or not. The removal costs of obsolete pesticides (transport and incineration) amounts to approximately EUR 2,000.- per ton.

Therefore, identifying quantities of other (hereafter named 'non-hazardous'²) substances before the clean-up (e.g. repackaging) campaign is important to save costs. Savings mean that more sites can be cleaned up with the same allocated budget - a very relevant issue as the amount of sites badly in need of cleaning far outnumbers the limited resources made available by the international community.

An approach was developed to identify obsolete pesticides from non-hazardous substances in the field. The approach is based on field tests that mainly involve basic chemistry. The approach that we want to use in Tajikistan is a follow-up from the approach that was used in other countries.

¹ In this report, the term 'obsolete pesticide' refers to harmful/hazardous (serious effects on human health and/or the environment) agrochemicals (including most of the POPs) that may be encountered in the setting of repackaging campaigns

² In this report, the term 'non-hazardous substance' is used for agrochemicals that do not have serious effects on human health or the environment, such as fertilizers. Note that some 'non-hazardous' substances can be used as pesticides (e.g. sulfur for managing mildew)

After several campaigns it was concluded that the focus should be on identifying fertilizers and other non-harmful agro-chemicals like agricultural lime.

Basic principles that should always be acknowledged when working with the approach:

- Only closed containers, (e.g. drums, bags) or homogeneous piles of substance should be subjected to the field test approach as contamination with small amounts of obsolete pesticides cannot be detected
- In case of doubt or questionable results during the field test process, the unknown substance should be assumed to be an obsolete pesticide and consequently removed

First, the unknown substance is checked for solubility in water. For this; 100 mg of the substance is put in 100 ml of demineralized water (as to obtain a solution of 1 gram/liter) and allowed five minutes to dissolve with some swirling of the liquid.

If (partially) soluble, the electrical conductivity (hereafter EC) of the solution is measured.

Following these results, the unknown substance can be put in one of three categories:

1. Soluble substances that give a rise in EC (i.e. salts, acids: substances that dissociate into ions). At one gram per liter, soluble salts give an EC of 800-1,700 $\mu\text{S}/\text{cm}$
2. Soluble substances that do not give a rise in EC (i.e. substances that do not dissociate into ions in a watery solution; for example urea, sugars, organic compounds)
3. Insoluble substances (insoluble inorganic or organic compounds). Usually the EC reads around 50 $\mu\text{S}/\text{cm}$ for insoluble substances, as some contamination with salts often seems to be present (as was concluded from the field work with piles of insoluble calcium carbonate)

If a solution is obtained with a rise in EC that is larger than, say, 200 $\mu\text{S}/\text{cm}$, it makes sense to continue the field test (other wise, it should be concluded the compound is insoluble, or is not a soluble salt). First the pH of the (partial) solution is determined. Then, NO_3^- , SO_4^{2-} , PO_4^{3-} , K^+ and NH_4^+ concentrations are determined with the use of Merckoquant colorimetric test strips.

This gives an impression of the fertilizer ions that are present in the solution.

Subjecting a pinch of substance to sulfuric acid immediately makes clear if the substance is agricultural lime (calcium carbonate) due to heavy carbon dioxide formation (bubbling, foaming). In the field, some sulfuric acid can be poured on a pile of substance. Sulfuric acid can easily be obtained from car shops as 'battery acid' in a standardized 37 % concentration.

Powdered chemicals could be available to perform field tests to:

- Identity of benzoic acid
- Identity of heavy metal ions

The fieldwork training will take place in the second week. Sites will be investigated for the presence of closed bags (suspected fertilizers) or homogeneous piles (see pictures figure 6.1).

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Figure 6.1 Homogenous piles in Ukraine

It should be mentioned that during inception no piles of agrochemicals were found to be present. Therefore one of input of the stakeholders is to assess whether or not 'non-hazardous' substance in large homogeneous quantities are to be encountered at the storage sites.

If not we will rule out this part of the practical training, we will always pay attention to this issue during our classroom training.

If we train staff in field we will set-up, a lab with available materials (see pictures of figure 6.2). At most sites the lab set-up only consisted of the plastic field test box, a level ground to work on, and protection from wind as this makes weighing a sample impossible. Samples are collected in reseal able sampling tubes with a unique code and the origin of the sample clearly noted.



Figure 6.2 On-site set up of field labs

6.5 Identification and feasibility assessment for management of POP and wastes

Assuming that coherent regional approach can be applied for the Kathlon region with regards to the remediation of residual pollution (soil and material) at the stockpile sites in combination with the remediation of the burial site, it's anticipated that the standard approach for the stockpile residual pollution exist of excavation of topsoil, transport and treatment/backfilling at the burial site. Excavation pits at the stockpile sites will be backfilled with clean soil. This standard approach for residual pollution at stockpile sites will be further elaborated during step 4 of the project and discussed in the workshop.

Also feasible options for repackaging, safeguarding, transport, temporary storage and /or destruction will be identified in step 4 of the project, as indicated in the proposal.

The draft documents will be prepared in October and the first half of November 2009 and will use the outcomes of the workshop in September as input. Final document will be prepared in second half of November 2009.

6.6 Stakeholders input

The needed technical input of the Tajikistan stakeholders is given in table 6.1. The first column, describes the needed input, the second column gives deliverable and the third column gives the deadline of the needed input.

All input will be coordinated by the representative of the consortium in Tajikistan. Before the tasks are carried out it should be agreed what the costs are to deliver the input. Upfront appointments concerning planning and refunding of expenses are made.

Table 6.1 Input stakeholders for training and workshop

Description	Deliverable	Deadline
List of all old pesticides stores in the Kathlon region indicating if:		
1. The topsoil probably is contaminated		
2. The building material is probably contaminated	List	Before the training which is end of September
3. There are stock of OPs		
4. It is expected that 'non hazardous chemicals' are at the site		
5. The store is adequate for training		
A list of used hazardous and non hazardous chemicals in the past	List	Before the training which is end of September

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Reference R003-4640777BFF-beb-V01

Description	Deliverable	Deadline
<p>Assessment and evaluation of:</p> <ul style="list-style-type: none"> • 'Technical manual on conducting inventory on identification of obsolete and forbidden POP containing pesticide' • 'Instruction on conducting inventory of POP containing pesticides' • 'Manual on safety measures and private hygiene during conducting inventory and taking samples of pesticides, soil and plants' <p>with the proposed approach of this project and in particular the draft HSE Plan</p>	Short memo	Before workshop
<p>Prepare a list of 20 sites to be visited during training. These sites should be:</p> <ol style="list-style-type: none"> 1. Representative 2. Accessible 3. Safe to enter 	List	Before the training which is end of September

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Reference R003-4640777BFF-beb-V01

7 Next steps Vakhsh burial site

7.1 Need for additional information

Although first analysis have been arranged for, their results are necessary for finalizing steps 3.2 and 3.3 of the project.

For the detailed site survey and desktop study of step 3.5 the following information is needed:

- Map of the burial site (it is proposed to use the high quality aerial photo's available in Google Earth)
- Photo report is already available, will be extended during training
- Site characterization is partly done, especially the quantities of pesticides and drums needs further assessment, this will be done during the group training in September 2009
- Results of interviews with local site operators have been incorporated in this inception report, till now no written sources haven been identified which contain historical information further identification of relevant documents remains a key issue
- No logbook information has been identified till now, quantities of remaining pesticide have to be assessed in the field, will be done in September training
- Assessment of local geological, (geo)hydrological and atmospheric conditions need still to be assessed, although the NIP can provide also some baseline information
- Land use will be assessed with the help of Google Earth, population data and regional flora and fauna need to assessed in more detail
- A brief description of the socio economic situation and the agricultural system in the Vakhsh Oblast needs still to be prepared

With regard to step 5 of the project we still have to identify the different groups which have to be identified in the future process as well as local opinions and socio/economic issues and structure of the local networks in relation with the foreseen remedial options. With regards to the preparation of cost estimates we have also to identify local unit prices for labour, materials and equipment.

Special attention needs to be given to the (inter)national legal obligation (f.e. Stockholm Convention) related to remedial action. Those obligations have still to be inventoried and evaluated.

7.2 Further actions and planning

For step 3 of the projects steps 3.4 (partly) till 3.6 have still to be done. All tasks for step 5 have to be conducted, although this inception report already contains a first indication about the review of remedial options for the burial sites.

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Reference R003-4640777BFF-beb-V01

It is anticipated that the final field investigation plan will be finalized before the September 2009 training period. Additional sampling will be executed during the September training period. The site survey report and the risk assessment will be finalized at the beginning of November 2009.

It is proposed that step 5.1 and 5.2 are finalized before the September 2009 training period. Results of step 5.1 and 5.2 in this way can be discussed during the September training period in a project meeting. Steps 5.4 and 5.5 will be executed during the course of November 2009.

Although follow up recommendations will be incorporated in the final report, the related actions will be a continuous aspect of the project.

7.3 Health and safety

7.4 Risk assessment

7.4.1 Introduction

For burial sites, a site specific risk assessment is needed as PSMS, which will be used during inventory for the storage sites with stocks of unwanted or obsolete pesticides, cannot be used. Burial sites in general differ from storage sites with respect to potential environmental impact on a larger area and often also with respect of heterogeneity of the waste material buried at the site. Burial sites in the past often were set up without confinement structures which are used nowadays to prevent direct contact of humans and the environment with waste material and impact of waste material on surrounding soil and groundwater. Therefore unprotected burial sites with unsatisfactory storage conditions present a major risk of direct contact both for humans and the environment and also a major risk to soil and groundwater in the surroundings of the site. These risks need to be assessed and managed in an appropriate way.

For burial sites the source-path-receptor approach can be used. This approach is based on the concept that a contamination poses a risk to the environment if a receptor can come into contact with the contamination (source) via an exposure path. The risks of the burial site can be assessed based on a conceptual site model, which is taking exposure pathways and possible receptors into account. The risk assessment can be performed using computer models like the Dutch model Sanscrit, the US-model RBCA toolkit for Chemical Releases or BP-RISC.

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Reference R003-4640777BFF-beb-V01

7.4.2 Two-zone approach for the centre and periphery of the burial sites

The risk assessment for burial sites should aim at identifying the need for remedial measures and selecting appropriate measures for the centre of the burial site and the periphery of the site. At the central zone of the burial site POPs are present in very high concentrations; the number of receptors might be limited. In the periphery often the concentrations decline, but the number of receptors and their sensitivity might be higher than in the central zone. Therefore a different approach for both zones can be useful.

One of the aims of this project is to support Tajikistan in its efforts to implement the Stockholm Convention (see paragraph 1.2.1). Parties to the Convention have agreed to reduce and eliminate POPs and to ensure that POPs waste is managed safely and in an environmentally sound manner. The technical guidelines of the Convention give information on best available techniques for destruction and irreversible transformation, which are the preferable options to deal with POPs waste. The technical guidelines of the Convention also describe criteria for specially engineered landfills if destruction or irreversible transformation options are not environmentally preferable.

Based on the site specific information obtained for the Vakhsh burial site and based on the site specific risk assessment using the source-path-receptor concept (see Figure 8.1) a risk assessment will be conducted for the site.

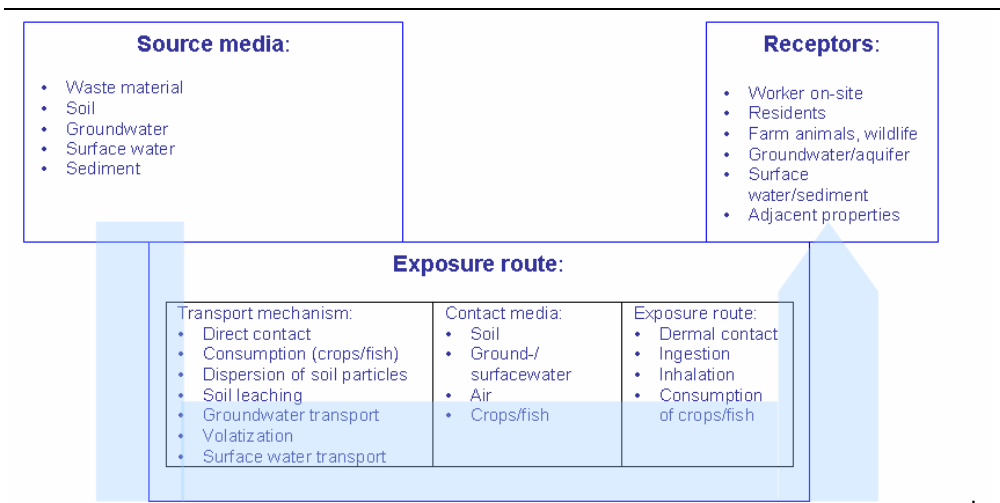


Figure 8.1 The 'source - path - receptor concept' as a basis for risk assessment

The site specific risk assessment for the Vakhsh site will be used in the feasibility study, in which a number of environmentally sound treatment, containment and or disposal options (or combinations thereof) will be compared. A selection of the appropriate approach can be made based on scores for risk reduction, environmental merit and costs.

Tauw's experience in addressing burial sites shows that at large waste burial site, for the centre of the site isolation of the waste material is a viable option of dealing with the contamination and thus eliminating any exposure pathways. In case the necessary continuous maintenance programmes are guaranteed for the total life cycle of the landfill. Experience also shows that for the periphery of the burial site, i.e. the zone, where the burial site confines with potentially more sensitive forms of land use (residential, agricultural, nature), a more detailed risk assessment is often desired in order to answer more specific questions on potential impact on receptors (i.e. to find out which form of land use is possible and which measures of remediation and sustainable site management are needed e.g. to prevent further contaminant migration). So for the periphery often a more detailed (quantitative) risk assessment is needed in order to predict the exposure of certain receptors (e.g. humans, cattle or groundwater resources).

The feasibility study will provide information based on which the environmentally preferred option can be selected. The preferred option might be a combination of several treatment, containment and or disposal options.

7.5 Conceptual site model and reporting

The Vakhsh burial site is a large disposal site occupying about 6.5 ha and is freely accessible (not fenced). Direct contact of receptors with waste material is possible. Infiltrating rain- or melt water, and erosion processes can contribute to the dispersal of contamination in various environmental compartments. An overview of the preliminary site conceptual model after the inception mission is given in the table below.

Table 7.1 Preliminary conceptual site model for the Vakhsh burial site

Contaminated source media	Exposure routes	Receptors
Waste material (Suspected 7,500 tons of pesticides, amongst which 3,000 tons of DDT)	Direct contact	Trespassers
	Run off	"Waste miners"
	Wind erosion	Cattle
	Leaching	Wildlife
Soil (To be confirmed)	Direct contact	Trespassers
	Run off	"Waste miners"
	Wind erosion	Cattle
	Leaching	Wildlife

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Reference R003-4640777BFF-beb-V01

Contaminated source media	Exposure routes	Receptors
Groundwater (to be confirmed, but not likely)	Direct contact (?) Groundwater transport	Downstream users (?)
(Temporary) surface water (To be confirmed, but likely)	Direct contact Run off Surface water transport	Human using surface water (children) Cattle Wildlife

7.6 Development of remediation alternatives

Before we can address the remedial options for the burial site one important issue has to be made clear. In line with the NIP all (easily) extractable pesticides of the burial site have to be separated from the POPs difficult to extract and contaminated soil in the trenches at the burial site. The separated (persistent) obsolete pesticides have to be repacked, (temporarily) stored, transported (when needed) and finally eliminated. These activities have to meet all the obligations of the Stockholm Convention.

It's obvious that inventory of the extractable pesticides from the burial sites have to be covered within step 4 of the project (i.e. Identification and feasibility assessment of safeguarding, transport and elimination/disposal options of identified stocks and other contaminated wastes). However this raises immediately the question what should be considered as extractable pesticides. An issue of definition which needs to be addressed before the field investigation of September 2009. Given the economic drivers of the past digging activities it is however clear that these illegal activities will stop if the pesticides are extracted to a level that commercial opportunities for the remaining pesticides ceases. On the other hand our experience shows to containment of product (pesticides) in the centre zone of the site (the trenches) might be a viable and cost effective remediation option.

It is also clear that the planning and execution of the extraction of POP's and the remediation of the burial sites have to be adjusted and synchronized. It will be clear that missing the possibilities of adjustment and synchronization will potentially increase the costs for extraction and remediation significantly. For example the extraction of pesticides can be combined with excavation activities which fit within the remedial approach of the burial sites.

Given the scale of the Vakhsh burial site it is clear that the extraction of pesticides and the subsequent safeguarding transport and elimination alone are an enormous task, which need careful planning. Apart from that the remediation of the remaining soil pollution is also a complex task which needs careful planning and which will cover most likely a time frame of a couple of years. Although it's clear that the final solution can not be reached on short notice, the current environmental situation is such that the causes for unacceptable environmental risks have to be addressed immediately. Therefore we propose a phased approach for the burial site which distinguishes necessary action:

1. On short notice (within one year)
2. For the midterm (within four years)
3. For the long term (more than four years).

On short notice

Given the current situation it is clear that the risks related to the direct contact possibilities and open air exposure, as well as the spreading risks related to the runoff of storm water have to be addressed as soon as possible. It is obvious that fencing of the burial site and provisional covering of the individual trenches will reduce risks related to direct contact possibilities already dramatically and will also prevent the accumulation of rainwater in the open trenches. With respect to the treats of the storm water runoff it is obvious that deviation of the water on short notice will also contribute to the temporary safeguarding of the burial site.

Although the urgent need for temporary action is eminent, it has to be realized that in the current situation there is a significant quantity of easily accessible pesticides present in the trenches which are opened by digging. Covering of these trenches with soil on short notice will increase future efforts to extract the pesticides and most likely will also lead to volume decreases of extractable pure products and volume increase of contaminated soil with product. It is therefore recommended to remove, repack and temporarily safe guard the easily extractable pesticides which in the current situation are exposed to the open air in conjunction with the proposed immediate measures. Given the volumes involved temporarily storage and safeguarding of the repacked pesticides within the perimeters of the burial site is considered as the most cost effective option at the moment. The removal of easily accessible pesticides together with the safeguarding and monitoring of the repacked products will also decrease potential future illegal digging.

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Reference R003-4640777BFF-beb-V01

For the midterm

After the most imminent risks are covered and limited by the aforementioned immediate remedial actions, the actual remediation of the burial site can start. However it should be realized that at the burial site still extractable POP's can be present in (part of) the trenches which till now for example are not affected by illegal digging. Preferably these POP's itself are not affected by remedial action, so they can be subject to future treatment with the preferred best available techniques for destruction and irreversible transformation as mentioned in the Stockholm Convention. Future innovations and local developments can lead to the introduction of feasible techniques for destruction and irreversible transformation.

After the immediate remedial actions are realized and the extractable pesticides have removed and repacked or have been registered with the burial site, it is obvious that the mid term remediation will address the remaining soil pollution in the centre of the burial site (ic. in and along the trenches).

In line with the TOR and the proposal the development of the risk based alternatives will focus on in-situ remediation and/or containment actions, which are safe, durable and have a low carbon footprint. Alternatives which deliver results on short term will be compared with alternatives which provide mid-term results.

The proposed remedial alternatives for the centre of the burial site will be compared with a baseline alternative aiming at complete removal and ex-situ treatment.

Although limited in size it is obvious that the remaining soil pollution in the centre of the burial site can not be considered as a homogenous batch of polluted material. Due to altering concentrations levels, type of pollutions and physical properties the feasibility for different in-situ techniques, ex-situ treatment methods or containment options will vary with regards to this alterations. On the basis of the final results of step 3 of the project the final feasibility of the different techniques, methods and/or options can be assessed in more detail. However in line with the proposal it is anticipated that the following remediation alternatives will be further elaborated during step 5 of the project:

- A straight forward low cost containment options
- An alternative utilizing as much as possible low costs in-situ remediation techniques
- An alternative utilizing as much as possible low costs ex-situ on-site biodegradation techniques
- A complete excavation and on-site or off-site physical treatment technique

The above mentioned alternatives focus all on a specific technical approach for the remediation. If variation in the source zone is however considerable an adaptation of multiple techniques and options within the preferred alternative has to be considered and evaluated.

For the long term

Apart from complete excavation and off-site treatment all alternatives will result in a situation where pollution will remain in the source zone. To a lesser or greater extent this remaining pollution has to be addressed during a longer period with regards to monitoring and aftercare. It is also anticipated that the burial site has had a distinct effect on the direct surroundings of the site during the past decades. Resulting pollutions have potentially also to be addressed with regards to a baseline monitoring program and emission control measures to the larger surroundings of the burial site. If for example the erosion due to surface water runoff has resulted in a significant spreading of polluted sediment outside of the burial site further spreading at least has to be stopped with the help of control measures.

Due to the anticipated removal of easily extractable POP's it is not likely that 'the history repeats a second time' with regards to the illegal digging activities, as all easy extractable pesticides will be removed and safeguarded. But it should be realized that it is most likely that at least in the coming years a significant soil pollution load will remain at the burial site. Proper management of the burial site has to address the potential risks related to the remaining pollution for at least a certain period. History has proven that a prerequisite for proper management is at least a continuous presence of safeguards at the site.

Coherent approach

From the aforementioned considerations with regards to the remediation of the burial site it is clear that it will be a complex operation over a period of several years with a subsequent need for proper management of the site. Due to obligations of the Stockholm Convention the burial site will also produce a considerable volume of repacked and temporarily safeguarded POP's. Apart from the burial site, the Khatlon region also contains stockpiles of POP's which need still to be addressed. It is most likely that the site of the (former) stockpiles also contain residual contamination in soil and buildings, which from a risk prospective need to be addressed.

It is recommended to apply the following coherent regional approach within the perimeters of the Vakhsh burial site:

- To setup a temporarily regional storage centre for repacked and safeguarded POP's
- To setup a regional treatment centre for soil and building materials containing residual POP pollutions
- Assess the possibilities to use contaminated soil and building materials to rehabilitate the burial site by installing erosion control measures (e.g. terracing by using gabions made of granulated debris from the stores)

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Reference R003-4640777BFF-beb-V01

- To setup a Central Asian Environmental Training Centre at the Vakhsh where professionals, experts and students of the Central Asian region can be trained in in-situ and ex-situ (f.e biobeds) treatment of polluted soils and thus also providing manpower for the on going remediation of the burial site
- The aforementioned training centre can for example also be used for training with regards to:
 - Inventories, repackaging, risk assessment for POPs
 - Erosion studies and erosion control
 - Reforestation as erosion control measure
 - Other training activities related to proposed project components as mentioned in a GEF Project Identification Form, dated August 30, 2007 (IPM, CSRP, EFSSIP)
- If the proposed (Central Asian) environmental training centre is really adopted to it's fullest extent the feasibility for final on-site solutions for the repacked POP's (coming from Tajikistan and surrounding countries) with innovative new techniques needs to be evaluated (and implemented)

It is anticipated that such a (Central Asian) environmental training centre will contribute to regional awareness raising and capacity building in the different countries of the region (transborder approach). It will also improve the socio economic structures of the Kathlon region and provides cost effective regional solutions for the final elimination of safeguarded POP's, polluted soil and other waste. Preferable new innovative treatment techniques combine the on-site treatment of POP's together with the severely polluted fractions of the soil pollution. Although a regional centre in itself is already a viable approach, it also provides optimal guarantees for a structural and proper management of the burial site for the long term.

7.7 Stakeholders input

The needed technical input of the Tajikistan stakeholders is given in table 7.2. The first column, describes the needed input, the second column gives deliverable and the third column gives the deadline of the needed input.

All input will be coordinated by the representative of the consortium in Tajikistan. Before the tasks are carried out it should be agreed what the costs are to deliver the input. Upfront appointments concerning planning and refunding of expenses are made.

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Reference R003-4640777BFF-beb-V01

Table 7.2 Input stakeholders for next steps

Description	Deliverable	Deadline (2009)
Data on shower intensity and annual distribution of local rainfall	Report/Memo	End October
Local hydrogeology and soil composition	Report/Memo	End October
Identification of relevant documents on the burial site	Report/Memo	End October
Exact information with regards to local wind patterns and forces need to be assessed in more detail.	Report/Memo	End October
Soil erosion characteristics and evaluation on Tajikistan soil erosion control practices	Report/Memo	End October
Description of local population, agricultural system and flora and fauna	Report/Memo	End October
Identification of local prices and production rates for infrastructural works	Report/Memo	End October
Identification for legal obligations with regards to remedial alternatives	Report/Memo	End October
Description of socio economic situation in the Vakhsh district	Report/Memo	End October

Appendix

1

Questionnaire

QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

1	GENERAL INFORMATION	PERSONNEL		
1.1	Contact details			
1.1.1	Name of the respondent	Kurbonali Partoev		
1.1.2	Organization	Social Organization "Hamkori bahri tarakiot" (Cooperation for development)		
1.1.3	Address	17, H.Hakimzoda Str., Dushanbe city, Tajikistan		
1.1.4	Postal code	734003		
1.1.5	City	Dushanbe city		
1.1.6	Office phone	992 -37 -88-173-77		
1.1.7	Cell phone	992 918-64-95-05 или 992-93 570-07-21		
1.1.8	E-mail	kurbonali@yahoo.com or pkurbonali@mail.ru		
1.2	Professional background and education			
1.2.1	Current position	Director of NGO "Hamkori bahri tarakiot" (Cooperation for development)		
1.2.2	Relevant experiences	More than 20 years in the field on usinf the farmers of pepcidice		
1.2.3	Highest education	Ph.D. Agrarian science, senior of research specialist		
1.3	Age	<i>Mark with X when applicable</i>		
1.3.1	18-25			
1.3.2	25-30			
1.3.3	30-45			
1.3.4	45-60	X		
1.3.5	60-and more			
1.4	Sex	<i>Mark with X when applicable</i>		
1.4.1	Female			
1.4.2	Male	X		
1.5	Languages respondent knows			
	<i>Fill in: Native / Good / Fair / Poor</i>	Speaking	Reading	Writing
1.5.1	Kyrgyz	Poor	Poor	Poor
1.5.2	Uzbek	Poor	Poor	Poor
1.5.3	Tajik	Native	Native	Native
1.5.4	English	Good	Good	Good
1.5.5	Russian	Native	Native	Native
1.5.6	German			
1.5.7	Other Specify			

QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

2	GENERAL INFORMATION	YOUR ORGANIZATION
2.1	Contact details	
2.1.1	Name of your organization	Social Organization "Hamkori bahri tarakyyot" (Cooperation for development)
2.1.2	Address	17, H.Hakimzoda Str., Dushanbe city, Tajikistan
2.1.3	Postal code	734003
2.1.4	City	Dushanbe city
2.1.5	Office phone	992 -37 -88-173-77
2.1.6	E-mail	kurbonali@yahoo.com or pkurbonali@mail.ru
2.1.7	Web site	www.cdpt.tj
2.2	Is your organization active in the field of POPs and obsolete pesticides	
2.2.1	Yes	Yes
2.2.2	I do not know	
2.2.3	No	
2.3	Please specify target groups of your organization's main activities	
2.3.1	is durations we reccomendation to farmers don't using those old pesticides and about it I am typing two articles in Republican News	
2.4	How many employees work in your organization?	
2.4.1	10 specialists	
2.5	Do you know other organizations/persons that are not mentioned in the annex 1 the "Distribution list", whom are involved in obsolete pesticides and POPs?	
2.5.1	Please give names and all contact details if possible in the annex 2	

QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

OK, see annex 2

3	YOUR KNOWLEDGE ON POPS AND OBSOLETE PESTICIDES IN YOUR COUNTRY	
3.1	What is your connection to pesticides?	
<i>Please give detailed answer on this question in text block below</i>		
3.1.1	We working in a countryside and constantly we face questions using our farmers of use of a number pesticides, by us is trained in it as on prospect to pass to use more safe local resources and biological products in pest control agriculture. By us also organized seminars and round tables for training of farmers as far as possible not to accept some pesticides, and to pass to pure organic agriculture.	
3.2	Do you know that the obsolete pesticides are harmful for the environment and the health of the people?	
<i>Please motivate your answer on this question in the text block below</i>		
3.2.1	Yes	Yes, we within April - May carry out researches in burial places pesticides and during these works we had been gave concrete recommendations about non-use of out-of-date pesticides and about it me was two are published scientifically - recommendatory articles in republican newspapers and one radio transmission by radio "Imruz" ("Today") in May month, 2009
3.2.3	No	
3.3	What are the main sources of information for you on the problems around obsolete pesticides and POPs?	
<i>Please read the answers given below and records the ranking from 1 most to 6 the least.</i>		
3.3.1	Local Newspapers	6
3.3.2	National Newspapers	4
3.3.3	TV	5
3.3.4	Internet	4
3.3.5	Professional literature	3
3.3.6	Meetings	5
3.3.7	Personal network	3
3.3.8	Friends	3
3.3.9	Government Committee on Environment protection, MoA, MH, Committee on Emergency and to other organisations in republic and with experts from Kyrgyzstan, Uzbekistan, Georgia, with experts Milieukontakt and others international experts)	
3.4	What are the most significant problems around POPs and obsolete pesticides problems in your country?	
3.4.1	Local level	3
3.4.2	Regional level	5
3.4.3	District level	5
3.4.4	Country level	6

QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study				
World Bank Code		100020592		
Questionnaire		For obsolete pesticides and POPs Stakeholders		
Questionnaire №		1		
Project phase		Inception		
Country (strike through when not applicable)		The Republic of Tajikistan		
3.5 Do you know if farmers still use obsolete pesticides and POPs on a large scale?				
Please explain your answer on this question in the text block below				
3.5.1	Yes	Yes, especially workers rural farmers, cattle breeders and others on places		
3.5.3				
3.6 Do you know inventory report(s) on obsolete pesticides and POPs sites (stores and burial sites)?				
If you know please use annex 3				
3.7 Do you know sites (stockpiles and burial sites) of obsolete pesticides and POPs that are not mentioned in the above given inventory report(s)				
If you know more sites please use annex 4				
3.8 Can you list the names, the active ingredient, the outlook and the way it was packed of pesticides used in the old days				
	Name	Active ingredient	Outlook	Packed in
3.8.1				
3.8.2				
3.8.3				
3.8.4				
3.8.5				
3.8.6				
3.8.7				
3.8.8				
3.8.9				
3.8.10				
3.8.11				
3.8.12				
3.8.13				
3.8.14				
3.9 Do you know building(s) that can be used as intermediate collection center				
3.9.1	Name			
3.9.2	Address			
3.9.3	Types			
3.9.4	Maintenance condition			
3.10 Do you know of local available POPs and obsolete pesticides destruction capacity in your country				
3.10.1	Name			
3.10.2	Address			
3.10.3	Types			
3.10.4	Current use			

QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

4.	Your own opinion on how to solve the obsolete pesticides problems in your country	
4.1	In your opinion who is responsible for solving the problem of obsolete pesticides?	
4.1.1	Local level	3
4.1.2	Regional level	4
4.1.3	District level	4
4.1.4	Country level	5
4.1.5	Other specify	6 (international supporting donors)
4.2	Do you know that the World Bank is carrying out this obsolete Pesticides technical study?	
<i>Please specify what was the source of this information</i>		
4.2.1	Yes	
4.2.3		
4.3	Do you think that implementation of the above mentioned project would assist significantly in the development of the country?	
<i>Please strike through if not applicable and motivate your answer in the text block below</i>		
4.3.1	I absolutely agree	
4.3.2		
4.3.3		
4.3.4		
4.4	Do you agree that active participation of the public would assist in solving the obsolete pesticides problems?	
<i>Please strike through if not applicable and motivate your answer in the text block below</i>		
4.4.1	I absolutely agree	
4.4.2		
4.4.3		
4.4.4		
4.5	Please give your vision of the solving of obsolete pesticides problem in your country?	
4.5.1	In my opinion it is necessary together with the international experts and local experts once again to visit burial grounds where have been buried POP's earlier and in more details to discuss strategy of performance of the given project.	

QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

The second is desirable to organize in each country working group from among workers of Committee Environment Comment, MoA, MH, the Ministry of Emergency Measures, NGO and communities for discussion and performance of the given project

5	I want to contribute to this World Bank project	
5.1	Would you participate in the process of solving of the obsolete pesticides problem in your country?	
5.1.1	Yes	
<i>If the answer is no please continue with question 5.2. If answer is yes please answer questions 5.1.2 till 5.1.11</i>		
5.1.2	Yes	<i>X when applicable in the list below more choices are possible</i>
5.1.3	I want to give commend on this World Bank project documents and reports	x
5.1.4	I want to participate in the steering group	x
5.1.5	I want to participate in meetings, workshops	x
5.1.6	I want to participate in the inventory	x
5.1.7	I want to participate in the risk assessment	x
5.1.8	I want to participate in soil remediation design	
5.1.9	I want to participate in repackaging	
5.1.10	I (or my organization) want(s) to sponsor clean-up actions	
5.1.11	Other (specify)	
5.2	Do you know experts that could participate in the process of solving of the obsolete pesticides problem in your country?	
5.2.1	No	
<i>If the answer is no please continue with question 6.1. If answer is yes please answer questions 5.2.2 till 5.2.11</i>		
5.2.2	Yes	<i>Please indicate names of these experts below</i>
5.2.3	I know an expert that could give commend on this World Bank project documents and reports	Abdusalim Juraev
5.2.4	I know an expert that could participate in the steering group	Abdumavlon Vahidov
5.2.5	I know an expert that could participate in meetings, workshops	Boinazar Bozorov
5.2.6	I know an expert that could participate in the inventory	Hakima Saidova
5.2.7	I know an expert that could participate in the risk assessment	Tagoimurod Avlloev
5.2.8	I know an expert that could participate in soil remediation design	Firuz Davlatov
5.2.9	I know and expert that could participate in repackaging	Firuz Davlatov
5.2.10	I know an organization that wants to sponsor clean-up actions	
5.2.11	other (specify)	

QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

6.1	Do you have any other comments?
6.1.1	It is necessary to involve in the course of inventory and estimation POP's and the project to involve more local population and region and the country on liquidation of rests POP's and to spend the big explanatory work in a society

Thank you very much for your cooperation!

Results will be available for www.popsstudyca.net

Annex 1 DISTRIBUTION LIST QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Distribution list questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

Name	
Organization	Social Organization "Hamkori bahri tarakyyot" (Cooperation for development)
Address	17, H.Hakimzoda Str., Dushanbe city, Tajikistan
Postal code	734003
City	Dushanbe city
Office phone	992 -37 -88-173-77
Cell phone	992 918-64-95-05 или 992-93 570-07-21
E-mail	kurbonali@yahoo.com or pkurbonali@mail.ru
Web site	www.cdpt.tj
Name	
Organization	Social Organization "Zan va Zamin" (Women and Earth)
Address	Dushanbe city, S.Sherozi Str., 11/21, Tajikistan
Postal code	734025
City	Dushanbe city
Office phone	992 -37 -33-29-39
Cell phone	992-918-65-04-83
E-mail	maftuna_zan@mail.ru
Web site	
Name	
Organization	Национальный координатор по Стогольмской конвенции по СОЗ в РТ
Address	Dushanbe city, Shamsi Str., 4/1, Tajikistan
Postal code	734022
City	Dushanbe city
Office phone	992-37-32-21-52
Cell phone	992-907-71-72-13
E-mail	office@pops.tj
Web site	
Name	
Organization	Orhus Center, RT
Address	Dushanbe city, Rudaki Str.,44 ,Tajikistan
Postal code	734025
City	Dushanbe city
Office phone	992-37-22-82-38
Cell phone	992.907.715.874
E-mail	orhus_center@tojikiston.com
Web site	
Name	
Organization	FAO UN, PT
Address	Dushanbe city, Bokhtar Str.,37,Tajikistan
Postal code	734025
City	Dushanbe city
Office phone	992-701-14-81
Cell phone	992-93-570-89-92
E-mail	snaimov@yahoo.com
Web site	

Annex 1 DISTRIBUTION LIST QUESTIONNAIRE

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Distribution list questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

Name	
Organization	Government agency of MoA RT
Address	Dushanbe city, Yaka - Chinarskya Str., 50, Tajikistan
Postal code	734042
City	Dushanbe city
Office phone	992-372-233-71-26
Cell phone	992-907-81-81-13
E-mail	m.chemikals@mail.ru
Web site	

Name	
Organization	WHO, Tajikistan
Address	Dushanbe city, Bokhtar Str., 37/1, Tajikistan
Postal code	734045
City	Dushanbe city
Office phone	992-48- 701-14-72
Cell phone	992-93-505- 26-84
E-mail	malaria_who@tajnet.com
Web site	

Name	
Organization	Tropical diseases center, Tajikistan
Address	Dushanbe city, N. Karaboeva Str., 57, Tajikistan
Postal code	734057
City	Dushanbe city
Office phone	992-37233-45-68
Cell phone	992-95-16-14-394
E-mail	kadamov79@mail.ru
Web site	

Name	
Organization	Ministry of Emergency, RT
Address	Dushanbe city, Shomansur Str., 59, Tajikistan
Postal code	734045
City	Dushanbe city
Office phone	992-48-701-14-84
Cell phone	992-93-505-26-84
E-mail	najot@rs.tj
Web site	

Name	
Organization	Ministry of Agriculture, PT
Address	Dushnabe city, Rudali Str., 44, Tajikistan
Postal code	734025
City	Dushanbe city
Office phone	992-372-22-74-60
Cell phone	992-95-26-59-907
E-mail	bbozorov@yahoo.com
Web site	

Annex 2 UNIDENTIFIED STAKEHOLDER

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Unidentified stakeholders	For obsolete pesticides and POPs Stakeholders
Questionnaire No	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

2.5	Do you know other organizations/persons that are not mentioned in the annexed distribution list, whom are involved in obsolete pesticides and POPs	
2.5.1		
2.5.1.1	Name of the respondent	Juraboy Khalikov
2.5.1.2	Organization	Chemical Research Institute, AS PT
2.5.1.3	Address	Dushanbe city, Aini Str.,229\2, Tajikistan
2.5.1.4	Postal code	734063
2.5.1.5	City	Dushanbe city
2.5.1.6	Office phone	992 -37 -225-80-98
2.5.1.7	Cell phone	992-3725-80-95
2.5.1.8	E-mail	jurabay@yahoo.com
2.5.1.9	Web site	
2.5.2		
2.5.2.1	Name of the respondent	Vahob Vohidov
2.5.2.2	Organization	Economy Research Institute, AS PT
2.5.2.3	Address	Dushanbe city, Rudaki Str.,42, Tajikistan
2.5.2.4	Postal code	734025
2.5.2.5	City	Dushanbe city
2.5.2.6	Office phone	992 -37 -221-75-02
2.5.2.7	Cell phone	992-93-504 80-40
2.5.2.8	E-mail	office@pops.tj
2.5.2.9	Web site	
2.5.3		
2.5.3.1	Name of the respondent	Marielle Leseur
2.5.3.2	Organization	OSCE, PT
2.5.3.3	Address	Dushanbe city, A. Donish Str., 18a, Tajikistan
2.5.3.4	Postal code	734012
2.5.3.5	City	Dushanbe city
2.5.3.6	Office phone	992-37-226-50-14
2.5.3.7	Cell phone	992-95-165-99-07
2.5.3.8	E-mail	Marielle.Leseur@osce.org
2.5.3.9	Web site	
2.5.4		
2.5.4.1	Name of the respondent	Azamjon Mirzoev
2.5.4.2	Organization	MoH, PT
2.5.4.3	Address	Dushanbe city, Dzerjinski Str.,10, Tajikistan
2.5.4.4	Postal code	734025
2.5.4.5	City	Dushanbe city
2.5.4.6	Office phone	992-37-221-07-48
2.5.4.7	Cell phone	992-907-70-98- 72
2.5.4.8	E-mail	azamjon@mail.ru
2.5.4.9	Web site	

Annex 3 Inventory report on obsolete pesticides and POPs sites

Consultancy on the POPs Pesticides Technical Study	
World Bank Code	100020592
Questionnaire	For obsolete pesticides and POPs Stakeholders
Questionnaire №	1
Project phase	Inception
Country (strike through when not applicable)	The Republic of Tajikistan

3.6	Do you know inventory report on obsolete pesticides and POPs sites (stores and burial sites)?	
3.6.1	Report 1	
3.6.1.1	Name	National Implementation Plan on realization of Stockholm Convention on Persistent Organic Pollutants in the Republic of Tajikistan
3.6.1.2	Organization	Ministry of Agriculture and Environment Protection the Republic of Tajikistan
3.6.1.3	Autor	Many aftors
3.6.1.4	Year of inventory	2004-2006 years
3.6.1.5	Estimated amounts	About 200 MT
3.6.2	Report 2	
3.6.2.1	Name	
3.6.2.2	Organization	
3.6.2.3	Autor	
3.6.2.4	Year of inventory	
3.6.2.5	Estimated amounts	
3.6.3	Report 3	
3.6.3.1	Name	
3.6.3.2	Organization	
3.6.3.3	Autor	
3.6.3.4	Year of inventory	
3.6.3.5	Estimated amounts	
3.6.4	Report 4	
3.6.4.1	Name	
3.6.4.2	Organization	
3.6.4.3	Autor	
3.6.4.4	Year of inventory	
3.6.4.5	Estimated amounts	
3.6.5	Report 5	
3.6.5.1	Name	
3.6.5.2	Organization	
3.6.5.3	Autor	
3.6.5.4	Year of inventory	
3.6.5.5	Estimated amounts	
3.6.6	Report 6	
3.6.6.1	Name	
3.6.6.2	Organization	
3.6.6.3	Autor	
3.6.6.4	Year of inventory	
3.6.6.5	Estimated amounts	

Annex 4 Sites others than mentioned in the inventory reports

Consultancy on the POPs Pesticides Technical Study			
World Bank Code		100020592	
Questionnaire		For obsolete pesticides and POPs Stakeholders	
Questionnaire №		1	
Project phase		Inception	
Country (strike through when not applicable)		Kyrgyz Republic	The Republic of Tajikistan The Republic of Uzbekistan
3.7	Do you know sites (stockpiles and burial sites) of obsolete pesticides and POPs that are not mentioned in the above given inventory report(s)		
3.7.1	Stores 1		
3.7.1.1	Name		
3.7.1.2	Adress		
3.7.1.3	Estimated amount of obsolete pesticides		
3.7.1.4	Types		
3.7.1.5	Maitenance condition		
3.7.2	Store 2		
3.7.2.1	Name		
3.7.2.2	Adress		
3.7.2.3	Estimated amount of obsolete pesticides		
3.7.2.4	Types		
3.7.2.5	Maitenance condition		
3.7.3	Stores 3		
3.7.3.1	Name		
3.7.3.2	Adress		
3.7.3.3	Estimated amount of obsolete pesticides		
3.7.3.4	Types		
3.7.3.5	Maitenance condition		
3.7.4	Burial sites 1		
3.7.4.1	Name	Pesticide burial in Tajikabad district, Rasht Valley, Tajikistan	
3.7.4.2	Adress	Maitaniyon village Tajikiabad district , Rasht Valley, Tajikistan	
3.7.4.3	Estimated amount of obsolete pesticides	5 MT	
3.7.4.4	Types	POP's and DDT	
3.7.4.5	Condition	Part of those, also DDT to suit for using	
3.7.5	Burial sites 2		
3.7.5.1	Name		
3.7.5.2	Adress		
3.7.5.3	Estimated amount of obsolete pesticides		
3.7.5.4	Types		
3.7.5.5	Condition		
3.7.6	Burial sites 3		
3.7.6.1	Name		
3.7.6.2	Adress		
3.7.6.3	Estimated amount of obsolete pesticides		
3.7.6.4	Types		
3.7.6.5	Condition		

Appendix

2

HSE Plan

Note

Handled by Boudewijn Fokke

Date June 12th, 2009

Reference N008-4640777BFF-beb-V01-NL

Health and Safety Plan

1 Introduction

Witteveen+Bos/Tauw examine four underground burial sites in Kyrgyzstan (KG), Tajikistan, (TJ) and Uzbekistan (UZ):

1. The Suzak burial site in KG
2. The Vaksh burial site in TJ
3. The burial site located in Yangiariq rayon in the Khorezm province of UZ
4. The plot in the Surkhandarya province of UZ

A typical burial site covers an area of approximately 5 to 15 hectares and contains several thousands tons of pesticides. Drums with pesticides are buried in open pitches of 3-4 meter depth and are covered with approximately 1 meter of soil/gravel. Due to recent activities some of the drums are exposed to the surface again. There are some indications that one of the burial sites is associated with a tailing dump.

To perform the soil investigation fieldwork has to be performed consisting of field investigation with drilling in the vicinity of the burial sites and drilling in the burial sites.

This memo identifies the risks that may occur during the execution of the fieldwork.

Guide

Chapter 2 describes how the field investigation is performed. Chapter 3 describes the research strategy. Chapter 4 explains how the work should be carried out.

2 Field investigation

The work will be performed in the following steps:

- Field inspection and drilling in the vicinity of the burial sites
- Evaluation of the drilling results and updating field investigation plan
- Drilling in the burial sites

The table below includes a risk assessment resulting from the design risk-analysis with corresponding controlling suggestions. If certain risks are applicable during execution, the company should develop management tools to control these risks, monitors over these risks or take away these risks. Only the specific risks for this project are given. Standard working risks are not stated in this risk-analysis. After field inspection this table will be adapted when necessary.

Table 2.1

Aspect	Risk	Risk cause	Measures
Drilling in contaminated soil	Exposure to harmful substances (vapors) resulting in injury or death	Contact with contaminated soil and groundwater by: <ul style="list-style-type: none"> • Sampling • Digging 	<ul style="list-style-type: none"> • Wearing Personal Protection Equipment (PPE) mentioned in table 3.1 • Air-measurements (if necessary contact the expert) • Perform continuous measurement on expected components, oxygen and Lower Explosive Limit (LEL) • If measurements indicate elevated concentration and /or if odour is observed use full face mask with a ABEKP3 filter • Proper cleaning procedure and good personal hygiene • Facilities to wash hands and face • Eating, drinking and health stop after washing hands and face • Don't smoke and drink alcohol
	Intoxication	Work in confined area's (wells and slots)	<ul style="list-style-type: none"> • Wearing PPE mentioned in table 3.1 • Drilling under guidance of a safety expert • Develop/update contingency management safety plan
	Explosion	Explosive mixture	<ul style="list-style-type: none"> • Continuous measurement LEL • Extinguisher nearby
Soil and/or groundwater contamination, gasses, fume of soil	Depending on the type of contamination <ul style="list-style-type: none"> • Risk of poisoning • Risk of fire/explosion 	<ul style="list-style-type: none"> • Sampling • Digging 	<ul style="list-style-type: none"> • Develop/update contingency management safety plan • Continuous measurement LEL • Extinguisher nearby

Aspect	Risk	Risk cause	Measures
Working in confined areas (slots). Confined areas are areas deeper than 2 meters.	<ul style="list-style-type: none"> Enlarged risks for accidents and falling materials and equipment Risk of suffocation Risk of poisoning Risk of explosion 	<ul style="list-style-type: none"> Too little oxygen present Accumulation of toxic fume of soil or waste 	<ul style="list-style-type: none"> Working with 2 man, with 1 one the slot edge (safety guard) Wearing personal protection equipment (a well shut overall, cases prior to the shoes, strong gloves, full face mask with a P3 filter) Continuous measurement
Digging trenches	<ul style="list-style-type: none"> Dig up broken drums with volatile substances 	<ul style="list-style-type: none"> Buried drums with pesticides 	<ul style="list-style-type: none"> Working upward winds Crane with overpressure

During the field inspection and drilling employees and persons present in the vicinity can be exposed to possible presence of pesticides. We therefore will always warn person to keep out the burial site and especially during drilling.

3 Execution

Supervision

A HSE expert will inform the staff before the start of the work about:

- The nature of the work and the associated risks
- Measures to prevent or minimize such hazards
- The use of personal protective equipment

All the drillings will be made under the supervision of a HSE expert. A safe and clean behaviour will be monitored and the behaviours will be evaluated on a daily basis.

PPE

All persons present at work have to use the following personal protective equipment:

- Well shut (disposable) overalls (without openings and pockets). Reserve overalls should be present
- Safety shoes or boots
- The trouser legs worn over the safety shoes or boots
- Boot or shoe covers which can be drawn on the shoes
- Strong gloves (impermeable for contaminants)
- Full face mask (with a ABEKP3 filter)

All people that have to enter the contaminate work zone will only enter this zone with the adequate PPE. Permanent field staff will be issued a personal set of PPE. The purpose of using a personal set is avoiding cross contamination and clean storage of PPE.

The following table shows what PPE in what stage must be used.

Table 3.1 Personal protective equipment

Personal Protective Equipment	Field inspection and drilling in vicinity of the burial sites	Drilling in burial sites
Disposal overalls	X	X
Reorganisation overall		X
Safety shoes or boots		X
Safety shoes or boots with shoe covers	X	X
Disposable gloves	X	
Strong gloves with long shaft		X
Full face mask (with ABEKP3 filter)		X
Half face mask (with ABEKP3 filter)	X	
Safety glasses		X
Safety helmet		X

The employees have to be qualified for working with soil and full face masks.

Eating, drinking, smoking and health stops provide health risks during the work. Eating, drinking, smoking and health stops are therefore only allowed outside the burial sites and after washing hands and face.

Zoning working area

The working area will be enclosed with a cord and indicated as the contaminated zone. Personnel entry this contaminated zone should always wear the proper PPE. Personnel leaving or entering the contaminated zone have to pass a decontamination zone. In the decontamination zone personnel leaving undress and leave the contaminated zone in their underwear. Contaminated disposable PPE will be displaced in a bin and other items will be cleaned before taken away.

After finishing the work the participants have to discard the disposable overalls and wash their hands and faces. The disposable overalls and other disposable PPE should be stored in a bin. All other used materials and equipment should be cleaned before demobilisation to another drilling location and or other site. For clean storing and transporting working boots and other reusable materials should be packed separately as much as practical possible. The aim to keep clean and used material separates from not used materials avoiding cross contamination

During the implementation of work at least 1 person is present and trained as a HSE expert. The HSE expert has a first aid kit and an Eye flush available at all times. A powder extinguisher of at least 6 kg has to be available during the drilling activities on the landfill site.

The following cases are recorded per day (if occurred):

- Cases if there is deviation from the circumstances described in this notice and the reasons for the deviation and it's consequences
- Registration of the weather conditions
- The registration of emergency actions
- The administration on the management of security devices
- An overview of the persons who have visited the site
- The results of the measurement

4 Measurement strategy

Pesticides are difficult to measure and often non-volatile. Measurement should focus on the presence of substances (pesticides related). These measurements cannot be done mobile. This means when visual material is observed (by the HSE expert), employees have to wear all necessary PPE.

There is no hundred percent certainty to indicate whether only pesticides are present in the burial sites. The use of a PID and explosive meter during field investigations (drilling) on the landfill will therefore be evaluated on the basis on the first site specific field observations.

When the PID and/or explosive meter gives an alarm, HSE expert should be contacted in order to assess possible next steps.

5 Directly involved employees

National employees

Name	Function	Company	Telephone number
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----

International employees

Name	Function	Company	Telephone number
Marten van der Wijk	Task leader	Witteveen+Bos	+31 6 20 94 30 33
Boudewijn Fokke	Task leader	Tauw	+31 6 51 83 70 89
John Vijgen	Team Leader	IHPA	+45 45 41 03 21
Rachel Mendelts	Back office HSE expert	Witteveen+Bos	+31 6 23 81 87 30
Gabor Raska	Trainer	Tauw	+36 303 77 11 53
Matthijs Bouwknegt	Trainer	Tauw	+31 6 26 76 47 29
Berto Collet	Trainer	Tauw	+31 6 53 16 60 86

Based on the observation in the first site visit a site specific emergency and Health and Safety Plan will be prepared which states the necessary actions in case of an emergency. This site specific plan will be based on this HS plan.