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Malta, 16-19 June 2015

Joint Session MED POL and REMPEC Focal Points Meetings
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Report of the Regional Meeting on environmental inspectorates and training on ELV/EQS, Athens, November 2014

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UNEP/MAP
Athens, 2015

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1 December 2014
Original: English

Regional training workshop for modeling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury, and Enhance the Environmental Inspectorate.

Athens, Greece, 25-27 November 2014

Report of the Meeting

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UNEP/MAP
Athens, 2014

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Introduction

1. The Regional training workshop for modelling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury and Enhance the Environmental Inspectorate was held in Athens, Greece on the 25 – 27 November 2014. Environmental Inspections represent a key instrument to promote and ensure compliance and enforcement. The LBS Protocol provides for the Secretariat to support the countries in strengthening their law implementation and enforcement. In this respect MED POL in cooperation with WHO has developed over the years a number of guidelines and indicators as well as undertaken several training workshops. Being an important component for MED POL work, the strengthening of environmental inspectorates was also considered and related activities included in the MedPartnership project. The Meeting was held at the Golden Age Hotel Athens, Greece from 25 to 27 November 2014.

2. The aim of the training workshop was to:

   - Review the existing WHO/MED POL guidelines and indicators related to environmental inspectorate and suggest the necessary elements for their update and further development.
   - Provide guidance to the concerned countries in preparing state of play reports, action plans, and need assessment to strengthen environmental inspectorate and their effectiveness.
   - Introduce the ELV-EQS tool which has the objective to provide a bridge between the ecosystem approach and the MED POL Land Based Sources Protocol. As such, it establishes a relation between environmental quality standards (EQS) and emission limit values (ELV) following a combined, precautionary approach.

Participation

3. The meeting was attended by 17 participants from the following Contracting Parties: Albania, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, Israel, Italy, Lebanon, Libya, Malta, Montenegro, Morocco and Slovenia. Palestine also attended the meeting as an observer.

4. The Secretariat of the Mediterranean Action Plan (UNEP/MAP) was represented by the MED POL Programme (MED POL) and MedPartnership Project. The list of participants is attached as Annex I to this report.

Agenda Item 1: Opening and organization of the workshop, scope and purpose of the meeting and election of officers and adoption of the agenda

5. The workshop was opened at 9.00 a.m. on 25 November 2014 by Mrs. Tatjana Hema, UNEP/MAP – MED POL Programme Officer. She welcomed all participants and made a brief introduction on UNEP/MAP-MED POL activities carried out in cooperation with WHO to strengthen Environmental Inspectorate in the Mediterranean countries. Mr. Lorenzo Galibati – MEDPARTNERSHIP project manager in his opening speech pointed out the MEDPARTNERSHIP activities in the Mediterranean countries.

6. The meeting elected its officers as follows:

   Chairperson: Ms. Olfat Khalil, Lebanon.
   Vice-Chairperson: Mr. Jawad Benhamidan, Morocco

7. Interpretation in English and French was provided at the meeting.

8. The meeting adopted the agenda set out in UNEP (DEPI)/MED WG 402/1, annotated in UNEP(DEPI)/MED WG 402./2 and presented in Annex II of the present report.

9. Mrs. Tatjana Hema introduced Mr. Jos van Gils and Mr. Mathieu Chatelain representing DELTARES and provided information on their work to develop a correlation model between

Emission Limit Values (ELV) and Environmental Quality Standards (EQS), as well as the related web based tool.

Agenda Item 2: Training on ELV/EQS correlation web based tool

10. The experts presented the correlation model on ELV/ EQS (UNEP(DEPI)/MED WG.402/4). They gave brief information on a number of key elements of the models such as the safety factor, environmental quality standards, mixing zone, practical limitations of the tool and the required data to run it effectively.

11. The experts provided explanations to the questions raised from the floor on the way the tool would operate, its scope of application etc. The main features of the tool are presented in Annex III to the present report.

12. Following the introductory presentation and discussion, the participants spread in smaller groups to examine the tool on line and practice it. Certificates were distributed at the end of the first day to all participants.

Agenda item 3: Compliance and Enforcement in the Mediterranean

13. Ms. Gehan El Sakka, MED POL consultant made a presentation on MED POL work supporting countries to implement Article 6 of the LBS Protocol of Barcelona Convention. She provided background information on MED POL activities in cooperation with WHO to promote compliance and enforcement in the Mediterranean.

14. Ms. Nancy Isarin, MED POL consultant, presented key principles on inspection and enforcement and up to date inspection methods (UNEP(DEPI)/MED WG.402/5). She presented the regulatory cycle and the environmental inspection system with its characteristics, as well as inspection strategy and plan, performance indicators, the minimum criteria of environmental inspection and the enforceable requirements.

15. Moreover, the MED POL consultant presented the regional and international framework on compliance and enforcement to combat marine pollution focusing on inspection methods on non-compliance cases with examples.

16. The participants were divided into two subgroups and carried out a number of exercises related to trans-boundary movements of hazardous waste. The groups worked on two case studies on Phosphogupsum, and Tanning industry. Both groups reported back to the plenary the results of their work.

Agenda item 4: Presentation of country reports on compliance and enforcement

17. Eight participants from Albania, Cyprus, Egypt, Italy, Israel, Lebanon, Morocco & Slovenia made short presentations and shared some of their practical experiences related to inspection and enforcement, success stories, best practices as well as difficulties encountered including collaboration among different relevant stakeholders at national level.

18. It was obvious from the countries presentations that there are strong efforts and that substantial progress was made by the countries on different levels. However, there are still some challenges to execute effective and efficient monitoring activities such as funding and monitoring equipment availability, limited involvement of the public and NGOs, difficulties in enforcing the sanctioning measures and the need for capacity building for inspectors.

19. Participants also pointed out a number of problematic sectors in their countries with regards to inspections such as landfills in coastal areas, industrial waste water treatment for some key sectors, aquaculture, fertilizer industry and municipal waste water treatment plants.

20. Participants also raised the need to enhance networking at various levels to improve the quality and efficiency of the inspection system.

Agenda item 5: Future priorities on technical assistance and capacity building needs to enhance compliance and enforcement in the Mediterranean

21. Ms. Isarin presented the existing interagency collaboration at regional and international levels, pointing our several collaboration agreements and enforcement bodies such as INTERPOL, World Customs Organizations, IMPEL, INECE networks and the Basel Convention ENFORCE.

22. Following a presentation by the Secretariat on potential priorities to enhance compliance and enforcement in the Mediterranean, the meeting identified a number of technical assistance and capacity building activities at regional and national levels that are presented in Annex III to the present report.

Agenda item 6: Conclusions and recommendations.

23. Participants reviewed a list of conclusions and recommendations that was amended and approved as contained in Annex III to the present report.

Agenda item 7: Closure of the training workshop

24. The Chair in his closing remarks thanked the participants and the Secretariat for their constructive contribution.

25. The Chairperson closed the meeting at 12:30 pm on 27 November 2014.

Annex 1
LIST OF PARTICIPANTS
LISTE DES PARTICIPANTS

ALBANIA	**Mr. Genti Haderaj** Environmental Inspector Tel: +355 42 420669 Email: genti.haderaj@hotmail.com **Mr. Xhevdet Haxhiaj** Environmental Inspector Tel: +355 42 316002 Email: xh.haxhiaj@hotmail.com State Inspectorate of Environment, Forestry and Water Boulevard Zhan d'Ark Tirana Albania
BOSNIA AND HERZEGOVINA	**Mr. Nebojsa Savic** Environmental Inspector Brcko Distrikt B/H Cvijete Zuzoric BB 76100 Brcko Bosnia and Herzegovina Tel: +38749220061 Mob:+38765842453 Email: nsavic@1962@gmail.com
CROATIA	**Ms. Slavica Cikotic** Head of Department for Dalmatia Watershed Area Division for Water Inspection Vukovarska 35 21000 Split Croatia Tel: +38521 309447 Mob:+385 992132404 Email: slavica.cikotic@mps.hr
CYPRUS	**Mr. Konstantinos Antoniadis** Department of Fisheries and Marine Research (DFMR) Ministry of Agriculture, Natural Resources and Environment 101 Bethleem Street, Strovolos, 1416 Nicosia, Cyprus Tel: +357 22 807852-4 Fax: +357 22 775955 E-mail: kantoniadis@dfmr.moa.gov.cy
EGYPT	**Ms. Krestine Magdy Fawzy** Environmental Researcher Ministry of Environment

	30, Misr Helwan El-Zyrae Road Maadi Cairo Tel: +202 25256452 Email: krestinemagdy88@yahoo.com **Mr. Nasser Abouel Enein** Environmental Researcher Ministry of Environment 30, Misr Helwan El-Zyrae Road Maadi Cairo Tel: +202 2251113 Email: Nasser_eeaa@yahoo.com
ISRAEL	**Ms. Yael Shai** Senior National Coordinator for Prevention of Marine Pollution from Industrial Sewage Ministry of Environmental Protection Marine and Coastal Environmental Division 15a Pal-Yam Street P.O Box 811 Haifa Israel Tel: +972 4 8633500 Email: yaels@sviva.gov.il
ITALY	**Ms. Geneve Farabegoli** Environmental Inspector ISPRA Via Vitaliano Brancati 48 00144 Rome Italy Tel: +3906 50072166 Email: geneve.farabegoli@isprambiente.it
LEBANON	**Ms. Olfat Hamdan** Head of Department, Urban Environmental Protection Beirut-Down Town Raid El Solh Str Lazarieh Building, 7th floor, Room 7-16 Beirut Lebanon Tel: +9611 976555 (448) Email: o.hamdan@moe.gov.lb
LIBYA	**Mr. Nassir Bsher Mohamed** General Environmental Authority Alkeran Janzor Tripoli Tel: +218913900171 Email: nassirega@gmail.com **Mr. Farid Elbakkoush** Environmental Inspectorate Expert Tel: +218913151169 Email: fgregne@yahoo.com
MONTENEGRO	**Mr. Dejan Filipovic** Environmental Inspector

	Department for Environmental Inspection October Revolution Street no. 130 Podgorica 81000 Montenegro Tel: +382 20 513059 Email: dejan.filipovic@uip.gov.me
MOROCCO	**Mr. Jawad Benhmidane** Engineer/Environment Inspector Ministry of Environment 9 Avenue Al Arrar Secteur 16 Hay Riad 10100 Rabat Morocco Tel: +212 537570636 Email: jawadbenhmidane@yahoo.fr **Ms. Wafaa Ouahbi** Service de la Legislation et de la Reglementation Ministere Delegue aupres du Ministre de l'Energie, des Mines, de l'Eau et de l'Environnement 9, Avenue Al Araar Secteur 16 Hay Riad 10100 Rabat Morocco Tel: +212 537570607 Email: ouahbiw@yahoo.fr
SLOVENIA	**Mr. Boris Zbona** Inspector for Environment Inspectorate for Agriculture and Environment Trg Edvarda Kardelja 1 5000 Nova Gorica Slovenia Tel: +3865 3311882 Email: boris.zbona@gov.si

OBSERVERS

PALESTINE	**Mr. Issam Qasem** Director Environment Quality Authority Ramallah Tel: +972 92674558 Mob: +0599 264232 Email: isammena@hotmail.com

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UNEP/MAP Coordinating Unit	**Ms. Tatjana Hema** MED POL Programme Officer

	Tel: +30210 7273115 Email: tatjana.hema@unepmap.gr **Mr. Lorenzo Galbiati** MedPartnership Project Manager Tel: +30210 7273106 Email: Lorenzo.galbiati@unepmap.gr **Ms. Virginie Hart** Marine Expert MedPartnership Tel: +30210 7273122 Email: virginie.hart@unepmap.gr **Ms. Shelley Farrington** MED POL/MedPartnership Assistant Tel: +30210 7273135 Email: Shelley.farrington@unepmap.gr **Ms. Gehan Elsakka** Consultant Email: medpol.medpartnership@unepmap.gr **Ms. Nancy Isarin** Consultant Email: nancy.isarin@ambiendura.com **Mr. Jos Van Gils** Senior Advisor/Researcher Tel: +310 883358472 Email: jos.vangils@deltares.nl **Mr.Matthiew Chatelain** P.O Box 177 2600 MH Delft The Netherlands Deltares (UNEP/MAP Consultants)

Annex II : Agenda

Agenda item 1. Opening of the workshop and organization of the workshop

Agenda item 2: Correlation tool on ELV and EQS

a) Development of correlation model between ELV and EQS

- *ELV/EQS correlation model*
- *Use of the safety factor*
- *Definition of Environmental Quality Standards*
- *Establishment of a Mixing Zone.*

b) Training on ELV/EQS correlation web based tool

- *Web based tool demonstration*
- *Training session*
- *Conclusions, follow-up*
- *Certificates*

Agenda item 3: Enforcement and Compliance

a) Key principles on inspection and enforcement and up to date inspection methods
b) Review of regional and international framework on compliance and enforcement to combat marine pollution, including UNEP/MAP-MEDPOL guidelines on inspection
c) Training sessions in sub-groups

Agenda item 4: Presentations of country reports on compliance and enforcement

Agenda item 5: Discussion on technical assistance and capacity building needs to enhance Compliance and enforcement in the Mediterranean

Agenda item 6: Conclusions and recommendations

Agenda item 7: Closure of the workshop

Annex III
Conclusions and Recommendations

Findings, conclusions and recommendations of the Regional Training workshop for a modeling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury and enhance environmental inspectorate.

On 25-27 November 2014, the Regional Training Workshop for a modeling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury and enhance environmental inspectorate was held at the Golden Age Hotel, Athens, Greece in the framework of the MED POL programme of work 2014-2015 and the MedPartnership project. The following contracting parties and observers participated: Albania, Bosnia & Herzegovina, Croatia, Cyprus, Egypt, Israel, Italy, Lebanon, The State of Libya, Montenegro, Morocco, Slovenia as well as Palestine.

The workshop focused on:

a) Review of and training on the ELVs/EQSs web-based tool.
b) Training on new elements related to compliance and enforcement.

Ways and means to strengthen the capacities of environmental bodies to enforce national legislation. Following the training sessions, the presentation made by the consultant, and country representatives, the workshop participants agreed on the following findings, conclusions and recommendations:

A ELVs/EQSs web-based tool

1) The participants thanked the Secretariat and Deltares Institute (the developer of the tool) for the work done and for developing a user friendly and simple tool that may fit several purposes (support permitting, facilitate compliance assessment, Environmental Assessment Studies, and enhance as appropriate public participation), taking into account that this tool is a good effort to better bridge between the LBS protocol and ecosystem approach implementation.

2) The ELVs/EQSs web-based tool and related guidance document have sufficient information for its implementation for ten substances selected as the most representative substances in the Mediterranean countries from the NBB analysis. Harmonization with the updated list of priorities substances is needed. It has to be noted that the tool is applicable

a) to individual point sources of pollution with a distance range from 200-2000 m from one source to another.
b) for not a very large discharge capacity
c) one substance a time.

3) The ELVs/EQSs web-based tool has sufficient flexibility and allows implementation for other substances as far as the relevant requested information is provided by the user. In this respect, the challenge might be the lack of information on a decay rate and partition coefficients for the new substances. This information is available and can be found in the literature, and needs to be used in a harmonized manner by different users and countries. The participants requested DELTARES to add the potential sources of information on the decay rate, partition coefficient and mixing zones for the new substances in the ELVs/EQSs web-based tool guidance document, and if possible extrapolation of results on satellite images.

4) The ELVs/EQSs web-based tool can be used to define either the ELVs or the minimum and maximum mixing zone provided that one of those parameters is available, given that EQSs values are already formally regulated by the national legislation. Preparation of common guidelines on the definition of mixing zones for the Mediterranean countries based on best national, regional or international practices can be considered.

5) The participants were trained on the use of the ELVs/EQSs web-based tool and ran the model for alternative examples. The participants got certificates on the use of the ELVs/EQSs web-based tool issued by UNEP/MAP and DELTARES.

6) The Secretariat confirmed that the web based tool will be hosted soon in the UNEP/MAP website and can be accessed by the contracting parties and the public. The Secretariat invited the participants to consider using the tool in their own work and disseminating to other stakeholders to apply real monitoring data to increase its confidence, through further validation as well as a screening tool to check compliance and support permitting as appropriate for point sources.

7) The Secretariat confirmed that some demonstration and training on this tool will be done during the national workshops on environmental inspectorates to be held in Egypt and Morocco in December 2014.

b) Compliance and enforcement in the Mediterranean (country reports and way forward).

8) Eight country representatives made a presentation on state–of-play of environmental inspectorate systems at the national level. They provided useful information on specific cases of how non-compliance situations were identified and resolved.

9) The legal framework on compliance and enforcement is quite developed in all the countries. In particular there is very good development and examples of improved networking and collaboration between different enforcement bodies in several countries.

10) The main challenges at country level remain to be financial constraints, limited human resources, need for technical assistance and capacity building. In this respect the need to enhance efficiency and effectiveness. was highlighted

11) The participants reviewed and agreed on a number of proposals made by the Secretariat on potential activities to support the Contracting parties to enhance compliance and enforcement as presented in the Appendix of these conclusions and recommendations.

APPENDIX
"Proposals on Priorities to Support Contracting Parties to Enhance Compliance and Enforcement in the framework of the LBS Protocol of UNEP/MAP Barcelona Convention"

Background

This paper tries to describe generally the state of play concerning the inspection and enforcement systems in place in the countries and some of the challenges they meet in performing effective and efficient inspection and enforcement actions, based on the presentations made by the countries during the second day of the workshop. It also proposes different approaches to deal with the identified issues and a proposal for course of action.
Strong efforts and clear progress has been made by the countries to have inspection and authorization systems and legislative frameworks in place, including effective cooperation between enforcement bodies at national level. However, countries still face challenges and obstacles to execute effective and efficient monitoring activities. Challenges mentioned by the countries included:

- Resources in terms of staff, funding and monitoring equipment
- Clear definitions of offences and non-compliance
- Setting Environmental Quality Standards, mixing zones and update as appropriate emission limit values
- Limited public and NGO involvement
- Systematic inspection and compliance systems
- Limited sanctioning measures
- Difficulties in enforcing the sanctioning measures
- Technical knowledge

Problematic sectors that came up involve landfills in coastal areas, industrial waste water treatment for some key sectors, oil companies, aquaculture, solid waste from tourism industry, fertilizer industry, and municipal waste water treatment plants.
A high priority is therefore to increase the technical skills and level of specialization of the inspectors and enhance the capability and efficiency of environmental inspection

Way forward

1. Technical assistance

In order to improve the skills and quality of the inspection and enforcement systems the following activities are suggested:
a. Development of detailed inspection guidelines for sector specific industries. This idea involves the development of manual/checklist for key priority industries, aiding the inspectors in their inspections, including listing environmental risks, proposing management plan (including BAT and BEP) and tools and ways of checking compliance.
b. Development of a working procedure to improve the link and cooperation between permitting and inspection authorities and relevant industry sectors. Exchange of information and knowledge between permitting and inspecting authorities is essential, firstly to write clear binding measures in permits and secondly to facilitate the feedback of inspection actions from the inspectors back to the permit writers.
c. Development of detailed guidelines to support the issuing of permits for sector specific industries. In order to perform efficient compliance checking, permits and their requirements should be clear and enforceable, cover all the key elements and refer to BAT and BEP.
d. Support as appropriate update of existing legislation and regulations related to inspections and enforcement.

2. Capacity building and training

Training both at the national and regional level is proposed based on the developed toolkit mentioned under point:1

- National training is driven by specific national priorities, whilst regional training is based on common issues for a considerable number of the contracting parties.
- The focus of the training should be to enhance the technical skills of the inspectors for key sectors and topics (e.g. landfills, landfills in coastal areas, industrial waste water treatment of key sectors, oil companies and municipal waste water treatment plants and mixing zones, transboundary movements of hazardous wastes). The training should be hands-on and include practical case studies, exercises and field visits.

3. Enhanced networking

Networking at various levels, is also considered a key activity to improve the impact of environmental inspections and the quality of the inspection systems and their efficiency. Use of already developed tools will also reduce the need for new or additional resources; it is more preferable to use existing available materials than re-inventing the wheel.

At national level activities should focus on strengthening institutional cooperation. Developing formal agreements between the relevant institutions are therefore strongly encouraged and as well as the follow up of their implementation. Joint compliance promotion activities should also be considered. Besides actively informing the regulated community about legislation, joint campaigns can also focus on incentives to promote compliance by the facilities. Examples are promoting self-auditing, self-monitoring, and offering a reduced inspection regime in case of good compliance behaviour. It is strongly suggested to make periodic reporting by the companies obligatory as appropriate and based on the specific situation of the contracting Parties.

At regional level, this would involve continuing and strengthening the Network on Compliance and Enforcement of Regulations for the Control of Pollution Resulting from Land-Based Activities. This could be supported by establishing an online communication platform and adding a dedicated section on inspection and enforcement on the UNEP/MAP website. Suggested activities include:

- *Update the scope and the mandate of the enforcement network.*
- *Hold annual or bi-annual meetings of the enforcement network.*
- *Share information and practices through national reporting by the countries.*
- *Undertake know-how visits to exchange experiences between the contracting Parties.*
- *Populate the 11 indicators as agreed by the enforcement network in 2011 or update them as deemed necessary.*

At the international level it is suggested to reach out and link with other relevant networks, like NECEMA, IMPEL and INECE at secretariat level. Agreements on collaboration with these networks could be developed as appropriate. Possible activities are joint workshops, sharing of tools, sharing of experiences and information and participate in training when appropriate.

Annex IV
DELTARES presentation

Deltares
Enabling Delta Life

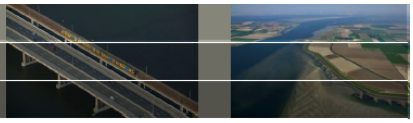
Development and Correlation on ELV and EQS

Jos van Gils, Mathieu Chatelain, Deltares

UNEP

28 november 2014

Content



- Introduction
- Background information on the ELV/EQS model
- Introduction to present results
- Safety factor, Environmental Quality Standards, Mixing Zone.

Deltares
Enabling Delta Life

Independent institute for applied research in the field of water, subsurface and infrastructure

- The Netherlands
- no government,
- no company,
- no university
- not for profit

www.deltares.nl

28 november 2014

UNEP MAP Deltares

Deltares team

- Mathieu Chatelain, advisor/researcher
- Jos van Gils, sr. advisor/researcher

28 november 2014

UNEP MAP Deltares

History of ELV-EQS tool

Phase 1: conceptual study

- *Testing of a modeling system to assess the variations of EQSs with ELVs for nitrogen and mercury in Gulf de Lion and Izmir Bay*
  Report 1201869-000 Deltares, January 2012
  UNEP(DEPI)/MED WG. 379/Inf. 6
- Main result: **recommended approach**

Phase 2: **implementation**

- web-based software tool
- Guidance Document
- training of users
- Tutorial
- Work plan for after project maintenance

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Emission Limit Values (ELV)

Effluent/discharge standard

The MAP Land Based Sources (LBS) Protocol defines an ELV as

"the maximum allowable concentration measured as a "composite" sample, of a pollutant in an effluent discharged to the environment"

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Environmental Quality Standard (EQS)

Standard for receiving waters:

"the concentration of a particular pollutant or group of pollutants in water, sediment (any material transported by water and settled to the bottom) or biota (all living organisms of an area) which should not be exceeded in order to protect human health and the environment."

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Combined Approach: EQS/ELV

MEDPOL LBS Protocol: Emission Limit Values ELV (effluent/load standard)

ELV-EQS tool:
a methodology to establish a relation between ELV and EQS for coastal discharges

Ecosystems approach:
Environmental Quality Standards (EQS)
(receiving waters standard)

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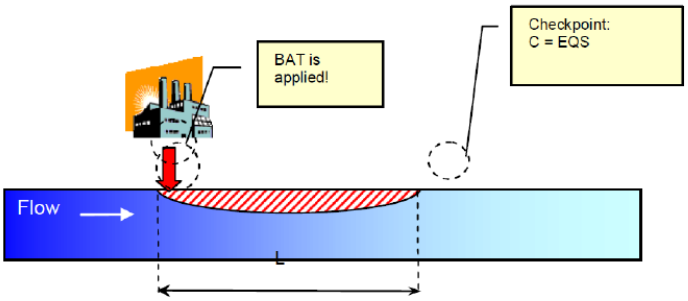
Mixing zone concept

- **mixing zone**: an area around a discharge point where the concentration of a substance may locally exceed the EQS
- as defined in the related EC Guidance Document (EC, 2010)
- if the EQS is given, the ELV follows from the requirement that the EQS is satisfied at the edge of the designated mixing zone



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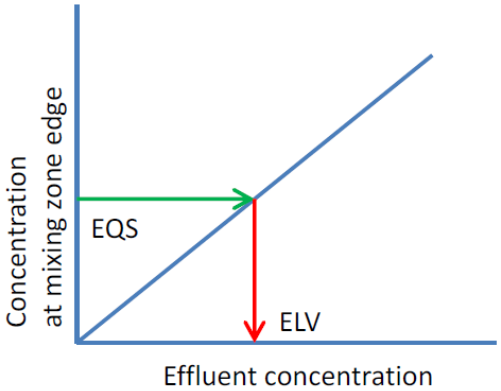
Relation between ELV and EQS

Depends on:

- discharge (location, depth, volume, density)
- substance of concern (decay? sorption?)
- receiving water body (open, enclosed, depth. currents)



How to quantify relation between ELV-EQS?

- mathematical water quality modelling
- accepted, widely used

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Conceptual (phase 1)

Increasing effort
Increasing accuracy

Stepwise ("tiered") approach

Tier 1: if ELV < EQS: discharge OK!
Tier 2: (simple) discharge test developed by Water Framework Directive expert group
Tier 3: Detailed 3D modelling

Phase 1: proposal for
Generalised Tier 3 model
(between Tier 2 and Tier 3)

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Comparison of modelling approaches

	Tier 2 Discharge Test	Generalised Tier 3 Model	Detailed 3D modelling
Required skill	Low	Still low	High
Required data	Few	Still few	Many
Required effort	Small	Small	Large
Representation of discharge char's	Good	Medium	Medium
Representation of substance char's	No	Yes	Yes
Representation of water body char's	Poor	Medium	Good
Accuracy	ELV 6-7 times lower	ELV ≈ 2 times lower	Highest ELV

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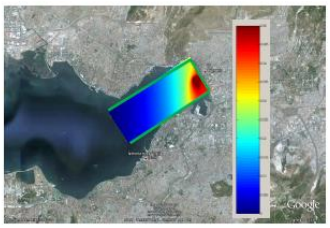
Outcome Phase 1

Proposal for a Generalised Tier 3 model

- Substance specific
- Site specific
- Generic
- Simple, fast, few data required

  many sites / substances at low cost



- Harmonized approach

  "level playing field"

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Pilot locations Phase 1

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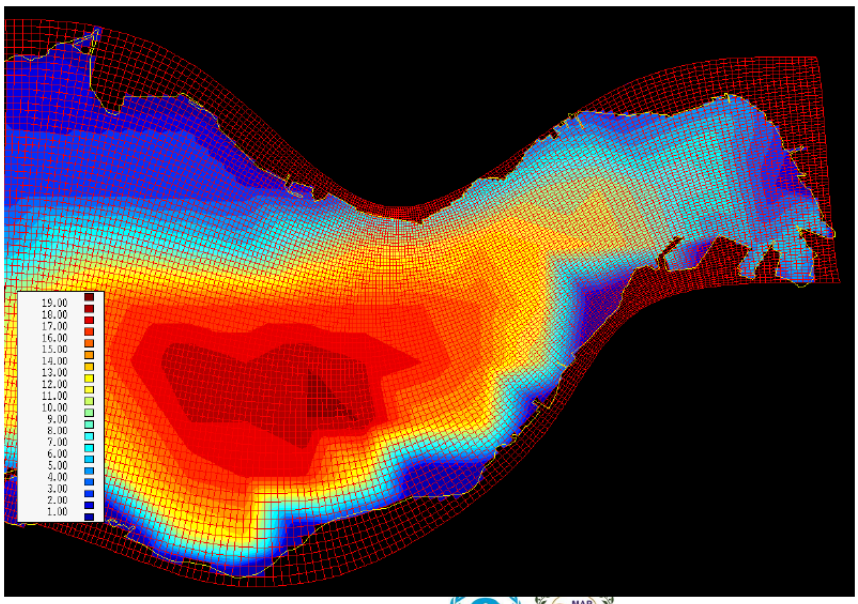
Example: Izmir Bay detailed 3D model



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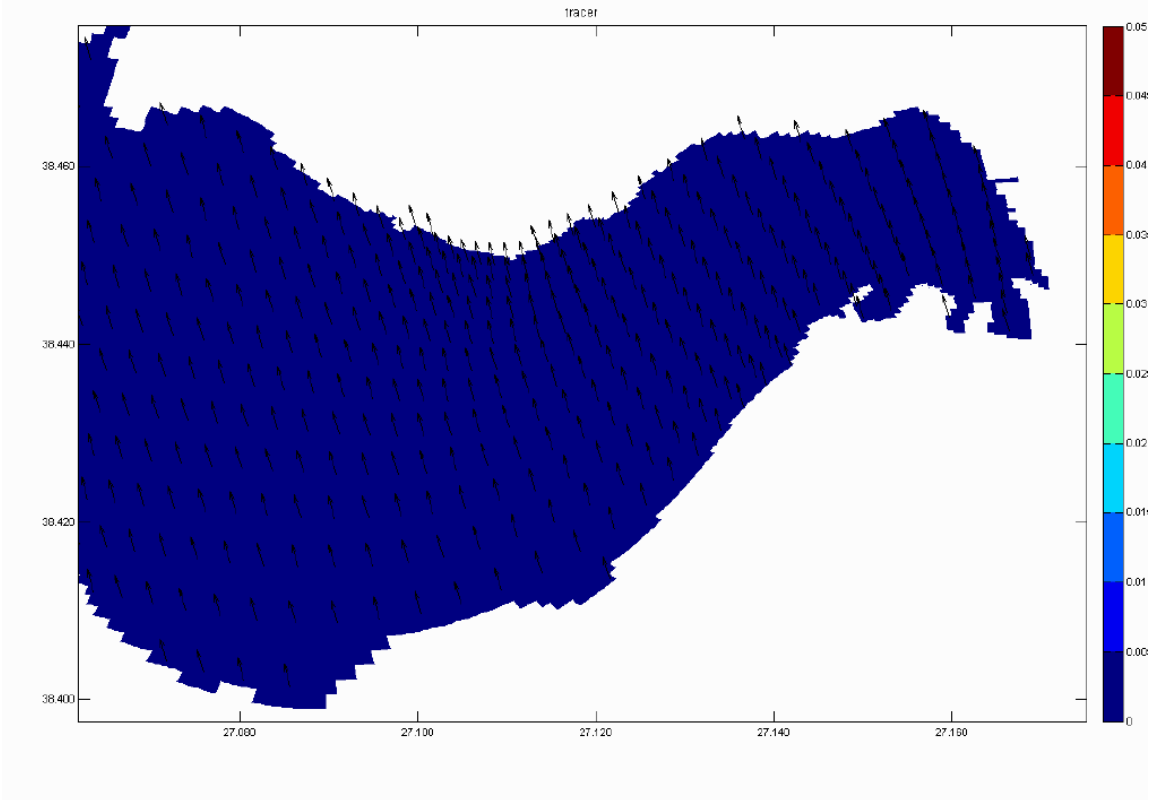
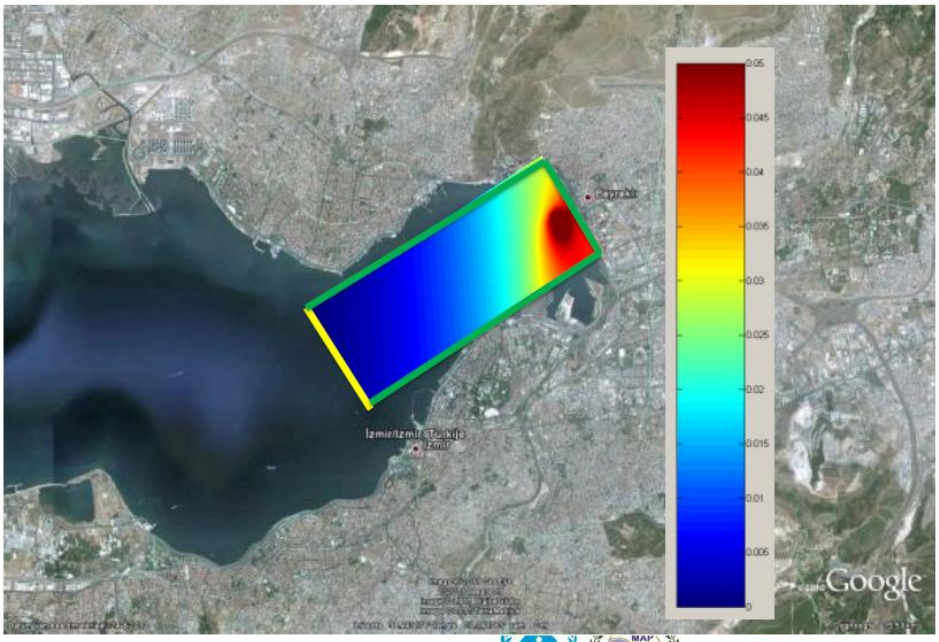


Izmir Bay: Generalised Tier 3 Model

Open

Closed



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Variable environmental conditions

Fate of discharge depends mainly on:

- Wind (drives local currents)
- (large scale) current

Up to 10 different sets of conditions with frequency of occurrence %

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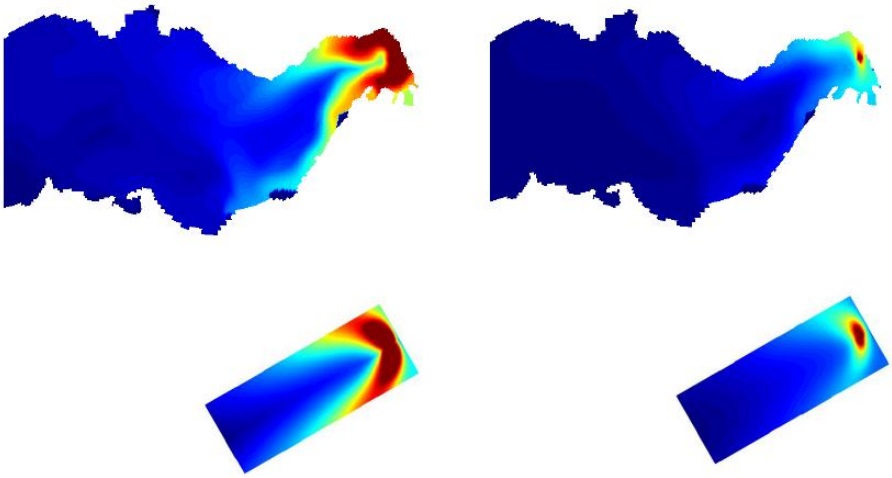
Detailed 3D vs Generalised Tier 3

Maximum concentrations
(worst case conditions)

Average concentrations
(all conditions)



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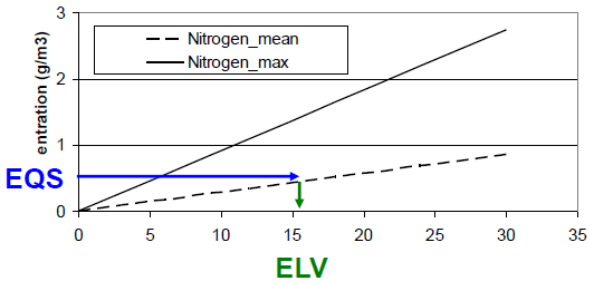
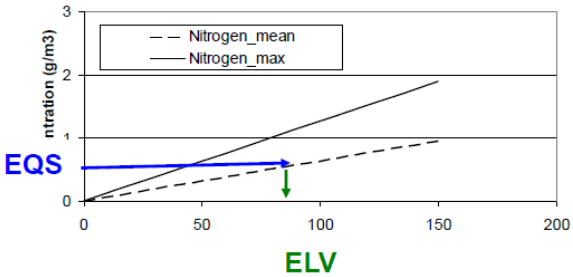
Example results



Izmir Bay

Gulf of Lions



mean concentrations
mixing zone 500 m

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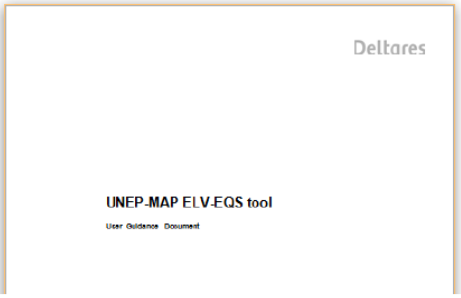
Guidance Document

1. Introduction
2. Is the ELV-EQS tool suitable for me?
3. Providing input to the ELV-EQS tool
4. Running the ELV-EQS tool and interpreting the output

A Substance decay rates
B Substance partition coefficients



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Substance of concern (SoC)

ELV-EQS tool: one substance at a time

When deal with a substance of concern (SoC)?

- present in discharge
- EQS defined

Assess all SoC's 1-by-1

(Guidance Document provides rules-of-thumb to find the critical SoC)

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Is the ELV-EQS tool suitable for me?

Conceptual limitations

- Mediterranean only
- No large volume discharges (> 3600 m3/h)
- Not two or more discharges of equal significance at a distance of 200-2000m
- No complex multiport diffusor
- No discharge in lower layer of a stratified water body

(larger, high tech discharges -> Tier 3)

(see Chapter 2 Guidance Document)

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Is the ELV-EQS tool suitable for me?

Practical limitations: required data

- Co-ordinates of the discharge.
- Depth of the discharge.
- Discharge quantity (m^3/h).
- Concentration in the discharge.
- Environmental Quality Standard
- (approximate) depth of receiving waters
- (approximate) strength of the marine currents

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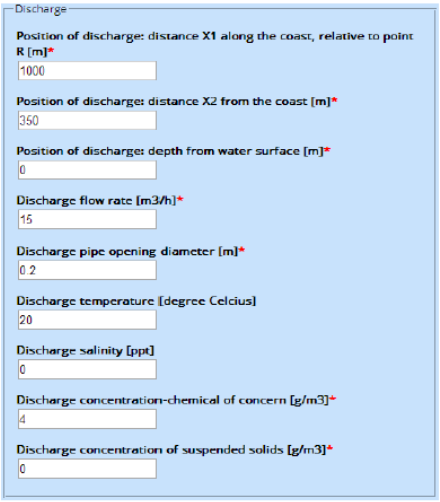
Providing input and running ELV-EQS tool

- Discharge definition
- Substance definition
- Environment definition

- Safety Factor
- EQS
- Mixing Zone

Further details during training
Guidance Document
Tutorial



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Example output

	Maximum concentration	Mean concentration
EQS	7E-05	5E-05
Defined mixing zone	5E+02	5E+02
Concentration at edge of mixing zone	2.8E-7	1.6E-7
Discharge permitted	Yes	Yes

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Safety factor

Phase 1:
Generalised Tier 3 Model compared to Detailed Tier 3 Model for
Nitrogen (N) & Mercury (Hg)
Izmir Bay & Gulf of Lions

Phase 2: ELV-EQS tool applicable to

- **other pollutants** of concern
  BOD N P metals PAHs phenols
- **other sites**, including
  Alexandria Bay, Tunis Bay,
  Barcelona Bay, Haifa Bay,
  the North Adriatic and
  the North Aegean

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Safety Factor

ELV-EQS tool should be "conservative":
simplicity should not lead to incorrect approval of discharge

- Safety Factor = 2
- Derived from Phase 1
  - N, Hg
  - Gulf of Lions, Izmir Bay
- Maybe more testing required?

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Mixing zones and EQS

- The definition of Environmental Quality Standards (EQS) and mixing zones is a policy decision
- No additional guidance is available outside regular UNEP-MAP activities

(we have made the tool compatible with EU legislation to allow EU member states to use it)

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Mixing zones and EQS – EU legislation

Water Framework Directive (WFD) 2000/60/EC, daughter Directive 2008/105/EC

- Maximum Allowable Concentration EQS (MAC-EQS)
- Annually Averaged EQS (AA-EQS)

- EQS for “total” concentration (unfiltered sample).
- EQS for dissolved concentration (filtered sample).

EU Guidance Document on Mixing Zones (EC, 2010):

- separate “MAC-EQS” and “AA-EQS” mixing zones
  (in some European countries, the MAC-EQS mixing zone is much smaller than the AA-EQS mixing zone)

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Next …

- Demo
- Hands-on training
- French or English
- Questions are welcome, now or later today

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Acknowledgements

This work was funded by UNEP-MAP and by the UNOPS Project Office and technically facilitated by the UNEP-MAP Secretariat in Athens.

We gratefully acknowledge the support from the UNOPS project office staff and the UNEP-MAP secretariat staff.

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Mixing zones

- Documents can be downloaded from Internet, Guidelines, Background Document
- Considerations for setting mixing zones:
  - Proportionate impact: small discharge should not have disproportionately large impacts, in practice: BAT
  - Sensitive receivers, sensitive functions: mixing zones should not touch drinking water intakes (not relevant for marine waters), sensitive water uses, nature reserve areas, etc.
  - Good Status of water body affected should not be in jeopardy

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Mixing zones

- ELV, EQS and mixing zone are related:

  if two are known, the third follows

- ELV and EQS have been set independent from each other, you can calculate the resulting mixing zone with the tool (area where EQS is exceeded):
  - Mixing zone is very small: environmental impact is limited
  - Mixing zone is very large: environmental impact is severe
  - Calculated mixing zones could be used to set priorities

- ELV should anyhow follow BAT (EU Guidance)

Mixing zones

- MAMPEC (anti-fouling, admission)
- RECOVERY (polluted sediment, need for capping)

- Rapid Assessment Tools (RATs)

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MED POL MEDPARTNERSHIP presentation

MedPartnership

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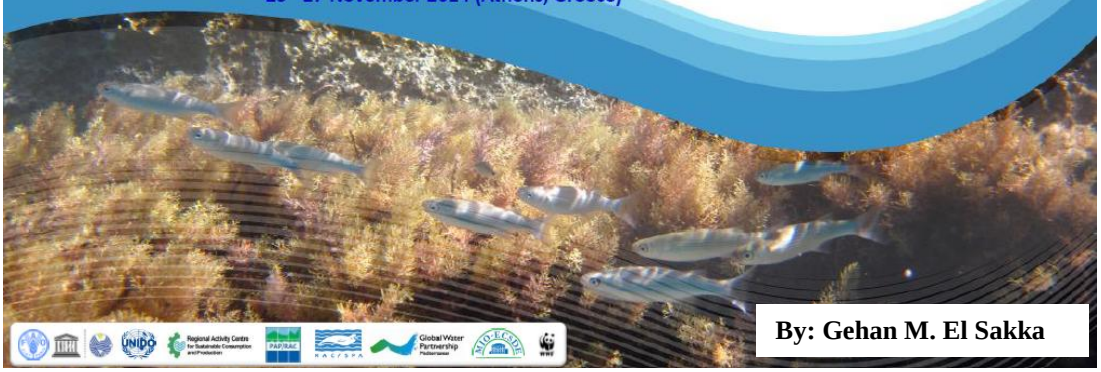
Facilitate the implementation of SAP-MED & NAPs promoting their sustainability

Regional Training workshop for modelling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury, and Enhance Environmental Inspectorate.

25 –27 November 2014 (Athens, Greece)



By: Gehan M. El Sakka

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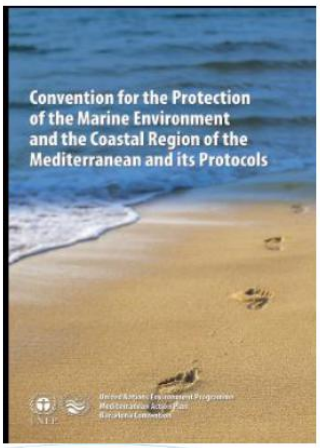
MedPartnership

UNEP – MAP – MED POL Programme.

- **MED POL** Programme (the marine pollution assessment and control component of MAP), is responsible for the follow up work related to the implementation of the LBS protocol, the protocol for the protection of the Mediterranean sea against pollution from Land–Based Sources and Activities, of the dumping, and hazardous waste protocols.
- **MED POL** assists the Mediterranean countries in the formulation and implementation of pollution monitoring programmes, including pollution control measures and the drafting of action plans aiming to eliminate pollution from land – based sources.

Article 6 of the LBS protocol.

- MED POL work to support countries to implement Article 6 of the LBS Protocol of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention).
- Articles 5, 6, 7, 9 and 10 of the LBS Protocol require cooperation between all countries in the region.
- Article 6, paragraphs 2, 3, and 4 call on the parties to the LBS Protocol to provide for systems of inspection by their competent authorities for the assessment of compliance and enforcement of regulations.



Guidelines on Environmental Inspection Systems for the Mediterranean Region

- The guidelines have been prepared in accordance with Article 6 et seq. of the LBS protocol. They are intended to help countries in the Mediterranean region to establish inspection systems or review existing inspection systems. In this respect, the guidelines are designed to act as a framework taking into account the situation in the various countries.
- **UNEP/MAP/MED POL/WHO:** Guidelines on environmental inspection systems for the Mediterranean region. **MAP Technical Reports Series No. 149, UNEP/MAP, Athens, 2004,** The report includes 15 Chapters as follows:

Chapter 1: Background information and purpose

Chapter 2: Coverage and rational

Chapter 3: Permitting

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Guidelines on environmental inspection systems for the Mediterranean region.

Chapter 4: Functions of Inspection systems and Inspectors
Chapter 5: Inspection strategies
Chapter 6: Planning and organization of inspections
Chapter 7: Conducting inspection visits
Chapter 8: Reporting
Chapter 9: Responses in the event of non-compliance
Chapter 10: Compliance promotion
Chapter 11: Enforcement
Chapter 12: Assessment and the provision of feedback
Chapter 13: Self-monitoring and monitoring by Inspection systems
Chapter 14: Environmental management systems
Chapter 15: Human resources management

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MED POL activities in cooperation with WHO to support Compliance and Enforcement.

- **MED Network of Compliance and Enforcement** established.
- **Meetings:** 2 meetings held (2009 & 2011).
- **Training workshops:** several training workshops held such as; Regional Training Course for Trainers on Environmental Inspection Systems (Cyprus 4-8 November 2002) & Discharge from Municipal Wastewater Treatment Plants into Rivers Flowing into the Mediterranean Sea (Greece 2- 4 June 2009).

Indicators: a number of indicators were adopted by the 15 th Meeting of the Contracting Parties, and the issues referring to compliance in all the Protocols were the following: (i) number of inspections, (ii) number of non-compliance cases and (iii) number of non-compliance cases in which sanctions were applied. More detailed information is to be found in **Annex IV of UNEP(DEPI)/MED WG.346/1.**

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The MedPartnership Project.

- "MedPartnership" co-funded by the GEF and involving several relevant agencies, IFIs and bilateral and multilateral donors, was launched by the Mediterranean countries in the framework of **UNEP/MAP** and in cooperation with the World Bank.
- The objective of the Regional Project is to support the implementation of the NAPs and SAP MED.

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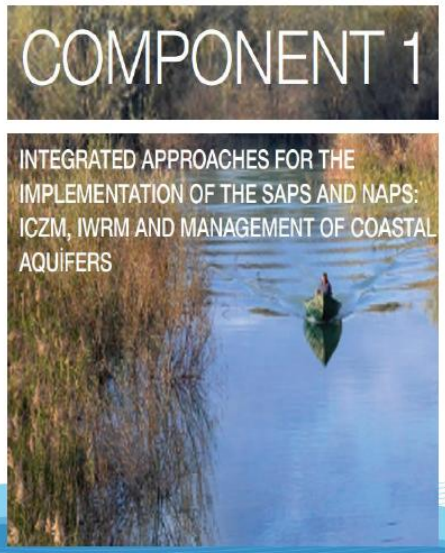
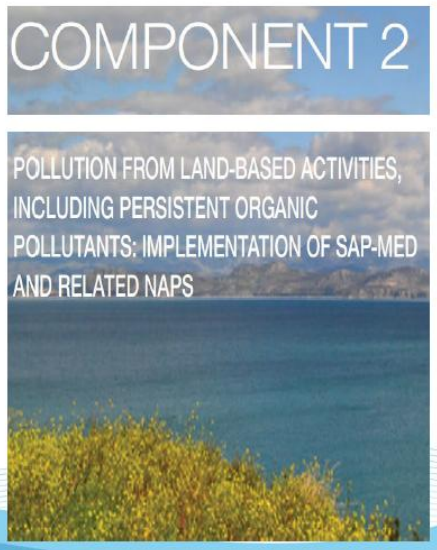
The Regional Project is composed of 4 components:





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COMPONENT 3
CONSERVATION OF BIOLOGICAL DIVERSITY: IMPLEMENTATION OF SAP-BIO AND RELATED NAPS
COMPONENT 4
PROJECT CO-ORDINATION, NGO INVOLVEMENT, REPLICATION AND COMMUNICATION STRATEGIES, MANAGEMENT AND MONITORING AND EVALUATION (M&E)

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Component 2.
MED POL is executing several activities to support the implementation of the NAPs, which were adopted between 2003 and 2005 by the Contracting Parties to the Barcelona Convention.

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Sub- components of Component 2

1. Policy reform to implement NAP/SAP in four sectors, this sub-component includes the capacity building for effective monitoring, compliance/inspection implementation and enforcement of environmental legislation/law.

2. Up to date assessment tools to enhance:
   a) policy reform and;
   b) country capacities.

3. PCBs disposal and capacity building.

4. NAPs implementation, evaluation, and update.

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Strengthening Environmental Inspectorate.

- **On the National Level:**

Two potential countries identified to participate in such activities (Egypt and Morocco) to:

a) organize training workshop for 30 to 50 participants in each country, they will be train on environmental inspection and up-to-date pollution control tools;

b) agree on priorities and establish a national capacity building programme;

C) prepare a report on the challenges to strengthen cooperation of the inspection and monitoring of the water bodies;

D) establish a network of the concerned participants/bodies to follow up on the implementation of the capacity building action plan.

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Strengthening Environmental Inspectorate.

- **Regional outputs:**
  Regional Workshop taking place from 25-27 November 2014 in Athens, Greece addressing:

  a) up to date pollution assessment tools (ELVs/EQSs web based tool);

  b) enhance permitting system, monitoring, control and enforcement tools;

  C) Enhance better cooperation among inspectorate and marine pollution monitoring bodies at national and regional levels.

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Thank you for your attention

Merci pour votre attention

شكراً لحسن استماعكم

Environmental Inspections Presentations

Environmental Inspection and Enforcement: Key principles

Regional Training workshop for modelling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury, and Enhance Environmental Inspectorate.

25 –27 November 2014 (Athens, Greece)

By Nancy Isarin

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Why do we perform

environmental inspections?

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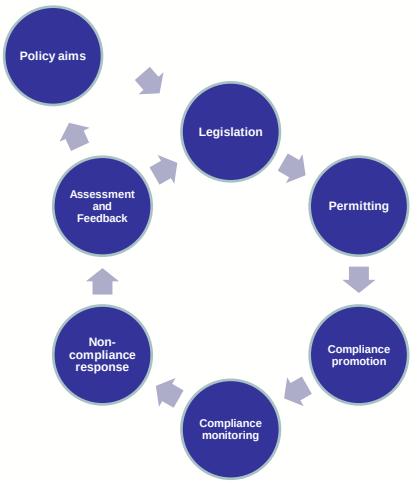
Regulatory cycle



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Environmental Inspection Systems

Enforce the laws in an indepent, consistent and fair way

Possible tasks:

- Provide information and advice to permit applicants
- Issue permits
- Advise on compliance activities
- Determine and require remedial action
- Check compliance promotion
- Maintain records of inspections
- Prepare and disseminate information to others
- Assist and coordinate between licensing authorities

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Characteristics of Environmental Inspection Systems

- Is independent;
- Is based on a solid legal framework;
- Is a governmental organisation (or acts on behalf of)
- Shows separation of responsibilities;
- Proofs integrity, accountability and professionalism;
- Possesses adequate inspection and enforcement powers.

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What problems do you meet as

environmental inspectorate?

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Inspection Strategy

Describes the efforts of the Inspectorate of the for a longer term, its priorities and activities, available tools, focus areas and includes a mission statement

Forms the basis for the operational inspection plan

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Inspection plan

- Operational level
- Installations / facilities to be inspected: number, categories, frequency, required resources
- Types of compliance assisstance, inspection and enforcement measures
- Budget planning
- Support (lab facilities, sampling, training, safety, legal, etc)

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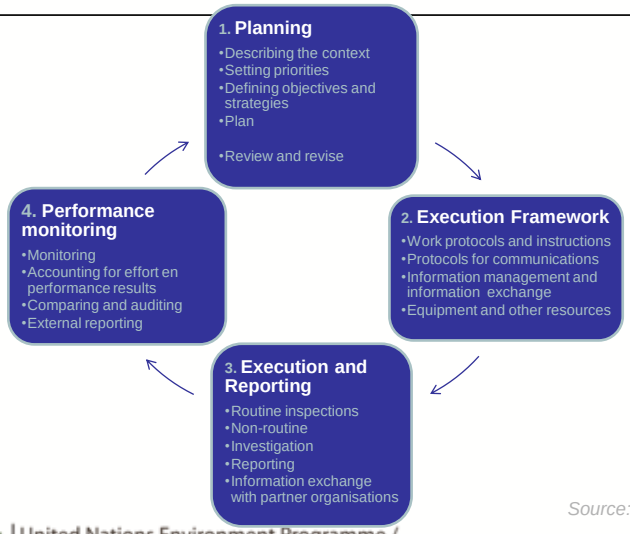
Environmental Inspection Cycle



Source: IMPEL

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Performance Indicators

Traditionally focussed on numbers (e.g. inspectors, facilities, cases, judicial actions).

Numerical	Non numerical
• Input • Output • Intermediate output • Final output	• Measures the basics of an inspectorate

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Minimum criteria environmental inspections

Aim for a more consistent implementation and enforcement in the involved countries

Example of EU criteria covering the following topics:

- The organisation of environmental inspections
- Environmental inspection plans
- Site visits
- Reports and conclusions following site visits
- Investigations
- General reporting

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Enforceable requirements

Types of requirements in a permit:

- Technical standards (equipment)
- Performance standards
- Economic standards

Practicable	Enforceable
• Definitions • Requirements • Timescale	• Technology availability • Limits to legal instruments • Exemptions • Burden of proof

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Example

A. The licensee, shall notify any incident.

B. The licensee, shall notify (WHO) by (HOW) as soon as practicable (WHEN) after the occurrence of any incident (WHAT IS CONSIDERED AN INCIDENT). The licensee shall include as part of the notification, date and time of the incident, summary details of the occurrence, and where available, the steps taken to minimise any discharges (WHAT).

NI1

Example

"The owner or operator of a registered sewage treatment plant shall not discharge to a protected water more than 90 mg/l of suspended solids from its permitted discharge pipe except during cleaning of the surge tank."

What facts do you need to establish to demonstrate compliance or prove a violation?

Contact:

United Nations Environment Programme
Coordinating Unit for the Mediterranean Action Plan
Vassileos Konstantinou 48
Athens 11635
Greece

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Inspection Methods
~~and~~
Dealing with Non-Compliance

Regional Training workshop for modelling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury, and Enhance Environmental Inspectorate.

25 –27 November 2014 (Athens, Greece)

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Do you have all the required competences?

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Examples of Competences

Inspections	Enforcement
• Enter places	• Warning
• Open spaces, packagings and transport means	• Penal Sum
• Take samples	• Order (clean up, end of violation)
• Require information	• Report
• Take copies	• Temporary order by Public Proscecutor
• Bring support (material or experts)	• Closing facilities

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Who are involved in environmental inspections

- Environmental Inspector(s)
- Team leader
- Manager
- Legal advisor
- Technical support
- Accountants
- Law enforcement officer(s)
- *PR person*

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Inspection ethics

Professionalism

- Integrity and impartiality
- No conflict of interest
- Standards of conduct (knowledge of regulations and laws, not accepting gifts or bribes, uniform, etc)

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Environmental inspections: basic steps

Prepare → Perform → Report → Follow up

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Traditional Inspection Methods

1. Administrative inspections (= “desk inspection”)

- Paperwork check
- Monitoring and self-monitoring data

Can you name examples of data?

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Examples

Annual company report show costs for sludge disposal suddenly went down compared to previous years

Fewer filters were purchased (comparison of invoices)

Gaps in monitoring data on air emissions

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Traditional Inspection Methods

2. On-site inspections

- Take place on the premises of the facility
- Actual compliance checking of the operations of the facility

Some Do's	Some Dont's
• Develop a plan of action • Identify yourself when entering the premises • Clearly communicate objective of the visit • Document all your findings (notes, pictures, video) • Write down whom you spoke to, their role and what they said	• Jeopardise your safety • Lose your professionalism • Accept bribes or gifts • Go unprepared

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Other types of inspections

Ad hoc inspections
- Carried out outside the inspection plan
- Based on complaints or off spin from other inspections/investigations

Specific inspection campaigns
- Obtain insight in a specific environmental issue
- Check the branch

Emergency inspections
- Direct threat to public health and environment
- Emergency response (e.g. to a fire or spill)
- Limited preparation time

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A reminder: Inspection versus Investigation

An inspection aims to check and ensure compliance

An investigation aims to collect evidence of a possible case of non-compliance

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New developments

Intelligence or information led

- Pro-active > understanding problems, probability and trends
- Targeted inspections > more efficient use of limited resources

Use of risk indicators

- Result of risk assessment
- Support detection of non-compliance

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New developments

Chain approach

- Identify weak spots in the chain
- up and down stream inspections

New technologies

- Tracking and tracing (e.g. GPS and satellite images)
- Scanning and testing devices
- Applications (e.g. For citizen complaints, but also for reporting

pursposes)

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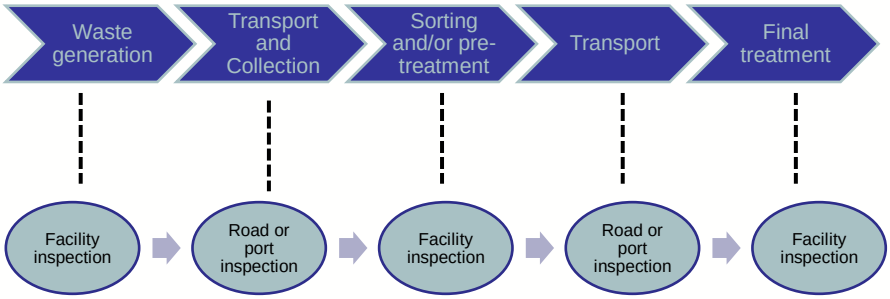
Example of chain approach



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Dealing with non-compliance

Enforcement strategy

- Part of a wider intervention and compliance strategy
- Should include what action for which violation and by whom
- Clarify responsibilities
- Assess what are motives for non-compliance
- Consistent approach
- Fair treatment of offenders

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Measures

- Administrative
- Criminal
- Civil

Can you name examples of possible measures in a case of non-compliance?

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Evidence

- Support decision by Competent Authorities
- Who is involved, where lie responsibilities
- Support court action

Provide training on handling evidence!

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Contact:

United Nations Environment Programme
Coordinating Unit for the Mediterranean Action Plan
Vassileos Konstantinou 48
Athens 11635
Greece

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Inter-agency Collaboration and Regional and International Frameworks

Regional Training workshop for modelling system to assess the variation of EQSs with ELVs for Nitrogen and Mercury, and Enhance Environmental Inspectorate.

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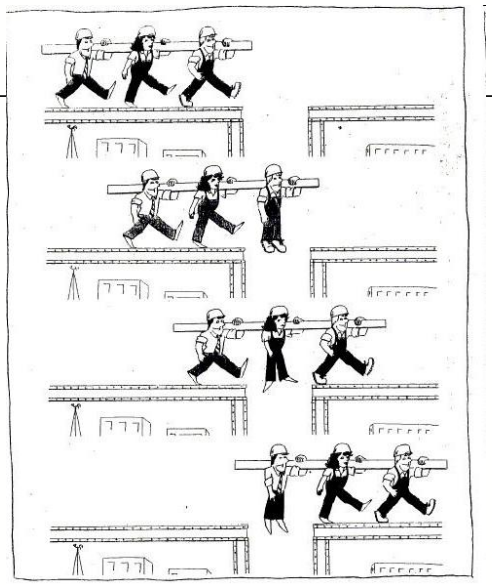

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Step 1: Indentify collaboration partners

Can you make a list of key organisations in your country?

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Step 2: Decide how to organise this collaboration

Informal (personal contact)

or

Formal:
By official agreement or by law

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Step 3. Develop an agreement

Items to be covered:

✓Training

✓Responsibilities

✓Mutual support and understanding

✓(Joint) Inspections

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What other items can you think of to include in a collaboration agreement?

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Examples of international frameworks

- **Ministries of Environment:** Basel Convention Focal Points
- **Police:** INTERPOL
- **Customs:** World Customs Organisations

Examples of environmental enforcement collaboration at international level:

- ENFORCE Network
- IMPEL Network
- INECE Network

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INTERPOL: National Environmental Security Task Force (NEST)

A NEST is a national multi-agency cooperative formed from police, customs, environmental agencies, other specialized agencies, prosecutors, non-governmental organizations and intergovernmental partners.

The purpose of the NEST is to bring together law enforcement agencies and their respective areas of expertise around a common mission or goal, such as reduction of pollution, conservation of a species or protection of other natural resources including forests and fish stocks.

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ENFORCE = Environmental Network for Optimizing Regulatory Compliance on Illegal Traffic

Aims to:

Promote compliance with the provisions of the Basel Convention pertaining to preventing and combating illegal traffic in hazardous wastes through the better implementation and enforcement of national law.

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ENFORCE = Environmental Network for Optimizing Regulatory Compliance on Illegal Traffic

➢Promoting dialogue between its partners to develop a vision;

➢Improving understanding of the issues, the role of the various stakeholders, their challenges and needs, and how best to address them;

➢Promoting cooperation between partners and a coordinated approach to capacity building activities, in order to avoid duplication or gaps in the activities, to ensure a broader geographical distribution of such activities, and to prevent competition over resources;

➢Increasing the visibility of and support for efforts aimed at preventing and combating illegal traffic.

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IMPEL = European Union network for the Implementation and Enforcement of Environmental Law

Aims to :

➢Promote the exchange of information and experiences

➢Promote the development of national networks

➢Carry out joint enforcement projects

➢Support, encourage and facilitate capacity building and training

➢Identify and develop good best practices

➢Produce guidance, tools and common standards

➢Develop a greater consistency of approach

➢Provide feedback and advice on better regulation issues

➢Explore the use of innovative regulatory and non-regulatory instruments

UNEP | United Nations Environment Programme / Mediterranean Action Plan (UNEP/MAP) Barcelona Convention

Examples of activities

- Inspection projects
- Inspector exchange programmes
- Development of tools to support inspectors
- Network for public prosecutors
- Perform peer reviews

United Nations Environment Programme / Mediterranean Action Plan (UNEP/MAP) Barcelona Convention

INECE: International Network for Environmental Compliance and Enforcement

INECE's goals are to:

➢Improve enforcement and compliance through better cooperation.

➢Strengthen capacity throughout the regulatory cycle to implement and secure compliance with environmental requirements.

➢Raise awareness of the importance of environmental compliance and enforcement to sustainable development.

United Nations Environment Programme / Mediterranean Action Plan (UNEP/MAP) Barcelona Convention

Examples of Activities

- Resource library
- Training and tools
- Seminars and conferences
- Develop and support regional networks (e.g. NECEMA)

United Nations Environment Programme /
Mediterranean Action Plan (UNEP/MAP)
Barcelona Convention

NECEMA: Network for Environmental Compliance and Enforcement in the Maghreb Region*

NECEMA's goals are to:

- Develop cooperation among the North African countries in the implementation of environmental laws;
- Strengthen the capacity of the authorities of those countries to promote compliance with environmental laws;
- Encourage exchanges in the field of environmental compliance and enforcement and between North Africa and the rest of the world through the main network INECE.

* *Algeria, Libya, Morocco, Mauritania and Tunisia*

United Nations Environment Programme /
Mediterranean Action Plan (UNEP/MAP)
Barcelona Convention

Contact:

United Nations Environment Programme
Coordinating Unit for the Mediterranean Action Plan
Vassileos Konstantinou 48
Athens 11635
Greece

www.unepmap.org

United Nations Environment Programme /
Mediterranean Action Plan (UNEP/MAP)
Barcelona Convention

Case Studies
Transit Case Study

Introduction

The movement of (hazardous) wastes is controlled by a number of international and regional frameworks, which should be implemented at the national level. Compliance monitoring activities of these types of movements are carried by a number of law enforcement authorities; ranging from environmental inspectorates, to police, customs and border control agencies.

Challenges these agencies quite often come across, are:

- Is the material that is being shipped a waste?
- Is het hazardous or not?
- Will it be environmentally sound treated at its final destination?

This case study underlines the need for collaboration at national and international level, and at the same time stress the need for in-depth inspections.

Legal Framework

The main provisions are laid down in the Basel Convention and the Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Waste and Their Disposal. Both the Convention and the Protocol should be implemented in national legislative frameworks.

In general the movement of hazardous waste across borders is either prohibited or only allowed if all involved Parties have given their prior informed consent before the movements starts.

Inspection and Enforcement

Part I.

A mobile customs unit in country S has carried out control near border of country H. They stopped truck from which came from Country I and was on his way to country R. On request the driver provided an invoice and a document for mixed metals and aluminium.

Questions:

- What is your opinion?
- Can the waste continue?
- Is further investigation required?

Part 2.

The officers decided to check to load and opened the truck. They discoverd the load was composed of two layers:

1. upper layer was pressed alluminium tin-cans;
2. the bottom layer were lead-acid batteries.

Questions:

- Does this change your initial decision taken at part 1?
- Describe how you proceed in this case?
- What should happen to the waste?
- What are the environmental risks in this case?

ALLEGATO B | 2

FORMULARIO RIFIUTI

D.Lgs. del 5 febbraio 1997, n. 22 (art. 15 e sgg.)
D.P.R. del 27 aprile 1998, n. 145
Direttiva Ministero Ambiente 9 aprile 2002
D.Lgs. 3 aprile 2006, n. 152, art. 193 e sgg. vigg.

NUMERO REGISTRO

DATA DI EMISSIONE DEL FORMULARIO: 21 09 2013

320455 /12

PZP

1 PRODUTTORE o [redacted]

Denominazione o Ragione

Unità Locale

Cod. fis.

Aut./Albo Na. 11119 del 19 06 12

2 DESTINATARIO [redacted]

Denominazione o Ragione sociale

Luogo di Destinazione

Cod. fis. 30436185 N. Autorizz. / Albo 12-312 del 17 12 12

3 TRASPORTATORE [redacted]

Denominazione o Ragione sociale

Indirizzo di N

Cod. fis. N. Autorizz. / Albo Na.11119. del 19 06 12

Trasporto di rifiuti non pericolosi prodotti nel proprio stabilimento ☐ di

ANNOTAZIONI

4 CARATTERISTICHE DEL RIFIUTO

Denominazione / Descrizione del rifiuto: Metalli Misti

CODICE del RIFIUTO(*)	STATO FISICO	CARATTERISTICHE DI PERICOLO	N. COLLI/CONTENITORI
170407	1 [X] 2 3 4 SOLIDO	NESSUNO	5 fusi

5 DESTINAZIONE DEL RIFIUTO

[X] Recupero ☐ Smaltimento R 13

CARATTERISTICHE CHIMICO/FISICHE: inorganico.

6 QUANTITÀ

[X] Kg 16900 ☐ Litri

P. lordo

Tara

7 PERCORSO

Se diverso dal più breve: Più BREVE

destino

8 TRASPORTO SOTTOPOSTO A NORMATIVA ADR / RID

SI [X] NO

9 FIRME [redacted]

PRODUTTORE TRASPORTATORE

10 MODALITÀ E MEZZO DI TRASPORTO

Cognome e Nome Conducente: MEDUNELI EMIL GEORGE

Targa automezzo: ES 860 CP

Targa rimorchio: AC 75857

Data e Ora inizio trasporto: 21 09 2013 18 00

11 RISERVATO AL DESTINATARIO

Si dichiara che il carico è stato: ☐ Accettato per intero ☐ Accettato per la seguente quantità ☐ Kg ☐ Litri

☐ Respinto per le seguenti motivazioni:

Data Ora Firma del Destinatario

(*) L'Elenco Europeo dei Rifiuti è stato istituito dal Nuovo Elenco Rifiuti di cui alla Decisione 2000/532/CE, modificata dalle Decisioni 2001/118/CE, 2001/119/CE e 2001/573/CE.

MODELLO CONFORME

24/09/2013 11:18

24/09/2013 11:18

24/09/2013 11:18

24/09/2013 11:22

Tanning Industry – Case Study

Prepared by: Nancy Isarin

The tanning process

By tanning the hides and skins are being preserved and prepared for the manufacture of a wide range of products and applications. The process generates a final product with specific properties: stability, appearance, water resistance, temperature resistance, elasticity and permeability for perspiration and air, etc.

The production processes in a tannery can be split into four main categories:

I. hide and skin storage and beamhouse operations, (pretanning: cleaning and conditioning)
II. tanyard operations, (tanning itself)
III. post-tanning operations (wet finishing) and
IV. finishing operations.

During the tanning process at least about 300 kg chemicals (lime, salt, etc.) are added per ton of hides.

Handout 1 – tanning case

Environmental concerns

Environmental concerns in a tannery include the prevention and control of emissions to water, air, and soil. A range of process chemicals is used, some of which may require special treatment in the effluent. The environmental effects that have to be taken into account in any tannery comprise not merely the load and concentration of the classic pollutants, but also the use of certain chemicals, e.g., biocides, surfactants, and organic solvents. Furthermore, the contamination of soil and groundwater may be caused through accidental releases, spillages, and leakages of certain agents as well as by the treatment of effluents and wastes.

Manufacturing of leather, leather goods, leather boards and fur produces numerous by-products, solid wastes, high amounts of wastewater containing different loads of pollutants and emissions into the air. The uncontrolled release of tannery effluents to natural water bodies increases health risks for human beings and environmental pollution. Effluents from raw hide processing tanneries, which produce wetblue, crust leather or finished leather contain compounds of trivalent chromium (Cr) and sulphides in most cases. Organic and other ingredients are responsible for high BOD (Biological Oxygen Demand) and COD (Chemical Oxygen Demand) values and represent an immense pollution load, causing technical problems, sophisticated technologies and high costs in concern with effluent treatment.

Wastewater treatment

Wastewater treatment is a multi-stage process to purify wastewater before it enters a body of natural water, or it is applied to the land, or it is reused. The goal is to reduce or remove organic matter, solids, nutrients, Cr and other pollutants since each receiving body of water can only receive certain amounts of pollutants without suffering degradation. Therefore, each effluent treatment plant must adhere to discharge standards – limits usually promulgated by the relevant environmental authority as allowable levels of pollutants, for practical reasons expressed as BOD5, COD, suspended solids (SS), Cr, total dissolved solids (TDS) and others.

The three main categories of tannery wastewater, each one having very distinctive characteristics, are:

- Effluents emanating from the beam-house – liming, deliming/bating, water from fleshing and splitting machines; they contain sulphides, their pH is high, but they are chrome-free.
- Effluents emanating from the tanyard (tanning and re-tanning, sammying) – high Cr content, acidic.
- Soaking and other general effluents, mainly from post-tanning operations (fat-liquoring, dyeing) – low Cr content

Handout 2 – tanning case

Environmental inspection of a tannery
Environmental inspections can be divided in the following types of controls:

1. Administrative control (documents, data and records)
2. Technical control (structural conditions of the installations)
3. Operational control (performance and process of installations)
4. Analytical control (environmental impact of the installations. Normally involves sampling and analysing)

This exercise is about performing an inspection at a tannery. Attached you will find a list of critical aspects of the tanning process.

Handout 3 – tanning case

Assignment
Try to describe for the waste water treatment unit how you would verify compliance and its performance.

Questions

1. What are some key criteria in the permit(s) should have been in place to prevent this situation?

2. How would you categorize this facility during the risk assessment phase?

3. What indications could the inspectors have observed to detect this case of non-compliance?

4. What type of data and sources could have indicated a case of non-compliance?

5. What type of enforcement measures could have been taken, with what aim and by whom?

6. What would be ways forward to deal with the situaiton?

7. Should there be any changes to the policies? If so, which ones?

Phosphogypsum waste treatment; a case study example

Preparated by: Nancy Isarin& Michiel Curfs

Draft V02

Introduction

This case study example shows waste treatment issues of industrial origin. In the area concerned, there are several heavy industries amongst which a big copper smelter, an oil refinery, petroleum and gas processing plants, a cellulose and paper pulp production plant and a chemical fertilizer facility. This case study specifically deals with waste treatment issues concerning phosphogypsum (PG). PG is a by-product (waste) in the production process of phosphate fertilizer (H_3PO_4). PG has high contents of potentially toxic metals and radioactive elements and its treatment is a difficult issue.

Background

To produce 1 ton of phosphate fertilizer (H_3PO_4), between 4 1/2 and 5 tonnes of phosphogypsum (PG) are produced. At present, the worldwide production of PG is estimated at 100–280 Mt/y and most of it is stored in piles in the open air, so called stacks. The production site in question has produced an estimated total amount of about $8x10^7$ ton (80 Mt) of PG and has an annual production of around 3 Mt. The PG stacks in the site are approximately 30m[1] high. The stacks and ponds are situated on the eastern shore of the river (figure 1). The fertilizer industrial complex is located at the confluence of two rivers, an estuarine zone of salt-marshes with high ecological value. The salt marshes of one of the river are declared a Biosphere Reserve by UNESCO since 1983. The other river marshes are included in the RAMSAR agreement and thus under protective order on an international scale. The total area of PG stacks is approximately 1200 Ha in size and contains an estimated 100Mt of PG. It is one kilometre far from the urban centre. The urban area of the nearest city, with 160.000 inhabitants, is approximately 1100 ha in size, thus slightly smaller than the area occupied by PG stacks.

Recent studies show several negative health and environmental effects that are potentially related to the industrial processes. Epidemiological studies and cancer (mortality) maps have defined this region as one of the areas with the highest risk of several types of cancer, which may be related to industrial activities.

[1] 10 times the allowed height

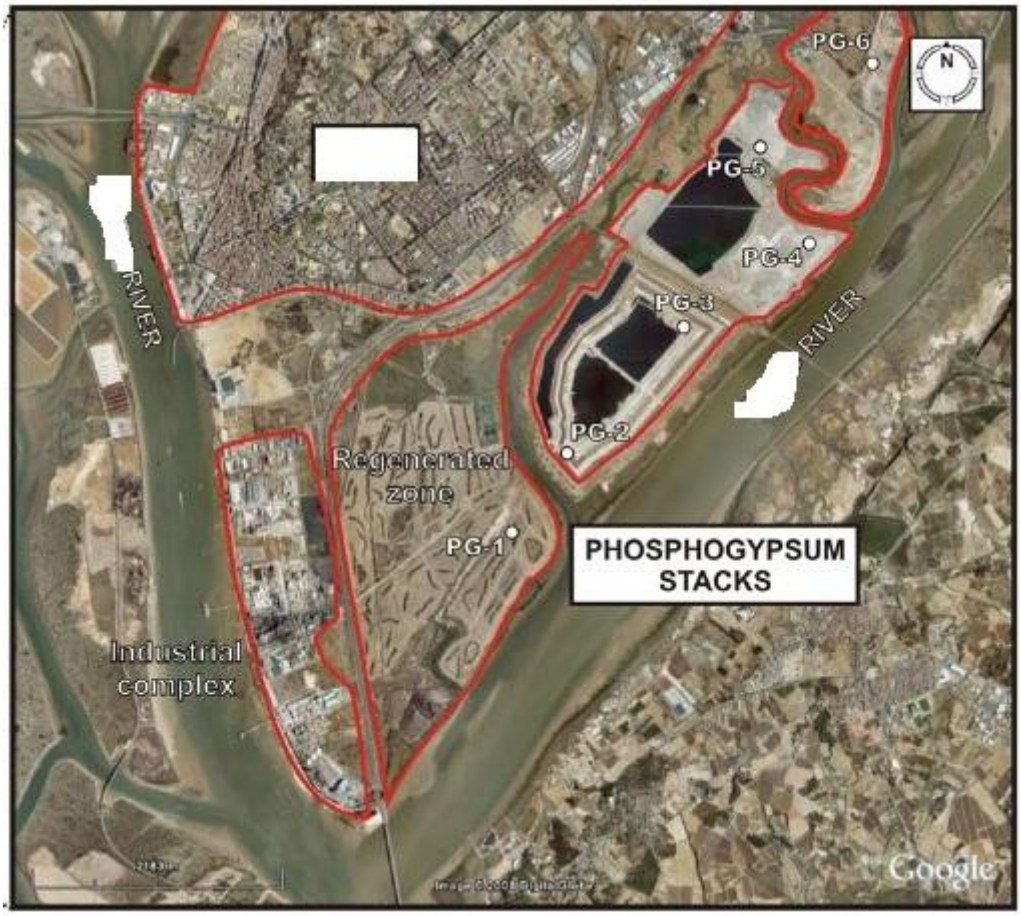

Figure 1 Location and aerial view of phosphogypsum stacks, industries and the city centre.

In the past 20 percent of the PG waste was poured directly into the river. This has caused environmental deterioration. Furthermore due to the impact of a strong storm, damage occurred at the area where the PG stacks are contained (embankment failure) and 50,000 m3 of acid waters were spilled to the Estuary. The extreme contamination potential of the PG dump has been estimated it was found that the PG at this site is the most hazardous waste when compared to other facilities in the world. It has the highest concentration of impurities which is related to the phosphate rock that is used as raw material. Phosphate rocks contain high concentrations of metal impurities such as Uranium (^{238}U), Radium (^{226}Ra) and Radon (^{222}Rn). About 85% of the uranium present in phosphate rock goes to the resulting phosphoric acid, while about 90% of the ^{226}Ra remains in the PG wastes.

The PG stacks are still vulnerable to leaching and weathering by which effluents affect the water and sediments with radioactivity and toxic metals. This is causing environmental degradation that can spread into the estuarine and ocean and thus affect the fauna and flora and endanger human health. The open air storage in stacks leave the PG particles vulnerable to transport by wind.
A study showed that in the peri- urban area - the transition zone where urban and rural activities meet –the soils are heavily polluted as a result of intensive industrial chemical activities and former poor management of industrial wastes. Samples showed that sites should be regarded as contaminated soils where risk reduction measures should be taken. The agricultural products in the vicinity of these lands are at risk due to the contaminated soils.

Legal Framework and Responsibilities

The responsible authorities and legal framework concerning the PG stacks and its waste treatment management are many.
National responsibilities in relation to the protection against natural radiation exposure are included in a National Decree approving the Regulation for Health Protection against Ionizing Radiations By this decree the facilities liable to generate radioactive effluents and/or waste is must have proper control

storage, treatment and removal systems. For 'Naturally Occurring Radioactive Material' (NORM) industries, such as it the case for PG, decisions with regard to any environmental radioactivity monitoring programme have to be made by the relevant competent authority on advice by the appointed nuclear advice council.
With regard to effects of discharges from NORM activities, the Regional government is the competent authority.
The nuclear safety council is the national organisation responsible for nuclear safety and radiological protection. It is independent from the Government and reports to the Parliament. The council issues reports with binding content prior to the awarding of authorisations to regulated facilities (either "nuclear" and/or "radioactive") by the Ministry and proposes regulations on nation- wide nuclear safety and radiation protection.
The Nuclear Energy Act defines radioactive waste as any residual material for which no use is foreseen that contains radioactivity above certain levels that need to be defined by the Ministry of Industry with a previous binding report of the council.
The management, protection and preservation of the land-maritime public domain, where the PG stacks area is located falls under the competences of the Ministry of the Environment.
The body responsible for the radiological monitoring of foodstuffs is the Ministry of Health. Radiological monitoring of foodstuffs in areas around installations which emit discharges externally is required of the proprietor of these installations in the corresponding regulations and directives.
The municipality is in charge of spatial planning issues and permits.

Actions on waste treatment

The nuclear safety council sent a series of suggestions to the regional government on the waste management and restoration of the PG ponds after a study. One of the suggestions was the attenuation of the emissions of radon gas using an appropriate cover for the PG deposits. The direct dumping of PG into the river estuary ceased. In the same year a new process of recirculation of waters was implemented (this process is still in use).
Recent national regulations explicitly allowed the use of PG as soil amendment with no mention to its radioactive content, while for instance the other national administrations have specific regulation for the agriculture use of PG, allowing it if ^{226}Ra concentration is below a certain concentration.
According to a study performed by an NGO between 5,800 to 7,000 tons of caesium 137 contaminated waste is buried in an Inert materials Recovery Centre (IRC) instead of it being brought to the designated area. The NGO further claims that the fertilizer company has illegally discharged PG in the estuary (figure 3)

Figure 2 Discharge of Phosphogypsum in the river *(Source NGO)*

In response to parliamentary questions and petitions, a special international team visited the sites, where special reference was made to presence ^{137}caesium and to the alleged existence of radiological levels due to emissions of ^{238}uranium, ^{222}radon and other radioactive components from the PG ponds. During this study the team was informed that the production plant was planned to be closed by 2012.

Enforcement

Several investigations were started up by various entities and at different levels.

The company was ordered to close down the discharge of PG in ponds and to stop this activity. The fertilizer company was ordered to present and start a technical regeneration plan. It had to restore a total of 720 Ha of areas that are occupied by two ponds in the marine zone. In total there are 1200 Ha that are affected by PG. The Supreme Tribunal proceeded with actions to the company. The magistrates declared that there had been unjustifiable delays in the presentation of the technical regeneration project that was ordered for. Recently the facility has been charged a fine of €240.000 by the ministry of the Environment. The penalty is based on the 'law of integrated management of environmental quality'. The facility claims it has started with a basic plan but that in any case the regeneration process will take at least 10 years for it to take effect.

Questions

1. What are some key criteria in the permit(s) should have been in place to prevent this situation?
2. How would you categorize this facility during the risk assessment phase?
3. What indications could the inspectors have observed to detect this case of non-compliance?
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Handout 2 – tanning case

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7. Operational control (performance and process of installations)
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Handout 3 – tanning case

Assignment
Try to describe for the waste water treatment unit how you would verify compliance and its performance.

Questions

8. What are some key criteria in the permit(s) should have been in place to prevent this situation?

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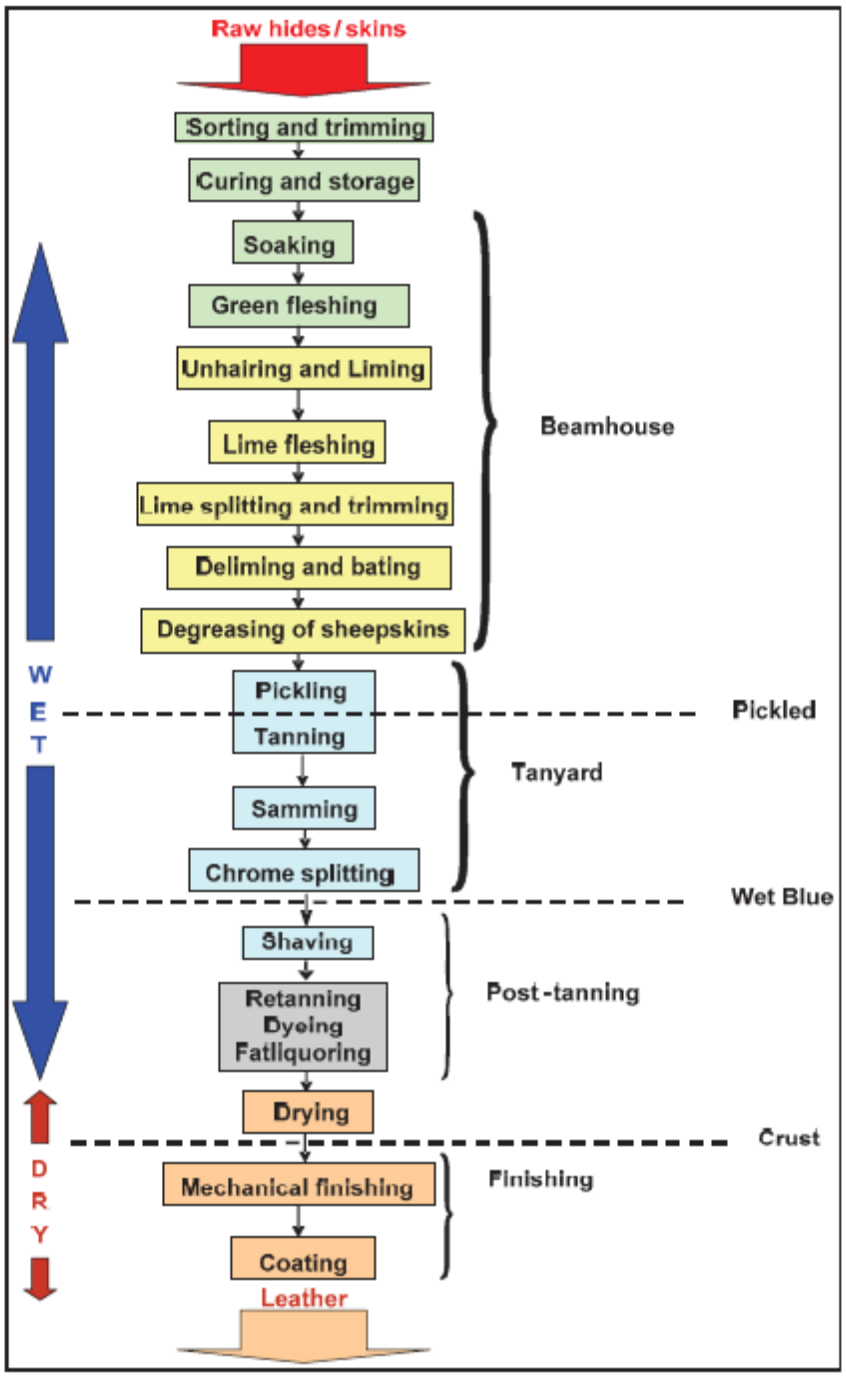
11. What type of data and sources could have indicated a case of non-compliance?

12. What type of enforcement measures could have been taken, with what aim and by whom?

13. What would be ways forward to deal with the situaiton?

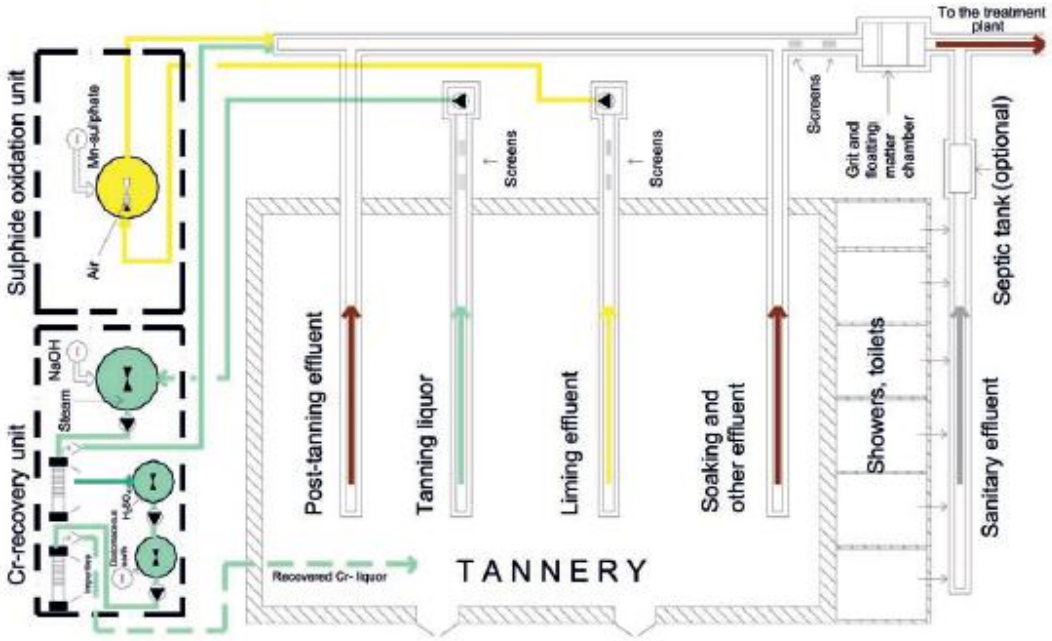
14. Should there be any changes to the policies? If so, which ones?

Possible steps in the production of leather. There is variation possible between tanneries, depending on the type of leather being produced.

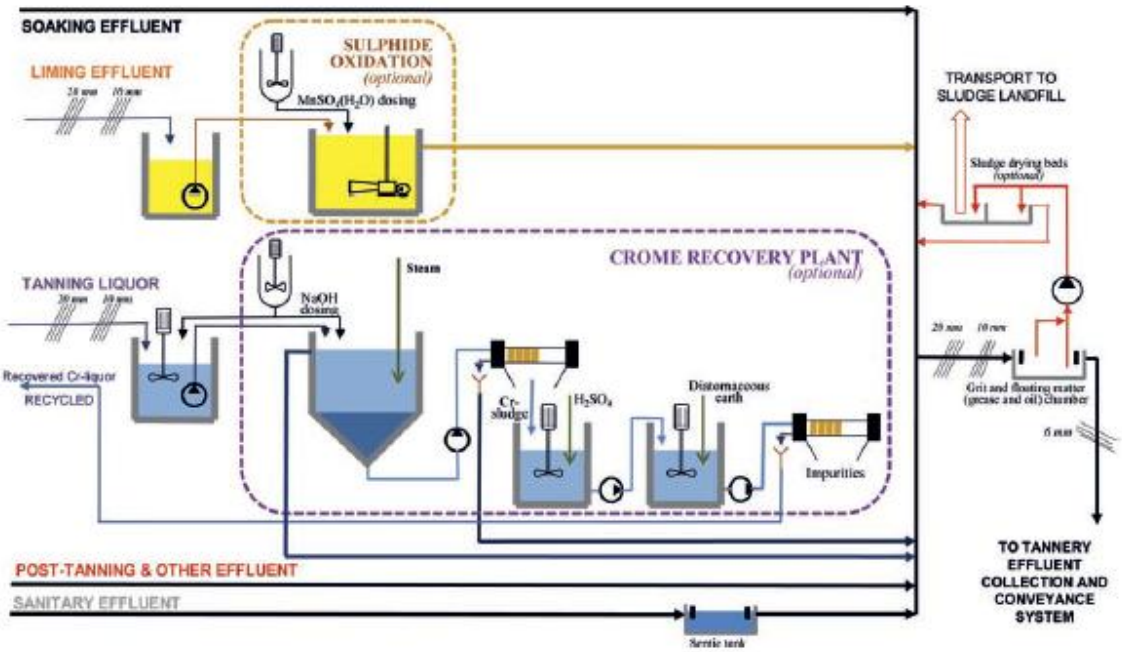


Source: Best Available Technique Reference Document for Tanning of Hides and Skins (JRC - 2013)

Source: UNIDO - Leather Panel Report:
Introduction to treatment of Tannery Effluents



Layout of in-house segregation of streams,
including chrome recycling and oxidation of sulphides in liming effluent



Flowchart of in-house segregation of streams,
including chrome recycling, treatment of liming effluents and pre-treatment of mixed effluent

Source: IMPEL INSPECTAN Project

IDENTIFICATION OF CRITICAL ASPECTS OF THE PRODUCT AND PROCESS OF THE TANNING CYCLE

The table below lists the relevant components of the complete tanning cycle. It is a help for the inspector planning the identification of critical aspects in a tanning plant. Source: adapted from the BREF "Tanning of hides and skins".

Process Unit	Waste water	Waste	Air emission	Energy consumption	Chemicals	Environmental Risks	Noise
HIDE AND SKIN STORAGE AND BEAMHOUSE OPERATIONS							
Trimming		• parts of the raw hidcs (trimmings)		For cooling systems of the storage drums			not particularly relevant
Curing & Storing		• salt brine				ground and surface water pollution, soil pollution	
Soaking	• BOD, COD, SS, DS from soluble proteins • salts • org -N • AOX • emulsificants. surfactants. biocides				relevant for use of hazardous chemicals (surfactants, biocides)	Soil pollution; Ground and surface water pollution	
Fleshing	BOD. COD. SS. DS from fat, grease	• fat, connective tissue, lime					
Liming & Unhairing	• sulphides, • BOD, COD, SS, DS• lime • high pH • org.-N, NH4-N, biocides	• hair • sludge from liming effluents (waste water treatment)	• sulphides • odour		relevant for use of hazardous chemicals (sulphides, Aliphatic thioles		
Rinsing after Unhairing							
Splitting		• lime split • trimmings					

Possible answers Tannery case:

- Check description of the waste water treatment unit in the application and relevant provisions in the permit
- Check self-monitoring procedure of the company(e.g.as described in the environment and quality management system of the company)
- Check self-monitoring data from the company (water use, input and output, performance of the wastewater treatment plant, maintenance report, replacement of filters, use of agents)
- Check costs/invoices
- Are streams segregated?
- How is the sludge treated?
- Check actual discharge point(s)
- Take own samples to check parameters and concentrations
- Interview staff
- Are there any actions taken to improve the process? (e.g. water management reduction measures, effective and preventive maintenance programme)

Country Presentations

Albania

REPUBLIC OF ALBANIA
MINISTRY OF ENVIRONMENT
STATE INSPECTORATE OF ENVIRONMENT FORESTRY AND WATER
ENVIRONMENTAL INSPECTORATE

ENVIRONMENTAL INSPECTORATE

Referring to the Council of Ministers Decision No. 46, dated 29.01.2014, "On the establishment and the mode of the organization and functioning of the State Inspectorate of Environment, Forestry and Water", published in the Official Gazette No. 11, dated 7.02.2014, the Prime Minister has approved the Order No. 56, dated 13.02.2014, "On the approval of the structure and staff of the State Inspectorate of Environment, Forestry and Water".

The structure at central level has three inspection units, Environmental Inspectorate, Forestry Police and Water Inspectorate and 12 Regional Branch at 12 Prefectures.

State Inspectorate of Environment, Forestry and Water is a public central institution, budgetary, under the dependence of the Minister of Environment. Its own mission is to assure the respecting of legal requirements in the field of environment, forestry and water.

In order to improve the enforcement of law, environmental inspectorate has significantly increased the number of controls moreover in industrial sites, marine pollution and in this context has been closely cooperating with other inspectorates and state institutions, increasing the cooperation with Local Government Units referring to their responsibilities for the implementation of the requests of the environmental legislation.

Starting from the importance of water resource for the national economy, connected with ecological and biodiversity problems for the preservation of climate and natural balance and also taking into account that the solution of the problems currently afflicting, the pollution of Marine Environment requires commitment interagency. Based on International Agreements ratified by Republic of Albania, we are in the stage of drafting an agreement between State Inspectorate of Environment Forestry and Water and Marine Directory to promote cooperation between two institucions, in order to protect Adriatic and Jonian sea from the pollution and illegal activities during shipping.

The scope of this agreement is to increase interagency cooperation in:
1-Prevention of dumping oil waste and its by products into the sea and other prohibited waste in the marine environment of Albania.
2-Taking legal action in case of, finding legal violations.

Referring the enforcement and EU obligations, the Ministry of Environment has demand to the Ministry of Justice the initiation of the legislative initiative to amend the 4 Crown of the Criminal Code, transposing the Directive 2008/99 European Comission "On the protection of the environment through criminal law" of the Parliament and Council of November 19, 2008.

Previous experience of cooperation with stakeholders.

In Zvernec coast of Vlora,in the area called TRIPORT from the Coast Guard Officer was found lubrificant pollution in the seaside.
The Environmental Inspectors after take the report in cooperation with border police exercised inspecting on the site, in order to localizate the spotted area and taking emergence provision.

Was announced Portual Athority Vlore which authorisate the exit of the antipollution ship on the sea to clear the area from the pollution.

From the administration investigation resulted that the source of pollution was a defect in the pipeline of Petrolifera, in which responsible authority was not annused the incident.

Responsibel company was forced to repair immediatly the defect, and against the company by Evironmental Insperctorate were taken relevant measures

Thank you for your attention!

Cyprus

REPUBLIC OF CYPRUS
MINISTRY OF AGRICULTURE,
NATURAL RESOURCES
AND ENVIRONMENT

Regional Training Workshop for Environmental Inspectorates

Athens, 25-27 November 2014

UNEP

REPUBLIC OF CYPRUS
MINISTRY OF AGRICULTURE,
NATURAL RESOURCES
AND ENVIRONMENT

Legal measures

Cyprus has adopted appropriate legislation, in accordance with Article 14 of the Barcelona Convention, implementing all provisions of the LBS Protocol

Athens, 25-27 November 2014

UNEP

REPUBLIC OF CYPRUS
MINISTRY OF AGRICULTURE,
NATURAL RESOURCES
AND ENVIRONMENT

Allocation of resources for the establishment of institutions and monitoring programmes

Cyprus has allocated the resources necessary to comply with the requirements of the provisions of the LBS Protocol:

- -Issue the permits provided for in Art. 6 of the Protocol
- -Competent structures for inspection of compliance (Art. 6, par.2)
- -Establishment of appropriate monitoring structures and programmes to assess, as far as possible, the levels of pollution along the coast (Art. 8) – e.g. Waste Discharge Permits
- -Establishment of appropriate monitoring programmes to eliminate, to the fullest possible extent, pollution of the marine environment (Art. 13)

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MINISTRY OF AGRICULTURE, NATURAL RESOURCES AND ENVIRONMENT

Authorizations for discharge granted

Number of ongoing authorizations

- Energy production 3
- Cement production 1
- Shipbuilding and ship repairing industry 1
- Harbour operations 3
- Food processing 1
- Aquaculture 11
- Treatment and disposal of domestic wastewater 2
- Waste management industry 1

Enforcement measures

Inspections and fines e.g. hydrocarbons leak

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Implementation of NAPs and their effectiveness

- **Collection and treatment of used lubricants** - private installations on operation
- **Hazardous wastes treatment centre** - private installations on operation
- **Batteries collection and export by licensed companies** - establishment of a collective system that operates under producer responsibility

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Implementation of monitoring programmes

- State and trend monitoring
- Compliance monitoring
- Biomonitoring
- Eutrophication monitoring

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Difficulties and challenges

- Financial resources
- Limited human resources
- Public participation
- New challenges e.g. oil industry
- Non Governmental Organizations

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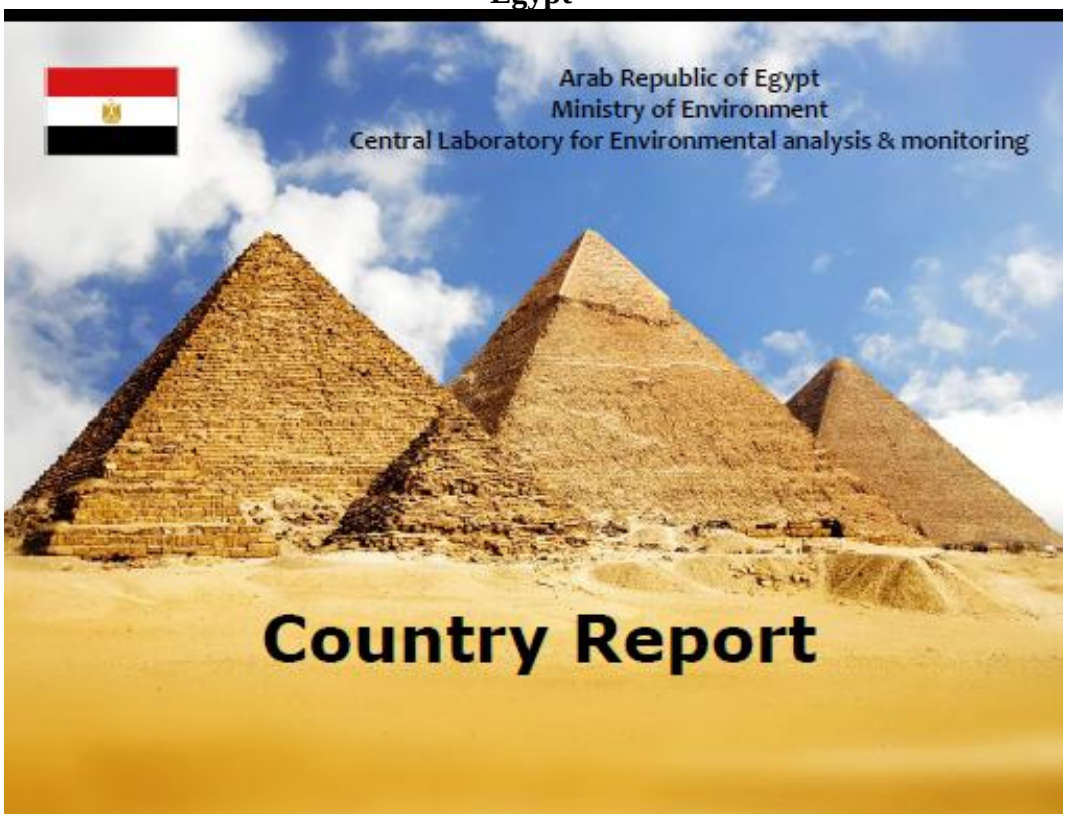
NATURAL RESOURCES
AND ENVIRONMENT

Egypt


Arab Republic of Egypt
Ministry of Environment
Central Laboratory for Environmental analysis & monitoring
Country Report

Location of Egypt
MEDITERRANEAN SEA
EGYPT
National capital
Governorate capital
Town, village
Major airport
Cistern, spring, well
International boundary
Dual highway
Main road
Secondary road
Track
Railroad
LIBYAN ARAB JAMAHIRIYA
ISRAEL
JORDAN
SAUDI ARABIA
RED SEA
SUDAN
© Nations Online Project

General information

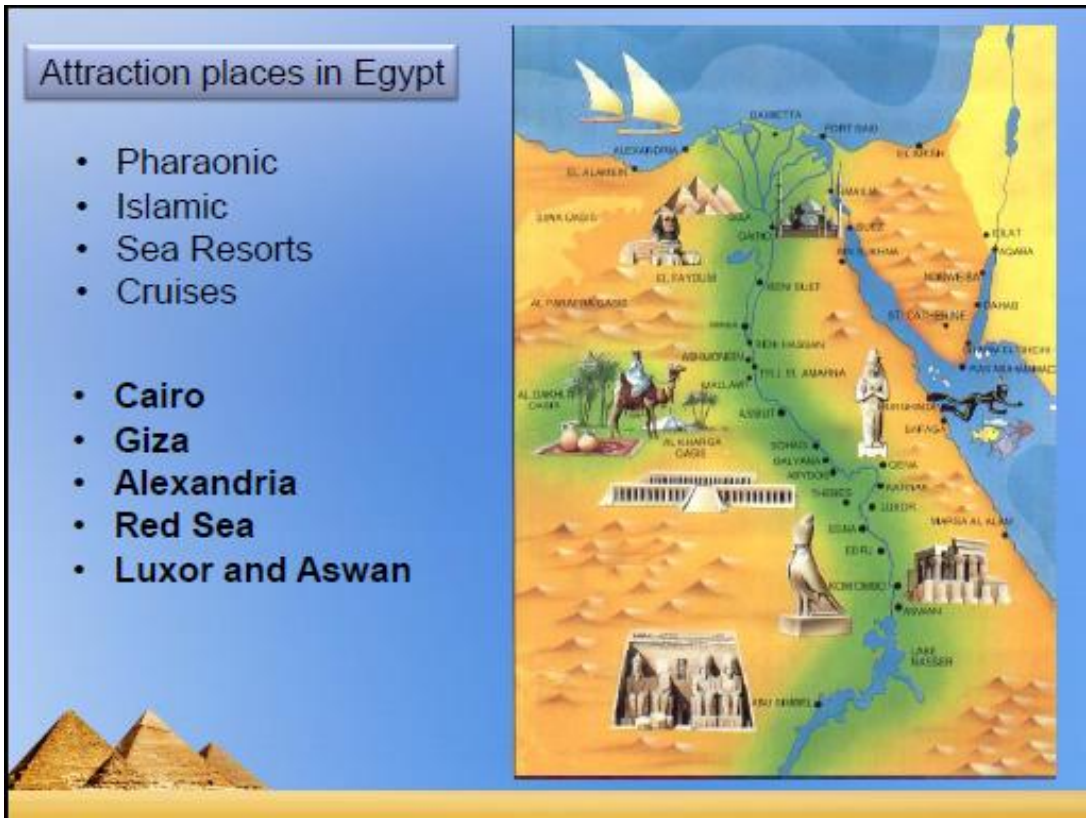
- Egypt is located in a strategic location between two continent, Africa and Asia and in connection with Europe through the Mediterranean Sea.
- Egypt is bordered by the Red Sea from its eastern part. The existing of the Suez Canal made Egypt in the center of the world where a considerable amount of the world trading is passing through.

Egypt Coast is 3500 km.1150 km
f for Mediterranean and 1850 km Red Sea.
The coastal area is about 374.000
k Km2 (200 m depth).

International Projects

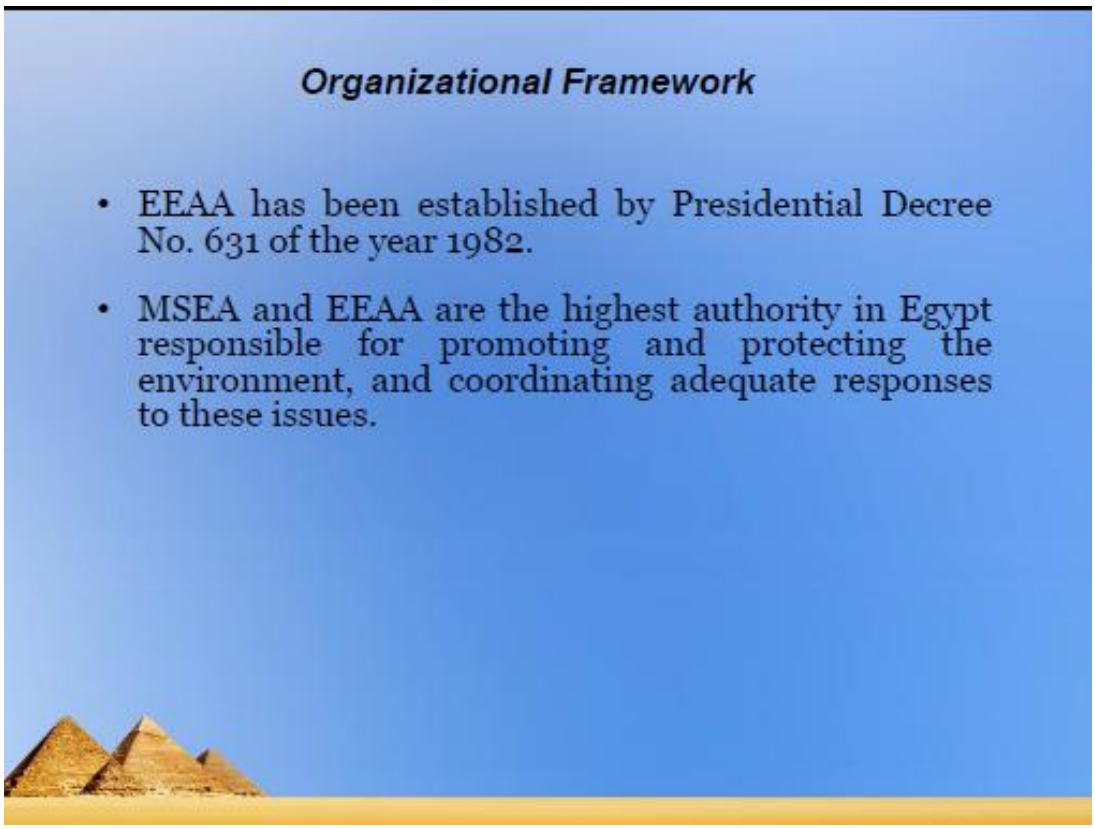
- Health
- Agriculture
- Industry
- Environment

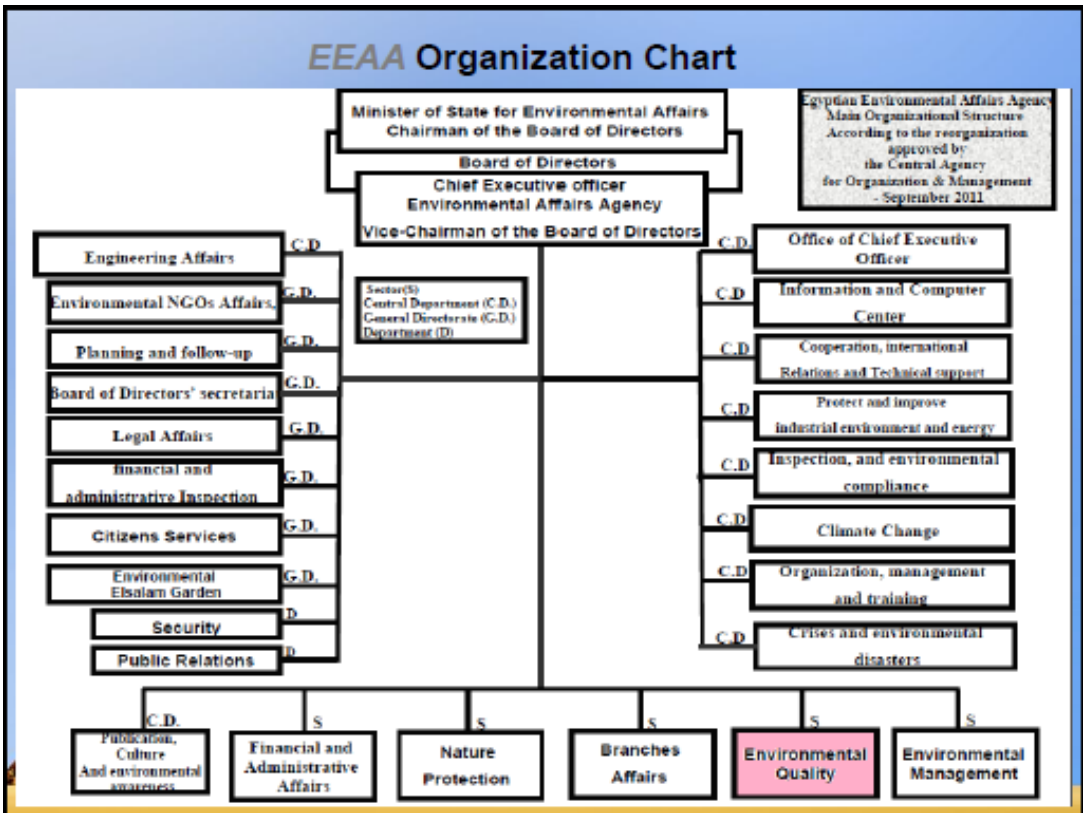
giz — Federal Ministry for Economic Cooperation and Development
TWINNING
JICA
USAID FROM THE AMERICAN PEOPLE
KOICA Korea International Cooperation Agency
Danida


Attraction places in Egypt
• Pharaonic
• Islamic
• Sea Resorts
• Cruises
• Cairo
• Giza
• Alexandria
• Red Sea
• Luxor and Aswan

Sharm El Sheikh (Red Sea)

Ministry of State for Environmental Affairs MSEA
Egyptian Environmental Affairs Agency EEAA


Organizational Framework
• EEAA has been established by Presidential Decree No. 631 of the year 1982.
• MSEA and EEAA are the highest authority in Egypt responsible for promoting and protecting the environment, and coordinating adequate responses to these issues.



Role and Activities of EEAA

- Prepare the national plans for environmental protection.
- Prepare emergency environmental plan for disasters.
- Prepare draft laws concerning the environment.
- Implement experimental projects.
- Prepare environmental training and planning policy.
- Participating in the preparation of an integrated national plan for the coastal zone management of the Mediterranean and the Red Sea areas.
- Preparing an annual report on the state of the environment to be submitted to the President and the Cabinet of Ministers .Supervise the Environmental Protection and Development Fund.

Water monitoring, national networks in Egypt:

- The main sources of pollution to surface water are industrial and municipal wastewater and agricultural drainage water.
- The Egyptian government has introduced legislations to protect the quality of fresh water.
- Environmental Law No. 4/1994 has been issued to protect the environment in Egypt in general, while Law No. 48/1982 deals with pollution of all water sources in Egypt and has set standards for the liquid waste discharge to fresh water.

The enforcement and the implementation of the law pertaining to water quality are also under the responsibility of:

Ministry of Water Resources and Irrigation (MWRI):

Law No. 48 of 1984 regarding to protect river Nile and channels from pollution .

Act No. 12 of 1998 for irrigation and drainage.

Ministry of Health and Population (MOHP)

Act No. 458 to drinking water standards

The national networks were established to monitor the quality of surface water through the measurement of physical, chemical and biological parameters.

Egyptian Environmental Affairs Agency (EEAA) Programs

- .MEDITERRANEAN AND LAKE MONITORING PROGRAMMES
- Strategic Objectives :
- The Mediterranean Sea Monitoring Programme monitors water quality along the Egyptian coast, evaluate indicators of pollution and identify sources of pollution along the Egyptian coast of Mediterranean Sea (1150 Km).
- Coordinate the preparation and follow-up the implementation of marine monitoring and sources inspection programmes.

Stations name	Abb.
Tallouza	Me1
Hatzoub	Me 2
Baghoush	Me 4a
Alamein – Marina	Me 6
Sidi Kraw	Me 7a
Mohareya	Me 8
Hanoville	Me 9
Bitash	Me 10
Dekhila	Me 10a
Mex	Me 11
W_harbor	Me 12
HIOF	Me 14
E_harbor – West	Me 15
E_harbor – East	Me 16
Alexandria – Shatby	Me 17a
Alexandria – Sidi Gaber	Me 17b
Montaza	Me 19
Abu Qir – West	Me 20
Abu Qir – East	Me 21
Electrical station	Me 22
Maadia	Me 23
Rashid	Me 29
Rashid	Me 31
El-Boqat	Me 33
Damietta	Me 35
El-Gamil – West	Me 39
El-Gamil – East	Me 40
Port Said	Me 41
Arish	Me 44
Rafah	Me 47a

The programme started in 1998, with fixed stations and monitoring being conducted on a regular basis for the measurement of natural and chemical and microbiological indicators as follows:

- Physical measurements (temperature, PH, dissolved oxygen, electrical conductivity, salinity, transparency).
- Chemical measurements (nitrate, nitrite, ammonia, total nitrogen, phosphate, total phosphorus, chlorophyll a, silicate).
- Bacteriological Measurements (coli form bacteria, bacteria Streptococcus career).

The Central Laboratory

- The central laboratory has been established in 1996 as a grant from the **JICA** and government of Japan to Egypt.
- The laboratory is divided into 4 laboratories (water , Air and Noise , Soil and QC/QC).
- The laboratory awarded the ISO-17025 Certificate in measuring the Heavy Metals.

Role and Activities of the Central Laboratory
Water Department

- Measuring the pollutants of Surface water (Fresh and Coastal).
- Monitoring surface and coastal water.
- Offer the Training on Water Analysis and Monitoring.
- Inspection on Industrial establishments and treatment plants in Egypt to ensure its compliance with the Environmental Law 4/1994.
- Offer the technical support for the other 7 RBOs of EEAA

CASE SUMMERY

During an inspection visit to Abu Qir Fertilizers Company an environmental problem was found.

- **Abu Kir Fertilizer Company is a private sector company producing nitrogen based fertilizers.**

- **The company located on the cost zone of Abu Qir Bay 20Km east of Alexandria.**
- **The problem was found in waste water where the nitrate level exceeded the limit for industrial effluents of the sea (law 9/2009).**
- **Environmental:**
  Reduce the nitrate levels in the industrial effluent to comply with law.
- **Type of Project: Waste Water treatment plant system.**
- **Project Objectives:**
  NO3 level will be eliminated by 72.8%, then the treated wastewater stream will be in full compliance with law .

Italy

ISPRA

Some inspection experiences in Italy

Geneve Farabegoli (geneve.farabegoli@isprambiente.it)

Istituto Superiore per la Protezione e la Ricerca Ambientale (ISPRA)

Athens 26 November 2014

ISPRA

Air emissions

Power plant chimneys

2

ISPRA

Waste emissions

Gypsum

Big bags

Sludge

Waste oil

3

ISPRA

Water emissions

Wastewater Treatment & discharge

4

ISPRA

Solid, liquid and gaseous fuels

Refinery

Coal-burning power plant

5

ISPRA

Coal transportation and storage

Coal

6

ISPRA

Heavy fuel oil tanks

Heavy fuel oil

7

Lebanon

Inspection, Compliance, Enforcement

The Lebanese Context

Regional Training Workshop for Environmental Inspectors – Athens, Greece

25-27 November 2014

CONTENT

- General Overview
- Environmental Inspection
- Environmental Compliance
- Challenges and Advantages
- Measures

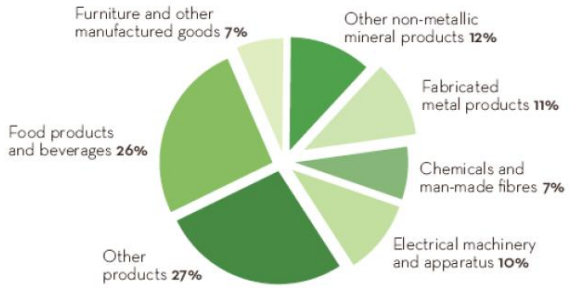
Regional Training Workshop for Environmental Inspectors – Athens, Greece

25-27 November 2014

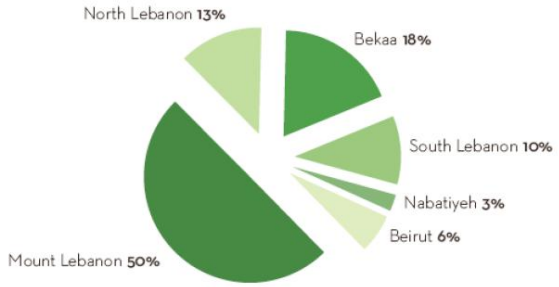
GENERAL OVERVIEW

- Industrial Sector in Lebanon is an important pillar of the economy contributing to around 8 % of GDP in 2010.
- Industrial Growth Rate showed decrease since 2010 due to political uncertainty (around 3% reduction).
- MoI census 2007: 4,033 industrial establishments
  - (> than 5 labors)
- ALI census 2013: 3,343 industrial establishments
  - (> than 8 labors)
- Number of permitted industries: ~ 5,000 (2014) of 7,000 insustries

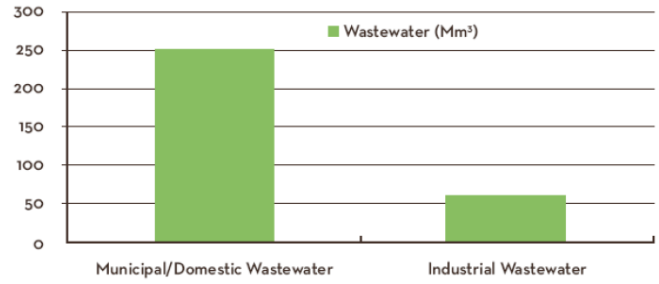
Distribution of Industrial Output by Economic activity[4]



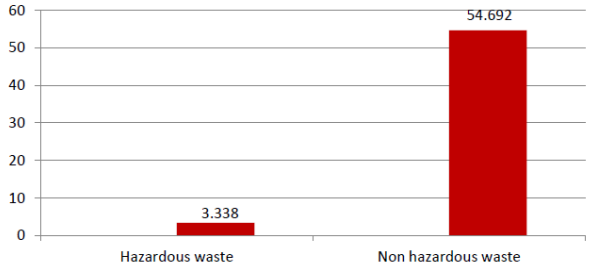
Distribution of industrial establishments by Mohafaza



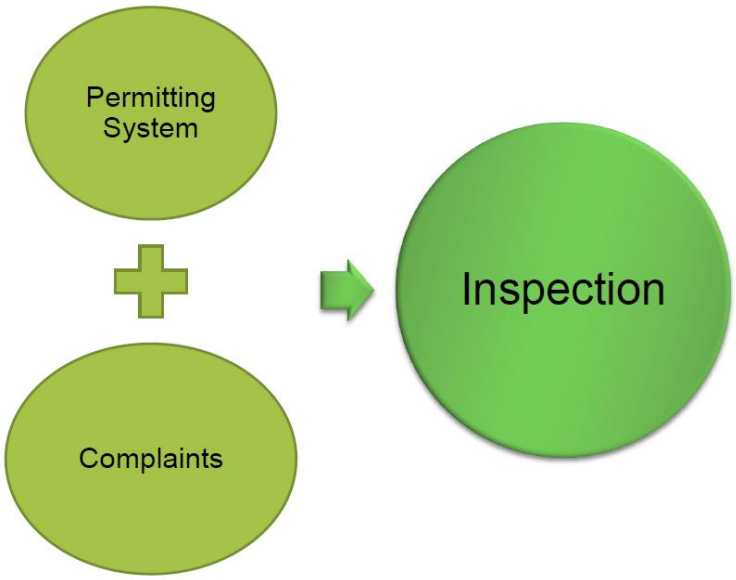
Quantities of Municipal and Industrial Wastewater in Lebanon (Mm³)



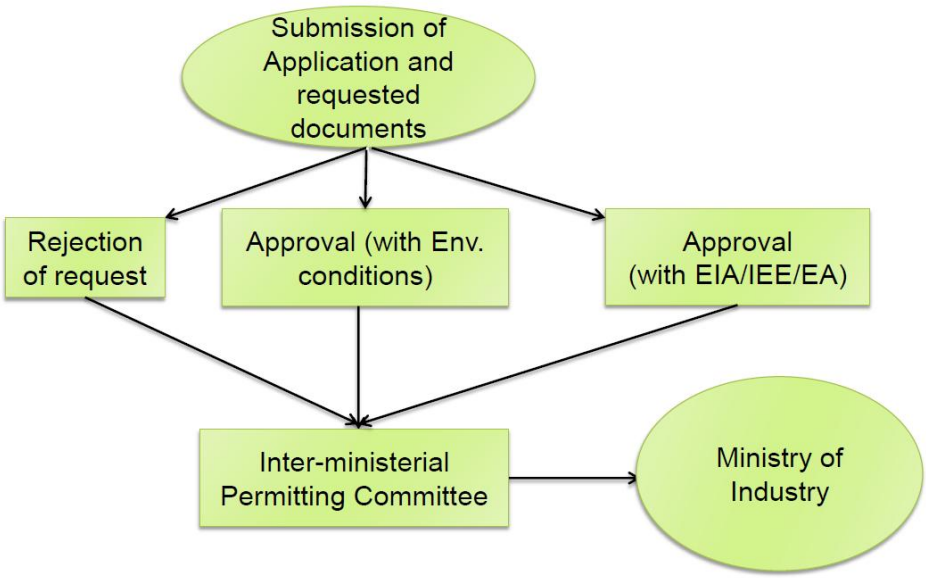
Generated industrial solid waste (1,000 T/year)



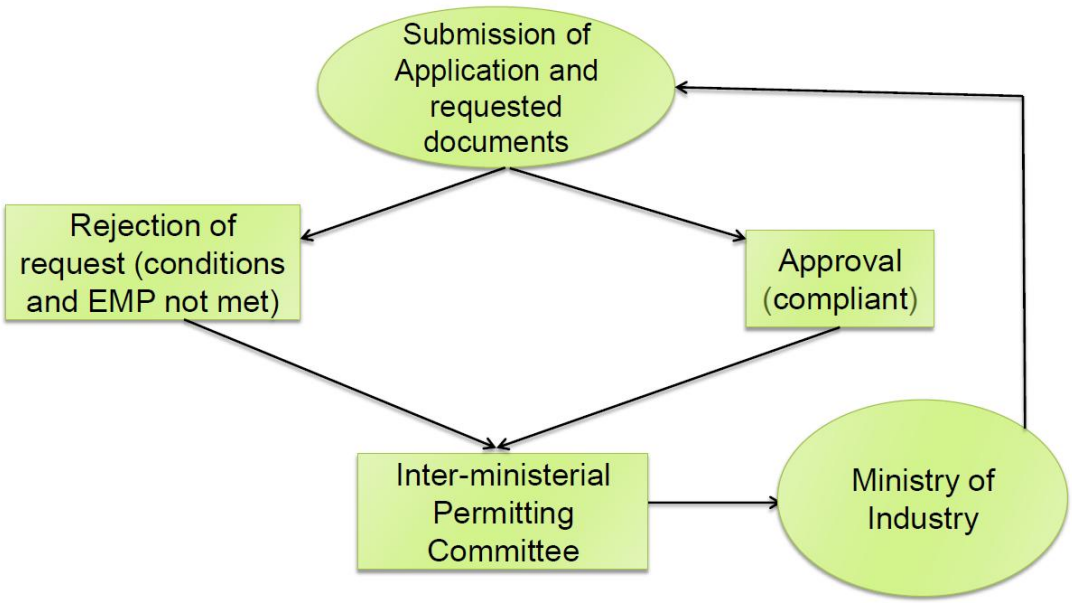
ENVIRONMENTAL INSPECTION



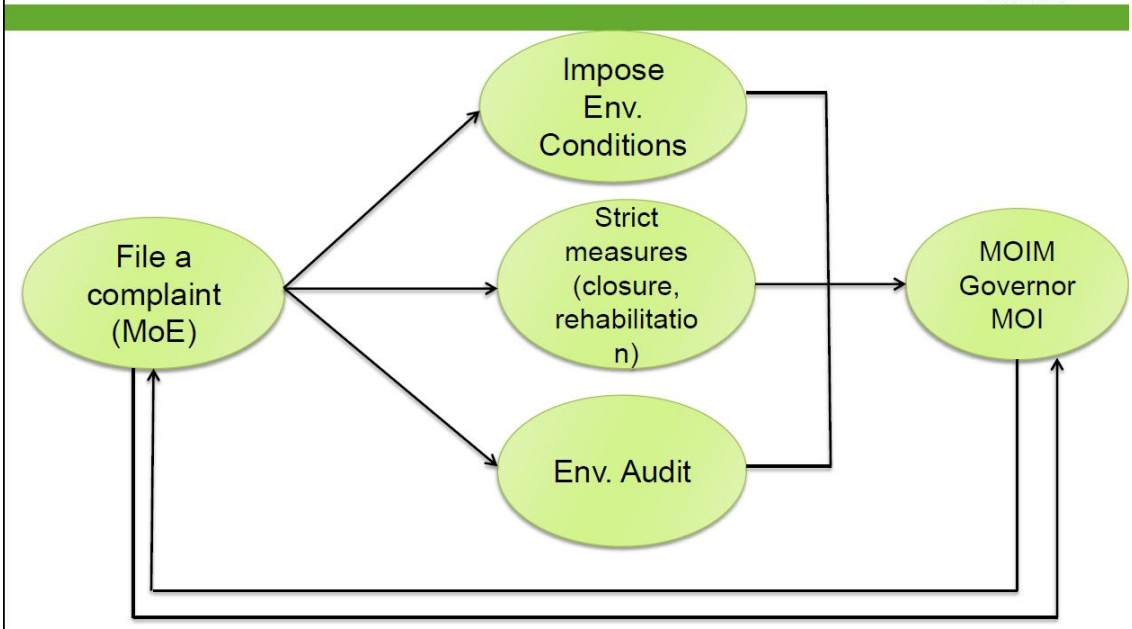
PERMITTING SYSTEM
(CONSTRUCTION PERMIT)



PERMITTING SYSTEM
(OPERATION PERMIT)



COMPLAINTS



ENVIRONMENTAL COMPLIANCE

- National Compliance Strategy developed in 1998, based on 3 scenarios:
  - one grace period for all the Lebanese industrial sectors;
  - grace period according to the location of the industrial zone;
  - grace period according to the specific industrial sector;

ENVIRONMENTAL COMPLIANCE

- No compliance Plan was developped till now:
  - Shortage of personnel;
  - Shortage of monitoring equipment;
  - Further legislations needed;
  - Limited capability for enforcing the available legislations;
  - Limited sanctions possible (no polluter-payer principle yet);
- Decree related to Environmental Compliance of the establishments was issued in 2012:
  - Application to this decree still on a volountary basis till end 2015;
  - MoE, in collaboration with MoI,, shall develop a Compliance Plan for industrial establishments before End 2015.

ENVIRONMENTAL COMPLIANCE
CHALLENGES AND ADVANTAGES

- Challenges
  - Shortage of personnel;
  - Shortage of monitoring equipment;
  - Limited capability for enforcing the available legislations;
  - Limited sanctions possible (no polluter-payer principle yet);
  - Limited infrastructure for the appropriates waste treatment or collection;
  - Limited political support concerning environmental issues;
  - Sector passing through economic crisis;

ENVIRONMENTAL COMPLIANCE
CHALLENGES AND ADVANTAGES

- Advantages
  - Available legislative texts (Protection of Environmnet Law, EIA decree, Environmental Prosecutors Law, …)
  - Available National Standards for Environmnetal Quality;
  - Available experts are highly qualified;
  - Additional support available through international projects (LEPAP, IDF, REGOKO, …);
  - Co-operation of relevant stakeholders (MoI, ALI, ...);
  - International pressure to comply with the signed protocols and agreements;
  - Willingness of some industrialists to be part of a pilot project for compliance;

ENVIRONMENTAL COMPLIANCE
MEASURES

CARROT
- Financial Incentives
- Non Financial Incentives

STICK
- Monitoring measures
- Public involvement
- Enforcement measures

OTHER
- Awareness;
- Capacity Building;
- Information;
- Human resources;
- Infrastructure;
- On site technical assistance;
- Participation;
- Capital Markets;
- Research and Development;

Thank you...

Olfat K. Hamdan

Head of the Department of Urban Environmental Protection

Service of Urban Environment
Ministry Of Environment

Lazarieh Builidng, Block 2-A, 7th Floor, Room 7-16
Beirut, Lebanon

Tel +961 (0)1 976555- Ext:448
Fax +961 (0)1 976530
Email o.hamdan@moe.gov.lb
Web www.moe.gov.lb