ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale

Sistema Nazionale per la Protezione dell'Ambiente

Environmental Liability Directive (ELD)
STAKEHOLDER WORKSHOP

Case studies assessed by ISPRA under ELD National Legislation

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CASES OF ENVIRONMENTAL DAMAGE

CASE STUDY 1

Groundwater damage

Diffusion of perchlorethylene (PCE) in GWB from industrial site

INTENTIONAL SPILLAGE OF PCE – Damaging occurrence, Damage factors, Adverse effects

- ✓ Intentional **spillage of halogenated solvents**
- ✓ Extensive **pollution by PCE** of the deep **aquifer used for water supply**
- ✓ **Contamination still ongoing**, secondary source not yet eliminated/isolated
- ✓ **Ineffectiveness of the intervention** in containing contamination within the site

Almost 14 Km^2 of territory and 42.000.000 m^3 of contaminated GWB

Diffusion of perchlorethylene (PCE) in GWB from industrial site

INTENTIONAL SPILLAGE OF PCE – Damage under ELD

- ✓ **Non-compliance** with **drinking water limits** and **threshold values** for the GWB good chemical status
- ✓ **Baseline** condition of GWB **available**
- ✓ **Partialisation** of the GWB
- ✓ **Decay of the chemical status** and **loss** of the aquifer for **drinking** purposes

Groundwater Damage + Interim loss of water supply services + Threat of further GW damage

Complementary (Primary not feasible) + Compensatory remediation + Preventive measures of further damage

Diffusion of perchlorethylene (PCE) in GWB from industrial site

REMARKS

- ✓ **High risk** of GWD for **continuous and long-term contamination**
- ✓ **Too much time needed** to assess and remediate GWD
- ✓ **Primary remediation** of deep acquifers **too complicated for DNAPL**
- ✓ **Key role of coordination among competent authorities** for WFD/GWD/IED enforcement and police officers, prosecutors
- ✓ **Risk based assessments and preventive measures for reducing the risk of groundwater damage** by Annex III activities

CASE STUDY 2

Surface water and biodiversity damage

Outflow of sediments from a dam during emergency spillage

EMERGENCY SPILLAGE OF A DAM – Damaging occurrence, Damage factors, Adverse effects

- ✓ **Uncontrolled spillage** of a dam
- ✓ Accumulation of **significant quantities of sediments** (Creek and River)
- ✓ **Significant** growth of **water turbidity**
- ✓ **Alteration** of the **river morphology and habitat** (about 6 km)
- ✓ **Death** of about **1 ton of fish**, including **5 protected species**

Outflow of sediments from a dam during emergency spillage

EMERGENCY SPILLAGE OF A DAM – Damage under ELD

Surface water + Biodiversity damage

- ✓ **Baseline** of ecological status and species **available**
- ✓ **Deterioration of the ecological status** of the surface water bodies for about 6 months
- ✓ **Zeroing and/or reduction of density** for 5 protected species including **recovery/recolonization difficulties** for the conditions of the torrential bed
- ✓ **Temporary loss** of ecosystem services: **supporting** services for biodiversity, **regulating** services and **recreational** services

Protected species

1) ***Barbus caninus***
2) ***Cobitis bilineata***
3) ***Rutilus rubilio***
4) ***Telestes muticellus***
5) ***Cottus gobio***

Primary + Compensatory remediation

Outflow of sediments from a dam during emergency spillage

REMARKS

- ✓ Key role of **quick intervention** of local authorities **for environmental data collection**
- ✓ Baseline condition available for **previous monitoring of the aquatic species and ecosystem**
- ✓ **Too much time needed for claiming** environmental liability and remedial measures **through the legal procedure**
- ✓ **Relevant number of monitoring activities** to determine the water and biodiversity damage

CASE STUDY 3

Land damage

Biogas contamination from improper dumping

IMPROPER DISPOSAL OF WASTE - Damaging occurrence, Damage factors, Adverse effects

- ✓ **Improper disposal of industrial waste** (foundry slag and "mixed" waste) in an old quarry
- ✓ **Biogas and other hazardous substances in soil** (soil gas) in **residential and commercial areas**
- ✓ Remediation measures still **in progress**

Biogas contamination from improper dumping

IMPROPER DISPOSAL OF WASTE – Damage under ELD

- ✓ **Soil gas** concentrations **within the range of explosivity of methane**
- ✓ Very high concentrations of **organohalogen compounds and aromatic compounds**
- ✓ **Migration of biogas** to the surrounding **residential and commercial areas** outside the industrial site
- ✓ Concentrations of biogas and substances (COV) generatig a **significant risk to human health**

Land Damage + Imminent threat of further damage

Primary remediation (still ongoing)

Biogas contamination from improper dumping

REMARKS

- ✓ **Historical industrial contaminated site** and related **improper waste disposal**
- ✓ **Assessment under ELD was requested pursuing art. 12** by the municipality
- ✓ **The only responsible party** for the reclamation of the area **is the old operator of the industrial site**
- ✓ **New residential and commercial areas** in the vicinity
- ✓ **Forced biogas extraction**, filtering and destruction plants as emergency safety containment measures to protect residentials
- ✓ **Frequent monitoring campaigns** required to control effectiveness of the containment system
- ✓ **The risk of explosion** made the assessment on risk to human health faster

CASE STUDY 4

Biodiversity damage

Reduction of population of a protected species

ILLEGAL PICKING OF DATE MUSSEL - Damaging occurrence, Damage factors, Adverse effects

- ✓ **Illegal picking and trade of the protected species** *Lithophaga lithophaga* (date mussel)
- ✓ **Reduction of the population** of the species on marine coast environment **for several kilometers**
- ✓ **Reduction of habitat for other species** (date mussel is an umbrella species)
- ✓ **Alteration of biological communities associated with the species** (date mussel is an umbrella species) and the marine ecosystem in general of the cliff environments

Protected under Bern and Barcelona Conventions, included in Annex IV of Habitats Directive and subject to Annex II to the Washington Convention (C.I.T.E.S.).

Reduction of population of a protected species

ILLEGAL PICKING OF DATE MUSSEL – Damage under ELD

- ✓ **Baseline condition** represented by intact areas adjacent to those damaged
- ✓ **Significant** and effectively measured **impairment of the population** of the species *Lithophaga lithophaga* (natural recovery in 20-60 years)
- ✓ **Structural and functional alteration** of the entire ecosystem due to loss of ecosystem service (natural recovery in more than a century)
- ✓ **Costly restoration** by transplantation **not relevant or successful**

Monitoring activities, conducted by means of series of diving activities over 4 months, on 30 sites

Illegal picking and trade of the protected species

REMARKS

- ✓ Non Annex III activity, no «occupational activity» involved but **«activity» of criminal organisation** with manifest misconduct
- ✓ **Restoration of the populations** of *Lithophaga lithophaga* must take place **naturally** and it is very long
- ✓ **Periodic monitoring is needed** to assess the progress of recolonisation by the species and any disturbing factors which may hinder its correct natural recovery
- ✓ **Primary remediation through long lasting monitoring** to be conducted by specialised experts of the competent authority
- ✓ **Complex allocation of costs** (different subjects involved) for remediation compensation

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THANKS FOR YOUR ATTENTION!

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