



Remediation strategies and costs for remediation

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Presentation Overview

- ✓ **Overview of contaminated sites management in Italy**
- ✓ **Application of Polluter Pays Principle (PPP)**
- ✓ **Funds**
- ✓ **Insurances**

Overview of Past and Present Regulation

1999-2006

Decree of the Ministry of the Environment n. 471:

Application of the “limit value” criterion

2006-.....?

Legislative Decree n. 152

(“*Framework Environmental Regulation*”):

Application of a Tiered Risk-Based Approach

“Limit Value Criterion” VS “Risk-based approach” (1)

Decree of the MoE n. 471/99

✓ Technical Regulation on Cleanup and Environmental Recovery of Contaminated Sites according to art. 17 of Law No. 22/97 (waste legislation), issued on December 1999.

✓ Application of “ threshold limit values” for contaminant concentrations in soil and groundwater; over them, a remedial action is mandatory;

Legislative Decree n. 152/06

✓ Framework Environmental Legislation issued on April 14th 2006: 6 sections (1. General, 2. Environmental Impact Assessment, 3. Soil and Water Protection and Management, 4. Waste Management and Soil Remediation 5. Air and Emissions, 6. Environmental Liability). The Title V under section 4 deals with contaminated sites clean-up activities.

✓ Application of a risk-based tiered approach (similar to RBCA, ASTM procedure): Tier 1 = screening values (CSC) equal to the “limit values” set by DMoE n.471/99; Tier 2 = site specific target levels (CSR) calculated by the application of site-specific risk analysis (backward application) both for soil and groundwater

“Limit Value Criterion” VS “Risk-based approach” (2)

Decree of the MoE n. 471/99

- ✓ Single values proposed for GW (drinkable use), two values for soil (residential and commercial/industrial use); limit values proposed in Annex 1 for about 100 contaminants (inorganic compounds + organic compounds)
- ✓ Site contaminated when even the concentration of a single pollutant is higher than the corresponding limit value set in Annex 1;
- ✓ Application of the “polluter pays principle”: if measured concentrations exceed limit values (Annex 1) the responsible/owner of the site must submit a remediation project

Legislative Decree n. 152/06

- ✓ Site specific target levels CSR (Concentrazioni Soglia di Rischio, Risk Treshold Levels) calculated by the application of a site specific risk (human health) analysis procedure.
- ✓ Site contaminated when the measured concentration of a single pollutant is higher than the corresponding CSR calculated by site-specific risk analysis;
- ✓ If the measured concentrations exceed screening values (CSC), site-specific risk analysis must be performed. If CSR values are exceeded, the responsible/owner of the site must submit a remediation project, otherwise monitoring action required.

Advantages (based on practical experience)

Decree of the MoE n. 471/99

- ✓ “Limit value criterion” is easy to apply;
- ✓ In 7 years of application many relevant procedural and technical problems were overcome (example: additional limits were given by the ISS for more than 250 substances, technical standards were developed both by APAT and ISS on relevant issues)
- ✓ The control and inspection procedures are well consolidated between national and local authorities
- ✓ The definition of contaminated site is univocal therefore the assessment of the environmental damage is not much questionable
- ✓ The drinkable use of groundwater resources is protected

Legislative Decree n. 152/06

- ✓ The “Framework Regulation” approach could facilitate the user of the regulation in finding the linkages with other sections (i.e. remediation-waste-groundwater-emission regulation)
- ✓ The risk-based approach is widely used in Europe and U.S.
- ✓ The application of risk-based site specific target levels, in certain conditions, could improve the diffusion of innovative remediation technologies that do not allow the achievement of the limit values set by DM 471/99

Limits (based on practical experiences)

Decree of the MoE n. 471/99

✓ Concentration limits too stringent for some contaminants in certain situations (example: clean-up action required if only iron or manganese threshold concentration is exceeded at one site);

✓ Some innovative technologies do not allow the achievement of the low concentration values set by DM 471/99

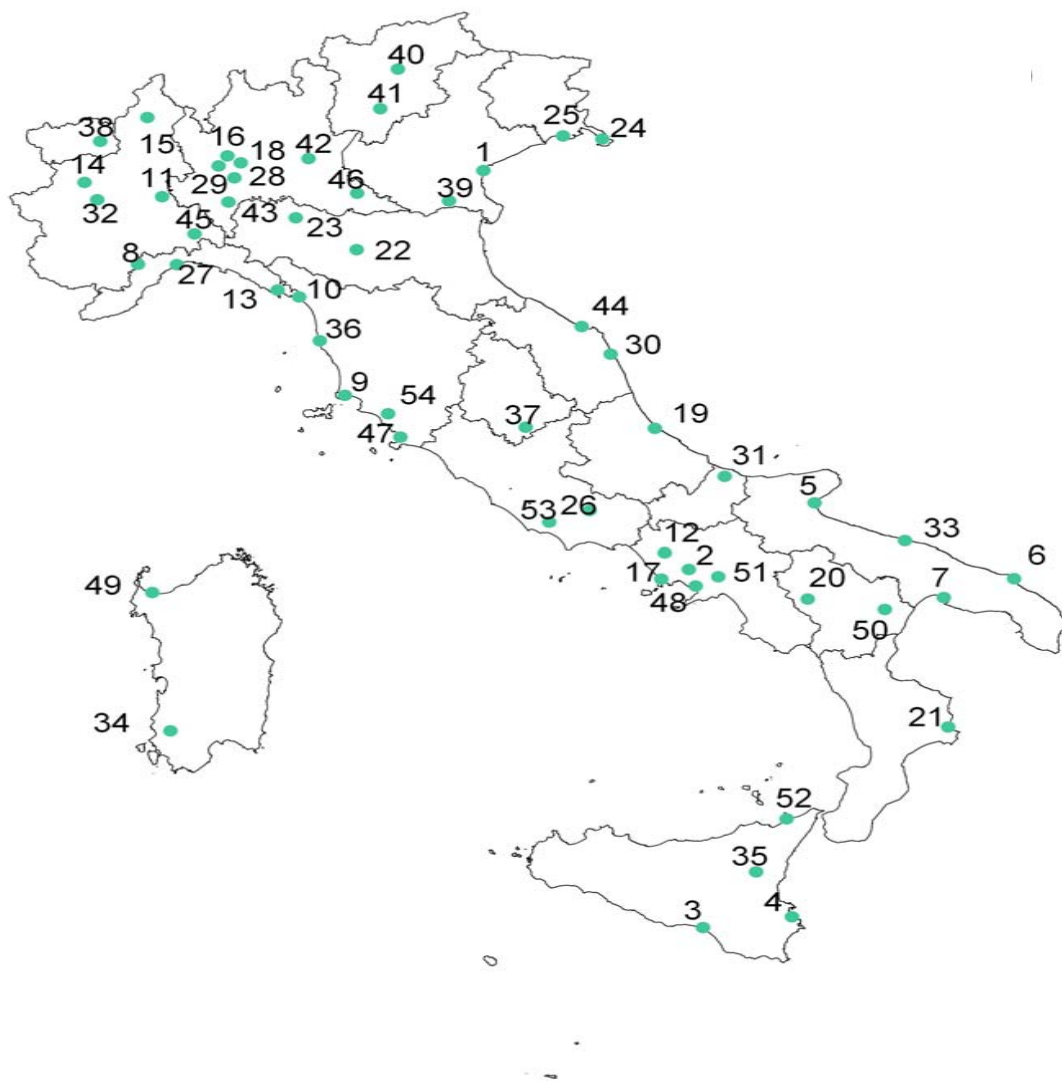
Legislative Decree n. 152/06

✓ The application of risk analysis models requires specific expertise: at a national level both the consultants and the public authorities involved in the contaminated site clean-up activities are not ready (see APAT reports);

✓ Some regulatory requirements are not in compliance with the EC indications (EU Directives on waste, water, environmental liability)

✓ The indications on the application of human health site-specific risk analysis are not technically sound (see also manual published by APAT that was not taken into account)

National Priority List Sites



✓ 54 sites

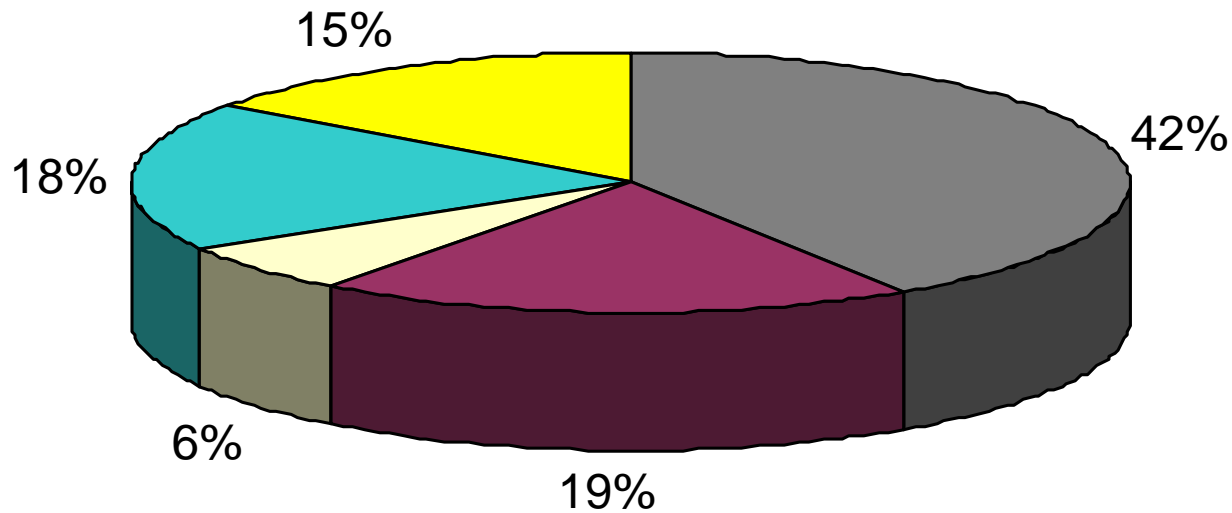
✓ 975068 ha

✓ about 34% water (sea, rivers, lagoons, lakes) included in the NPL sites perimeters

✓ procedure under responsibility of the Ministry of the Environment with the technical support of APAT and other relevant scientific institutions

Remediation of Contaminated Sites: Current Situation in Italy (APAT, 2006)

54 NPL Sites + > 13.000 potentially contaminated sites + about 4400 contaminated sites



- Preliminary Survey Completed
- Investigation Plan Approved by PA
- Preliminary Remediation Project Approved by PA
- Final Remediation Project Approved
- Cleaned-Up

Application of “Polluter Pays Principle” (PPP)

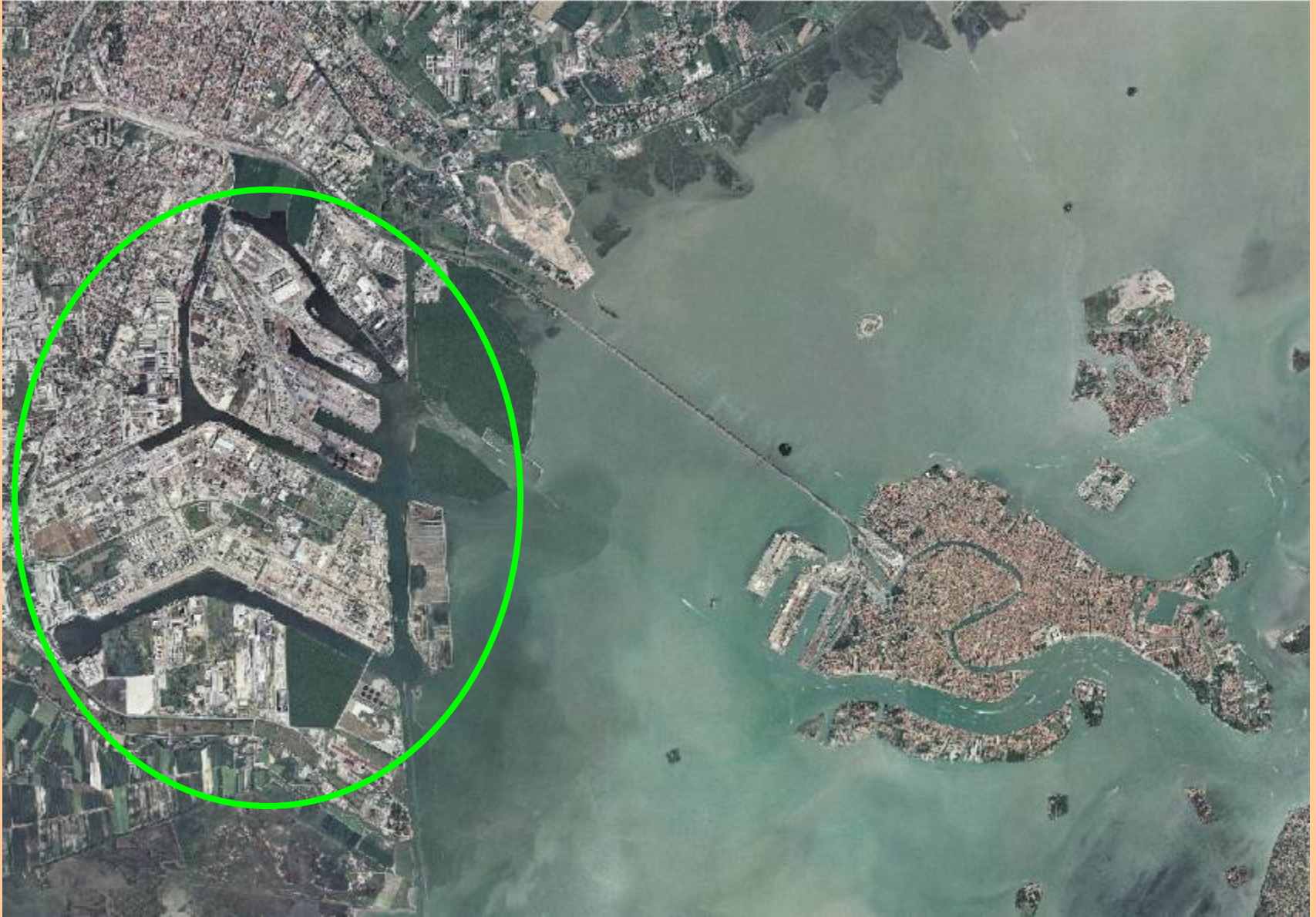
- ✓ According to the national regulation on remediation activities “polluter pays principle” is applied at national and regional level;
- ✓ Generally the responsible for contamination is required to carry out remediation measures. If the responsible for contamination doesn't carry out remediation, municipalities (or the Ministry of Environment for the National Sites) do provide and the costs are charged to the contamination responsible or to the land owner;
- ✓ Remediation projects are approved by Local (Regions, Municipalities) or National (for the 54 National Priority List Sites) Authorities (Ministry of the Environment, Land Protection and Sea with the technical support of APAT, National Health Institute and Regional Environmental Protection Agencies). The follow up of the remediation activities is made by the local Authorities (mainly Regional Environmental Protection Agencies, ARPAs) while the achievement of remediation objectives is certificated by the Provinces.

Application of PPP: Case Study

Venezia – Porto Marghera

Evaluation criteria	% of the area of the NPL site	% of the costs paid by the polluter	% of the costs paid by public authorities
1. Polluter found by P.A.	77		
2. Polluter charged by P.A. for remediation expenses	77		
3. Polluter paid the remediation expenses		88	12

Porto Marghera NPL Site (1)



Porto Marghera NPL Site (2)

The Lagoon before the construction of Porto Marghera



**Sandbanks
systems**

Application of PPP: Case Study 2

Gela – Sicily

Evaluation criteria	% of the area of the NPL site	% of the costs paid by the polluter	% of the costs paid by public authorities
1. Polluter found by P.A.	15,6		
2. Polluter charged by P.A. for remediation expenses	15,3		
3. Polluter paid the remediation expenses		98,1	1,9



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Puntatore 37°03'18.46" N 14°16'48.75" E elev 30 m Streaming ||||| 100%

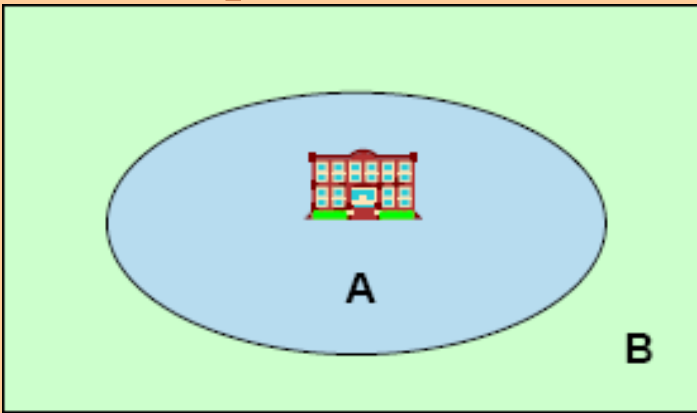
Alt 2.67 km

Funds

- ✓ For NPL Sites up to 50% of the costs for the remediation of areas owned by the public can be covered by public funds. An initial amount of funds available for NPL Sites was set by the Decree of the Ministry of the Environment n. 426 of 1998 and 468 of 2001 (National Remediation Plan). The amount of funds available each year for remediation activities is set by the Financial Law
- ✓ The remediation activities carried out by the public when the polluter of the site cannot be identified or cannot bear the costs of remediation activities (orphan sites) can be paid by public funds
- ✓ Financial transaction can be carried out between the State and the private responsible for the contamination; under these agreement the polluter can pay for part of the remediation activities carried out by the State (e.g. some companies of Porto Marghera-Venice Lagoon National Priority List Sites carried out financial transaction with the Ministry of the Environment for the final confinement of their areas to avoid the migration of contaminated groundwater in the lagoon).

Insurances

- ✓ In Italy private insurances are available for polluters to finance remediation measures
- ✓ Some insurances cover on site and off site pollution and pay for historical contamination (generally up to 10 years)
- ✓ The insurance can cover from 1 to 3 years (for new contamination)
- ✓ In some situations also penalties made by Public Authorities can be paid by insurance
- ✓ Pollution prevention costs cannot be object of insurance



A: Covered by the Insurance (On Site)

B: Not covered by the insurance (Off-Site)