



Agència de
Residus de
Catalunya

WORKSHOP ON MERCURY MANAGEMENT AND DECONTAMINATION IN THE FRAMEWORK OF THE MEDITERRANEAN REGIONAL PLAN ON MERCURY

CONTAMINATED SOIL LEGAL INSTRUMENTS AND MANAGEMENT

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Catalan waste Agency

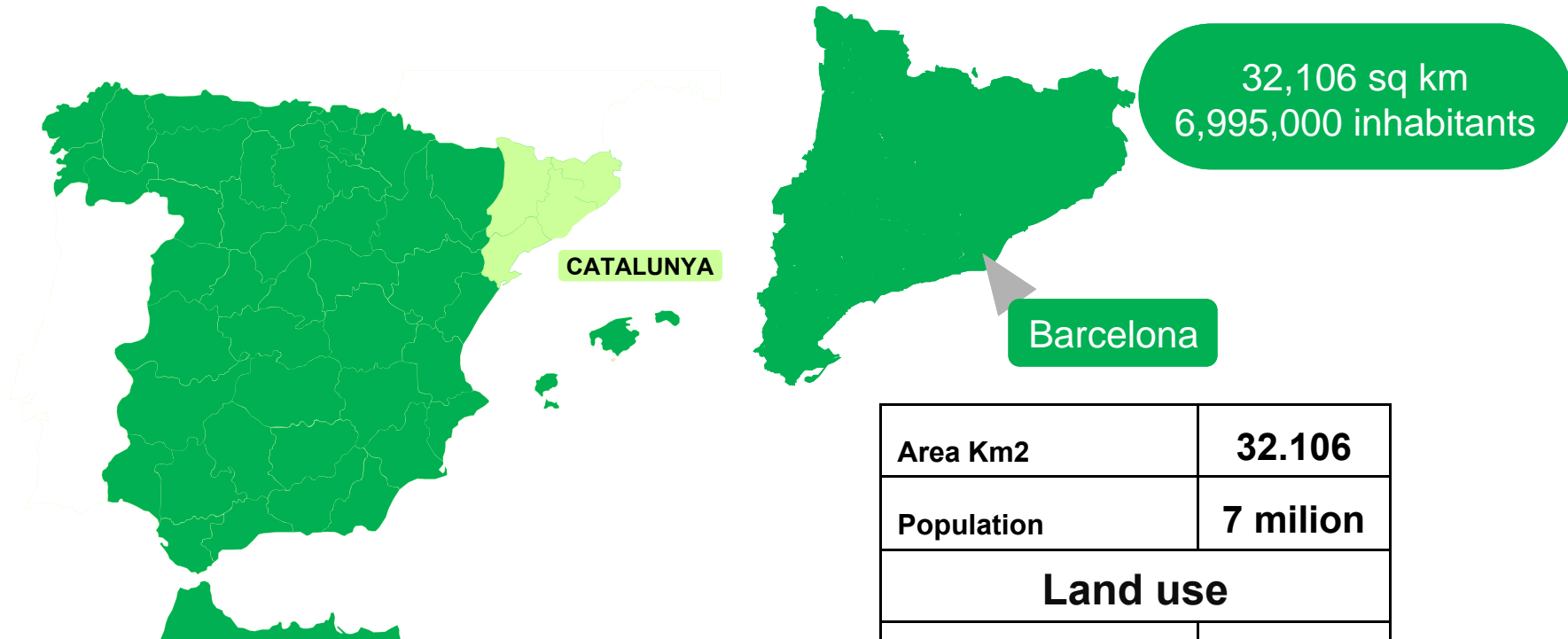
ALMADÉN, 13 DECEMBER 2012



Generalitat de Catalunya
Departament de Territori
i Sostenibilitat



Catalonia: general information



Area Km2	32.106
Population	7 milion
Land use	
Nature	65,5
Agriculture	28,28 %
Residential	6,22 %
Industry	
Infrastructure	

Catalan Water Agency (ACA):

fully competent in the water cycle in the inland basins of Catalonia. In the inter-basin the Catalan Water Agency is shared competence with the Ebro River Basin. (Surface water + groundwater).

Catalan Waste Agency (ARC):

competence in the management of waste and the recovery of areas and land that have been deteriorated or polluted by uncontrolled dumping or other sources

ARC has not competences in mining wastes, radioactive wastes or military wastes

The current regulatory framework on polluted soils in Catalonia:

- Articles 19,20 and 21 of the legislative Decree 1/2009, of 21 of July, what approves the regulatory Law of the waste.
- Articles 33 to 38 of Basic Law 22/2011 of 26st July on waste and contaminated soil.
- Royal Decree 9/2005 of 14th January, establishing the list of potentially soil contaminating activities and the criteria and standards for the declaration of polluted soils.
- Order MAH/153/2007 of 4th May approving the procedures for the telematics presentation of preliminary situational reports and situational reports in accordance with that is established by Royal Decree 9/2005.

- **Potentially soil polluting activities:** according to the regulations some activities are considered potentially contaminating of soil and must submit a preliminary report on soil quality to ARC.
- **Generic levels of reference (NGR):** concentration of a contaminant substance in the soil that could result in an upper risk than the acceptable maximum for the human health or the ecosystems.
- **Risk assessment:** If a concentration surpass the generic levels of reference its necessary to develop a risk assessment.
- **Statement of soil contaminated:** Unacceptable risk ---→ Statement of soil contaminated---→ obligation to decontaminate.



Plans and programs which are set for the basic strategies:

- The Comprehensive National Waste Plan, 2008-2015 (PNIR)

Approval: Resolution of 20 of January of 2009

- The Management of Industrial Waste 2007-2012. Sub-soil protection (PROGRIC).

Approval: Order 88/2010 of 29 of June. DOGC núm. 5664, of 2010.07.6





- **Promotion and implementation of measures to prevent pollution.**
- **Get data for the National Inventory of Contaminated Soil, declared as such under RD 9 / 2005.**
- **Development of a national map of contaminated sites.**
- **Revision and full implementation of RD 9 / 2005.**
- **Development of National Strategy for Soil Protection.**
- **Set the stage for the soil decontamination.**



Regulatory Catalan framework development and management tools

- Determination of background levels and reference of trace elements in soils of Catalonia. March 2009.
- Determination of reference levels for metals in soils of Catalonia for the protection of human health. March 2009.
- Identification of all potentially soil polluting activities existing and evaluate the information provided.
- Identify contaminated sites, creating an inventory of contaminated soil and their recovery
- Encourage the use of best available techniques and reduce contaminated land management via landfill.
- Establish prevention mechanisms to avoid the generation of new soil contamination.

Encourage the use of best available techniques and reduce contaminated land management via landfill.

- The available data suggest that 80-90% of the recovery performances are based in the excavation and management of contaminated land to landfill.
- Poor implementation of recovery techniques such soil treatment plants (both mobile and fixed plants). We must promote the reduction of landfilling as a final management.
- Locations for treatment plant: Province of Barcelona (which is located a 64% of all APC) and Tarragona (where is located a 15% of all APC).
- Total treatment capacity estimated for Catalonia needs: around 100,000 tones / year by biological treatment, 50,000 tons/ year by physical and chemical treatments, and 25,000 tons / year by heat treatments.

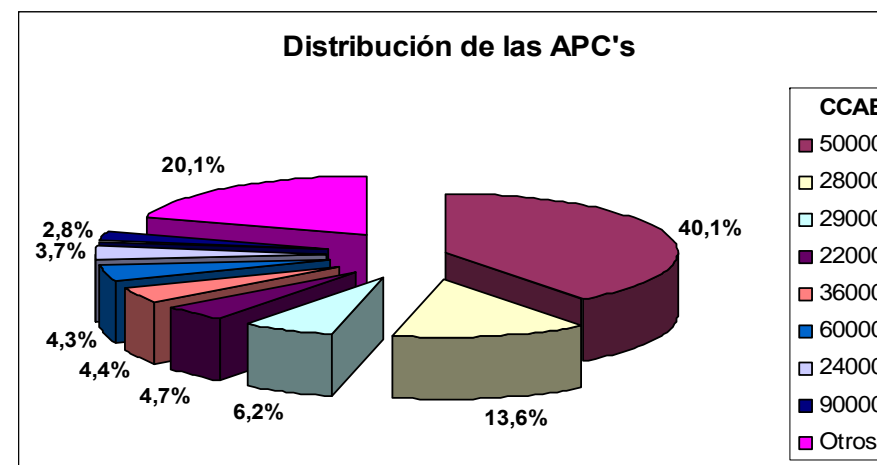
Source of information about potentially contaminated sites

1. Inventory of sites and potentially soil polluting activities done by different administrations.
2. Complaints, accidents,.....
3. Purchase transactions - sale of sites, due diligences
4. Urban development in degraded areas. Changes in land use.
5. Enforcement by existing legislation related to potentially soil polluting activities
6. Application for permits and licenses under environmental legislation.
7. Compliance with environmental excellence (ISO, EMAS).
8. Environmental Liability Law
9. Environmental Assessment of plans, programs and infrastructures.

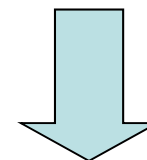
Potentially soil polluting activities since RD 9/2005:

- The activities included in the list of Annex 1 RD 9 / 2005, according to national code of economic activities CNAE-93 Rev.1)
- Those companies that produce, handle or store more than 10 t/y of one or more of the substances listed in the RD 363/1995 of 10 March.
- The storage of fuel for own use and other substances under RD 1523/1999 of 1 October, with an average annual consumption > 300,000 l with a total storage => 50,000 l

CNAE	Description	Total
50000	Sale, maintenance and repair of motor vehicles, motorcycles and mopeds. Retail fuel for motor vehicles	12.183
28000	Fabricated metal products, except machinery and equipment	4.143
29000	Construction industry machinery and mechanical equipment	1.875
22000	Publishing, printing and reproduction of recorded media	1.428
36000	Manufacture of furniture and other manufacturing industries	1.337
60000	Land transport and pipeline transport	1.320
24000	Chemical Industry	1.131
90000	Public health activities	857
Other	24 different CNAE	6.100



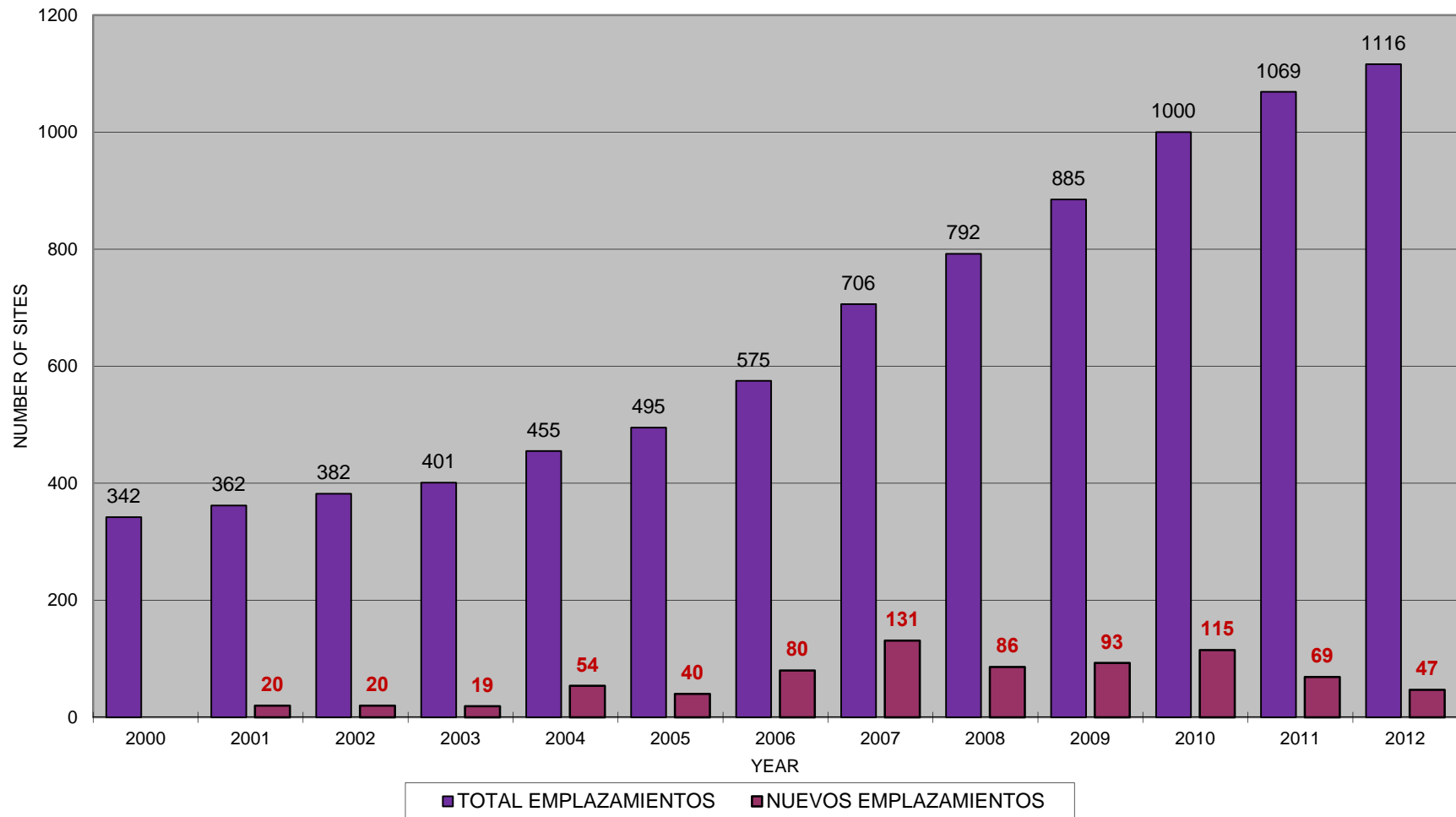
How many potentially soil polluting activities in Catalonia?



30.000 activities (year 2005)



Evolution of potentially contaminated sites that have been evaluated (November 2012)



Potentially contaminated sites (PCS) that have been evaluated 1116

Sites in assessment (open files): 391 (35%)

Completed files: 725 (65%)

Declarations of contaminated soil (DSC)

SC files statement: 64

SC-resolution files: 53

Decontamination projects approved: 37

Declassified sites: 12

Voluntary recoveries projects(RV)

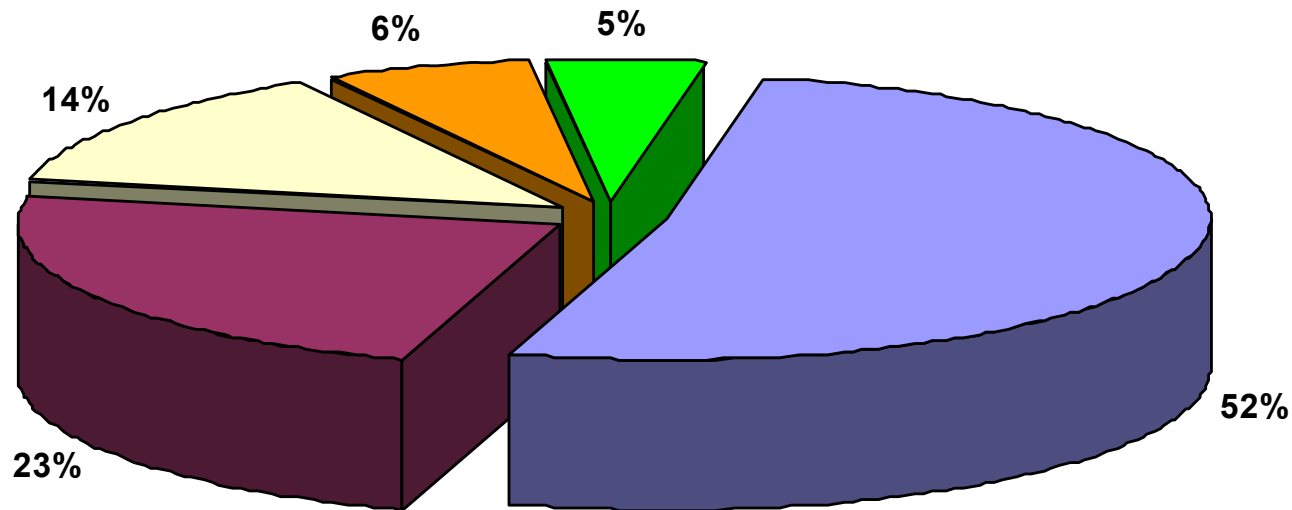
Recoveries voluntary submitted: 25

Projects approved RV: 10

Completed projects: 0



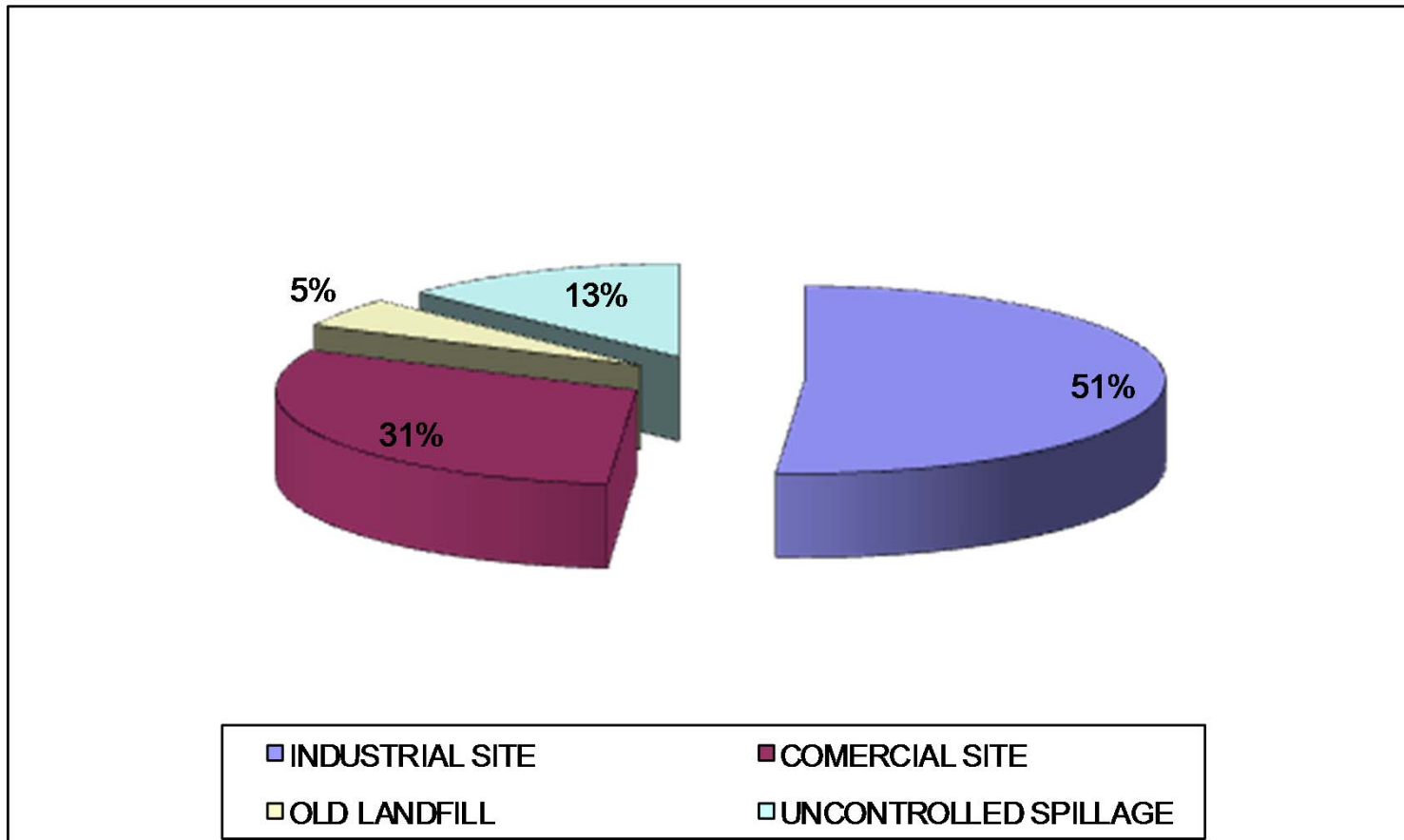
Sources of potentially contaminated sites (PCS)



- INDUSTRIAL SITE
- COMMERCIAL SITE
- OLD LANDFILL
- Uncontrolled spillage
- Accident or spillage, port dredging, OTHER

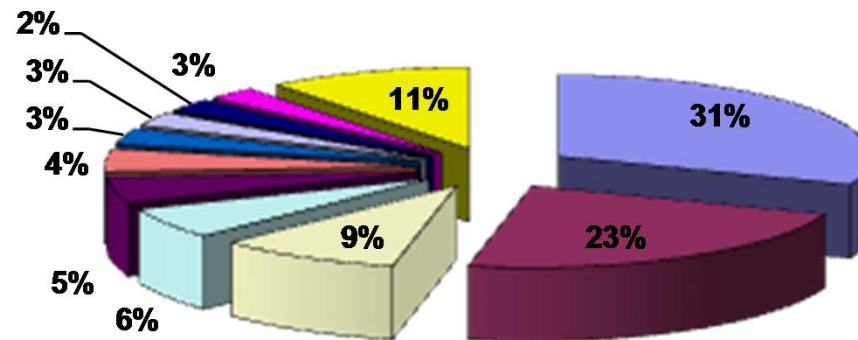


Sources of contaminated sites (SC)





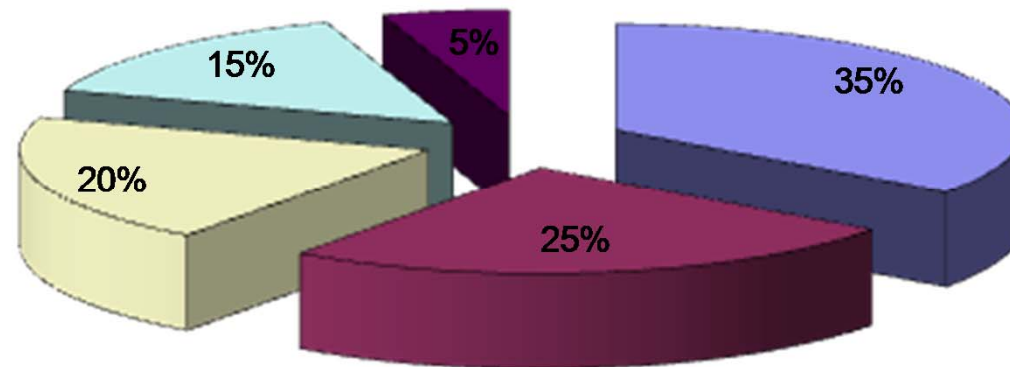
Industrial activities of potentially contaminated sites (PCS)



- | | |
|---|--------------------------------|
| ■ CHEMICAL INDUSTRY | ■ WASTE MANAGEMENT ACTIVITIES |
| ■ Metallurgical industry | ■ Oil Industry |
| ■ Manufacture of machinery, parts, ... | ■ TEXTILE INDUSTRY, LEATHER |
| ■ Automotive industry | ■ ELECTRONICS INDUSTRY |
| ■ GLASS INDUSTRY, CERAMICS, STONE, SOIL | ■ PLANTS FOR ENERGY PRODUCTION |
| ■ OTHER | |



Industrial activities of contaminated sites (SC)

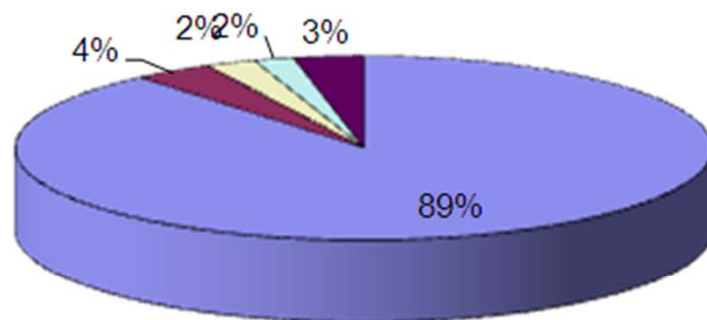


- | | |
|-----------------------------|--------------------------|
| ■ CHEMICAL INDUSTRY | ■ OIL INDUSTRY |
| ■ AUTOMOTIVE INDUSTRY | ■ METALLURGICAL INDUSTRY |
| ■ TEXTILE INDUSTRY, LEATHER | |





MAIN SECTORS OF THE COMMERCIAL ACTIVITIES CAUSING POLLUTION

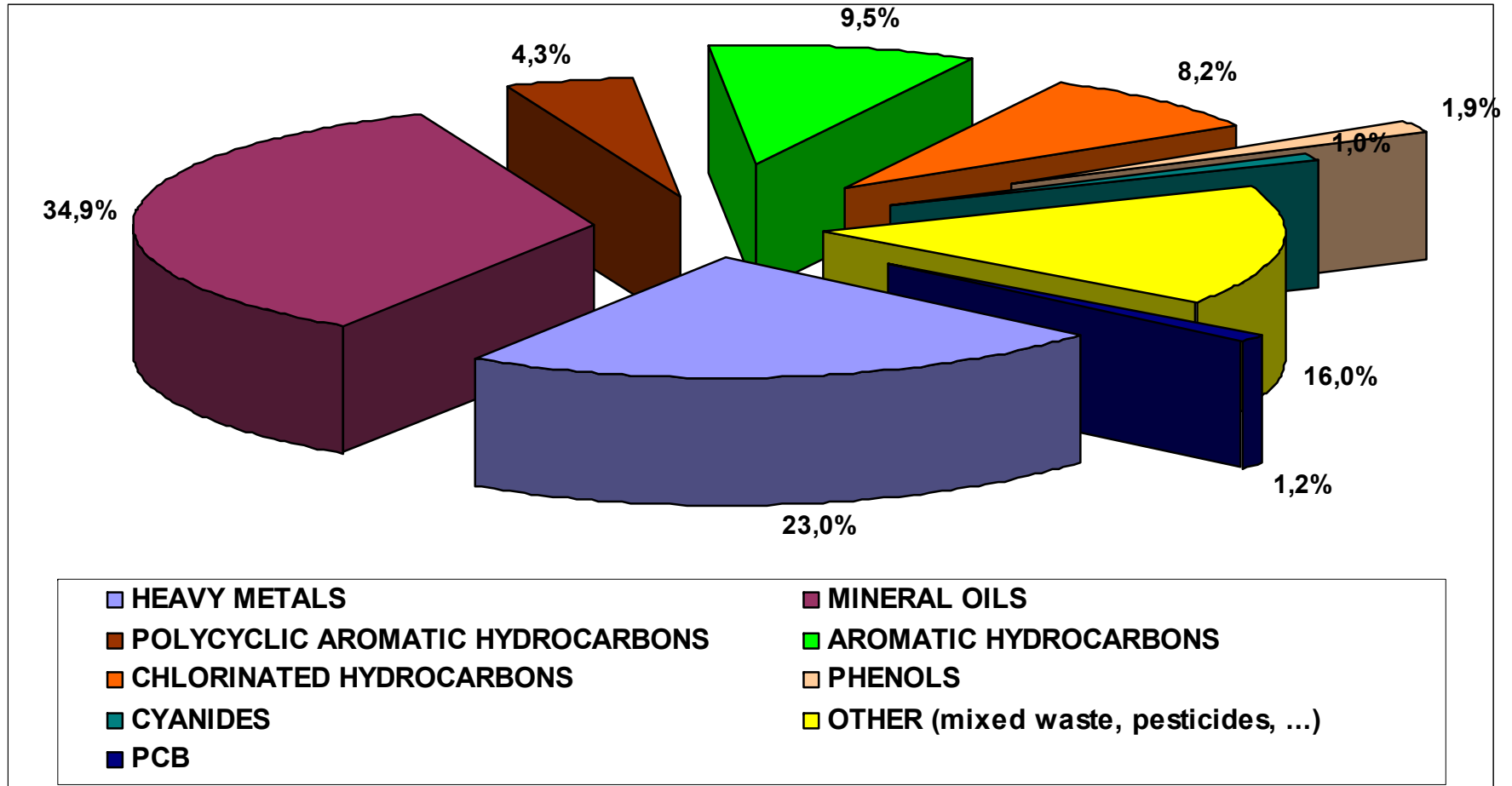


- RETAIL SALE OF FUEL
- VEHICLE WORKSHOPS
- TRADE INTERMEDIARIES
- Transport activities
- Other



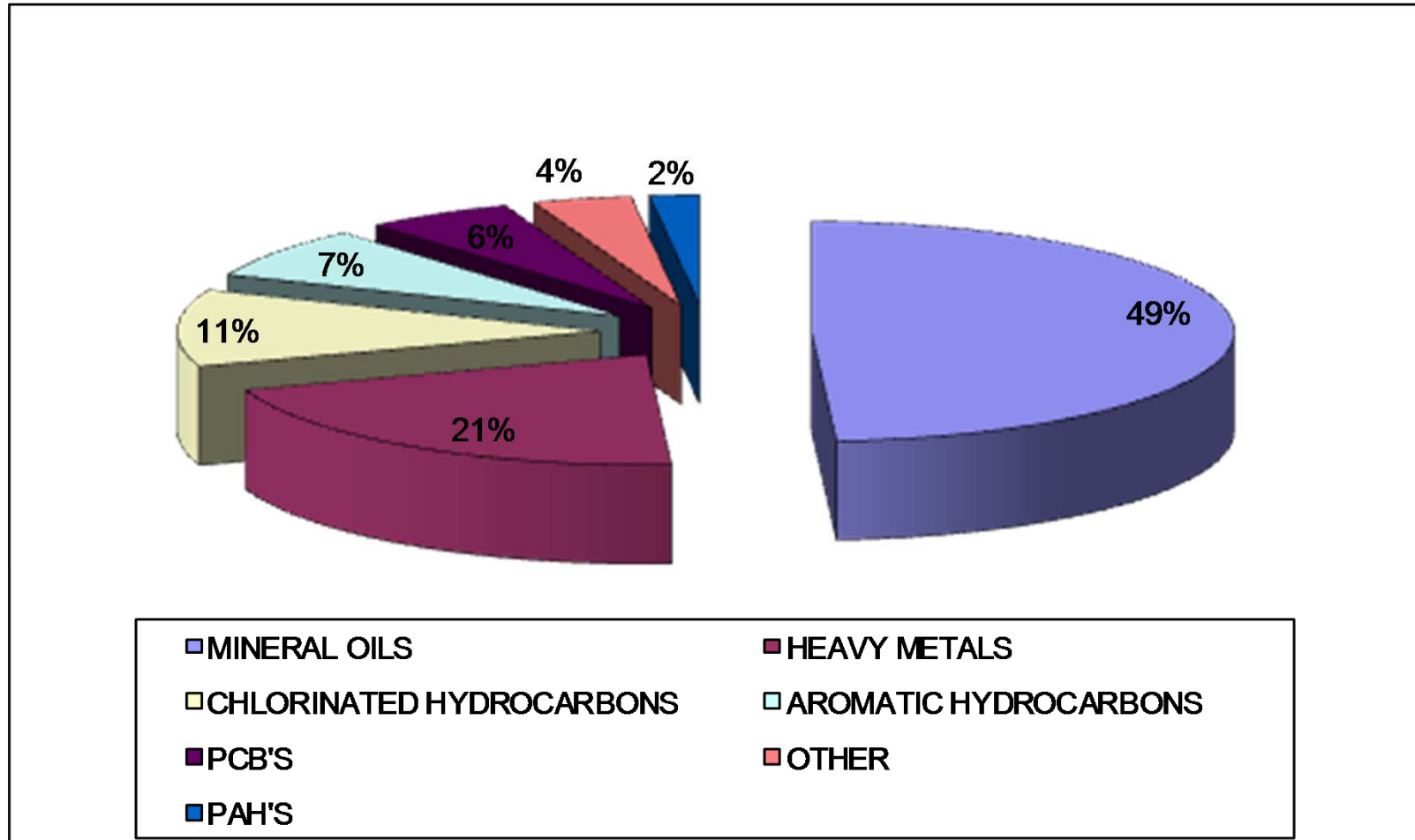


Main pollutants in the potentially contaminated sites (PCS)





Main pollutants of contaminated sites



Management process:

1st Stage: Preliminary recognition

- Information
- Evidence of pollution of the soil and/or of the waters

2nd Stage: Preliminary evaluation

- Report
- Exceeding the General Reference Levels (GRL)

3rd Stage: Detailed evaluation

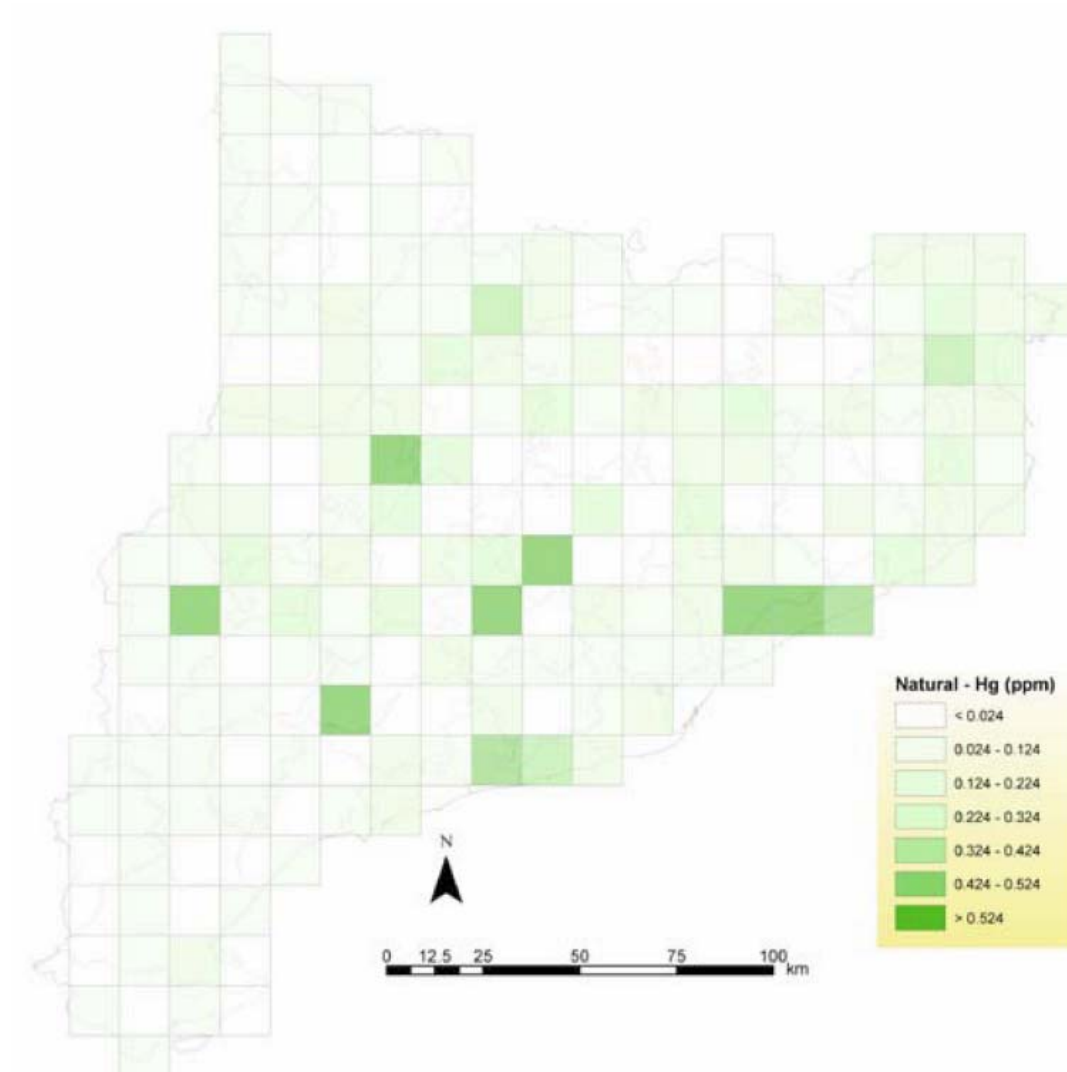
- Report
- Unacceptable risk

4th Stage: Recovery

- Preparation of the recovery project
- Execution of the recovery
- Monitoring

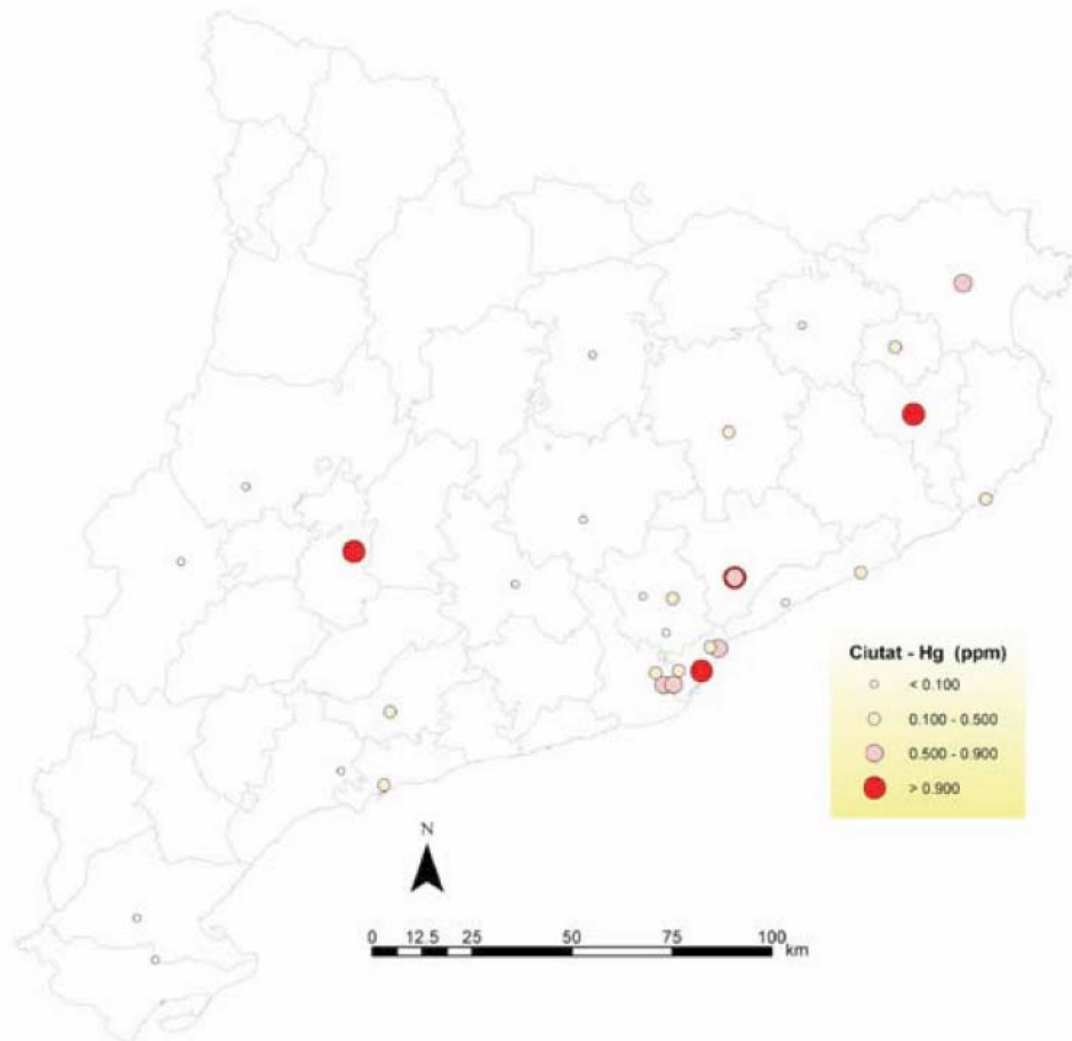


Natural background levels of mercury in Catalonia





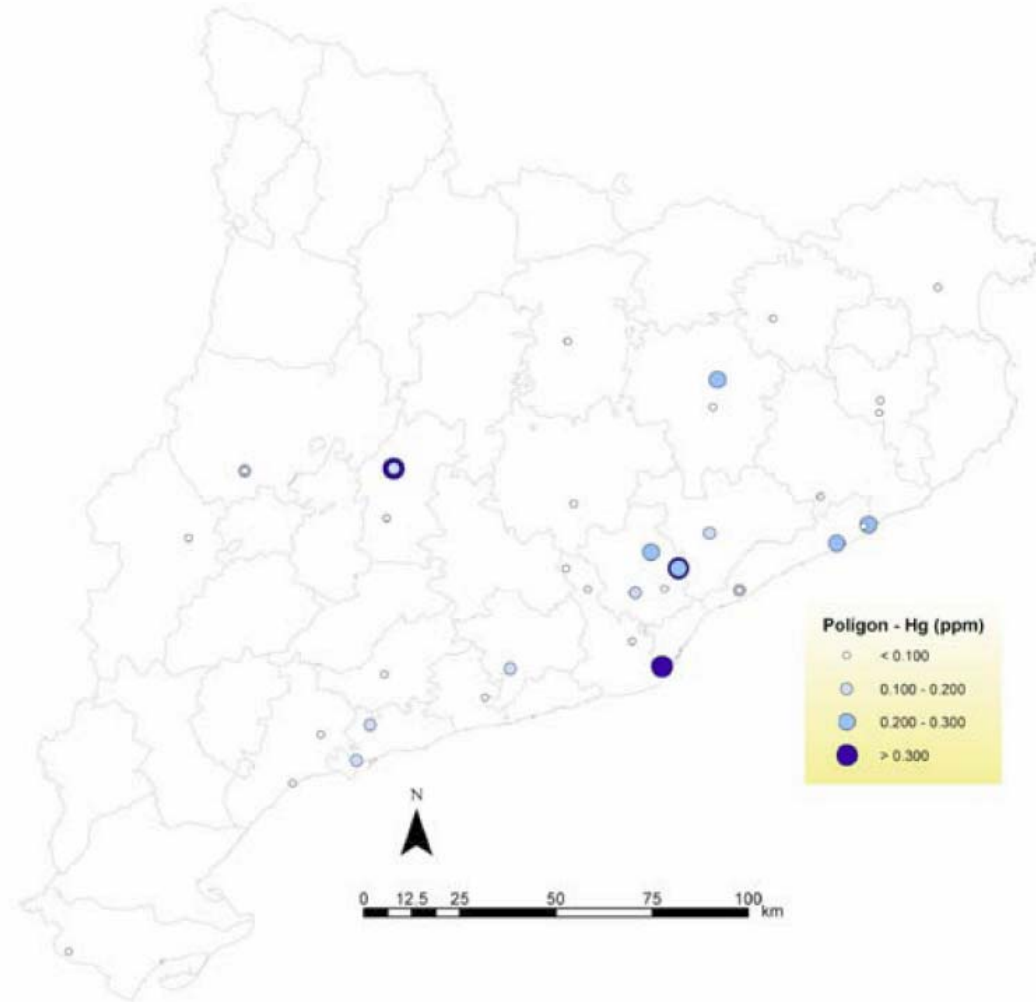
Background levels of mercury in urban sites in Catalonia





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Background levels of mercury in industrial sites in Catalonia



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Values for GRL for metals and metalloids and protection to the human health applicable in Catalonia

ELEMENT	INDUSTRIAL USE mg/kg ds	URBAN USE mg/kg ds	OTHER USES mg/kg ds
Antimony	30 *	6 **	6 **
Arsenic	30 **	30 **	30 **
Barium	1.000 ***	880	500
Beryllium	90	40	10
Cadmium	55 *	5.5	2.5
Cobalt	90	45	25 **
Copper	1.000 ***	310	90
Chromium (III)	1.000 ***	1.000 ***	400
Chromium (VI)	25	10	1
Tin	1.000 ***	1.000 ***	50
Mercury	30 *	3	2 **
Molybdenum	70 *	7 *	3,5 **
Nickel	1.000 ***	470 *	45 **
Lead	550 *	60 **	60 **
Selenium	70 *	7 *	0,7
Thallium	45 *	4,5 *	1,5 **
Vanadium	1.000 ***	190	135 **
Zinc	1.000 ***	650 *	170 **

Values for GRL for metals and metalloids and protection to the ecosystem applicable in Catalonia

ELEMENT	OTHERS ¹ mg/kg ds	ZONA AGROPECUÀRIA I FORESTAL ² mg/kg ds
Antimony	6,0	6,0
Arsenic	30	30
Barium	270	500
Beryllium	4,5	10
Cadmium	0,6	2,5
Cobalt	25	25
Copper	55	90
Chromium (III)	85	400
Chromium (IV)	1,0	1,0
Tin	7	50
Mercury	2,0	2,0
Molybdenum	3,5	3,5
Nickel	45	45
Lead	60	60
Selenium	0,5	0,7
Thallium	1,5	1,5
Vanadium	135	135
Zinc	110	170

1 Reference levels: upper level of** the 95% confidence interval, calculated based on samples of natural soil.

2 The GRL column defined as an agricultural, stockbreeding or forest area will be applicable to all soils subjected to agricultural practices using fertilizer. In this case, the representative surface sample of the soil will be that derived from a homogeneous sample of the first 50 cm, once the natural earth cover has been removed (the first 5-10 cm).

Generic restoration values from the Catalan Water Agency for groundwater restoration on sites contaminated by isolated point sources.

Values in $\mu\text{g/l}$

	Valor Genèric de No Risc (VGNR)	Valor Genèric d'Intervenció (VGI)
Substàncies del GRUP 1		
Mercuri	1	1,5
Arsènic	15	40
Cadmi	15	70
Antimoni	20	60
Crom (VI)	100	450

Published guides for prevention of soil contamination.

Guide to prevention of pollution of the soil for potentially soil polluting activities under paragraph CNAE 50500: retail sale of automotive fuel. March 2009.

Manual for the prevention of soil contamination. June 2009.

Guide to prevention of pollution of land for potentially polluting activities located in the harbor of Barcelona. June 2009

Guidelines for prevention of soil pollution to the environmental management system. December 2009. Eco-management manuals 30

Published guides about soil investigation and remediation.

Guide for bioremediation of soils contaminated with petroleum hydrocarbons. July 2009.

Methodological guide for vacuum tests (test efficiency) in capturing soil vapors at gas stations. July 2012



- Protocol groundwater sampling: a practical guide, February 2005.
- Action protocol for decontamination of the groundwater at gas stations, January 2008.
- Protocol in episodes of contamination of groundwater sources point source. October 2009.
- Monitored natural attenuation Guide: groundwater contaminated by petroleum hydrocarbons, January 2008.
- Guide bioremediation, groundwater contaminated by petroleum hydrocarbons, January 2008.
- Guide contains the technical criteria for the replacement of public water in the event of termination, abandonment and temporary closure of groundwater exploitation. July 2009.
- Piezometer installation guide: assessing the quality of groundwater in episodes of point-source pollution. December 2009
- Generic values for restoration of groundwater at sites contaminated by point source sources. December 2007.
- Criteria for applying the generic values for restoration of groundwater at sites contaminated by point source sources. September 2009.
- Compilation of geophysical techniques: Research from the ground. Description and feasibility of implementation. December 2009.





- Use of non-intrusive investigative techniques.
- Use of soil treatment techniques in-situ and ex situ more sustainable and economically attractive.
- Market to reuse decontaminated soil.
- Risk management more sustainable.
- Communication /information about all aspects related to the decontamination of soils.
- The outcrop of historical pollution.



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