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SECRETARY OF STATE  
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GENERAL DIRECTORATE FOR  
ENVIRONMENTAL QUALITY AND ASSESSMENT

## **STRUCTURE AND GENERAL CONTENT OF SECTOR-SPECIFIC INSTRUMENTS FOR ENVIRONMENTAL RISK ANALYSIS**

Updated version according to Royal Decree 183/2015, of 13 March, amending the Regulations for the partial development of Law 26/2007, of 23 October, on Environmental Liability, approved by Royal Decree 2090/2008, of 22 December.

**TECHNICAL COMMISSION FOR THE PREVENTION AND REMEDIATION  
OF ENVIRONMENTAL DAMAGES**

***This document is a summary in English of the original version of the document published on the section on Environmental Liability of the website of the Ministry for the Ecological Transition and the Demographic Challenge.***

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## 1. Introduction and rationale

*Royal Decree 183/2015, of 13 March, amending the Regulations for the partial development of Law 26/2007, of 23 October, on environmental liability, approved by Royal Decree 2090/2008, of 22 December (hereinafter RD 183/2015) introduces a series of amendments aimed at, among other things, simplifying the procedure for determining the mandatory financial security.*

This simplification is based on introducing an Environmental Damage Index (IDM) that the operator must estimate for each accident scenario identified in its environmental risk analysis, following the steps set out in the new Annex III of the Regulations.

The IDM makes it possible to estimate an order of magnitude of the environmental damage caused in each hypothetical accident scenario. This makes it possible to compare various scenarios and to select the reference scenario that will form the basis for determining the amount of the financial security, per the new wording of article 33 of the Regulation.

With this simplification, the operator avoids one of the most technically complex stages: the quantification and hence monetisation of the damage associated with each and every accident scenarios identified in the environmental risk analysis; it is now necessary only to quantify and monetise the environmental damage associated with the selected reference scenario.

On the other hand, the IDM is systematic and relatively simple to apply, and it allows for continuity with the general system used to date by professional sectors and operators to calculate the financial security.

This amendment to this procedure for determining the financial security has made it necessary to review the document “*Structure and General Content of the Sector-specific Instruments for Environmental Risk Analysis*” drawn up within the *Technical Commission for the prevention and remediation of environmental damage*, and approved by that body in 2011, so as to adapt it to the new methodology.

However, it is necessary to bear in mind the transitory provision of Royal Decree 183/2015, of 13 March, which provides that “*Operators whose sector or sectoral association has submitted to the Technical Commission for the Prevention and Remediation of Environmental Damage, for its report, a sector-specific environmental risk analysis or a rate tables, within six months of this Royal Decree coming into force, may carry out their individual environmental risk analyses based on the methodology set out in the original wording of article 33 of these regulations, as passed in Royal Decree 2090/2008, of 22 December, when this instrument is reported favourably by the aforementioned Technical Commission.*”

*Likewise, those operators who have conducted their environmental risk analysis based on the methodology set out in the original wording of article 33 of these regulations, may use it to constitute the mandatory financial security when it comes into force, when within six months of this Royal Decree coming into force, these operators make a voluntary financial security based thereon, and submit to the relevant authorities an affidavit stating that they have set such a financial security.”*

Therefore, for sectors or sectoral associations that have already had their sector-specific risk analyses approved, or which avail themselves of the provisions of the transitory provision of Royal Decree 183/2015 of 13 March, the version of the document “*Structure and General Content of the Sector-specific Instruments for Environmental Risk Analysis*” approved in 2011 by the Technical Commission for the Prevention and Remediation of Environmental Damage will remain valid.

The purpose of this document is to make it easier for professional activity groups wishing to do so to draw up their sector-specific instruments and thus help operators in the sector to analyse their individual environmental risk and assess whether they will have to provide the financial provision established in article 24 of Law 26/2007 of 23 October 2007.

## 2. Background

The Regulations for the partial implementation of Law 26/2007, of 23 October, on Environmental Liability, approved by Royal Decree 2090/2008, of 22 December, provides for the use, on a voluntary basis, of different environmental risk analysis instruments at sectoral level, which facilitate the individual assessment of their risk scenarios by their operators. The performance of this environmental risk analysis, whether at sectoral or individual level, must be based on standard UNE150.008 or other equivalent standards.

Article 35 of the aforementioned Regulation, establish that individual environmental risk analyses may be drawn up based on sector-specific environmental risk analyses approved by the Technical Commission for the Prevention and Remediation of Environmental Damage. The sector-specific instruments for environmental risk analyses may consist either of model environmental risk reports, so-called MIRATs, or of methodological guides to risk analysis, depending on the extent to which the environmental risk of the sector is homogeneous.

Likewise, article 36 of the Regulation provides that to calculate the amount of the mandatory financial security for sectors or subsectors of activity or for small and medium-sized companies which, due to their high degree of homogeneity, make it possible to standardise their environmental risks, since they are limited, identifiable and known, other instrument called the rate table may be used, if they have a favourable report from the Technical Commission for the Prevention and Remediation of Environmental Damage.

It is for each professional sector or group of activities to decide the type of basic instrument to analyse their environmental risk. However, there are some decision criteria to identify the most appropriate one — the MIRAT instrument (Model Environmental Risk Reports Template), Rate table or methodological guide — for each specific case; these are, on the one hand, those referring to the level of danger or environmental risk of the sector in question and, on the other, to heterogeneity in terms of the variability of the behaviour of the activities of the same sector with respect to the variables describing the aforementioned environmental risk. The variables on which the risk depends notably include the following: the type and complexity of the production process; the treatment and production capacity; the type and quantity of emissions to water, soil and/or air; the type and quantity of waste generated; the territorial context where the activity takes place and the sensitivity and vulnerability of the potentially affected receiver; and the operator's management of its environmental risk.

Figure 1 shows a simplified representation of the decision-making process on which basis it will be possible to identify the type of instrument that operators can use as a basis for assessing the environmental risk arising from the group of activities belonging to the same sector. This diagram is intended to be indicative and not exhaustive and offers a series of guidelines to make it easier to select the most appropriate sector-specific instrument for environmental risk analysis.

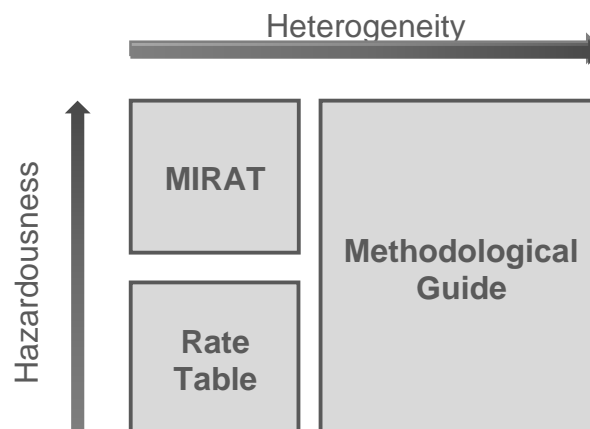


Figure 1. Decision diagram to guide identification of the sector-specific instrument for environmental risk analysis. Source: Prepared by the author.

It may be inferred from Figure 1 that the MIRAT models and the Rate tables will be applied when the various activities that make up that sector are associated with a high degree of homogeneity. In other words, a Methodological Guide shall be used when the heterogeneity of the activities making up the same sector does not make it possible to homogenise its environmental risk scenarios. If the decision diagram considers, besides the heterogeneity criterion, the criterion based on the hazardousness of the professional activity, it can be concluded that the use of those methodological guides referring to sectors and/or activities associated with a high level of hazardousness could be given priority over the preparation of other sector-specific guides referring to activities with a lesser environmental impact. Although the homogeneity or heterogeneity of the group of activities in the same professional sector is the factor that has more influence in the selection of the most appropriate sector-specific instrument, by similar logic, it seems appropriate that the activities of one sector that show a high degree of homogeneity, but which are not necessarily associated with a high level of hazardousness, can use a Rate table from which the operators can individually calculate the damage to be covered by the financial security without needing to carry out an individual environmental risk analysis. Furthermore, attention must be paid to the size of the activities in the same sector, so that this criterion can be borne in mind when identifying the most appropriate type of sector-specific instrument; this is true of rate tables, which, according to the Royal Decree, are intended for sectors with small and medium-sized companies which, due to their high degree of homogeneity, allow their environmental risks to be standardised.

### **3. Scope of sector-specific environmental risk analyses**

Law 11/2014, of 4 July, amending Law 26/2007, of 23 October, on Environmental Liability, amended article 28 of the law by including a new section d) which refers to the activities which, due to their potential to cause environmental damage and their accident rate being lower, can be exempted from the obligations to provide a financial security and to conduct an environmental risk analysis.

Based on this new article 28 d) of Law 26/2007, Royal Decree 183/2015, of 13 March, has thus amended article 37 of the Regulations for the partial implementation of the law, to introduce a new section a) which includes the activities whose operators are still obliged to provide the mandatory financial security as well as to conduct the environmental risk analysis, and which are as follows:

- *Operators within the scope of application* Royal Legislative Decree 1/2016, of 16 December, approving the consolidated text of the law on Integrated Pollution Prevention and Control (*IPPC activities*).
- *Operators within the scope of application of Royal Decree 840/2015, of 21 September 2015, approving measures to control the risks inherent in major accidents involving dangerous substances (SEVESO operators).*
- *Operators who manage waste from the extractive industries, in the case of facilities classified as category A, per the provisions of Royal Decree 975/2009, of 12 June.*

On the other hand, a new paragraph b) is introduced in article 37, which lists the activities that are provisionally exempt from the obligation to provide a financial security.

It should be stressed that, irrespective of the obligation to provide a financial security, all operators listed in Annex III of Law 26/2007 who cause environmental damage or threaten to cause such damage must take the necessary measures to prevent it from occurring or, where damage has occurred, to restore the damaged natural resources to the state in which they were before the damage was caused, , in application of the prevention and polluter pays principles, on which Law 26/2007 is based,.

The entry into force of the mandatory financial security for the professional activities that must provide it, will be determined, in each case, by the approval of the corresponding Ministerial Order taking into account the timetable set out in Order ARM/1783/2011, of 22 June.. In this context, the Ministry wishes to offer technical solutions to help the aforementioned operators, and by extension to all Annex III operators, to assess and manage the environmental risk associated with their activity.

The sector-specific instruments for environmental risk analysis are voluntary and are designed to make it easier for the operator individually to assess the risk in the later individual environmental risk analysis, which shall be used to determine the amount of any damage should be covered by the financial security for environmental liability.

As set out in the Regulation, in its current version, following the amendment made by Royal Decree 183/2015 of 13 March, the methodological sequence to be followed by the operator instrument when using the sector-specific instrument for risk analysis developed by the sector would be as follows<sup>1</sup>:

- 1) The operator must prove that his/her professional activity meets the technical requirements to use the relevant sector-specific instrument, which must have been approved by the Technical Commission for the Prevention and Remediation of Environmental Damage.
- 2) Carry out the individual environmental risk analysis, conducted by the operator or by a third party contracted by the operator, that can be based on the sector-specific instrument. The operator must identify the relevant accident scenarios in terms of environmental risk and estimate both the probability of the scenario's occurring and the environmental damage index (IDM) of each of these scenarios, following the steps set out in the new Annex III to the Regulation.
- 3) Calculate the risk associated with each accident scenario by multiplying the probability of the scenario's occurring by the IDM.
- 4) Select the reference scenario (from which the amount of the financial security amount shall be estimated) from the scenarios with the lowest IDM representing 95 percent of the total risk.
- 5) Quantify the amount of potentially affected resource associated with the previously selected reference scenario.
- 6) Monetise the damage associated with the reference accident scenario. To do this, the operator may use the "Environmental Liability Offer Model"<sup>2</sup> developed by the Ministry for the Ecological Transition and the Demographic Challenge, that is available to the public through its website: <https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/responsabilidad-mediambiental/modelo-de-oferta-de-responsabilidad-ambiental/>

It is important to note that, in the case of the Rate Table, when the sector or subsector of activity, due to its characteristics, is eligible for this instrument and it has been approved by the Technical Commission for the Prevention and Remediation of Environmental Damage, the operator may estimate the amount of the mandatory financial security directly without needing to carry out an environmental risk analysis.

The following sections include some technical guidelines for selecting and developing sector-specific instruments for environmental risk analysis or rate tables.

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<sup>1</sup> Operators whose sector had a favorable report on their sector-specific instrument for environmental risk analysis prior to the amendment of the Regulation for the partial implementation of Law 26/2007, of 23 October, or that use transitory provision of Royal Decree 183/2015 of 13 March, may carry out their individual environmental risk analyses based on the methodology set out in the original wording of article 33 of this regulation, passed by Royal Decree 2090/2008, of 22 December.

<sup>2</sup> The Environmental Liability Offer Model (MORA) is an instrument for voluntary use that makes it possible to monetize the damage associated with a series of accident scenarios: spillage of chemical substances, extractions, spillage of inert materials, fires, biological damage, etc. To this end, and to assess the cost of remediation, initial information will be required regarding the place where the damage occurs, the agent that caused the damage, the quantity of resources that have been affected by the damage and the expected reversibility of the damage.

### 3.1 Model Environmental Risk Report Templates

Model Environmental Risk Report Templates (MIRAT) are indicated for homogeneous sectors or groups of activity from the point of view of environmental risk which, in principle, are associated with greater hazardousness, given that this instrument does not exempt the operator from carrying out its individual risk analysis to assess the need to constitute a mandatory financial security.

The MIRATs must be able to identify all the relevant accident scenarios in a sector of activity, including all the accident types common to the activities and facilities of the sector found in the majority of the facilities. These MIRATs will therefore exclude “singular” risk scenarios, that is, those that are not representative at the sector level because they are found in a minority of activities or facilities. “Unique” scenarios that generate significant damage must nevertheless be borne in mind in the individual environmental risk analysis.

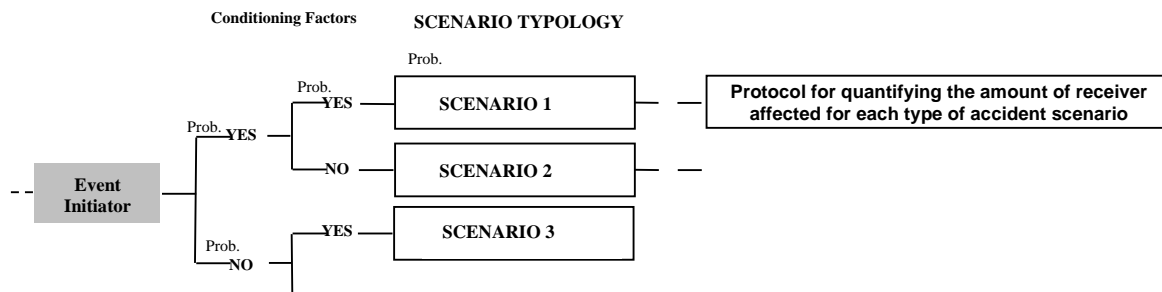


Figure 2. General diagram of the MIRAT. Prepared by the author based on UNE 150.008.

To conduct the sector-specific instrument and identify each of the relevant risk scenarios for the sector, the UNE 150.008 methodology, or another equivalent standard will be followed (see Figure 2).

The MIRATs must also include protocols that make it easier for the operator to carry out both the assessment of the significance associated with the accident scenarios that may arise from his/her professional activity, and to quantify the potentially affected resources associated with each type of damage or accident scenario inferred from the sector-specific risk analysis.

On the other hand, and for the purposes described in the previous paragraph, these protocols should help the operator to, if deemed necessary, use dispersion models of the corresponding agents causing the damage in the receiving media that could be affected so that these models may serve as a basis for estimating the quantity of potentially affected resources that are associated with the environmental damage of the reference scenario that is selected. The protocols for each type of accident scenario should be as simple as possible so as to standardise the quantification of the damage and make it easier for the operator to apply them.

### 3.2 Methodological Guide

The Methodological Guides (GM) are intended to homogenise and unify the content of the risk analyses to be conducted by the various sectors of activity with a high degree of heterogeneity in terms of environmental risk. These sector-specific instruments must contain the general guidelines to be followed to conduct the environmental risk analysis according to the type of facilities or activities in the sector, as besides the variables and factors to be borne in mind when undertaking this analysis.

The Methodological Guides may contain variable information depending on the sector concerning various different aspects, such as types of agents and recipients, dissemination models, estimation of risk, etc.



### 3.3 Rate Tables

Rate tables (TB) are particularly suitable for small and medium-sized companies which, due to their high degree of homogeneity in terms of risk, make it possible to standardise their environmental risks. This is why the professional sectors that rely on a Rate Table to assess their environmental risk must have a common production profile and, therefore, a high degree of homogeneity in accident scenarios, with no “singular” scenarios or they must be isolated cases. When the operator has “singular scenarios” that are relevant at an individual level, these scenarios must also be born in mind at a particular level to set the amount of the financial security.

Rate Tables are mainly indicated for sectors whose activity is associated with a lower level of hazardousness; however, other sectors will be able to use a Rate Table as long as they can demonstrate that they have a high degree of homogeneity that makes it possible to standardise their environmental risks. In this regard, the homogeneity of the sector will be the most decisive decision-making criterion when selecting this type of instrument.

Developing a Rate Table requires identifying a relationship between the environmental risk and the primary remediation cost, which makes it possible to calculate the financial security without the need for a risk analysis to be conducted by the operator of the sector.

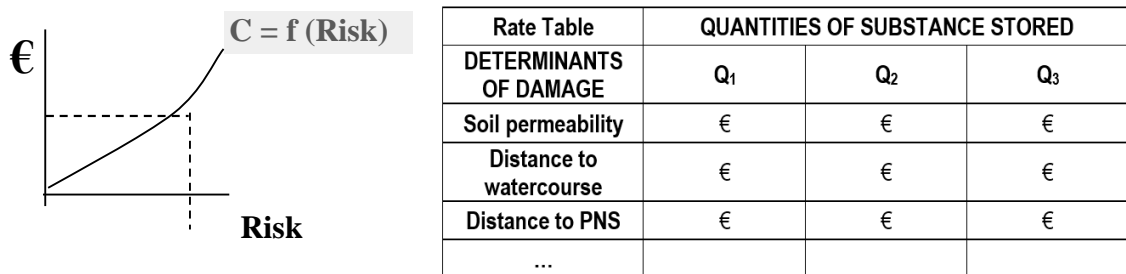


Figure 3. Conceptual diagram of the relationship between environmental risk and the cost of primary remediation, and an example of a Rate table. Prepared by the author.

The existence of a historical accident register with a considerable and sufficient number of records to be used in the standardisation of a sector’s risk will be factor that will determine that this type of sector-specific instrument will be used. To do this, it will be necessary to estimate the costs of the primary remediation associated with each accident, if that register does not have this information.

Where the Rate Table refers to an activity that is part of a production process of another, broader professional sector, that sector may use this Rate Table to assess the environmental risk relating exclusive to that activity.

## 4. Aspects to consider in the environmental risk analysis

This section includes a description of some of the most relevant variables that the operator must bear in mind on an individual basis to assess its environmental risk. To this end, it seems appropriate for the sector-specific instrument for environmental risk analysis to present information that is available at the sectoral level, which may be useful to the operator on an individual level.

The table set out in this section is intended to be indicative, not exhaustive, so as to specify some of the most decisive variables in quantifying the damage, assessing its significance and finding its monetary valuation at both the individual and the sectoral level. Therefore, the aspects that the “Environmental Liability Supply Model” demands of the analyst, through its IT application, to proceed to calculate the costs of primary, compensatory and complementary remediation measures, as appropriate, have taken into account. Given the simplification exercise that a monetisation model inevitably entails at the national

level, the aspects necessary to apply it have been extended to include the variables expected to be most decisive when quantifying and assessing significance.

The sources of information shown in this table are indicative at the national level and may be expanded in each case, according to other, more specific information available at the regional level, and to the characteristics of the risks and damage being assessed.

	VARIABLES/CHARACTERISTICS	UNIT/TYPE	SOURCES OF INFORMATION
Chemical agents	Type of substance released	Name	Databases of chemicals from official sources (e.g. European Chemical Substances Information System)
	Concentration of the released substance in the receiving medium (PEC)	mg subst./Kg soil mg subst./Litres water	Technical Guidance Document on Risk Assessment, Part 2. (EC)
	Toxicity Thresholds: Acute (LC50-EC50) Chronic (NOEC-NOAEL) Potential (PNEC)	mg subst./Kg of soil mg subst./Litres of water	
	Biodegradability	Biodegradability	Databases of chemicals from official sources (e.g. European Chemical Substances Information System)
	Bioaccumulation	Koc (Coefficient of Organic Carbon)	
	Solubility	Kow (Octanol-Water Partition Coefficient)	
Physical agents	Quantity	Tonnes	Quantity extracted or stored
			Extraction or storage capacity
			Amount of soil that can be extracted Average depth and density
		m <sup>3</sup>	Quantity extracted or stored
			Extraction or storage capacity
			Quantity of water that can be abstracted Digital Water Book (MAGRAMA)
	Number of individuals	Hydrographic Confederations and Demarcations	
		Threatened species present	
		National Inventory of Biodiversity (MAGRAMA)	
		Existing population Land Management Plans: PORN, PRUG and PORF	
Biological agents	Type of biological agent	Genetic modification	Commission Regulation (EC) No 65/2004 on the assignment of unique identifiers to GMOs
	Level of confinement associated with its handling	Containment level	Royal Decree 178/2004, on the contained use, voluntary release and marketing of GMOs.
	Area occupied by affected individuals	has	Forestry Map of Spain 1:50.000. National Forest Inventory (MAGRAMA)
			National Biodiversity Inventory (Priority Habitats) (MAGRAMA)
Individuals affected	Number of individuals	National Biodiversity Inventory (species present) (MAGRAMA)	
		Land Management Plans: PORN, PRUG and PORF	

Source: Prepared by the author

	VARIABLES/CHARACTERISTICS	UNIT/TYPE	SOURCES OF INFORMATION
<b>Soil</b>	Type of soil	Soil	Soil map, Geological maps (Magna Series. IGME) Direct observation of the environment.
	Permeability	cm <sup>2</sup> , m <sup>2</sup> , millidarcys	Permeability Map of Spain 1:200.000 (IGME)
	Risk of infiltration	Risk of infiltration	Permeability Map of Spain 1:200.000 (IGME) Map of Aquifers (Digital Water Book, MAGRAMA) Hydrographic Confederations and Demarcations
	Hydraulic conductivity	cm/day	Permeability Map of Spain 1:200.000 (IGME) Specific bibliography
	Slope of the terrain	%	Digital Terrain Model (e.g. CSIC)
	Topography of the terrain	Topography	Altitude map (e.g. CSIC)
<b>Inland water</b>	Depth of water table	Piezometric level (m)	Digital Water Book (MAGRAMA) Hydrographic Confederations and Demarcations
	Type of surface or groundwater body (river, lake, wetland, etc.)	Name	
	Geometry (channel width, depth, etc.)	metres	
	Flow rate	m <sup>3</sup> /s	
	Flow rate	Vol / T (m/s; cm/h;...)	
	Water Quality	Quality standards, etc.	
<b>Sea water</b>	Delimitation of coastal and marine waters	metres	Coastal baseline
	Water Quality	Environmental quality standards, etc.	Quality of bathing water. Ministry of Health, Social Services and Equality.
<b>Seashore and estuaries</b>	Depth of water table	Piezometric level (m)	Digital Water Book (MAGRAMA) Hydrographic Confederations and Demarcations Coastal baseline Bathing Water Quality (Ministry of Health, Social Services and Equality)
	Type of surface, ground or coastal water body (coastal, delta, beach, etc.)	Name	
	Geometry (length, width and depth of the watercourse, etc.)	metres	
	Water Quality	Quality standards, etc.	
<b>Wild species</b>	Wild species present	Presence/absence, number of individuals, etc.	National Biodiversity Inventory (MAGRAMA)
	Age of tree species	Years	Forestry Map of Spain 1:50.000. (MAGRAMA)
	Fraction of land area covered (trees and shrubland)	%	Forestry Map of Spain 1:50.000. (MAGRAMA)
	Tree species density	ft/ha	III and IV National Forestry Inventory (MAGRAMA)
<b>Habitat</b>	Protected areas and Natura 2000 Network	Presence/absence, extent, etc.	Biodiversity Data Bank (MAGRAMA)

Source: Prepared by the author

	VARIABLES/CHARACTERISTICS	UNIT/TYPE	SOURCES OF INFORMATION
Pollution hotspots	Coordinates	UTM	Geo-referenced orthophotos Thematic mapping of roads and urban areas
	Type: submerged or surface discharge, continuous or discontinuous emission, etc.	Contamination focus	Facility-specific
	Height of the emission fort	metres	Facility-specific
Meteorological data	Pressure	bars	State Meteorological Agency
	Ambient and soil temperature	°C	State Meteorological Agency Infiltration Precipitation Simulation Model (SIMPA, MAGRAMA) Specific reference literature that related soil temperature to ambient temperature
	Precipitation	mm	State Meteorological Agency Infiltration Precipitation Simulation Model (SIMPA, MAGRAMA)
	Humidity	%	State Meteorological Agency
	Wind speed and direction	Km/h	State Meteorological Agency National Atlas of Spain (IGN)
	Evapotranspiration	mm	Infiltration Precipitation Simulation Model (SIMPA, MAGRAMA)
Location of the site	Coordinates	UTM	Geo-referenced orthophotos Thematic mapping of roads and urban areas
Reversibility of damage	Biodegradability of the causative agent of the damage	Biodegradability	Databases of chemicals from official sources (e.g. European Chemical Substances Information System)
	Solubility of the damaging agent	Kow (Octanol-Water Partition Coefficient)	
	Sensitivity or vulnerability of the receiving environment	Sensitivity or vulnerability	Biodiversity Data Bank. MAGRAMA (Protected Natural Spaces: Natura 2000 Network, Priority Habitats, etc.).

Source: Prepared by the author

## 5. Critical points

To avoid possible divergences that may arise in the analysis of environmental risk at activity level, it is recommended to adopt the following guidelines at sector level for helping to standardise the work to be conducted subsequently by each operator:

- ❖ Common information sources for the sector.
- ❖ Describe the production profile of the sector. Determine the homogeneity and complexity of the production processes and identify common and unique processes.
 

A “singular scenario” is understood to be one that is not representative of the sector due to being present in a minority of facilities.
- ❖ Describe the damage-causing agents involved in the sector of activity and compilation of their physical-chemical properties.
- ❖ Proposal to use a specific method in each of the following tasks:
  - *Identify relevant accident scenarios in terms of the potential environmental damage.* It includes proposing a series of guidelines for excluding unique scenarios.
  - *Assign the probability associated with each accident scenario.* The most appropriate method for conducting this task (quantitative or semi-quantitative analysis) shall be specified.
  - *Estimate the environmental consequences of accident scenarios relevant to the sector according to the agent causing the damage and the resource that may be affected.*
- ❖ Quantification protocols or guidelines to estimate the quantity of resource affected for each type of accident scenario. To this end, the basic condition of the natural resources potentially affected at the time the hypothetical accident takes place shall be borne in mind. The analyst shall ensure that the protocols and dispersion models proposed, if any, shall be related to the information available.
- ❖ Proposal for measures to prevent and avoid environmental damage.
- ❖ Recommendations to monetise the damage associated with each accident scenario.
- ❖ Use of templates to make it easier and quicker for the operator to use the sector-specific instrument for environmental risk analysis in each particular context.
- ❖ Guidelines for giving feedback and updating the sector-specific instrument in light given the experience acquired in the area with the risk assessment according to activity or operator.
- ❖ Practical exercise aimed at an activity to illustrate the performance of the environmental risk analysis at the individual level and calculating the amount of the financial security.

## **Appendix I. Structure and general content of the MIRATs**

### **I. PURPOSE AND SCOPE OF THE REPORT**

Describe the activity and sub-activities encompassed by the professional sector to which the sector-specific instrument is to be applied. To indicate, where appropriate:

- Phases of activity for which the report shall be made (operation, use, design, construction, etc.).
- Exclusions of activities not included in the report

### **II. TEAM RESPONSIBLE FOR THE STUDY**

Identify the technical managers of the study, including their position, training and functions.

### **III. RATIONALE FOR THE SECTOR-SPECIFIC INSTRUMENT SELECTED**

A reasoned statement of the suitability of the instrument selected for the professional sector under study.

### **IV. DESCRIPTION OF THE ACTIVITY**

- a. Techniques, process lines, facilities, units or parts of the sector under study.
- b. Describe the environmental profile of the sector

### **V. DESCRIPTION OF THE TERRITORIAL CONTEXT OF THE SECTOR**

This will address the aspects of the physical environment (biotic and abiotic) that are most frequent in the sector's facilities. This section will help to identify sources of information, as well as to provide practical guidelines, which will subsequently facilitate the description of the territorial context to be conducted by the operator in the environmental risk analysis to be conducted for his activity at an individual level.

The aspects the operator will have to address at an individual level to characterise its territorial context will depend on each case; however, some of the commonest variables are: the geographical site and location, the geological framework (situation, lithology, hydrogeological and geomorphological characteristics), the type and characteristics of water bodies, flora and fauna, protected habitats, landscape, etc.

### **VI. BRIEF IDENTIFICATION OF THE MAIN LEGAL PROVISIONS**

Legal provisions affecting the sector's facilities and that may influence the characterisation of environmental risks, with special emphasis on the operating limits set by the mandatory permits.

### **VII. METHODOLOGY USED FOR RISK ANALYSIS**

Describes the methodology followed to identify accident scenarios. The analyst shall use the methods set out in standard UNE 150.008 or other equivalent standards.

### **VIII. IDENTIFICATION OF RELEVANT ACCIDENT SCENARIOS IN THE SECTOR**

- a. Identify causes and hazards.

The relevant and most common risk sources to the facilities belonging to the sector being studied will be determined; they shall mainly be related to, among other things, the quantities and types of substances involved, the sources of pollution, production processes, storage

conditions and activities, the energy sources used, waste management, environmental elements, organisational and individual human factors and auxiliary processes and activities.

b. Identify initiating events.

Once the sources of risk have been identified, the relevant and most common initiating events at the facilities belonging to the sector being studied are identified.

Initiating events are physical events, identified by a causal analysis, which can generate an incident or accident depending on how they evolve in space and time.

It is possible that identifying the initiating event is prior to identifying its causes, since it may be a very common and well-known event. Therefore, other sources of information may be used to identify the initiating events, such as bibliographic sources, statistical analyses, accident records, consultation with experts, etc.

c. Determination of the types of relevant accident scenarios in the sector according to the agent causing the damage and/or the receiving environment affected.

The relevant accident scenarios of the sector being studied that are derived from the identified initiating events will be determined. A relevant scenario will be taken to be one that is common to most of the activities in a given sector.

To determine the accident scenarios, the possible influences each initiating event, the possible receptor that could be affected and the contaminant paths will be borne in mind. To this end, special consideration should be given to environmental factors, especially those of the physical environment (biotic and abiotic) that may influence the environmental risk. Any event occurring after the initiating event of an environmental accident may be a factor that changes the consequences of the accident scenario.

d. Set out protocols for assigning the probability associated with accident scenarios.

The protocols should guide the operators in the sector when estimating the probability of the accident scenarios' occurring at their facility. This probability shall be a combination of the probability of occurrence of the initiating event for each scenario and of the probabilities of the various conditioning factors' occurring. The result of this probability shall be expressed in quantitative or semi-quantitative terms, and different criteria may be used for this purpose, such as accident databases, historical data on the activity, bibliography, expert consultation, information from manufacturers and suppliers, etc.

e. Guidance on prevention and avoidance measures that may be adopted by operators in the sector for each type of accident scenario.

## IX. PROTOCOLS FOR QUANTIFYING AND ASSESSING THE SIGNIFICANCE OF ACCIDENT SCENARIOS <sup>3</sup>

a. Estimation of the severity of environmental consequences using the Environmental Damage Index (IDM).

The IDM calculated for each accident scenario estimates the severity of the environmental consequences set out in standard UNE 150.008 for environmental risk analysis (the higher the IDM value, the greater the consequences initially foreseen).

This analysis will help the operator:

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<sup>3</sup> Operators whose sector had a favorable report on their sector-specific instrument for environmental risk analysis prior to the amendment of the Regulation for the partial implementation of Law 26/2007, of 23 October, or who have availed themselves of the provisions of the sole transitory provision of Royal Decree 183/2015 of 13 March, may carry out their individual environmental risk analyses based on the methodology set out in the original wording of article 33 of this regulation, approved by Royal Decree 2090/2008, of 22 December.

- To select the reference scenario to calculate the amount of the financial security that should be provided. To calculate this amount, it will be necessary to quantify and monetise the reference scenario obtained.
- To manage his/her environmental risk, identifying the actions to be taken to minimise risks according to the severity of their consequences and their likelihood.

The risk associated with each accident scenario will be the result of multiplying the probability the scenario's occurring by the resulting value of the Environmental Damage Index (IDM).

- b. Definition of protocols to quantify the damage related to each type of accident scenario and to evaluate its significance.

This section will establish the procedure the operator may use in its individual environmental risk analysis to quantify the environmental damage of the reference scenario selected to estimate the amount of the financial security in a particular context. The technical criteria for determining the environmental damage set out in Chapter II, Section 1 of the Regulations for the partial implementation of Law 26/2007, of 23 October, shall be borne in mind.

The protocols should guide operators, on the one hand, to determine the extent, intensity and duration of the damage in each risk scenario associated with their activity, and on the other hand, to identify significant accident scenarios. These protocols should pay special attention to the method the operator will use to determine the amount of potentially affected natural resource, since this amount will be, along with the type of agent causing the damage, the characteristic that will most influence the choice of the most appropriate primary remediation technique and, therefore, the amount of the financial security that is determined by the cost of such remediation of the reference scenario.

If it is considered necessary to use dispersion models to estimate the amount of potentially damaged resources associated with the types of accident scenarios to which the group of professional activities in the sector could cause. Therefore, a proposal shall be made regarding the most appropriate models. Where possible, simpler alternative solutions or formulae may be proposed for making it possible to obtain a reliable order of magnitude of the amount of potentially affected natural resources.

Regarding the determination of the significance of the damage, the MIRAT will provide specific criteria to estimate it. Thus, it is advisable that the sector-specific instrument should provide guidance to operators in the sector on how to proceed in the event of uncertainty when determining the significance associated with one or more accident scenarios; a commonly accepted solution is to adopt a conservative criterion, that is, if in doubt, to consider it/them significant, according to the "precautionary principle".

Once the protocols for quantifying and assessing the significance of potential damage have been set out, a single procedure for assessing the environmental damage associated with the accidental reference scenario finally selected by operators will be recommended at the sector level. According to article 33.2 of the Regulation, the value of the environmental damage associated with this accidental reference scenario shall be equal to the cost of the primary remediation project. In making this valuation, the operator may make use of the "Environmental Liability Offer Model (MORA)."

## X. GUIDELINES FOR ENVIRONMENTAL RISK MANAGEMENT

Proposal for management measures that may be adopted by operators on an individual basis. Among the contents this section may include are: implementing improvements to the facilities and operations, designing an environmental monitoring system and the drafting of a contingency plan.

## XI. CRITICAL POINTS

Foreseen divergences that might arise in conducting the environmental risk analysis at the operator level and propose solutions to be adopted.



## XII. PLAN FOR REVIEWING AND UPDATING THE SECTOR-SPECIFIC INSTRUMENT FOR RISK ANALYSIS

This section will be accompanied by a protocol for updating data that will allow the sector-specific instrument for environmental risk analysis to be further developed and fine-tuned, as professional operators in the sector gain practical experience in analysing the environmental risk of their respective facilities.

## XIII. PRACTICAL EXERCISE: DETERMINING THE FINANCIAL SECURITY FOR A SPECIFIC ACTIVITY THAT IS REPRESENTATIVE OF THE SECTOR<sup>4</sup>

- a. Describe the activity and characterise the environment where it takes place.
- b. Identify relevant accident scenarios, taking into account aspects such as the type of operation, the agent causing the damage, the prevention and/or avoidance measures adopted, and the receiving environment affected.
- c. Estimate the probability associated with each scenario.
- d. Calculate the environmental damage index (IDM) for each accident scenario.
- e. Estimate the risk associated with each accident scenario arrived at by multiplying the probability of its occurring and the IDM value of each scenario.
- f. Selection of the accidental reference scenario following the steps set out in article 33 of the Regulation.
- g. Determine and quantify the damage associated with the reference accident scenario.
- h. Monetise the damage associated with the accidental reference scenario. At this stage the analyst may use the “Environmental Liability Offer Model (MORA).”
- i. Assess the need to provide, where appropriate, a financial security for that activity. The amount of the financial security shall be set out as the primary remediation value or cost associated with the environmental damage of the reference scenario. Prevention and avoidance costs, as provided for in article 33.3 of the Regulation, shall be added to this amount.
- j. Possibility of assessing the tolerability of the environmental risk based on the probability and severity of the environmental consequences associated with each accident scenario.
- k. Option to include a sensitivity analysis to assess the effects that the variation of the input parameters has on the calculation of the amount of financial security.

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<sup>4</sup> Operators whose sector had a favorable report on their sector-specific instrument for environmental risk analysis prior to the amendment of the Regulation for the partial implementation of Law 26/2007, of 23 October, or who have availed themselves of the provisions of the sole transitory provision of Royal Decree 183/2015 of 13 March, may carry out their individual environmental risk analyses based on the methodology set out in the original wording of article 33 of this regulation, passed by Royal Decree 2090/2008, of 22 December.

## **Appendix II. Structure and general content of the Methodological Guides**

### **I. PURPOSE AND SCOPE**

Define the activity and sub-activities covered by the professional sector to which the sector-specific instrument is to be applied.

### **II. TEAM RESPONSIBLE FOR THE STUDY**

Identify the technical managers of the study, including their position, training and functions.

### **III. RATIONALE FOR THE SELECTED SECTOR-SPECIFIC INSTRUMENT**

Justified statement of the suitability of the instrument selected for the professional sector under study.

### **IV. GENERAL DESCRIPTION**

- a. Diversity of activities and facilities, process lines, units or parts of the sector being studied.
- b. Variability of agents that may cause damages and receptors that, where appropriate, could be affected.

### **V. IDENTIFICATION OF VARIABLES AND RISK DETERMINANTS**

The variables that are decisive in assessing environmental risk at the sectoral level should be specified. These variables will vary depending upon the nature of the risks of each sector or activity.

### **VI. GUIDELINES TO BE FOLLOWED TO CONDUCT THE ENVIRONMENTAL RISK ANALYSIS DEPENDING UPON THE ACTIVITIES AND FACILITIES OF THE SECTOR IN RELATION TO THE AFFECTED RECEIVING ENVIRONMENT**

### **VII. GUIDELINES FOR ENVIRONMENTAL RISK MANAGEMENT**

Proposal of management measures that may be adopted by operators on an individual basis. Among the contents this section may include are: implementing improvements to the facilities and operations, designing an environmental monitoring system and the drafting of a contingency plan.

### **VIII. PLAN FOR REVISING AND UPDATING THE SECTOR ANALYSIS INSTRUMENT**

This section will be accompanied by a protocol for updating data that will allow the sector-specific instrument for environmental risk analysis to be further developed and fine-tuned, as professional operators in the sector gain practical experience in analysing the environmental risk of their respective facilities.

Note: Although the practical exercise is not mandatory in a Methodological Guide, its development makes it easier for operators in the sector to apply this instrument to their facilities, and it is therefore recommended to draft it.

## **Appendix III. Structure and General Content of the Rate Tables**

### **I. PURPOSE AND SCOPE**

Define the activity and sub-activities covered by the professional sector on which the sector-specific instrument is to be applied. Indicate, where appropriate:

- Phases of activity for which the report will be drafted (operation, exploitation, design, construction, etc.).
- Indication of exclusions for not belonging to the activity within the Rate Table.

### **II. TEAM RESPONSIBLE FOR THE STUDY**

Identification of the technical managers of the study, with their position, training and functions.

### **III. RATIONALE FOR THE SELECTED SECTOR-SPECIFIC INSTRUMENT**

A reasoned statement of the suitability of the instrument selected for the professional sector under study.

### **IV. DESCRIPTION OF THE ACTIVITY**

- a. List of the techniques, process lines, facilities, units or parts of the sector under study.
- b. Description of the environmental profile of the sector.

### **V. DESCRIPTION OF THE TERRITORIAL CONTEXT OF THE SECTOR**

### **VI. BRIEF IDENTIFICATION OF THE MAIN LEGAL PROVISIONS**

Legal provisions affecting the facility that might influence the characterisation of environmental risks, with special emphasis on the operating limits set by the mandatory permits.

### **VII. METHODOLOGY FOLLOWED FOR THE DEVELOPMENT OF THE RATE TABLE**

Description of the conceptual framework followed by the analyst for the design of the Rate Table.

In the event that a historical accident register is not available, a description of the environmental risk analysis, conducted at sector level, will be included, on the basis of which the Rate table is proposed, which will include the calculation of the financial security for a representative sample of facilities.

### **VIII. HISTORICAL RECORD OF ACCIDENTS**

- a. Rationale of the validity and consistency of the historical accident register. The analyst must prove that the number of records is substantial and sufficient to be used in standardising a sector's risk.
- b. Selection of the type of accidents subject to environmental liability.

If no accident history record is available, this section will not be completed.

### **IX. DESIGN OF THE RATE TABLE**

- a. Methodological description.
- b. Identification of the variable(s) determining the environmental damage.

- c. Analysis of the relationship between the explanatory variables of the environmental risk identified and the remediation cost (as calculated either from the accident register or from the quantification and monetisation of the reference scenario selected for each specific facility).
- d. Proposed sector-specific Rate Table.

## X. GUIDELINES FOR ENVIRONMENTAL RISK MANAGEMENT

Proposal for management measures that may be adopted by operators on an individual basis. Among the contents this section may include are: implementing improvements to the facilities and operations, designing an environmental monitoring system and the drafting a contingency plan.

## XI. SENSITIVITY ANALYSIS

Evaluate the effects variation of the input parameters has on the financial security calculation.

## XII. PLAN TO REVIEW AND UPDATE THE SECTOR-SPECIFIC INSTRUMENT FOR RISK ANALYSIS

This section will be accompanied by a protocol for updating data that will allow the sectoral instrument to be further developed and fine-tuned.

## XIII. PRACTICAL EXERCISE: FACILITY DETERMINING THE FINANCIAL SECURITY FOR A SPECIFIC FACILITY THAT IS REPRESENTATIVE OF THE SECTOR



GOBIERNO  
DE ESPAÑA

MINISTERIO  
PARA LA TRANSICIÓN ECOLÓGICA  
Y EL RETO DEMOGRÁFICO

SECRETARY OF STATE  
FOR THE ENVIRONMENT

DIRECTORATE GENERAL FOR ENVIRONMENTAL  
QUALITY AND ASSESSMENT

**TECHNICAL COMMISSION OF PREVENTION AND REMEDIATION OF ENVIRONMENTAL DAMAGES**