FUNDACIÓN AMBIENTE Y RECURSOS NATURALES

Environment
and the OECD Guidelines:

A User's Guide

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Environment and the OECD Guidelines: A User's Guide

"The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations".

Rio Declaration on Environment and Development, 1992

March 2009, Buenos Aires, Argentina.

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About OECD Watch

OECD Watch is an international network of civil society organisations promoting corporate accountability. For more information, send an e-mail to info@oecdwatch.org or visit: www.oecdwatch.org

About FARN

FARN is a non-political, non-partisan, non-governmental organization whose main mission is to promote sustainable development through policy, law and the institutional organization of society. For more information, send and e-mail to info@farn.org.ar or visit www.farn.org.ar

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Acronyms and Abbreviations:

OECD: Organisation for Economic Co-operation and Development

MNE: Multinational Company

NCP: National Contact Point

GUIDELINES: OECD Guidelines for Multinational Enterprises

CASE: Complaint

EMS: Environmental Management System

NGO: Non-governmental organisation

FOE: Friends of the Earth

UNEP: United Nations Environment Programme

Prologue OECDWatch

The Organisation for Economic Co-operation and Development's (OECD) "Guidelines forMultinational Enterprises" (Guidelines) embody what OECD and adhering governments have agreed are the basic components of responsible corporate conduct. They cover a range of issues such as labour and human rights, bribery and corruption, environment and information disclosure. Though voluntary for companies, governments that have endorsed the Guidelines are essentially conveying that they expect multinational companies to follow these principles and standards of good conduct in their operations worldwide.

In a revision of the Guidelines in the year 2000, a new complaint procedure was agreed upon that allows non-governmental organisations (NGOs) to submit complaints concerning alleged breaches of the Guidelines to a government's National Contact Point (NCP). Before the revision in 2000, only trade unions could submit complaints. As of March 2009, more than 79 OECD Guidelines complaints had been filed by NGOs.

In November 2006, OECD Watch produced a *Guide to the OECD Guidelines for Multinational Enterprises' Complaint Procedure* based on NGO experiences with past complaints (see www.oecdwatch.org). The Guide aims to help NGOs and other civil society organisations understand what the OECD Guidelines are, how to construct a complaint, strategic issues to be considered before submitting a complaint, how the complaint process can be expected to proceed, and what roadblocks could be encountered.

FARN's "Environment and the OECD Guidelines: A User's Guide" is a supplement to the OECD Watch Guide designed to help the Guide reach its abovementioned aims. The Environmental Supplement explores in greater detail Chapter V of the OECD Guidelines on environmental issues and provides concrete examples and advice about how to go about collecting evidence and drafting a complaint under this chapter of the Guidelines. For civil society organisations considering filing an OECD Guidelines case related to environmental issues, this Environmental Supplement, along with the OECD Watch Guide, is an essential tool.

Joseph Wilde-Ramsing,
OECD Watch Secretariat

Amsterdam, 10 March 2009

Prologue FARN

FARN considers the OECD Guidelines for Multinational Corporations to be an important tool for bringing about responsible corporate behavior. These Guidelines are recommendations led by the OECD, which to Multinational Corporations (MNCs). The Guidelines state principles and voluntary norms for responsible corporate behavior. Even though there may exist many initiatives and tools for Corporate Social Responsibility, the Guidelines are the only multilaterally accepted code governments have committed themselves to promote. This makes them one of the main tools for corporate responsibility in the world.

In this sense, since 2004, FARN has been working on the construction and implementation of strategies for the dissemination and awareness-raising of the Guidelines, as well as in the construction of the participatory institutional framework of the Argentine National Contact Point.

FARN is a non-profit, non-partisan, non-governmental organization (ONG),whose main objective is the promotion of sustainable development through politics, law, and the institutional organization of society. In this sense, the OECD Guidelines are an effective tool for promoting the sustainable development goals proposed in the most important international environmental conventions and tools of the world. Thus, FARN intends that the present Practical Environmental Guide, contributes to the promotion and protection of the environment and achieves the sustainable development goals, for present and future generations.

As a preliminary diagnosis, it can be observed that there exists an information deficit for civil society about how to implement and apply Chapter V about the environment of the OECD Guidelines Multinational Corporations. With this publication as a "Practical Environmental Guide" it aims tocontribute and strengthen civil society, getting deeper into the knowledge of the environmental chapter of the Guidelines.

This guide is divided into three chapters, each one of which is complementary to the others. The first part contains an explanatory analysis of the environmental chapter of the Guidelines; the second part is dedicated to the task of developing the environmental cases presented by the civil society organizations, to the present day;and, finally, the third part introduces the reader to environmental sampling.

I would like to thank OECD Watch and very specially Peter Pennartz, the confidence and support for carrying out this project, as well as the hard work put in by FARNs team, coordinated by Belén Esteves, who has performed his task professionally, with dedication and efficiency.

We hope the present guide will be a useful tool and will contribute to sustainable development, at both the local and global levels.

María Eugenia Di Paola
Executive Director
FARN

March, 2009

Introduction

The OECD Guidelines for Multinational Enterprises (Guidelines) express the values shared by its 40 signatory states: the 30 member states of the Organisation for Economic Co-operation and Development (OECD) and 10 non-member states that have additionally signed on to the guidelines, including Argentina, Brazil, Chile, Estonia, Israel, Latvia, Lithuania, Romania, Slovenia and recently Peru.

These governments have agreed on certain principles and norms implying that multinational enterprises (MNEs) comply with the law and operate in a socially and environmentally responsible manner globally.

Protecting and preserving the environment is central to achieving sustainable development and to creating a better world. During the World Summit for Sustainable Development in Johannesburg in 2002, participating heads of state and leaders in government agreed on the need to promote corporate responsibility and accountability in the environmental field. The continued promotion of the Guidelines for Multinational Enterprises of the OECD in its environmental aspects is a promising way to serve this stated goal of the Johannesburg Summit.

The Guidelines directly address environmental responsibility by specifically including a chapter on corporate environmental performance. The content of Chapter V reflects the environmental principles and objectives of the Rio Declaration on Environment and Development (Agenda 21), as well as the Aarhus Convention and the norms established by instruments such as the ISO standards.

In its capacity as an introductory guide, this paper begins by providing detailed information on each of the 8 paragraphs or items of the Guidelines' Chapter V. These paragraphs center on tools and approaches related to corporate environmental performance.

Part II summarises all cases concerning environmental violations submitted to National Contact Points (NCPs) by non-governmental organisations (NGOs) before December 2008.

Finally, this paper includes an introduction to environmental sampling in relation to MNEs' impact on the environment. Part III is limited to soil, air and water. A methodological review of further sampling mediums shall be the objective of a future, more detailed, environmental guidebook.

It is advisable to read this guide in conjunction with the "Guide to the OECD Guidelines for Multinational Enterprises' complaint procedure. Lessons from past NGO complaints", written by OECD Watch.

Part 1:

Chapter on Environment

The chapter on environment provides recommendations on the following subjects:

- Complying with the law and Contributing to Sustainable Development
- Environmental Management Systems
- Public Information and Consultation with Stakeholders and Interested Parties
- Environmental Impact Assessment
- Exercising Precaution
- Emergency Prevention, Preparedness and Response
- Continuous Improvement in Environmental Performance
- Environmental Education and Training
- Contributing to the Development of Environmental Policy

Introductory text: Complying with the law and Contributing to Sustainable Development

OFFICIAL OECD GUIDELINES PROVISION

Enterprises should, within the framework of laws, regulations and administrative practices in the countries in which they operate, and in consideration of relevant international agreements, principles, objectives, and standards, take due account of the need to protect the environment, public health and safety, and generally to conduct their activities in a manner contributing to the wider goal of sustainable development. In particular, enterprises should: ...

OFFICIAL COMMENTARY ON THE OECD GUIDELINES

30. The text of the Environment Chapter broadly reflects the principles and objectives contained in the Rio Declaration on Environment and Development, in Agenda 21 (within the Rio Declaration). It also takes into account the (Aarhus) Convention on Access to Information, Public Participation in Decision-making, and Access to Justice in Environmental Matters and reflects the standards contained in such instruments as the ISO Standard on Environmental Management Systems.

Multinational enterprises (MNEs) are required to comply with domestic legislation in the countries in which they operate, which may include norms adopted at different government levels. For instance, in states with federal systems, MNEs should comply with constitutional, national, and sub-national (province and municipal) levels of regulation. These various sources of legal authority may imply a particular hierarchy of norms.

In accordance with international law and the countries' own domestic law, MNEs must also comply with international agreements ratified by the states in which they operate.

Many cases filed to date have referred to specific agreements, instruments or norms in order to demonstrate a company's violation of the Guidelines' provisions in more concrete terms.

Additionally, multinational enterprises should make a concerted effort to contribute to the wider goal of sustainable development. They should take into account both the local reality in the places in which they operate and the potential absence of legal provisions in a host-country. Such considerations will enable MNEs to adopt the best practices in the field and to contribute to sustainable development in the community in which they carry out their activities. Such is the case when a MNE plans to operate in a developing country whose government displays an obvious legal and institutional weakness; it is there where MNEs will be required to implement the highest standards, those they would apply in other host countries or in their countries of origin (usually OECD member countries).

1. Environmental Management Systems (EMSs)

OFFICIAL OECD GUIDELINES PROVISION, CHAPTER V, PARAGRAPH 1

[Enterprises should:]

1. Establish and maintain a system of environmental management appropriate to the enterprise, including:

a) Collection and evaluation of adequate and timely information regarding the environmental, health, and safety impacts of their activities,

b) Establishment of measurable objectives and, where appropriate, targets for improved environmental performance, including periodically reviewing the continuing relevance of these objectives; and

c) Regular monitoring and verification of progress toward environmental, health, and safety objectives or targets.

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31. Sound environmental management is an important part of sustainable development, and is increasingly being seen as both a business responsibility and a business opportunity. Multinational enterprises have a role to play in both respects. Managers of these enterprises should therefore give appropriate attention to environmental issues within their business strategies. Improving environmental performance requires a commitment to a systematic approach and to continual improvement of the system. An environmental management system provides the internal framework necessary to control an enterprise's environmental impacts and to integrate environmental considerations into business operations. Having such a system in place should help to assure stockholders, employees and the community that the enterprise is actively working to protect the environment from the impacts of its activities.

32. In addition to improving environmental performance, instituting an environmental management system can provide economic benefits to companies through reduced operating and insurance costs, improved energy and resource conservation, reduced compliance and liability charges, improved access to capital, improved customer satisfaction, and improved community and public relations.

33. In the context of these Guidelines, "sound environmental management" should be interpreted in its broadest sense, embodying activities aimed at controlling both direct and indirect environmental impacts of enterprise activities over the long-term, and involving both pollution control and resource management elements.

34. In most enterprises, an internal control system is needed to manage the enterprise's activities. The environmental part of this system may include such elements as targets for improved performance and regular monitoring of progress towards these targets.

The implementation of an Environmental Management System (EMS) is a predicate to most recommendations contained in the Guidelines' Environment Chapter, all of which deal with the specific aspects of solid environmental management. In this sense, paragraph 1 deals with the general facets of environmental management, whereas the subsequent paragraphs deal with more specific facets of environmental mangement. Additionally, when considering any of the paragraphs in Chpater V, it is important to take into account the fact that the MNE should encourage "business partners" (including suppliers and subcontractors) to engage in behaviour consistent with the guidelines, a practice that is in accordance with the Guidelines chapter on "Principles". .

According to the Guidelines, an enterprise should implement an EMS. This creates an expectation that an enterprise be able to detect and correct potential deviations so as to improve its environmental performance (beyond legal requirements) and that it be able to reformulate objectives and targets towards higher requirements if appropriate.

The United Nations Environment Programme (UNEP) defines an EMS as "a problem-identification and problem-solving tool, based on the concept of continual improvement that can be implemented in an organisation in many different ways, depending on the sector of activity and the needs perceived by management".

In other words, an EMS is a management tool used 1) to develop and implement an environmental policy, 2) to monitor environmental variables that measure the impact of business activities on the environment, 3)

to solve and address relevant environmental problems through improvement and remediation systems, and 4) to pursue continuous improvement in sound environmental management.

UNEP identifies five key elements in an EMS:

- Plan: undertake an initial environmental review in order to define an environmental policy that includes objectives and targets (according to the nature, the range and the environmental impacts of company activities, products and services)
- Do: develop an environmental action plan and define environmental responsibiilties
- Check/Correct: auditing the EMS and corrective and preventive actions
- Act/Improve: environmental management review
- Continuous improvement

Therefore, an EMS implies self-control in areas where an external control – by an auditor or certifier – is also recommended. The latter, although not necessary for the institution of an EMS, makes third parties presume the fact that the EMS exists and is being implemented.

In this context, and in relation to EMSs certified by independent certifiers, the ISO 14001 standard is one of the main international certification standards applicable to the design and definition of an EMS. It is part of the ISO 14000 standards, a set of generic tools for the development, institution, maintenance and evaluation of environmental policies and objectives.

While the Guidelines instruct MNEs to implement an EMS and continuously improve their performance, they don't establish specific performance norms, standards or targets for MNEs. Thus, a key element to be taken into account by NGOs – according to paragraph 33 of the Commentary on the OECD Guidelines – is that a "sound environmental management" system should be interpreted in its broad sense, in order to control the direct and indirect environmental effects of enterprise activities while including pollution control and resources management elements.

Although most complaints filed to date have not focused on EMSs themselves, when a company displays a poor environmental record, it seems logical to conclude that: 1) the company lacks an EMS or has failed to implement it properly, and therefore 2) that the company has failed to engage in sound environmental management.

Therefore, when a company's activities harm the environment or human health directly or indirectly, it is not necessary to determine which type of EMS it has adopted or to inspect the company's relevant documents in order to assert that the company has violated the provisions in paragraph 1, Chapter V.

2. Public Information and Consultation with Stakeholders and Interested Parties

OFFICIAL OECD GUIDELINES PROVISION, CHAPTER V, PARAGRAPH 2

[Enterprises should:]

2. Taking into account concerns about cost, business confidentiality, and the protection of intellectual property rights:

a) Provide the public and employees with adequate and timely information on the potential environment, health and safety impacts of the activities of the enterprise, which could include reporting on the progress in improving environmental performance; and

b) Engage in adequate and timely communication and consultation with the communities directly affected by the environmental, health and safety policies of the enterprise and by their implementation.

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35. Information about the activities of enterprises and associated environmental impacts is an important vehicle for building confidence with the public. This vehicle is most effective when information is provided in a transparent manner and when it encourages active consultation with stakeholders such as employees, customers, suppliers, contractors, local communities and with the public-at-large so as to promote a climate of long-term trust and understanding on environmental issues of mutual interest.

Considering the importance of access to information and citizen participation in relation to environmental issues – both accepted and promoted at the international level – it is of great importance that companies synthesize information about their operations, activities and environmental impacts and make it available to the public in a transparent and timely manner. This is an important way of generating trust and constitutes an integral part of sound environmental management. Additionally, companies should engage in active and timely consultation with affected communities and interested parties regarding the environmental impact of its activities and projects. Such practices enable the company to obtain a realistic and efficient appraisal of the environmental impact of its activities as well as the public's perception of its environmental performance..

Public information

The fundamental reason for companies to provide information to the public rests on a vision of companies not as separate actors from society, but rather as imbedded participants linked to society through a network of stakeholder relationships (Rahman et al., 2003). In this sense, the Guidelines' chapter on disclosure differentiates between the information the enterprise must disclose in accordance with relevant norms, and the information it should disclose, such as social, environmental and risk management information.

In general, the disclosure of this latter type of information enables a great variety of interested parties to make decisions and appraisals. One group of interested parties – consumers, clients and investors among others, may use the information to direct their purchasing or investment preferences towards "greener" companies or products. Workers – another interested party that includes both the company's own as well as those employed along its supply chain – may use the information to evaluate occupational risk, for instance. Finally, both NGOs and rights defense groups may use this information to identify companies whose conduct is unacceptable.

Companies make their environmental information available to the public through internally-published reports. These reports are meant to enable a better understanding of the company's environmental policies, programmes and performance. However, in the absence of generally accepted standards, their reach and content are determined solely by the company, which may lead to problems in terms of credibility and comparability.

Therefore, while there is no universal consensus on a model or standard concerning the amount and type of information to be disclosed, there are initiatives aimed at establishing certain patterns. The Global Reporting Initiative (GRI) is a framework tool for information disclosure, providing a set of general principles and suggested specific content. The AA1000 standard, a particular type of company report certification, aims at improving the credibility of the information provided by companies to the public.

In this context of voluntary disclosure, it comes as no surprise that the companies that pursue high environmental performance levels tend to be those with more incentives to disclose information to the public.

Consultation with Interested Parties

AIn general, interested parties can be defined as those who can affect or are affected by the company. They can be classified into two large groups: those from whom the company only demands consumables and those involved in a continuous interactive process with the company (including civil society, trade unions, states, etc). Paragraph 2 and its accompanying commentary recommend active consultation with both groups.

As stated earlier in this section, when a company engages in active and meaningful consultation with affected communities and interested parties in regard to the environmental impact of its activities and projects, not only does it help foster a more trusting relationship between the company and the affected/ interested parties, but it also allows the company to appraise its environmental impact from a social and cultural point of view. Thus, the process of consultation can provide the company with meaningful

information about the affected/interested parties' opinions. If these opinions are later taken into account by corporate decision-makers, there is undoubted progress in the achievement of sustainability.

Though stakeholder participation is incipient and even less developed than disclosure policies, there are models for its structure. The previously mentioned AA1000 describes "good" stakeholder participation as a process that considers the views and needs of all stakeholder groups. It is important that this inclusion takes into consideration those stakeholders who may not have a voice, such as future generations and the environment.

3. Environmental Impact Assessment

OFFICIAL OECD GUIDELINES PROVISION, CHAPTER V, PARAGRAPH 3

[Enterprises should:]

3. Assess, and address in decision-making, the foreseeable environmental, health, and safety-related impacts associated with the processes, goods and services of the enterprise over their full life cycle. Where these proposed activities may have significant environmental, health, or safety impacts, and where they are subject to a decision of a competent authority, prepare an appropriate environmental impact assessment.

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36. Normal business activity can involve the *ex ante* assessment of the potential environmental impacts associated with the enterprise's activities. Enterprises often carry out appropriate environmental impact assessments, even if they are not required by law. Environmental assessments made by the enterprise may contain a broad and forward-looking view of the potential impacts of an enterprise's activities, addressing relevant impacts and examining alternatives and mitigation measures to avoid or redress adverse impacts. The Guidelines also recognise that multinational enterprises have certain responsibilities in other parts of the product life cycle.

Life Cycle Assessments (LCAs)

The Environmental Life Cycle Assessment is a tool that enables the systematic evaluation of the environmental aspects of a product or service during its life cycle phases. A product's life cycle begins with the extraction of raw materials, continues with its manufacturing, transportation and use, and ends with the waste management phase. The waste management phase includes both recycling and final disposal. All the phases in this life cycle involve the production of emissions and the consumption of resources.. In including the initial as well as final impacts of products and the process by which they are manufactured – which encompasses both internal and external effects – the LCA promotes a holistic approach to environmental management.

There are diverse tools for the LCA evaluation. For example, ISO has developed standards in this field. Companies may use their LCAs to provide information on their products' environmental impact, displaying it on eco-labels and in environmental declarations. The assessment is an instrument for environmental management and communication.

LCAs compel MNEs to internalize and consider the risks and commitments associated with their products and services throughout their full life cycle. Through this process, MNE's are necessarily made aware of their impact on sustainable development.

The interaction between LCAs and supply chains is particularly interesting, as various processes along the supply chain may occur in different locations. In the event that a supply chain activity occurs in a country with low environmental standards, MNEs are encouraged to either work with the relevant subsidiary and/or independent supplier to improve their environmental impact or to replace them in the supply chain.

Environmental Impact Assessments (EIAs)

EIAs are processes normally applied in the project planning phase and aimed at identifying ex ante adverse social and environmental consequences that may potentially flow from a proposed project. Authorities

use the information provided in an EIA in order to determine whether to withhold approval or request modification of a project through corrective measures. In this way, the community's – and therefore the interested parties' – access to information and participation is essential, taking into account the characteristics and possible impacts of the project or activity to be carried out.

In general, undertaking an environmental impact assessment ex ante is an obligatory requirement in most OECD countries as well as in many non-member countries whenever a proposed activity will produce a significant impact on the environment.

4. Exercising Precaution

OFFICIAL OECD GUIDELINES PROVISION, CHAPTER V, PARAGRAPH 4

[Enterprises should:]

4. Consistent with the scientific and technical understanding of the risks, where there are threats of serious damage to the environment, taking also into account human health and safety, not use the lack of full scientific certainty as a reason for postponing cost-effective measures to prevent or minimise such damage.

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37. Several instruments already adopted by countries adhering to the *Guidelines,* including Principle 15 of the Rio Declaration on Environment and Development, enunciate a "precautionary approach". None of these instruments is explicitly addressed to enterprises, although enterprise contributions are implicit in all of them.

38. The basic premise of the *Guidelines* is that enterprises should act as soon as possible, and in a proactive way, to avoid, for instance, serious or irreversible environmental damages resulting from their activities. However, the fact that the *Guidelines* are addressed to enterprises means that no existing instrument is completely adequate for expressing this recommendation. The *Guidelines* therefore draw upon, but do not completely mirror, any existing instrument.

39. The *Guidelines* are not intended to reinterpret any existing instruments or to create new commitments or precedents on the part of governments – they are intended only to recommend how the precautionary approach should be implemented at the level of enterprises. Given the early stage of this process, it is recognised that some flexibility is needed in its application, based on the specific context in which it is carried out. It is also recognised that governments determine the basic framework in this field, and have the responsibility to periodically consult with stakeholders on the most appropriate ways forward.

The so-called precautionary principle is amply recognised by both international instruments and domestic law in a large number of countries. The Rio Declaration of 1992 defines the principle as follows: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".

The precautionary principle is an extension of the prevention principle. The prevention principle is applicable in cases where damages or effects are expected, that is, in cases of certainty, whereas the precautionary principle applies in cases of uncertainty. More specifically, the precautionary principle involves operating with precaution and anticipating potential environmental effects that – even if not currently a proven consequence of certain business practices – could potentially occur. The principle should be incorporated into decisions made by actors in both the public and private sectors

The Guidelines propose that companies act in a proactive manner as soon as possible in order to avoid serious or irreversible damage to human health and/or the environment. To this end, the Guidelines invoke the precautionary principle. Companies must abstain from using scientific uncertainty as a reason or excuse for failing to adopt measures or prevent such damages. It is not enough to repair the environmental damage once it has been caused: it must be avoided, especially when it is irreversible.

The invocation of the precautionary principle is a call to exercise caution in situations a) that may pose a risk (i.e., upon identifying that there are potential risks associated with an activity, product or process), and b) where there is no scientific certainty about the effects of the activity, product or process on human health or the environment or about the extent of the possible damage. In other words, an integral part of responsible corporate practices – which companies are encouraged to adopt – rests in choosing to act with caution when science cannot provide a full or adequate evaluation that directly addresses the concerns associated with the potential consequences of a particular activity, technology or product.

Filing a complaint is possible if one can demonstrate that a company has failed to take adequate action in order to prevent future damages to the environment and to health. In such cases, it could be useful 1) to keep a record of the company's negligent conduct over time, 2) to commission an external assessment in order to determine whether the company has failed to prevent future damages to the environment and to health through its business practices, or 3) to conduct environmental sampling (see Part 3 of the Guide).

5. Emergency Prevention, Preparedness and Response

OFFICIAL OECD GUIDELINES PROVISION, Chapter V, paragraph 5

[Enterprises should:]

5. Maintain contingency plans for preventing, mitigating, and controlling serious environmental and health damage from their operations, including accidents and emergencies; and mechanisms for immediate reporting to the competent authorities.

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None.

Everyone who, through his or her conduct, introduces the risk of an unexpected and damaging event into society has a duty to prepare to face an emergency situation in the best possible manner. This paragraph codifies this duty.

As part of an adequate EMS, companies must establish, implement and maintain procedures that enable them to identify potential emergency and accident situations. Companies must also be able to respond to real emergency or accident situations and to prevent or mitigate adverse impacts on the environment and health stemming from the emergency.

The three elements of emergency management are: 1) Prevention: minimising the likehoood that an accident will ocurr; 2) Preparedness: being alert, prepared and trained to act before the event of an accident takes place; 3) Response: Manage and limitation of adverse consecuences in the event of an accident. Additionally, companies should include environmental restoration and a return to normalcy as objectives of their response.

Proper emergency management includes: planning in accordance with risks, reserving resources for emergency cases and, of course, envisaging a rapid, safe and effective system to inform all relevant authorities and institutions of the event. Resources not only refer to economic resources potentially required for the emergency, but also to trained and specialised staff (Paragraph 7 addresses environmental training in more detail) as well as to ad-hoc, non-economic resources needed to face the particular emergency (e.g. protective clothing in the event of a toxic spill).

Clearly, emergency prevention cannot depend solely on legislation; thus, if a company observes that relevant legislative standards are insufficient, the company should implement an emergency plan utilizing higher standards based on best practices.

If a company is aware of particular difficulty in addressing or preventing an emergency, it is good practice to alert potentially affected communities. Further, communities and other interested parties should be involved in the planning of emergency procedures and procedures related to accident response from the outset.

It is essential that MNEs periodically review their emergency preparedness and response procedures and revise and modify them if necessary. This is particularly true after accidents or emergency situations have taken place. Periodic testing of such procedures better positions MNEs to confront any event that may occur.

6. Continuous Improvement in Environmental Performance

OFFICIAL OECD GUIDELINES PROVISION, Chapter V, paragraph 6

[Enterprises should:]

6. Continually seek to improve corporate environmental performance, by encouraging, where appropriate, such activities as:

a) Adoption of technologies and operating procedures in all parts of the enterprise that reflect standards concerning environmental performance in the best performing part of the enterprise;

b) Development and provision of products or services that have no undue environmental impacts; are safe in their intended use; are efficient in their consumption of energy and natural resources; can be reused, recycled, or disposed of safely;

c) Promoting higher levels of awareness among customers of the environmental implications of using the products and services of the enterprise; and

d) Research on ways of improving the environmental performance of the enterprise over the longer term

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40. The *Guidelines* also encourage enterprises to work to raise the level of environmental performance in all parts of their operations, even where this may not be formally required by existing practice in the countries in which they operate.

41. For example, multinational enterprises often have access to technologies or operating procedures which could, if applied, help raise environmental performance overall. Multinational enterprises are frequently regarded as leaders in their respective fields, so the potential for a "demonstration effect" on other enterprises should not be overlooked. Ensuring that the environment of the countries in which multinational enterprises operate also benefits from available technologies is an important way of building support for international investment activities more generally.

Environmental management is neither a static nor a finite action; it requires constant follow-up in order to ensure that the objectives established by the company are effectively met or even exceeded, even when this means a level of performance that surpasses the regulatory requirements of the host country. Continuous improvement can be measured through environmental performance metrics, among other tools. The commitment to continuous improvement is the main raison d'être of an EMS.

Within the following four categories, a company retains a responsibility to improve its environmental conduct in all senses, including:

- **Improvements related to processes:** companies are encouraged to adopt technologies and operational procedures that avoid double standards in environmental performance. In other words, companies must make an effort to raise their level of environmental performance in all parts of their operations even when this is not formally required by a country in which the operate.

- **Improvements related to products and services:** this type of environmental improvement –related to quality, use and disposal of products- can be achieved through tools such as an LCA.

- **Consumer awareness raising:** the Guidelines encourage MNEs to promote greater awareness of the environmental implications that stem from the use of their products and services. An eco-label is a tool that companies can use to increase consumer knowledge and tout the environmental advantages of certain products. In addition to highlighting the advantages of certain products, companies should equally communicate any disadvantages associated with the use of their products through means such as environmental reports, databases, etc.

- **Investigation for long-term improvements:** in the same way that companies are encouraged to invest in more sustainable technologies, they are also encouraged to dedicate resources to upfront investigation aimed at identifying products with lower environmental impacts., both, in terms of natural resources consumed in their production and the potential risks they could pose.

Each of these categories is part in parcel of a company's broad responsibility to the environment.

7. Environmental Education and Training

OFFICIAL OECD GUIDELINES PROVISION, Chapter V, paragraph 7

[Enterprises should:]

7. Provide adequate education and training to employees in environmental health and safety matters, including the handling of hazardous materials and the prevention of environmental accidents, as well as more general environmental management areas, such as environmental impact assessment procedures, public relations, and environmental technologies.

OFFICIAL COMMENTARY ON THE OECD GUIDELINES

42. Enterprises have an important role to play in the training and education of their employees with regard to environmental matters. They are encouraged to discharge this responsibility in as broad a manner as possible, especially in areas directly related to human health and safety.

Companies are inevitably accountable for the risks created by their activities both to those within the company workplace and to the environment. This particular paragraph of the Guidelines refers to a company's obligation to inform and train its employees adequately – in a clear, precise and sustained manner – concerning risks that might arise from their positions and activities within the company (occupational risks) and concerning potential environmental impacts that may stem from their positions and activities within the company. Thus, effective hazardous substance management within the company requires specific training for those who are in contact with such substances, including at least the basic content of the so-called intervention sheets or "security sheets" (Material Safety Data Sheet – MSDS).

In a practical sense, most countries regulate the obligation to inform and train through workplace safety legislation and through environmental legislation.

Adequate education and training does not only include permanent theoretical and/or practical teaching, but also appropriate signage, proper manuals, and a set of developed protocols for emergency situations (what to do in the event of fire or toxic spill for instance). An organisational chart that lists, among other things, the names of staff in charge during emergencies is also a must. These types of procedures and tools serve to properly inform employees of appropriate risks and are a necessity for a satisfactory EMS.

Concerning the education and training related to "more general environmental management areas" –such as in EIA procedures, public relations and environmental technologies-, adequate employee instruction regarding compliance with legal environmental requirements and the commitments assumed by the company in this field will foster better relationships with both the company's environment and public authorities, thus improving the organisation's culture.

8. Contributing to the Development of Environmental Policy

OFFICIAL OECD GUIDELINES PROVISION, Chapter V, paragraph 8

[Enterprises should:]

8. Contribute to the development of environmentally meaningful and economically efficient public policy, for example, by means of partnerships or initiatives that will enhance environmental awareness and protection.

OFFICIAL COMMENTARY ON THE OECD GUIDELINES

None.

According to Principle 10 of the Rio Decleration and the accepted understanding of sustainable development social, economic, and environmental variables must all be taken into account and balanced when crafting relevant public policy. Private sector participation in public policy design undoubtedly helps to achieve this balance (as does the participation of other sectors) and to create policies and norms that will more realistically be enforced in practice. The Aarhus Convention reflects this sentiment when it establishes mechanisms for public participation in the preparation of plans and programmes related to the environment.

Therefore, companies should contribute to the development of environmental policies that are both successful in protecting the environment and economically viable. In an effort to achieve these twin objectives, companies should consider the possibility of increasing environmental protection and raising environmental awareness through, for instance, 1) establishing partnerships with local authorities for joint policy elaboration, 2) creating cooperative relationships and/or alliances with other stakeholders (initiated by the private sector and involving other sectors such as authorities, universities, the community, civil society organisations, etc.), 3) sharing internal research data with the proper government authority in order to assist the policy creation process, and 4) implementing concrete programmes in fields such as legislation compliance promotion or projects with common objectives.

"Key Questions" for the Viability of a Complaint Based on Chapter V on The Environment

INTRODCUTRORY TEXT: COMPLYING WITH THE LAW AND CONTRIBUTIING TO SUSTAINABLE DEVELOPMENT

☐ Does the company comply with the environmental laws/standards of the host country?

☐ Does the company conduct its activities in a manner that contributes to sustainable development?

1. ENVIRONMENTAL MANAGEMENT SYSTEM

The company maintains an environmental management system, including

☐ Evaluation of the impact on Environmental, Health and Security (EHS) of their activities?

☐ Establishment of measurable objectives and metrics (with targets where appropriate) in regard to environmental management?

☐ Verification of progress towards EHS objectives and targets?

2. PUBLIC INFORMATIONAND CONSULTATION WITH STAKEHOLDERS

☐ The company provides employees and the public with adequate information about the environmental impact of their activities? The information is provided in a timely and transparent manner?

☐ The company engages in meaningful consultation with interested parties and affected communities regarding the environmental impact of its activities and projects? The consultation occurs in a timely manner?

3. ENVIRONMENTAL IMPACT ASSESSMENT

☐ The company conducts assessments of the impact on EHS of their activities, goods, and services over their products and services' full life cycle?

☐ The company conducts Environment Impact Assessment when activities may have significant impact on EHS and are subject to regulation by competent authorities?

4. EXCERCISING PRECAUTION

☐ The company utilizes a precautionary approach in their operations / activities / decision-making in order to prevent serious damage to the EHS?

☐ The precautionary approach utilized by the company is consistent with scientific and technical understanding of potential risks?

5. EMERGENCY PREVENTION

☐ The company possesses a functioning Emergency Plan that enables them to identify and respond to potential emergency and accident situations arising from their operations?

☐ The company has established rapid and effective measures to communicate the accident/emergency to the relevant authorities? (In the event of an accident or emergency, has the company reported the event to the relevant authorities?)

6. CONTINUOUS IMPROVEMENT IN ENVIRONMENTAL PERFORMANCE

The company continually seeks to improve their environmental performance through:

☐ a) The adoption of best-practices technologies and operating procedures

☐ b) The development of products or services with no undue environmental impacts

☐ c) Effectively communicating the environmental implications of using their products or services to consumers?

☐ d) Engaging in research focused on long-term environmental performance improvement?

7. ENVIRONMENTAL EDUCATION AND TRAINING

☐ The company provides education and training for employees on issues of EHS that includes the handling of hazardous materials and the prevention of environmental accidents?

8. CONTRIBUTING TO THE DEVELOPMENT OF ENVIRONMENTAL POLICY

☐ The company, through its actions or initiatives, contributes to and participates in the development of environmentally meaningful and economically efficient public policy?

Part 2:

Environmental Cases Filed by NGOs

Communities as well as civil society groups may use the Guidelines to define and promote responsible environmental conducts, and also promote their implementation on having a complaint at the National Contact Points (NCPs).

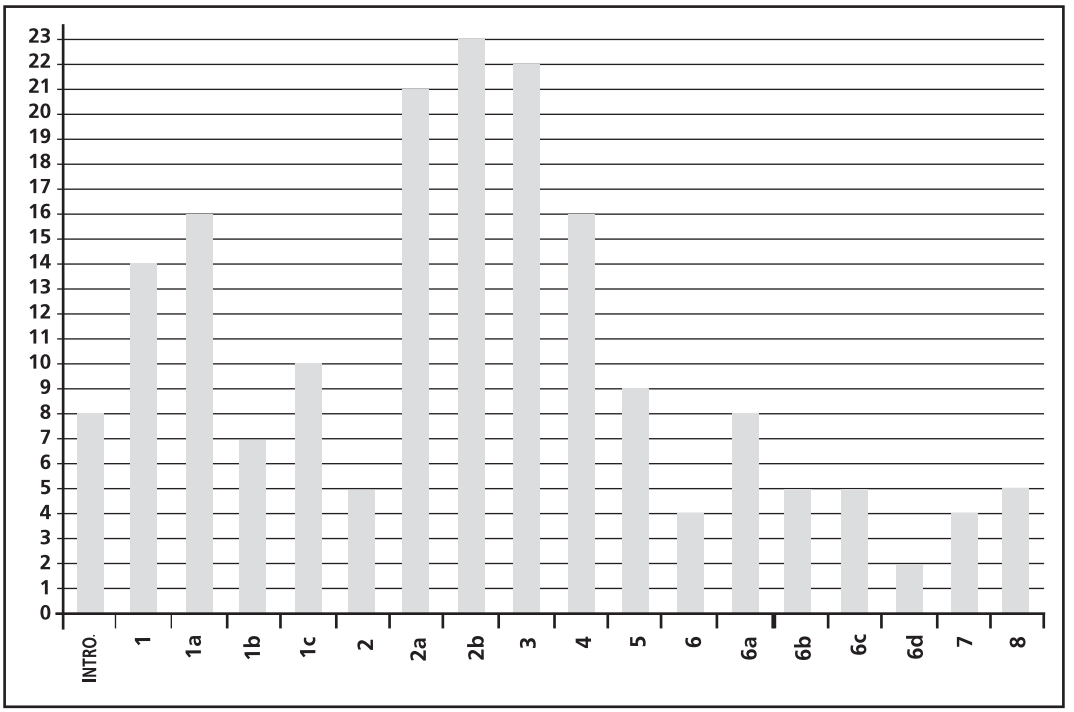
In spite of a series of disappointing results, each one of the cases has contributed to the development of a normative framework allowing to distinguish between acceptable and unacceptable environmental conducts with respect to the Guidelines.

Most environmental cases filed by NGOs until December 2008, refer to paragraph 2b, which refers to companies' duty to consult with affected communities regarding company policies and their implementation in the field of environment, health and safety.

These cases are followed by complaints based on paragraph 3 which establishes that companies should prepare an EIA when their activities risk having significant environmental, health, or safety impacts.

Finally, the third place are based on Paragraph 2a of Chapter V, advising companies to provide employees and the general public with information on its potential environmental, health and safety impacts.

The following graph illustrates this:



The following is a brief summary of the cases on violations to the Environment Chapter, classified by subject or by industry sector, until December 2008.

This is only a frame of reference, you will be able to find most of the information in the database of cases listed on OECDWatch <http://www.oecdwatch.org/> where you can run an advanced search by business, complaintants, NCPs, countries, OECD guideline violations, state of case, key words, and industrial sectors.

In addition, you will also be able to find this information in the Quarterly Case Update newsletter on the same website.

CLIMATE CHANGE

- **Germanwatch vs. Volkswagen**
  Volkswagen's climate change impacts

DAMS

- **MAB, Terra de Direitos vs. Alcoa Alumínios and Companhia Brasileira de Aluminio (Votorantim)**
  Alcoa Alumínios et al hydroelectric dam in Brazil
- **Proyecto Gato vs. Electricité de France**
  Electricité de France involvement in Laos hydroelectric dam
- **Proyecto Gato vs. Tractebel**
  Tractebel's Houay Ho dam in Laos

FISH FARMING

- **FOE Netherlands vs. Nutreco**
  Nutreco/Marine Harvest's salmon farming in Chile
- **ForUM and Friends of the Earth Norway vs Cermaq ASA**

FORESTRY

- **Australian Conservation Foundation vs. ANZ Bank**
  ANZ Bank's facilitation of desctructive forestry in PNG
- **Green Party of New Zealand vs. el ANZ Bank**
  ANZ Bank's facilitation of desctructive forestry in PNG
- **Nepenthes vs. Dalhoff, Larsen & Hornemann**
  DLH's purchasing of illegal timber from conflict zones

MINING

- **11.11.11, et. al. vs. George Forrest International SA**
  Belgian cos. & illegal resource exploitation in DRC
- **ATTAC and FOE Sweden vs. Sandvik, Atlas Copco**
  Gold mining, pollution, rights violations in Ghana
- **DECOIN, et. al. vs. Ascendant Copper Corporation**
  Ascendant's Junin mine in Ecuador's cloud forest
- **FOE USA and RAID vs. OM Group Inc.**
  US companies & illegal resource exploitation in DRC
- **Niza, et. al. vs. Chemie Pharmacie Holland**
  CPH & illegal resource exploitation in DRC

- **Colombian communities vs. BHP Billiton**
  BHP Billiton and forced evictions at Colombian coal mine
- **Colombian communities vs. Xstrata**
  BHP Billiton and forced evictions at Colombian coal mine
- **Oxfam Canada vs. First Quantum Mining**
  First Quantum and forced evictions in Zambia
- **RAID vs. Anglo American**
  Anglo American mining activities in Zambia
- **RAID vs. Oryx**
  UK companies & illegal resource exploitation in DRC
- **Survival International vs Vedanta Resources plc**
  Vedanta's environmental and human rights violations in India

PIPELINES, EXTRACTION AND PROCESSING

- **FOCO and FOE Argentina vs. Shell Capsa**
  Shell's environmental and health violations in Argentina
- **CAVE, FOE Netherlands vs. Royal Dutch Shell and Exxon**
  Shell and Exxon's chemical storage & health impact in Brazil
- **Fenceline Community and FOE Netherlands vs. Royal Dutch**
  Shell's Pandacan oil depot in the Philippines
- **Greenpeace vs. TotalFinaElf**
  TotalFinaElf's oil supply from Russia
- **Greenpeace Germany vs. West LB**
  West LB financing of oil pipeline in Ecuador
- **Proyecto Gato vs. Dexia, KBC and ING**
  BTC oil pipeline in Azerbaijan, Georgia & Turkey
- **Earth Rights International et al. vs. KOGAS**
  Daewoo & KOGAS' pipeline project in Burma
- **Earth Rights International et al. vs. Daewoo**
  Daewoo & KOGAS' pipeline project in Burma
- **Pobal Chill Chomain Community et al. vs. Statoil,**
  Shell-led consortium's pipeline project in Ireland
- **Pobal Chill Chomain Community et al. vs. Marathon Oil**
  Shell-led consortium's pipeline project in Ireland
- **Pobal Chill Chomain Community et al. vs. Shell**
  Shell-led consortium's pipeline project in Ireland
- **FoE US vs. Unocal**
  BTC oil pipeline in Azerbaijan, Georgia & Turkey

- **FoE France vs. TotalFinaElf**
  BTC oil pipeline in Azerbaijan, Georgia & Turkey

- **Corner House et al vs. BP**
  BTC oil pipeline in Azerbaijan, Georgia & Turkey

- **FoE US vs Delta Hess**
  BTC oil pipeline in Azerbaijan, Georgia & Turkey

- **CRBM vs ENI**
  BTC oil pipeline in Azerbaijan, Georgia & Turkey

CONSTRUCTION

- **Shehri-Citizens for a Better Environment vs SHV Holdings, NV**
  Makro's human rights and environment violations in Pakistan

PULP MILLS

- **CEDHA vs. Botnia SA**
  Botnia's Orion pulp mill project in Uruguay

- **CEDHA vs. Finnvera Plc**
  Botnia's Orion pulp mill project in Uruguay

- **CEDHA and Bellona vs. Nordea**
  Botnia's Orion pulp mill project in Uruguay

Guidelines' Environmental Chapter violations claimed in these cases:

Paragraphs in Chapter V	Introduction	1	1 a	1b	1 c	2	2 a	2b	3	4	5	6	6 a	6b	6 c	6d	7	8
11.11.11 v. George Forrest International			✓	✓	✓			✓	✓								✓	
Australian Conservation Foundation v. ANZ Bank		✓																
ATTAC, FOE SE v. Atlas Copco			✓	✓	✓		✓	✓			✓		✓	✓	✓			✓
ATTAC, FOE SE v. Sandvik			✓	✓	✓		✓	✓			✓		✓	✓	✓			✓
CAVE, FOE NL v. Exxon			✓	✓	✓				✓	✓								
CAVE, FOE NL v. Shell			✓	✓	✓				✓	✓								
CEDHA v. Botnia			✓					✓	✓	✓	✓	✓	✓					
CEDHA v. Finnvera			✓						✓		✓	✓	✓					
CEDHA, Bellona v. Nordea	✓		✓					✓	✓	✓	✓	✓						
Colombian Communities v. BHP			✓				✓	✓										
Colombian Communities v. Xstrata			✓				✓	✓										
Corner House et al v. BP		✓					✓	✓		✓								
CRBM v ENI		✓					✓	✓		✓								
DECOIN v. Ascendant Copper							✓	✓										
Earth Rights International et al. v. KOGAS						✓			✓									
Earth Rights International et al. v. Daewoo						✓			✓									
Fenceline, FOE NL v. Shell							✓	✓			✓		✓					
Foco, FOE Argentina v. Shell Capsa	✓	✓				✓			✓	✓	✓	✓					✓	✓
FOE NL v. Nutreco							✓		✓	✓								
FOE US, RAID v. OM Group							✓		✓	✓	✓						✓	
FoE France v. TotalFinaElf		✓					✓	✓		✓								
FoE US v. Unocal		✓					✓	✓		✓								
FoE US v Delta Hess		✓					✓	✓		✓								
ForUM and FOE Norway v. Cermaq ASA						✓			✓	✓								

Paragraphs in Chapter V	Introduction	1	1 a	1b	1 c	2	2 a	2b	3	4	5	6	6 a	6b	6 c	6d	7	8
Germanwatch v. Volkswagen			✓	✓			✓		✓				✓	✓	✓			✓
Greenpeace Germany v. West LB	✓		✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Greenpeace v. TotalFinaElf							✓	✓										
Green Party NL v. ANZ Bank		✓																
MAB, Terra de Directos v. Alcoa Alumínios		✓							✓	✓								
MAB, Terra de Directos v. Votorantim		✓							✓	✓								
Nepenthes v. Dalhoff, Larsen & Hornemann		✓																
NiZA et al. v. CPH	✓					✓			✓									
Oxfam CAN v. First Quantum Mining							✓	✓										
Pobal Chill Chomain Community et al. v. Statoil,	✓	✓					✓	✓	✓									
Pobal Chill Chomain Community et al. v., Marathon Oil	✓	✓					✓	✓	✓									
Pobal Chill Chomain Community et al. v., Shell	✓	✓					✓	✓	✓									
Proyecto Gato v. Dexia			✓		✓													
Proyecto Gato v. Electricité de France			✓				✓	✓	✓									
Proyecto Gato v. ING			✓		✓													
Proyecto Gato v. KBC			✓		✓													
Proyecto Gato v. Tractebel					✓													
RAID v. Anglo American	✓							✓										
RAID v. Oryx													✓	✓	✓	✓		
Shehri-Citizens for a Better Environment v. SHV Holdings, NV									✓									
Survival International v. Vedanta Resources plc								✓										

Part 3:

Introduction to Environmental Sampling

Among NGOs and the media, there is great interest in using scientific data able to fully demonstrate if there is environmental pollution or risks to human health. This occurs more frequently in contexts where environmental risks have been denied or ignored by the company in question.

In this context, it is necessary to acknowledge that scientific data can influence the debate on whether an activity is damaging human health or the environment when seeking dialogue on prevention, control, improvement and, consequently, a policy of change. Therefore, when NGOs can demonstrate that the sampling has been done in accordance with legal and/or standardised procedures, it becomes more difficult for companies and governments to deny the conclusions' validity and ignore the real, documented data confronting them.

While environmental sampling must not necessarily be extremely sophisticated in order to obtain extensive results, the characteristics and complexity of each case should always be taken into account which may require a professional specialized in this field.

This chapter's objective is to provide NGOs with practical information on how to develop an environmental sampling project. As mentioned earlier in this Guide, the chapter's scope is limited to an introduction to environmental sampling and, within this, to the abiotic media –soil, air and water- as subject matters. Developing a broader field for sampling as a methodological guide shall be the object of a future environmental guidebook to be elaborated with greater detail.

The following table shows the possible scenarios for sampling. It seeks to display, with an introductory approach, that there are correct and wrong ways to carry out a sampling process.

SAMPLING SCENARIOS: Good, Bad and Best Scenario

Bad Sampling Scenario:

- Absence of a Sampling and Analysis Plan
- Two soil samples from two locations were taken with a spoon and then placed in a previously used plastic bag
- Absence of samples from reference areas
- The samples were taken by only one person
- Little information has been documented on the sampling locations
- Absence of photographs of the sampling locations
- The chain of custody was not followed when sending the samples to the laboratory

Good Sampling Scenario:

- A Sampling and Analysis Plan has been developed
- Labels for each one of the samples were prepared beforehand
- Four samples were taken from two different locations
- A "reference sample" was taken
- The samples were taken by one NGO representative together with a community representative observing
- The soil samples were taken with an adequate laboratory instrument
- Field notes and photographs were taken in each sampling area
- The samples were analysed by a highly reliable laboratory

Best Sampling Scenario:

- A Sampling and Analysis Plan was developed and revised by all project participants
- Labels to identify the samples and field logbooks were prepared beforehand
- Three samples were taken in each sampling location. The samples were taken in three different places (total samples = 6)
- Two reference samples were taken at locations 1 km and 2 km "against the wind" or "upstream"
- The samples were taken with adequate laboratory instruments
- The person taking the samples used a new pair of gloves in each sampling location
- The sampling was carried out by two NGO representatives and a community representative
- One person took the samples, another one took detailed notes in the field (using the field logbooks), and another one took photographs and assisted in the sampling when necessary
- The samples were analysed by a reputed, highly reliable laboratory, and the chain of custody (documentation and seals) was followed all along the process

Developing an Environmental Sampling and Analysis Plan

The following section provides sufficient information to NGOs seeking to develop a simple preliminary sampling study. However, they are strongly encouraged to work with academics, scientists and NGOs who possess the adequate knowledge to develop an environmental sampling project.

It is also recommended the observation and implementation of the local laws in the territory in which the perform of the procedure sampled will take place. In the absence of legislation on the matter, a possible alternative is to adjust the operation to mind internationally recognized and accepted.

1. What is an Environmental Sampling and Analysis Plan?

An Environmental Sampling and Analysis Plan (SAP) is a road map enabling to confirm the sample's traceability from the moment it is taken to its subsequent analysis. This is of vital importance when explaining what has been done, in order to present results correctly. The capacity to document the own compliance of adequate procedures is fundamental to demonstrate that the obtained results are credible, legitimate and certain.

In itself, sampling is a process that entails the selection of a portion of material representing or providing information on the system under examination.
If the SAP is well developed and written, its results should be reproducible. In other words, another person/ entity could use that SAP in order to carry out the same sampling process and should obtain very similar if not identical results.

Key resource: the US Environmental Protection Agency has developed a SAP template providing specific item-by-item instructions. It is 84 pages long and can be considerably reduced in order to include only the sections relevant to the study. The sheet is particularly useful, as it provides the basic elements of quality assurance and control in abbreviated form.
http://www.epa.gov/region09/qa/pdfs/sap_ot6_pvt_v2.pdf

The following table illustrates a Sampling Plan:

SAMPLING PLAN

Sampling Plan:

1) Procedure to select, extract, preserve, transport and prepare the portions to be taken from the system to be analized, while maintaining sample quality.
2) Must include: a) where the sampling will be done; b) who will carry it out; c) which procedure must be followed for the sampling d) sample conservation

The Sampling Process must be planned, detailed, written.

Sampling Plan requirements:

1) Information on the sample's nature and matrix
2) Information on the techniques and instruments to be used for the sampling
3) Knowledge of the degree of homogeneity of the sample
4) Indication of the number of subsamples needed for a particular level of exactitude
5) A precautions scheme that lists the precautions to be taken when preparing the sample

Sample types:

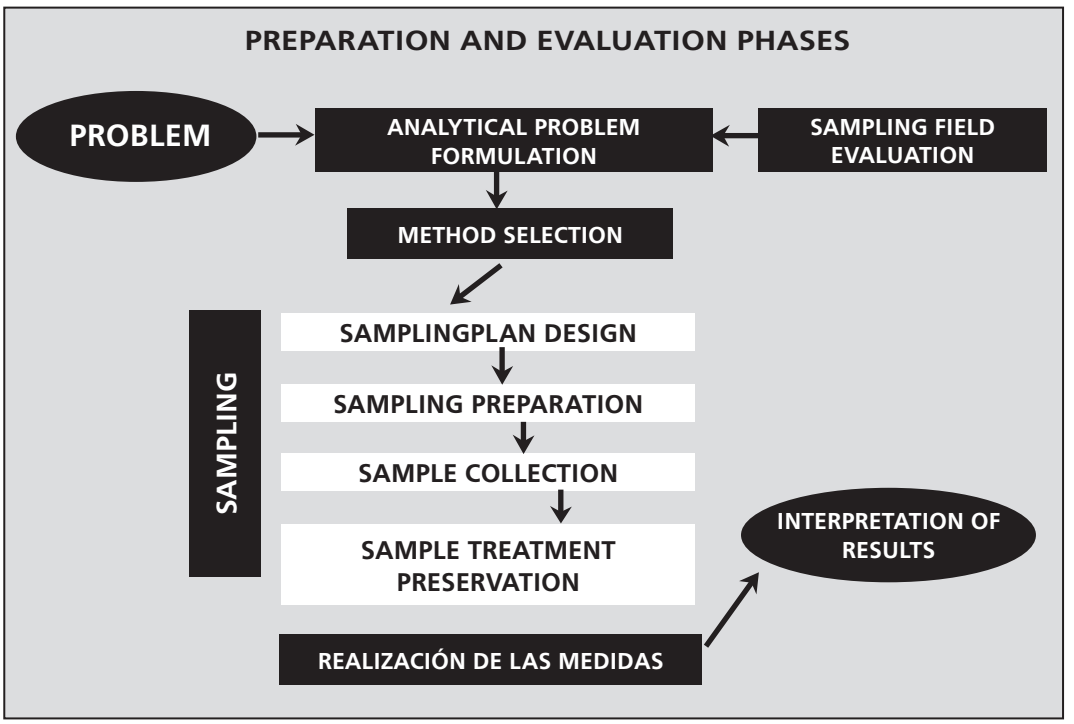
1) Representative: similar in composition and properties to the sample's system to be analized
2) Selective: taken in the sampling of specific locations
3) Systematic: taken according to a systematic procedure
4) Random: taken randomly
5) Composite: formed by two or more subsamples

Sampling types:

1) Intuitive: based on experience with particular types of samples
2) Statistical: using a previously validated statistical model
3) Systematic: following a protocol which specifies: type, size, frequency, sampling period and location.

The following list includes the most important phases an environmental SAP must undergo

- **Identifying the problem** and obtaining as much information as possible (regarding the location, conditions, etc).
- **Sampling Plan.** Objectives. Sampling requirements (see the previous graph). Quantity and Quality of the Sample.
- **Collecting the Samples**: Labeling of each sample (sample number, name of collector, point of collection, date and time of collecting, etc). Sealing (prevents it to be open) Documentation of the entire process. Use of appropriate equipment for sampling.
- **Sample conservation and transport**: Recommendations such as: do not expose to high temperatures the sample, immediacy for analysis (will be necessary to send the sample to the laboratory as soon as possible to avoid changes to it), will be necessary.
- **Sample storage**: This is in the event that the analysis is not immediately done or to save a duplicate in order to check the results obtained in the initial analysis (must be taken into account according to sampling done: the right conditions for storage, the container / package, suitable preservative agent, the maximum time for the storage and others recommendations in order to the sample suffer the less possible variation).
- **Sample chain of custody**: is the process by which a sample is kept under physical possession or control over the entire life cycle, that is, from which a sample is taken until its disposal in order to avoid undue manipulation The documentation of this process is advisable for greater security of the whole procedure (Identifying persons involved in the investigation, documentation of sampling, etc.)
- **Registration in the laboratory**
- **Sample traceability**.
- **Sample analysis**. Interpretation of results.



2. What is the objective of the SAP?

When developing a SAP, the first question to be asked is: why sampling? Why a sample? Is it to determine whether the suspected problem is real? To determine which types of contaminants are in the soil, the water or the air? To obtain preliminary data in order to carry out a broader sample study later on? To demonstrate non-compliance with domestic or international norms? If both objectives and scope are not criteriously defined, the sampling will be unable to achieve the expected results.

Examples of SAP objectives

1. Collecting soil samples and analysing them to determine the levels of the following contaminant metals: silver (Ag), arsenic (As), beryllium (Be), cadmium (Cd), chrome (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb), antimony (Sb), selenium (Se), titanium (Ti) and zinc (Zn).

2. Compare laboratory results (based on health indicators) with relevant norms to determine the potential impacts on human health of a particular activity (name) in a particular community (name).

A particular objective in the case of environmental samples (specifically, water, air or soil samples) is for the samples to be sufficiently small in volume so as to be easily transported to the laboratory for further investigation, and yet be representative of the system under study.

The first issue raised is obvious: the sample must be homogenous and representative of the average characteristics of the sampled material' whole. This implies that the concentration of any component in the sample will be identical (or reasonably identical) to that existing in the whole.

The necessary questions here are what to do with the data obtained through the sampling, what degrees of depth and complexity are necessary for the partial or total evaluation of the process or for decision making.

The exactitude and complexity of the required data conditions the sampling plan, its extent, depth and costs. To require certain data in order to measure trends is not the same as requiring other types of data before making an important decision.

As a general rule, the sampling must have representativeness and a scientific base given by the need and the degree of use of the required data. Also, it is necessary to keep in mind that there is no security in the analysis when it is based on badly taken samples.

3. What characteristics should the sample have?

Part of the SAP development process includes the identification of the contamination sources, their channels, any mitigation measure as well as of the receptors to be included in the sample. This process is known as "destiny and transport"; briefly, it is the physical movement of the chemical component from the source to the receptor.

4. How will the sample be?

The SAP must detail the materials and equipment to be used. In addition, it must consider whether the samples will be sent to a laboratory or whether the test will be done in the field. Testing kits are cheap, easy to use and may provide immediate information on the presence of alarming levels of contaminants. However, the detection limits of testing kits' make them less efficient than laboratory analysis. These kits can provide good indications as to whether a SAP should be developed or whether the samples should be sent to a laboratory for further analysis, for example.

5. When should the sampling be done?

The SAP will identify each sampling location and whether the sampling will be a one-time event or rather take place within a certain period of time. The issues to consider include whether or not there are seasonal fluctuations (i. e. rainy/dry seasons). For example, consider the case of a river with a low flow

during the dry season and therefore higher levels of contaminants than during the rainy season, which may "clean" its waters. A second issue to consider is whether there are daily variations. For instance, do you suspect the company of disposing its waste in specific moments, such as on weekends or at night?

The timing for the sampling must be kept in mind, as it has direct relation to the actions or events producing the contaminants under study. It should be part of the technical report correlating the values of sampled parameters with the actions or processes that produce or affect them directly or indirectly. The more data is correlated to the samples, the simpler it will be to determine the origin of the contamination and its treatment or elimination.

6. Where should the sampling be done?

NGOs lacking previous experience or training in environmental sampling will very likely be tempted to take "critical samples", which result from the subjective selection of the sampling locations in an area, on the basis of historical information, visual inspections, etc.

The sampling should have the previously mentioned information base and should represent the whole under study; it may have subjective elements (historical or perceptive knowledge) but should also contain objective information enabling the sample's reproducibility and scientific justification.

7. Who should do the sampling?

The SAP must identify all parties involved in the project, such as other NGOs, independent experts and members of the community who may participate. Who will analyse the samples (a local or foreign laboratory, a university, etc.)? The participants in the project and the quality of the laboratory may affect the determination of how results are perceived. In some scenarios, the participation of company representatives may have sense if the goal is that the company trusts the results. On the other hand, a community may oppose to the company's involvement, or the company itself may not be willing to participate.

8. How should the data be interpreted?

The SAP should set the threshold as well as the national and international norms that will be used to interpret the results. Most norms are "based on health protection criteria", which means they derive from the known impacts on the receptors.

9. What are the Protocols for Quality Assurance / Quality Control (QA/QC)?

Section QA/QC of the SAP describes in detail the steps to be taken in the field (sampling location) as well as in the laboratory, in order to prove the validity of the results. QA/QC protocols are essential to demonstrate that the results are repeatable and credible. While QA/QC procedures can be very elaborate, most are mainly measures of common sense. For example: keeping the sampling equipment clean; using gloves; using laboratory materials; preserving, sealing and labelling samples immediately; carefully recording notes; taking pictures; preserving samples adequately and under control; chosing a reliable laboratory to analyse the samples; and following the chain of custody along the entire process.

Specific samplings

The following section presents, in an introductory way, the steps to take when carrying out a sampling of abiotic media: water, air and soil.

1. Water sampling

a) General introduction

The great variety of water types (for human use, deep layer water, freatic water, water collecting industrial or domestic liquid waste spills, etc.), hydric systems and circumstances they may present in practice results

in the absence of a totally standardised method to be applied in all cases, be it for selecting the kind of sample to be taken, the type and location of the sampling or ultimately the suitable sampling frequency. Nevertheless, this section will consider certain clarifying ideas in this context.

Roughly, a correct water sampling requires the following:

1) **Executing preliminary studies**: revision of existing prior data and data from prior investigations, which will inform on the quality of the water, provide hydrologic and climatologic data, describe local conditions that may influence the study, and illustrate additional factors that condition the quality and circumstances of the water or hydric system to be evaluated.

2) **Observe the number of samples to be taken and parameters to be investigated**: these are determined according to the desired depth of the study, the operative availability and infrastructure of the laboratory and the storage possibilities deemed acceptable. Normal parameters used to determine the quality of the water can be of physical, chemical, organic, radiologic, biologic and microbiologic nature; each one may require different sampling and manipulation criteria.

3) **Representativeness**: it is necessary to ensure the representativeness of the whole of the investigated water mass.

4) **Sampling equipment**: it depends on the type of samples required. Currently, these sampling equipments are extremely versatile and often constitute irreplaceable allies, due to the existence of automatic sample-takers with diverse possibilities to programme the time for sample collection, the time between samplings and the volume of the samples to be taken, even in relation to the flow that circulates in the hydric system under investigation (which, in turn, is measured by a sensor element).

5) **Preservation and transport**: it is necessary to avoid even the slightest variation of the water sample's characteristics between its source to its definitive analysis location. For example, this is made possible by reducing to a minimum the time between sample taking and final destination and/or using an effective means of preservation that does not alter perceptibly the quality of the sample (the higher the biological presence or the concentration of organic material in the water, the higher the variation in the water's characteristics).

b) Types of water: drinking water

In the case of potable water for public consumption (including water contained in bottled beverages), sampling programmes are regulated by state legislation establishing minimum requirements.

In general, local legislation establishes sampling frequency and techniques and analysis procedures for the water at the outflow of water treatment stations as well as for the water in distribution networks. It also establishes the determinations that are required in relation to the number of inhabitants supplied with water by each public water supplier.

Particularly interesting in a sampling are the analytical characteristics related to "microbiological parameters" and "physical-chemical parameters", which must be investigated in potable water for public consumption.

Raw waters intended for potabilisation and public consumption

Raw waters are untreated waters, the sampling of which is also regulated by domestic legislation both concerning sampling frequency and sample analysis.

If, for example, the water to be potabilised proceeds from a river (which logically is more prone to unexpected variations in quality as a lake or reservoir), it is also necessary to establish its quality standard at the water intake point. The aforementioned frequency and analysis will have to be increased (particularly in atypical circumstances such as rains, uncontrolled spills, etc.). In addition, and besides the aforementioned parameters, it should be interesting to investigate the solids in suspension, the biochemical demand of oxygen, the hardness, the total nitrogen and certain heavy metals in the water. In short, the analysis to be done should include, regardless of the raw water's origin, all parameters established by legislation and also accessory physicochemical analyses that may be of interest in each concrete case.

Wastewater

Wastewater is water that has been discharged after a process or operation that changed its quality and was influenced by mankind.

Industrial discharges are a complex subject, as their characteristics are given by the specific activity of the industry causing the discharge. Discharge limits are established by local or international legislation. Practical examples of the different industries' discharges are: meat industry discharge, presenting high levels of solids and biochemical demand of oxygen; beverage industry discharge, displaying extreme pH-values; food industry (in general) discharge, posing problems with its high levels of solids and organic charge; and discharges by metallurgical and surface treatment companies, with high concentrations of metals, detergents and grease and occasionally extreme pH-values.

A sample extraction program should take into account:

- Industry-related factors: produced material and raw materials, quantity and quality of liquid vs. production proportion, type of establishment (seasonal or permanent), location of the waste pipes in the facilities
- Sample-related factors: sample quantity, determination of contaminants, investigation of variations in quality and quantity

c) Sampling techniques

Water samples can be ser: a) simple b) composite c) "continuous"

- The simple sample provides information on water quality at a specific place and moment: it may be important when establishing the water's characteristics at a certain point of a population's supply network.
- The composite sample is composed of several temporally separated individual samples (often variable, in minutes, hours, days) that are added to the same container. This type of sample is used, for example, when monitoring industrial discharges, as their quality may vary considerable during the working day.
- Continuous samples are essential in industrial-scale processes, such as the determination of residual chlorine in potable water at the outflow of a potabilisation plant. Samples integrated in time are obtained by pumping at a continuous flow of sample liquid that is added to the same container.

d) Sampling equipment and temporary sample storage containers

Sampling equipment may be as simple as a glass, metal or plastic bottle with a hermetic cap, to be filled with the water under analysis.

In this context, manually operated equipment serves to take samples from superficial waters and wells lacking pumping systems. It is suggested to rinse them several times with the water to be sampled before filling them up definitively (except for sterilised bottles for microbiological analyses).

Automatic equipment is widely distributed and constitutes the main element for the sampling of wastewater, domestic and industrial water and water in treatment plants. Automatic sampling equipment is particularly adequate when monitoring industrial discharges, as the emission of the largest amounts of contaminating charge tends to take place at times of production peaks, and industrial discharges are also linked to significant variations in the discharged amount, for which this kind of equipment is essential. In addition, automatic equipment reduces or eliminates errors by their operators and enables to obtain samples with greater frequency.

e) Sample preservation

The preservation of a water sample will depend on the parameter to be analysed, which will indicate the type of container, the preserving agent and the maximum storage period.

General recommendations for water sampling:

The following are a few usual norms (taken from ordinary practice) to be taken into account when sampling water, regardless of the system used:

1) When several samples are to be taken from a sampling location or station, the first sample to be taken is the volume destined to the microbiological analysis, followed by the sample destined to the biological analysis and ultimately by the sample used for physicochemical determinations, thus avoiding potential contamination.
2) In multiple depth water sampling in lakes or reservoirs, the samples shall be initially collected from the surface and then from deeper layers, in order to avoid possible mixing of water layers.
3) The samples of bottom water will be collected while trying to avoid removing sediments, which would severely alter the analytical result.
4) In discharge samplings, it is important to consider that the concentration of particles is affected both in depth as in space, and may not be homogenous in time.
5) When taking deep-water samples, the container must be hermetically closed, so as to prevent that substances which oxydate when in contact with air vary their concentration during transit from their source to the moment of final analysis in the laboratory.
6) When taking samples through pumping, it is necessary to pump during a certain time before taking the sample to be analysed later on, in order for the water to reach homogeneity and thus be representative of the total of the liquid mass in the source.

2. Air sampling

a) General introduction

The main difficulty in obtaining a correct appraisal of the state of contamination in a certain region or sector lies in the possibility that the concentration of the diverse contaminants present in its different areas may vary abruptly and significantly.

International and domestic legislation allow framing and determining the conditions in which atmospheric contamination is considered to exist.

In order to know the level of contaminants in the air, it will be necessary to follow –as with the other receptors- the phases of sample collection, preparation, analysis and calculation of results.

In general, a correct air sampling requires taking the following items into account:

1) Specificity of the technique: determining the parameter to be measured and that it is not interfering with other parameters or forming chemical complexes

2) Sample size: its representativeness in time and space is important

3) Sample volume: for each type of sampling equipment there is a volume which optimises its performance. A sampling train is a group of elements serving to measure the concentration of one or more contaminants.

4) Sampling duration: it depends on the contaminant's capacity to produce effects in certain concentrations, and is established by the maximum concentration values allowed by legislation for health protection reasons (concept of dose)

5) Sample alterations: in all contamination tests, precautions must be taken to avoid possible sample alterations

6) Sampling station location: let's consider the chimney of an industrial facility, which emits contaminants in the form of big and small particles and gases. The wind, coming from a certain direction, has the capacity to disperse the contaminants; the large particles will fall quickly, the small ones will be swept a longer distance and the gases will travel even further. This example shows that the sampling location must be chosen according to a series of variables such as the winds' predominant direction, the types of agents, their geographical distribution, etc., and particularly the location that will probably be affected.

7) Variations in time (hours, days and seasons): they should be considered when planning the sampling.

b) Distinction between Air Quality Measurement and Gas Emission Measurement

In air sampling it is necessary to distinguish between two types of basic evaluations: a) air quality sampling and, within it, internal environments (work or public places) and internal environments (atmospheric air quality); and b) gas emission sampling, through a conduct releasing it to the atmosphere.

c) Air quality measurement

When the aim is to know the quality of the air in a specific space and period of time, it is necessary to establish an evaluation network (determination of the sampling points distributed according to a technical criterion of validation).

Evaluation networks

In this context, both the "measurement model" and the "probabilistic model" can be established as evaluation models.

- ✓ The first model's outline relies on the possibility to access the technology allowing to collect data on the concentration of contaminants continuously in time, generally with direct reading equipment that can transmit or accumulate data and then extract all the data necessary to contribute to a knowledge and control strategy.

- ✓ The probabilistic model is highly useful when a continuous measurement of contaminants cannot be carried out, as it enables to collect the data within the parameters of error and reliability that are established and validate the data on concentration that has been collected.

Measurement organisation and planning

Organising and planning the measurements in a city or region essentially involves the following topics:

- ✓ The design of the measurement grid or net allowing to cover the area under study. The higher or lower density of the net is closely linked to the precision with which the results obtained represent the degree of contamination in a given region.

- ✓ The sampling time for individual measurements

- ✓ The frequency of the sampling and the sequence to follow for the different grid or net stations

d) Gas emission measurement

The goal of the sampling is to collect reliable data on the composition and amount of effluents released to the atmosphere. It is necessary, among other things, to verify the meeting of expectations regarding the mass, energetic and optimisation balances programmed by the company, as well as to evaluate compliance with certain legislations that establish emissions maxima or to identify one's own contribution of a certain contaminant to the quality of the air being measured (in cases of several sources).

3. Soil sampling

a) General introduction

The general concepts expressed for any representative sampling are also a frame of reference for soil sampling and analysis actions.

The soil analysis process is carried out in several phases:

- Preparation of the sample
- Collection of the soil sample in the field
- Transport to the laboratory
- Preparation of sample for analysis
- Extractions and analytical determinations of the sample in the laboratory

As mentioned earlier, the procedures to take a soil sample must be rigurous, as the laboratory analysis –which, from the operational and instrumental point of view, is the most sophisticated phase- does not correct the defects of a deficient sampling. On the contrary, it adds errors in each different phase, so that an incorrectly taken sample may cause subsequent interpretation errors in the analyses' results.

As a suggestion, the one interested in carrying out the sampling is encouraged to clearly express to the laboratory what the own the objectives for sending the soil sample are and, according to these, seek advice on how and when to take the sample, the time, sample conditioning, etc., as the variables to be measured will vary according to the objectives.

b) Sampling equipment

Any of the following tools, among others, may be used for soil sampling:

- Straight shovel
- Special drills for sample extraction
- Bucket
- Plastic bag

Regardless of which one is used, it is essential that the tool is completely cleaned between the taking of one sample and the taking of the next.

c) Location and identification of the area to be sampled

There are two alternatives for soil sampling:

a) If the parameters that may have contaminated a given area can be known or inferred from preliminary studies, it is possible to:
   - "Prioritise", from the extensive list of parameters (analites), those which were considered by preliminary studies as probably being present in the environment under study, as well as those whose impact level one desires to determine; and
   - Compare the laboratory results (according to techniques established by applicable legislation for the use of that soil: agricultural, industrial, urban, etc.) either with the maxima allowed by this legislation for health protection purposes (primary standards) or with secondary standards (protection of fauna and flora or of community goods).

b) If the soil's "history" is totally unknown, it is possible to:
   - Sample the total of parameters indicated by applicable legislation (establishing the allowed maxima for comparison) in certain scattered locations and send the samples to the laboratory
   - Take the results for each sampled location and verify which parameters display concentration values close to the maxima allowed by legislation
   - Sample the entire area (following a representativeness principle).

Several factors contribute to variations in the composition level of the soil in the area to be sampled. The basic principle to delimit an area is the given soil's "history" (whether it is natural or has been used for filling that landsite, previous uses of the ground, possible spills in the area, etc.) as well as the uniformity within the whole. Thus, an area should be divided into sub-areas representing the greatest homogeneity possible in terms of topography, vegetation, uses, physical characteristics (texture and colour), soil depth, drainage, etc.

Once determined, the areas should be delimited in a map of the location and numerically identified. It is important to use a logbook for each identified area, in order to ensure a minimum environmental description and a summary of the history of the soil's use.

d) Depth of the sampling

The sampling depth is mainly determined by the soil's vegetation layer, the greater density of roots in it, and its profile characteristics (be it natural soil or soil modified for its use). Therefore, it is important to

know whether the samples will be superficial or in-depth, where they could intercept the moist layers of the shallower aquifer (freatic).

In this sense, it is essential to know –*a priori* or after a preliminary test– whether the samples will be topsoil (superficial) or subsoil (between 0.20 and 0.40 m deep), measured from ground level (zero), or whether they will be in-depth samples, which requires different techniques, equipment and tools to carry out the sampling.

When evaluating the historical conduct of a chemical component spilled on the soil, it is common to carry out a sampling by layer or at different depths (by meter), in order to verify whether their has been runoff and the degree of spreading of the contaminant (plume). This procedure is essential to know the volumes of contaminated soil and for reconstitution and remediation actions.

e) Sampling time

The moment for sampling is mainly defined by climatic conditions –especially variations in rain and temperature patterns- and by the soil management system.

f) Sampling frequency

The sampling frequency is determined by soil use intensity in the area and available seasonal climatological data, mainly in relation to the intended use of the data (conduct assessment, improvement, remediation, etc.).

g) Sample conditioning

Samples weighing approximately 500g, identified and conditioned in plastic bags, are taken to the laboratory following the requirements of a chain of custody (traceability).

h) Soil laboratory

Upon delivery to the laboratory, samples are given a protocol number and logged into the laboratory log book, including the following information: date of receipt, sample identification, requested type of analysis, the requesting organisation's details and the history of the lot.

The newly arrived samples with their protocol numbers are placed on trays and left to dry in the air. They are then prepared according to the requested analysis and then placed again in marked plastic bags for a subsequent control analysis.

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