

# POLLUTION PREVENTION

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## 1. ABOUT THIS E&S BRIEFING NOTE

This E&S Briefing Note is designed to help fund managers quickly familiarise themselves with the topic of pollution prevention as it relates to investment. It is not intended to be a detailed technical guidance document.

Formal specific technical guidance is provided at the end of this E&S Briefing Note and in [Downloads & Reference Materials](#), including [International Finance Corporation's \(IFC's\) 2012 Performance Standard 3: Resource Efficiency and Pollution Prevention](#). Where companies' activities present risks to local communities' health and safety, [International Finance Corporation's \(IFC's\) 2012 Performance Standard 4: Community Health, Safety, and Security](#) is also relevant.

This E&S Briefing Note provides an overview and general guidance. Fund managers should carefully consider each company based on its specific characteristics and circumstances including scale, location, technology, management capacity and commitment, and track record. Risks, impacts and opportunities relating to a particular company or sector can also change over time for a number of reasons (e.g. changes in the applicable laws and regulations, or changes to a company's activities or assets). Fund managers may need to engage external experts in some situations (see 'Advice for fund managers' section below).

## 2. INTRODUCTION

Economic activities can be the source of significant pollution to air, water and land, adversely affecting the health of living beings and the resources which sustain life. Pollution can be defined as causing adverse changes to the natural environment by the introduction of contaminants. Pollution can take the form of chemical substances or energy, such as noise, heat or light. Pollutants can be either man-made substances/energies or naturally occurring contaminants.

### **Companies should focus on opportunities to avoid or reduce the release of contaminants at source**

Although pollution control technologies can be installed to address pollution such as air emissions, wastewater or solid wastes, these controls can result in significant additional costs (which need to be fully understood and factored into valuations and asset development if implemented). In most instances, it is more effective and better value to reduce pollution at source (e.g. through Project design, better management and operation or control of inputs).

Compared to the conventional 'end-of-pipe' approach to pollution-abatement investments, which increase both capital and running costs, cleaner production initiatives yield payback of three to 24 months, usually because process re-engineering cuts ongoing operating costs as well as reducing pollution. Cleaner production also has the potential to improve quality, resulting in higher value products and improved competitiveness ([FIRST for Sustainability](#)).

## **3. WHY COMPANIES AND FUND MANAGERS SHOULD ADDRESS THIS TOPIC**

### **3.1 Risks for the business**

Failure to apply appropriate pollution prevention measures can result in a range of negative impacts on companies, such as:

- Excessive expenditure on management of air emissions and liquid and solid wastes due to inefficient/inappropriate design of pollution control measures.
- Fines and penalties for non-compliance with national pollution prevention standards, especially with respect to air emissions, wastewater discharges, solid waste and hazardous chemicals management.
- Significant fines and penalties, and reputational damage, due to the occurrence of accidents (e.g. major chemical spills or accidents involving the release of hazardous materials to the environment).

Costs associated with accident remediation and compensation (e.g. costs associated with soil remediation).

### **3.2 Opportunities for the business**

Active management, especially through the reduction and removal of pollution at source can result in a range of short, medium and long-term business benefits, such as:

- Cost savings through more efficient pollution control equipment and technologies.
- Additional revenue (or reduced costs) as result of the reuse or recycling of waste either at the company's facilities or in other industries.
- Preparedness for regulatory changes, such as implementation of a carbon tax or more stringent emissions standards.
- Reduction of risks and costs associated with serious accidents (see above).
- Reputational benefits.

## 4. ADVICE FOR FUND MANAGERS

See [CDC Environmental and Social Checklist](#) as it contains questions and tips to help fund managers to assess the E&S aspects of an investment.

Companies and investors should understand the main pollution risks present within an organisation. Virtually every sector releases pollutants into the environment to some degree and the risks and impacts vary considerably.

### 4.1 Sectors and activities with particularly significant pollution issues

- Medium- to large-scale construction (e.g. infrastructure development).
- Infrastructure.
- Power (particularly thermal power plants).
- Mining.
- Oil and gas operations (including extraction, refining and transportation).
- Agriculture, aquaculture and forestry.
- Manufacturing and/or transportation of hazardous materials (e.g. fertilisers, pesticides).
- Heavy manufacturing (e.g. cement, glass, pulp and paper mills, foundries).

Fund managers should ensure that, at a minimum, companies have appropriate management systems in place and operate in compliance with applicable laws and regulations. In many cases, local regulations may not be fully aligned with good international industry practice (GIIP). Fund managers should assess companies' alignment with international standards and, where appropriate, develop Action Plans to ensure that any gaps are addressed within a reasonable time frame.

If an existing company does not operate in accordance with expected performance levels, and if retrofitting is not feasible in the short to medium-term, fund managers should consider the level of risks/impacts and establish Project/company-specific emissions/discharge reduction targets. These should be technically and financially feasible, with an appropriate timetable for achieving them.

Companies should be able to demonstrate that they have implemented a management system that covers the following:

### 4.2 Avoid pollution/reduce pollution at source

Where possible, the first option should always be to avoid generating pollutants (e.g. by substituting raw materials/energy sources with less polluting raw materials/energy sources).

If this is not possible, pollution control technologies can be installed. However, these controls can result in significant additional costs which need to be fully understood and factored into valuations and asset development. In most instances therefore, it is more effective and better value to reduce pollution at source (e.g. through Project design, better management and operation or control of inputs).

### 4.3 Air emissions and air quality

Air and particulate emissions are typically associated with processes such as fossil fuel combustion. They take the form of a range of gases depending on the industry sector, such as

CO<sub>2</sub>, nitrogen oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), carbon monoxide (CO), ammonia (NH<sub>4</sub>), volatile organic compounds (VOCs), ozone depleting substances (ODS) and metals. Air emissions are generated by three sources, these are, emissions generated at point sources (e.g. stacks), fugitive sources (e.g. sand and gravel storage areas) and mobile sources (e.g. vehicles).

Fund managers should establish whether the company has systems in place to be able to manage and monitor the air emissions associated with their operations. In some cases this may require qualitative or quantitative assessments and atmospheric dispersion models to assess potential ground level concentrations and environmental impacts.

At a facility level, air emissions should not result in pollutant concentrations that exceed emission limits or the ambient air quality standards set by national authorities. Pollutant concentrations can also be compared to GIIP to identify any deviations which might indicate poor performance (see the applicable [World Bank Group EHS Guidelines](#)).

Additional assessment and monitoring should be conducted for companies that generate significant emissions, and made to reduce emissions over the life of the investment.

#### **4.4 Wastewater and water quality**

Fund managers should establish whether the company monitors the quality, quantity, sources and discharge points of liquid effluents by type (i.e. process wastewater, wastewater from utility operations, stormwater and sanitary wastewater) and assess what these levels are.

At a facility level, water discharges should not exceed wastewater discharge limits set by national authorities. Pollutant concentrations should also be compared to GIIP to identify any deviations, which would indicate poor performance (see the applicable [World Bank Group EHS Guidelines](#)).

To reduce the volume of wastewater requiring specialised treatment, improvements can often be made to water use efficiency and production processes (including reducing the use of hazardous materials that contaminate water), and treating wastewater on-site prior to discharge in order to reduce the load of contaminants. When discharging to water bodies (e.g. rivers, the ocean), an assessment should be conducted to evaluate impacts on the receiving bodies.

Mixing rainwater and/or clean water with wastewater should typically be avoided as this: (i) will increase the volume of polluted water and, therefore the volume of wastewater to be treated; and (ii) is not good practice and is illegal in some countries.

The level of pollutants present in wastewater effluents depends on the nature of the operations. Key parameters of wastewater that require attention include, coliform levels (from domestic and sanitary effluents and livestock operations), biochemical oxygen demand (BOD), chemical oxygen demand (COD), suspended solids (SS) (often an issue from construction site run-off), oil and grease, and concentration of heavy metals.

Additional assessment and monitoring should be conducted for companies that generate higher than average levels of wastewater and efforts made to reduce those levels over the life of the investment.

#### **4.5 Wastes and hazardous materials**

Waste can contain solid, liquid or gaseous material that can be reused, recycled, used for energy

generation or disposed of. Companies should always try to first avoid or minimise waste generation. Where this is not possible, the following hierarchy should be followed (from most favourable to least favourable): reuse, recycle, use waste for energy generation and, where no other alternative is technically and economically feasible, dispose of adequately. Inappropriate waste disposal practices can lead to contamination of ground water and potential fines and/or penalties under national regulations.

Companies should have a waste management plan defining how wastes would be managed.

**Solid (non-hazardous)** waste generally includes domestic trash, inert construction/demolition materials, metal scrap and empty containers (except those previously used to contain hazardous materials, which should be managed as a hazardous waste), and residual waste from industrial operations.

**Hazardous waste** shares the properties of a hazardous material (such as ignitability, corrosivity, reactivity, or toxicity), or other physical, chemical, or biological characteristics that may pose a potential risk to human health or the environment if improperly managed. When a hazardous material is no longer usable for its original purpose and is intended for disposal, but still has hazardous properties, it is considered hazardous waste.

Typically, hazardous wastes include solvents, fuels, asbestos in building materials, PCB oils in electrical equipment, most pesticides, and ozone depleting substances in refrigeration systems. Wastes may also be defined as 'hazardous' by local regulations or international conventions, based on the origin of the waste and/or its inclusion on hazardous waste lists. Hazardous wastes should be segregated from non-hazardous wastes and managed by accredited waste management companies. Waste disposal includes a duty of care requirement which imposes accountability on companies to ensure that third parties who transport and dispose of waste do so in ways that are safe, secure and legal.

**Hazardous materials** should be adequately stored to avoid any release which could have an impact on workers, communities, biodiversity and ecosystem services (e.g. water, soil). Companies should have management plans covering the handling of hazardous materials.

If a company's activities involve the use of pesticides, management plans to ensure they are handled adequately should be implemented.

#### **4.6 Land and groundwater contamination**

Land and/or groundwater can become contaminated as a result of current or past operations, including accidents (e.g. oil spills). Fund managers should take into account potential historic land contamination liabilities, which are typically associated with inadequate management/use of hazardous substances (e.g. oil) and/or wastes. In some cases, technical studies to assess land contamination risks may be appropriate prior to or post investment, depending on the materiality of the risks.

It should be noted that pollutants in the soil can migrate and therefore impact areas and receptors which are not next to the source of pollution. This could cause potential risks to human health and ecology and can generate liabilities for the business owners (e.g. cost of remediation, damage to reputation and/or business-community relations) or affected parties (e.g. workers at the site and nearby property owners).

#### **4.7 Other forms of pollution**

Risks and impacts associated with radiation, vibration, noise, odours, electromagnetic energy, pests and pathogens and visual impacts should also be assessed by fund managers and, where appropriate, management measures should be discussed with companies.

## 5. FURTHER RESOURCES

### 5.1 Further information and guidance

- [IFC 2012 Performance Standard 3: Resource Efficiency and Pollution Prevention.](#)
- [IFC 2012 Guidance Note3: Resource Efficiency and Pollution Prevention.](#)
- [World Bank Group EHS Guidelines.](#)
- [Resource Efficient and Cleaner Production UN Cleaner Production Web.](#)