

4. The project is classified as a category III according to the IIC's environmental and labor review procedure because specific impacts may result that can be avoided or mitigated by adhering to generally recognized performance standards, guidelines, and design criteria. The environmental and labor considerations related to the project include the following: handling and disposal of solid wastes, treatment of liquid effluents, emissions to the atmosphere, noise, fire safety, occupational health and safety, and labor considerations.

#### Environmental Aspects:

5. The waste normally generated by flexible packaging production processes includes solid wastes (plastic, paper, and aluminum); used solvents; toxic residual effluents; emissions of solvents to the air, and noise, chiefly from presses and printing machinery. As part of its operations, the company has taken steps to mitigate environmental impact, including the use of environmentally friendly technologies and processes and protective measures.

6. The inks and solvents used in Sigma S.A.'s operations are supplied by Sun Chemical de Centroamérica, which in 1995 started substituting pigments in order to eliminate toxic substances (heavy metals) from its inks. Since 1996 the pigments used in the company's inks have been lead-free. Initiatives such as these have been implemented despite the fact that El Salvador does not currently have any legislation restricting the use of lead-based pigments in food products. The Asociación Salvadoreña de la Industria del Plástico (ASIPLASTIC) provides training for the industry in, among other areas, the use of inks with organic-based pigments.

7. For quality control, Sigma S.A. the company has a laboratory equipped to comply with its customers' standards; the customers visit the packaging plants regularly so as to ensure that the facilities and the production process meet the requirements for their products. According to Sigma S.A., it recently received ISO 9000 certification, and has scheduled the audit for ISO 9001 certification.

8. On 2 March 1998, El Salvador's environmental protection act was passed by means of legislative decree No 233. The Ministerio de Medio Ambiente y Recursos Naturales (MARN) is responsible for enforcing the relevant regulations, published in the Diario Oficial de El Salvador on 12 April 2000, which establish the obligation to carry out an environmental impact study, obtain an environmental permit, and draft an environmental compliance program. The MARN subsequently carries out environmental evaluation audits (monitoring). In compliance with environmental regulations, Sigma S.A., with assistance from a local consulting firm, drafted an environmental diagnostic review covering its permits for solid waste disposal, liquid effluents, emissions to the atmosphere, and other requirements. The environmental diagnostic review was submitted to the MARN; a decision is expected in the next few months and will be reported to the IIC. The IIC will require that Sigma S.A. keep its permits up to date and comply with local and national laws and regulations and applicable IIC policies.

9. In order to develop an environmental management system eligible for ISO 14000 certification, Sigma S.A. will provide its personnel and internal auditors with training on this standard in October 2003, draft and implement procedures in June 2004, and carry out internal audits of the system in July and October 2004. It expects to obtain ISO 1400 certification in December 2004. Sigma S.A. has professionals in charge of handling environmental and plant safety matters.

10. Solid waste: The solid wastes generated in the production process are: (1) scraps of flexible material (polyethylene) from checking the rolls after the flexible packaging has been printed and shaped; these may contain paper, polypropylene; polyethylene, polyester cellophane, and aluminum;

(2) material rejected for failing to meet quality standards; the quality control process for finished materials takes into consideration such factors as printing errors due to color trapping, printing out of register, scratches, and misshapen cylinders. About 30% of the solid wastes are sold; the remaining 70% (an average of 108 tons per month) is taken to the Nejapa sanitary landfill because the company is authorized to dispose of its wastes in a municipal landfill. The steps taken by the company to decrease the generation of solid wastes and dispose of them appropriately include the following:

*Waste Management:* The suppliers will develop and implement a plan to manage waste and prevent pollution, avoiding the use of landfill or burning, by waste recycling. Empty pesticide containers will be handled appropriately and will not be re-used. The containers will be pressure washed at least three times with water, will be punctured to ensure they can not be re-used, will be kept secure until they are given its manufacturers for recycling. As part of a pilot initiative to implement organic agriculture by one of the suppliers visited during the appraisal visit, organic waste such as grapes that can no longer be harvested were being composted, thereby reducing the generation of organic waste.

- Use of new machinery that reduces the volume of solid wastes generated;
- Using plastic scraps as an alternative source of energy in the cement industry. Three times a week, plastic waste is taken to the warehouses of Ecoamigos for subsequent onshipment to the Cemento de El Salvador (CESSA) production plant. Ecoamigos is an environmental protection program sponsored by the Asociación Salvadoreña de la Industria del Plástico, which, jointly with CESSA, disposes of plastic waste by means of an energy recovery program (energy ecoefficiency); the cement plant complies with worldwide environmental standards and won the national environmental protection prize in 2000.

11. Liquid effluents: The production process generates liquid effluents (10 m<sup>3</sup> daily) from the electrotype process (galvano 1 and galvano 2) for treating and preparing the rollers for printing flexible packaging. Used in the process are: hydrochloric acid, copper sulfate, caustic soda, detergent, and rinse water. This effluent currently converges in a tank, where it spills over directly to the public sewer system. Sigma S.A. has taken steps to mitigate the environmental impact of the liquid waste it generates, including:

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- Use of lead-free ink since five years ago;
- Purchase, in 1998, of a solvent recycling and recovery system for the print washing area, reducing the generation of toxic effluents. Before then, the solvent was not recycled;
- Use of a new electromechanical electrotype and engraving process that has decreased the generation of liquid waste;
- Program for reducing the use of different solvents, from seven different ones to just the three used at present (ethyl acetate, normal-propyl, and isopropyl alcohol). Waste solvent is sold locally for reprocessing.

Sigma, S.A. has recently built a wastewater holding pond where the solid particles of metals and contaminants are separated from the liquid effluents. In order to achieve a comprehensive solution, Sigma, S.A. will very soon acquire a liquid effluent treatment plant. The handling and disposal of liquid effluents are covered in the environmental diagnostic review submitted to the MARN and are included in the wastewater treatment plant project. The IIC will require that liquid effluent discharges comply with local and national regulations and applicable IIC standards.

12. Emissions to the atmosphere and noise: Outside the boundaries of the property where the ROTOFLEX production operations take place, the concentration of volatile organic compounds due to emission of solvents is acceptable, according to tests made during the environmental diagnostic review. Concentrations inside the production area in which inks and solvents are used, while not high, need to be controlled. To this end the air extraction system has been modified to improve conditions in the plant. Vapor extraction has been made more effective, vapor no longer concentrates in the production plant, and working conditions have improved in this area of the plant. In addition, two solventless rolling mills were purchased in 1992 and 2002 to minimize the use of adhesives with solvent and prevent emissions to the atmosphere. Contribution to the outside noise level is acceptable, but in order to improve working conditions at the plant, workers in the noisiest areas should use earplugs.

13. Fire safety: Fire is the main risk in the paper and packaging industry. Safety measures currently in place for handling inflammable and toxic substances include the safe storage of inflammable liquids, explosion-proof lamps in the ink warehouse, training in the safe handling of chemicals and inflammable substances, training in firefighting and preventive measures, and statistics on the delivery of industrial safety equipment. The signage of emergency exits, walkways, and the location of fire extinguishers is up to date. At its flexible packaging plant, Sigma S.A. has a pool that can be used as a back-up supply in the event of fire. The pool has separate pump and energy sources in case of an emergency. Progress with the firefighting plans in 2001 and 2002 includes:

- Purchase of ten, twenty-pound CO<sub>2</sub> fire extinguishers.
- Layout with information on the location of fire extinguishers.
- Worker training provided by the San Salvador fire department.
- Follow-up visits and inspections by the fire department.
- Fire analysis and statistics.
- Electrical system audits.

14. Occupational health and safety: In addition to the labor benefits required by law, Sigma S.A. offers its workers general medical, dental, and pediatric care, including office visits and drugs; coops for purchasing staples, and a dining hall.

15. The moving parts on all of the machinery have guards to keep the workers' clothing or extremities from being caught. Sigma S.A.'s internal rules prohibit wearing long, loose hair, watches, necklaces and pendants, ties, or other items that could endanger the operators. Everyone wears a cap to keep hair from falling on the packaging for food and pharmaceutical products. The progress made by Sigma S.A. in 2001 and 2002 in the area of safety plans includes:

- Ministerio de Trabajo certification of Sigma, S.A.'s safety committee.
- Hiring of a new chief of industrial safety.
- Purchase of safety training videos.
- Provision of protective shoes for production workers.
- More orderly and cleaner production plant.
- Drafting of safety manuals for each process.

- Effective implementation of pest control.
- Drawing up of accident statistics and provision of protective gear.

16. Labor considerations: The minimum age to work in Sigma S.A. is eighteen. Organizational climate polls are taken periodically to find out the workers' opinions on: their jobs, relationships with immediate superiors, physical working conditions, communication, and training, among others. The labor climate is harmonious and in full compliance with labor principles and guidelines.

**Oversight and Compliance:**

17. The IIC will require Sigma S.A. to implement an acceptable environmental management plan. The plan must include (1) a description of planned improvements to the company's safety and environmental protection systems; (2) a schedule for implementing all of the environmental and safety measures mentioned herein; and (3) the components that are subject to yearly oversight. Throughout the project, the IIC will ensure compliance with its own environmental and labor policies, review the verification reports that Sigma, S.A. submits each year, and make regular field visits as part of the project supervision process.