MONSANTO PLEDGE GUIDELINE

#1

POLLUTION PREVENTION

The company will work toward the ultimate goal of ensuring zero effect attributable to waste in all media. It will research, design and operate its facilities to minimize the generation of process and nonprocess waste and the potential effect of chemical releases to the environment. For waste and releases that remain, the company will comply with regulations, while minimizing environmental threat and long-term liability.

KEY RESULTS

- Reduce by 90 percent the company's 1987 level of worldwide air emissions of chemicals named by the United States Environmental Protection Agency (USEPA) under Title III of the Superfund Amendments and Reauthorization Act (SARA Section 313) and chemicals of local concern outside the United States by the end of 1992.
- Reduce by 70 percent the company's worldwide SARA Section 313, European Community Priority Pollutant List (EC 129) and carbon monoxide chemical releases to all media and off-site transfers by the end of 1995.
- Discontinue the deep-well injection of Resource Conservation and Recovery Act (RCRA) hazardous waste streams and SARA Section 313 toxic chemicals by the end of 1999.

PROGRAM

1.1 Process Waste

The operating units will integrate into their release reduction plans the corporate goal of reducing all toxic and hazardous releases and emission to all media, working toward an ultimate goal of zero effect. For reducing releases from processes, the order of preference is source reduction, followed by reuse, recycling or co-product sale, and finally by incineration or other treatment to reduce the volume and/or toxicity of pollutant streams. The development and use of technologies that improve competitive positions will be emphasized.

The operating units will integrate into their release-reduction plans the following corporate goals:

> Reduce by 90 percent the company's 1987 level of worldwide air emissions of SARA Section 313 chemicals and chemicals of local concern outside the United States by the end of 1992.
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> Reduce by 70 percent the company's worldwide SARA Section 313, EC 129 and carbon monoxide chemical releases to all media and off-site transfers by end of 1995. The January 1990 SARA 313 and EC 129 lists plus carbon monoxide apply through the end of the multimedia release reduction program.

An effect-based release reduction target will be established every five years beginning in 1995, working toward an ultimate goal of zero effect. By the end of 1993, a method and process for an effect-based reduction program for toxic chemicals will be developed.

1.2 Nonprocess Waste

Each facility will maintain an inventory of all nonprocess sources of waste generation, including power generation, office and maintenance operations, general warehouse trash, packaging/shipping materials and similar sources.

1.3 Underground Well (Deep-well) Injection

The company will discontinue deep-well injection of RCRA hazardous waste streams by the end of 1999. It will also apply best feasible technology to virtually eliminate the deep-well injection of SARA 313 chemicals. The company's name will not appear on the list of companies making significant use of injection wells for disposal of SARA chemicals for the reporting year 2000 and beyond. The company will demonstrate progress by achieving in 1996 an 80 percent reduction of injected SARA chemicals against the 1990 base reporting year.

To be prepared for the possibility of mandatory regulations, the company intends to select by the end of 1995 optimal technical strategies for total withdrawal from deep wells. This preparation will include study-grade estimates to achieve non-brine, treated surface discharge. All operating units will continue where possible to challenge the technical impediments to total withdrawal from deep wells.

No new uses of deep wells for hazardous or toxic materials are permitted. A "new" use of deep wells is defined as injection of streams from new products or the addition of substances not previously injected at that site. New internal or external uses of deep wells for non-hazardous wastes and nontoxic chemicals will be considered by the Environmental Policy Committee (EPC) only on an exception basis and within the constraints of these guidelines. The economics of any project appropriation request for such use must be based on disposal technology other than the use of deep wells.

1.4 Polychlorinated Biphenyls – "PCB-Free"

All company-owned sites (e.g., warehouses, plants, offices) located in the United States will minimize the potential for releases of polychlorinated biphenyls (PCB) by becoming "PCB-free" of Toxic Substances Control Act (TSCA)-contaminated articles by the end of 1994.

1.5 Land Disposal

Landfill of "acutely hazardous" wastes[1] and "incinerables"[2] will not be practiced. For hazardous wastes and wastes managed as hazardous, fixation of particularly mobile, persistent or bioaccumulative wastes will be accomplished whenever warranted and feasible. In making the decision to manage wastes as hazardous, the company will take into account public expectations, emerging trends and worldwide company practice regarding the same or similar wastes.

Contractors hired for land disposal of process wastes will be subject to contracting and assessment requirements (see *Pledge Guideline No. 7, Outside Processors*). In the United States, the use of off-site hazardous waste landfills will be approved by the Environmental Policy Committee and will be limited in number.

Medical wastes generated at the company's locations will be incinerated prior to land disposal of residues. Assurance of incineration will be obtained via manifests or equivalent documents if manifests are not available.

The use of Monsanto facilities to commercially treat, store or dispose of non-Monsanto wastes is normally discouraged. Any such use or joint ventures (other than in site guest/host relationships) for waste management must be reviewed and approved by the Environmental Policy Committee.

Proposals for land application of process by-products and residues, for beneficial use or disposal, should be guided by the "Monsanto Guidance Document: Land Application of Process By-Products and Residues." The ESHA (formerly EC-201/202) discipline will be followed for such proposals, including 5-year reviews. New applications must be approved by the appropriate Directors of Manufacturing and Environmental operations; the Environmental Policy Committee must approve if beneficial use is not included.

Each company location will maintain a record of both the on-site and the commercial waste treatment, storage and disposal sites it uses.

1.6 Air Emission and Water Release Assessments

The company will conduct and maintain an ongoing assessment of potential human health impacts for selected, routinely emitted air pollutants. It will develop appropriate control strategies to reduce identified, potentially unreasonable risk of harm to human health in surrounding communities. The list of air pollutants to be studied include: a) those listed under Section 112(b) of the U.S. Clean Air Act; b) those for which the

[1] As listed in 40 CFR 261.33(e), plus any mixtures containing greater than 5 percent.
[2] Hazardous wastes, or wastes managed as hazardous, with a heat of combustion greater than 6000 BTU/lb.

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USEPA has established cancer unit risk values; c) those contained on the International Agency for Research on Cancer (IARC) group 1 and 2A lists; d) other site-specific pollutants identified by the plant that appear to warrant consideration (including those in significant quantities reportable via SARA Section 313). Plants outside the United States will use the above-given pollutant list plus any additional air pollutants on any local regulatory list that the plant manager deems important.

Each plant will maintain a list of all such air pollutants, ranked by established and approved protocols. Depending upon the pollutant's relative ranking and if required by the protocols, the plant will use appropriate dispersion modeling techniques to determine potential maximum downwind concentrations for each such pollutant at specified receptors representative of the exposed population utilizing appropriate dispersion modeling techniques. Appropriate assessments of potential human health impacts at the community receptor points will then be analyzed according to protocols established by the company's Environmental, Safety and Health staff. Any potentially unreasonable risk to human health that is identified will be expeditiously reduced to acceptable levels through appropriate actions.

The company will conduct aquatic safety assessments to determine the measurable impacts, if any, of its effluents on receptor water quality. The assessments should include both direct and indirect discharges (if applicable) with the mitigating impacts of the publicly owned treatment works (POTW) taken into account for the indirect discharge assessments. Any potentially unacceptable impacts to the aquatic environment identified will be mitigated in a timely manner. A reconfirming assessment will be conducted to verify that the impacts have been reduced to acceptable levels.

All initial air emission and surface water release assessments required should be conducted for each of the company's worldwide manufacturing sites within two years of the EPC's approval of this guideline. Operating units will review the status of the assessments annually, and if any significant changes have occurred at a plant site, determine whether the assessment should be repeated. Any such reassessments will be completed within 12 months.

1.7 Measurement

The following indicators will be used to measure progress against this guideline:

1.7.1 Annual progress toward achievement of 90 percent SARA Section 313 air emissions reduction goal.

1.7.2 Annual progress toward achievement of 70 percent worldwide SARA Section 313 chemical releases and off-site transfer reduction goal.

1.7.3 Achievement of contingency planning for reduction of use of deep-well injection.

1.7.4 Annual progress toward goals involving discontinued deep-well injection of RCRA hazardous waste streams and toxic SARA Section 313 chemicals.

1.7.5 Air Emissions and Water Release Assessments

The company's air and water steering committees will be responsible for tracking the air emission and water release environmental assessments conducted at each site and maintaining an ongoing list of the assessments' current status. In addition, each plant's environmental compliance audit will check the current status of these assessments and report on progress as part of the audit's findings.

1.8 Coordinators

Where clarification is required, the following coordinators should be contacted:

WASTE MANAGEMENT
D. B. Redington, ESH, Corporate, A3NA
(314) 694-6503.

ASSESSMENT
C. D. Malloch, ESH, Corporate, A3NA
(314) 694-8889.

(Revised and approved by the Environmental Policy Committee, February 18, 1994.)

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