United States Environmental Protection Agency | Prevention, Pesticides And Toxic Substances (7508W) | EPA-738-F-94-023 September 1994

# R.E.D. FACTS

# 2,2-dibromo-3-nitrilo-propionamide (DBNPA)

## Pesticide Reregistration

All pesticides sold or distributed in the United States must be registered by EPA, based on scientific studies showing that they can be used without posing unreasonable risks to people or the environment. Because of advances in scientific knowledge, the law requires that pesticides which were first registered years ago be reregistered to ensure that they meet today's more stringent standards.

In evaluating pesticides for reregistration, EPA obtains and reviews a complete set of studies from pesticide producers, describing the human health and environmental effects of each pesticide. The Agency imposes any regulatory controls that are needed to effectively manage each pesticide's risks. EPA then reregisters pesticides that can be used without posing unreasonable risks to human health or the environment.

When a pesticide is eligible for reregistration, EPA announces this and explains why in a Reregistration Eligibility Decision (RED) document. This fact sheet summarizes the information in the RED document for reregistration case 3056; 2,2-dibromo-3-nitrilopropionamide or DBNPA.

## Use Profile

DBNPA is a biocide used in a variety of industrial processes to control algae, bacteria, fungi and yeasts. Formulations include tablets and both solid and liquid soluble concentrates. DBNPA is applied through shock/slug, initial, intermittent, maintenance, during manufacture and continuous feed treatments, using metering pumps, drip feed devices and other types of industrial equipment. A National Pollutant Discharge Elimination System (NPDES) permit is required for discharges to waterways.

## Regulatory History

DBNPA was first registered as a pesticide in the U.S. in 1972. Currently, 44 products are registered that contain this active ingredient.

## Human Health Assessment

### Toxicity

DBNPA is corrosive to the eyes and has been placed in toxicity category I (the highest of four acute toxicity categories) for this effect. It is moderately, systemically toxic by oral or inhalation routes (toxicity category II), and slightly toxic by the dermal route (toxicity category III). Although classified in toxicity category III for primary dermal irritation, DBNPA can kill skin tissue in rabbits when administered at high doses for a prolonged period of time. DBNPA also is a skin sensitizer.

In a subchronic toxicity study using rats, DBNPA caused breathing difficulty associated with lung or heart disease, as well as weight loss and several deaths at the higher doses. When applied to the skin of rats in another subchronic study, DBNPA caused changes in body chemistry and dermal irritation at the higher doses.

DBNPA is a developmental toxicant in rabbits. It was shown to cause structural alterations (retarded ossification of several fetal skeleton elements) at a maternally non-toxic dose level. DBNPA is not mutagenic.

EPA has received several human incident reports in which eye, throat and respiratory irritation, runny nose and headache resulted from spills or misuse of DBNPA.

### Dietary Exposure

A food additive tolerance, or maximum pesticide residue limit for processed food, has been established for food grade paper or paperboard manufactured by processes using DBNPA (please see 21 CFR 176.300). This tolerance is under the regulatory purview of the Food and Drug Administration (FDA), and EPA defers to FDA regarding the safety of dietary exposure to DBNPA.

### Occupational and Residential Exposure

The potential for occupational exposure exists, particularly among those workers or "handlers" loading DBNPA products by open delivery or pouring methods. Handlers may be at risk for acute or developmental toxicity effects via dermal or inhalation exposure.

EPA estimated the Margins of Exposure (MOE) to handlers using open pouring systems and closed systems. All the MOEs are acceptable except for the scenario in which a handler uses an open pouring method to add DBNPA to cooling. With appropriate personal protective equipment (PPE), however, this handler's exposure would be significantly reduced and the MOE would be acceptable.

Risks to post-application/reentry workers are not anticipated because their potential for exposure is much less than handlers'. Residential exposure is not expected since DBNPA has no residential uses.

### Human Risk Assessment

DBNPA is corrosive to the eyes, can kill skin tissue exposed to the chemical at high levels for a prolonged period of time, and is a developmental toxicant in rabbits. Several human incidents have been reported involving acute exposure to DBNPA after spills or misuse.

Handlers of DBNPA may be at risk for acute or developmental toxicity effects, particularly those using open pouring methods to add the pesticide to cooling towers. EPA is requiring use of appropriate PPE or a closed application system through this RED to mitigate these risks to workers.

## Environmental Assessment

### Environmental Fate

Because of its use pattern, DBNPA would not generally contaminate ground water, but could contaminate surface waters through discharge or spill. DBNPA generally hydrolyses rapidly in natural waters to many degradates which continue to degrade rapidly by aerobic and anaerobic aquatic metabolism. This decreases their threat to surface water contamination. The primary degradation pathway is through aerobic and anaerobic metabolism.

### Ecological Effects

DBNPA is highly toxic to mammals and birds on an acute oral basis, but has low toxicity to birds on a dietary basis. The pesticide is moderately toxic to freshwater fish, estuarine fish and shrimp; moderately to highly toxic to freshwater crustaceans; and highly to very highly toxic to estuarine shellfish and larvae. Levels at which acute effects begin for shellfish have not been established, but are less than the analytical detection limit. Many effects to aquatic organisms occur within 24 hours of exposure.

### Ecological Effects Risk Assessment

DBNPA will be of moderate toxicity to terrestrial mammals and birds if they are exposed orally to concentrated doses of the pesticide in situations such as an accidental spill or excessive discharge of the pesticide into a static pool. Under usual circumstances, however, dietary toxicity to birds is low.

Without any mitigation measures, DBNPA poses a high risk to aquatic organisms. To mitigate these risks, EPA is requiring secondary biological treatment of waste water for all uses of DBNPA except use in waste water treatment systems (since biological degradation readily occurs there, anyway); in secondary oil recovery systems (where biological treatment is

not feasible, but EPA is less concerned about this use pattern due to the potential for only limited exposure); and in single flow-through cooling tower systems.

The use of DBNPA in single flow-through cooling tower systems poses an unacceptable risk to aquatic organisms. Secondary biological effluent treatment is not practical for this use; thus, the risks it poses to aquatic organisms cannot be mitigated. Meanwhile, the benefits it affords are low or non-existent--the amount of DBNPA used for this purpose is negligible and registered alternatives are less costly. Therefore, the use of DBNPA in single flow-through cooling tower systems is not eligible for reregistration, and EPA will take appropriate regulatory action against DBNPA products labeled for this use.

## Additional Data Required

No additional generic data are required to support current uses of DBNPA. The Agency is requiring product-specific data including product chemistry and acute toxicity studies, revised Confidential Statements of Formula (CSFs) and revised labeling for reregistration.

## Product Labeling Changes Required

All DBNPA end-use products must comply with EPA's current pesticide product labeling requirements, and with the following:

**Personal Protective Equipment (PPE), Engineering Controls, and Safety Requirements**

The minimum (baseline) PPE for handlers engaged in open pouring of DBNPA into cooling towers is: long sleeve shirt, long pants, shoes plus socks, chemical-resistant gloves, and a chemical-resistant apron.

The following labeling statements are required on all DBNPA end-use products intended primarily for occupational use:

Application Restrictions:

> "Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application."

Engineering Controls:

> "When handlers use closed metering systems the handler requirements may be reduced or modified to long-sleeve shirt, long pants, shoes and socks."

User Safety Requirements:

> "Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry."

User Safety Recommendations:

"Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet."

"Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing."

"Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing."

Sensitization Statement:

Required in the "Hazards to Humans (and Domestic Animals)" section of the Precautionary Statements on labeling of all end-use products:

"This product may cause skin sensitization reactions in some people."

Type of Respirator:

If the acute inhalation toxicity of the end-use product is in category I or II and, therefore, a respirator is required for pesticide handlers, the following type of respirator is appropriate to mitigate DBNPA inhalation concerns:

"A respirator with either an organic-vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G)."

**Effluent Discharge Labeling Statement**

All DBNPA manufacturing-use or end-use pesticide products that may be contained in an effluent discharged to the waters of the U.S. or municipal sewer systems must bear the following statement:

"This product is toxic to fish and invertebrates. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Secondary biological treatment of DBNPA effluent is required for all uses except for use in secondary oil recovery systems. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA."

## Regulatory Conclusion

Most uses of currently registered pesticide products containing DBNPA in accordance with approved labeling will not pose unreasonable risks or adverse effects to humans or the environment. Therefore, most DBNPA uses are eligible for reregistration, and pertinent products will be reregistered once product-specific data, revised Confidential Statements of Formula and revised labeling are received and accepted by EPA.

Because the risk to non-target organisms outweighs the potential benefits associated with the use of DBNPA in single flow-through cooling towers, this use is ineligible for reregistration. EPA will take appropriate regulatory action against DBNPA products labeled for this use.

## For More Information

EPA is requesting public comments on the Reregistration Eligibility Decision (RED) document for DBNPA during a 60-day time period, as announced in a Notice of Availability published in the Federal Register. To obtain a copy of the RED document or to submit written comments, please contact the Pesticide Docket, Public Response and Program Resources Branch, Field Operations Division (7506C), Office of Pesticide Programs (OPP), US EPA, Washington, DC 20460, telephone 703-305-5805.

Following the comment period, the DBNPA RED document will be available from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161, telephone 703-487-4650.

For more information about EPA's pesticide reregistration program, the DBNPA RED, or reregistration of individual products containing DBNPA, please contact the Special Review and Reregistration Division (7508W), OPP, US EPA, Washington, DC 20460, telephone 703-308-8000.

For information about the health effects of pesticides, or for assistance in recognizing and managing pesticide poisoning symptoms, please contact the National Pesticides Telecommunications Network (NPTN). Call toll-free 1-800-858-7378, between 8:00 am and 6:00 pm Central Time, Monday through Friday.