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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: EPA Reg. No./File Symbol 9779-293
Phorate 20 G

FROM: Lucy D. Markarian 6/13/90
Precautionary Review Section E
Registration Support Branch
Registration Division (H75-05C)

TO: W. Miller (PM 16)
Insecticide & Rodenticide
Registration Division (H75-05C)

APPLICANT: Riverside/Terra Corp.
Terra Centre,
600 Fourth Street
Sioux City, Iowa 51101

FORMULATION FROM LABEL:

Active Ingredient(s):	% by wt.
<u>Phorate (O,O-diethyl S-[(ethylthio) methyl] -</u>	<u>20.0</u>
<u>Phosphorothioate</u>	
Inert Ingredient(s):	<u>80.0</u>
Total	100.0%

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BACKGROUND:

The Riverside/Terra Corporation has submitted
a new acute inhalation study in support of their
product Phorate 20 G under EPA 9779-293

This was in lieu of a study that had been found
to have deficiencies.

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RECOMMENDATION: The present test support in Inhalation Toxicity is graded core minimum because the chamber concentrations were not monitored all through the exposure periods. It would have been supplementary had the test material been less toxic. $4/5$ males died at 0.012 mg/L level that puts the LC_{50} at less than that amount. Consequently the test material is in category I. The test is acceptable as such.

Labeling

The signal word is "Danger" with the word Poison must appear in red on background of distinctly contrasting color with skull and crossbones in the immediate vicinity.

Precautionary Label must read:

Fatal if swallowed, inhaled or absorbed through skin. Do not breathe dust (vapors or spray mist) wear respiratory protective device approved by NIOSH and MSHA. Do not get in eyes, skin or clothing, wear protective clothing and rubber gloves. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

Statement of Practical Treatment must read:

If swallowed: Call physician or Poison central center
Drink 1 or 2 glasses of water and induce
vomiting by Touching back of Throat with
finger. Do not induce vomiting or give
anything by mouth to an unconscious
person.

If on skin: Wash with plenty of soap and water.
Get medical attention

If inhaled: Remove Victim To fresh air. If not
breathing give artificial respiration,
preferably mouth to mouth. Get
medical attention

if in eyes: Hold eyelids open and flush with
steady gentle stream of water for
15 minutes - Get medical attention
Note to physician: Probable mucosal
damage, may contraindicate gastric
lavage.

Restricted use pesticide

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DATA REVIEW FOR ACUTE INHALATION TOXICITY TESTING (§81-3)

Product Manager: (16)
 MRID No.: 414199-0
 Testing Laboratory: Stillmeadow, Inc. Huston Texas
 Author(s): Mark S. Heibest
 Species: Rat Harlan Sprague Dawley (SD) BR
 Sex: 15 ♂ + 15 ♀
 Source: Harlan Sprague Dawley, Inc. Huston Texas
 Test Material: Terra International Phorate 20G micronized Pesticide FD-14-2511
 Quality Assurance (40 CFR §160.12): included

Reviewer: Luc, D. Markacion

Report Date: 11/1/80

Report No. 666 J-87

Summary:

1. LC₅₀ (mg/kg): Males = _____; Females = _____; Combined = _____
2. The estimated LC₅₀ is ♂ less than 0.012 mg/L, ♀ less than 0.04 mg/L
3. Mean Concentration: 0.012, 0.040, 0.060, 0.222
4. Tox. Category: 1. Classification: Core minimum

Procedure (Deviations From §81-2): Exposure was at four levels with each of the sexes exposed to three levels. Maximum of 10 animals were exposed per level. Exposure was in 500 L N.Y. University design Standard Steel Dynamic flow inhalation chamber.

Results:

Exposure Concentration (mg/L)	Reported Mortality (NUMBER KILLED/NUMBER TESTED)		
	Males	Females	Combined
0.012	4/5		4/5
0.040		5/5	5/5
0.060	5/5	5/5	10/10
0.222	5/5	5/5	10/10

The aerosol was generated with Gem T Trist Air Mill coupled with a motor driven revolving disc delivery system, and was diluted with filtered air and drawn into the exposure chamber. Air flow into the chamber was maintained using a calibrated critical orifice. Concentrations of Test Material were measured gravimetrically.

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Anderson Cascade impactor was used to determine particle sizes.

Gravimetric				
Mean Chamber concentration →	mg/L	mg/L	mg/L	mg/L
	0.012	0.040	0.060	0.222
@ 1 hr	0.012	0.040	0.107	0.675
@ 2 hr	—	—	0.013	0.090
@ 3 hr	—	—	—	0.080
Average	0.012	0.040	0.060	0.222
Nominal concentration	0.110	0.063	0.174	1.74
Air flow LPM	133.1	145.0	112.6	106.2
Mass Median aerodynamic diameter μm	2.711	—	2.064	1.917
% of particles $\geq 3 \mu\text{m}$	30.76	—	20.22	17.91

Deaths at the three high levels occurred either during exposure or shortly thereafter. The 4 males at the 0.012 mg/L concentration died within two days after exposure. One male survived the 14 day observation period.

Signs of toxicity among the animals that succumbed to treatment showed signs of toxicity that included decreased activity, nasal discharge, tremors, ataxia, constriction of pupils, salivation, polyuria, lacrimation, exophthalmos, muscle tremors, swollen neck, chemodacryomeres, and withdrawn testes in males. These symptoms were manifested earlier and to more marked degree at the higher levels of exposure prior to death. The only surviving male showed piloerection and decreased activity. Piloerection lasted for 7 days.

Necropsy of the animals that died within 2.5 hrs into Treatment revealed dark red lungs. The signs of gross abnormal pathology in the animals that died between 4.5 hrs and two days included dark red or swollen lungs, ^{first} gastrointestinal distress as mucoid or clagified in the intestines, brownish in caecum and staining at the anal area indicative of mucoid discharge. Additionally the testes of the males were drawn into the abdominal cavity.

The survivor at 0.012 mg/L showed no abnormalities.

It is not at all clear why the chamber concentrations were not sampled at 2 and 3 hrs. for the two lower levels. If the 0.012 mg/L or 0.040 mg/L was maintained or not is not known. It is not known why the initial concentrations at 0.060 mg/L and 0.222 mg/L level group dropped dramatically to less than 56 + 42 % of the initial output at 2 hrs. Whether this was intended or not is not clear. The fact remains that the animals were initially exposed to 1.8 and 2.4 times, respectively, the target exposure level and succumbed to treatment. However, even if the concentration at the lowest level had dropped to half of 0.012 mg/L it would not change the death ratio nor the toxicity category. The study is accepted as core minimum and rated Category I.