United States Environmental Protection Agency
Prevention, Pesticides And Toxic Substances (7508W)
EPA738-R-98-010
September 1998

Reregistration Eligibility Decision (RED)

DEET

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

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

CERTIFIED MAIL

Dear Registrant:

I am pleased to announce that the Environmental Protection Agency has completed its reregistration eligibility review and decisions on the pesticide chemical case 0002 which includes the active ingredients N,N-diethyl-meta-toluamide (DEET). The enclosed Reregistration Eligibility Decision (RED), which was approved on April 13, 1998 contains the Agency's evaluation of the data base of these chemicals, its conclusions of the potential human health and environmental risks of the current product uses, and its decisions and conditions under which these uses and products will be eligible for reregistration. The RED includes the data and labeling requirements for products for reregistration. It may also include requirements for additional data (generic) on the active ingredients to confirm the risk assessments.

To assist you with a proper response, read the enclosed document entitled "Summary of Instructions for Responding to the RED." This summary also refers to other enclosed documents which include further instructions. You must follow all instructions and submit complete and timely responses. **The first set of required responses is due 90 days from the receipt of this letter. The second set of required responses is due 8 months from the date of this letter.** Complete and timely responses will avoid the Agency taking the enforcement action of suspension against your products.

Please note that the Food Quality Protection Act of 1996 (FQPA) became effective on August 3, 1996, amending portions of both pesticide law (FIFRA) and the food and drug law (FFDCA). This RED takes into account, to the extent currently possible, the new safety standard set by FQPA for establishing and reassessing tolerances. However, it should be noted that in continuing to make reregistration determinations during the early stages of FQPA implementation, EPA recognizes that it will be necessary to make decisions relating to FQPA before the implementation process is complete. In making these early case-by-case decisions, EPA does not intend to set broad precedents for the application of FQPA. Rather, these early determinations will be made on a case-by-case basis and will not bind EPA as it proceeds with further policy development and any rulemaking that may be required.

If EPA determines, as a result of this later implementation process, that any of the determinations described in this RED are no longer appropriate, the Agency will pursue whatever action may be appropriate, including but not limited to reconsideration of any portion of this RED.

If you have questions on the product specific data requirements or wish to meet with the Agency, please contact the Special Review and Reregistration Division representative Jane Mitchell (703) 308-8061.

Sincerely yours,

Lois A. Rossi, Director
Special Review and
Reregistration Division

Enclosures

SUMMARY OF INSTRUCTIONS FOR RESPONDING TO THE REREGISTRATION ELIGIBILITY DECISION (RED)

1. **DATA CALL-IN (DCI) OR "90-DAY RESPONSE"**--If **generic data** are required for reregistration, a DCI letter will be enclosed describing such data. If **product specific data** are required, a DCI letter will be enclosed listing such requirements. If **both generic and product specific data** are required, a combined Generic and Product Specific DCI letter will be enclosed describing such data. However, if you are an end-use product registrant only and have been granted a generic data exemption (GDE) by EPA, you are being sent only the **product specific** response forms (2 forms) with the RED. Registrants responsible for generic data are being sent response forms for both generic and product specific data requirements (4 forms). **You must submit the appropriate response forms (following the instructions provided) within 90 days of the receipt of this RED/DCI letter; otherwise, your product may be suspended.**

2. **TIME EXTENSIONS AND DATA WAIVER REQUESTS**--No time extension requests will be granted for the 90-day response. Time extension requests may be submitted only with respect to actual data submissions. Requests for time extensions for product specific data should be submitted in the 90-day response. Requests for data waivers must be submitted as part of the 90-day response. All data waiver and time extension requests must be accompanied by a full justification. All waivers and time extensions must be granted by EPA in order to go into effect.

3. **APPLICATION FOR REREGISTRATION OR "8-MONTH RESPONSE"--You must submit the following items for each product within eight months of the date of this letter (RED issuance date).**

a. **Application for Reregistration** (EPA Form 8570-1). Use only an original application form. Mark it "Application for Reregistration." Send your Application for Reregistration (along with the other forms listed in b-e below) to the address listed in item 5.

b. **Five copies of draft labeling** which complies with the RED and current regulations and requirements. Only make labeling changes which are required by the RED and current regulations (40 CFR 156.10) and policies. Submit any other amendments (such as formulation changes, or labeling changes not related to reregistration) separately. You may, but are not required to, delete uses which the RED says are ineligible for reregistration. For further labeling guidance, refer to the labeling section of the EPA publication "General Information on Applying for Registration in the U.S., Second Edition, August 1992" (available from the National Technical Information Service, publication #PB92-221811; telephone number 703-487-4650).

c. **Generic or Product Specific Data**. Submit all data in a format which complies with PR Notice 86-5, and/or submit citations of data already submitted and give the EPA identifier (MRID) numbers. Before citing these studies, you must **make sure that they meet the Agency's acceptance criteria** (attached to the DCI).

d. **Two copies of the Confidential Statement of Formula (CSF)** for each basic and each alternate formulation. The labeling and CSF which you submit for each product must

comply with P.R. Notice 91-2 by declaring the active ingredient as the **nominal concentration**. You have two options for submitting a CSF: (1) accept the standard certified limits (see 40 CFR §158.175) or (2) provide certified limits that are supported by the analysis of five batches. If you choose the second option, you must submit or cite the data for the five batches along with a certification statement as described in 40 CFR §158.175(e). A copy of the CSF is enclosed; follow the instructions on its back.

e. **Certification With Respect to Data Compensation Requirements**. Complete and sign EPA form 8570-31 for each product.

4. **COMMENTS IN RESPONSE TO FEDERAL REGISTER NOTICE**--Comments pertaining to the content of the RED may be submitted to the address shown in the Federal Register Notice which announces the availability of this RED.

5. **WHERE TO SEND PRODUCT SPECIFIC DCI RESPONSES (90-DAY) AND APPLICATIONS FOR REREGISTRATION (8-MONTH RESPONSES)**

By U.S. Mail:

Document Processing Desk **(RED-SRRD-PRB)**
Office of Pesticide Programs (7504C)
EPA, 401 M St. S.W.
Washington, D.C. 20460-0001

By express:

Document Processing Desk **(RED-SRRD-PRB)**
Office of Pesticide Programs (7504C)
Room 266A, Crystal Mall 2
1921 Jefferson Davis Hwy.
Arlington, VA 22202

6. **EPA'S REVIEWS**--EPA will screen all submissions for completeness; those which are not complete will be returned with a request for corrections. EPA will try to respond to data waiver and time extension requests within 60 days. EPA will also try to respond to all 8-month submissions with a final reregistration determination within 14 months after the RED has been issued.

REREGISTRATION ELIGIBILITY DECISION

DEET

LIST A

CASE 0002

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDE PROGRAMS
SPECIAL REVIEW AND REREGISTRATION DIVISION

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DEET REREGISTRATION ELIGIBILITY DECISION TEAM

Office of Pesticide Programs:

Environmental Fate and Effects Assessment

Mary Powell	Science Analysis and Coordination Staff
William Erickson	Ecological Effects Branch

Health Effects Assessment

Kathleen Martin	Risk Characterization and Analysis Branch
Whang Phang	Toxicology Branch II
William Sette	Toxicology Branch
Olga Odiott	Occupational and Residential Exposure Branch
Jerry Blondell	Occupational and Residential Exposure Branch

Biological and Economic Assessment

Wilfred Burr	Herbicide and Insecticide Branch
Alan Halvorson	Economic Analysis Branch
Thomas Harris	LUIS
Eric Riddick	Herbicide and Insecticide Branch

Risk Management Assessment

Tina Levine	Registration Support Branch
Richard Keigwin	Insecticide-Rodenticide Branch
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Marion Johnson	Insecticide-Rodenticide Branch
Kevin Sweeney	Insecticides Branch
Jane Mitchell	Reregistration Branch
Judith Coombs	Reregistration Branch
Linda Werrell	Reregistration Branch

GLOSSARY OF TERMS AND ABBREVIATIONS

ADI	Acceptable Daily Intake. A now defunct term for reference dose (RfD).
AE	Acid Equivalent
a.i.	Active Ingredient
ARC	Anticipated Residue Contribution
CAS	Chemical Abstracts Service
CI	Cation
CNS	Central Nervous System
CSF	Confidential Statement of Formula
DFR	Dislodgeable Foliar Residue
DRES	Dietary Risk Evaluation System
DWEL	Drinking Water Equivalent Level (DWEL) The DWEL represents a medium specific (i.e. drinking water) lifetime exposure at which adverse, non carcinogenic health effects are not anticipated to occur.
EEC	Estimated Environmental Concentration. The estimated pesticide concentration in an environment, such as a terrestrial ecosystem.
EP	End-Use Product
EPA	U.S. Environmental Protection Agency
FAO/WHO	Food and Agriculture Organization/World Health Organization
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FFDCA	Federal Food, Drug, and Cosmetic Act
FOB	Functional Observation Battery
FQPA	Food Quality Protection Act
GLC	Gas Liquid Chromatography
GM	Geometric Mean
GRAS	Generally Recognized as Safe as Designated by FDA
HA	Health Advisory (HA). The HA values are used as informal guidance to municipalities and other organizations when emergency spills or contamination situations occur.
HDT	Highest Dose Tested
LC_{50}	Median Lethal Concentration. A statistically derived concentration of a substance that can be expected to cause death in 50% of test animals. It is usually expressed as the weight of substance per weight or volume of water, air or feed, e.g., mg/l, mg/kg or ppm.
LD_{50}	Median Lethal Dose. A statistically derived single dose that can be expected to cause death in 50% of the test animals when administered by the route indicated (oral, dermal, inhalation). It is expressed as a weight of substance per unit weight of animal, e.g., mg/kg.
LD_{lo}	Lethal Dose-low. Lowest Dose at which lethality occurs.
LEL	Lowest Effect Level
LOC	Level of Concern
LOD	Limit of Detection
LOEL	Lowest Observed Effect Level
MATC	Maximum Acceptable Toxicant Concentration
MCLG	Maximum Contaminant Level Goal (MCLG) The MCLG is used by the Agency to regulate contaminants in drinking water under the Safe Drinking Water Act.
µg/g	Micrograms Per Gram
mg/L	Milligrams Per Liter
MOE	Margin of Exposure
MP	Manufacturing-Use Product
MPI	Maximum Permissible Intake

GLOSSARY OF TERMS AND ABBREVIATIONS

MRID	Master Record Identification (number). EPA's system of recording and tracking studies submitted.
N/A	Not Applicable
NOEC	No effect concentration
NPDES	National Pollutant Discharge Elimination System
NOEL	No Observed Effect Level
NOAEL	No Observed Adverse Effect Level
OP	Organophosphate
OPP	Office of Pesticide Programs
PADI	Provisional Acceptable Daily Intake
PAG	Pesticide Assessment Guideline
PAM	Pesticide Analytical Method
PHED	Pesticide Handler's Exposure Data
PHI	Preharvest Interval
ppb	Parts Per Billion
PPE	Personal Protective Equipment
ppm	Parts Per Million
PRN	Pesticide Registration Notice
Q^*_1	The Carcinogenic Potential of a Compound, Quantified by the EPA's Cancer Risk Model
RBC	Red Blood Cell
RED	Reregistration Eligibility Decision
REI	Restricted Entry Interval
RfD	Reference Dose
RS	Registration Standard
RUP	Restricted Use Pesticide
SLN	Special Local Need (Registrations Under Section 24 (c) of FIFRA)
TC	Toxic Concentration. The concentration at which a substance produces a toxic effect.
TD	Toxic Dose. The dose at which a substance produces a toxic effect.
TEP	Typical End-Use Product
TGAI	Technical Grade Active Ingredient
TLC	Thin Layer Chromatography
TMRC	Theoretical Maximum Residue Contribution
torr	A unit of pressure needed to support a column of mercury 1 mm high under standard conditions.
ug/L	Micrograms per liter
WP	Wettable Powder
WPS	Worker Protection Standard

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) has completed its Reregistration Eligibility Decision (RED) for the pesticide N,N-diethyl-meta-toluamide (DEET), which includes the active ingredient N,N-diethyl-meta-toluamide and its isomers. This decision includes a comprehensive reassessment of the required target data and the use patterns of currently registered products. DEET is an insect and acarid repellent used in households/domestic dwellings, on the human body and clothing being worn, on cats, dogs and horses and in pet living/sleeping quarters. DEET is used to repel biting flies, biting midges, black flies, chiggers, deer flies, fleas, gnats, horse flies, mosquitoes, no-see-ums, sand flies, small flying insects, stable flies and ticks. DEET products, which are applied directly to skin and/or clothing, are available in numerous formulation types (e.g., aerosol sprays, non-aerosol sprays, creams, lotions, sticks, foams, and towelettes) and concentrations (products range from ≈4% a.i. to 100% a.i.). The Agency is requiring the submission of product efficacy data as part of the Product-Specific Data Call-In for the reregistration of DEET end-use products.

The Agency has concluded that DEET insect repellents will generally not cause unreasonable risks to humans or the environment. However, because DEET is: (1) so widely used among the U.S. population, including children; (2) is one of the few residential-use pesticides that is applied directly to the skin; and (3) has been thought to be associated with incidents of seizure, the Agency believes that it is prudent to require improved label warnings and restrictions for DEET products. The Agency believes that such common sense measures will be especially protective of children and other individuals who may be more sensitive to chemical substances. Product labels must be revised as specified in this RED to be more protective of the people using them, especially children.

With the exception of products/formulations that combine DEET and sunscreen, all uses/formulations of DEET are eligible for reregistration provided all labels are amended as specified. Registrants with products that make child safety claims must remove such claims from the product labels. The scientific data and incident data reviewed for DEET do not support label claims that infer that certain DEET products (e.g., those with lower percentage active ingredient) are safer to use on children than others. These claims are therefore misleading. Cosmetic claims may appear on DEET product labels, however, with certain restrictions that are listed in section V.B.2. "Labeling Requirements for End-Use Products." In addition, the ingredient statement on all DEET product labels must be listed as "DEET" (the common name) instead of the chemical name "N, N-diethyl-meta-toluamide and its isomers." Label requirements and restrictions for all DEET end-use products are listed in Section V of this RED document.

The Agency will defer its decision regarding the reregistration eligibility of products/formulations that combine DEET and sunscreen until the Agency has solicited the views of various governmental agencies and other groups. Additionally, the Agency will not act on any pending registration applications under section 3 until that time. The Agency is concerned about consumer use of products that combine sunscreen and DEET, since directions to reapply sunscreens generously and frequently may promote greater use of DEET than needed for pesticidal efficacy and thus pose unnecessary exposure to DEET. As stated in the amended Reregistration Standard (dated

March 1985), the Agency will not register products whose acute toxicity falls into Toxicity Category I or II. Additionally, end-use products must not be corrosive to the eye or cause corneal involvement or irritation persisting for 21 days or more.

I. INTRODUCTION

In 1988, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) was amended to accelerate the reregistration of products with active ingredients registered prior to November 1, 1984. The amended Act provides a schedule for the reregistration process to be completed in nine years. There are five phases to the reregistration process. The first four phases of the process focus on identification of data requirements to support the reregistration of an active ingredient and the generation and submission of data to fulfill the requirements. The fifth phase is a review by the U.S. Environmental Protection Agency (referred to as "the Agency") of all data submitted to support reregistration.

FIFRA Section 4(g)(2)(A) states that in Phase 5 "the Administrator shall determine whether pesticides containing such active ingredient are eligible for reregistration" before calling in data on products and either reregistering products or taking "other appropriate regulatory action." Thus, reregistration involves a thorough review of the scientific data base underlying a pesticide's registration. The purpose of the Agency's review is to reassess the potential hazards arising from the currently registered uses of the pesticide; to determine the need for additional data on health and environmental effects; and to determine whether the pesticide meets the "no unreasonable adverse effects" criterion of FIFRA.

This document presents the Agency's decision regarding the reregistration eligibility of the registered uses of N,N-diethyl-meta-toluamide (DEET). The document consists of six sections. Section I is the introduction. Section II describes DEET, its uses, data requirements and regulatory history. Section III discusses the human health and environmental assessment based on the data available to the Agency. Section IV presents the reregistration decision for DEET. Section V discusses the reregistration requirements for DEET. Finally, Section VI is the Appendices which support this Reregistration Eligibility Decision. Additional details concerning the Agency's review of applicable data are available on request.

II. CASE OVERVIEW

A. Chemical Overview

The following active ingredient is covered by this Reregistration Eligibility Decision document:

- **Common Name:** DEET (ESA)
- **Chemical Name:** N,N-diethyl-m-toluamide and other isomers
- **Chemical Family:** N,N-dialkylamides

! **CAS Registry Number:** 134-62-3

! **OPP Chemical Code:** 080301

! **Empirical Formula:** $C_{12}H_{17}NO$

! **Multiple Active Ingredient Products Contain:**

011901 Butoxypolypropylene glycol
057001 N-Octyl bicyclopheptene dicaboximide
109301 Fenvalerate
047201 Dipropyl isocinchromeronate
057001 N-Octyl bicyclopheptene dicarboximide

! **Trade and Other Names:** DEET, OFF, Delphene, MGK diethyltoluamide, Detamine, Metadelphene, Chemform, Chiggar-Wash, Muskol, Cutter, Repel, Old Time Woodsman.

! **Basic Manufacturer:** McLaughlin, Gormley, King Company, S.C. Johnson, Clariant Corp., Schering-Plough, Morflex Inc.

B. Use Profile

The following is information on the currently registered uses with an overview of use sites and application methods. A detailed table of these uses of DEET is in Appendix A.

For N,N-Diethyl-meta-toluamide:

Type of Pesticide: Insect and acarid repellent

Use Sites: INDOOR RESIDENTIAL: Households/Domestic Dwellings, Human body/clothing while being worn (insect repellent), Cats (adults/kittens), Dogs/canines (adults/puppies), Horses, Pet living/sleeping quarters

Target Pests:

Biting flies, biting midges, black flies, chiggers (redbugs), deer flies, fleas, gnats, horse flies, mosquitoes, no-see-ums, sand flies, small flying insects, stable flies and ticks

Formulation Types Registered:

Technical grade active ingredient	100%
Manufacturing products	17.5 to 88.89%
End Use products	
Impregnated material	7.15 to 82.00%
Liquid - RTU	7.00 to 100%
Pressurized liquid	3.99 to 80.00%
Sunscreen/DEET	7.13 to 20.00%

Methods of Application:

Types of Treatment - Animal bedding/litter treatment; animal treatment(spray); clothing treatment; skin contact treatment; spot treatment

Equipment - Aerosol can; by hand; non-aerosol pump sprayer; package applicator; pump spray bottle

Timing - When needed

C. Estimated Usage of Pesticide

This section summarizes the best estimates available for the pesticide uses of DEET. These estimates are derived from a variety of published and proprietary sources available to the Agency. The data, reported on an aggregate and site basis, reflect annual fluctuations in use patterns as well as the variability in using data from various information sources.

Based on pesticide usage information mainly for 1990, an average annual estimate of the domestic usage of N,N-diethyl-meta-toluamide (DEET) is 4 million pounds (active ingredient). About 30% of the U.S. population uses DEET annually as an insect repellent (about 27% of adult males, 31% of adult females and 34% of children). Approximately 21% of U.S. households use DEET annually. About 19% of households use it on household members, and about 4% of households that have cats and/or dogs use DEET on those pets. The table below summarizes use of the pesticide by site.

Table 1: Estimated Annual U.S. Usage of Diethyl Toluamide (DEET), Based Mainly on 1990 Data

Site	Site Available	Site Treated		% of Site Treated		Lbs A.I. Applied		Average Application Rates (skin/cloth)			Regions (**) of Most Use
		Likely Average	Likely Max. (*)	Likely Average	Likely Max. (*)	Likely Average	Likely Maz. (*)	grms ai/ applied	apps/year	grms a.i./year	
US Popul.	252,688	77,033	115,549	30	46	3,022	4,533	1.2	15	17.3	US Pop:ENC,SA ,WSC,MA,W NC: 65% Others: N/A
Adult Male	90,053	24,588	36,882	27	41	1,314	1,971	1.3	19	24.2	
Adult Female	97,490	30,003	45,005	31	46	1,001	1,501	1.0	15	15.1	
Pregnant	na	na	na	33	50	na	na	1.0	15	15.1	
Children	65,145	22,441	33,662	34	52	707	1,060	1.2	12	14.3	
13-17 years old	16,837	4,635	6,952	28	41	162	242	1.3	12	15.8	
<13 years old	48,308	17,807	26,710	37	55	545	818	1.2	12	13.9	
All House.(a)	84,573	17,340	26,101	21	31	na	na	na	12	na	MW,SE,NE, SW: %na
Persons	84,573	15,870	23,890	19	28	na	na	na	12	na	
Fabric	84,573	234	352	<1	<1	na	na	na	12	na	
Pet (b)	28,191	1,236	1,859	4	7	na	na	na	12	na	
Cert./Comm App.(c)	na	na	na	na	na	<1	<1	na	na	na	na
Eat. Est. Areas	na	na	na	na	na	na	na	na	na	na	na
Recreat. Areas	na	na	na	na	na	na	na	na	na	na	na
Horses	2,050	na	na	na	na	na	na	na	na	na	na
Total US						3,800	5,700				

- Above estimated household usage of DEET includes applications only by householders themselves.
- Total "households treating" with DEET are allocated to individual sites according to the allocation of products used by site; if some households treat more than one site, then the number of households treating those sites may be underestimated.
- Usage is unknown for horses, recreation areas and eating establishments since usage sources are not readily available.
- "na" means not available or not applicable.

(*) Maximums are arbitrarily assumed to be 50% greater than averages.
(**) ENC = East No. Central, MA = Mid-Atlantic, MW = Midwest, SA = So. Atlantic, WNC = West No. Central, WSC = West So. Central.
(a) Primary residences excluding group quarters, institutions and military and Indian reservations.
(b) One-third of households are arbitrarily assumed to have cats and/or dogs.
(c) Non-agricultural treatments by applicators certified in five non-agricultural categories.

SOURCES:

- Boomsma, John C. and Murali Parthasarathy, S.C. Johnson Wax, Inc., Human Use & Exposure to Insect Repellents Containing DEET, Sept. 16, 1990.
- CA EPA, Report of Pesticides Sold in California for 1990.
- Kline & Co., Consumer Markets for Pesticides and Fertilizers, 1990 Update.
- Research Triangle Institute, National Home and Garden Household Use Survey, March 1992.
- Research Triangle Institute, Results of the 1993 Certified/Commercial Pesticide Applicator Survey, May 1995.
- US Dept. of Commerce, Bureau of the Census, Census of Agriculture, 1992.
- US Dept. of Commerce, Bureau of the Census, Statistical Abstract of the United States, 1992.

D. Data Requirements

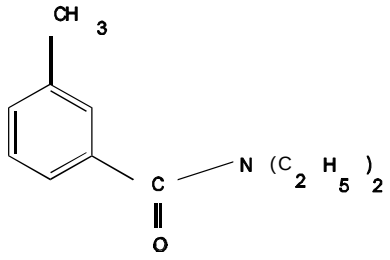
Data requested in the 1980 Registration Standard for N,N-diethyl-meta-toluamide and its isomers (DEET) include studies on product chemistry, product efficacy, toxicology, and ecological effects. These data were required to support the uses listed in the Registration Standard. Appendix B includes all data requirements identified by the Agency for currently registered uses needed to support reregistration. The Agency is not requiring any additional generic data for DEET at this time; however, product chemistry data (including product efficacy) and acute toxicity data are being called in with this RED for the reregistration of DEET end-use products.

E. Regulatory History

DEET was registered in the United States in 1957 for use by the general public, after first being developed by the U.S. Army in 1946 for use by military personnel in insect-infested areas. It is used to repel biting pests such as mosquitos and ticks, including ticks that may carry Lyme disease. A Registration Standard for DEET was issued in December 1980 (NTIS #PB81-207722), and a subsequent Data Call-In (DCI) for DEET (issued September, 1988) required additional animal and avian toxicity data. This Reregistration Eligibility Decision (RED) document reflects a reassessment of all data submitted in response to the Registration Standard.

III. SCIENCE ASSESSMENT

A. Physical Chemistry Assessment



1. Identification of Active Ingredient

DEET (N,N-diethyl-meta-toluamide), is an all-purpose individual insect repellent which contains a minimum of 95% of the meta isomer, the most effective form of diethyl toluamide, as a technical active ingredient.

Technical DEET is a nearly colorless liquid with a faint characteristic odor. It is relatively stable, highly hygroscopic and sensitive to light. Technical DEET is practically insoluble in water and glycerin but miscible with several organic solvents.

B. Human Risk Assessment

N,N-diethyl-meta-toluamide (DEET) was developed and patented by the U.S. Army in 1946 for use by military personnel in insect-infested areas. Because DEET was recognized as one of the few products effective against mosquitoes and biting flies, it was registered for use by the general public in 1957. Today, DEET is a widely-used insect repellent. Most DEET products are registered for human use; there are a few products registered for veterinary uses.

The use of effective insect repellents provides certain public health benefits. Application of DEET insect repellents to the skin and clothing can help prevent bites from ticks and other biting insects that may cause disease. Lyme Disease may develop from the bite of an infected deer tick, and mosquitoes can transmit malaria, yellow fever, dengue fever and encephalitis.

DEET's exposure pattern is unusual in that it is one of the few residential-use pesticides that is applied directly to skin and clothing. Users of DEET are expected to be exposed to the product intermittently for days or weeks (subchronic exposure). Except in the most unusual circumstances, long-term exposure (chronic) is not expected.

1. Toxicology Assessment

The toxicological database on DEET is adequate and will support reregistration eligibility. In addition to acute effects, DEET has also been tested for an entire battery of subchronic and chronic toxicity effects. Although some minor effects were seen at the doses tested, the data do not show DEET to be carcinogenic, significantly developmentally toxic, nor mutagenic.

a. Acute Toxicity

Table 2. Acute Toxicity Values for DEET Technical

Study and Guideline	MRID	Results	Toxicity Category
Oral LD_{50}-rat (81-1)	00134359 43763201	2170 to 3664 mg/kg	III
Dermal LD_{50}-rabbit (81-2)	00134359	4280 mg/kg	III
Acute inhalation LD_{50}-rat (81-3)	00134359	5.95 mg/L	IV
Eye irritation-rabbit (81-4)*	00134359	Eye irritation and corneal opacity cleared by day seven and three, respectively.	III
Dermal irritation-rabbit (81-5)*	00134359	Minimal irritation-cleared by day seven.	IV
Dermal sensitization (81-6)*	00134359	Not a skin sensitizer.	--

*Data pertaining to guidelines 81-4 through 81-6 are not required to support the reregistration of the TGAI. They are presented here for informational purposes.

b. Subchronic Toxicity

In the initial two 90-day dose range-finding studies, an increase in the incidence of renal lesions was seen in all treated male rats when DEET was administered by either the oral or dermal route to CD® rats. The renal lesions were characterized by granular casts, inflammation, regeneration, and hyaline droplets in the renal tubules. The registrant believed that the renal lesions seen in the males were due to an increased accumulation of $\alpha_{2\mu}$-globulin which led to granular casts and other related lesions in the renal tubules. The accumulation of $\alpha_{2\mu}$-globulin can initiate a sequence of events that appear to lead to renal tubule tumor formation.

The Agency has extensively examined the issue of chemically-induced accumulation of $\alpha_{2\mu}$-globulin, a low molecular weight protein in the renal tubules. After analyzing all the data, it was concluded that chemically-induced accumulation of $\alpha_{2\mu}$-globulin and its associated renal lesions should be distinguished from other renal lesions. In addition, the $\alpha_{2\mu}$-globulin-related nephropathy occurs specifically in the male rats.

The registrant conducted additional 90-day studies in micropigs®, castrated male rats, different strains of rats, and hamsters to show that the renal lesions were unique to males rats and related to the accumulation of $\alpha_{2\mu}$-globulin. When the results of all these studies were evaluated collectively, they provided sufficient evidence to indicate that the renal lesions seen in DEET-treated male rats were related to chemically-induced $\alpha_{2\mu}$-globulin accumulation.

The combined data from all these studies provide sufficient information for understanding the subchronic toxicity of DEET in rodents. Provided below are summaries of the toxicity tests and results for 90-day oral toxicity in rodent studies, 90-day oral toxicity in non-rodent studies, and 90-day dermal toxicity studies.

90-Day Oral Toxicity - Rodent

<u>90-Day Oral Dose-Range Finding Study in CD® Rats</u>

Groups of rats (15/sex/dose) received DEET (technical grade) in the diet at doses of 0, 100, 500, 1000, 2000, or 4000 mg/kg for 90 days. The following effects were seen:

- At 4000 mg/kg, an increase in the incidence of deaths; all animals in this dose group were sacrificed at week three of the study.

- Decreased body weights and food consumption in animals that received DEET at doses of 500 mg/kg or above.

- An increase in absolute kidney weights in 500 mg/kg males and an increase in absolute and relative liver weights in all treated groups except 100 mg/kg females.

- An increase in the incidence of renal lesions, which were characterized by granular casts, inflammation, regeneration, and hyaline droplets in the kidneys of all treated males.

Although the study was well designed, executed, and reported, due to the last finding (i.e., an increase in the incidence of renal lesions...) a NOEL could not be established. By itself, the study did not meet the data requirements for a subchronic toxicity study in rats (Guideline 82-1) (MRID 40241703).

90-Day Feeding Study in CD®, Fischer, and NBR Male Rats

The objective of this study was to establish an association between the renal toxicity seen in DEET-treated male rats and the α_{2u}-globulin mechanism of renal toxicity.

Groups of CD®, Fischer, and NBR male rats (10/group) received either a control diet or DEET-treated diet at a concentration that would lead to a dose level of 400 mg/kg/day for 90 days. The following effects were seen:

- In CD® male rats, DEET treatment produced an increased incidence of hyaline droplets in the renal tubules, renal tubular regeneration, chronic inflammation in the renal cortex, and granular casts in the renal tubules.

- In Fischer rats, DEET did not affect hyaline droplet formation. In the Fischer control rats, the kidney contained trace amounts of hyaline droplets. In the Fischer DEET-treated rats, there was an increase in the incidence of kidney lesions, characterized by the presence of hyaline droplets, regenerative tubule, and chronic inflammation.

- In NBR rats, no renal effects were found.

The report was considered unacceptable due to conflicting information on the actual dose and missing information on renal lesions (MRID 42518101). Subsequently, the registrant submitted the missing data, which was reviewed and considered to be sufficient to fulfill the missing information. The supplemental data (MRID 44279901) showed that the actual dose was 400 mg/kg body weight/day and the findings of renal tubular dilation and tubular necrosis were not seen in this study. Therefore, the previous submission (MRID 42518101) is upgraded to acceptable/non-guideline.

90-Day Range-Finding Study in Hamsters

Groups of hamsters (15/sex/dose) received 0, 1000, 5000, 10,000, or 15,000 ppm of DEET in the diet for 90 days (0, 61, 305, 624, or 940 mg/kg/day for males and females). Compound-related effects were seen in animals that received 5000 ppm DEET or above. At 5000 ppm in males, there was a consistent drop in food consumption and body weight. The decrease in body weight and food consumption was more marked in 10,000 and 15,000 ppm males and females. The increase in the incidence of gross pathologic and histologic changes in testes and epididymides were found in 10,000 and 15,000 ppm males. The gross pathologic changes were small testes and epididymides; microscopically these changes were degeneration of the testes and cellular debris in the epididymal tubules. At 15,000 ppm, there were deaths in both males and females. Based upon these observations, the NOEL was 1000 ppm; the LEL was 5000 ppm.

The renal lesions seen in the DEET-treated CD® male rats were not found in the hamsters that received DEET up to 15,000 ppm. This study satisfies the data requirements for a 90-day feeding study in rodents (Guideline 82-1) (MRID 41344101).

90-Day Dose-Range Finding Study in Mice

Groups of CR CD-1 mice (15/sex/dose) received DEET at dietary concentrations of 0, 300, 1000, 3000, 6000, or 10,000 mg/kg/day body weight for 13 weeks. A marked decrease in the food intake and body weights were found in the 6000 and 10,000 mg/kg/day groups during the first week of the study. These groups were terminated at week three. A decrease in body weight was seen in 3000 mg/kg/day mice of both sexes. A statistically-significant increase in the liver weight was seen in 1000 and 3000 mg/kg/day mice of both sexes. A slight increase in liver weight was also seen in 300 mg/kg/day male and female mice. Based on the increase in liver weights, a NOEL could not be established in mice for this 90-day study (MRID 40241704).

90-Day Oral Toxicity - Non-Rodent

Eight-Week Feeding/Dose Range-Finding Study in Dogs

Groups of beagle dogs (2/sex/dose) received DEET in the diet at concentrations of 0, 300, 1000, 3000, or 6000/4500/3000 ppm[1] (8.4, 28.6, 93.3, or

[1] During the first two weeks of the study, the highest dose male and female dogs received 6000 ppm test diet, but the dogs rejected the test diet. The treatment diet was withdrawn at the end of the second week and the animals were given the basal diet for about one week. The dosage was then reduced at week four from 6000 ppm to 4500 ppm and at week seven from 4500 ppm to 3000 ppm. At week six, this dose group of dogs was again given the basal diet.

19.5 mg/kg/day for males or 9.7, 30.6, 91.8, or 11.5 mg/kg/day for females). The control animals received basal diet.

Under the conditions of this study, DEET did not produce any toxicity at dietary concentrations of 3000 ppm or less. At a concentration of 6000/4500/3000 ppm, DEET caused food rejection which led to a decrease in body weight, thin appearance, fat depletion, organ weight decrease, and histological changes in kidneys (cytoplasmic vacuolation of tubules in the kidney cortex), bone marrow, and thymus.

The reliability of the results of this study is compromised by the small number of dogs used (i.e., 2/sex/dose); the test guidelines recommend 4 dogs/sex/dose. Thus, a useful NOEL and LEL could not be established. In summary, this study does not meet the data requirements for a subchronic oral toxicity study in dogs (Guideline 82-1) (MRID 43514202).

Eight-Week Oral Toxicity Dose-Range Finding Study in Dogs (Gelatin Capsule)

Groups of beagle dogs (2/sex/dose) received DEET in a gelatin capsule at dose levels of 0, 50, 100, 200, or 400 mg/kg/day. The control animals received white mineral oil in gelatin capsule. The following results were obtained:

- Clinical observation data showed a significant increase in ptyalism in 100 mg/kg/day or above in males and females and an increase in abnormal head movements in 400 mg/kg/day males.
- A decrease in body weight gains was found in 400 mg/kg/day males and females; and that in female dogs was more marked.
- Food consumption was substantially reduced in 400 mg/kg/day females.
- There was a decrease in cholesterol level in 400 mg/kg/day male dogs.
- A decrease in testis/epididymis weight was found in 400 mg/kg/day males. However, both gross examination and histopathology did not indicate any changes in the testis or any other organs.

The reliability of the results of this study is compromised by the small number of dogs used (i.e., 2/sex/dose); a useful NOEL and LEL could not be established. This study does not meet the data requirements for a subchronic oral toxicity study in dogs (Guideline 82-1) (MRID 43514201).

90-Day Dermal Toxicity

90-Day Dermal Toxicity Study in Rats

Groups of CD® rats (15/sex/dose) received DEET (technical) at doses of 0, 100, 300, or 1000 mg/kg/day. The following effects were found:

- An increase in the incidence of acanthosis and hyperkeratosis of the dermal application sites of all compound-treated rats.
- A decrease in the body weights of high-dose males.
- An increase in liver weight in mid- and high-dose females and high-dose males.
- Increased absolute and relative kidney weights (kidney/body weight and kidney/brain weight) in mid- and high-dose males and increased relative kidney weights in high-dose females.
- Increased incidence of renal lesions that included granular casts, inflammation, tubular regeneration, hyaline droplets in all treated males; and marginal renal effect in high-dose females. This type of renal lesion was also seen in the 90-day feeding study in CD® rats (MRID 40241703).

Although the study was well-designed, executed, and reported, due to the finding of an increased incidence of renal lesions in all treated males, a NOEL could not be established. By itself, the study did not meet the data requirements for a subchronic toxicity study in rats (Guideline 82-1) (MRID 40241702).

90-Day Dermal Toxicity Study in Castrated Male Rats

The objective of this study was to determine the cause of the increase in the incidence of hyaline droplets in the renal tubules of DEET-treated CD® male rats seen in a 90-day dermal toxicity study (MRID 40241702). Prior to this study, the registrant thought that this increase might be strongly influenced by the male sex hormone testosterone. In this study, groups of castrated male CD® rats (15/group) received DEET by dermal application at dose levels of 0 or 1000 mg/kg/day for 90 days. The results showed that castration did not protect the DEET-treated animals from hyaline droplet formation and other related findings of kidney lesions.

Because this is a special study conducted to clarify a specific finding previously seen in another study, it did not meet the data requirements for a subchronic toxicity study in rats (Guideline 82-1) (MRID 41199301).

90-Day Dermal Toxicity Study in Micropigs®

The purpose of this study was to determine if a renal lesion related to an increase in hyaline droplet formation and the presence of $\alpha_{2\mu}$-globulin in the kidney tubules observed in male rats of previously conducted 90-day dermal and oral toxicity studies (MRIDs 40241702 and 40241703, respectively) would occur in micropigs®.

DEET was dermally applied to groups of micropigs® (4/sex/dose) at dose levels of 0 (water), 100, 300, or 1000 mg/kg/day b.w. for 13 weeks.[2] The results indicated that DEET did not produce any mortality or changes in body weights, hematological and biochemical parameters, gross pathology, and organ weights. At the skin application sites, gross pathology showed that the DEET-treated animals had an increase in the incidence of desquamation and/or dry skin; histopathology showed an increase in the incidence of acanthosis and/or hyperkeratosis at the skin application sites.

Under the conditions of this study, DEET did not produce any renal lesions in micropigs®. It also did not cause any renal lesions in hamsters that received DEET in dietary concentrations up to 15,000 ppm (≈940 mg/kg/day) (MRID 41344101). These findings indicate that the renal lesion produced by DEET was unique to male rats.

This study meets the data requirements for a non-rodent 90-day toxicity study and satisfies Guideline 82-1b (MRID 41987401).

c. Chronic Toxicity and Carcinogenicity

Combined Chronic and Carcinogenicity Study in Rats

In a combined two-year chronic toxicity/carcinogenicity in rats, groups of CD® rats (60 sex/dose) received DEET (98.3% purity) in the diet at dose levels of 0, 10, 30, or 100 mg/kg/day for males and 30, 100, or 400 mg/kg/day for females. Two control groups were run concurrently. The animals were treated for two years.

In the 400 mg/kg/day female rats, there were progressive and statistically-significant decreases in body weights, a decrease in food consumption, and a statistically-significant increase (≈25 to 50%) in cholesterol levels at various intervals. No compound-related increases in non-neoplastic or neoplastic lesions were seen. No toxicity was seen in any dose groups of male rats.

Based on the results of this study, the NOEL for the chronic toxicity of DEET in females is 100 mg/kg/day and the LEL is 400 mg/kg/day (based on decreased body

[2] 1000 mg/kg/day was a maximum dose which could be applied without significant runoff.

weights and food consumption and increased cholesterol levels in female rats). The NOEL for the chronic toxicity of DEET in males is 100 mg/kg/day (i.e., the highest dose tested or HDT).

This study meets the data requirements for a combined chronic toxicity/oncogenicity study in female rats (Guideline 83-5). With respect to male rats, the test animals clearly could have tolerated higher doses (MRID 43514203).

Chronic Toxicity Study in Dogs (one-year)

Groups of beagle dogs (4/sex/dose) received DEET in a gelatin capsule at dose levels of 0, 30, 100, or 400 mg/kg/day/day for one year. The control animals received white mineral oil in gelatin capsule. Each daily dose was divided into two equal administrations. Under the conditions of this study, DEET, at dosages of 30 and 100 mg/kg/day, did not produce systemic toxicity. However, at 400 mg/kg/day DEET produced the following effects:

- An increase in the incidence of ptyalism in both males and females. A male and a female dog showed signs of tremor. Most of the clinical signs were observed within 30 minutes after dosing.
- A decrease in food intake and body weights in males and females during the first five weeks of the treatment.
- A decrease in cholesterol level in males.
- An increased incidence of thin males and females.
- An increase in platelet level in female dogs.
- Hyperplasia of uterine epithelium.

Based on the finding of the decreases in food consumption and body weights, an increase in the incidence of ptyalism, and a decrease in cholesterol levels in 400 mg/kg/day dogs, the NOEL for chronic toxicity in dogs is 100 mg/kg/day and the LEL is 400 mg/kg/day. This study meets the data requirements for a chronic toxicity study in dogs (Guideline 83-1b) (MRID 43320101).

Carcinogenicity Study in Mice

Groups of mice (60/sex/dose) received DEET at dietary concentrations of 0, 250, 500, or 1000 mg/kg/day for 78 weeks. A statistically-significant decrease in mean body weight, body weight gains, and food consumption for both male and female mice were seen in the 1000 mg/kg/day group.

Based on these findings, a NOEL for systemic toxicity was established at 500 mg/kg/day and a LEL at 1000 mg/kg/day. No evidence of carcinogenicity was found.

This study satisfies the data requirements for a mouse carcinogenicity study (Guideline 83-2b)(MRID 41351501).

d. Reproduction

Two-Generation Reproduction Study (Rats)

Groups of Sprague-Dawley rats (28/sex/dose) received DEET at dietary concentrations of 0, 500, 2000, or 5000 ppm for two consecutive generations. Kidney effects were seen in all treated males, including mottling, inflammation, presence of hyaline droplets, granular cast formation, and tubular regeneration. Therefore, a NOEL for parental toxicity could not be established.

No compound-related effects on the reproductive parameters such as fertility, gestation, and viability were noted. A significant reduction in the body weights of pups from the high-dose group beginning at day seven of lactation for males and day 14 of lactation for females was found at 2000 ppm. This reduction in body weights in the pups was considered as systemic toxicity. The reproductive toxicity NOEL was 5000 ppm (or 250 mg/kg/day based on standard conversion, 20 ppm = 1 mg/kg/day), which is the Highest Dose Tested (HDT). This study satisfies the data requirement for a reproduction study (Guideline 83-4) (MRID 40979001).

e. Developmental Toxicity

Developmental Toxicity Study in Rats

Groups of 25 mated female CD® rats received DEET at doses of 0, 125, 250, or 750 mg/kg/day from days six to 15 of gestation. In the high-dose dams (750 mg/kg/day), clinical signs such as hypoactivity, ataxia, decreased muscle tone, foot splay, perinasal encrustation, and perioral wetness were observed; some of these signs were suggestive of neurotoxicity in this dose group because none of these signs were seen in the controls. Some of these clinical signs were seen only sporadically in the other treated groups. In the high-dose dams, there was an increase in mortality rate, a reduction in body weight gain and food consumption, and an increase in mean liver weights.

A slight increase in percent post-implantation loss was seen in the high-dose group and a statistically-significant decrease in mean fetal body weight/litter was seen in the high-dose group. No additional compound-related effects were found.

Based on the increase in the clinical signs, reduced body weights and food consumption, increased mortality rate, and an increase in mean liver weight, the NOEL for maternal toxicity was 250 mg/kg/day and the LEL was 750 mg/kg/day. The NOEL for developmental toxicity was 250 mg/kg/day and the LEL was 750

mg/kg/day (based on a statistically-significant decrease in mean fetal body weight/litter). This study satisfies the data requirements for a developmental toxicity study in rats (Guideline 83-3a)(MRID 41351401).

Developmental Toxicity in Rabbits

Groups of presumed pregnant female New Zealand white rabbits (16/group) received DEET at doses of 0, 30, 100, or 325 mg/kg/day body weight from gestation day six through day eighteen. Under the conditions of this study, DEET did not produce any compound-related maternal toxicity or developmental toxicity. The NOEL for maternal and developmental toxicity was 325 mg/kg/day (i.e., the HDT). The results indicate that the test animals could have tolerated higher dose levels. The report failed to present any explanation for dose selection.

Supplemental data, which consisted of a dose-range finding developmental toxicity study in rabbits (MRID 44279903), were submitted to upgrade this study. In the dose-range finding developmental toxicity study, groups of timed-pregnant NZ white rabbits (5/dose group) received DEET (98.7%) by gavage at dose levels of 0 (corn oil), 62.5, 125, 250, 500, or 1000 mg/kg/day from gestation days 6 through 18. The results indicated that at doses of 250 mg/kg/day or above there was a non-dose-related increase in the incidence of rapid respiration in the maternal animals. The incidence seen in 250 and 1000 mg/kg/day were statistically significant. At 1000 mg/kg, clinical signs of hypoactivity, ataxia, and prostration were also seen.

Deaths were found in 500 and 1000 mg/kg/day groups. The individual necropsy data showed that the animals that died at 500 and 1000 mg/kg/day groups all had sloughing and/or ulceration of the stomach lining. In contrast, the survivors did not show any gross pathology of the stomach. At doses of 500 mg/kg and above, the corrosive effect of DEET to the gastric lining appeared to be linked to the death of these animals. No evidence of treatment-related developmental toxicity was reported in any treatment groups. In the surviving litters, there was no evidence of pre- or post-implantation loss in treated groups as compared to the controls. Based on these results, the investigator of the study recommended 0, 30, 100, and 325 mg/kg/day be employed for the definitive developmental toxicity study in rabbits.

The results of the definitive study (MRID 42141101), in which no maternal nor developmental toxicity was observed at doses of 325 mg/kg/day were consistent with the results of the dose range-finding study, in which toxic effect was not seen in animals which were treated at doses below 500 mg/kg/day. In reviewing the definitive and the dose range-finding developmental toxicity studies together, the results indicate that the highest possible dose, which would not result in stomach ulceration and death for a gavage developmental toxicity study in rabbits, would probably be approximately 400 mg/kg/day. The difference between 400 mg/kg/day and 325 mg/kg/day in a toxicological study is not marked. The highest dose tested in the definitive rabbit developmental toxicity study (325 mg/kg/day) has been

adequately high to assess the maternal and the developmental toxicity of DEET. Little would be gained by conducting an additional study to establish a more precise NOEL and LEL, especially in light of the severe maternal toxicity noted at 500 mg/kg/day and above in the dose range-finding study. Therefore, the developmental toxicity study in rabbits (MRID 42141101) is upgraded to acceptable.

f. Mutagenicity

The required mutagenicity battery for DEET has been met and the results are all negative. DEET is not mutagenic under the conditions of the test assays. Provided below are the results of the Ames, Chromosomal Aberration, and Unscheduled DNA Synthesis assays.

Ames Assay

In an Ames assay, DEET was tested over a concentration of 28 to 8333 µg/plate with Salmonella typhimurium strains TA1535, TA1537, TA1538, TA98, and TA100 in the presence and absence of S9 activation. The results indicated that DEET was not mutagenic in this test system. This study satisfies the data requirements for a gene mutation assay (Guideline 84-2a) (MRID 41344801).

Chromosomal Aberration Assay

In a chromosomal aberration assay using chinese hamster ovary cells, DEET was tested at concentrations ranging from 0.125 to 1.0 µL/mL in the absence of S9 activation and from 0.063 to 0.50 µL/mL in the presence of S9 activation. The results showed that DEET was not clastogenic. The study satisfies the data requirements for a structural chromosomal aberration assay (Guideline 84-2b)(MRID 41344401).

Unscheduled DNA Synthesis (UDS) Assay

In an UDS assay using primary rat hepatocytes, DEET was tested at doses of 0.003 to 0.3 µL/mL. The results showed that DEET was tested to a cytotoxic level with no evidence of a genotoxic effect. The study satisfies the data requirements for an assay on other genotoxic effects (Guideline 84-4) (MRID 41344301).

g. Metabolism and Dermal Absorption

Metabolism Study in Rats

A series of experiments that consisted of a preliminary and six definitive experiments was conducted to determine the absorption, distribution, elimination, and metabolism of DEET.

In the preliminary experiment, groups of CD® rats (4/sex) received a single dose (100 mg/kg/day b.w.) of radiolabeled DEET by either oral (gavage) or dermal administration; the blood radioactivity levels were measured at various intervals for 24 hours to determine the peak blood ^{14}C-level.

In the definitive experiments, groups of rats (5/sex/dose regimen) received DEET by single oral low dose (100 mg/kg), single oral high dose (500 mg/kg), repeated oral low dose (100 mg/kg), or single dermal low dose (100 mg/kg). Two groups (5 rats/sex/group) -- a single oral low dose and a single dermal low dose group -- were sacrificed at peak blood ^{14}C level to determine the radioactivity levels in various tissues. The results were as follows:

- With oral dosing, the peak blood level was reached in one-half hour after dosing in males while in females it took about two hours. With dermal application, no peak blood level was found; instead a blood level plateau, which began approximately one and one-half hours after dosing and persisted until the termination of the study (24 hours after dosing), was found in both male and female rats. These data indicated that when DEET was dermally applied to rats, a small amount of the test compound was continuously absorbed from the application site.

- At the time of peak ^{14}C-blood level, the fraction of the administered dose reaching the systemic circulation and the residue levels in tissue following oral administration was substantially higher than that following dermal application. At peak ^{14}C-blood levels, approximately 17% and 5.3% of the dermally-applied dose was absorbed by males and females, respectively; in comparison, approximately 53.3% and 65.25% of the orally administered dose was absorbed by males and females, respectively.

- The major route of DEET elimination in both male and female rats was via the urine. No marked difference was found in the total urinary or fecal radioactivity among the different dosing regimens or between male and female rats of different dosing regimens. However, there was a difference in the rate of urinary elimination of DEET among the different dose groups. For example, repeated oral dose groups or pretreatment groups showed the fastest rate of urinary elimination during the first four hours after dosing than any other dose groups. In contrast, the single dermal low-dose groups showed the slowest rate of urinary excretion; this finding might reflect the slow rate of dermal absorption.

- The liver, kidneys, lung, spleen, whole blood, and the carcass contained higher radioactivity than any other tissues. However, the total radioactivity found in all the tissues of various groups ranged

from only 0.15% to 0.67% of the administered dose. Therefore, very little DEET was sequestered in the body.

- The metabolism data indicated that the absorbed DEET was quantitatively metabolized, and the intact DEET was below the detection limit. Two major metabolites were found. One was formed by oxidation of the methyl group on the aromatic ring, and it represented 50% of the administered DEET. The other one was derived from oxidation of the methyl group of the aromatic ring and N-dealkylation of an ethyl substituent on the amide moiety. The second metabolite represents 18% of the administered DEET.

This study, along with its addendum (MRID 41994402), satisfies the data requirements for a metabolism study (Guideline 85-1)(MRID 41994401).

Human Dermal Absorption Study

In a human dermal absorption study, radiolabeled DEET in either 15% ethanol solution (12 mg; ≈36 µCi) or undiluted (15 mg; ≈37 µCi) was dermally-applied to two groups of healthy human volunteers (6 males/group; ages ranged from 20-29 years). The test material was applied on an area of 4x6 cm^2 of the forearm for eight hours. The results showed that a small percentage of dermally applied DEET was absorbed. The rate and amount of absorption were greater in the individuals who were treated with the 15% DEET solution. The level of radioactivity in the plasma declined rapidly after cessation of exposure.

The radioactivity found in the urine expressed as the percentage of the applied radioactivity was 8.41% and 5.63% for a 15% solution of DEET and undiluted DEET, respectively. Very little radioactivity was found in the feces (mean <0.1%). With dermal application, the majority of the applied radioactivity remained unabsorbed on the application site (≈78% of the applied dose for a 15% solution of DEET and 83% of the applied dose for undiluted DEET) and was recovered in skin rinsates, swabs, and protective coverings. Based on the amount administered, eliminated, found in tape-stripping, and unabsorbed (recovered in skin rinsates, swabs, applicator, and protective coverings), the amount of DEET penetrating into the skin was conservatively calculated to be ≈20% of the administered dose for 15% DEET and 12% for undiluted DEET. It should be noted that there was a difference in the total recovery between the two DEET treatment groups: in the 15% group, the total recovery was 89% of the administered dose while in the undiluted group, the total recovery was 94% of the administered dose. This difference is reflected in the variations seen in the calculated dermal absorption values (i.e., 20% vs. 12%).

Essentially all of the absorbed DEET was metabolized prior to elimination in the urine. A total of six metabolites were found; two of them were major metabolites that were found to be similar to those seen in a rat metabolism study (MRID

41994401). One metabolite resulted from oxidation of the methyl moiety on the aromatic ring of DEET to carboxylic acid while the other one was formed through N-dealkylation of an ethyl group from the amide moiety and the oxidation of the methyl group on the ring.

The study satisfied the data requirement for a dermal absorption study (Guideline 85-2)(MRID 42578501).

h. Neurotoxicity

Acute Neurotoxicity Screening Study in Rats

An acceptable acute neurotoxicity screening study in rats was available. Groups of Crl:CD VAF/Plus rats (10/sex/dose) received a single dose of DEET by gavage at levels of 0, 50, 200, or 500 mg/kg. The test animals were then observed for 14 days. At 500 mg/kg/day, rats showed signs of piloerection, increased vocalization, a decrease in horizontal and vertical activity, and an increase in the response time to heat. In general, these clinical signs were seen approximately one hour after dosing with recovery 24 hours after dosing. At 200 mg/kg, a decrease in vertical activity was observed during the first 15 minutes of the first trial at one hour after dosing. At 50 mg/kg, no effect was seen in any test animals. The NOEL was established at 50 mg/kg; the LOEL at 200 mg/kg (satisfies Guideline 81-7; MRID 41368501).

The Agency's Office of Pesticide Programs (OPP) Health Effects Division Toxicity Endpoint Selection (TES) Committee debated the results of this study were extensively. The TES Committee concluded that the decrease in vertical activity seen at 200 mg/kg was an isolated and transient effect; the toxicological significance of this finding is not certain. This set of data was also evaluated by Robert McPhil, Ph.D. of the Neurotoxicity Division, Office of Research and Development, RTP, N.C. His conclusion was similar to that of the TES Committee. Additionally, this set of data was presented to the FIFRA Scientific Advisory Panel (SAP). The members of the SAP also agreed with the conclusion derived by the TES Committee (i.e., the toxicological significance of the effect seen at 200 mg/kg is uncertain). Therefore, the NOEL for this study was then set at 200 mg/kg; the LEL at 500 mg/kg.

Multi-Generation Exposure Neurotoxicity Study in Rats

Sprague-Dawley rats were selected from the second generation (F2) offspring from a rat multigeneration study (MRID 40979001). Whenever possible, two males and two females were selected from each litter of each dose group. These F2 rats had been exposed to DEET in utero and during lactation, and were then exposed for an additional nine months, at dietary concentrations of 500, 2000, or 5000 ppm. A

control group was also included in this study. Following the nine-month exposure, one male and one female from each litter and each dose group were selected for neurotoxicity evaluations.

An increase in motor activity was seen in the 5000 ppm rats at the beginning of the evaluation session (this effect was transient, occurring early during the test session.) Based on this effect, the NOEL for neurotoxicity was established as 2000 ppm (100 mg/kg/day based on standard conversion, 20 ppm = 1 mg/kg/day) and the LOEL as 5000 ppm (250 mg/kg/day).

Although this study was not designed as a subchronic neurotoxicity screening battery (Guideline 82-7), the duration of exposure and the parameters examined meet the data requirements for a 90-day neurotoxicity study (MRID 41368401). In addition, although this study was not designed as a developmental neurotoxicity study (Guideline 83-6), it provided an abbreviated assessment of functional development following in utero and postnatal exposure to DEET. However, because the animals were not evaluated until they were adults, the effect of treatment with DEET on the ontogeny (i.e., the history of the development of an individual) of functional development was not assessed.

i. Special Studies: Synergistic Effect of DEET with Other Insecticides

In addition to the required toxicity data that have been submitted to the Agency, the following studies, which examine the synergistic effects of DEET, pyridostigmine bromide (PB), and permethrin (PERM), have been considered. The Agency would like to note that there are no available data on the mechanism of action for DEET, other than the information presented below, on the enhancement of toxicity of PB + PERM with concurrent administration of DEET in hens and rats.

Department of Defense

As part of the Department of Defense's research efforts to investigate potential causes of illnesses resulting from service in the Persian Gulf War, a study was undertaken to examine the health effects of three chemicals used in the War: DEET, PERM, and PB. PERM is another insect repellent that is often imbedded into clothing and PB is an anti-nerve gas agent.

In a comparative acute oral toxicity study in male Sprague-Dawley rats, groups of males (10/dose) received (by gavage) either DEET, PERM, or PB at doses ranging from 2000 to 5010 mg/kg for DEET, 316 to 2000 mg/kg for PERM, and 50 to 126 mg/kg for PB. With probit analysis, the results indicated that the oral LD_{50} for

DEET was 3664 mg/kg; PERM, 1000 mg/kg/day; and PB, 61.36 mg/kg. These LD_{50} values are consistent with existing data.

In the interaction portion of the study, groups of animals (6 males/dose group) received (by gavage) a single dose which was composed of different combinations of DEET, PERM, and PB. The combinations consisted of varying doses of one chemical (DEET, 0 to 6898 mg/kg; PERM, 279 to 3576 mg/kg; PB, 45.76 to 83.24 mg/kg) while keeping the other two chemicals at a constant dosage which corresponded to the LD_{16} (DEET, 1946 mg/kg; PERM, 279 mg/kg; PB, 45.76 mg/kg). The results indicated that combining PB with either PERM or DEET resulted in a statistically-significant potentiation in mortality which was substantially greater than the expected additive effect (at a dose which corresponds to LD_{16}: 2X for PB + PERM; 3X for PB + DEET). In contrast, combining DEET and PERM yielded a mortality rate that was less than the expected additive effect.

The author of the report offered an explanation for the potentiation of mortality produced by the combination of PB with either DEET or PERM. A possible mechanism for DEET is that when PB is combined with DEET, DEET may facilitate the absorption of PB leading to an increase in the PB level in the blood, an increase in inhibition of cholinesterase activity, and higher mortality. A possible mechanism for the observed potentiation produced by a combination of PB and PERM is the inhibition of the detoxification system by PB, leading to an increase in the residence time of PERM in the body (MRID 43763201).

While this study provides suggestive evidence of interactions between DEET and PERM/PB when used in combination, it does not provide significant information concerning the toxicity of DEET when it is used by itself.

Duke University

In this published study, groups of egg-laying leghorn hens (5/group) received DEET (≥97%, 500 mg/kg/day, sc); permethrin (≈94%, 500 mg/kg/day, sc); or PB (≥99%, 5 mg/kg/day, po) individually or in combinations of two or three for 2 months (5 days/week). Under the conditions of this study, the following compound-related effects were seen:

Combination Treatments. No deaths were seen in the hens treated with individual chemicals. However, with combination treatments, 1/5, 2/5, and 2/5 hens died in PB+permethrin, PB+DEET, and DEET+permethrin treated groups, respectively. Only 1 hen survived when DEET, permethrin, and PB were administered concurrently to 5 hens.

Individual Administration. With individual administration, DEET produced clinical signs characterized by rapid shallow breathing and tendency toward inactivity shortly after dosing, but the treated hens recovered within 24 hours. A slight decrease in body weight was also found in this group of hens. Histopathology showed a small increase in the incidence of slightly enlarged axons (2/4). An inhibition of plasma cholinesterase activity (20%) was seen. PB produced mild and transient signs of cholinergic toxicity characterized by decreased activity and diarrhea. Plasma butyl cholinesterase (BuChE) was inhibited by as much as 83%. Permethrin did not produce clinical signs, but it induced minor neuropathological changes characterized by slightly enlarged axons. Brain ChE activity was not affected by any of these three chemicals.

In general, hens treated with a combination of two chemicals produced more toxicity than the individual compound did; however, the enhanced toxicity did not approach an additive effect. The combination of the three chemicals yielded even more toxicity, and again the toxicity was less than the additive effects. The enhanced toxicity seen in the combined treatment in hens of this study was consistent with the findings of an acute oral toxicity study in male rats (MRID 43763201).

In this study, the subcutaneous injection of DEET results in direct access to the blood. A dose of 500 mg/kg/day sc is rather large. The dermal absorption data, derived from a study with human volunteers, indicated that approximately 12% of the administered dose on the forearm was absorbed (MRID 42578501). To achieve a subcutaneous dose of 500 mg/kg/day in humans would have required a dermal dose of approximately 4,167 mg/kg/day, which is an excessive dose. For an average person with a body weight of 70 kg, an amount of 292 g of DEET would be required to achieve this dose. Therefore, the results derived from this study are relevant to excessive exposure to DEET and coexposure to PB and/or permethrin. Currently, there are no data to indicate whether or not an interaction would take place at lower doses.

j. Incident Data

DEET has been commercially marketed for use as a personal insect repellent since 1965 (Veltri, et al., 1994). Today, it is a widely used insect repellent in the United States and the world. Currently, approximately 30% of the U.S. population uses DEET annually (Veltri, et al., 1994).

Prior to a cluster episode in 1989, there were six cases of seizure in children (all female, aged 1-8 years) reported in the medical literature. Three of these children died and all had received very frequent and/or extensive applications of DEET. In 1989, the New York State Department of Health received notification of five cases of generalized seizures, including four children and one adult. All of these cases were

males and four of the five had fewer than three previous applications. None of the cases died (Oransky, 1989).

Between 1989 and 1995, the Agency was notified of three cases of seizure related to dermal application of DEET. Two of the cases were children, a 3-year old girl and a 2-year old boy. Both of the cases recovered, although the girl reportedly went into cardiac arrest and was revived with CPR. The third case was an adult male who applied the product twice, had a seizure and died from choking on the food he was eating at the time of the seizure.

Two annual reports have been submitted by the DEET Joint Venture covering all cases reported in 1995 and 1996. There were 32 cases that mentioned some type of seizure activity in 1995 and 1996 that could not be ascribed to some other likely cause based on the information initially collected. A number of the cases reported in 1995 and 1996 are still undergoing follow-up to obtain medical records and complete the supplemental questionnaire forms. Once this review is completed, some of the cases will be more likely due to other causes besides DEET exposure. Until this review is completed, however, no firm conclusions should be drawn concerning these 32 cases.

In summary, since 1960, there have been 14 cases of seizure, including four deaths, potentially related to DEET exposure, for which other more likely causes have not been identified. An additional 32 cases of seizure reported to the national DEET registry are currently under review. Thus, the final number of potential DEET-associated seizures will fall between 14 and 46 cases since 1960. This range is subject to both over- and under-reporting. Seizure coinciding with DEET use can be expected, given an estimated 15,000-20,000 afebrile (occurring without a fever) seizures in children (aged 0-19 years) estimated annually and an estimated 17 million children using DEET perhaps as often as 10 times a year. On the other hand, physicians may fail to check for history of DEET use or fail to report cases of seizure subsequent to DEET use. As noted in the Morbidity and Mortality Weekly Report editorial on the five cases in 1989, "Anecdotal reports of seizures are difficult to interpret. None of the recent cases in New York and Connecticut have been clearly established as DEET toxicity" (Oransky, 1989). Taking all the cases together, it does appear that some of the cases are likely related to DEET toxicity, though it is not possible with certainty to say which ones.

In 1989, the Agency notified the Centers for Disease Control and Poison Control Centers through a physician's advisory of our concern for these health effects and asked them to report any new cases. The Agency also urged the manufacturer to undertake a review of Poison Control Center records. Neither the manufacturer's review of over 9,000 DEET exposures nor the Agency's physician advisory revealed any new cases of seizure that could be substantiated with medical records. Given only 14 to 32 cases since 1960 (the first case was reported in 1961) and 50-80 million

people using DEET each year, the observed incidence of recognized seizures is about one per 100 million users.

2. Toxicological Endpoints for Risk Assessment

Exposure to DEET occurs in the short to intermediate term; chronic exposure is not expected. The Agency's Office of Pesticide Programs (OPP) Health Effects Division Toxicity Endpoint Selection (TES) Committee considered subchronic dermal and neurotoxicity data for the short and intermediate-term endpoint. Even though chronic exposure is not expected, the Agency's OPP Health Effects Division RfD Peer Review Committee established a chronic endpoint to be used in the evaluation of potential chronic exposure. These endpoints are discussed in detail below.

a. Carcinogenicity Classification

The RfD Peer Review Committee has recommended that DEET be classified as Group D (i.e., not classifiable as a human carcinogen) because the mouse and rat carcinogenicity studies did not demonstrate any carcinogenic potential and because the Committee believed that the male rats could have tolerated higher doses. A Group D classification is generally used for agents with inadequate human and animal evidence of carcinogenicity or for which no data are available.

b. Other Toxicological Endpoints

On October 18, 1995 the TES Committee met to discuss the toxicological endpoints to be used in the risk characterization for DEET. Exposure to DEET occurs in the short to intermediate term; chronic exposure is not expected. Because the reported incidences were neurological in nature (i.e., seizures), the Committee evaluated the entire toxicology database on DEET with emphasis on the available acute and subchronic neurotoxicity screening studies. The Committee concluded that the observed toxicological effects from laboratory data are not toxicologically significant with respect to the labeled use of DEET; the following provides the Committee's rationale for this conclusion.

Neurotoxicity

In a subchronic neurotoxicity screening study in rats (MRID 41368401), groups of rats received DEET in the diet at concentrations of 0, 500, 2000, or 5000 ppm over two generations. There was an increase in horizontal activity and a decrease in body weight of rats dosed at 5000 ppm. The LEL was established as 5000 ppm (250 mg/kg/day, based on a standard conversion of 20 ppm = 1 mg/kg/day); NOEL, 2000 ppm (100 mg/kg/day).

In an acute neurotoxicity screening study (MRID 41368501), groups of rats (10/sex/dose) received DEET by gavage at dose levels of 0, 50, 200, or 500

mg/kg/day. A suggestive increase in the horizontal activity was seen in 500 mg/kg/day females on day 14 after cessation of treatment. However, at one and 24 hours after dosing, there was a significant decrease in horizontal and vertical activities in 500 mg/kg/day rats.

Subchronic Dermal Toxicity

Two subchronic dermal toxicity studies were considered: One 90-day dermal toxicity study in micropigs® and the second a 90-day dermal toxicity study in rats. In the micropig® study (MRID 41987401), DEET was dermally-applied to groups of micropigs® at dose levels of 0 (water), 100, 300, or 1000 mg/kg/day b.w. for 13 weeks. Under the conditions of the study, DEET did not produce any systemic effects at any dose levels. At the skin application sites, DEET produced skin irritation and histological changes which would be reversible upon termination of the treatment. Therefore, the NOEL for systemic toxicity is 1000 mg/kg/day (i.e., the HDT).

In the rat study (MRID 40241702), groups of CD® rats (15/sex/dose) received DEET by dermal application at doses of 0, 100, 300, or 1000 mg/kg/day for 90 days. In the high dose males, there was a decrease in body weight. An increase in kidney and liver weights was seen in high dose males. An increase in the incidence of renal lesions was seen in all treated males. The renal lesions were characterized by inflammation, tubular regeneration, hyaline droplets, and granular casts in the renal tubules. Marginal increases in the incidence of renal lesions were also seen in high dose females. Skin irritation at the application sites was seen in all compound-treated rats.

The renal lesions seen in all treated males were shown to be associated with the accumulation of $\alpha_{2\mu}$-globulin in the renal tubules of the affected rats, and they were shown to be unique to DEET treated male rats. The $\alpha_{2\mu}$-globulin-associated renal lesions were evaluated by the Agency, and the Agency concluded that they should not be used as an endpoint for determining non-carcinogenic hazards in humans. Therefore, based on a decrease in body weight gain and an increase in liver weights, the LEL is 1000 mg/kg/day (i.e., the HDT) and the NOEL is 300 mg/kg/day.

Endpoint Selection

The TES Committee determined that the possible neurotoxic effect in the two neurotoxicity screening studies was not robust enough to provide an adequate basis for risk assessment for the following reasons: (1) the increase in horizontal activity seen in the 225 mg/kg/day dose of the subchronic toxicity test was transient with significance only at the first measuring period; (2) the effect was not accompanied by any clinical signs or histopathological changes; and (3) the magnitude of the effect

was small. The members of the Committee proceeded to consider the subchronic dermal toxicity data.

The Committee debated the probability of using the NOEL of 300 mg/kg/day from the subchronic dermal toxicity study in rats (MRID 40241702) as an endpoint for short and intermediate term risk assessment. However, the liver weight increase seen in 1000 mg/kg/day level was not accompanied by any histopathological changes or any significant alterations in biochemical parameters which are frequently associated with liver injury. Therefore, the increase in liver weight could be an adaptive response. The decrease in body weight gain was modest. In addition, 1000 mg/kg/day is a relative high dose and it is also the limit dose for chronic toxicity and oncogenicity studies. Based on these considerations and the labeled dermal use of DEET, the Committee concluded that the minor effects seen in such a high dose (1000 mg/kg/day) were not sufficient to justify setting a short and intermediate term endpoint for conducting a quantitative risk assessment.

3. Children's Special Sensitivity

Children may be more or less sensitive to the potentially harmful effects of pesticides than adults (because of body size, physiology, etc.). To determine if there are any special sensitivities to children, the Agency looks at the overall use pattern (e.g., food-use, non food-use, residential exposure, etc.) along with the available reproductive and developmental toxicity data. DEET is a non-food use pesticide that is used almost exclusively in a residential setting; the few non-residential uses are for veterinary applications. With respect to the additional uncertainty factor for enhanced sensitivity of infants and children (as required by FQPA), EPA has concluded that it is not warranted; the rationale is outlined below.

In a two-generation reproductive toxicity study in rats (MRID 40979001), no compound-related effects on the reproductive parameters such as fertility, gestation, and viability were noted up to dietary doses of 5000 ppm. A systemic effect (reduction in the body weights of pups in late lactation) was noted in the highest dose tested, which is 5000 ppm (or 250 mg/kg/day, based on standard conversion, 20 ppm = 1 mg/kg/day). In parental animals, no NOEL was established; kidney effects were observed in adult males at all treatment levels.

In a developmental toxicity study in rats (MRID 41351401), some signs that are suggestive of neurotoxicity (e.g., hypoactivity, decreased muscle tone), were noted in the high-dose dams (750 mg/kg/day); however, these effects were transient. Also, in the high-dose dams, there was an increase in mortality rate, a reduction in body weight gain and food consumption, and an increase in mean liver weights. Further, in the high-dose dams, a slight increase in post-implantation loss and a statistically-significant decrease in mean fetal body weight/litter was seen. No

additional compound-related effects were found. Based on these findings, the NOEL for maternal toxicity was 250 mg/kg/day and the LEL was 750 mg/kg/day. The NOEL for developmental toxicity was 250 mg/kg/day and the LEL was 750 mg/kg/day (based on a statistically-significant decrease in mean fetal body weight/litter).

In a developmental toxicity study in rabbits (MRID 42141101), no compound-related maternal or developmental toxicity was noted. The NOEL for maternal and developmental toxicity was 325 mg/kg/day (i.e., the HDT). Although the study results indicated that the test animals could have tolerated higher dose levels, these data are useful in that they confirm the results of a much earlier developmental study in rabbits where pregnant rabbits received DEET by dermal application at doses as high as 5000 mg/kg/day and no developmental toxicity was seen.

Based on the existing reproductive and developmental toxicity data, there is no evidence that would lead the Agency to believe that DEET is uniquely toxic to infants and/or children. This conclusion is based on the following evidence:

The reproductive study shows that DEET produces systemic toxicity (i.e., reduced body weights) in the offspring at a dietary treatment level of 500 mg/kg/day, while in adult males, kidney effects were observed in all treatment levels, including the LDT (22.5 mg/kg/day).

Among the developmental studies where effects were noted (i.e., the rat study), the NOEL for the developing offspring was the same as that of the mother (i.e., 250 mg/kg/day).

4. Dietary Exposure and Risk Characterization

A dietary exposure and risk characterization for DEET is not required, based on the current use pattern and the absence of dietary exposure for this pesticide.

5. Residential Exposure and Risk Characterization

DEET is a chemical that repels (but does not kill) insects. Most of the 200 or so registered end-use products are intended for residential human use; there are a few products registered for veterinary uses. Among the residential human (i.e., non-veterinary) end-use products, all but four are products that are applied directly to the skin and/or clothing. The four products that are not applied directly to skin include two that have DEET imbedded in picnic tablecloths and two that have DEET imbedded in a wristband.

DEET products that are applied directly to skin and/or clothing are available in numerous formulation types (e.g., aerosol sprays, non-aerosol sprays, creams, lotions, sticks, foams, and towelettes) and concentrations (products range from ≈4%

a.i. to 100% a.i.). Often, the lower concentration products (those less than 30% a.i.) are formulated as sprays while the higher concentration products (those greater than 50% a.i.) are formulated as creams or lotions.

The following exposure and risk characterization is limited to the non-veterinary uses of DEET.

a. Residential Exposure

Tablecloths and Wristbands

Exposure to DEET from these two product types will be via the dermal route. Because the pesticide is imbedded into the matrix (i.e., tablecloth or wristband), the Agency expects that human exposure to the active ingredient will be negligible.

Products Applied Directly to Skin and/or Clothing

Most DEET end-use products are formulated as sprays, creams, etc. that are intended to be applied directly to the skin and/or clothing; thus, the Agency assumes that the primary route of exposure will be dermal. The Agency recognizes that exposure via the inhalation or oral route is possible. However, such exposure would be accidental (e.g., spraying the product in the eyes because the can was pointed the wrong way) or would result from misuse (spraying in an enclosed area such as a tent). In any case, any exposure via the inhalation or oral route will be much less than exposure via the dermal route.

DEET products are used by both adults and children. Users of DEET are expected to be exposed to the product intermittently for days or weeks (acute to subchronic exposure). The Agency considers acute to subchronic exposure to be one to several weeks; chronic exposure is generally considered to be over a long portion of an individual's lifetime and is continuous. The Agency expects that residential exposure to DEET would be subchronic; except in the most unusual circumstances (e.g., military personnel who are in the field for an extended period of time), long-term exposure (chronic) is not expected.

DEET products are applied by spraying or spreading the material directly onto the skin and/or clothing. In terms of pesticide exposure patterns, that of DEET is unusual in that it is one of the few residential-use pesticides that is applied directly to skin. The amount typically absorbed is a function of the product formulation and the area of the body to which it has been

applied. Products that are formulated by diluting concentrated DEET with a solvent such as ethanol have a greater dermal absorption than products that are undiluted. This point is illustrated in the human dermal absorption study (MRID 42578501) in which a 15% DEET product yielded 20% dermal absorption while an undiluted DEET product yielded 12% dermal absorption. Dermal absorption of pesticides is approximately four times greater around the ears than the forearm (Maibach, 1971).

In 1991, the DEET registrants submitted a study to the Agency where the amount of DEET an individual typically applies to himself or to children was measured. Assuming one application per day and standard body weights, the following Daily Exposure estimates were derived (Table 3):

Table 3. Daily Exposure Estimates for DEET

Category of Exposure	Amt. of DEET per Application (mg)	Body weight (kg)	Daily Exposure (mg/kg/day)
Adult Male	952.25	78.7	12.10
Adult Female	649.31	67.1	9.68
Child, 13-17	1065.35	50.6	21.05
Child, ≤12	940.83	25	37.63

CATEGORY OF EXPOSURE. To differentiate among adult males, adult females, and children, the study investigators provided exposure estimates for each of these sub-groups.
AMT. OF DEET USED PER APPLICATION. This is the total amount of product applied; it has been corrected for the concentration of the product used.
BODY WEIGHT. These are mean body weights; they were obtained from the "Exposure Factors Handbook."

DAILY EXPOSURE (mg/kg/day). This was derived using the formula:

$$\text{Daily Exposure (mg/kg/day)} = \frac{\text{Amount of DEET per application (or day)}}{\text{Body weight (kg)}}$$

The Agency recognizes that there are many shortcomings with these exposure data and that they may be underestimating exposure. For example, common sense indicates that users of DEET may apply the product two or three times in a single day (not just once), depending on the concentration of product being used and the level of insect infestation. Also, these data do not consider exposure via the inhalation or oral route (however, this omission is not expected to significantly underestimate exposure as dermal exposure to DEET is so much greater than inhalation or oral). However, even though there are weaknesses with these data, the Agency believes that they are useful in that they provide an idea of the magnitude of DEET exposure.

b. Risk Characterization

Based on the results of extensive toxicity testing, the Agency believes that the use of DEET does not present a health concern to the general U.S. population. The toxicity of DEET has been investigated since the 1940's when the U.S. Army first developed and patented it for use by military personnel in insect-infested areas. In acute toxicity testing using the technical grade material, DEET exhibited relatively mild effects. For example, in rabbits, eye and dermal irritation were exhibited; however, both conditions cleared within a week. Also, the LD_{50} values were quite high, on the order of four grams of test material per kilogram of body weight.

In addition to acute effects, DEET has also been tested for an entire battery of subchronic and chronic toxicity effects. Although some minor effects were seen at the doses tested, the data do not show DEET to be carcinogenic, significantly developmentally toxic, nor mutagenic.

Even though the empirical testing does not demonstrate significant human toxicity to DEET, there are a few reports of individuals experiencing adverse effects after using a DEET product. Over the past 35 years, 14 people have reported having a seizure as a result of being exposed to DEET. Twelve of these individuals were children and two were adults. Among these 14 incidents is the cluster of five that was reported to the New York State (NYS) Department of Health in 1989. The Agency has analyzed these incidents and cannot, at this time, conclude that these seizures are directly related to DEET exposure. However, neither can the Agency definitely conclude that they are not DEET-related. As noted in the Morbidity and Mortality Weekly Report editorial on the five NYS cases in 1989, "Anecdotal reports of seizures are difficult to interpret. None of the recent cases in New York and Connecticut have been clearly established as DEET toxicity" (Oransky, 1989). One possible explanation for the seizures is coincidence. Seizure coinciding with DEET is not unexpected, given an estimated 15,000-20,000 afebrile seizures in children (ages zero-19 years) estimated annually and an estimated 17 million children using DEET 10 times a year.

External Review

The FIFRA Scientific Advisory Panel (SAP) generally agrees with EPA's conclusion. In June 1997, OPP presented DEET to the SAP; the Agency felt that it would be wise to do so as DEET is such a widely-used consumer pesticide. Three questions were presented:

(1) Based on the currently available data on DEET, OPP requests that the members of the SAP comment on OPP's hazard characterization of this chemical and the decision not to establish toxicity endpoints for risk assessment.

(2) What do you think about our approach to and methodology for the risk assessment and characterization?

(3) What is your opinion of our interpretation of the incident information? (EPA believes that the reported incidences are inconclusive).

In response to the first two questions, the Panel stated that it "agrees with the Agency's hazard characterization and decision not to establish toxicity endpoints to be used for risk assessment, as exposure to DEET does not result in clearly characterized specific toxicological responses; to rationally choose toxicity endpoints that reflect a consistent response to DEET would be impossible." Additionally, the Panel suggested that the EPA improve upon its exposure assessment by looking at multiple applications, inhalation, and chronic exposure. With respect to the incident information, the SAP indicated that it "agrees with the Agency's interpretation of the incident information (that the reported incidences are inconclusive). There is no compelling information that exposure to DEET is causing an appreciable number of seizures, and data from animal studies do not support or predict symptoms experienced by children exposed to DEET."

Conclusion

In summary, the Agency concludes that, based on the currently available information, the use of DEET as an insect repellent does not pose a significant health risk to the general U.S. population for the following reasons:

(1) DEET is not believed to be acutely toxic nor carcinogenic, significantly developmentally toxic nor mutagenic at the doses tested.

(2) The available data do not support a direct link between exposure to DEET and reported seizure incidences (14 cases).

However, because DEET is: (1) so widely used among the U.S. population, including children; (2) is one of the few residential-use pesticides that is applied directly to the skin; and (3) has been thought to be associated with incidents of seizure, the Agency believes that it is prudent to require improved label warnings and restrictions for DEET products. The Agency believes that such common sense measures will be especially protective of children and other individuals who may be more sensitive to chemical substances.

Finally, in a continuing effort to monitor and understand DEET poisonings, the Chemical Specialties Manufacturers Association (CSMA) has recently set up a DEET registry through PEGUS, an independent research company in Utah. They have made agreements with a number of Poison Control Centers (PCCs) to collect

information and follow-up on any serious DEET-related cases. The information will be collected to determine whether any seizure type effects may have been related to DEET use.

C. Environmental Assessment

1. Ecological Toxicity Data

A limited set of toxicity data are required for pesticides that have only indoor uses. N,N-diethyl-meta-toluamide (DEET) qualifies for a reduced data set, because use patterns are limited to indoor nonfood and indoor residential. The data available are adequate to assess the hazard of DEET to nontarget terrestrial and aquatic organisms.

a. Toxicity to Terrestrial Animals

(1) Birds, Acute and Subacute

To establish the toxicity of DEET to birds, the following test is required using the technical grade material: a single-dose oral (LD_{50}) study on one avian species (preferably mallard or bobwhite quail). Subacute dietary studies (LC_{50}) on a waterfowl species and an upland gamebird species are waived. Table 4 summarizes the avian acute oral findings for DEET:

Table 4: Avian Acute Oral Toxicity

Species	% A.I.	LD_{50} (mg/kg)	MRID No. Author/Year	Toxicity Category
Northern Bobwhite	98.3	1375	41159701 (Grimes and Jabar, 1989)	slightly toxic

These results indicate that DEET is slightly toxic to avian species on an acute oral basis. The guideline requirement for an acute oral toxicity test is fulfilled. (MRID 41159701)

(2) Mammals

Wild mammal testing is required on a case-by-case basis, depending on the results of the lower tier studies such as acute and subacute testing, intended use pattern, and pertinent environmental fate characteristics. In most cases, however, an acute oral LD_{50} from the Agency's Health Effects Division (HED) is used to determine toxicity to mammals. This LD_{50} is reported below.

Table 5: Mammalian Acute Oral Toxicity

Species	LD_{50} (mg/kg)	MRID No.	Toxicity Category
Rat (small mammal surrogate)	3900 (73.0% ai)	41678101	practically nontoxic

The available mammalian data are sufficient to characterize DEET as practically nontoxic to small mammals on an acute oral basis.

b. Toxicity to Aquatic Animals

(1) Freshwater Fish

To establish the toxicity of DEET to freshwater fish, the minimum data required on the technical grade of the active ingredient is one freshwater fish toxicity study with a coldwater species (preferably the rainbow trout). The following acute toxicity findings with coldwater fish species apply to DEET:

Table 6: Freshwater Fish Acute Toxicity

Species	% A.I.	LC_{50} ppm a.i.	MRID No.	Toxicity Category
Rainbow trout	95	75	00001026 (McCann, 1972)	slightly toxic

The results of the 96-hour acute toxicity study indicate that DEET is slightly toxic to fish. The guideline requirement is fulfilled. (MRID 00001026)

(2) Freshwater Invertebrates

The minimum testing required to assess the hazard of a pesticide to freshwater invertebrates is a freshwater aquatic invertebrate toxicity test, preferably using first instar *Daphnia magna* or early instar amphipods, stoneflies, mayflies, or midges. The following acute toxicity findings apply to DEET:

Table 7: Freshwater Invertebrate Toxicity

Species	% A.I.	EC_{50} (ppm)	MRID No. Author/Year	Toxicity Category
Daphnia magna	100	75	00243419	slightly toxic

There is sufficient information to characterize DEET as slightly toxic to aquatic invertebrates. The guideline requirement is fulfilled. (MRID 00243419)

2. Environmental Fate

a. Environmental Fate Assessment

Because of its limited use pattern, the only environmental fate study required for DEET was hydrolysis. The registrant submitted a hydrolysis study that satisfied this data requirement (MRID 40192701). That study demonstrated that DEET is stable to hydrolysis in solutions initially buffered to pH 5, 7, and 9. It can be concluded that DEET will be stable to hydrolysis at pH levels found in the environment.

3. Exposure and Risk Characterization

a. Ecological Exposure and Risk Characterization

(1) Exposure and Risk to Nontarget Terrestrial Animals

Environmental risk assessments are not conducted for pesticides with exclusively indoor use patterns. N,N-diethyl-m-toluamide (DEET) is considered to be an "indoor residential" use rather than an outdoor use because it is only applied directly to the human body/clothing, cats, dogs, pet quarters, and household/domestic dwellings. Application of DEET to these sites is not likely to adversely affect terrestrial wildlife or aquatic organisms.

A limited set of toxicity data for indoor-use pesticides is required to determine precautionary label statements and to assess environmental hazards in case of spills. The available data characterize DEET as slightly toxic to birds, fish, and aquatic invertebrates and as practically nontoxic to mammals.

(2) Endangered Species

Based on the current indoor-only use patterns and the relatively low toxicity of DEET, risks to endangered species are not anticipated.

IV. RISK MANAGEMENT AND REREGISTRATION DECISION

A. Determination of Eligibility

Section 4(g)(2)(A) of FIFRA calls for the Agency to determine, after submission of relevant data concerning an active ingredient, whether products containing the active ingredient are eligible for reregistration. The Agency has previously identified and required the submission of the generic (i.e. active ingredient specific) data required to support

reregistration of products containing N,N-diethyl-meta-toluamide (DEET) active ingredients. The Agency has completed its review of these generic data, and has determined that the data are sufficient to support reregistration of most formulations/uses of DEET under the conditions specified in this RED. Appendix B identifies the generic data requirements that the Agency reviewed as part of its determination of reregistration eligibility of DEET, and lists the submitted studies that the Agency found acceptable.

The data identified in Appendix B were sufficient to allow the Agency to assess the registered uses of DEET and to determine that DEET can be used without resulting in unreasonable adverse effects to humans and the environment if used according to the labels as amended by this RED. The Agency therefore finds that most products containing DEET as the active ingredient are eligible for reregistration under the conditions specified in this RED. The Agency will defer its decision regarding the eligibility of products/formulations that combine DEET and sunscreen until an advisory panel has been convened and has made specific recommendations to the Agency concerning the reregistration of these products. DEET products with labels that make child-safety claims are ineligible for reregistration, and can only be reregistered when all child-safety claims (including trade names) are removed from product labels. In order to be eligible for reregistration, DEET products with cosmetic claims must conform to the labeling requirements for these products as outlined in Section V. of this document.

The Agency made its reregistration eligibility determination based upon the target data base required for reregistration, the current guidelines for conducting acceptable studies to generate such data, published scientific literature, etc. and the data identified in Appendix B. The Agency has found that all uses of DEET are eligible for reregistration under the conditions specified in this RED, except for uses/formulations that contain sunscreen and uses/formulations that make child-safety claims. Child-safety claims must be removed from end-use product labels in order for those products to be reregistered. It should be understood that the Agency may take additional appropriate regulatory action, and/or require the submission of additional data to support the registration of products containing DEET, if new information comes to the Agency's attention or if the data requirements for registration (or the guidelines for generating such data) change.

B. Determination of Eligibility Decision

1. Eligibility Decision

Based on the reviews of the generic data for the active ingredient DEET, the Agency has sufficient information on the health effects of DEET and on its potential for causing adverse effects in fish and wildlife and the environment. The Agency has determined that DEET products, labeled and used as specified in this Reregistration Eligibility Decision, will not pose unreasonable risks to humans or the environment.

The Agency is concerned in general with the use directions and label precautions for all DEET end-use products. EPA believes that it is prudent to require consistent, protective, and common sense directions to prevent overapplication and misuse. The Agency is particularly concerned with DEET registrations for which cosmetic claims are made, where DEET is formulated with sunscreen, and where labeling indicates that use is safe for children. Consequently, all DEET registrations (with the exception of the products containing sunscreens) are eligible for reregistration as long as labeling is amended as specified below.

Although the scientific data reviewed for DEET do not show it to be carcinogenic, developmentally toxic, nor mutagenic, there have been seizure incidents associated with DEET use. The Agency has concerns regarding these seizures, especially for children who are more susceptible to seizures in general and who receive a higher dose of DEET due to a greater surface area to body weight ratio. This concern is heightened due to the manner in which DEET is applied: directly to the skin. Therefore, the Agency is requiring label directions for the safe, effective application and reapplication of all DEET-containing products.

The Agency will defer its decision regarding the reregistration eligibility of products/formulations that combine DEET and sunscreen until the Agency has solicited the views of various governmental agencies and other groups. Additionally, the Agency will not act on any pending registration applications under section 3 until that time. As stated in the amended Reregistration Standard (dated March 1985), the Agency will not register products whose acute toxicity falls into Toxicity Category I or II. Additionally, end-use products must not be corrosive to the eye or cause corneal involvement or irritation persisting for 21 days or more.

The Agency is concerned about consumer use of products that combine sunscreen and DEET, since directions to reapply sunscreens generously and frequently may promote greater use of DEET than needed for pesticidal efficacy and thus pose unnecessary exposure to DEET. DEET labels currently recommend that products be used sparingly and not be reapplied too often. Sunscreen products, however, recommend frequent reapplication. No benefits attach to use of DEET more frequently than necessary to achieve its purpose. Products containing DEET which have cosmetic claims could encourage the user to apply the product for reasons other than to repel insects resulting in unnecessary exposure. DEET uses/formulations whose labels make child-safety claims are ineligible for reregistration. DEET uses/formulations with labels that make cosmetic claims must be labeled such that label statements and use directions regarding insect repellency appear first and more prominently on the label than cosmetic claims.

Finally, brand names for certain DEET products with 15% or less DEET contain statements such as “for kids” or “for use on children.” Products with child safety claims are ineligible for reregistration because the Agency believes such claims are false and misleading. The Agency is generally wary of safety claims and EPA regulations specify that safety claims for pesticides are, on their face, false or

misleading. 40 C.F.R. § 156.10 (a) (5) (ix). However, the Agency does not believe this regulation would necessarily bar a children's version of a personal use pesticide if such product was formulated based on scientific testing. But that is not the case here. The Agency believes there is no factual basis to support a claim that certain DEET products pose significantly lower risk to children. The children's safety claims appear on certain DEET products containing 15% or less DEET and thus, the Agency presumes, these claims are tied to the percentage of DEET in the product. Yet, the scientific data for DEET do not support product label claims of safety for children based on the percent active ingredient. In addition, there is no apparent correlation between reported cases of seizure incidents and the concentration of DEET that was applied. Registrations for which the labeling is amended as specified below will be considered to be eligible for reregistration.

2. Eligible and Ineligible Uses

The Agency has determined that all uses of DEET are eligible for reregistration ***except*** uses/formulations that contain sunscreen and uses/formulations whose labels make child-safety claims. Products labels with cosmetic claims must be revised to conform with the labeling requirements for those products outlined in Section V. of this RED document.

C. Regulatory Position

The following is a summary of the regulatory positions and rationales for DEET. Where labeling revisions are imposed, specific language is set forth in Section V of this document.

1. Labeling Rationale

Because DEET is applied directly to skin and/or clothing being worn and because of its association with seizure incidents, the Agency believes it is prudent to require consistent, protective, common sense use directions and label precautions for all DEET end-use products to prevent over-application and misuse. Product labeling requirements have been revised in accordance with this goal and are outlined in Section V. B. 2., "Labeling Requirements for DEET End-Use Products."

<u>Child-Safety Claims</u>

Some DEET formulations have label language and/or brand names that imply that those formulations are better for use on children (e.g. "...for children," " ...for kids.") The Agency considers these formulations/products to be ineligible for reregistration. The scientific data reviewed by the Agency for DEET do not support the claim that certain concentration DEET formulations are safer than others. Also, there appears to be no correlation between the reported cases of seizure and the concentration of DEET that was used. All direct or indirect claims of child safety must be removed from DEET labeling for those products to be reregistered.

V. ACTIONS REQUIRED OF REGISTRANTS

This section specifies the data requirements and responses necessary for the reregistration of both manufacturing-use and end-use products.

A. Manufacturing-Use Products

1. Additional Generic Data Requirements

The generic data base supporting the reregistration of N,N-diethyl-meta-toluamide (DEET) for the above eligible uses has been reviewed and determined to be substantially complete. No additional generic data are being called-in for DEET at this time.

2. Labeling Requirements for Manufacturing-Use Products

To remain in compliance with FIFRA, manufacturing use product (MP) labeling must be revised to comply with all current EPA regulations, PR Notices and applicable policies. The MP labeling must bear the following statement under Directions for Use:

> "Only for formulation into an Insecticide for the following use(s)[fill blank only with those uses that are being supported by MP registrant]."

An MP registrant may, at his/her discretion, add one of the following statements to an MP label under

> "Directions for Use" to permit the reformulation of the product for a specific use or all additional uses supported by a formulator or user group:

(a) "This product may be used to formulate products for specific use(s) not listed on the MP label if the formulator, user group, or grower has complied with U.S. EPA submission requirements regarding support of such use(s)."

(b) "This product may be used to formulate products for any additional use(s) not listed on the MP label if the formulator, user group, or grower has complied with U.S. EPA submission requirements regarding support of such use(s)."

The Agency has determined that registrants may distribute and sell N,N-diethyl-m-toluamide products bearing old labels/labeling for **26 months** from the date of issuance of this RED. Persons other than the registrant may distribute or sell such products for **50 months** from the date of the issuance of this RED. Registrants and persons other than registrants remain obligated to meet pre-existing Agency imposed

label changes and existing stocks requirements applicable to products they sell or distribute.

B. End-Use Products

1. Additional Product-Specific Data Requirements

Section 4(g)(2)(B) of FIFRA calls for the Agency to obtain any needed product-specific data regarding the pesticide after a determination of eligibility has been made. The product specific data requirements are listed in Appendix G, the Product Specific Data Call-In Notice. Note that product-specific efficacy data is being called in for end-use products containing N,N-diethyl-m-toluamide (DEET).

Registrants must review previous data submissions to ensure that they meet current EPA acceptance criteria (Appendix F; Attachment E) and if not, commit to conduct new studies. If a registrant believes that previously submitted data meet current testing standards, then study MRID numbers should be cited according to the instructions in the Requirement Status and Registrants Response Form provided for each product.

2. Labeling Requirements for End-Use Products

All registrants of DEET end-use products must comply with the labeling statements listed below.

ALL PRODUCTS

To be eligible for reregistration, the following statements are required on **all** DEET product labels:

1. Read and follow all directions and precautions on this product label.

2. Do not apply over cuts, wounds, or irritated skin.

3. Do not apply near eyes and mouth. Apply sparingly around ears.

4. Do not apply to children's hands.

5. Do not allow children to handle this product.

6. When using on children, apply to your own hands and then put it on the child.

7. Use just enough repellent to cover exposed skin and/or clothing.

8. **Do not use under clothing.**

9. **Avoid over-application of this product.**

10. **After returning indoors, wash treated skin with soap and water.**

11. **Wash treated clothing before wearing it again.**

12. **Use of this product may cause skin reactions in rare cases.**

13. **If you suspect a reaction to this product, discontinue use, wash treated skin, and call your local poison control center.**

14. **If you go to a doctor, take this product with you.**

AEROSOL AND PUMP SPRAY FORMULATIONS

To be eligible for reregistration, the following additional statements/requirements are required for all aerosol and pump spray formulations:

1. Do not spray in enclosed areas.

2. If used on the face, spray on hands first and then apply sparingly and avoid eyes. Do not spray directly onto face.

3. To be eligible for reregistration, aerosol and pump spray formulations must be packaged in containers utilizing a **concave trigger to help aim product** or other comparable mechanism that will ensure that the product will not be inadvertently sprayed in the eyes.

OTHER LABELING REQUIREMENTS

1. Ingredients Statement for DEET Products

The following label statement is required for all DEET products:

ACTIVE INGREDIENTS

DEET..... XX.XX%

2. Statement of Practical Treatment

"First Aid" must replace "**Statement of Practical Treatment** " on all product labels.

3. Telephone Number on all Product Labels

A toll-free telephone number must appear on all product labels for consumers to call for additional product information and to report incidents.

4. Dissolving Labels

Current labels on DEET repellent products tend to dissolve from contact with the repellent (usually liquids). All reregistered DEET product labels must use materials that remain permanent and readable for the reasonable life of the product.

5. Cosmetic Claims

Cosmetic claims may be used in DEET end-use labeling, however, the words "**INSECT REPELLENT**" must be displayed prominently on the front panel of all product labels, immediately after the brand name, in capital lettering, with large, contrasting, bold-faced type.

6. Child-Safety Claims

All direct or indirect claims of child safety must be removed from DEET end-use product labeling in order for those products to be eligible for reregistration.

C. Existing Stocks

Registrants may generally distribute and sell products bearing old labels/labeling for 26 months from the date of the issuance of this Reregistration Eligibility Decision (RED). Persons other than the registrant may generally distribute or sell such products for 50 months from the date of the issuance of this RED. However, existing stocks time frames will be established case-by-case, depending on the number of products involved, the number of label changes, and other factors. Refer to "Existing Stocks of Pesticide Products; Statement of Policy"; Federal Register, Volume 56, No. 123, June 26, 1991.

The Agency has determined that registrants may distribute and sell N,N-diethyl-m-toluamide products bearing old labels/labeling for 26 months from the date of issuance of this RED. Persons other than the registrant may distribute or sell such products for 50 months from the date of the issuance of this RED. Registrants and persons other than registrants remain obligated to meet pre-existing Agency imposed label changes and existing stocks requirements applicable to products they sell or distribute.

VI. APPENDICES

APPENDIX A REPORT

Case 0002 [Deet] Chemical 080301 [N,N-Diethyl-meta-toluamide and other isomers]

SITE Application Type, Application Timing, Application Equipment) Surface Type (Antimicrobial only) & Efficacy Influencing Factor (Antimicrobial only)	Form(s)	Min. Appl. Rate (AI unless noted otherwise)	Max. Appl. Rate (AI unless noted otherwise)	Soil	Tex.	Max. # Apps @ Max. Rate Max. Dose /crop	/year cycle	Max. Dose [(AI unless noted otherwise)/A] /crop	/year cycle	Min. Interv (days)	Re-Entry Intv.	Geographic Limitations Allowed	Geographic Limitations Disallowed	Use Limitations Codes
The uses listed in Appendix A were evaluated for reregistration. The following uses do not include any changes to use patterns, such as application rates or frequency, that may be mandated by this RED document.														
NON-FOOD/NON-FEED														
CATS (ADULTS/KITTENS)				Use Group: INDOOR RESIDENTIAL										
Animal treatment (spray), When needed, Aerosol can	PRL	NA		UC	*	NS	NS	NS	NS	7	NS			
	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS			
DOGS/CANINES (ADULTS/PUPPIES)				Use Group: INDOOR RESIDENTIAL										
Animal treatment (spray), When needed, Aerosol can	PRL	NA		UC	*	NS	NS	NS	NS	7	NS			
	PRL	NA		UC	*	NS	NS	NS	NS	7	NS			C04, CAL
	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS			
HORSES (SHOW/RACE/SPECIAL/PONIES)				Use Group: INDOOR NON-FOOD										
Animal treatment (spray), When needed, Pump spray bottle	RTU	NA		UC	*	NS	NS	NS	NS	1	NS			S01
Animal treatment (spray), When needed, Pump-up sprayer	RTU	NA		UC	*	NS	NS	NS	NS	AN	NS			
HOUSEHOLD/DOMESTIC DWELLINGS OUTDOOR PREMISES				Use Group: OUTDOOR RESIDENTIAL										
Impregnated covering, When needed, By hand	IMPR	NA		UC	*	NS	NS	NS	NS	NS	NS			
HUMAN BODY/CLOTHING WHILE BEING WORN (INSECT CONTROL)				Use Group: INDOOR RESIDENTIAL										
Clothing treatment, When needed, Aerosol can	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS			
	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS			CAC, CAL, CAU
	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS			CAC, CAU
	PRL	NA		UC	*	NS	NS	NS	NS	NS	NS			

APPENDIX A REPORT

Case 0002 [Deet] Chemical 080301 [N,N-Diethyl-meta-toluamide and other isomers]

SITE Application Type, Application Timing, Application Equipment) Surface Type (Antimicrobial only) & Efficacy Influencing Factor (Antimicrobial only)	Form(s)	Min. Appl. Rate (AI unless noted otherwise)	Max. Appl. Rate (AI unless noted otherwise)	Soil Tex. Max. Dose	Max. # Apps @ Max. Rate /crop cycle	/year	Max. Dose [(AI unless noted otherwise)/A] /crop cycle	/year	Min. Interv (days)	Re-Entry Intv.	Geographic Limitations Allowed	Geographic Limitations Disallowed	Use Limitations Codes
USES ELIGIBLE FOR REREGISTRATION													
NON-FOOD/NON-FEED (con't)													
HUMAN BODY/CLOTHING WHILE BEING WORN (INSECT CONTROL) (con't)	Use Group: INDOOR RESIDENTIAL (con't)												
Clothing treatment, When needed, By hand	IMPR	NA		UC	*	NS	NS	NS	NS	AN	NS		
	IMPR	NA		UC	*	NS	NS	NS	NS	NS	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	AN	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Clothing treatment, When needed, Non-aerosol pump sprayer	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Clothing treatment, When needed, Package applicator	IMPR	NA		UC	*	NS	NS	NS	NS	NS	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	AN	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Clothing treatment, When needed, Pump spray bottle	RTU	NA		UC	*	NS	NS	NS	NS	0.12	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	AN	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Clothing treatment, When needed, Sprayer	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Clothing treatment, When needed, Squirt bottle	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Impregnated covering, When needed, By hand	IMPR	NA		UC	*	NS	NS	NS	NS	NS	NS		
Skin contact treatment, When needed, Aerosol can	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS		
	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS		CAC, CAL, CAU

APPENDIX A REPORT

Case 0002 [Deet] Chemical 080301 [N,N-Diethyl-meta-toluamide and other isomers]

SITE Application Type, Application Timing, Application Equipment) Surface Type (Antimicrobial only) & Efficacy Influencing Factor (Antimicrobial only)	Form(s)	Min. Appl. Rate (AI unless noted otherwise)	Max. Appl. Rate (AI unless noted otherwise)	Soil Tex. Max. Dose	Max. # Apps @ Max. Rate /crop cycle	/year	Max. Dose [(AI unless noted otherwise)/A] /crop cycle	/year	Min. Interv (days)	Re-Entry Intv.	Geographic Limitations Allowed	Disallowed	Use Limitations Codes
USES ELIGIBLE FOR REREGISTRATION													
NON-FOOD/NON-FEED (con't)													
HUMAN BODY/CLOTHING WHILE BEING WORN (INSECT CONTROL) (con't)	Use Group: INDOOR RESIDENTIAL (con't)												
	PRL	NA		UC	*	NS	NS	NS	NS	AN	NS		CAC, CAU
	PRL	NA		UC	*	NS	NS	NS	NS	NS	NS		
Skin contact treatment, When needed, By hand	IMPR	NA		UC	*	NS	NS	NS	NS	AN	NS		
	IMPR	NA		UC	*	NS	NS	NS	NS	NS	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	AN	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		CAL
Skin contact treatment, When needed, Non-aerosol pump sprayer	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Skin contact treatment, When needed, Package applicator	IMPR	NA		UC	*	NS	NS	NS	NS	NS	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	AN	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Skin contact treatment, When needed, Pump spray bottle	RTU	NA		UC	*	NS	NS	NS	NS	0.12	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	AN	NS		
	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Skin contact treatment, When needed, Sprayer	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Skin contact treatment, When needed, Squirt bottle	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		

APPENDIX A REPORT

Case 0002 [Deet] Chemical 080301 [N,N-Diethyl-meta-toluamide and other isomers]

SITE Application Type, Application Timing, Application Equipment) Surface Type (Antimicrobial only) & Efficacy Influencing Factor (Antimicrobial only)	Form(s)	Min. Appl. Rate (AI unless noted otherwise)	Max. Appl. Rate (AI unless noted otherwise)	Soil Tex. Max. Dose	Max. # Apps @ Max. Rate /crop	/year cycle	Max. Dose [(AI unless noted otherwise)/A] /crop	/year cycle	Min. Interv (days)	Re-Entry Intv.	Geographic Limitations Allowed	Geographic Limitations Disallowed	Use Limitations Codes
USES ELIGIBLE FOR REREGISTRATION													
NON-FOOD/NON-FEED (con't)													
HUMAN CLOTHING (INSECT AND MOLD/MILDEW CONTROL)				Use Group: INDOOR RESIDENTIAL									
Clothing treatment, When needed, Squirt bottle	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
Skin contact treatment, When needed, Squirt bottle	RTU	NA		UC	*	NS	NS	NS	NS	NS	NS		
PET LIVING/SLEEPING QUARTERS				Use Group: INDOOR RESIDENTIAL									
Animal bedding/litter treatment, When needed, Aerosol can	PRL	NA		UC	*	NS	NS	NS	NS	NS	NS		
Spot treatment, When needed, Aerosol can	PRL	NA		UC	*	NS	NS	NS	NS	NS	NS		
Spray, When needed, Aerosol can	PRL	NA		UC	*	NS	NS	NS	NS	NS	NS		C04, CAL
RECREATIONAL AREAS				Use Group: TERRESTRIAL NON-FOOD CROP									
Impregnated covering, When needed, By hand	IMPR	NA		UC	*	NS	NS	NS	NS	NS	NS		

APPENDIX A REPORT

Case 0002 [Deet] Chemical 080301 [N,N-Diethyl-meta-toluamide and other isomers]

LEGEND

Sort: Uses Eligible or Ineligible for Re-registration, Food/Feed or Non-Food/Non-Feed Uses, Alpha Site Name, Use Group Name, Alpha Application Type/Timing/Equipment Description, Formulation, Maximum Application Rate Unit/Area Quantity, Minimum Application Rate

HEADER ABBREVIATIONS

Min. Appl. Rate (AI unless noted otherwise)	: Minimum dose for a single application to a single site. System calculated. Antimicrobial claims only.
Max. Appl. Rate (AI unless noted otherwise)	: Maximum dose for a single application to a single site. System calculated.
Soil Tex. Max. Dose	: Maximum dose for a single application to a single site as related to soil texture (Herbicide claims only).
Max. # Apps @ Max. Rate	: Maximum number of Applications at Maximum Dosage Rate. Example: "4 applications per year" is expressed as "4/1 yr"; "4 applications per 3 years" is expressed as "4/3 yr"
Max. Dose [(AI unless noted otherwise)/A]	: Maximum dose applied to a site over a single crop cycle or year. System calculated.
Min. Interv (days)	: Minimum Interval between Applications (days)
Re-Entry Intv.	: Reentry Intervals
PRD Report Date	: LUIS contains all products that were active or suspended (and that were available from OPP Document Center) as of this date. Some products registered after this date may have data included in this report, but LUIS does not guarantee that all products registered after this date have data that has been captured.

SOIL TEXTURE FOR MAX APP. RATE

*	: Non-specific
C	: Coarse
M	: Medium
F	: Fine
O	: Others

FORMULATION CODES

IMPR	: IMPREGNATED MATERIAL
PRL	: PRESSURIZED LIQUID
RTU	: LIQUID-READY TO USE

ABBREVIATIONS

AN	: As Needed
NA	: Not Applicable
NS	: Not Specified (on label)
UC	: Unconverted due to lack of data (on label), or with one of following units: bag, bait, bait block, bait pack, bait station, bait station(s), block, briquet, briquets, bursts, cake, can, canister, capsule, cartridges, coil, collar, container, dispenser, drop, eartag, grains, lure, pack, packet, packets, pad, part, parts, pellets, piece, pieces, pill, pumps, sec, sec burst, sheet, spike, stake, stick, strip, tab, tablet, tablets, tag, tape, towelette, tray, unit, --

APPLICATION RATE

DCNC	: Dosage Can Not be Calculated
No Calc	: No Calculation can be made
W	: PPM calculated by weight
V	: PPM Calculated by volume
U	: Unknown whether PPM is given by weight or by volume

APPENDIX A REPORT

Case 0002 [Deet] Chemical 080301 [N,N-Diethyl-meta-toluamide and other isomers]

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APPLICATION RATE (CONT.)

cwt : Hundred Weight
nnE-xx : nn times (10 power -xx); for instance, "1.234E-04" is equivalent to ".0001234"

USE LIMITATIONS CODES

C04 : Proper ventilation required.
CAC : Keep out of lakes, streams, and ponds.
CAL : Do not contaminate water, food or feed.
CAU : Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark.
S01 : Do not apply to animals being finished for slaughter.
* NUMBER IN PARENTHESES REPRESENTS THE NUMBER OF TIME UNITS (HOURS,DAYS, ETC.) DESCRIBED IN THE LIMITATION.

GUIDE TO APPENDIX B

Appendix B contains listings of data requirements which support the reregistration for active ingredients within the case DEET covered by this Reregistration Eligibility Decision Document. It contains generic data requirements that apply to DEET in all products, including data requirements for which a "typical formulation" is the test substance.

The data table is organized in the following format:

1. Data Requirement (Column 1). The data requirements are listed in the order in which they appear in 40 CFR Part 158. the reference numbers accompanying each test refer to the test protocols set in the Pesticide Assessment Guidelines, which are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 487-4650.

2. Use Pattern (Column 2). This column indicates the use patterns for which the data requirements apply. The following letter designations are used for the given use patterns:

A	Terrestrial food
B	Terrestrial feed
C	Terrestrial non-food
D	Aquatic food
E	Aquatic non-food outdoor
F	Aquatic non-food industrial
G	Aquatic non-food residential
H	Greenhouse food
I	Greenhouse non-food
J	Forestry
K	Residential
L	Indoor food
M	Indoor non-food
N	Indoor medical
O	Indoor residential

3. Bibliographic citation (Column 3). If the Agency has acceptable data in its files, this column lists the identifying number of each study. This normally is the Master Record Identification (MRID) number, but may be a "GS" number if no MRID number has been assigned. Refer to the Bibliography appendix for a complete citation of the study.

APPENDIX B

Data Supporting Guideline Requirements for the Reregistration of DEET

REQUIREMENT		USE PATTERN	CITATION(S)(MRID#)
PRODUCT CHEMISTRY			
61-1	Chemical Identity	ALL	42910001
61-2A	Start. Mat. & Mnfg. Process	ALL	43241002
61-2B	Formation of Impurities	ALL	43241003
62-1	Preliminary Analysis	ALL	43241004
62-2	Certification of limits		43241001 43241005
62-3	Analytical Method	ALL	43241006
63-2	Color	ALL	00001025
63-3	Physical State	ALL	00001068
63-4	Odor	ALL	00001100
63-6	Boiling Point	ALL	43241007
63-8	Solubility	ALL	4321008
63-9	Vapor Pressure	ALL	4321009
63-11	Octanol/Water Partition	ALL	4321010
63-13	Stability	ALL	43241012
ECOLOGICAL EFFECTS			
71-1a	Acute Avian Oral - Quail/Duck	ABCDEFJK	41159701
72-1C	Fish Toxicity Rainbow Trout	ABCDEFJK	00001026
72-2a	Invertebrate Toxicity	ABCDEFJK	00243419
TOXICOLOGY			
81-1	Acute Oral Toxicity - Rat		00134359a 43763201
81-2	Acute Dermal Toxicity - Rabbit/Rat	ALL	00134359b
81-3	Acute Inhalation Toxicity - Rat	ALL	00134359c
81-4	Primary Eye Irritation - Rabbit	ALL	00134359d
81-5	Primary Dermal Irritation - Rabbit	ALL	00134359e
81-6	Dermal Sensitization - Guinea Pig	ALL	00134359f

Data Supporting Guideline Requirements for the Reregistration of DEET

REQUIREMENT		USE PATTERN	CITATION(S)(MRID#)
82-1A	90-Day Feeding - Rodent	ABDHL	40241703 42518101 41344101
82-1B	90-Day Feeding - Non-rodent	ABDHL	41987401 43514201 43514202
82-3	90-Day Dermal - micropig - rat - rat		41987401 40241702 41199301
83-1A	Chronic Feeding Toxicity - Rodent	ABDHL	43514203
83-1B	Chronic Feeding Toxicity - Non-Rodent	ABDHL	43320101
83-2A	Oncogenicity - Rat	ABDHL	43320101
83-2B	Oncogenicity - Mouse	ABDHL	41351501
83-3A	Developmental Toxicity - Rat	ABDHL	41351401
83-3B	Developmental Toxicity - Rabbit	ABDHL	42141101
83-4	2-Generation Reproduction - Rat	ABDHL	40979001
83-5	Combined chronic/oncogenicity - rats		43514202
84-2A	Gene Mutation (Ames Test)	ALL	41344801
84-2B	Structural Chromosomal Aberration	ALL	41344401
84-4	Other Genotoxic Effects	ALL	41344301
85-1	General Metabolism	ABDHL	41994401 41994402 41994403
85-2	Dermal Penetration		42578501
ENVIRONMENTAL FATE			
160-5	Chemical Identity	ALL	
161-1	Hydrolysis	ABCDEFGHI JK	40192701
SPECIAL STUDIES			
158.75-s	Human Use Exposure		41968001

Data Supporting Guideline Requirements for the Reregistration of DEET

REQUIREMENT		USE PATTERN	CITATION(S)(MRID#)
85-2-ss	Dermal Absorption (human)		42578501
88-1-ss	Acute/Subacute neurotoxicity		41368401 41368501

GUIDE TO APPENDIX C

1. CONTENTS OF BIBLIOGRAPHY. This bibliography contains citations of all studies considered relevant by EPA in arriving at the positions and conclusions stated elsewhere in the Reregistration Eligibility Document. Primary sources for studies in this bibliography have been the body of data submitted to EPA and its predecessor agencies in support of past regulatory decisions. Selections from other sources including the published literature, in those instances where they have been considered, are included.

2. UNITS OF ENTRY. The unit of entry in this bibliography is called a "study". In the case of published materials, this corresponds closely to an article. In the case of unpublished materials submitted to the Agency, the Agency has sought to identify documents at a level parallel to the published article from within the typically larger volumes in which they were submitted. The resulting "studies" generally have a distinct title (or at least a single subject), can stand alone for purposes of review and can be described with a conventional bibliographic citation. The Agency has also attempted to unite basic documents and commentaries upon them, treating them as a single study.

3. IDENTIFICATION OF ENTRIES. The entries in this bibliography are sorted numerically by Master Record Identifier, or "MRID number". This number is unique to the citation, and should be used whenever a specific reference is required. It is not related to the six-digit "Accession Number" which has been used to identify volumes of submitted studies (see paragraph 4(d)(4) below for further explanation). In a few cases, entries added to the bibliography late in the review may be preceded by a nine character temporary identifier. These entries are listed after all MRID entries. This temporary identifying number is also to be used whenever specific reference is needed.

4. FORM OF ENTRY. In addition to the Master Record Identifier (MRID), each entry consists of a citation containing standard elements followed, in the case of material submitted to EPA, by a description of the earliest known submission. Bibliographic conventions used reflect the standard of the American National Standards Institute (ANSI), expanded to provide for certain special needs.

    a Author. Whenever the author could confidently be identified, the Agency has chosen to show a personal author. When no individual was identified, the Agency has shown an identifiable laboratory or testing facility as the author. When no author or laboratory could be identified, the Agency has shown the first submitter as the author.

    b. Document date. The date of the study is taken directly from the document. When the date is followed by a question mark, the bibliographer has deduced the date from the evidence contained in the document. When the date appears as (19??), the Agency was unable to determine or estimate the date of the document.

c. Title. In some cases, it has been necessary for the Agency bibliographers to create or enhance a document title. Any such editorial insertions are contained between square brackets.

d. Trailing parentheses. For studies submitted to the Agency in the past, the trailing parentheses include (in addition to any self-explanatory text) the following elements describing the earliest known submission:

(1) Submission date. The date of the earliest known submission appears immediately following the word "received."

(2) Administrative number. The next element immediately following the word "under" is the registration number, experimental use permit number, petition number, or other administrative number associated with the earliest known submission.

(3) Submitter. The third element is the submitter. When authorship is defaulted to the submitter, this element is omitted.

(4) Volume Identification (Accession Numbers). The final element in the trailing parentheses identifies the EPA accession number of the volume in which the original submission of the study appears. The six-digit accession number follows the symbol "CDL," which stands for "Company Data Library." This accession number is in turn followed by an alphabetic suffix which shows the relative position of the study within the volume.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

DATA CALL-IN NOTICE

CERTIFIED MAIL

Dear Sir or Madam:

This Notice requires you and other registrants of pesticide products containing the active ingredient identified in Attachment 1 of this Notice, the Data Call-In Chemical Status Sheet, to submit certain product specific data as noted herein to the U.S. Environmental Protection Agency (EPA, the Agency). These data are necessary to maintain the continued registration of your product(s) containing this active ingredient. Within 90 days after you receive this Notice you must respond as set forth in Section III below. Your response must state:

1. How you will comply with the requirements set forth in this Notice and its Attachments 1 through 6; or

2. Why you believe you are exempt from the requirements listed in this Notice and in Attachment 3, Requirements Status and Registrant's Response Form, (see section III-B); or

3. Why you believe EPA should not require your submission of product specific data in the manner specified by this Notice (see section III-D).

If you do not respond to this Notice, or if you do not satisfy EPA that you will comply with its requirements or should be exempt or excused from doing so, then the registration of your

product(s) subject to this Notice will be subject to suspension. We have provided a list of all of your products subject to this Notice in Attachment 2, Data Call-In Response Form, as well as a list of all registrants who were sent this Notice (Attachment 6).

The authority for this Notice is section 3(c)(2)(B) of the Federal Insecticide, Fungicide and Rodenticide Act as amended (FIFRA), 7 U.S.C. section 136a(c)(2)(B). Collection of this information is authorized under the Paperwork Reduction Act by OMB Approval No. 2070-0107 and 2070-0057 (expiration date 03-31-99).

This Notice is divided into six sections and six Attachments. The Notice itself contains information and instructions applicable to all Data Call-In Notices. The Attachments contain specific chemical information and instructions. The six sections of the Notice are:

Section I - Why You Are Receiving This Notice
Section II - Data Required By This Notice
Section III - Compliance With Requirements Of This Notice
Section IV - Consequences Of Failure To Comply With This Notice
Section V - Registrants' Obligation To Report Possible Unreasonable Adverse Effects
Section VI - Inquiries And Responses To This Notice

The Attachments to this Notice are:

1 - Data Call-In Chemical Status Sheet
2 - Product-Specific Data Call-In Response Form
3 - Requirements Status and Registrant's Response Form
4 - EPA Batching of End-Use Products for Meeting Acute Toxicology Data Requirements for Reregistration
5 - List of Registrants Receiving This Notice
6 - Cost Share and Data Compensation Forms

SECTION I. WHY YOU ARE RECEIVING THIS NOTICE

The Agency has reviewed existing data for this active ingredient and reevaluated the data needed to support continued registration of the subject active ingredient. The Agency has concluded that the only additional data necessary are product specific data. No additional generic data requirements are being imposed. You have been sent this Notice because you have product(s) containing the subject active ingredient.

SECTION II. DATA REQUIRED BY THIS NOTICE

II-A. DATA REQUIRED

The product specific data required by this Notice are specified in Attachment 3, Requirements Status and Registrant's Response Form. Depending on the results of the studies required in this Notice, additional testing may be required.

II-B. SCHEDULE FOR SUBMISSION OF DATA

You are required to submit the data or otherwise satisfy the data requirements specified in Attachment 3, Requirements Status and Registrant's Response Form, within the time frames provided.

II-C. TESTING PROTOCOL

All studies required under this Notice must be conducted in accordance with test standards outlined in the Pesticide Assessment Guidelines for those studies for which guidelines have been established.

These EPA Guidelines are available from the National Technical Information Service (NTIS), Attn: Order Desk, 5285 Port Royal Road, Springfield, Va 22161 (tel: 703-487-4650).

Protocols approved by the Organization for Economic Cooperation and Development (OECD) are also acceptable if the OECD-recommended test standards conform to those specified in the Pesticide Data Requirements regulation (40 CFR § 158.70). When using the OECD protocols, they should be modified as appropriate so that the data generated by the study will satisfy the requirements of 40 CFR § 158. Normally, the Agency will not extend deadlines for complying with data requirements when the studies were not conducted in accordance with acceptable standards. The OECD protocols are available from OECD, 2001 L Street, N.W., Washington, D.C. 20036 (Telephone number 202-785-6323; Fax telephone number 202-785-0350).

All new studies and proposed protocols submitted in response to this Data Call-In Notice must be in accordance with Good Laboratory Practices [40 CFR Part 160.3(a)(6)].

II-D. REGISTRANTS RECEIVING PREVIOUS SECTION 3(c)(2)(B) NOTICES ISSUED BY THE AGENCY

Unless otherwise noted herein, this Data Call-In does not in any way supersede or change the requirements of any previous Data Call-In(s), or any other agreements entered into with the Agency pertaining to such prior Notice. Registrants must comply with the requirements of all Notices to avoid issuance of a Notice of Intent to Suspend their affected products.

SECTION III. COMPLIANCE WITH REQUIREMENTS OF THIS NOTICE

III-A. SCHEDULE FOR RESPONDING TO THE AGENCY

The appropriate responses initially required by this Notice for product specific data must be submitted to the Agency within 90 days after your receipt of this Notice. Failure to adequately respond to this Notice within 90 days of your receipt will be a basis for issuing a Notice of Intent to

Suspend (NOIS) affecting your products. This and other bases for issuance of NOIS due to failure to comply with this Notice are presented in Section IV-A and IV-B.

III-B. OPTIONS FOR RESPONDING TO THE AGENCY

The options for responding to this Notice for product specific data are: (a) voluntary cancellation, (b) agree to satisfy the product specific data requirements imposed by this notice or (c) request a data waiver(s).

A discussion of how to respond if you chose the Voluntary Cancellation option is presented below. A discussion of the various options available for satisfying the product specific data requirements of this Notice is contained in Section III-C. A discussion of options relating to requests for data waivers is contained in Section III-D.

There are two forms that accompany this Notice of which, depending upon your response, one or both must be used in your response to the Agency. These forms are the Data-Call-In Response Form, and the Requirements Status and Registrant's Response Form, Attachment 2 and Attachment 3. The Data Call-In Response Form must be submitted as part of every response to this Notice. In addition, one copy of the Requirements Status and Registrant's Response Form must be submitted for each product listed on the Data Call-In Response Form unless the voluntary cancellation option is selected or unless the product is identical to another (refer to the instructions for completing the Data Call-In Response Form in Attachment 2). Please note that the company's authorized representative is required to sign the first page of the Data Call-In Response Form and Requirements Status and Registrant's Response Form (if this form is required) and initial any subsequent pages. The forms contain separate detailed instructions on the response options. Do not alter the printed material. If you have questions or need assistance in preparing your response, call or write the contact person(s) identified in Attachment 1.

1. Voluntary Cancellation - You may avoid the requirements of this Notice by requesting voluntary cancellation of your product(s) containing the active ingredient that is the subject of this Notice. If you wish to voluntarily cancel your product, you must submit a completed Data Call-In Response Form, indicating your election of this option. Voluntary cancellation is item number 5 on the Data Call-In Response Form. If you choose this option, this is the only form that you are required to complete.

If you chose to voluntarily cancel your product, further sale and distribution of your product after the effective date of cancellation must be in accordance with the Existing Stocks provisions of this Notice which are contained in Section IV-C.

2. Satisfying the Product Specific Data Requirements of this Notice There are various options available to satisfy the product specific data requirements of this Notice. These options are discussed in Section III-C of this Notice and comprise options 1 through 6 on the Requirements Status and Registrant's Response Form and item numbers 7a and 7b on the Data Call-In Response Form.

Deletion of a use(s) and the low volume/minor use option are not valid options for fulfilling product specific data requirements.

3. Request for Product Specific Data Waivers. Waivers for product specific data are discussed in Section III-D of this Notice and are covered by option 7 on the Requirements Status and Registrant's Response Form. If you choose one of these options, you must submit both forms as well as any other information/data pertaining to the option chosen to address the data requirement.

III-C SATISFYING THE DATA REQUIREMENTS OF THIS NOTICE

If you acknowledge on the Data Call-In Response Form that you agree to satisfy the product specific data requirements (i.e. you select item number 7a or 7b), then you must select one of the six options on the Requirements Status and Registrant's Response Form related to data production for each data requirement. Your option selection should be entered under item number 9, "Registrant Response." The six options related to data production are the first six options discussed under item 9 in the instructions for completing the Requirements Status and Registrant's Response Form. These six options are listed immediately below with information in parentheses to guide registrants to additional instructions provided in this Section. The options are:

(1) I will generate and submit data within the specified time frame (Developing Data)
(2) I have entered into an agreement with one or more registrants to develop data jointly (Cost Sharing)
(3) I have made offers to cost-share (Offers to Cost Share)
(4) I am submitting an existing study that has not been submitted previously to the Agency by anyone (Submitting an Existing Study)
(5) I am submitting or citing data to upgrade a study classified by EPA as partially acceptable and upgradeable (Upgrading a Study)
(6) I am citing an existing study that EPA has classified as acceptable or an existing study that has been submitted but not reviewed by the Agency (Citing an Existing Study)

Option 1, Developing Data -- If you choose to develop the required data it must be in conformance with Agency deadlines and with other Agency requirements as referenced herein and in the attachments. All data generated and submitted must comply with the Good Laboratory Practice (GLP) rule (40 CFR Part 160), be conducted according to the Pesticide Assessment Guidelines (PAG), and be in conformance with the requirements of PR Notice 86-5.

The time frames in the Requirements Status and Registrant's Response Form are the time frames that the Agency is allowing for the submission of completed study reports. The noted deadlines run from the date of the receipt of this Notice by the registrant. If the data are not submitted by the deadline, each registrant is subject to receipt of a Notice of Intent to Suspend the affected registration(s).

If you cannot submit the data/reports to the Agency in the time required by this Notice and intend to seek additional time to meet the requirements(s), you must submit a request to the Agency which includes: (1) a detailed description of the expected difficulty and (2) a proposed schedule including alternative dates for meeting such requirements on a step-by-step basis. You must explain

any technical or laboratory difficulties and provide documentation from the laboratory performing the testing. While EPA is considering your request, the original deadline remains. The Agency will respond to your request in writing. If EPA does not grant your request, the original deadline remains. Normally, extensions can be requested only in cases of extraordinary testing problems beyond the expectation or control of the registrant. Extensions will not be given in submitting the 90-day responses. Extensions will not be considered if the request for extension is not made in a timely fashion; in no event shall an extension request be considered if it is submitted at or after the lapse of the subject deadline.

Option 2, Agreement to Share in Cost to Develop Data -- Registrants may only choose this option for acute toxicity data and certain efficacy data and only if EPA has indicated in the attached data tables that your product and at least one other product are similar for purposes of depending on the same data. If this is the case, data may be generated for just one of the products in the group. The registration number of the product for which data will be submitted must be noted in the agreement to cost share by the registrant selecting this option. If you choose to enter into an agreement to share in the cost of producing the required data but will not be submitting the data yourself, you must provide the name of the registrant who will be submitting the data. You must also provide EPA with documentary evidence that an agreement has been formed. Such evidence may be your letter offering to join in an agreement and the other registrant's acceptance of your offer, or a written statement by the parties that an agreement exists. The agreement to produce the data need not specify all of the terms of the final arrangement between the parties or the mechanism to resolve the terms. Section 3(c)(2)(B) provides that if the parties cannot resolve the terms of the agreement they may resolve their differences through binding arbitration.

Option 3, Offer to Share in the Cost of Data Development -- This option only applies to acute toxicity and certain efficacy data as described in option 2 above. If you have made an offer to pay in an attempt to enter into an agreement or amend an existing agreement to meet the requirements of this Notice and have been unsuccessful, you may request EPA (by selecting this option) to exercise its discretion not to suspend your registration(s), although you do not comply with the data submission requirements of this Notice. EPA has determined that as a general policy, absent other relevant considerations, it will not suspend the registration of a product of a registrant who has in good faith sought and continues to seek to enter into a joint data development/cost sharing program, but the other registrant(s) developing the data has refused to accept your offer. To qualify for this option, you must submit documentation to the Agency proving that you have made an offer to another registrant (who has an obligation to submit data) to share in the burden of developing that data. You must also submit to the Agency a completed EPA Form 8570-32, Certification of Offer to Cost Share in the Development of Data, Attachment 7. In addition, you must demonstrate that the other registrant to whom the offer was made has not accepted your offer to enter into a cost sharing agreement by including a copy of your offer and proof of the other registrant's receipt of that offer (such as a certified mail receipt). Your offer must, in addition to anything else, offer to share in the burden of producing the data upon terms to be agreed or failing agreement to be bound by binding arbitration as provided by FIFRA section 3(c)(2)(B)(iii) and must not qualify this offer. The other registrant must also inform EPA of its election of an option to develop and submit the data required by this Notice by submitting a Data Call-In Response Form and a Requirements Status and Registrant's Response Form committing to develop and submit the data required by this Notice.

In order for you to avoid suspension under this option, you may not withdraw your offer to share in the burdens of developing the data. In addition, the other registrant must fulfill its commitment to develop and submit the data as required by this Notice. If the other registrant fails to develop the data or for some other reason is subject to suspension, your registration as well as that of the other registrant will normally be subject to initiation of suspension proceedings, unless you commit to submit, and do submit the required data in the specified time frame. In such cases, the Agency generally will not grant a time extension for submitting the data.

Option 4, Submitting an Existing Study -- If you choose to submit an existing study in response to this Notice, you must determine that the study satisfies the requirements imposed by this Notice. You may only submit a study that has not been previously submitted to the Agency or previously cited by anyone. Existing studies are studies which predate issuance of this Notice. Do not use this option if you are submitting data to upgrade a study. (See Option 5).

You should be aware that if the Agency determines that the study is not acceptable, the Agency will require you to comply with this Notice, normally without an extension of the required date of submission. The Agency may determine at any time that a study is not valid and needs to be repeated.

To meet the requirements of the DCI Notice for submitting an existing study, all of the following three criteria must be clearly met:

a. You must certify at the time that the existing study is submitted that the raw data and specimens from the study are available for audit and review and you must identify where they are available. This must be done in accordance with the requirements of the Good Laboratory Practice (GLP) regulation, 40 CFR Part 160. As stated in 40 CFR 160.3(j) " 'raw data' means any laboratory worksheets, records, memoranda, notes, or exact copies thereof, that are the result of original observations and activities of a study and are necessary for the reconstruction and evaluation of the report of that study. In the event that exact transcripts of raw data have been prepared (e.g., tapes which have been transcribed verbatim, dated, and verified accurate by signature), the exact copy or exact transcript may be substituted for the original source as raw data. 'Raw data' may include photographs, microfilm or microfiche copies, computer printouts, magnetic media, including dictated observations, and recorded data from automated instruments." The term "specimens", according to 40 CFR 160.3(k), means "any material derived from a test system for examination or analysis."

b. Health and safety studies completed after May 1984 must also contain all GLP-required quality assurance and quality control information, pursuant to the requirements of 40 CFR Part 160. Registrants must also certify at the time of submitting the existing study that such GLP information is available for post-May 1984 studies by including an appropriate statement on or attached to the study signed by an authorized official or representative of the registrant.

c. You must certify that each study fulfills the acceptance criteria for the Guideline relevant to the study provided in the FIFRA Accelerated Reregistration Phase 3

Technical Guidance and that the study has been conducted according to the Pesticide Assessment Guidelines (PAG) or meets the purpose of the PAG (both available from NTIS). A study not conducted according to the PAG may be submitted to the Agency for consideration if the registrant believes that the study clearly meets the purpose of the PAG. The registrant is referred to 40 CFR 158.70 which states the Agency's policy regarding acceptable protocols. If you wish to submit the study, you must, in addition to certifying that the purposes of the PAG are met by the study, clearly articulate the rationale why you believe the study meets the purpose of the PAG, including copies of any supporting information or data. It has been the Agency's experience that studies completed prior to January 1970 rarely satisfied the purpose of the PAG and that necessary raw data are usually not available for such studies.

If you submit an existing study, you must certify that the study meets all requirements of the criteria outlined above.

If you know of a study pertaining to any requirement in this Notice which does not meet the criteria outlined above but does contain factual information regarding unreasonable adverse effects, you must notify the Agency of such a study. If such study is in the Agency's files, you need only cite it along with the notification. If not in the Agency's files, you must submit a summary and copies as required by PR Notice 86-5.

Option 5, Upgrading a Study -- If a study has been classified as partially acceptable and upgradeable, you may submit data to upgrade that study. The Agency will review the data submitted and determine if the requirement is satisfied. If the Agency decides the requirement is not satisfied, you may still be required to submit new data normally without any time extension. Deficient, but upgradeable studies will normally be classified as supplemental. However, it is important to note that not all studies classified as supplemental are upgradeable. If you have questions regarding the classification of a study or whether a study may be upgraded, call or write the contact person listed in Attachment 1. If you submit data to upgrade an existing study you must satisfy or supply information to correct all deficiencies in the study identified by EPA. You must provide a clearly articulated rationale of how the deficiencies have been remedied or corrected and why the study should be rated as acceptable to EPA. Your submission must also specify the MRID number(s) of the study which you are attempting to upgrade and must be in conformance with PR Notice 86-5.

Do not submit additional data for the purpose of upgrading a study classified as unacceptable and determined by the Agency as not capable of being upgraded.

This option should also be used to cite data that has been previously submitted to upgrade a study, but has not yet been reviewed by the Agency. You must provide the MRID number of the data submission as well as the MRID number of the study being upgraded.

The criteria for submitting an existing study, as specified in Option 4 above, apply to all data submissions intended to upgrade studies. Additionally your submission of data intended to upgrade studies must be accompanied by a certification that you comply with each of those criteria as well as a certification regarding protocol compliance with Agency requirements.

Option 6, Citing Existing Studies -- If you choose to cite a study that has been previously submitted to EPA, that study must have been previously classified by EPA as acceptable or it must be a study which has not yet been reviewed by the Agency. Acceptable toxicology studies generally will have been classified as "core-guideline" or "core minimum." For all other disciplines the classification would be "acceptable." With respect to any studies for which you wish to select this option you must provide the MRID number of the study you are citing and, if the study has been reviewed by the Agency, you must provide the Agency's classification of the study.

If you are citing a study of which you are not the original data submitter, you must submit a completed copy of EPA Form 8570-31, Certification with Respect to Data Compensation Requirements.

Registrants who select one of the above 6 options must meet all of the requirements described in the instructions for completing the Data Call-In Response Form and the Requirements Status and Registrant's Response Form, as appropriate.

III-D REQUESTS FOR DATA WAIVERS

If you request a waiver for product specific data because you believe it is inappropriate, you must attach a complete justification for the request, including technical reasons, data and references to relevant EPA regulations, guidelines or policies. (Note: any supplemental data must be submitted in the format required by PR Notice 86-5). This will be the only opportunity to state the reasons or provide information in support of your request. If the Agency approves your waiver request, you will not be required to supply the data pursuant to section 3(c)(2)(B) of FIFRA. If the Agency denies your waiver request, you must choose an option for meeting the data requirements of this Notice within 30 days of the receipt of the Agency's decision. You must indicate and submit the option chosen on the Requirements Status and Registrant's Response Form. Product specific data requirements for product chemistry, acute toxicity and efficacy (where appropriate) are required for all products and the Agency would grant a waiver only under extraordinary circumstances. You should also be aware that submitting a waiver request will not automatically extend the due date for the study in question. Waiver requests submitted without adequate supporting rationale will be denied and the original due date will remain in force.

IV. CONSEQUENCES OF FAILURE TO COMPLY WITH THIS NOTICE

IV-A NOTICE OF INTENT TO SUSPEND

The Agency may issue a Notice of Intent to Suspend products subject to this Notice due to failure by a registrant to comply with the requirements of this Data Call-In Notice, pursuant to FIFRA section 3(c)(2)(B). Events which may be the basis for issuance of a Notice of Intent to Suspend include, but are not limited to, the following:

1. Failure to respond as required by this Notice within 90 days of your receipt of this Notice.

2. Failure to submit on the required schedule an acceptable proposed or final protocol when such is required to be submitted to the Agency for review.

3. Failure to submit on the required schedule an adequate progress report on a study as required by this Notice.

4. Failure to submit on the required schedule acceptable data as required by this Notice.

5. Failure to take a required action or submit adequate information pertaining to any option chosen to address the data requirements (e.g., any required action or information pertaining to submission or citation of existing studies or offers, arrangements, or arbitration on the sharing of costs or the formation of Task Forces, failure to comply with the terms of an agreement or arbitration concerning joint data development or failure to comply with any terms of a data waiver).

6. Failure to submit supportable certifications as to the conditions of submitted studies, as required by Section III-C of this Notice.

7. Withdrawal of an offer to share in the cost of developing required data.

8. Failure of the registrant to whom you have tendered an offer to share in the cost of developing data and provided proof of the registrant's receipt of such offer or failure of a registrant on whom you rely for a generic data exemption either to:

   a. inform EPA of intent to develop and submit the data required by this Notice on a Data Call-In Response Form and a Requirements Status and Registrant's Response Form;

   b. fulfill the commitment to develop and submit the data as required by this Notice; or

   c. otherwise take appropriate steps to meet the requirements stated in this Notice, unless you commit to submit and do submit the required data in the specified time frame.

9. Failure to take any required or appropriate steps, not mentioned above, at any time following the issuance of this Notice.

IV-B. BASIS FOR DETERMINATION THAT SUBMITTED STUDY IS UNACCEPTABLE

The Agency may determine that a study (even if submitted within the required time) is unacceptable and constitutes a basis for issuance of a Notice of Intent to Suspend. The grounds for suspension include, but are not limited to, failure to meet any of the following:

1. EPA requirements specified in the Data Call-In Notice or other documents incorporated by reference (including, as applicable, EPA Pesticide Assessment Guidelines, Data Reporting Guidelines, and GeneTox Health Effects Test Guidelines) regarding the design, conduct, and reporting of required studies. Such requirements include, but are not limited to, those relating to test material, test procedures, selection of species, number of animals, sex and distribution of animals, dose and effect levels to be tested or attained, duration of test, and, as applicable, Good Laboratory Practices.

2. EPA requirements regarding the submission of protocols, including the incorporation of any changes required by the Agency following review.

3. EPA requirements regarding the reporting of data, including the manner of reporting, the completeness of results, and the adequacy of any required supporting (or raw) data, including, but not limited to, requirements referenced or included in this Notice or contained in PR 86-5. All studies must be submitted in the form of a final report; a preliminary report will not be considered to fulfill the submission requirement.

IV-C EXISTING STOCKS OF SUSPENDED OR CANCELLED PRODUCTS

EPA has statutory authority to permit continued sale, distribution and use of existing stocks of a pesticide product which has been suspended or cancelled if doing so would be consistent with the purposes of the Act.

The Agency has determined that such disposition by registrants of existing stocks for a suspended registration when a section 3(c)(2)(B) data request is outstanding would generally not be consistent with the Act's purposes. Accordingly, the Agency anticipates granting registrants permission to sell, distribute, or use existing stocks of suspended product(s) only in exceptional circumstances. If you believe such disposition of existing stocks of your product(s) which may be suspended for failure to comply with this Notice should be permitted, you have the burden of clearly demonstrating to EPA that granting such permission would be consistent with the Act. You must also explain why an "existing stocks" provision is necessary, including a statement of the quantity of existing stocks and your estimate of the time required for their sale, distribution, and use. Unless you meet this burden the Agency will not consider any request pertaining to the continued sale, distribution, or use of your existing stocks after suspension.

If you request a voluntary cancellation of your product(s) as a response to this Notice and your product is in full compliance with all Agency requirements, you will have, under most circumstances, one year from the date your 90 day response to this Notice is due, to sell, distribute, or use existing stocks. Normally, the Agency will allow persons other than the registrant such as independent distributors, retailers and end users to sell, distribute or use such existing stocks until the stocks are exhausted. Any sale, distribution or use of stocks of voluntarily cancelled products containing an active ingredient for which the Agency has particular risk concerns will be determined on case-by-case basis.

Requests for voluntary cancellation received after the 90 day response period required by this Notice will not result in the Agency granting any additional time to sell, distribute, or use existing stocks beyond a year from the date the 90 day response was due unless you demonstrate to the Agency that you are in full compliance with all Agency requirements, including the requirements of this Notice. For example, if you decide to voluntarily cancel your registration six months before a 3 year study is scheduled to be submitted, all progress reports and other information necessary to establish that you have been conducting the study in an acceptable and good faith manner must have been submitted to the Agency, before EPA will consider granting an existing stocks provision.

SECTION V. REGISTRANTS' OBLIGATION TO REPORT POSSIBLE UNREASONABLE ADVERSE EFFECTS

Registrants are reminded that FIFRA section 6(a)(2) states that if at any time after a pesticide is registered a registrant has additional factual information regarding unreasonable adverse effects on the environment by the pesticide, the registrant shall submit the information to the Agency. Registrants must notify the Agency of any factual information they have, from whatever source, including but not limited to interim or preliminary results of studies, regarding unreasonable adverse effects on man or the environment. This requirement continues as long as the products are registered by the Agency.

SECTION VI. INQUIRIES AND RESPONSES TO THIS NOTICE

If you have any questions regarding the requirements and procedures established by this Notice, call the contact person(s) listed in Attachment 1, the Data Call-In Chemical Status Sheet.

All responses to this Notice (other than voluntary cancellation requests and generic data exemption claims) must include a completed Data Call-In Response Form and a completed Requirements Status and Registrant's Response Form (Attachment 2 and Attachment 3 for product specific data) and any other documents required by this Notice, and should be submitted to the contact person(s) identified in Attachment 1. If the voluntary cancellation or generic data exemption option is chosen, only the Data Call-In Response Form need be submitted.

The Office of Compliance Monitoring (OCM) of the Office of Pesticides and Toxic Substances (OPTS), EPA, will be monitoring the data being generated in response to this Notice.

Sincerely yours,

Lois A. Rossi, Director
Special Review and
Reregistration Division

Attachments

1 - Data Call-In Chemical Status Sheet
2 - Product-Specific Data Call-In Response Form
3 - Requirements Status and Registrant's Response Form
4 - EPA Batching of End-Use Products for Meeting Acute Toxicology Data Requirements for Reregistration
5 - List of Registrants Receiving This Notice
6 - Cost Share and Data Compensation Forms and the Confidential Statement of Formula Form

DEET DATA CALL-IN CHEMICAL STATUS SHEET

INTRODUCTION

You have been sent this Product Specific Data Call-In Notice because you have product(s) containing DEET.

This Product Specific Data Call-In Chemical Status Sheet, contains an overview of data required by this notice, and point of contact for inquiries pertaining to the reregistration of DEET. This attachment is to be used in conjunction with (1) the Product Specific Data Call-In Notice, (2) the Product Specific Data Call-In Response Form (Attachment 2), (3) the Requirements Status and Registrant's Form (Attachment 3), (4) EPA's Grouping of End-Use Products for Meeting Acute Toxicology Data Requirement (Attachment 4), (5) the EPA Acceptance Criteria (Attachment 5), (6) a list of registrants receiving this DCI (Attachment 6) and (7) the Cost Share and Data Compensation Forms in replying to this DEET Product Specific Data Call-In (Attachment 7). Instructions and guidance accompany each form.

DATA REQUIRED BY THIS NOTICE

The additional data requirements needed to complete the database for DEET are contained in the Requirements Status and Registrant's Response, Attachment 3. The Agency has concluded that additional data on DEET are needed for specific products. These data are required to be submitted to the Agency within the time frame listed. These data are needed to fully complete the reregistration of all eligible DEET products.

INQUIRIES AND RESPONSES TO THIS NOTICE

If you have any questions regarding this product specific data requirements and procedures established by this Notice, please contact at (703) .

All responses to this Notice for the Product Specific data requirements should be submitted to:

Chemical Review Manager Team 81
Product Reregistration Branch
Special Review and Reregistration Branch 7508W
Office of Pesticide Programs
U.S. Environmental Protection Agency
Washington, D.C. 20460

RE: **DEET**

INSTRUCTIONS FOR COMPLETING THE **DATA CALL-IN RESPONSE FORM** FOR **PRODUCT SPECIFIC DATA**

Item 1-4. Already completed by EPA.

Item 5. If you wish to **voluntarily cancel** your product, answer "**yes**." If you choose this option, you will not have to provide the data required by the Data Call-In Notice and you will not have to complete any other forms. Further sale and distribution of your product after the effective date of cancellation must be in accordance with the Existing Stocks provision of the Data Call-In Notice (Section IV-C).

Item 6. Not applicable since this form calls in product specific data only. However, if your product is **identical** to another product and you qualify for a **data exemption**, you must respond with "**yes**" to Item 7a (MUP) or 7B (EUP) on this form, provide the **EPA registration numbers of your source(s)**; you would **not** complete the "Requirements Status and Registrant's Response" form. Examples of such products include **repackaged** products and **Special Local Needs (Section 24c)** products which are identical to federally registered products.

Item 7a. For each **manufacturing use product** (MUP) for which you wish to maintain registration, you must agree to satisfy the data requirements by responding "**yes**."

Item 7b. For each **end use product** (EUP) for which you wish to maintain registration, you must agree to satisfy the data requirements by responding "**yes**." If you are requesting a **data waiver**, answer "**yes**" here; in addition, on the "Requirements Status and Registrant's Response" form under Item 9, you must respond with **Option 7** (Waiver Request) for each study for which you are requesting a waiver. See Item 6 with regard to identical products and data exemptions.

Items 8-11. Self-explanatory.

NOTE: You may provide **additional information** that does not fit on this form in a signed letter that accompanies this form. For example, you may wish to report that your product has already been transferred to another company or that you have already voluntarily canceled this product. For these cases, please supply all relevant details so that EPA can ensure that its records are correct.

INSTRUCTIONS FOR COMPLETING THE **REQUIREMENTS STATUS AND REGISTRANT'S RESPONSE FORM** FOR **PRODUCT SPECIFIC DATA**

Item 1-3 Completed by EPA. Note the **unique identifier number** assigned by EPA in Item 3. This number **must be used in the transmittal document for any data submissions** in response to this Data Call-In Notice.

Item 4. The guideline reference numbers of studies required to support the product's continued registration are identified. These guidelines, in addition to the requirements specified in the Notice, govern the conduct of the required studies. Note that series 61 and 62 in product chemistry are now listed under 40 CFR 158.155 through 158.180, Subpart C.

Item 5. The study title associated with the guideline reference number is identified.

Item 6. The use pattern(s) of the pesticide associated with the product specific requirements is (are) identified. For most product specific data requirements, all use patterns are covered by the data requirements. In the case of efficacy data, the required studies only pertain to products which have the use sites and/or pests indicated.

Item 7. The substance to be tested is identified by EPA. For product specific data, the product as formulated for sale and distribution is the test substance, except in rare cases.

Item 8. The due date for submission of each study is identified. It is normally based on **8 months after issuance of the Reregistration Eligibility Document** unless EPA determines that a longer time period is necessary.

Item 9. **Enter <u>only one</u> of the following response codes <u>for each data requirement</u> to show how you intend to comply with the data requirements listed in this table.** Fuller descriptions of each option are contained in the Data Call-In Notice.

1. I will generate and submit data by the specified due date (**Developing Data**). By indicating that I have chosen this option, I certify that I will comply with all the requirements pertaining to the conditions for submittal of this study as outlined in the Data Call-In Notice. By the specified due date, I will also submit: (1) a completed **"Certification With Respect To Data Compensation Requirements" form (EPA Form 8570-29)** and (2) two completed and signed copies of the **Confidential Statement of Formula (EPA Form 8570-4)**.

2. I have entered into an agreement with one or more registrants to develop data jointly (**Cost Sharing**). I am submitting a **copy of this agreement**. I understand that this option is available **only** for acute toxicity or certain efficacy data and **only** if EPA indicates in an attachment to this Notice that my product is similar enough to another

product to qualify for this option. I certify that another party in the agreement is committing to submit or provide the required data; if the required study is not submitted on time, my product may be subject to suspension. By the specified due date, I will also submit: (1) a completed **"Certification With Respect To Data Compensation Requirements" form (EPA Form 8570-29)** and (2) two completed and signed copies of the **Confidential Statement of Formula (EPA Form 8570-4)**.

3. I have made offers to share in the cost to develop data (**Offers to Cost Share**). I understand that this option is available **only** for acute toxicity or certain efficacy data and **only** if EPA indicates in an attachment to this Data Call-In Notice that my product is similar enough to another product to qualify for this option. I am submitting **evidence that I have made an offer** to another registrant (who has an obligation to submit data) to share in the cost of that data. I am also submitting a completed **"Certification of Offer to Cost Share in the Development Data" form**. I am including a copy of my offer and proof of the other registrant's receipt of that offer. I am identifying the party which is committing to submit or provide the required data; if the required study is not submitted on time, my product may be subject to suspension. I understand that other terms under Option 3 in the Data Call-In Notice (Section III-C.1.) apply as well. By the specified due date, I will also submit: (1) a completed **"Certification With Respect To Data Compensation Requirements" form (EPA Form 8570-29)** and (2) two completed and signed copies of the **Confidential Statement of Formula (EPA Form 8570-4)**.

4. By the specified due date, I will submit an existing study that has not been submitted previously to the Agency by anyone (**Submitting an Existing Study**). I certify that this study will meet all the requirements for submittal of existing data outlined in Option 4 in the Data Call-In Notice (Section III-C.1.) and will meet the attached acceptance criteria (for acute toxicity and product chemistry data). I will attach the needed supporting information along with this response. I also certify that I have determined that this study will fill the data requirement for which I have indicated this choice. By the specified due date, I will also submit a completed **"Certification With Respect To Data Compensation Requirements" form (EPA Form 8570-29)** to show what data compensation option I have chosen. By the specified due date, I will also submit: (1) a completed **"Certification With Respect To Data Compensation Requirements" form (EPA Form 8570-29)** and (2) two completed and signed copies of the **Confidential Statement of Formula (EPA Form 8570-4)**.

5. By the specified due date, I will submit or cite data to upgrade a study classified by the Agency as partially acceptable and upgradable (**Upgrading a Study**). I will submit **evidence of the Agency's review** indicating that the study may be upgraded and what information is required to do so. I will provide the MRID or Accession number of the study at the due date. I understand that the conditions for this option outlined Option 5 in the Data Call-In Notice (Section III-C.1.) apply. By the specified due date, I will also submit: (1) a completed **"Certification With Respect To Data**

Compensation Requirements" form (EPA Form 8570-29) and (2) two completed and signed copies of the **Confidential Statement of Formula (EPA Form 8570-4)**.

6. By the specified due date, I will cite an existing study that the Agency has classified as acceptable or an existing study that has been submitted but not reviewed by the Agency (**Citing an Existing Study**). If I am citing another registrant's study, I understand that this option is available **only** for acute toxicity or certain efficacy data and **only** if the cited study was conducted on my product, an identical product or a product which EPA has "grouped" with one or more other products for purposes of depending on the same data. I may also choose this option if I am citing my own data. In either case, I will provide the **MRID or Accession number(s)** for the cited data on a "Product Specific Data Report" form or in a similar format. By the specified due date, I will also submit: (1) a completed **"Certification With Respect To Data Compensation Requirements" form (EPA Form 8570-29)** and (2) two completed and signed copies of the **Confidential Statement of Formula (EPA Form 8570-4)**.

7. I request a waiver for this study because it is inappropriate for my product (**Waiver Request**). I am attaching a complete justification for this request, including technical reasons, data and references to relevant EPA regulations, guidelines or policies. [Note: any supplemental data must be submitted in the format required by P.R. Notice 86-5]. I understand that this is my **only** opportunity to state the reasons or provide information in support of my request. If the Agency approves my waiver request, I will **not** be required to supply the data pursuant to Section 3(c)(2)(B) of FIFRA. If the Agency denies my waiver request, I **must choose** a method of meeting the data requirements of this Notice by the due date stated by this Notice. In this case, I must, within **30 days** of my receipt of the Agency's written decision, submit a revised "Requirements Status and Registrant's Response" Form indicating the option chosen. I also understand that the deadline for submission of data as specified by the original data call-in notice will not change. By the specified due date, I will also submit: (1) a completed **"Certification With Respect To Data Compensation Requirements" form (EPA Form 8570-29)** and (2) two completed and signed copies of the **Confidential Statement of Formula (EPA Form 8570-4)**.

Items 10-13. Self-explanatory.

NOTE: You may provide **additional information** that does not fit on this form in a signed letter that accompanies this form. For example, you may wish to report that your product has already been transferred to another company or that you have already voluntarily canceled this product. For these cases, please supply all relevant details so that EPA can ensure that its records are correct.

EPA'S BATCHING OF DIETHYLTOLUAMIDE (DEET) PRODUCTS FOR MEETING ACUTE TOXICITY DATA REQUIREMENTS FOR REREGISTRATION

In an effort to reduce the time, resources and number of animals needed to fulfill the acute toxicity data requirements for reregistration of products containing DEET as the active ingredient, the Agency has batched products which can be considered similar for purposes of acute toxicity. Factors considered in the sorting process include each product's active and inert ingredients (identity, percent composition and biological activity), type of formulation (e.g., emulsifiable concentrate, aerosol, wettable powder, granular, etc.), and labeling (e.g., signal word, use classification, precautionary labeling, etc.). Note that the Agency is not describing batched products as "substantially similar" since some products within a batch may not be considered chemically similar or have identical use patterns.

Using available information, batching has been accomplished by the process described in the preceding paragraph. Notwith-standing the batching process, the Agency reserves the right to require, at any time, acute toxicity data for an individual product should the need arise.

Registrants of products within a batch may choose to cooperatively generate, submit or cite a single battery of six acute toxicological studies to represent all the products within that batch. It is the registrants' option to participate in the process with all other registrants, only some of the other registrants, or only their own products within a batch, or to generate all the required acute toxicological studies for each of their own products. If a registrant chooses to generate the data for a batch, he/she must use one of the products within the batch as the test material. If a registrant chooses to rely upon previously submitted acute toxicity data, he/she may do so provided that the data base is complete and valid by today's standards (see acceptance criteria attached), the formulation tested is considered by EPA to be similar for acute toxicity, and the formulation has not been significantly altered since submission and acceptance of the acute toxicity data. Regardless of whether new data is generated or existing data is referenced, registrants must clearly identify the test material by EPA Registration Number. If more than one confidential statement of formula (CSF) exists for a product, the registrant must indicate the formulation actually tested by identifying the corresponding CSF.

In deciding how to meet the product specific data requirements, registrants must follow the directions given in the Data Call-In Notice and its attachments appended to the RED. The DCI Notice contains two response forms which are to be completed and submitted to the Agency within 90 days of receipt. The first form, "Data Call-In Response," asks whether the registrant will meet the data requirements for each product. The second form, "Requirements Status and Registrant's Response," lists the product specific data required for each product, including the standard six acute toxicity tests. A registrant who wishes to participate in a batch must decide whether he/she will provide the data or depend on someone else to do so. If a registrant supplies the data to support a batch of products, he/she must select one of the following options: Developing Data (Option 1), Submitting an Existing Study (Option 4), Upgrading an Existing Study (Option 5) or Citing an Existing Study (Option 6). If a registrant depends on another's data, he/she must choose among: Cost Sharing (Option 2), Offers to Cost Share (Option 3) or Citing an Existing Study (Option 6). If a registrant does not want to participate in a batch, the choices are Options 1, 4, 5 or 6. However, a registrant should know that

choosing not to participate in a batch does not preclude other registrants in the batch from citing his/her studies and offering to cost share (Option 3) those studies.

Two hundred and thirty nine products were found which contain DEET as the active ingredient. The products have been placed into twenty-six batches and a "no batch" category in accordance with the active and inert ingredients, type of formulation and current labeling. Table 1 identifies the batched products. Table 2 lists the products which have been placed in the "no batch" category. Products which have previous acute data reviews on file with the Agency have been identified with an asterisk. The studies addressed in these reviews, however, may or may not be acceptable under current acceptance criteria. The following explains how acceptable data may be bridged to support products between batches and sub-batches:

Batch 1B -Can rely on batch 1A data except for eye irritation. Need separate eye study for each product in 1B.

Batch 1C -Can rely on batch 1A data.

Batch 1D -Can rely on category 3/4 batch 1A data.

Batch 1E -Can rely on batch 1A data except for eye irritation. Need separate eye study for each product in 1E.

Batch 1F -Can rely on batch 1A data.

Batch 1G -Can rely on category 3/4 batch 1A data.

Batch 2B -Can rely on data from batch 2A except for eye irritation. Need separate eye study for each product in 2B.

Batch 2C -Can rely on data from batch 2A.

Batch 3B -Can rely on data from batch 3A except for eye irritation. Need separate eye study for each product in 3B.

Batch 4B -Can rely on category 3/4 data from batch 4A.

Batch 4C -Can rely on data from batch 4A except for eye irritation. Need separate eye study for each product in 4C.

Batch 5B -Can rely on category 3/4 data from batch 5A except for eye irritation. Need separate eye study for each product.

Batch 6B -Can rely on data from batch 6A except for eye irritation. Need separate eye study for each product.

Batch 7B -Can rely on data from batch 7A except for eye irritation. Need separate eye study for each product.

Batch 7C -Can rely on data from batch 7A except for acute dermal toxicity.

Batch 11B-Can rely on category 3/4 data from batch 11A.

Batch 15B-Can rely on category 3/4 data from batch 15A.

Batch 16B-Can rely on category 3/4 data from batch 16A.

Batch 18B-Can rely on data from batch 18A except for eye irritation. Need separate eye study for each product in 18B.

Batch 19B-Can rely on data from batch 19A except for eye irritation. Need separate eye study for each product in 19B.

Batch 20A-May be supported by data on source components.

Batch 20B-May be supported by data on source components or by data on batch 20A.

Batch 21B-Can rely on data from batch 21A except for eye irritation. Need separate eye study for each product in 21B.

Batch 22B-Can rely on data from batch 22A except for eye irritation. Need separate eye study for each product in 22B.

Batch 22C-Can rely on data supporting batch 22A.

Batch 22D-Can rely on category 3/4 data from batch 22A except for eye studies. Need separate eye studies for each product in 22D.

Batch 23- Needs separate eye irritation study for each product.

Batch 24A-Needs separate eye irritation study for each product.

Batch 24B-Can rely on category 3/4 data from batch 24A except for eye irritation. Need separate eye study for each product.

Batch 25 -Can rely on category 3/4 data from batch 22A except for eye irritation. Need separate eye study for each product.

Batch 26B-Can rely on data from batch 26A except for eye irritation. Need separate eye study for each product.

Batch 26C-Can rely on category 3/4 data from batch 26A except for eye irritation. Need separate eye study for each product.

Batch 26D-Can rely on category 3/4 data from batch 26A except for eye irritation. Need separate eye study for each product.

Table 1

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
1A	121-17	95.0	Liquid
	121-25	95.0	Liquid
	305-30	95.0	Liquid
	1021-891	95.0	Liquid
	2217-779	95.0	Liquid
	3095-27	95.0	Liquid
	4822-215	95.0	Liquid
	4822-216	94.5	Liquid
	4822-276	95.0	Liquid
	*6148-8	95.0	Liquid
	7754-36	95.0	Liquid
	8340-39	95.0	Liquid
	10807-160	95.0	Liquid
	11715-185	95.0	Liquid
	34797-32	95.0	Liquid
	41878-2	95.0	Liquid
	46075-1	95.0	Liquid
	48139-5	95.0	Liquid
	50830-1	95.0	Liquid
	51147-1	95.0	Liquid
	53356-3	95.0	Liquid
	54287-2	95.0	Liquid
	56575-7	95.0	Liquid
	62424-1	95.0	Liquid
	62446-1	95.0	Liquid
	65636-58	95.0	Liquid
	67405-2	95.0	Liquid
	67867-1	95.0	Liquid
	68688-20	95.0	Liquid
	69421-28	95.0	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
1B	11715-22	71.25	Aerosol
	28293-101	71.25	Aerosol
	48139-4	76.0	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
1C	8668-3	78.0	Towelette
	67200-3	9.5	Wristband
	67200-4	9-9.5	Tablecloth
	69152-1	10.0	Wristband
	69152-2	10.0	Tablecloth

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
1D	3282-55	42.75	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
1E	4822-174	14.25	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
1F	8668-3	78.0	Towelette

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
1G	54287-5	30.0	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
2A	305-29	55.0	Towelettes
	901-37	71.25	Liquid
	4822-217	71.25	Liquid
	*4822-244	71.27	Liquid
	28293-114	71.25	Liquid
	39494-1	71.0	Liquid
	46075-2	71.25	Liquid
	53356-2	71.25	Liquid
	66733-5	71.25	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
2B	4822-241	71.25	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
2C	305-29	52.25	Towelette

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
3A	4822-7	47.5	Liquid
	4822-242	38.0	Liquid
	4822-243	47.5	Liquid
	19713-314	50.0	Liquid
	56575-10	47.5	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
3B	*305-32	38.0	Aerosol
	305-33	52.25	Aerosol
	305-46	38.0	Aerosol
	*4822-239	38.0	Aerosol
	4822-240	47.5	Aerosol
	4822-398	38.0	Aerosol
	6148-10	38.0	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
4A	*4822-253	33.25	Liquid
	*4822-254	28.5	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
4B	*4822-258	23.75	Towelette

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
4C	*121-45	28.5	Aerosol
	121-46	28.5	Aerosol
	121-67	28.5	Aerosol
	305-49	29.0	Aerosol
	305-52	27.0	Aerosol
	4758-81	28.5	Aerosol
	4822-197	33.25	Aerosol
	*4822-204	28.5	Aerosol
	4822-397	28.5	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
5A	*4822-205	14.25	Liquid
	4822-207	19.0	Liquid
	11556-114	21.8	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
5B	*121-31	21.85	Aerosol
	*121-33	21.85	Aerosol
	305-48	15.0	Aerosol
	305-50	23.0	Aerosol
	305-51	25.0	Aerosol
	4822-10	14.25	Aerosol
	*4822-51	17.1	Aerosol
	4822-119	19.0	Aerosol
	4822-167	23.8	Aerosol
	4822-380	14.25	Aerosol
	4822-401	23.8	Aerosol
	*6718-6	14.25	Aerosol
	7056-20	14.25	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
6A	*4822-368	6.65	Liquid
	4822-495	6.65	Liquid
	4822-415	4.75	Liquid
	4822-417	4.75	Liquid
	46515-46	6.65	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
6B	*121-50	9.5	Aerosol
	121-51	9.5	Aerosol
	4822-366	6.65	Aerosol
	4822-396	6.65	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
7A	*121-54	9.5	Liquid
	121-56	6.79	Towelette

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
	121-73	9.5	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
7B	121-62	9.5	Aerosol
	121-63	9.5	Aerosol
	121-64	9.5	Aerosol
	121-65	9.5	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
7C	121-52	9.5	Liquid
	121-53	9.5	Liquid
	121-55	9.5	Liquid
	121-72	9.5	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
8	498-122	14.25	Aerosol
	*498-154	14.25	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
9	121-29	21.85	Liquid
	121-34	21.85	Liquid
	4822-160	17.10	Liquid
	*4822-206	23.75	Liquid
	4822-399	23.75	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
10	121-60	7.125	Liquid
	121-61	7.125	Liquid
	*4822-362	7.125	Liquid
	4822-373	7.125	Liquid
	4822-414	4.75	Liquid
	4822-416	4.75	Liquid
	4822-424	7.125	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
11A	121-66	28.5	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
	121-68	21.85	Aerosol
	121-69	21.85	Aerosol
11B	121-77	6.65	Aerosol
Batch	**EPA Reg. No.**	**% Active Ingredient**	**Formulation Type**
12	69298-1	23.75	Liquid
	69298-2	11.875	Liquid
	68298-3	10.83	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
13	121-18	31.35	Solid
	121-20	31.35	Solid
	121-59	28.5	Solid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
14	*66306-1	19.00	Liquid
	66306-3	19.00	Liquid
	66306-5	9.50	Liquid
	66306-4	19.00	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
15A	305-41	9.5	Liquid
	305-43	19.00	Liquid
	305-44	19.00	Liquid
	305-45	19.00	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
15B	*121-70	9.5	Liquid
	305-42	9.5	Liquid
	*64583-1	9.5	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
16A	121-16	DEET 33.25 N-octyl 1.0 Di-N-propyl 1.0	Liquid
	121-22	DEET 33.25 N-octyl 1.0 Di-N-propyl 1.0	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
16B	*121-30	33.25	Liquid
	*121-32	33.25	Liquid
	121-57	28.5	Liquid
	121-58	28.5	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
17	58007-1	31.50	Liquid
	58001-4	28.4	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
18A	121-27	DEET 17.1 N-octyl 1.0 Di-N-propyl 1.0	Liquid
	*121-41	DEET 17.1 N-octyl 1.0 Di-N-propyl 1.0	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
18B	121-15	DEET 17.1 N-octyl 1.0 Di-N-Propyl 1.0	Aerosol
	121-21	DEET 17.1 N-octyl 1.0 Di-N-propyl 1.0	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
19A	2596-114	Esfenvalerate .11 DEET 10.0	Aerosol
	2596-115	Esfenvalerate .11 DEET 10.0	Aerosol
19B	2596-120	Esfenvalerate 0.025 DEET 3.99	Aerosol
	2596-121	Esfenvalerate 0.025 DEET 3.99	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
20A	1021-567	DEET 66.50 N-octyl 20.00 Di-N-propyl 10.00	Liquid
	1021-1276	DEET 86.00 N-octyl 8.00 Di-N-propyl 6.00	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
	1021-1290	DEET 73.07 N-octyl 15.38 Di-N-propyl 7.70	Liquid
	1021-1312	DEET 76.00 N-octyl 12.00 Di-N-propyl 8.00	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
20B	1021-737	DEET 84.45 N-octyl 11.11	Liquid
Batch	**EPA Reg. No.**	**% Active Ingredient**	**Formulation Type**
21A	99-123	DEET 36.53 N-octyl 7.69 Di-N-propyl 3.85	Liquid
	10404-25	DEET 38.0 N-octyl 6.0 Di-N-propyl 2.0	Liquid
	2217-780	DEET 33.25 N-octyl 10.0 Di-N-propyl 5.0	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
21B	3546-28	DEET 26.60 N-octyl 8.00 Di-N-propyl 4.00	Aerosol
	10806-86	DEET 26.60 N-octyl 8.00 Di-N-propyl 4.00	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
22A	305-40	DEET 16.62 N-octyl 5.00 Di-N-propyl 2.50	Liquid
	769-606	DEET 16.62 N-octyl 5.00 Di-N-propyl 2.50	Liquid
	1021-535	DEET 16.625 N-octyl 5.00 Di-N-propyl 2.50	Liquid
	56058-4	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
	56058-5	DEET 16.625 N-octyl 5.000 Di-N-propyl 2.500	Liquid
	54287-11	DEET 16.625 N-octyl 5.000 Di-N-propyl 2.500	Liquid
	56575-9	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Liquid
	65636-86	DEET 16.62 N-octyl 5.00 Di-N-propyl 2.50	Liquid
22A	67405-1	DEET 16.625 N-octyl 5.000 Di-N-propyl 2.500	Liquid
	68688-42	DEET 16.62 N-octyl 5.00 Di-N-propyl 2.50	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
22B	7405-60	DEET 9.975 N-octyl 3.000 Di-N-propyl 1.500	Aerosol
	7754-40	DEET 6.65 N-octyl 2.00 Di-N-propyl 1.00	Aerosol
	11715-86	DEET 13.66 N-octyl 3.84 Di-N-propyl 0.96	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
22C	11715-242	DEET 15.43 N-octyl 4.34 Di-N-propyl 1.08	Towelette

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
22D	9444-26	DEET 6.65 N-octyl 2.00 Di-N-propyl 1.00	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
23	69421-55	DEET 6.65 N-octyl 2.00 Di-N-propyl 1.00	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
	10807-29	DEET 6.65 N-octyl 2.00 Di-N-propyl 1.00	Aerosol
	10900-74	DEET 9.975 N-octyl 3.000 Di-N-propyl 1.500	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
24A	3282-38	DEET 25.0 N-octyl 5.0 Di-N-propyl 1.25	Aerosol
	7754-41	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	69421-53	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
24B	305-39	DEET 25.50 N-octyl 7.67 Di-N-propyl 3.84	Aerosol
	334-561	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	498-148	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	*1021-1600	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	10807-127	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	10900-72	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	11715-85	DEET 27.32 N-octyl 7.67 Di-N-propyl 1.92	Aerosol
	13283-12	DEET 27.32 N-octyl 7.67 Di-N-propyl 1.92	Aerosol
	34702-5	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	44446-48	DEET 22.56 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	46813-22	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
24B	56058-6	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol
	58284-20	DEET 23.75 N-octyl 5.00 Di-N-propyl 2.50	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
25	1685-72	DEET 4.38 N-octyl 1.30 Di-N-propyl 0.65	Aerosol
	2915-47	DEET 8.0 N-octyl 0.54 Di-N-propyl 0.54	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
26A	48139-6	DEET 28.5	Liquid

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
26B	305-31	DEET 33.25	Aerosol
	6148-9	DEET 25.0	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
26C	1270-107	DEET 15.0	Aerosol

Batch	EPA Reg. No.	% Active Ingredient	Formulation Type
26D	478-40	DEET 15.0	Aerosol

The following table lists products that were either considered not to be similar or the Agency lacked sufficient information for decision making and were not placed in any batch. The registrants of these products are responsible for meeting the acute toxicity data requirements separately.

Table 2 (No Batch)

EPA Reg. No.	% Active Ingredient		Formulation Type
121-74	DEET	9.5	Liquid
305-28	DEET	52.25	Liquid

EPA Reg. No.	% Active Ingredient		Formulation Type
498-41	DEET N-octyl Di-N-propyl	16.62 5.00 2.50	Aerosol
498-175	DEET N-octyl Di-N-propyl	24.46 5.0 2.5	Liquid
*2915-40	DEET N-octyl	7.0 2.50	Liquid
3095-23	DEET N-octyl Di-N-propyl	22.80 1.72 3.00	Liquid
4822-UAI	DEET	7.5	Liquid
4758-78	DEET Butoxypolypropylene glycol	28.5 15.0	Aerosol
3862-102	DEET	14.25	Aerosol
4972-32	DEET N-octyl Di-N-propyl	9.975 3.000 1.50	Aerosol
6148-11	DEET	10.0	Liquid
10806-34	DEET N-octyl Di-N-propyl	9.975 3.000 1.50	Aerosol
28293-113	DEET	14.25	Aerosol
44599-1	DEET	9.50	Liquid
44599-2	DEET	19.00	Aerosol
46813-46	DEET N-octyl	8.45 1.11	Aerosol
*50830-3	DEET N-octyl Di-N-propyl	25.00 5.00 3.00	Liquid
54287-6	DEET N-octyl	19.00 5.00	Aerosol
*54287-8	DEET N-octyl Di-N-propyl	16.625 5.000 2.500	Liquid
*58007-2	DEET	9.02	Aerosol
*58007-3	DEET	23.75	Aerosol
61553-1	DEET N-octyl Di-N-propyl	11.2 3.2 0.8	Liquid

EPA Reg. No.	% Active Ingredient		Formulation Type
66306-5	DEET	9.50	Liquid
66306-7	DEET	19.95	Liquid

Cost Share, Data Compensation Forms, Confidential Statement of Formula Form and Instructions

The Confidential Statement of Formula (CSF) Form 8570-4 must be used. Two legible, signed copies of the form are required. Following are basic instructions:

a. All the blocks on the form must be filled in and answered completely.

b. If any block is not applicable, mark it N/A.

c. The CSF must be signed, dated and the telephone number of the responsible party must be provided.

d. All applicable information which is on the product specific data submission must also be reported on the CSF.

e. All weights reported under item 7 must be in pounds per gallon for liquids and pounds per cubic feet for solids.

f. Flashpoint must be in degrees Fahrenheit and flame extension in inches.

g. For all active ingredients, the EPA Registration Numbers for the currently registered source products must be reported under column 12.

h. The Chemical Abstracts Service (CAS) Numbers for all actives and inerts and all common names for the trade names must be reported.

I. For the active ingredients, the percent purity of the source products must be reported under column 10 and must be exactly the same as on the source product's label.

j. All the weights in columns 13.a. and 13.b. must be in pounds, kilograms, or grams. In no case will volumes be accepted. Do not mix English and metric system units (i.e., pounds and kilograms).

k. All the items under column 13.b. must total 100 percent.

1. All items under columns 14.a. and 14.b. for the active ingredients must represent pure active form.

m. The upper and lower certified limits for al`-l active and inert ingredients must follow the 40 CFR 158.175 instructions. An explanation must be provided if the proposed limits are different than standard certified limits.

n. When new CSFs are submitted and approved, all previously submitted CSFs become obsolete for that specific formulation.

Confidential Business Information: Does Not Contain National Security Information (E.O. 12065) Form Approved. OMB No. 2070-0060. Approval Expires 2/28/94

EPA

United States Environmental Protection Agency
Office of Pesticide Programs (TS-767)
Washington, DC 20460

Confidential Statement of Formula

A. ☐ Basic Formulation ☐ Alternate Formulation

B. Page of

See Instructions on Back

1. Name and Address of Applicant/Registrant *(Include ZIP Code)*

2. Name and Address of Producer *(Include ZIP Code)*

3. Product Name

4. Registration No./File Symbol

5. EPA Product Mgr/Team No.

6. Country Where Formulated

7. Pounds/Gal or Bulk Density

8. pH

9. Flash Point/Flame Extension

EPA USE ONLY	10. Components in Formulation *(List as actually introduced into the formulation. Give commonly accepted chemical name, trade name, and CAS number.)*	11. Supplier Name & Address	12. EPA Reg. No.	13. Each Component in Formulation a. Amount	b. % by Weight	14. Certified Limits % by Weight a. Upper Limit	b. Lower Limit	15. Purpose in Formulation
	16. Typed Name of Approving Official			17. Total Weight	100%			

18. Signature of Approving Official	19. Title	20. Phone No. *(Include Area Code)*	21. Date

EPA Form 8570-4 (Rev. 12-90) **Previous editions are obsolete.** If you can photocopy this, please submit an additional copy. White - EPA File Copy (original) Yellow - Applicant copy

United States Environmental Protection Agency
Washington, D.C. 20460

Certification of Offer to Cost Share in the Development of Data

Form Approved
OMB No. 2070-0106, 2070-0057
Approval Expires 3-31-99

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to, Chief Information Policy Branch, PM-233, U.S. Environmental Protection Agency, 401 M St., S.W., Washington, DC 20460; and to the Office of Management and Budget, Paperwork Reduction Project (2070-0106), Washington, DC 20503.

Please fill in blanks below:

Company Name	Company Number

Product Name	EPA Reg. No.

I Certify that:

My company is willing to develop and submit the data required by EPA under the authority of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), if necessary. However my company would prefer to enter into an agreement with one or more registrants to develop jointly or share in the cost of developing data.

My firm has offered in writing to enter into such an agreement. That offer was irrevocable and included an an offer to be bound by arbitration decision under section 3(c)(2)(B)(iii) of FIFRA if final agreement on all terms could not be reached otherwise. This offer was made to the following firms on the following date(s):

Name of Firm(s)	Date of Offer

Certification:

I certify that I am duly authorized to represent the company named above, and that the statements that I have made on
this form and all attachments therein are true, accurate, and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.

Signature of Company's Authorized Representative	Date

Name and Title (Please Type or Print)

EPA Form 8570-32 (5/91) Replaces EPA form 8580 which is obselete

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
401 M Street, S.W.
WASHINGTON, D.C. 20460

Paperwork Reduction Act Notice: The public reporting burden for this collection of information is estimated to average 1.25 hours per response for registration and 0.25 hours per response for reregistration and special review activities, including time for reading the instructions and completing the necessary forms. Send comments regarding burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to: Director, OPPE Information Management Division (2137), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, DC 20460.
Do not send the completed form to this address.

Certification with Respect to Citation of Data

Applicant's/Registrant's Name, Address, and Telephone Number	EPA Registration Number/File Symbol
Active Ingredient(s) and/or representative test compound(s)	Date
General Use Pattern(s) (list all those claimed for this product using 40 CFR Part 158)	Product Name

NOTE: If your product is a 100% repackaging of another purchased EPA-registered product labeled for all the same uses on your label, you do not need to submit this form. You must submit the Formulator's Exemption Statement (EPA Form 8570-27).

☐ I am responding to a Data-Call-In Notice, and have included with this form a list of companies sent offers of compensation (the Data Matrix form should be used for this purpose).

SECTION I: METHOD OF DATA SUPPORT (Check one method only)

☐ I am using the cite-all method of support, and have included with this form a list of companies sent offers of compensation (the Data Matrix form should be used for this purpose).

☐ I am using the selective method of support (or cite-all option under the selective method), and have included with this form a completed list of data requirements (the Data Matrix form must be used).

SECTION II: GENERAL OFFER TO PAY

[Required if using the cite-all method or when using the cite-all option under the selective method to satisfy one or more data requirements]

☐ I hereby offer and agree to pay compensation, to other persons, with regard to the approval of this application, to the extent required by FIFRA.

SECTION III: CERTIFICATION

I certify that this application for registration, this form for reregistration, or this Data-Call-In response is supported by all data submitted or cited in the application for registration, the form for reregistration, or the Data-Call-In response. In addition, if the cite-all option or cite-all option under the selective method is indicated in Section I, this application is supported by all data in the Agency's files that (1) concern the properties or effects of this product or an identical or substantially similar product, or one or more of the ingredients in this product; and (2) is a type of data that would be required to be submitted under the data requirements in effect on the date of approval of this application if the application sought the initial registration of a product of identical or similar composition and uses .

I certify that for each exclusive use study cited in support of this registration or reregistration, that I am the original data submitter or that I have obtained the written permission of the original data submitter to cite that study.

I certify that for each study cited in support of this registration or reregistration that is not an exclusive use study, either: (a) I am the original data submitter; (b) I have obtained the permission of the original data submitter to use the study in support of this application; (c) all periods of eligibility for compensation have expired for the study; (d) the study is in the public literature; or (e) I have notified in writing the company that submitted the study and have offered (I) to pay compensation to the extent required by sections 3(c)(1)(F) and/or 3(c)(2)(B) of FIFRA; and (ii) to commence negotiations to determine the amount and terms of compensation, if any, to be paid for the use of the study.

I certify that in all instances where an offer of compensation is required, copies of all offers to pay compensation and evidence of their delivery in accordance with sections 3(c)(1)(F) and/or 3(c)(2)(B) of FIFRA are available and will be submitted to the Agency upon request. Should I fail to produce such evidence to the Agency upon request, I understand that the Agency may initiate action to deny, cancel or suspend the registration of my product in conformity with FIFRA.

I certify that the statements I have made on this form and all attachments to it are true, accurate, and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law.

Signature	Date	Typed or Printed Name and Title

EPA Form 8570-34 (9-97) Electronic and Paper versions available. Submit only Paper version.

Form Approved OMB No. 2070-0060

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
401 M Street, S.W.
WASHINGTON, D.C. 20460

Paperwork Reduction Act Notice: The public reporting burden for this collection of information is estimated to average 0.25 hours per response for registration activities and 0.25 hours per response for reregistration and special review activities, including time for reading the instructions and completing the necessary forms. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to: Director, OPPE Information Management Division (2137), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, DC 20460. Do not send the form to this address.

DATA MATRIX

Date			EPA Reg No./File Symbol		Page of
Applicant's/Registrant's Name & Address			Product		
Ingredient					
Guideline Reference Number	Guideline Study Name	MRID Number	Submitter	Status	Note
[redacted]					
Signature			Name and Title		Date

EPA Form 8570-35 (9-97) Electronic and Paper versions available. Submit only Paper version. **Public File Copy**

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Ingredient

Guideline Reference Number	Guideline Study Name	MRID Number	Submitter	Status	Note

Signature	Name and Title	Date

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Agency Internal Use Copy

INSTRUCTIONS FOR DATA MATRIX

INSTRUCTIONS: Identify all data submitted or cited and all submitters from whom permission has been received or to whom offers to pay have been sent by entering sufficient information in the attached matrix (photocopy and attach additional pages as necessary). Complete all columns; omission of essential information will delay approval of the registration/reregistration. On each page enter the date, Applicant's/Registrant's name, EPA Registration Number or application file symbol of the product, ingredient, page number, and total number of pages.

The Data Compensation Form entitled "Certification with Respect to Citation of Data" and the Data Matrix will be publicly available, except for the Guideline Reference Number, Guideline Study Name, and MRID Number columns after the registration/reregistration of this product has been granted or once this form is received in response to a Data-Call-In Notice. However, the information in the Guideline Reference Number, Guideline Study Name, and MRID Number columns is available through the Freedom of Information Act in association with the EPA Registration Number.

Ingredient: Identify the active ingredient(s) in this product for which data are cited. The active ingredient(s) are to be identified by entering the chemical name and the CAS registry number. Begin a new page for each separate active ingredient for which data are cited. If bridging data from a related chemical or representative test compound are cited, enter the identity of that chemical/representative test compound including the EPA Registration Number/File Symbol if appropriate.

If the cite-all method is used for all data supporting this particular ingredient, enter "CITE-ALL" in the Guideline Reference Number column and leave the Guideline Study Name column blank. If the cite-all method is used for a particular Guideline Reference Number enter "CITE-ALL" in the MRID Number column on the line for that Guideline Reference Number. In either case, enter all submitters to whom offers to pay have been sent on subsequent lines. [Note: if the selective method of support is used and written authorization (letter of permission) is provided, the individual Guideline Reference Number, Guideline Study Name, and MRID Number columns must still be completed.] Otherwise:

Guideline Reference Number: Enter on separate lines in numerical order the Guideline Reference Numbers from 40 CFR Part 158 for all studies cited to support the registration/reregistration for this ingredient.

Guideline Study Name: For each Guideline Reference Number cited, enter the corresponding Guideline Study Name.

MRID Number: For each individual study cited in support of a Guideline Reference Number and Guideline Study Name, enter the Master Record Identification (MRID) Number listed in the Pesticide Document Management System (PDMS). Enter only one MRID Number on each line. Note that more than one MRID Number may be required per Guideline Reference Number. Note: Occasionally a study required to maintain a registration/reregistration is not associated with a Guideline Reference Number and Guideline Study Name. In such case, enter the MRID Number(s) for the study(ies).

Submitter: Using the most recent Data Submitters List, identify the Original Data Submitter with their current address for each study cited. The EPA assigned company number or other abbreviation may be used. Clearly explain any variations (alternate addresses, data owners not on the Data Submitters List, etc.) in footnotes to this table.

Status: Enter one of the following codes for each study cited, as appropriate:

OWN: I am the Original Data Submitter for this study.

EXC: I have obtained written permission of the Original Data Submitter to cite this exclusive-use study in support of this application.

PER: I have obtained the permission of the Original Data Submitter to use this study in support of this application.

OLD: The study was submitted more than 15 years ago and all periods of compensation have expired.

PL: The study is in the public literature.

PAY: I have notified in writing the Original Data Submitter or, if the cite-all method is used, all companies listed in the most current Data Submitters List for this ingredient, and have offered (a) to pay compensation in accordance with FIFRA sections 3(c)(1)(F) and/or 3(c)(2)(B), and (b) to commence negotiations to determine the amount and terms of compensation, if any, to be paid for the use of the study(ies).

GAP: This Guideline data requirement is a data gap as defined in 40 CFR sections 152.83(a) and 152.96.

FOR: I am taking the formulator's exemption for this ingredient only. Other columns of this line should be marked "NA". However, if this product is to be registered/reregistered for additional uses for which the purchased EPA registered ingredient is not supported, additional data must be submitted or cited here to support those uses.

Note: If additional explanation is needed, enter a footnote number in this column and attach the corresponding explanation.

United States Environmental Protection Agency
Washington, DC 20460

Form Approved
OMB No. 2070-0107,
2070-0057
Approval Expires
3-31-99

CERTIFICATION WITH RESPECT TO DATA COMPENSATION REQUIREMENTS

Please fill in blanks below.

Company Name	Company Number

Product Name	EPA Reg. No.

I Certify that:

1. For each study cited in support of registration or reregistration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) that is an exclusive use study, I am the original data submitter, or I have obtained the written permission of the original data submitter to cite that study.

2. That for each study cited in support of registration or reregistration under FIFRA that is NOT an exclusive use study, I am the original data submitter, or I have obtained the written permission of the original data submitter, or I have notified in writing the company(ies) that submitted data I have cited and have offered to: (a) Pay compensation for those data in accordance with sections 3(c)(1)(F) and 3(c)(2)(D) of FIFRA; and (b) Commence negotiation to determine which data are subject to the compensation requirement of FIFRA and the amount of compensation due, if any. The companies I have notified are: (check one)

[ ] The companies who have submitted the studies listed on the back of this form or attached sheets, or indicated on the attached "Requirements Status and Registrants' Response Form,"

3. That I have previously complied with section 3(c)(1)(F) of FIFRA for the studies I have cited in support of registration or reregistration under FIFRA.

Signature	Date

Name and Title (Please Type or Print)

GENERAL OFFER TO PAY: I hereby offer and agree to pay compensation to other persons, with regard to the registration or reregistration of my products, to the extent required by FIFRA section 3(c)(1)(F) and 3(c)(2)(D).

Signature	Date

Name and Title (Please Type or Print)

EPA Form 8570-31 (4-96)

List of Available Related Documents

The following is a list of available documents for DEET that my further assist you in responding to this Reregistration Eligibility Decision document. These documents may be obtained by the following methods:

Electronic
File format: Portable Document Format (.PDF) Requires Adobe® Acrobat or compatible reader. Electronic copies can be downloaded from the Pesticide Special Review and Reregistration Information System at 703-308-7224. They also are available on the Internet using ftp on FTP.EPA.GOV, or using WWW (World Wide Web) on WWW.EPA.GOV., or contact Linda Werrell at (703)-308-8033.

1. PR Notice 86-5.

2. PR Notice 91-2 (pertains to the Label Ingredient Statement).

3. A full copy of this RED document.

4. A copy of the fact sheet for DEET.

The following documents are part of the Administrative Record for DEET and may included in the EPA's Office of Pesticide Programs Public Docket. Copies of these documents are not available electronically, but may be obtained by contacting the person listed on the Chemical Status Sheet.

1. Health and Environmental Effects Science Chapters.

2. Detailed Label Usage Information System (LUIS) Report.

The following Agency reference documents are not available electronically, but may be obtained by contacting the person listed on the Chemical Status Sheet of this RED document.

1. The Label Review Manual.

2. EPA Acceptance Criteria