Reregistration Eligibility Decision (RED) Document for Nitrapyrin

April 29, 2005

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Reregistration Eligibility Decision

Nitrapyrin

List [B]

Case No. 0213

Reregistration Eligibility Decision (RED) Document for Nitrapyrin

Approved by: _____

Debra Edwards, Ph. D.
Director
Special Review and Reregistration Division

Date: April 29, 2005

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Nitrapyrin Reregistration Eligibility Decision Team

Office of Pesticide Programs:

Biological and Economic Analysis Assessment

Nicole Zinn

Environmental Fate and Effects Risk Assessment

Amer Al-Mudallal
Christine Hartless

Health Effects Risk Assessment

John Doherty
David Soderberg
Seyed Tadayon

Registration Support

Joanne Miller

Risk Management

Stephanie Plummer
Laura Parsons

Glossary of Terms and Abbreviations

AGDCI	Agricultural Data Call-In
ai	Active Ingredient
aPAD	Acute Population Adjusted Dose
AR	Anticipated Residue
BCF	Bioconcentration Factor
CFR	Code of Federal Regulations
cPAD	Chronic Population Adjusted Dose
CSF	Confidential Statement of Formula
CSFII	USDA Continuing Surveys for Food Intake by Individuals
DCI	Data Call-In
DEEM	Dietary Exposure Evaluation Model
DFR	Dislodgeable Foliar Residue
DWLOC	Drinking Water Level of Comparison.
EC	Emulsifiable Concentrate Formulation
EEC	Estimated Environmental Concentration
EPA	Environmental Protection Agency
EUP	End-Use Product
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FFDCA	Federal Food, Drug, and Cosmetic Act
FQPA	Food Quality Protection Act
FOB	Functional Observation Battery
G	Granular Formulation
GENEEC	Tier I Surface Water Computer Model
GLN	Guideline Number
HAFT	Highest Average Field Trial
IR	Index Reservoir
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.
LOC	Level of Concern
LOD	Limit of Detection
LOAEL	Lowest Observed Adverse Effect Level
MATC	Maximum Acceptable Toxicant Concentration
μg/g	Micrograms Per Gram
μg/L	Micrograms Per Liter
mg/kg/day	Milligram Per Kilogram Per Day
mg/L	Milligrams Per Liter

MOE	Margin of Exposure
MRID	Master Record Identification (number). EPA's system of recording and tracking studies submitted.
MUP	Manufacturing-Use Product
NA	Not Applicable
NAWQA	USGS National Water Quality Assessment
NPDES	National Pollutant Discharge Elimination System
NR	Not Required
NOAEL	No Observed Adverse Effect Level
OP	Organophosphate
OPP	EPA Office of Pesticide Programs
OPPTS	EPA Office of Prevention, Pesticides and Toxic Substances
PAD	Population Adjusted Dose
PCA	Percent Crop Area
PDP	USDA Pesticide Data Program
PHED	Pesticide Handler's Exposure Data
PHI	Preharvest Interval
ppb	Parts Per Billion
PPE	Personal Protective Equipment
ppm	Parts Per Million
PRZM/EXAMS	Tier II Surface Water Computer Model
Q_1*	The Carcinogenic Potential of a Compound, Quantified by the EPA's Cancer Risk Model
RAC	Raw Agriculture Commodity
RED	Reregistration Eligibility Decision
REI	Restricted Entry Interval
RfD	Reference Dose
RQ	Risk Quotient
SCI-GROW	Tier I Ground Water Computer Model
SAP	Science Advisory Panel
SF	Safety Factor
SLC	Single Layer Clothing
SLN	Special Local Need (Registrations Under Section 24(c) of FIFRA)
TCPSA	2,3,3-trichloroprop-2-ene sulfonic acid (nitrapyrin Metabolite)
TGAI	Technical Grade Active Ingredient
TRR	Total Radioactive Residue
USDA	United States Department of Agriculture
USGS	United States Geological Survey
UF	Uncertainty Factor
UV	Ultraviolet
WPS	Worker Protection Standard

Executive Summary

This document presents the Environmental Protection Agency's (hereafter the Agency or EPA) decision regarding the reregistration eligibility of the registered uses of nitrapyrin [2-chloro-6-(trichloromethyl) pyridine]. The Agency made its reregistration eligibility determination based on the required data, the current guidelines for conducting acceptable studies to generate such data, and published scientific literature. The Agency has found that currently registered uses of nitrapyrin are eligible for reregistration, provided that the changes specified in this document are made to the label.

Nitrapyrin is a nitrification inhibitor used on corn, sorghum, and wheat. There are tolerances for nitrapyrin on corn, wheat, sorghum, livestock, and poultry. The Agency estimates that approximately 99% of nitrapyrin is used on corn, with the remaining 1% used on sorghum and wheat.

Risks summarized in this document are those that result only from the use of nitrapyrin. The Food Quality Protection Act (FQPA) requires that the Agency consider available information concerning the cumulative effects of a particular pesticide's residues and other substances that have a common mechanism of toxicity. The reason for consideration of other substances is due to the possibility that low-level exposures to multiple chemical substances that cause a common toxic effect by a common toxic mechanism could lead to the same adverse health effect as would a higher level of exposure to any of the substances individually. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding for nitrapyrin and any other substances, and nitrapyrin does not appear to produce a toxic metabolite produced by other substances. For the purposes of this action, therefore, EPA has assumed that nitrapyrin does not have a common mechanism of toxicity with other substances. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA's Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism on EPA's website at http://www.epa.gov/pesicides/cumulative/.

Dietary Risk from Food

No acute dietary assessment was performed for nitrapyrin. The chronic (non-cancer) dietary risks are less than 100% of the Chronic Population Adjusted Dose (cPAD) for all population subgroups and are therefore not of concern.

Dietary Risk from Drinking Water

Drinking water exposure to pesticides can occur through groundwater and surface water contamination. All modeled surface water EECs (which are < 1.71 ppb) and ground water EECs (which are < 278.82 ppb) are less than the chronic DWLOCs (300 or greater) and therefore are not of concern.

Residential Risk

There are currently no nitrapyrin products registered for residential use; therefore, a residential risk assessment was not conducted.

Aggregate Risk

A chronic aggregate risk assessment was conducted for nitrapyrin. The chronic aggregate risk assessment looked at the combined risk from dietary exposure (food and drinking water pathways), since there are no residential uses. Chronic risks from food exposures were below the Agency's level of concern, with a cPAD of less than 100%.

Occupational Risk

The Agency identified two major occupational scenarios where exposures might occur: (1) mixing/loading liquids for groundboom application; and (2) applying sprays via groundboom. Occupational risks were assessed for short and intermediate term exposures only because use patterns for nitrapyrin do not suggest any long term use. For the two exposure scenarios, all margin of exposure (MOE) values calculated did not exceed EPA's level of concern.

Workers would be expected to be exposed to nitrapyrin, which is classified as "likely to be a human carcinogen" based on the mouse study that demonstrated liver tumors, stomach tumors, and Harderian gland neoplasm. The Q_1* was determined to be 4.25×10^{-2} $(mg/kg/day)^{-1}$ human equivalents. At baseline PPE, cancer risks for workers mixing/loading liquids for groundboom application exceed the Agency's level of concern; however, when the PPE that is required on current labels is worn (long pants, long sleeved shirt, and gloves), the cancer risk is considered to be at an acceptable level for non-commercial and commercial handlers, who would use the product more than 30 days.

Ecological Risk

Nitrapyrin hydrolyzes and photodegrades rapidly, and hence should not persist in most environments. It is shown to be mobile to moderately mobile in mineral soils, and also prone to volatilize from the application site, so it could leave application sites through leaching or volatilization. 6-CPA, the primary degradate of nitrapyrin, is mobile and degrades via hydroxylation (breaking the pyridine ring) and microbial mineralization.

EPA concludes that nitrapyrin presents ecological risks of concern only when soil incorporation does not occur immediately after incorporation. In order for nitrapyrin to be eligible for reregistration, the Agency has determined that the product labels must require immediate soil incorporation. The implementation of this mitigation measure should result in decreased exposure values, leading to much lower RQs for both terrestrial and aquatic organisms. When soil incorporation occurs immediately after application, ecological risks are below the Agency's levels of concern for terrestrial and aquatic organisms, and EPA has therefore determined that no further risk mitigation is necessary for environmental concerns.

Endangered Species

The screening level risk assessment for nitrapyrin resulted in no acute risks above EPA's level of concern to any listed species and no chronic risks above EPA's level of concern for any listed terrestrial organisms if nitrapyrin is incorporated immediately post-treatment. However, at this time, the Agency does not have chronic toxicity data for estuarine aquatic organisms. Therefore, EPA concludes that there is "no effect" from direct acute risks for any listed species and from direct chronic risks for any listed terrestrial species when nitrapyrin is soil incorporated immediately post-treatment. The EPA cannot, at this time, make a clear "no effect" finding for indirect effects or for direct chronic effects for listed estuarine organisms.

The general risk mitigation required through this RED will serve to protect listed species of potential concern until such time as the Agency refines its risk assessment for plants and for chronic effects to avian species. If in the future specific measures are necessary for the protection of listed species, the Agency will implement them through the Endangered Species Protection Program.

Risk Mitigation Summary

The only risks of concern from current uses of nitrapyrin are risks to birds and mammals. Currently all end-use product labels except one require soil incorporation to take place during or immediately after application. One product (EPA Reg. No. 34701-804) allows for a delay of up to 48 hours. By changing this label to also require immediate incorporation, all ecological risks of concern are reduced to acceptable levels. Therefore, EPA will require the registrant to revise its label.

Next Steps

The Agency is announcing issuance of the Reregistration Eligibility Document (RED) for nitrapyrin in the *Federal Register*, with a 60-day public comment period. This RED document includes guidance and time frames for complying with any required label changes for products containing nitrapyrin. With the addition of the label restrictions and amendments detailed in this document, the Agency has determined that all currently registered uses of nitrapyrin are eligible for reregistration. If substantive information is received during the comment period that indicates a need to refine any of EPA's assumptions or a need for additional risk mitigation, then this decision will be modified as appropriate through an amendment to the RED.

In the future, EPA will issue a generic data call-in (DCI) for additional data necessary to confirm the conclusions of this RED for the active ingredient nitrapyrin. EPA will also issue a product specific DCI for data necessary to complete reregistration for products containing nitrapyrin.

I. Introduction

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) was amended in 1988 to accelerate the reregistration of products with active ingredients registered prior to November 1, 1984. The amended Act calls for the development and submission of data to support the reregistration of an active ingredient, as well as a review of all submitted data by the U.S. Environmental Protection Agency (hereafter referred to as EPA or the Agency). Reregistration involves a thorough review of the scientific database underlying a pesticide's registration. The purpose of the Agency's review is to reassess the potential risks 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 or not the pesticide meets the "no unreasonable adverse effects" criteria of FIFRA.

On August 3, 1996, the Food Quality Protection Act of 1996 (FQPA) was signed into law. This Act amends FIFRA to require reassessment of all tolerances in effect on the day before it was enacted. EPA decided that, for those chemicals that have tolerances and are undergoing reregistration, tolerance reassessment will be accomplished through the reregistration process. FQPA also amended the FFDCA to require a safety finding in tolerance reassessment based on factors that include an assessment of cumulative effects of chemicals with a common mechanism of toxicity. The reason for consideration of other substances is that the possibility exists that low-level exposures to multiple chemicals that cause a common toxic effect by a common mechanism could lead to the same adverse health effect as would a high level of exposure to any one of the other substances individually.

FQPA requires that the Agency consider available information concerning the cumulative effects of a particular pesticide's residues and other substances that have a common mechanism of toxicity. The reason for consideration of other substances is due to the possibility that low-level exposures to multiple chemical substances that cause a common toxic effect by a common mechanism of toxicity could lead to the same adverse health effect that would occur at a higher level of exposure to any of the substances individually. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding for nitrapyrin and any other substances, and nitrapyrin does not appear to produce a toxic metabolite produced by other substances. For the purposes of this action, therefore, EPA has assumed that nitrapyrin does not have a common mechanism of toxicity with other substances. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA's Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism on EPA's website at http://www.epa.gov/pesticides/cumulative.

This document presents EPA's revised human health and ecological risk assessments and its progress toward tolerance reassessment, and the reregistration eligibility decision for nitrapyrin. The document consists of six sections: section I contains the regulatory framework for reregistration/tolerance reassessment; section II provides a profile of the use and usage of the chemical; section III gives an overview of the revised human health and environmental effects risk assessments based on data, public comments, and other

information received in response to the preliminary risk assessments, section IV presents the Agency's reregistration eligibility and risk management decisions; section V summarizes label changes necessary to implement the risk mitigation measures outlined in Section IV; and section VI provides information on how to access related documents. Finally, the Appendices list related and supporting documents and Data Call-In (DCI) information. The revised risk assessment documents and related addenda are not included in this document, but are available on the Agency's web page http://www.epa.gov/pesticides, and in the Public Docket under docket number OPP-2004-0283.

II. Chemical Overview

A. Regulatory History

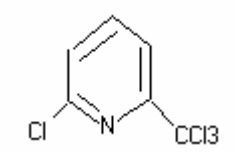
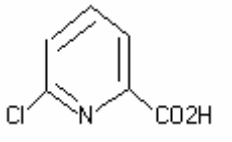
Nitrapyrin has been registered in the United States since l974 for use as a nitrification inhibitor. During the second phase of reregistration, the Agency conducted a review of the scientific data base underlying pesticide registrations and identified any missing or inadequate studies. Subsequent Data Call-Ins (DCIs) were issued in 1991 and 1995 for nitrapyrin. This Reregistration Eligibility Decision (RED) reflects a reassessment of all data submitted to date.

There are four products containing nitrapyrin registered under Section 3 of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Currently, there are no Section 18 (Emergency Exemption) uses, or Section 24(c) (Special Local Need) uses registered for nitrapyrin. This Reregistration Eligibility Decision document evaluates risks from all currently registered uses.

A close-out conference call was conducted on April 28, 2005, with EPA, USDA, and the registrant, to discuss the risk management decisions and resultant changes to the nitrapyrin labels.

B. Chemical Identification

Figure A. Chemical structures of Nitrapyrin Residues of Concern.

	
Nitrapyrin	6-Chloropicolinic Acid

Common Name:	Nitrapyrin
Chemical Name:	2-chloro-6-(trichloromethyl) pyridine
Chemical Family:	Pyridine
Empirical Formula:	$C_6H_3Cl_4N$
CAS Registry Number:	1929-82-4
Case Number:	0213
OPP Chemical Code:	069203
Molecular weight:	230.9
Trade Names:	N-Serve TG®, N-Serve 24E®, N-Serve 24®, Stay-N 2000®
Basic Manufacturers:	Dow AgroSciences, LLC

Nitrapyrin is a white crystalline solid with a mildly sweet odor. It has a melting point of 62-63 degrees Celsius, a solubility of 92 ppm in water 25 degrees Celsius and a vapor pressure of 2.8×10^{-5} mm Hg.

C. Use Profile

The following is information on the currently registered uses of nitrapyrin, including an overview of use sites and application methods. A detailed table of the uses of nitrapyrin eligible for reregistration is contained in Appendix A.

Type of Pesticide:	Nitrification inhibitor, bacteriostat, plant growth regulator
Summary of Use:	Used as a nitrification inhibitor and soil bactericide, and can delay the nitration of ammonium ion in soil when used together with urea and nitrogen fertilizer. Soil incorporation is currently required immediately after application for all products except one, for which soil incorporation can be delayed up to 48 hrs, provided that conditions exist where the soil contains at least 3% organic matter and soil temperatures do not exceed 65°F.
Food uses:	Corn, sorghum, wheat

Formulation Type:	All products are formulated as emulsifiable concentrates, ranging from 19.8% to 22.2% active ingredient.
Registrants:	Dow AgroSciences LLC and Loveland Products, Inc.

Method and Rates of Application:

Application Methods:	Applied as a broadcast treatment, soil band treatment, soil incorporated broadcast treatment, top dressing treatment, soil injection, and soil sidedress.
Application Rates:	Current maximum application rates are a single application of 0.9 lb a.i./A to sorghum and wheat and two applications of 0.45 lb a.i./A at a 30 day interval to corn.
Application Timing:	Applied pre-plant, at plant, post-plant, and/or post harvest for all use sites.
Use Classification:	General

D. Estimated Usage of Pesticide

The technical registrant requested that EPA consider any market data for nitrapyrin as Confidential Business Information, and as such, an estimate of pounds applied annually is not disclosed in this document.

III. Summary of Nitrapyrin Risk Assessments

The following is a summary of EPA's human health and ecological risk findings and conclusions for nitrapyrin, as presented fully in the documents "Nitrapyrin. Revised HED Chapter of the Reregistration Eligibility Decision Document (RED)" written by S. Tadayon, D. Soderberg, and J. Doherty (3/1/05) and "Environmental Fate and Effects Division Revised Risk Assessment for the Nitrapyrin Reregistration Eligibility Decision" written by C. Hartless and A. Al-Mudallal (3/1/05).

The purpose of this section is to summarize the key features and findings of the risk assessment in order to help the reader better understand the risk management decisions reached by the Agency. While the risk assessments and related addenda are not included in this document, they are available in the public docket (docket number OPP-2004-0283) and on the Agency's website at http://www.epa.gov/pesticides/reregistration/status.htm.

A. Human Health Risk Assessment

1. Dietary Risk from Food

A brief overview of the toxicity studies used for endpoints in the dietary risk assessments is outlined below in Table 1. Further details on the toxicity of nitrapyrin can be found in the revised human health risk assessment, dated March 1, 2005.

a. Toxicity of Nitrapyrin

The Agency has reviewed all toxicity studies submitted and has determined that the toxicity database for nitrapyrin is complete and supports a reregistration eligibility determination for all currently registered uses. The studies have been submitted to support guideline requirements. Acute toxicity values and categories for the technical grades of nitrapyrin and 6-CPA are summarized in Tables 1 and 2, respectively.

Note: The technical acute toxicity values included in this document are for informational purposes only. The data may not be appropriate for product reregistration citation.

Table 1. Acute Toxicity Data on Nitrapyrin

Old Guideline No.	New Guideline No.	Study Type	MRID #(s)	Results	Toxicity Category
81-1	870.1100	Acute Oral - rat	00037519 (1972)	LD_{50} = 1.07 gm/kg ♂ 1.23 gm/kg ♀	III
81-2	870.1200	Acute Dermal - rabbit	00158904 (1986)	LD_{50} > 2000 mg/kg	III
81-3	870.1300	Acute Inhalation	00158901 (1986)	LC_{50} > 0.03 m/L no effects (technically limited atmospheric conc.)	Cannot Classify*
81-4	870.2400	Primary Eye Irritation	00158902 (1986)	Corneal opacity to day 14 (2/6), conjunctivitis today 21, iritis to day 7.	II
81-5	870.5200	Primary Skin Irritation	00037519 (1972)	Very slight erythema and slight exfoliation.	IV
81-6	870.2600	Dermal Sensitization	00158903 (1986)	Positive in the modified Maguire method.	

*The waxy physical nature of technical nitrapyrin precludes generating aerosols of appropriate atmospheric concentration to meaningfully assess inhalation toxicity.

No appropriate endpoints (effects) attributable to a single exposure (dose) were identified in any study, including developmental studies in rabbits or rats. Therefore, an acute RfD was not established and EPA has not assessed acute dietary risk for nitrapyrin.

In longer term studies, the liver was demonstrated to be the principle target organ in rat, mouse, and dog. Decreases in body weight were demonstrated in subchronic and chronic studies. In addition to the liver, the kidney was also demonstrated to be a target organ in male rats only and the weight of evidence indicated that nitrapyrin affects the kidney in a manner consistent with the alpha 2μ globulin model. Consistent with this model, kidney non-neoplastic pathology was evident and there were increases in kidney tumors in male rats. Induction of kidney pathological changes in the alpha 2μ globulin model is not related to human risk assessment.

In a dermal absorption (rat) study conducted with nitrapyrin, dermal absorption was found to be 46% at 24 hours. Since an oral NOAEL was selected, 46% dermal absorption should be used for route-to-route extrapolation. A dermal absorption value of 46% was calculated to represent the residual chemical that could be absorbed and for use in route-to-route extrapolation.

For nitrapyrin, the Agency selected the developmental oral study for rabbits to be the basis for short-term inhalation risk assessment. Also, an assumption is made that 100% of the estimated inhalation dose will be absorbed. Risk estimates are based on the NOAEL dose of 10 mg/kg/day and LOAEL of 15 mg/kg/day, based on decreased body weight gain and increased liver weight.

The intermediate-term inhalation risk assessment is based on the chronic dog study, considering liver enzymes, liver weights and liver lesions at a LOAEL of 15 mg/kg/day. The NOAEL is 3 mg/kg/day. As in the short-term inhalation risk assessment, an assumption is made that 100% of the estimated inhalation dose will be absorbed. All toxicological endpoints used for risk assessment are presented in Table 2 below.

Table 2. Summary of Doses and Toxicological Endpoints for Nitrapyrin

Guideline No./ Study Type	MRID/Accession No.	Results
870.4200 Carcinogenicity mice	41651601	The Carcinogenicity Peer Review Committee determined that the high dose in this study was not adequate for carcinogenicity evaluation.
870.4300 Combined chronic feeding and carcinogenicity study - rats	41345403	NOAEL = 5 mg/kg/day LOAEL = 20 mg/kg/day based on decreased body weight gain in males. Increase in kidney tumors related to the alpha 2μ globulin model (not relevant to humans).
870.5100 Gene Mutation – Ames Test	Accession No. 259818.	No evidence of mutagenic activity in strains TA-97, TA-98, TA-100 and TA 1535 in the presence or absence of activation.
870.5300 Cytogenetics - Mammalian gene mutation.	MRID No. 00163805	Negative for genotoxic effect.
870.5375 Cytogenetics - Micro-nucleus test.	Accession No. 259818	No evidence of mutagenic potential in the mouse micronucleus test at a dose of 800 mg/kg.

Guideline No./ Study Type	MRID/Accession No.	Results
870.5550 Other Effects	MRID No. 00109456.	No increase in unscheduled DNA synthesis.

Nitrapyrin did not demonstrate increased sensitivity to fetuses and offspring. Maternal toxicity consisted of decreases in body weight and liver effects and kidney effects in the rat reproduction study. There were no indications of impaired reproductive performance. Fetal and offspring toxicity was slight and included increased incidence of crooked hyoid in rabbits, ossification decreases in rats and body weight decreases and evidence of hepatic centrilobular hypertrophy with fatty changes in rats in the reproduction study.

Table 3. Summary of Toxicological Doses and Endpoints for Nitrapyrin for Use in the Dietary Exposure Assessment

Exposure Scenario	Dose Used in Risk Assessment, UF	Special FQPA SF* and Level of Concern for Risk Assessment	Study and Toxicological Effects
Acute Dietary (All Populations)	No study was selected for this scenario since neither the rat nor the rabbit demonstrated definite toxicity following a single dose and developmental toxicity was not a concern for nitrapyrin.		
Chronic Dietary (All Populations)	NOAEL = 3 mg/kg.day UF = 100 Chronic RfD = .03 mg/kg/day	FQPA SF = 1X cPAD = chronic RfD / FQPA SF = 0.03 mg/kg/day	Chronic feeding – dog LOAEL = 15 mg/kg/day based on liver effects
Cancer (oral, dermal, inhalation)	Classified as "likely to be a carcinogen in humans" as per May 5, 2000 and April 26, 2005 CARC reports. $Q1^* = 4.25 \times 10^{-2}$ human equivalents (refer to TXR # 0014035 memo dated 3/9/00).		

A classification of "likely to be carcinogenic to humans" was assigned by the Cancer Assessment Review Committee (CARC) dated May 5, 2000, using the criteria in the Draft Guidelines for Carcinogen Risk Assessment (July, 1999). The Q_1^* was determined to be 4.25×10^{-2} $(mg/kg/day)^{-1}$ human equivalents. The CARC also met on February 9, 2005, to reconsider the cancer classification of nitrapyrin, based on a rebuttal report submitted by the technical registrant during the Phase 3 public comment period. As a result of this meeting, the CARC reaffirmed the cancer classification, noting, however, that the Harderian gland tumors seen in the mouse study are no longer considered a response to treatment with nitrapyrin, and that the forestomach tumors are not relevant to human health risk assessment. The CARC did retain its concern for the epididymal tumors and did not accept the registrant's proposed mechanism for liver tumors.

Under a two year dietary study 6-chloropicolinic acid (6-CPA) was considered not to be carcinogenic to male and female mice [Cancer Assessment Review Committee Report for Nitrapyrin (2nd Review), May 5, 2000]. A cancer risk assessment was done for occupational, but not dietary, exposures to nitrapyrin, because dietary exposures are to 6-CPA only, whereas occupational exposures are to parent nitrapyrin.

The mutagenicity data base for nitrapyrin satisfies the current recommendations for testing. However, there is one study conducted by the National Toxicology Program (NTP) that reports that nitrapyrin is mutagenic in the Salmonella typhimurium strains TA97, TA98, and TA100 in the presence of S9 metabolite activation. The results of the NTP study are in contrast with the submitted study, which did not demonstrate positive mutagenicity effects in these strains. In addition, certain structural activity factors would predict that nitrapyrin could have mutagenic potential.

The technical registrant has expressed interest in developing new data that may affect the cancer classification. If they choose to submit such data to the Agency, the Agency will review the data according to the scheduling guidelines of the Pesticide Registration Improvement Act, and revise the cancer classification if appropriate. However, at this time, the Agency has no data that would warrant changing the current cancer classification for nitrapyrin.

Neither the subchronic, chronic, developmental, or reproductive rat, mouse, dog or rabbit studies indicates that nitrapyrin was associated with either a specific or an indirect neurotoxic or immunotoxic response or endocrine disruption.

b. FQPA Safety Factor

The FQPA Safety Factor (as required by the Food Quality Protection Act of 1996) is intended to provide up to an additional 10-fold safety factor (10X), to protect for special sensitivity in infants and children to specific pesticide residues in food, drinking water, or residential exposures. In the case of nitrapyrin, the Agency has concluded that the FQPA Safety Factor should be removed (which would make it equivalent to 1X) based on a conclusion of no increased susceptibility and no residual uncertainty. In addition, there is not a concern for neurotoxicity or for pre- and/or postnatal toxicity resulting from exposure to nitrapyrin. On this basis, the Agency concluded that the special FQPA safety factor should be removed (i.e., reduced to1X) for all potential exposure scenarios to nitrapyrin.

c. Population Adjusted Dose

A population adjusted dose, or PAD, is the reference dose (RfD) adjusted for the FQPA safety factor. A risk estimate that is less than 100% of the acute PAD, the dose at which an individual could be exposed over the course of a single day and no adverse health effects would be expected, does not exceed EPA's level of concern. Likewise, a risk estimate that is less than 100% of the chronic PAD, the dose at which an individual could be exposed over the course of a lifetime and no adverse health effects would be expected, does not exceed EPA's level of concern.

1) Acute PAD

As discussed in Section III.A.1.a of this document, EPA has not assessed acute dietary risk for nitrapyrin because no appropriate endpoint attributable to a single exposure (dose) could be identified. As a result, an acute dietary RfD was not established.

2) Chronic PAD

Dietary risk for nitrapyrin was assessed by comparing chronic dietary exposure estimates (in mg/kg/day) to the nitrapyrin cPAD. Dietary risk is expressed as a percent of the cPAD, which is the chronic Reference Dose (3 mg/kg/day) modified by an uncertainty factor of 100 (10X for inter-species extrapolation and 10X for intra-species variability). Therefore, the theoretical cPAD for nitrapyrin would be 0.03 mg/kg/day. The cPAD was derived from a chronic dog study, in which nitrapyrin was administered to beagles (4/sex/dose) in the diet at dose levels at 0.5, 5.0, 125, and 250 mg/kg/day for up to 53 weeks, with a NOAEL of 3 mg/kg/day as noted in Table 3 above.

d. Exposure Assumptions

A refined chronic dietary exposure assessment was performed in order to determine the exposure risk assessment to nitrapyrin for use in chronic dietary risk assessment from all registered uses. The assessment was conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™, Version 1.3), which incorporates consumption data from USDA's Continuing Surveys of Food Intakes by Individuals (CSFII), 1994-1996 and 1998. Field trial data, estimated percent crop treated information, and processing factors, where available, were used. The chronic and cancer dietary exposure estimates were also conducted using the Lifeline™ model (Version 2.0). These Lifeline™ assessments were conducted using the same consumption data as the DEEM-FCID™ (CSFII, 1994-1996 and 1998 consumption data with FCID). Lifeline™ uses the recipe file to relate RACs to foods "as-eaten" (D299299, March 04, D Soderberg). Exposure estimates are reported in milligrams per kilogram of body weight per day, and risk is expressed as a percent of the cPAD.

e. Dietary (Food) Risk Assessment

1) Acute Dietary Risk

Acute dietary risk was not assessed for nitrapyrin, since no appropriate endpoint attributable to a single dose has been identified.

2) Chronic Dietary Risk

Chronic dietary risk was calculated by using the average consumption value for food and average residue values on those foods. For all commodities, the results of both the DEEM-FCID™ and Lifeline™ analyses for chronic dietary exposure (food only) yielded exposure results <1% cPAD for the US Population and for all population subgroups, which is below EPA's level of concern. Dietary exposure results <100% of the cPAD are below EPA's level of concern. A summary of chronic dietary risk estimates are presented in Table 4.

Table 4. Summary of Chronic Dietary Exposure and Risk for Nitrapyrin

Population Subgroup	Chronic Dietary Exposure and Risk			
	DEEM		Lifeline	
	Dietary Exposure (mg/kg/day)	% cPAD[a]	Dietary Exposure (mg/kg/day)	% cPAD[a]
General U.S. Population	0.000013	<1	0.000012	<1
All Infants (< 1 year old)	0.000015	<1	0.000012	<1
Children 1-2 years old	0.000027	<1	0.000026	<1

[a]Percent of cPAD = (Exposure ÷ cPAD) x 100%.

For more information on the chronic dietary risk assessment, please refer to the Chronic Dietary Exposure and Risk section of the revised human health chapter for nitrapyrin, dated March 1, 2005.

3) Dietary Cancer Risk

A dietary cancer risk assessment was not conducted for nitrapyrin because exposure to nitrapyrin, per se, in the diet is negligible (zero). Human exposure to residues of nitrapyrin is only through the grains and grain products of corn, sorghum, and wheat, and the only residues detected on these grain products are free or conjugated forms of 6-chlorpicolinic acid. Nitrapyrin, per se, has never been detected. The cancer endpoint is relevant only to nitrapyrin, per se, and not to 6-CPA.

2. Dietary Risk from Drinking Water

Dietary water exposure to pesticides can occur through ground and surface water contamination. In assessing drinking water risks EPA considers acute (one day), chronic (long-term) and, if applicable, cancer (overall mean) exposure, and uses either modeling or monitoring data if available, to estimate those risks. To determine the maximum contribution from water allowed in the diet, EPA first looks at how much of the overall allowable risk is contributed by food and then calculates a "drinking water level of comparison" (DWLOC) to determine whether modeled or monitoring exposure estimates exceed the allowable risk level. Estimated environmental concentrations (EECs) that are above the corresponding DWLOC exceed the Agency's level of concern.

Estimated Environmental Concentrations (EECs) of parent nitrapyrin and its major degradate 6-CPA from ingestion of drinking water were assessed by modeling because there are no monitoring data available to the Agency for nitrapyrin and 6-CPA in surface and ground water. The Agency modeled nitrapyrin and 6-CPA separately because a combined residue approach was not possible. 6-CPA was not detected or adequately quantified in any of the environmental fate studies that are used in the PRZM/EXAMS input parameters; therefore, no combined residue half-lives (nitrapyrin + 6-CPA) could be determined.

a. Surface Water

Nitrapyrin can be transported to surface water during or after application via run-off and soil leaching from ground applications. Estimated surface water (drinking water) concentrations are based on two models coupled together, PRZM and EXAMS. Tier II PRZM-EXAMS modeling was performed using index reservoir (IR) scenarios with percent crop area (PCA) adjustment factors for the use of nitrapyrin on corn, sorghum, and wheat. The application rate for corn is 0.45 lbs ai/A with 2 applications per year at a 30 day interval, and the application rate for sorghum and wheat is 0.90 lbs ai/A with 1 application per year. The default PCA factor of 0.87 was used in the modeling to reflect the possibility of having more than one crop treated with nitrapyrin within the same water shed. For the modeling of 6-CPA in drinking water, the application rate was corrected for the difference in molecular weight between parent nitrapyrin and 6-CPA. Due to the lack of environmental fate data for 6-CPA, EPA assumed that 6-CPA is stable to all abiotic and biotic routes of degradation, thus producing very conservative estimates of 6-CPA concentrations in drinking water.

The Texas sorghum scenario produced the highest estimated concentration of nitrapyrin in surface water among the modeled scenarios. The estimated concentration of nitrapyrin in water is not expected to exceed 1.21 ppb for the 1 in 10 year annual peak concentration, 0.03 ppb for the 1 in 10 year annual daily mean concentration, and 0.01 ppb for the 30 year annual average concentration.

The Oregon wheat scenario produced the highest estimated concentration of 6-CPA in surface water among the modeled scenarios. The estimated concentration of 6-CPA in water is not expected to exceed 1.71 ppb for the 1 in 10 year annual peak concentration, 1.63 ppb for the 1 in 10 year annual daily mean concentration, and 1.02 ppb for the 30 year annual average concentration.

Table 5. Estimated Concentrations of Nitrapyrin and 6-CPA in Surface Drinking Water Using IR/PCA PRZM/EXAMS Scenarios

Crop Scenario	1 in 10 year peak concentration ppb		1 in 10 year annual daily average concentration ppb		30-year annual daily average ppb	
	Nitrapyrin	6-CPA	Nitrapyrin	6-CPA	Nitrapyrin	6-CPA
Corn						
Pennsylvania Corn	0.158	0.568	0.005	0.359	0.001	0.134
Texas Corn	0.868	1.182	0.024	0.374	0.014	0.194
Sorghum						
Kansas Sorghum	0.685	0.944	0.020	0.338	0.009	0.165
Texas Sorghum	1.214	1.431	0.032	0.459	0.014	0.236
Wheat						
North Dakota Wheat	0.451	0.743	0.011	0.489	0.005	0.286
Oregon Wheat	0.343	1.705	0.011	1.627	0.004	1.023

Crop Scenario	1 in 10 year peak concentration ppb		1 in 10 year annual daily average concentration ppb		30-year annual daily average ppb	
	Nitrapyrin	6-CPA	Nitrapyrin	6-CPA	Nitrapyrin	6-CPA
Corn						
Texas Wheat	1.057	0.781	0.026	0.260	0.010	0.117

b. Groundwater

In the absence of monitoring data, the Screening Concentration in Ground Water (SCI-GROW) model was used to estimate potential ground water concentrations of nitrapyrin and 6-CPA. SCI-GROW estimates likely groundwater concentrations assuming the pesticide is used at the maximum allowable rate in areas where groundwater is exceptionally vulnerable to contamination. In most cases, a large majority of the use area will have groundwater that is less vulnerable to contamination than the areas used to derive the SCI-GROW estimate.

Application of nitrapyrin to corn, sorghum, and wheat was modeled. The estimated concentration of nitrapyrin in shallow ground water sources is 0.073 ppb. For 6-CPA, EPA assumed the compound to be stable to aerobic soil metabolism and used a half-life range of 360 to 10,000 days. The estimated concentration of 6-CPA in shallow ground water sources ranged from 30.87 ppb to 278.82 ppb. However, The EPI Suite program (structure estimation program) estimated the biodegradation half-life for 6-CPA to be in the range of days to weeks.

For more information on drinking water risks and the DWLOC calculations, see the Water Exposure/Risk Pathway section of the revised human health risk assessment, dated March 1, 2005.

3. Residential (Non-dietary) Risk

There are no residential uses of nitrapyrin.

4. Aggregate Risk

The Food Quality Protection Act amendments to the Federal Food, Drug, and Cosmetic Act (FFDCA, Section 408(b)(2)(A)(ii)) require that "there is reasonable certainty that no harm will result from aggregate exposure to pesticide chemical residue, including all anticipated dietary exposures and other exposures for which there are reliable information." Aggregate exposure will typically include exposures from food, drinking water, residential uses of a pesticide, and other non-occupational sources of exposure.

For nitrapyrin, aggregate risk assessments were conducted for chronic (several months to lifetime) exposures only, and this aggregate assessment includes a non-cancer and a cancer risk assessment. An acute aggregate assessment was not performed because an endpoint could not be selected for the acute dietary exposure scenario, based on available studies.

In the case of nitrapyrin, there are no residential uses, so the aggregate assessments include exposures via food and drinking water only. Furthermore, food exposures were considered to be negligible, and EPA concludes with reasonable certainty that residues of nitrapyrin and 6-CPA in drinking water will not contribute to aggregate risks of concern.

a. Chronic Aggregate Risk

Chronic aggregate risk was considered by aggregating chronic food and drinking water exposure. The chronic DWLOCs range from 300 µg/L for the population subgroup with the highest food exposure (Children 1 to 2 years old) to 1050 µg/L for the subgroups U.S. Population, Adults 20 to 49 years old, and Adults 50+ years old. The chronic EECs (highest value) generated are less than EPA's calculated chronic DWLOCs for 6-CPA and nitrapyrin in drinking water. Thus, the Agency concludes with reasonable certainty that residues of nitrapyrin in drinking water will not contribute significantly to the aggregate chronic human health risk and that the chronic aggregate exposure from nitrapyrin residues in food and drinking water will not exceed the Agency's level of concern (100% of the cPAD) for any population subgroup. For more information on how nitrapyrin concentrations in surface water were modeled, see the drinking water assessment in the environmental fate and effects risk assessment for nitrapyrin, dated March 1, 2005.

Table 6. Summary of Chronic DWLOC Calculations for Nitrapyrin and 6 CPA

Population Subgroup	Chronic Scenario					
	Theoretical cPAD mg/kg/day	Chronic Food Exp mg/kg/day	Max Chronic Water Exp mg/kg/day[1]	6-CPA Surface Water EDWC ($\mu g/L$)	6-CPA Ground Water EDWC ($\mu g/L$)	Chronic DWLOC (μg/L)
General U.S. Population	0.03	0.000013	0.029987	1.6	280	1050
All Infants (< 1 year old)		0.000015	0.029985			300
Children 1-2 years old		0.000027	0.029973			300

b. Cancer Aggregate Risk

The Agency used multi-year mean water concentration values to calculate cancer (Q_1*) exposures. The cancer DWLOC is the concentration in drinking water as a part of the aggregate chronic exposure that is expected to result in a negligible cancer risk (10^{-6}).

An aggregate cancer risk assessment for the U.S. Population based on nitrapyrin was conducted in which food exposure was assumed to be negligible, but water exposures were not. The EECs used for the cancer aggregate risk assessment are 0.01 ug/L (surface water) and 0.07 ug/L (groundwater). Both values are below the cancer DWLOC of 0.84 ug/L; therefore, the Agency concludes that aggregate exposure to nitrapyrin in food and drinking water will not result in a cancer risk of concern. The cancer endpoint is relevant only to

nitrapyrin and not to 6-CPA. A summary of cancer DWLOC calculations for nitrapyrin is presented in Table 7 below.

Table 7. Summary of Cancer DWLOC Calculations for Nitrapyrin

Population	Q*	Negligible Risk Level	Target Max Exposure mg/kg/day	Chronic Food Exposure mg/kg/day	Max Water Exposure mg/kg/day	Surface Water EDWC ($\mu g/L$)	Ground Water EDWC ($\mu g/L$)	Cancer DWLOC (μg/L)
U.S. Pop	4.25e-02	1.0e-06	0.000024	NA	0.000024	0.01 (corn)	0.07	0.84

5. Cumulative Risk Assessment

Risks summarized in this document are those that result only from the use of nitrapyrin. The Food Quality Protection Act (FQPA) requires that the Agency consider available information concerning the cumulative effects of a particular pesticide's residues and other substances that have a common mechanism of toxicity. The reason for consideration of other substances is due to the possibility that low-level exposures to multiple chemical substances that cause a common toxic effect by a common toxic mechanism could lead to the same adverse health effect as would a higher level of exposure to any of the substances individually. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding for nitrapyrin and any other substances, and nitrapyrin does not appear to produce a toxic metabolite produced by other substances. For the purposes of this action, therefore, EPA has assumed that nitrapyrin does not have a common mechanism of toxicity with other substances. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA's Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism on EPA's website at http://www.epa.gov/pesicides/cumulative/.

6. Occupational Risk

Workers can be exposed to a pesticide through mixing, loading, and/or applying a pesticide, or re-entering treated sites. Occupational handlers of nitrapyrin include mixers, loaders, and applicators in agricultural settings only. Occupational risk for all of these potentially exposed populations is measured by a Margin of Exposure (MOE), which determines how close the occupational exposure comes to a No Observed Adverse Effect Level (NOAEL). In the case of nitrapyrin, MOEs greater than 100 do not exceed the Agency's level of concern. For workers entering a treated site, MOEs are calculated for each day after application to determine the minimum length of time required before workers can safely re-enter.

For nitrapyrin, a dermal absorption value of 46% was used, based on a rat dermal absorption study, to represent the residual chemical that could be absorbed. An absorption

factor of 100% was applied for inhalation exposures. Nitrapyrin MOEs are determined by a comparison of specific exposure scenario estimates to the dermal and inhalation NOAEL of 10 mg/kg/day (from the oral developmental toxicity study with rabbits) for short-term assessment, or 3 mg/kg/day (from the chronic feeding toxicity study with dogs) for intermediate-term assessment. For nitrapyrin users, an MOE of 100 has been determined to be adequately protective (for both short- and intermediate-term exposure), based on the standard uncertainty factors of 10X for interspecies extrapolation and 10X for intraspecies variability. Long-term worker exposure is not expected for nitrapyrin.

Occupational risk is assessed for exposure at the time of application (termed "handler" exposure) and following application, or post-application exposure. Application parameters are generally defined by the physical nature of the formulation (e.g., formula and packaging), by the equipment required to deliver the chemical to the use site, and by the application rate required to achieve an efficacious dose. Post-application risk is assessed for activities such as scouting, irrigating, pruning, and harvesting, and is based primarily on dermal exposure estimates. Note that occupational risk estimates are intended to represent pesticide workers, and on this basis assumptions are made concerning acres treated per day and the seasonal duration of exposure.

For more information on the assumptions and calculations of potential risk of nitrapyrin to workers, see the Occupational Exposure Assessment (Section 7.0) in the "Revised HED Chapter of the Reregistration Eligibility Decision Document (RED)," dated March 1, 2005.

a. Occupational Toxicity

Table 8 below provides a listing of the toxicological endpoints used in the nitrapyrin occupational risk assessment.

Table 8. Toxicological Endpoints for the Nitrapyrin Occupational Risk Assessment

Exposure Scenario	Dose used in Risk Assessment (mg/kg/day)	Margin of Exposure (MOE) for Risk Assessment	Study and Toxicological Effects
Short-Term (1-30 days) Dermal and Inhalation	NOAEL= 10	MOE = 100	Developmental Toxicity-Rabbits LOAEL = 30 mg/kg/day based on decreased body weight gain and increased liver weights
Intermediate-Term (1-6 months) Dermal and Inhalation	NOAEL= 3	MOE = 100	Chronic feeding study – Dogs LOAEL = 15 mg/kg/day based on liver enzymes, liver weights and liver lesions.
Cancer (oral, dermal, inhalation)	Classified as "likely to be a carcinogen in humans."		

b. Occupational Handler Exposure

Occupational handler risk estimates have been assessed for both short- and intermediate-term exposure durations. Due to the use patterns for nitrapyrin, long term exposures are not expected. However, since the duration of exposure is uncertain, intermediate-term risk estimates are provided as an upper-bound assessment.

Occupational handler assessments are conducted using increasing levels of protection. The Agency typically evaluates all exposures with minimal protection and then considers additional protective measures using a tiered approach in an attempt to obtain an adequate MOE. The lowest tier is represented by the baseline clothing scenario (i.e., single layer clothing, socks, and shoes), followed by increasing levels of risk mitigation such as personal protective equipment (PPE) and engineering controls (EC). In the case of nitrapyrin, all potential non-cancer exposure scenarios provide a total MOE greater than or equal to 100 either at the baseline, using open systems, or with PPE while using closed systems. All current labels require handlers to wear a long sleeve shirt, long pants, chemical-resistant gloves, shoes plus socks, and protective eyewear when mixing, loading, or applying products containing nitrapyrin. End-use product PPE will be assessed on a product-by-product basis.

c. Occupational Handler Risk Summary

The Agency has determined that there are potential exposures to individuals who mix, load, apply, and otherwise handle nitrapyrin during the usual use patterns associated with the pesticide's use. Based on the use patterns, two major occupational handler exposure scenarios were identified as follows:

(1) mixing/loading liquids for groundboom application
(2) application of sprays via groundboom application.

Occupational Handler Exposure Assumptions:

The assumptions for daily areas treated are taken from the Health Effects Division Science Advisory Committee on Exposure *Policy 9: Standard Values for Daily Acres Treated in Agriculture* (July 5, 2000).

Chemical-specific data for assessing human exposures during pesticide handling activities were not submitted to the Agency in support of the reregistration of nitrapyrin. In such instances, it is the policy of the EPA to use data from the Pesticide Handlers Exposure Database (PHED) Version 1.1 to assess handler exposures for regulatory actions when chemical-specific monitoring data are not available.

The following assumptions and factors were used in order to complete the exposure and risk assessments for occupational handlers and applicators:

- Average body weight of an adult handler is 70kg;
- Average occupational workday is 8 hours;

- Treatments for all crops are assessed at the maximum labeled single application rates of 0.45 lb a.i./A for corn and 0.9 lb a.i./A for sorghum and wheat.

Summary of Risk Concerns and Data Gaps for Handlers

Non-cancer MOEs for all potential exposure scenarios are greater than or equal to 100 either at the baseline, using open systems, or using PPE (single layer and gloves, no respirator) while using closed systems. All current labels require handlers to wear a long sleeve shirt, long pants, chemical-resistant gloves, shoes plus socks, and protective eyewear. Short-term MOEs for the two scenarios assessed are 250 for mixers/loaders and 420 for applicators with PPE, and intermediate-term MOEs are 100 for mixers/loaders and 150 for applicators with PPE. Therefore, short- and intermediate-term occupational risk is not of concern. Chronic occupational risks were not assessed because long term exposures are not expected. Table 9 provides a listing of the short- and intermediate-term risk estimates for handlers.

Table 9. Summary of Occupational Handler Risks for Nitrapyrin

Exposure Scenario (Scenario #)	Crop	Application Rate lb ai/A	Daily Treated Acres/ day	Total Baseline Short-term MOE[1,2]	Total Baseline Intermediate -term MOE[1,2]	Total PPE1 Short-term MOE	Total PPE1 Intermediate-term MOE
Mixer/Loader							
Mixing/loading liquids for groundboom application (1)	Wheat, corn, sorghum	1	200	22	1	250	100
Applicator							
Sprays for groundboom application (2)	Wheat, corn, sorghum	1	200	420	150	420	150

[1]Baseline dermal attire scenarios include long pants, long sleeved shirt, and no gloves.
[2]Baseline inhalation attire represents no respirator.
[3]PPE1 dermal attire includes long pants, long sleeved shirt, and gloves for mixers/loaders only.

For occupational cancer risks, EPA begins mitigation at $\leq 1.0 \times 10^{-4}$, and attempts to mitigate risks to $\leq 1.0 \times 10^{-6}$ when feasible. The results of the occupational handler cancer assessment (Table 10) for nitrapyrin indicate that the cancer risks for all of the exposure scenarios considered do not exceed the Agency's level of concern, with the exception of commercial handlers at baseline PPE. All current labels require workers handling nitrapyrin to wear the equivalent of the PPE1 scenario (long pants, long sleeved shirt, plus gloves). Assessments with additional PPE or engineering controls did not significantly reduce the cancer risk estimates. In addition, cancer risk was assessed at two application frequencies; the first (3 applications) represents the maximum number of applications per site per season, and represents private use. In the second application frequency, a factor of ten was applied, to represent commercial handlers making multiple applications per site per season, resulting in an assumption of 30 applications. The Agency considers this to be a conservative assumption, and given that the cancer risk is at an acceptable level for commercial and non-commercial handlers using PPE1, the Agency believes this current level of PPE is adequate.

Table 10. Summary of Occupational Handler Cancer (Q*) Risks for Nitrapyrin

Exposure Scenario	App. Rate lb ai/A	Acres Treated A/day	Crop Type	Baseline Risk 3/30	PPE1 Risk 3/30
Mixer/Loader					
Mixing/Loading Liquids for Groundboom Application	1.00	200	Wheat, Corn, Sorghum	6.66e-4/ 6.66e-3	5.88e-6/ 5.88e-5
Applicator					
Sprays for Groundboom Application	1.00	200	Wheat, Corn, Sorghum	3.6e-6/ 3.6e-5	3.6e-6/ 3.6e-5

Baseline dermal unit exposure scenarios includes long pants, long sleeved shirts and no gloves.
PPE1 long pants, long sleeved shirts and gloves (no respirator)

d. Occupational Postapplication Risk Summary

A postapplication assessment was not conducted for nitrapyrin because the expectation for postapplication exposures is low. Because nitrapyrin is applied directly to the soil and mechanically soil incorporated well before the plants are mature, and because nitrapyrin is usually applied pre-plant, significant exposure during harvesting or any other late season activities is not likely. Further, the timing of the application greatly reduces the potential for post application exposure to treated soil. Also, many agricultural operations mechanically plant seeds early in the season, which minimizes the potential for contact. It should be noted, however, that the Restricted Entry Interval will remain at 24 hours for all crops, based on the fact that this chemical is a Toxicity Category II Eye Irritant.

e. Human Incident Data

In evaluating incidents to humans, the Agency reviewed reports from the National Poison Control Centers (PCC), the Agency's Office of Pesticide Program's Incident Data System (IDS), and the California Department of Pesticide Regulation. Relatively few incidents of illness have been reported due to nitrapyrin. Some of the reports suggest that nitrapyrin can be an eye and skin irritant.

B. Environmental Risk Assessment

A summary of the Agency's environmental risk assessment for nitrapyrin is presented below. Nitrapyrin has the following registered uses, which result in environmental exposures: soil applications to corn, sorghum, and wheat. More detailed information associated with the environmental risk from the use of nitrapyrin can be found in the Environmental Fate and Effects Division Revised Risk Assessment for the Nitrapyrin Reregistration Eligibility Decision, dated October 7, 2004. The complete environmental risk assessment is not included in this RED, but may be accessed in the OPP Public Docket (docket number OPP-2004-0283) and on the Agency's website at http://www.epa.gov/pesticides/reregistration/status.htm.

1. Environmental Exposure

a. Environmental Fate and Transport

Nitrapyrin hydrolyzes and photodegrades rapidly and hence should not persist in most environments. In aerobic mineral soils half lives ranged from 11 to 17.9 days, and in anaerobic aquatic environments, nitrapyrin had a half-life of less than 3 hours. 6-CPA was identified as the major degradate in both hydrolysis and photolysis. 6-CPA appears to degrade through hydroxylation (breaking the pyridine ring) and microbial mineralization.

Nitrapyrin was shown to be mobile to moderately mobile in several soils, according to available mobility studies. The adsorption coefficient (K_d) for nitrapyrin ranged from 0.947 to 19.9 with K_{oc} values ranging from 254 to 360, respectively. The major degradate 6-CPA is mobile in mineral soils and high organic matter soils, with approximate K_d values ranging from 0.387 (mineral soils) to 1.02 (high organic matter soils). Nitrapyrin also has a high vapor pressure (2.8 e-3 torr) and hence is prone to volatilize from the application site. Nitrapyrin volatilization from soil appears to be dependent on the depth of incorporation as well as air-flow rates and soil temperatures. Hence, nitrapyrin could move off site through leaching and volatilization.

Nitrapyrin accumulated in bluegill sunfish (303 X BCF) after a 21 day exposure period. However, the bioaccumulated residues were almost completely eliminated from fish tissues (82%) during a 2 week depuration period.

b. Aquatic Organism Exposure

For exposure to aquatic fish and invertebrates, EPA considers surface water only, since most aquatic organisms are not found in groundwater. Surface water models are used to estimate exposure to freshwater aquatic animals, since monitoring data are generally not from studies targeted on small water bodies and primary streams, where many aquatic animals are found. The modeling results used in risk calculations for nitrapyrin are detailed in the "Environmental Fate and Effects Division Revised Risk Assessment for the Nitrapyrin Reregistration Eligibility Decision," dated March 1, 2005.

The Agency used modeling to derive estimated environmental concentrations (EECs) for nitrapyrin in surface water. Unlike the drinking water assessment described in the human health risk assessment section of this document, the ecological water resource assessment does not include the Index Reservoir (IR) and Percent-Crop Area (PCA) factor refinements. The IR and PCA factors represent a drinking water reservoir, not the variety of aquatic habitats, such as ponds adjacent to treated fields, relevant to a risk assessment for aquatic animals. Therefore, the EEC values used to assess exposure to aquatic animals are not the same as the values used to assess human dietary exposure from drinking water sources. Several scenarios were modeled for each use and can be found in the environmental fate and effects assessment for nitrapyrin. The Texas scenarios gave the maximum EECs, and so were chosen for regulatory purposes. The EEC values used to assess exposure to aquatic animals can be found in Table 10 below.

Table 11. Estimated Environmental Concentrations (µg ai/L) of Nitrapyrin in Surface Water (PRZM-EXAMS) for Ecological Assessment.

Crop Scenario	Peak	21-day Average	60-day Average
Incorporated Applications			
Texas Corn	0.41	0.19	0.07
Texas Sorghum	0.59	0.24	0.10
Texas Wheat (Winter Wheat)	0.50	0.20	0.08
Unincorporated Applications			
Texas Corn	28.89	11.93	4.78

c. Terrestrial Organism Exposure

The Agency assessed exposure to terrestrial organisms by first predicting the amount of nitrapyrin residues found on animal food items and then using information on typical food consumption by various species of birds and mammals to determine the amount of pesticide consumed. The amount of residues on animal feed items are based on the Fletcher nomogram, which is a model developed by Hoerger and Kenaga (1972) and modified by Fletcher (1994), and the current maximum application rate for nitrapyrin. Current labels allow a maximum single application of 0.9 lb a.i./Acre per year for sorghum and wheat, and two applications per year for corn at a rate of 0.45 lbs a.i./Acre, for a seasonal maximum application rate of 0.9 lbs a.i./Acre. For every pound of nitrapyrin applied per acre, the resulting maximum concentration on short grass is 240 ppm (mean is 85 ppm), on tall grass is 110 ppm (mean is 36 ppm), on broad-leaved plants/small insects is 135 ppm (mean is 45 ppm), and on seeds/large insects is 15 ppm (mean is 7 ppm).

Birds and Mammals

For birds and mammals, predicted maximum and mean EECs for food items resulting from multiple applications are calculated from the FATE5 program. FATE5 estimates the highest one-day residue, based on the maximum or mean initial EEC from the first application, the total number of applications, interval between applications, and a first-order degradation rate, consistent with EPA policy. Acute RQs are calculated from these EECs. For this assessment, fruit, pods, seeds, and insects are the only food items of concern, since nitrapyrin is applied to the ground and incorporated into the soil.

Non-target Terrestrial Plants

Based on a screening assessment using non-guideline terrestrial plant toxicity data, it appears unlikely that adverse effects in plants would be observed at the current labeled rates of nitrapyrin.

Non-target Terrestrial Insects

EPA currently does not quantify risks to terrestrial non-target insects. Risk quotients are therefore not calculated for these organisms. Since the method of application is ground spray with incorporation or soil injection, the likelihood of exposure to honey bees is low. In addition, one study evaluating toxicity to earthworms was submitted to the Agency, and based on this study, exposure was not likely significant for adverse effects.

2. Environmental Effects (Hazard)

a. Toxicity to Aquatic Organisms

Freshwater and Esturarine/Marine Fish

Toxicity studies conducted using technical nitrapyrin demonstrate that it is moderately toxic to freshwater fish under acute exposure with definitive LC_{50} values ranging from 3.4 to 9.29 mg a.i./L. A single toxicity study conducted using technical nitrapyrin demonstrated that it is moderately toxic to estuarine/marine fish under acute exposure with a definitive LC_{50} of 4.28 mg ai/L. Table 12 summarizes the data that support the acute toxicity endpoints used in assessing the risks to fish. No fish early-life stage toxicity studies were submitted to the Agency.

Table 12. Acute Toxicity Endpoints for Freshwater and Estuarine/Marine Fish

Test Species	% a.i.	96-hr LC_{50} (mg/L)	NOAEC (mg/L)	Measured/nominal Flow-through/static	Toxicity Classification	MRID or Accession Number
Freshwater Fish						
Bluegill	92.4	3.4	1.5	Mean measured, flow-through	Moderately toxic	420776-01
Estuarine/Marine Fish						
Silverside minnow	91.2	4.28	<1.26	Mean measured, flow-through	Moderately toxic	420776-04

Freshwater and Estuarine/Marine Invertebrates

Toxicity studies conducted using technical nitrapyrin demonstrate that it is moderately toxic to freshwater invertebrates under acute exposure with definitive LC_{50} values ranging from 2.2 to 5.8 mg a.i./L. Toxicity studies conducted using technical nitrapyrin demonstrate that it is moderately to highly toxic to estuarine/marine invertebrates under acute exposure with definitive EC_{50} values and LC_{50} values ranging from 0.41 to 3.1 mg a.i./L. Table 13 summarizes the data that support the acute toxicity endpoints used in assessing the risks to aquatic invertebrates. No invertebrate full-life-cycle toxicity studies were submitted to the Agency.

Table 13. Acute Toxicity Endpoints for Freshwater and Estuarine/Marine Invertebrates

Test Species	% a.i.	48- or 96-hr LC_{50} (mg/L)	NOAEC (mg/L)	Measured/nominal Flow-through/static	Toxicity Classification	MRID or Accession Number
Freshwater Invertebrates (48-hr LC_{50})						
Daphnia magna	92.4	2.2	1.5	Mean measured, flow through	Moderately toxic	420776-03
Estuarine/Marine Invertebrates (96-hr LC_{50})						
Grass shrimp	91.2	3.1	2.19	Mean measured, flow through	Moderately toxic	420776-06
Easter oyster, shell deposition	90	1.5	0.7	Mean measured, flow through	Moderately toxic	430262-01
Eastern oyster, shell deposition	91.2	0.41	0.16	Mean measured, flow through	Highly toxic	420776-05

Aquatic Plants

No aquatic plant data were submitted to the Agency for nitrapyrin. However, toxicity of nitrapyrin to green algae can be estimated using the ECOSAR model. ECOSAR predicted a 96-hr EC_{50} for green algae of 0.263 mg ai/L. The highest modeled peak EECs (incorporated = 0.00059 mg/L and unincorporated = 0.03622 mg/L) are equal to 0.22% of the 96-hr EC_{50} in the incorporated use scenario and 14% of the 96 hr EC_{50} in the unincorporated scenario.

b. Toxicity to Terrestrial Organisms

Birds

Nitrapyrin is classified as moderately toxic to practically non-toxic to birds on an acute basis, since the LD_{50} value is between 118 and greater than 2510 mg/kg. Additionally, since the LC_{50} values fall within the range of 820 to 2131 ppm, nitrapyrin is classified as moderately toxic to slightly toxic to birds on a subacute basis. Table 14 summarizes the data that support the acute toxicity endpoints used in assessing the risks to birds. No avian chronic data were submitted to the Agency for nitrapyrin.

Table 14. Avian Toxicity Endpoints for Nitrapyrin

Toxicity Study	Species	% a.i.	Toxicity Endpoint	NOAEC/ NOAEL	Toxicity Classification	MRID
Acute Single Oral Dose	Beltsville small white turkey poults	93.6	LD_{50} = 118 mg/kg – bwt (85,164)	NA	Moderately toxic	Acc. 116870
Subacute Dietary	Japanese quail	93.6	LC_{50} = 820 mg/kg-diet (754, 894)	NOAEC = 600 mg/kg-diet	Moderately toxic	Acc. 116899

Table 15. Avian Acute Toxicity Endpoints for 6-CPA

Toxicity Study	Test Species	% a.i.	Toxicity Endpoint	NOAEC/ NOAEL	Toxicity Classification	MRID
Acute Dietary	Mallard duck	99	LC_{50} > 4640 mg/kg-diet	1000 mg/ kg-diet	practically non-toxic	Acc. 117016
Acute Dietary	Japanese quail	99	LC_{50} > 5000 mg/kg-diet	5000 mg/kg-diet	practically non-toxic	Acc. 116899

Mammals

Nitrapyrin is classified as slightly toxic to mammals on an acute basis; however, adverse effects were demonstrated in the mammalian subchronic, developmental, and 2-generation toxicity studies (see Table 16).

Subchronic toxicity data for mammals from the 1-year feeding study with dogs indicate increases in alkaline phosphatase, cholesterol, absolute and relative (to body) liver weights, and liver hypertrophy. The LOAEL was 15 mg a.i./kg-bwt/day and the NOAEL was 3 mg a.i./kg-bwt/day. Other subchronic mammalian studies had treatment related effects with NOAELs ranging from 5 to 200 mg ai/kg-bwt/day and LOAELs ranging from 20 to 400 mg ai/kg-bwt/day. Effects observed in these studies included increased liver weights and hypertrophy.

Pre-natal developmental toxicity studies with rats and rabbits also demonstrated toxic effects, including decreased body weight gains, increased absolute and relative (to body) liver weights, and increased incidences of crooked hyoid (NOAEL = 10 mg ai/kg-bwt/day).

Chronic toxicity data for mammals from the 2-generation rat reproduction study indicate increases in liver and kidney weight and hepatic centrilobular diffuse hypertrophy (NOAEL = 5 mg ai/kg-bwt/day, LOAEL = 20 mg ai/kg-bwt/day). No treatment-related reproductive effects were observed; therefore, the parental NOAEL was set at the highest treatment level, 75 mg ai/kg-bwt/day. The offspring NOAEL was set at 20 mg ai/kg-bwt/day based on decreased body weights and increased hepatic centrilobular vacuolation consistent with fatty change in both sexes and generations.

Table 16. Summary of Acute Toxicity Endpoints for Mammals

Test Species	% a.i.	Toxicity Endpoint	Toxicity Classification	MRID
Rat	90	LD_{50} (mg/kg-bwt) = 1070 (males) 1230 (females)	Slightly toxic	Acc. 37519

Table 17. Summary of Subchronic and Chronic Toxicity Endpoints for Mammals

Toxicity Study	Test Species	% a.i.	NOAEL/ LOAEL (mg/kg-bwt)	MRID
Subchronic				
24-month Oral Toxicity	Rat	93.3	5/20	41345403
90-day Feeding	Mouse	90-92.05	200/300 (males) and 400 (females)	44231802
52-week Oral Toxicity	Dog	92.8	3/15	41345401
Chronic (reproductive)				
Prenatal Developmental Toxicity	Rabbit	91.9	10/30	Acc. 153543
Prenatal Developmental Toxicity	Rat	92	50/120	43210302
2-generation Reproductive	Rat	93.3	Parental = 5/20 Repro = 75/>75 Offspring = 20/75	40952701

Non-target Insects

No acute contact or dietary honey bee studies for nitrapyrin were submitted to the Agency.

Non-target Terrestrial Plants

No guideline studies evaluating the toxicity of nitrapyrin to terrestrial plants have been submitted to the Agency. However, several non-guideline studies evaluating nitrapyrin phytotoxicity were submitted and one is summarized below.

The phytotoxicity of nitrapyrin was compared to that of ten commercial herbicides on both monocots and dicot field crops and vegetables. Because little information is provided in this study regarding laboratory methodology and quality controls, toxicity endpoints for nitrapyrin cannot be derived from these data, but this study does provide anecdotal evidence that nitrapyrin is less phytotoxic than several commercial herbicides.

3. Ecological Risk Estimation (RQs)

The Agency's ecological risk assessment compares toxicity endpoints from ecological toxicity studies to estimated environmental concentrations (EECs) based on environmental fate characteristics and pesticide use data. To evaluate the potential risk to non-target organisms from the use of nitrapyrin products, the Agency calculates a Risk Quotient (RQ), which is the ratio of the EEC to the most sensitive toxicity endpoint values, such as the median lethal dose (LD50) or the median lethal concentration (LC50). These RQ values are then compared to the Agency's levels of concern (LOCs), given in Table 17, which indicate whether a pesticide, when used as directed, has the potential to cause adverse effects on non-target organisms. When the RQ exceeds the LOC for a particular category, (e.g., endangered

species), the Agency presumes a risk of concern to that category. These risks of concern may be addressed by further refinements of the risk assessment or mitigation. Use, toxicity, fate, and exposure are considered when characterizing the risk, as well as the levels of certainty and uncertainty in the assessment. EPA further characterizes ecological risk based on any reported incidents to non-target terrestrial or aquatic organisms in the field (e.g., fish or bird kills).

Table 18. EPA's Levels of Concern and Associated Risk Presumptions

Risk Presumption	LOC terrestrial animals	LOC aquatic animals
Acute Risk - there is potential for acute risk; regulatory action may be warranted in addition to restricted use classification.	0.5	0.5
Acute Restricted Use - there is potential for acute risk, but may be mitigated through restricted use classification.	0.2	0.1
Acute Endangered Species - endangered species may be adversely affected; regulatory action may be warranted.	0.1	0.05
Chronic Risk - there is potential for chronic risk; regulatory action may be warranted.	1	1

For a more detailed explanation of the ecological risks posed by the use of nitrapyrin, refer to the "Environmental Fate and Effects Division Revised Risk Assessment for the Nitrapyrin Reregistration Eligibility Decision", dated March 1, 2005.

a. Risk to Aquatic Organisms

Fish and Aquatic Invertebrates

Acute risks to aquatic species are not of concern when nitrapyrin products are incorporated immediately upon application. For use without immediate soil incorporation, the endangered species LOC is exceeded for estuarine/marine invertebrates; however, there are no listed endangered or threatened estuarine/marine invertebrates at this time.

Chronic effects toxicity data were not available for nitrapyrin; therefore, RQs could not be calculated. However, chronic risks to freshwater aquatic organisms would not be expected for applications with either immediate or delayed soil incorporation because of the low potential acute risks and rapid degradation of nitrapyrin.

The RQs and LOCs for acute risk from nitrapyrin for both freshwater and estuarine/marine organisms are outlined in Table 18.

Table 19. Acute Risk Quotients for Fish and Aquatic Invertebrates

Use Site	Peak Water Concentration (µg a.i./L)	Acute RQ [a,b]			
		Freshwater Fish	Freshwater Invertebrate	Estuarine/Marine Fish	Estuarine/Marine Invertebrate
Immediately Incorporated Application Scenarios					
Texas Corn	0.41	<0.01	<0.01	<0.01	<0.01
Texas Sorghum	0.59	<0.01	<0.01	<0.01	<0.01
Texas Wheat	0.50	<0.01	<0.01	<0.01	<0.01
Un-incorporated Application Scenarios					
Texas Corn	28.89	<0.01	<0.01	0.013	0.070*

[a] * indicates an exceedance of Endangered Species Level of Concern (LOC); RQ > 0.05.

[b] Acute toxicity endpoints (LC_{50} or EC_{50}) were 3.4, 4.28, 2.2, and 0.41 mg ai/L for freshwater fish, freshwater invertebrates, estuarine/marine fish, and estuarine/marine invertebrates, respectively.

Aquatic Plants

Aquatic plant toxicity data were not available to the Agency for nitrapyrin; therefore, a quantitative risk assessment could not be conducted. However, adverse effects in green algae at the current labeled rates of nitrapyrin are unlikely, based on a screening assessment using predicted toxicity data from the ECOSAR program. An algae study has been submitted, but has not been reviewed at this time. The review of this study is expected to confirm this preliminary assessment.

Other Aquatic System Issues

Nitrapyrin disrupts bacterially mediated steps in the nitrogen cycle. Specifically the compound inhibits the bacterial conversion of ammonia to nitrite. In aquatic systems this may serve to increase the residence time of ammonia in surface waters. The duration and magnitude of ammonia in water is a toxic concern in freshwater systems. The quantitative extent to which runoff and drift of nitrapyrin to surface waters has not been evaluated in this risk assessment because no data are available to assess the extent to which nitrapyrin inhibits ammonia conversion in aquatic environments.

b. Risk to Non-target Terrestrial Organisms

RQs for birds and mammals were calculated by two methods: 1) using acute toxicity endpoints and residues on food items and 2) the LD_{50}/sq foot method. The RQs calculated by both methods indicate similar risk levels, but the LD_{50}/sq foot method is considered more appropriate for the purpose of this document, because nitrapyrin is applied directly to soil, and hence residues on food items are expected to be very low.

For the RQ methodology that utilizes LD_{50}/sq ft, two application scenarios for each crop scenario were modeled. In one scenario it was assumed that incorporation was delayed and 100% of nitrapyrin was available to birds, and in the second scenario it was assumed that incorporation occurred immediately after application and only 1% of the chemical remained available on the soil surface.

Birds

There are no exceedances of any acute LOCs for birds, assuming nitrapyrin was soil incorporated immediately after application (RQs range from <0.01 to 0.08; see Table 19). However, if incorporation is delayed, then potential risks to small and medium (i.e., 20 and 100 g) birds are of concern (Endangered Species, Acute Restricted Use, and Acute LOCs are exceeded) (RQs range from 0.05 to 8.25). There is only one end-use product label (EPA Reg. No. 34704-804) that permits a delay of incorporation, up to 48 hours.

Potential acute risks to birds from 6-CPA, the major degradate of nitrapyrin, are low, based on acute dietary bird toxicity studies.

Table 20. Avian Acute RQs Estimated from Nitrapyrin Application Using LD^{50}/Sq Ft Methodology

Scenario and Bird Weight Class (g)	RQ[a,b]	
	Delayed Incorporation (100% Available)	Immediate Incorporation (1% Available)
Sorghum and Wheat (0.9 lb a.i./A/app, single app)		
20	8.25***	0.08
100	1.29**	0.01
1,000	0.09	<0.01
Corn (0.45 lbs/a.i./A/app, 2 apps at 30 day interval), single app of 0.45 lbs a.i./A for calculations		
20	4.12***	<0.01
100	0.64***	<0.01
1,000	0.05	<0.01

[a] RQ = (mg ai/sq ft) / (adjusted LD_{50} * wt. of bird, kg) [final units are: LD_{50}/sqft]

[b] * indicates an exceedance of Endangered Species Level of Concern (LOC); RQ > 0.10.
** indicates an exceedance of Acute Restricted Use LOC; RQ > 0.20.
*** indicates an exceedance of Acute Risk LOC; RQ > 0.50.

Mammals

There are no exceedances of any acute LOCs for mammals, assuming nitrapyrin is soil incorporated immediately after application (all RQs were <0.01). If incorporation is delayed, however, acute LOC exceedances occur for small and medium sized mammals (15 and 35 g) (RQs range from <0.01 to 0.59). Acute mammal RQs are summarized in Table 21.

Table 21. Acute Mammal RQ Summary (LD_{50}/sq foot)

Scenario and Mammal Weight Class (g)	RQ[a,b]	
	Delayed Incorporation (100% Available)	Immediate Incorporation (1% Available)
Sorghum and Wheat (0.9 lb a.i./A/app, single app)		
15	0.59***	<0.01
35	0.25**	<0.01
1,000	<0.01	<0.01
Corn (0.45 lbs/a.i./A/app, 2 apps at 30 day interval), single app of 0.45 lbs a.i./A for calculations		
15	0.29**	<0.01
35	0.13*	<0.01
1,000	<0.01	<0.01

[a] RQ = (mg ai/sq ft) / (LD_{50} * wt. of mammal, kg) [final units are: LD_{50}/sqft]

[b] * indicates an exceedance of Endangered Species Level of Concern (LOC); RQ > 0.10.
** indicates an exceedance of Acute Restricted Use LOC; RQ > 0.20.
*** indicates an exceedance of Acute Risk LOC; RQ > 0.50.

Chronic RQs for mammals were calculated assuming no soil incorporation of nitrapyrin occurs. For sorghum and wheat applications, when the maximum residue levels are assumed, the chronic LOC was exceeded for smaller mammals (15 and 35 g) consuming fruit and large insects. For corn applications, when the maximum residue levels are assumed, the chronic LOC was exceeded for small mammals (15 g) consuming fruit and large insects. There were no exceedances of the chronic LOC for mammals consuming seeds and pods with predicted maximum residues or for mammals when mean residue levels are assumed.

Table 22. Mammal Chronic RQ Summary (Assuming No Soil Incorporation)[a,b,c]

Scenario and Mammal Weight Class (g)	RQ (Fruit and Large Insects)		RQ (Seeds and Pods)	
	Predicted Max Residues	Predicted Mean Residues	Predicted Max Residues	Predicted Mean Residues
Sorghum and Wheat (0.9 lbs a.i./A/app, 1 app)				
15	1.72+	0.86	0.59	0.30
35	1.19+	0.60	0.41	0.21
1,000	0.28	0.14	0.10	0.05
Corn (0.45 lbs ai/A/app, 2 apps at 30 day interval), single app of 0.45 lbs a.i./A for calculations				
15	1.35+	0.25	0.47	0.08
35	0.94	0.17	0.32	0.06
1,000	0.22	0.04	0.07	0.01

[a] Chronic toxicity endpoint was NOAEL = 5 mg ai/kg-bwt-day.
[b] Detailed calculations for chronic RQs are provided in Table G-6 of EFED chapter.
[c] + indicates an exceedance of Chronic Level of Concern (LOC); RQ > 1.0.

Non-target Insects

EPA currently does not quantify risks to terrestrial non-target insects; therefore, risk quotients are not calculated for these organisms. The likelihood of exposure to honey bees is not likely to be significant because the method of application is ground spray with incorporation, or soil injection. However, nitrapyrin exposure to beneficial ground dwelling insects and other organisms may be significant. Based on submitted toxicity data, adverse effects in earthworms are unlikely at the current labeled rates of nitrapyrin.

Non-target Terrestrial Plants

No guideline studies were submitted to the Agency for terrestrial plants; therefore, RQs were not calculated for nitrapyrin. Adverse effects in terrestrial plants at the current labeled rates of nitrapyrin are unlikely, based on a screening assessment using non-guideline terrestrial plant toxicity data. Please refer to the environmental fate and effects risk assessment for more detailed information.

Terrestrial Organism Risk Characterization

The risk assessment and calculated RQs for nitrapyrin assume 100% of the diet is relegated to single food types foraged only from treated fields. The assumption of 100% diet from a single food type may be realistic for acute exposures, but diets are likely to be more

variable over longer periods of time. This assumption is likely to be conservative and will tend to overestimate potential risks for chronic exposure, especially for larger organisms that have larger home ranges (e.g., deer and geese).

In addition, exposure routes other than dietary are also possible for animals residing in or moving through treated areas, including ingestion of contaminated drinking water, ingestion of contaminated soils, preening/grooming, and dermal contact. Consumption of drinking water would appear to be inconsequential if water concentrations were equivalent to the concentrations from PRZM/EXAMS; however, concentrations in puddled water sources on treated fields may be higher than concentrations in a modeled small water body. Preening exposures, involving the oral ingestion of material from the feathers, have not been quantified, but are a potentially important exposure route. Toxicity due to dermal contact is likely to be of moderate importance because mammal testing revealed nitrapyrin was a dermal sensitizer (Acc. 158903); however, no dermal effects were noted in the acute dermal study with rabbits (LD_{50} > 2000 mg ai/kg-bwt, Acc. 158904). If toxicity is expected through any of these other routes of exposure, then the risks of a toxic response to nitrapyrin is underestimated in this risk assessment.

Because nitrapyrin is a volatile compound (v.p. $2.8x10^{-3}$ torr) and does not have a strong tendency to bind to organic matter in soil (K_{oc} ranges between 278 and 360 based on experimental data submitted by the registrant), inhalation of gas phase nitrapyrin may be a significant contributor to overall exposure. For mammals, no toxic effects were seen in available inhalation studies (Acc. 158901). For birds, however, there would be a potential for adverse acute effects due to inhalation of the test chemical, if the amount inhaled was close to or greater than the dietary $LD_{50.}$ If the amount inhaled was much smaller than the LD50, however, then it is unlikely that adverse effects would be triggered.

c. Endangered Species

The screening level risk assessment for nitrapyrin resulted in no acute risks above EPA's level of concern to any listed species and no chronic risks above EPA's level of concern for any listed terrestrial organisms if nitrapyrin is incorporated immediately post-treatment. However, at this time, the Agency does not have chronic toxicity data for estuarine aquatic organisms. Therefore, EPA concludes that there is "no effect" from direct acute risks for any listed species and from direct chronic risks for any listed terrestrial species when nitrapyrin is soil incorporated immediately post-treatment. The EPA cannot, at this time, make a clear "no effect" finding for indirect effects or for direct chronic effects for listed estuarine organisms.

d. Assumptions, Uncertainties, Strengths, and Limitations

There are a number of areas of uncertainty in the terrestrial and the aquatic organism risk assessments that could potentially cause an underestimation of risk. First, risks to terrestrial and aquatic organisms from exposures to parent nitrapyrin, but not its degradates, have been (with the exception of acute avian risk) have been assessed. The Metabolism Assessment Review Committee (MARC) of the EPA has determined that the major degradate, 6-CPA is of toxicological concern for mammals. Second, the risk assessment only considers the most

sensitive species tested and only considers a subset of possible use scenarios. Third, the effect of volatility of nitrapyrin on non-target organisms should be viewed as a source of uncertainty in the ecological risk assessment for nitrapyrin. For the aquatic organism risk assessment, there are uncertainties associated with the PRZM/EXAMS model, input values, and scenarios, as well as uncertainties in the potential for modifications to the surface water concentration of ammonia; however, these uncertainties cannot be quantified. The potential impacts of these uncertainties are outlined in the Environmental Fate and Effects Division Revised Risk Assessment for the Nitrapyrin Reregistration Eligibility Decision.

IV. Risk Management, Reregistration, and Tolerance Reassessment Decision

A. Determination of Reregistration Eligibility

Section 4(g)(2)(A) of FIFRA calls for the Agency to determine, after submission of relevant data concerning an active ingredient, whether or not 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 nitrapyrin as an active ingredient. The Agency has completed its review of these generic data, and has determined that the data are sufficient to support reregistration of all products containing nitrapyrin.

The Agency has completed its assessment of the dietary, occupational, residential, and ecological risk associated with the use of pesticide products containing the active ingredient nitrapyrin. Based on a review of these data and on public comments on the Agency's assessments for the nitrapyrin, the Agency has sufficient information on the human health and ecological effects to make decisions as part of the tolerance reassessment process under FFDCA and reregistration process under FIFRA, as amended by FQPA. The Agency has determined that products containing nitrapyrin are eligible for reregistration provided that: (i) current data gaps and confirmatory data needs are addressed; (ii) the risk mitigation measures outlined in this document are adopted; and (iii) label amendments are made to reflect these measures. Label changes are described in Section V. Appendix A summarizes the uses of nitrapyrin that are eligible for reregistration, and Appendix B identifies the generic data requirements that the Agency reviewed as part of its determination of reregistration eligibility of nitrapyrin, and lists the submitted studies that the Agency found acceptable. Data gaps are identified as generic data requirements that have not been satisfied with acceptable data.

Based on its evaluation of nitrapyrin, the Agency has determined that nitrapyrin products, unless labeled and used as specified in this document, would present risks inconsistent with FIFRA. Accordingly, should a registrant fail to implement any of the risk mitigation measures identified in this document, the Agency may take regulatory action to address the risk concerns from the use of nitrapyrin. If all changes outlined in this document are incorporated into the product labels, then all current risks for nitrapyrin will be adequately mitigated for the purposes of this determination.

B. Public Comments and Responses

Through the Agency's public participation process, EPA worked extensively with stakeholders and the public to reach the regulatory decisions for nitrapyrin. During the public comment period on the risk assessments, which closed on January 3, 2005, the Agency received only one set of comments from Dow AgroSciences, the technical registrant. These comments are available in the EPA's public docket, www.epa.gov/.edocket, (OPP-2004-0283). An individual response to these comments will also be made available in the docket.

C. Regulatory Position

1. Food Quality Protection Act Findings

a. "Risk Cup" Determination

As part of the FQPA tolerance reassessment process, EPA assessed the risks associated with nitrapyrin. EPA has determined that risk from dietary (food sources only) exposure to nitrapyrin fits within its own "risk cup." An aggregate assessment was conducted for exposures through food and drinking water uses (nitrapyrin is not registered for residential use), and the Agency has determined that the human health risks from these combined exposures are within acceptable levels. In other words, EPA has concluded that the tolerances for nitrapyrin meet FQPA safety standards. In reaching this determination, EPA has considered the available information on the special sensitivity of infants and children, as well as aggregate exposure from food and water.

b. Determination of Safety to U.S. Population

The Agency has determined that the established tolerances for nitrapyrin, with amendments and changes as specified in this document, meet the safety standards under the FQPA amendments to section 408(b)(2)(D) of the FFDCA, and that there is a reasonable certainty no harm will result to the general population or any subgroup from the use of nitrapyrin. In reaching this conclusion, the Agency has considered all available information on the toxicity, use practices and exposure scenarios, and the environmental behavior of nitrapyrin. As discussed in Chapter 3, the total acute dietary (food alone) risk was not assessed because no acute oral endpoint was observed. Further, the chronic non-cancer and cancer dietary (food alone) risks from nitrapyrin are not of concern.

Acute and chronic risks from drinking water exposures are not of concern. Models have been used to estimate ground and surface water concentrations. The DWLOC calculated to assess the surface water contribution to chronic (non-cancer) dietary exposure is a range from 300 µg/L (Children 1 to 2 years old) to 1050 µg/L for the subgroups U.S. Population, Adults 20 to 49 years old, and Adults 50+ years old, and the DWLOC calculated to assess the surface water contribution to chronic (cancer) dietary exposure is 0.84 µg/L.

c. Determination of Safety to Infants and Children

EPA has determined that the established tolerances for nitrapyrin, with amendments and changes as specified in this document, meet the safety standards under the FQPA amendments to section 408(b)(2)(C) of the FFDCA, that there is a reasonable certainty of no harm for infants and children. The safety determination for infants and children considers the toxicity, use practices and environmental behavior noted above for the general population, but also takes into account the possibility of increased dietary exposure due to the specific consumption patterns of infants and children, as well as the possibility of increased susceptibility to the toxic effects of nitrapyrin residues in this population subgroup.

In determining whether or not infants and children are particularly susceptible to toxic effects from nitrapyrin residues, the Agency considered the completeness of the database for developmental and reproductive effects, the nature of the effects observed, and other information. The FQPA Safety Factor has been removed (i.e., reduced to 1X) for nitrapyrin because: 1) there is no indication of quantitative or qualitative increased susceptibility of rats or rabbits to *in utero* or postnatal exposure; 2) a DNT study with nitrapyrin is not required; and 3) the dietary and non-dietary (residential) exposure assessments will not underestimate the potential exposures to infants and children.

d. Endocrine Disruptor Effects

EPA is required under the FFDCA, as amended by FQPA, to develop a screening program to determine whether certain substances (including all pesticide active and other ingredients) "may have an effect in humans that is similar to an effect produced by a naturally occurring estrogen, or other endocrine effects as the Administrator may designate." Following recommendations of its Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC), EPA determined that there was a scientific basis for including, as part of the program, the androgen and thyroid hormone systems, in addition to the estrogen hormone system. EPA also adopted EDSTAC's recommendation to include evaluations of potential effects in wildlife. For pesticides, EPA will use FIFRA and, to the extent that effects in wildlife may help determine whether a substance may have an effect in humans, FFDCA authority to require the wildlife evaluations. As the science develops and resources allow, screening of additional hormone systems may be added to the Endocrine Disruptor Screening Program (EDSP).

Neither the subchronic, chronic, developmental or reproductive rat, mouse, dog or rabbit studies indicated that nitrapyrin was associated with either a specific or an indirect neurotoxic or immunotoxic response or endocrine disruption.

e. Cumulative Risks

Risks summarized in this document are those that result only from the use of nitrapyrin. The Food Quality Protection Act (FQPA) requires that the Agency consider available information concerning the cumulative effects of a particular pesticide's residues and "other substances that have a common mechanism of toxicity." The reason for consideration of other substances is due to the possibility that low-level exposures to multiple chemical

substances that cause a common toxic effect by a common toxic mechanism could lead to the same adverse health effect as would a higher level of exposure to any of the substances individually. Unlike other pesticides for which EPA has followed a cumulative risk approach based on a common mechanism of toxicity, EPA has not made a common mechanism of toxicity finding for nitrapyrin. For information regarding EPA's efforts to determine which chemicals have a common mechanism of toxicity and to evaluate the cumulative effects of such chemicals, see the policy statements released by EPA's Office of Pesticide Programs concerning common mechanism determinations and procedures for cumulating effects from substances found to have a common mechanism on EPA's website at *http://www.epa.gov/pesticides/cumulative/*.

2. Tolerance Summary

Tolerances of nitrapyrin in/on plant and livestock commodities (40 CFR § 180.350) are presently expressed in terms of the parent compound, as well as the major metabolite, 6-CPA, because EPA has determined 6-CPA to be the major residue in all registered or rotated crops.

a. Tolerances Currently Listed Under 40 CFR §180.350

Sufficient field trial data have been submitted (or were translated when appropriate) to reassess the established tolerances for corn, sorghum, and wheat. The Agency plans to set new tolerances for wheat, for some crop factions of wheat, and for one crop faction of corn, because studies submitted since the last Registration Standard have shown higher residues than were considered before. In addition, there is no reasonable expectation of residues in livestock or poultry, and so the Agency plans to revoke tolerances for livestock commodities. A tolerance summary for nitrapyrin is presented in Table 23.

Table 23. Tolerance Summary for Nitrapyrin

Commodity	Established Tolerance (ppm)	Reassessed Tolerance (ppm)	Comments (correct commodity definition)
Cattle, Fat	0.05 (N)	Revoke	No anticipated residues
Cattle, Meat Byproducts	0.05 (N)	Revoke	No anticipated residues
Cattle, Meat	0.05 (N)	Revoke	No anticipated residues
Corn, Forage	1.0	1.0	[*Corn, field, forage*] and [*Corn, sweet, forage*]
Corn, Fresh, K+C, With Husks Removed	0.1 (N)	0.1	[*Corn, sweet, kernel plus cob with husks removed*]
Corn, Grain	0.1 (N)	0.1	[*Corn, field, grain*] and [*Corn, pop, grain*]
Corn, Stover	1.0	1.0	[*Corn, field, stover*]; [*Corn, pop, stover*]; and [*Corn, sweet, stover*]
Goat, Fat	0.05 (N)	Revoke	No anticipated residues

Commodity	Established Tolerance (ppm)	Reassessed Tolerance (ppm)	Comments (correct commodity definition)
Goat, Meat Byproducts	0.05 (N)	Revoke	No anticipated residues
Goat, Meat	0.05 (N)	Revoke	No anticipated residues
Hog, Fat	0.05 (N)	Revoke	No anticipated residues
Hog, Meat Byproducts	0.05 (N)	Revoke	No anticipated residues
Hog, Meat	0.05 (N)	Revoke	No anticipated residues
Horse, Fat	0.05 (N)	Revoke	No anticipated residues
Horse, Meat Byproducts	0.05 (N)	Revoke	No anticipated residues
Horse, Meat	0.05 (N)	Revoke	No anticipated residues
Poultry, Fat	0.05 (N)	Revoke	No anticipated residues
Poultry, Meat Byproducts	0.05 (N)	Revoke	No anticipated residues
Poultry, Meat	0.05 (N)	Revoke	No anticipated residues
Sheep, Fat	0.05 (N)	Revoke	No anticipated residues
Sheep, Meat Byproducts	0.05 (N)	Revoke	No anticipated residues
Sheep, Meat	0.05 (N)	Revoke	No anticipated residues
Sorghum, Forage	0.1 (N)	0.5	
Sorghum, Grain	0.1 (N)	0.1	[*Sorghum, grain, grain*]
Sorghum, Grain, Stover	0.5	0.5	
Wheat, Forage	0.5	2.0	Based on field trial data
Wheat, Grain	0.1 (N)	0.5	
Wheat, Straw	0.5	6.0	Based on field trial data
Tolerances To Be Established Under 40 CFR §180.350(a)			
Corn, Milled Byproducts	None	0.2	Based on processing studies [*Corn, field, milled byproducts*]
Wheat, Bran	None	3.0	Based on processing studies
Wheat, Milled Byproducts	None	2.0	Based on processing studies

[1]EPA expects to remove the "(N)" designation from all entries to conform to current Agency administrative practice ["(N)" designation means negligible residues].

b. Codex Harmonization

No Codex maximum residue levels (MRLs) have been established for nitrapyrin.

c. Residue Analytical Methods – Plants and Livestock

The reregistration requirements for residue analytical methods are fulfilled. Adequate methods are available for data collection and for the enforcement of tolerances for residues of nitrapyrin *per se* in/on plant commodities. Since there is no reasonable expectation of residues in livestock or poultry, enforcement methods for the determination of nitrapyrin residues in livestock commodities are not needed. However, should new uses of nitrapyrin be requested that lead to higher residues in livestock or poultry, additional data may be required to support a tolerance enforcement method for livestock.

D. Regulatory Rationale

The Agency has determined that nitrapyrin is eligible for reregistration provided that: 1) additional data that the Agency intends to require confirm this decision, 2) the risk mitigation measures outlined in this document are adopted, and 3) label amendments are made to reflect these measures.

The following is a summary of the rationale for managing risks associated with the use of nitrapyrin. Where labeling revisions are warranted, specific language is set forth in the summary tables of Chapter V of this document. Immediate incorporation of nitrapyrin is expected to reduce risks to occupational handlers, as well as wildlife. The risk reduction from this action has not been completely quantified, but will reduce exposure to nitrapyrin.

1. Human Health Risk Management

a. Dietary (Food) Risk Mitigation

No adverse effects attributed to a single exposure were identified in any available study for nitrapyrin, including developmental studies in rabbits or rats. Therefore, no acute dietary assessment was conducted and no mitigation is needed.

The chronic (non-cancer) dietary analysis indicates all risk estimates are below the Agency's level of concern for all population subgroups for nitrapyrin. The highest chronic dietary risk estimates are less than 1% of the chronic population adjusted dose (PAD). Therefore, the chronic dietary (food) risk estimate is not of concern, and no risk reduction measures are necessary.

b. Drinking Water Risk Mitigation

Estimated environmental concentrations (EECs) of nitrapyrin and its degradates for both groundwater and surface water sources of drinking water are below the Agency's drinking water levels of concern (DWLOCs). Therefore, no mitigation is needed for drinking water.

c. Aggregate Risk Mitigation

1) Acute Aggregate Risk

There are no adverse effects expected from a single exposure to nitrapyrin; therefore, an acute aggregate risk assessment was not conducted.

2) Chronic Aggregate Risk

The chronic aggregate risk assessment addresses only exposure to nitrapyrin residues in food and water; since there are no nitrapyrin uses that could result in residential exposure. The estimated environmental concentrations (EECs) do not exceed the drinking water level of comparison (DWLOC). Chronic dietary aggregate risk are below the Agency's level of concern,and therefore, no mitigation is required.

3) Cancer Aggregate Risk

An aggregate cancer risk assessment for the U.S. Population based on nitrapyrin was conducted in which food exposure was assumed to be negligible, but water exposures were not. The EECs do not exceed the DWLOC. Aggregate cancer risk is below the Agency's level of concern, and therefore, no mitigation is required.

d. Occupational Risk Mitigation

1) Handler Exposure

Non-cancer handler exposure assessments are completed by EPA using a baseline (long-sleeved shirt and long pants) exposure scenario and, if required, increasing levels of mitigation Personal Protective Equipment (PPE) and engineering controls] to achieve an adequate margin of exposure (MOE). Analyses for handler/applicator exposures were performed using data from the Pesticide Handlers Exposure Database. Short- and intermediate-term dermal and inhalation risks to occupational handlers are below the Agency's level of concern (i.e., MOE $\geq$ 100) at the baseline (i.e., no respirator) for applicators. For mixing/loading to support ground boom application, MOEs are <100 for short- and intermediate-term exposures at baseline, but are $\geq$100 when chemical resistant gloves were added. Current labels require chemical resistant gloves; therefore, no further mitigation is required.

The Agency's level of concern for occupational cancer risks begins at $\geq 1.0 \times 10^{-4}$, with all attempts to mitigate risks to $\leq 1.0 \times 10^{-6}$ when possible. The results of the occupational handler cancer assessment (Table 10) for nitrapyrin indicate that none of the cancer risks for any of the exposure scenarios considered exceeds the Agency's level of concern. In addition, all current labels require workers handling nitrapyrin to wear the equivalent of the PPE1 scenario (long pants, long sleeved shirt, plus gloves), and the Agency believes this level of PPE is adequate.

2) Post-application Risk Mitigation

A post-application assessment was not conducted for nitrapyrin because there is a low potential for occupational postapplication exposure when a soil directed pesticide is used.

2. Environmental Risk Mitigation

EPA's screening level ecological risk assessment shows some exceedances of the Acute, Acute Restricted Use, and the Endangered Species LOCs for small and medium birds and mammals and the Chronic LOC for smaller mammals when soil incorporation of nitrapyrin does not occur immediately after application. However, there are no LOC exceedances when incorporation is immediate. There is currently only one nitrapyrin label that allows delayed incorporation (up to 48 hours), and that label will be changed to require immediate incorporation. This mitigation is expected to substantially reduce risks of concern to wildlife from nitrapyrin use.

3. Other Labeling

In order to be eligible for reregistration, various use and safety information will be included in the labeling of all end-use products containing nitrapyrin. For the specific labeling statements and a list of outstanding data, refer to Section V of this RED document.

4. Endangered Species Program

The Agency has developed the Endangered Species Protection Program to identify pesticides whose use may cause adverse impacts on endangered and threatened species, and to implement mitigation measures that address these impacts. The Endangered Species Act requires federal agencies to ensure that their actions are not likely to jeopardize listed species or adversely modify designated critical habitat. To analyze the potential of registered pesticide uses that may affect any particular species, EPA uses basic toxicity and exposure data developed for the REDs and considers ecological parameters, pesticide use information, geographic relationship between specific pesticide uses and species locations, and biological requirements and behavioral aspects of the particular species. This analysis will consider the risk mitigation measures that are being implemented as a result of this RED.

The screening level risk assessment for nitrapyrin resulted in no acute risks above EPA's level of concern to any listed species and no chronic risks above EPA's level of concern for any listed terrestrial organisms if nitrapyrin is incorporated immediately post-treatment. However, at this time, the Agency does not have chronic toxicity data for estuarine aquatic organisms. Therefore, EPA concludes that there is "no effect" from direct acute risks for any listed species and from direct chronic risks for any listed terrestrial species when nitrapyrin is soil incorporated immediately post-treatment. The EPA cannot, at this time, make a clear "no effect" finding for indirect effects or for direct chronic effects for listed estuarine organisms.

V. What Registrants Need to Do

The use of currently registered products containing nitrapyrin in accordance with approved labeling will not pose unreasonable risks or adverse effects to humans or the environment if the risk mitigation measures and label changes outlined in the RED are implemented. Therefore, all uses of these products are eligible for reregistration. These products will be reregistered once the required confirmatory generic data, product specific data, CSFs, and revised labeling are received and accepted by EPA. Products which contain other ingredients in addition to nitrapyrin will be reregistered when all of their other active ingredients are also reregistered.

A. For nitrapyrin technical grade active ingredient products, the registrant needs to submit the following items:

Within 90 days from receipt of the generic data call in (DCI):

1. Completed response forms to the generic DCI (i.e., DCI response form and requirements status and registrant's response form); and
2. Any time extension and/or waiver requests with a full written justification.

Within the time limit specified in the generic DCI:

1. Citations of any existing generic data which address data requirements or submit new generic data responding to the DCI.

Please contact Stephanie Plummer at (703) 305-0076 with questions regarding generic reregistration.

By U.S. Mail:
Document Processing Desk (DCI/SRRD)
Stephanie Plummer
U.S. EPA (7508C)
1200 Pennsylvania Ave., NW
Washington, DC 20460

By express or courier service:
Document Processing Desk (DCI/SRRD)
Stephanie Plummer
Office of Pesticide Programs (7508C)
Room 266A, Crystal Mall 2
1801 South Bell Street
Arlington, VA 22202

B. For end-use products containing the active ingredient nitrapyrin, the registrant needs to submit the following items for each product:

Within 90 days from the receipt of the product-specific data call-in (PDCI):

(1) completed response forms to the PDCI (i.e., PDCI response form and requirements status and registrant's response form); and

(2) any time extension or waiver requests with a full written justification.

Within eight months from the receipt of the PDCI:

(1) two copies of the confidential statement of formula (EPA Form 8570-4);

(2) a completed original application for reregistration (EPA Form 8570-1). Indicate on the form that it is an "application for reregistration";

(3) five copies of the draft label, incorporating all label amendments outlined in Table 24 of this document;

(4) a completed form certifying compliance with data compensation requirements (EPA Form 8570-34);

(5) if applicable, a completed form certifying compliance with cost share offer requirements (EPA Form 8570-32); and

(6) the product-specific data responding to the PDCI.

Please contact Karen Jones at (703) 308-8047 with questions regarding product reregistration and/or the PDCI. All materials submitted in response to the PDCI should be addressed:

By US mail:
Document Processing Desk (PDCI/PRB)
Karen Jones
US EPA (7508C)
1200 Pennsylvania Ave., NW
Washington, DC 20460

By express or courier service only:
Document Processing Desk (PDCI/PRB)
Karen Jones
Office of Pesticide Programs (7508C)
Room 266A, Crystal Mall 2
1801 South Bell Street
Arlington, VA 22202

A. Manufacturing Use Products

1. Additional Generic Data Requirements

The generic data base supporting the reregistration of nitrapyrin for the above eligible uses has been reviewed and determined to be substantially complete. However, the following data requirements are necessary to confirm the reregistration eligibility decision documented in this RED:

Environmental Fate
835.2410 Soil photolysis (nitrapyrin)
835.4300 Aerobic aquatic metabolism (nitrapyrin)
835.6100 Terrestrial field dissipation (nitrapyrin)
835.2120 Hydrolysis (6-CPA)
835.2240 Aqueous photolysis (6-CPA)
835.4100 Aerobic soil metabolism (6-CPA)
835.4300 Aerobic aquatic metabolism (6-CPA)
835.1410 Laboratory volatilization (6-CPA)

Ecological Effects

850.1350 Estuarine/marine invertebrates, life cycle
850.1400 Estuarine/marine fish, early-life stage

2. Labeling for Manufacturing Use Products

To ensure compliance with FIFRA, manufacturing use product (MUP) labeling should be revised to comply with all current EPA regulations, PR Notices, and applicable policies. The MUP labeling should bear the labeling contained in the labeling table, which will be issued separately.

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

A product-specific data call-in, outlining specific data requirements, accompanies this RED.

2. Labeling for End-Use Products

Labeling changes are necessary to implement measures outlined in Section IV above. Specific language to incorporate these changes is specified in Table 24.

C. Label Summary Table

Table 24. Summary of Labeling for Nitrapyrin

Description	Amended Labeling Language	Placement on Label
Manufacturing Use Products		
One of these statements may be added to a label to allow reformulation of the product for a specific use or all additional uses supported by a formulator or user group.	"Only for formulation into a nitrification inhibitor for use on corn, sorghum, and wheat."	Directions for Use
	"This product may be used to formulate products for specific use(s) not listed on this label if the formulator, user group, or grower has complied with U.S. EPA submission requirements regarding the support of such use(s)."	Directions for Use
Environmental Hazards Statements Required by the RED and Agency Label Policies	"Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollution Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA."	Directions for Use

Description	Amended Labeling Language	Placement on Label
End Use Products Intended for Occupational Use		
PPE Requirements Established by the RED for liquid formulations	"Personal Protective Equipment (PPE)" "Some materials that are chemical-resistant to this product are" (*registrant inserts correct chemical-resistant material*). "If you want more options, follow the instructions for category" (*registrant inserts A,B,C,D,E,F,G, or H*) "on an EPA chemical-resistance category selection chart." "Mixers, loaders, applicators and other handlers must wear: Long-sleeved shirt and long pants, Chemical-resistant gloves, and Shoes plus socks."	Immediately following/below Precautionary Statements: Hazards to Humans and Domestic Animals
User Safety Requirements	"Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry."	Precautionary Statements: Hazards to Humans and Domestic Animals immediately following the PPE Requirements

Description	Amended Labeling Language	Placement on Label
User Safety Recommendations	"User Safety Recommendations Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet. Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing."	Precautionary Statements under: Hazards to Humans and Domestic Animals immediately following User Safety Requirements (Must be placed in a box.)
Environmental Hazards	"Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters or rinsate."	Precautionary Statements immediately following the User Safety Recommendations
Restricted-Entry Interval	"Do no enter of allow worker entry into treated areas during the restricted entry interval (REI) of 24 hours."	Directions for Use, Under Agricultural Use Requirements Box

Description	Amended Labeling Language	Placement on Label
Early Re-Entry Personal Protective Equipment established by the RED	"PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is: * coveralls * shoes plus socks * chemical-resistant gloves made of any waterproof material * protective eyewear."	Direction for Use Agricultural Use Requirement Box
General Application Restrictions	"Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application."	Place in the Direction for Use directly above the Agricultural Use Box.
Other Application Restrictions (Risk Mitigation)	"Must be injected or incorporated in a zone or band in the soil with the fertilizer at a minimum depth of 2 to 4 inches during or immediately after application."	Place in the Directions for Use under Application Instructions for Each Crop

VI. Appendices

Appendix A. Food/Feed Use Patterns Subject to Reregistration for Nitrapyrin (Case 0213)					
Site Application Timing Application Type Application Equipment	Maximum Single Application Rate (lb a.i./A)	Maximum Number of Applications Per Year	Maximum Yearly Rate (lb a.i./A)	Preharvest Interval (Days)	Use Directions and Limitations
Corn					
Preplant Broadcast/band soil incorporated Sprayer, injection equipment	0.45	2	0.9	NS	Applications may be made in 1 to 2 pints (band) or 1 to 4 pints (broadcast) of water or liquid fertilizer per acre. Product must be soil injected or incorporated at a minimum of 2 to 4 inches during or immediately after application. A split application, with one pre-plant and one post-plant, is allowed for corn only.
Postplant Soil side dress Sprayer, injection equipment	0.45	1	0.9	NS	Applications may be made in 1 to 2 pints of water or liquid fertilizer per acre. Product must be soil injected or incorporated at a minimum of 2 to 4 inches during or immediately after application. May be applied up to 30 days post-plant. A split application, with one pre-plant and one post-plant, is allowed for corn only.
Sorghum					
Preplant Broadcast/band soil incorporated Sprayer, injection equipment	0.9	1	0.9	NS	See corn.
Wheat					
Preplant Broadcast/ban soil incorporated Sprayer injection equipment	0.9	1	0.9	NS	See corn.

Appendix B. Table of Generic Data Requirements and Studies Used to Make the Reregistration Decision

GUIDE TO APPENDIX B

Appendix B contains a listing of data requirements which support the reregistration for active ingredients within the case Nitrapyrin covered by this RED. In contains generic data requirements that apply nitrapyrin in all products, including data requirements for which a "typical formulation" is the test substance.

The data table is organized in the following formats:

1. Data requirement (Column 1). The data requirements are listed in the order in which they appear in 40 CFR 158. The reference numbers accompanying each test refer to the test protocols set in the Pesticide Assessment Guidance, which is 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 is 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 Nitrapyrin

New Guideline Number	Old Guideline Number	Description	Use Patterns	Citations
PRODUCT CHEMISTRY				
830.1550	61-1	Product Identity and Composition	A,B	00156504
830.1600	61-2A	Description of materials used to produce the product	A,B	00156504
830.1620	61-2B	Description of production process	A,B	00156504
830.1670	61-2B	Formation of Impurities	A,B	00156504
830.1700	62-1	Preliminary Analysis	A,B	00163516
830.1750	62-0	Certification of Limits	A,B	00163516
830.1800	62-3	Analytical Method	A,B	00163516
830.6302	63-2	Color	A,B	00156505, 40099501
830.6303	63-3	Physical State	A,B	00156505, 40099501
830.6304	63-4	Odor	A,B	00156505, 40099501
830.6313	63-13	Stability to normal and elevated temperatures, metals, and metal ions	A,B	00156505, 40099501
830.6314		Oxidation/reduction: Chemical Incompatibility	A,B	40099501
830.6316		Explodability	A,B	40099501
830.6367		Storage Stability	A,B	40099501, 41563104
830.6320		Corrosion Characteristics	A,B	40099501, 41563104
830.7000	63-12	pH	A,B	00156505
830.7050	None	UV/Visible Absorption	A,B	Data Gap
830.7200	63-5	Melting Point	A,B	00156505, 40099501, 41563102
830.7300	63-7	Density	A,B	00156505, 40099501, 41563101
830.7370	63-10	Dissociation Constants in Water	A,B	00156505
830.7550	63-11	Partition coefficient, shake flask method	A,B	00156505, 40099501, 41563106
830.7840	63-8	Solubility	A,B	00156505, 40099501
830.7950	63-9	Vapor Pressure	A,B	00156505, 40099501
ECOLOGICAL EFFECTS				
850.2100	71-1A	Avian Acute Oral Toxicity	A,B	Acc. 110296, Acc. 116879
850.2200	71-2A	Avian Dietary Toxicity – Quail	A,B	Acc. 79565, Acc. 116898, Acc. 116899
850.2200	71-2B	Avian Dietary Toxicity – Duck	A,B	Acc. 118934, Acc. 117016
850.2300	71-4A	Avian Reproduction - Quail	A,B	Data gap
850.2300	71-4B	Avian Reproduction – Duck	A,B	Data gap
850.1075	72-1A	Fish Toxicity Bluegill	A,B	42077601, 42077602, 00116894, Acc. 110297
850.1075	72-1C	Freshwater Fish Toxicity Rainbow Trout	A,B	00116894, 42077601, 42077602
850.1075	72-1D	Freshwater Fish Toxicity Rainbow Trout – TEP	A,B	00116895, 00129370, 00042005
850.1010	72-2A	Freshwater Invertebrate Toxicity	A,B	42077603, Acc.

New Guideline Number	Old Guideline Number	Description	Use Patterns	Citations
				110295, Acc. 110298
850.1075	72-3A	Estuarine/Marine Toxicity – Fish	A,B	42077604
850.1025	72-3B	Estuarine/Marine Toxicity – Mollusk	A,B	43026201, 42077605, 0074042
850.1035	72-3C	Estuarine/Marine Toxicity – Shrimp	A,B	42077606
850.1350	72-4B	Estuarine/Marine Invertebrate Life Cycle	A,B	Data gap
850.1450	72-4D	Estuarine/Marine Fish Early-Life Stage	A,B	Data gap
850.5400	122-2	Aquatic Plant Growth	A,B	46411401
850.6200	None	Earthworm Toxicity	A,B	46411402
TOXICOLOGY				
870.1100	81-1	Acute Oral Toxicity - Rat	A,B	Acc. 37519
870.1200	81-2	Acute Dermal Toxicity – Rabbit/Rat	A,B	Acc. 37519, 00158904
870.1300	81-3	Acute Inhalation Toxicity – Rat	A,B	Acc. 37519, 00158901
870.2400	81-4	Primary Eye Irritation - Rabbit	A,B	Acc. 37519, 00158902
870.2500	81-5	Primary Skin Irritation	A,B	Acc. 37519
870.2600	81-6	Dermal Sensitization	A,B	00158903
870.3100	82-1A	Subchronic Oral Toxicity: 90-Day Study Rodent	A,B	44231802
870.3150	82-1B	Subchronic Oral Toxicity: 90-Day Study Non-rodent	A,B	41345401
870.3200	82-2	21-Day Dermal – Rabbit/Rat	A,B	42239301
	83-1	Chronic Feeding Toxicity - Rat	A,B	00163217, 40339301, 41345401, 41345403
870.4100	83-1B	Chronic Feeding Toxicity – Non-rodent	A,B	41345401, 41345403
870.3700	83-3A	Developmental Toxicity – Rat	A,B	00163792, 42050101, 43210301, 43210302, Acc. 153543
870.3700	83-3B	Developmental Toxicity – Rabbit	A,B	Acc. 153543
870.3800	83-4	2-Generation Reproduction – Rat	A,B	40952701
870.4100	83-1A	Chronic Feeding Toxicity Study – Rat	A,B	41345403
870.4100	83-1B	Chronic Feeding Toxicity Study - Non-rodent	A,B	41345401
870.4200	83-2B	Carcinogenicity Mice	A,B	40339301, 41345403, 44231803, 41651601, 44231801
870.4300	83-5	Combined Chronic Toxicity/Carcinogenicity: Rats	A,B	41651601, 41345403
870.5100	84-2	Bacterial Reverse Gene Mutation	A,B	00104957, 00151627, 00151628, 00163805
870.5375	84-2B	Cytogenetics	A,B	00104957, 00151627, 00151628, 00163805
870.5550	84-2	Unscheduled DNA Synthesis in Mammalian Cells in Culture	A,B	00163805
870.7485	85-1	General Metabolism	A,B	44282501, 40305501, 44679301

New Guideline Number	Old Guideline Number	Description	Use Patterns	Citations
870.7600	85-3	Dermal Penetration and Absorption	A,B	44282501
ENVIRONMENTAL FATE				
835.2120	161-1	Hydrolysis	A,B	40515302 (Data gap for 6-CPA)
835.2240	161-2	Photodegradation - Water	A,B	40515303 (Data gap for 6-CPA)
835.2410	161-3	Photodegradation - Soil	A,B	Data gap
835.4100	162-1	Aerobic Soil Metabolism	A,B	00117010, 00117998
835.4200	162-2	Anaerobic Soil Metabolism	A,B	00117010
835.4400	162-3	Anaerobic Aquatic Metabolism	A,B	40515303
835.4300	162-4	Aerobic Aquatic Metabolism	A,B	Data gap for nitrapyrin and 6-CPA
835.1240	163-1	Leaching/Adsorption/Desorption	A,B	00079381, 40339401, 00110294
835.1410	163-2	Laboratory Volatilization	A,B	00110294 (Data gap for 6-CPA)
835.6100	164-1	Terrestrial Field Dissipation	A,B	Data gap
None	165-4	Bioaccumulation in Fish	A,B	00101635
RESIDUE CHEMISTRY				
860.1300	171-4A	Nature of Residue – Plants	A,B	00110311, 00116907, Acc. 37878, Acc. 37873, Acc. 88727, Acc. 37876, Acc. 37870, Acc. 37872, 40370401
860.1300	171-4B	Nature of Residue – Livestock	A,B	Acc. 37875, Acc. 38480, 00116901, 00116902, 00116919, 40339402, 40339403, 42815101, 42815102, 43512101, 43781501
860.1340	171-4C	Residue Analytical Method – Plants	A,B	40339402, 40339403, 40370401, 42740102, Acc. 37881, Acc. 37886, Acc. 37887, Acc. 39620, Acc. 39624, Acc. 39625, Acc. 40046, Acc. 40049, Acc. 52343, Acc. 52964, Acc. 88737, 00109457, 00110314, 40515301, 42740102, 42740103, 42740104, 42815101, 42815102, 43356402 43356405, 43356406, 40407201, 40572301, 40407203, 40363803, 40363802, 42229201
860.1340	171-4D	Residue Analytical Method - Livestock	A,B	Acc. 37882, Acc. 37885, Acc. 37886,

New Guideline Number	Old Guideline Number	Description	Use Patterns	Citations
				Acc. 37888, 40515301, 41461103, 41461104, 42740102, 43356401, 43356402, 43356403, 43356404, 43512101, 43781501, 43810601
860.1380	171-4E	Storage Stability	A,B	Acc. 40049, Acc. 40054, Acc. 76728, Acc. 52343, Acc. 40056, Acc. 40057, 00039619, 00110311, GS0213001, GS0213002, 40407202, 40968601, 41461103, 41461104, 42776601, 42795901, 43849001, 43849002, 43849003
860.1500	171-4K	Crop Field Trials		
		Corn, Grain	A,B	Acc. 40048, Acc. 40050, 00110318, 40407201
		Corn, Stover	A,B	Acc. 40046, Acc. 40050, 00110318, 40407201
		Corn, Forage	A,B	Acc. 40046, Acc. 40048, Acc. 40050, 00110318, 40407201
		Corn, Sweet	A,B	40363802
		Sorghum, Grain	A,B	Acc. 39619, 40363803
		Sorghum, Stover	A,B	Acc. 39619, Acc. 40046, 40363803
		Sorghum, Forage	A,B	Acc. 39619, Acc. 40046, 40363803
		Wheat, Grain	A,B	Acc. 37881, Acc. 39620, 40407203, 40572301, 42229201
		Wheat, Forage	A,B	Acc. 37881, Acc. 40046, Acc. 39620,40407203, 40572301
		Wheat, Straw	A,B	acc. 37881, Acc. 39620, 40407203, 40572301
860.1360	171-4M	Multiresidue Methods	A,B	43094501
860.1480	171-4J	Magnitude of Residue in Meat, Milk, Poultry and Eggs		
		Cattle, Goats, Horses and Sheep Meat	A,B	Acc. 40054
		Cattle, Goats, Horses and Sheep	A,B	Acc. 40054

New Guideline Number	Old Guideline Number	Description	Use Patterns	Citations
		Meat Byproducts		
		Cattle, Goats, Horses and Sheep Fat	A,B	Acc. 40054
		Hog Meat	A,B	Acc. 40055
		Hog Meat Byproducts	A,B	Acc. 40055
		Hog Fat	A,B	Acc. 40055
		Poultry Meat	A,B	Acc. 40057
		Poultry Meat Byproducts	A,B	Acc. 40057
		Poultry Fat	A,B	Acc. 40057
		Milk	A,B	Acc. 40056, 42740101
		Eggs	A,B	Acc. 40057
860.1520	171-4L	Magnitude of Residue in Processed Food/Feed		
		Corn, Field	A,B	41951101, 42815102
		Corn, Sweet	A,B	43356408
		Sorghum	A,B	43356407
		Wheat	A,B	42176001
860.1850	165-1	Confined Accumulation in Rotational Crops	A,B	00156610
860.1900	165-2	Field Accumulation in Rotational Crop Study	A,B	41563101
OTHER				
		Hepatocyte Proliferation and Apoptosis	A,B	44231801
		Unscheduled DNA Synthesis	A,B	00109456
Non-guideline		Determination of Bioconcentration Factor – Bluegill	A,B	00101635
870.7200	86-1	Domestic Animal Safety	A,B	Acc. 116879
		Phytotoxicity	A,B	Acc. 116917, 116918

Appendix C. Technical Support Documents

Additional documentation in support of this RED is maintained in the OPP docket, located in Room 119, Crystal Mall 2, 1801 S. Bell Street, Arlington, VA. It is open Monday through Friday, excluding legal holidays, from 8:30 AM to 4:30 PM.

The nitrapyrin docket initially contained preliminary risk assessments and related documents as of October 27, 2004. Sixty days later, the comment period closed. The Agency considered the comments and added the formal "Response to Comments" documents to the docket. All documents, in hard copy form, may be viewed in the OPP docket room or downloaded or viewed via the Internet at the following website:

http://www.epa.gov/pesticides/reregistration/status.htm.

These documents include:

HED Documents:

Nitrapyrin: Revised HED Chapter of the Reregistration Eligibility Decision Document. (Tadayon, Seyed, David Soderberg, and John Doherty. 3/1/2005)

- Nitrapyrin Chronic Dietary Exposure Assessment for the Reregistration Eligibility Decision. (Soderberg, David 5/14/2004)

- Nitrapyrin. Reregistration Action. Corrected Summary of Analytical Chemistry and Residue Data. (Soderberg, David 9/29/2004)

- Review of Nitrapyrin Incident Reports. (Blondell, Jerome and Monica S. Hawkins 9/29/2004)

- Nitrapyrin: Second Revision of the Toxicology Chapter for the RED. (Doherty, John. 2/24/2004)

- Reviews of a Number of Studies Submitted in Support of the Reregistration of Nitrapyrin. (Soderberg, David 5/25/2004)

- Nitrapyrin – 1st Report of the Hazard Identification Assessment Review Committee. (Doherty, John. 3/1/2004)

- Nitrapyrin: Team Review of Metabolism Information. (Soderberg, David, John Doherty, and Seyed Tadayon. 2/23/2004)

- Nitrapyrin RED – Reregistration Eligibility Decision Product Chemistry Considerations. (Soderberg, David. 2/19/2004)

EFED Documents:

- Environmental Fate and Effects Division Revised Risk Assessment for the Nitrapyrin Reregistration Eligibility Decision. (Hartless, Christine and Amer Al-Mudallal. 3/1/2005)

- Drinking Water Assessment for Nitrapyrin and Its Major Degradate 6-Chloropicolinic Acid (6-CPA). (Al-Mudallal, Amer, Pat Jennings, and Sid Abel. 4/14/2004.)

Appendix D. Citations Considered to be Part of the Database Supporting the Reregistration Eligibility Decision (Bibliography)

GUIDE TO APPENDIX D

1. CONTENTS OF BIBLIOGRAPHY. This bibliography contains citations of all studies considered relevant by EPA in arriving at 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. Selection from other sources, including 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 a s single studies.

3. IDENIFICATION 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 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 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 (1999), 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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163805 Linscombe, V.; Gollapudi, B. (1986) Evaluation of Nitrapyrin in the Chinese Hamster Ovary Cell/Hypoxanthine-guanine-phosphoribosyl Transferase (CHO/HGPRT) Forward Mutation Assay: Laboratory Report Code TXT:K-031304-022. Unpublished study prepared by Dow Chemical Co. 20 p.

40099501 Hemmer, N.; Wichman, K. (1987) Nitrapyrin: Physical and Chemical Characteristics. Unpublished study prepared by Dow Chemical U.S.A. 8 p.

40305501 Timchalk, C.; Dryzga, M.; Cambell, R. (1987) The Metabolism and Tissue Distribution of Orally Administered [Carbon 14]-nitrapy- rin in Fischer 344 Rats: Laboratory Project Study ID(s): K- 031304-026. Unpublished study prepared by Dow Chemical Co., Mammalian and Environmental Toxicology Research Laboratory. 48 p.

40339301 Zimmer, M.; Eisenbrandt, D.; Cieszlak, F.; et al. (1987) 6-Chloropicolinic Acid: 2-Year Dietary Chronic Toxicity-Oncogenicity Study in B6C3F1 Mice: Supplemental Data: Laboratory Project ID: K-034953-013. Unpublished study prepared by Dow Chemical Co. 42 p.

40339402 Stafford, L. (1987) The Metabolism of [Carbon 14] Labeled Nitrapyrin in Laying Hens: Dow Laboratories Project ID: GH-C 1936: HLA Study No. 6148-105. Unpublished study prepared by Dow Chemical U.S.A in cooperation with Hazleton Laboratories America, Inc. 110 p.

40339403 Stafford, L. (1987) The Metabolism of [Carbon 14] Labeled Nitrapyrin in Lactating Goats: Dow Lab Project ID: GH-C 1938: HLA Study No. 6148-104. Unpublished study prepared by Dow Chemical U.S.A. in cooperation with Hazleton Laboratories America, Inc. 126 p.

40363802 Bjerke, E.; Martin, M. (1987) Residues of Nitrapyrin, 2-chloro-6- (Dichloromethyl) Pyridine and 6-chloropicolinic Acid in Sweet Corn: Laboratory Project ID: GHC-1944. Unpublished study pre- pared by Dow Chemical U.S.A., Agricultural Chemistry R&D Laboratories. 32 p.

40363803 Bjerke, E. (1987) A Residue Study of Nitrapyrin, 2-chloro-6-(Dichloromethyl)Pyridine and 6-

chloropicolinic Acid in Sorghum: Project ID: GH-C 1947. Unpublished study prepared by Dow Chemical Co. U.S.A., Agricultural Chemistry R&D Laboratories. 23 p.

40370401 Stafford, L.; Miller, J.; Lardie, T. (1987) Metabolism of [Carbon 14] Labeled Nitrapyrin in Field Corn following at Plant Application at a Rate of 1.0 LB AI/Acre with Solid Fertilizer: Dow Lab. Project ID: GH-C 1949. Unpublished study prepared by Dow Chemical U.S.A. 50 p.

40407201 Bjerke, E.; Woods, J. (1987) A Residue Study of Nitrapyrin, 2-Chlo- ro-6-(dichloromethyl)-Pyridine and 6-Chloropicolinic Acid in Field Corn: Project ID: GHC-1960. Unpublished study prepared by Dow Chemical U.S.A. 39 p.

40407202 Bjerke, E.; Martin, M.; McGee, G. (1987) Stability of Nitrapyrin, 2-Chloro-6-(Dichloromethyl)-pyridine and 6-Chloropicoloinic Acid in Various Substrates Stored Frozen: Project ID: GHC-1961. Unpublished study prepared by Dow Chemical U.S.A. 24 p.

40407203 Bjerke, E. (1982) Residues of 6-Chloropicolinic Acid and Ntrapyrin in Wheat from Fields Treated with Broadcast Spray-on, Disc-in Applications of N-Serve Nitrogen Stabilizer: Project ID: GHC- 1519. Unpublished study prepared by Dow Chemical U.S.A. 21 p.

40515301 Bjerke, E. (1979) Determination of Nitrapyrin in Potatoes and Sorghum; Rice Green Forage and Straw; Rice Bran and Hulls; Bovin Tissue, Milk and Eggs: Project ID: ACR 79.6. Unpublished study prepared by Dow Chemical U.S.A. 27 p.

40515302 Peterson, J.; Carpenter, M. (1988) Determination of the Hydrolysis Rate of Carbon|-Nitrapyrin: Project ID: GHC-2002. Unpublished study prepared by Dow Chemical U.S.A. 73 p.

40515303 Peterson, J.; Carpenter, M. (1988) Determination of the Photolysis Rate of Carbon|-Nitrapyrin in pH-7 Buffer: Project ID: GHC-2001. Unpublished study prepared by Dow Chemical U.S.A. and Analytical Biochemistry Laboratories, Inc. 71 p.

40572301 Bjerke, E.; Martin, M.; VanDyke, M. (1988) A Residue Study of Ni- trapyrin, 2-Chloro-6-(dichloromethyl) Pyridine and 6-Chloropicolinic Acid in Wheat: Project ID: GHC-2033. Unpublished study prepared by Dow Chemical U.S.A. 36 p.

40952701 Zempel, J.; Mensik, D.; Szabo, J. (1988) Nitrapyrin (N-Serve TG): Results of a Two-Generation Reproduction Study in Fischer 344 Rats: Study ID's: TXT:K-031304-025; TXT:K-031304-025F1; TXT: K-031304-025FAW. Unpublished study prepared by Dow Chemical Co. 927 p.

40968601 Bjerke, E. (1989) Stability of Nitrapyrin and 2-Chloro-6-(dichloro-methyl)pyridine in Sweet Corn Stored Frozen: Laboratory Project ID: GH-C-2144: Protocol No. 88091. Unpublished study prepared by Dow Chemical U.S.A. 11 p.

41345401 Barna-Lloyd, T.; Szabo, J.; Rachunek, B. (1989) Nitrapyrin: Chronic (One-Year) Dietary Toxicity Study in Dogs: Lab Project Number: K-031304-029. Unpublished study prepared by The Dow Chemical Co., Lake Jackson Research Center. 142 p.

41345403 Szabo, J.; Landenberger, B.; Rachunek, R. (1989) Nitrapyrin (N- Serve): Two Year Chronic Toxicity and Oncogenicity Study in Fischer 344 Rats: Lab Project Number: K-031304-023. Unpublished study prepared by The Dow Chemical Co. 758 p.

41461103 Bjerke, E. (1990) Stability of 6-Chloropicolinic Acid in Wheat Straw Stored Frozen: Lab Project Number: GH-C/2280. Unpublished study prepared by DowElanco. 13 p.

41461104 Bjerke, E. (1990) Stability of 6-Chloropicolinic Acid in Sweet Corn Stored Frozen: Lab Project Number: GH-C/2281. Unpublished study prepared by DowElanco. 13 p.

41563101 Bjerke, E.; Lafevor, D.; Willett, S.; et al. (1990) A Residue Study of Nitrapyrin, 2-Choro-6-(Dichloromethyl) Pyridine and 6-Chloropicolinic Acid in Rotational Crops: Lab Project Number: GH-C 2321. Unpublished study prepared by DowElanco. 76 p.

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41563104 Kroposki, L. (1977) Technical Grade N-Serve: Stability Studies: Lab Project Number: GP 1751. Unpublished study prepared by Dow Chemical USA, Western Research Labs. 31 p.

41563106 Swann, R.; Laskowski, D.; McCall, K.; et al. (1983) A rapid method for estimation of the environmental parameters octanol/water partition coefficient, soil sorption constant, water to air ratio and water solubility. Residue Reviews 85(1983):17-28.

41651601 Quast, J.; Cosse, P.; Corley, R. (1990) Nitrapyrin (N-Serve): Two-Year Dietary Oncogenicity Study in B6C3F1 Mice: Lab Project Number: K-031304-027. Unpublished study prepared by The Dow Chemical Co. 812 p.

41951101 Bjerke, E.; McNett, D. (1991) A Residue Study of Nitrapyrin, 2- Chloro-6-(Dichloromethyl) Pyridine and 6-Chloropicolinic Acid in Corn Process Fractions: Lab Project Number: GH-C 2504: 88061: 88061AN. Unpublished study prepared by DowElanco. 49 p.

42050101 Berdasco, N.; Wolfe, E.; Zimmer, M.; et al. (1986) Nitrapyrin: Oral Teratology Probe Study in Fischer 344 Rats: Lab Project Number: HET-K-031304-014. Unpublished study prepared by The Dow Chemical Co. 23 p.

42077601 Weinberg, J.; Gorzinski, S.; Richardson,; C.; et al. (1991) Nitrapyrin (Nitrogen Stabilizer): Evaluation of the Acute Toxicity to the Bluegill, Lepomis macrochirus: Lab Project Number: ES-DR- 0114-1340-6. Unpublished study prepared by The Environmental Toxicology & Chemistry Research Laboratory. 26 p.

42077602 Weinberg, J.; Gorzinski, S.; Richardson, C.; et al. (1991) Nitrapyrin (Nitrogen Stabilizer): Evaluation of the Acute Toxicity to the Rainbow Trout, Oncorhynchus mykiss Walbaum: Lab Project Number: ES-DR-0114-1340-7. Unpublished study prepared by The Environmental Toxicological & Chemistry Research Laboratory. 26 p.

42077603 Weinberg, J.; Milazzo, D.; Servinski, M.; et al. (1991) Nitrapyrin (Nitrogen Stabilizer): Evaluation of the Acute Toxicity to the Daphnid, Daphnia magna Straus: Lab Project Number: ES-DR-0114- 1340-8. Unpublished study prepared by The Environmental Toxicology & Chemistry Research Laboratory. 26 p.

42077604 Ward, G. (1991) Nitrapyrin Acute Toxicity to the Tidewater Silver- side, Mendia beryllina Under Flow-Through Test Conditions: Lab Project Number: J9010006B. Unpublished study prepared by Toxik- on Environmental Sciences. 25 p.

42077605 Ward, G.; Ward, S. (1991) Nitrapyrin: Acute Toxicity to the Eastern Oyster, Crassostrea virginca, Under Flow-Through Conditions: Lab Project Number: J9010006D. Unpublished study prepared by Toxikon Environmental Sciences. 27 p.

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42740101 Bjerke, E. (1992) Reregistration of Nitrapyrin--Information Requested in EPA Response of September 16, 1992 to the Registration Standard Update: Lab Project Number: ELB041693. Unpublished study prepared by DowElanco. 7 p.

42740102 Bjerke, E. (1992) Determination of 6-Chloropicolinic Acid in Corn, Rice and Cottonseed: Lab Project Number: ELB041693.1. Unpublished study prepared by DowElanco. 10 p.

42740103 Bjerke, E. (1992) Determination of Nitrapyrin in Corn Forage, Corn Fodder, Wheat Forage, and Wheat Straw: Lab Project Number: ELB041693.2. Unpublished study prepared by DowElanco. 11 p.

42740104 Bjerke, E. (1992) Determination of Nitrapyrin in Corn Oil: Lab Project Number: ELB041693.3. Unpublished study prepared by DowElanco. 8 p.

42776601 Bargar, E., Bjerke, E. (1993) Frozen Storage Stability of 6-Chloropicolinic Acid in Corn Oil Stored Frozen: Lab Project Number: 90067. Unpublished study prepared by North American Environmental Chemistry Lab. 16 p.

42795901 Bargar, E.; Bjerke, E. (1993) Stability of 6-Chloropicolinic Acid in Wheat Grain Stored Frozen: Supplemental Data to GH-C 1961, MRID #40407202: Lab Project Number: GH-C 2958. Unpublished study prepared by North American Environmental Chemistry Lab. 16 p.

42815101 Bjerke, E. (1992) Validation of Method ACR 77.16 Using Field Corn Samples from (carbon 14) Metabolism Study: Nitrapyrin: Lab Project Number: RES92089: ACR 77.16. Unpublished study prepared by DowElanco. 20 p.

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43026201 Boeri, R.; Magazu, J.; Ward, T. (1993) Nitrapyrin: Acute Flow-Through Mollusc Shell Deposition Test: Lab Project Number: 326/DO: ES/2685. Unpublished study prepared by T. R. Wilbury Labs, Inc. 25 p.

43210301 Schroeder, R. (1994) A Range-Finding Study to Evaluate the Developmental Toxicity of Nitrapyrin in the Rat: Lab Project Number: 93-4049: TSN-100172. Unpublished study prepared by Pharmaco LSR, Inc. 192 p.

43210302 Schroeder, R. (1994) A Developmental Toxicity Study in Rats with Nitrapyrin: Lab Project Number: 93-4050: TSN-100172: 414. Unpublished study prepared by Pharmaco LSR, Inc. 485 p.

43356401 Jensen, D. (1970) Determination of Residues of 6-Chloropicolinic Acid in Cream by Gas Chromatography: Lab Project Number: ACR 70.2. Unpublished study prepared by DowElanco. 13 p.

43356402 Swann, R. (1972) Determination of Residues of 6-Chloropicolinic Acid in Plant and Animal Tissues: Lab Project Number: ACR 71.8R. Unpublished study prepared by DowElanco. 16 p.

43356403 Sulaiman, M. (1994) Second Party Method Validation: Determination of Residues of 6-Chloropicolinic Acid in Animal Tissues by Gas Chromatography with Electron Capture Detection: Lab Project Number: RES94106: 379C-109. Unpublished study prepared by Wildlife International Ltd. 35 p.

43356404 Sulaiman, M. (1994) Second Party Method Validation: Determination of Residues of 6-Chloropicolinic Acid in Milk and Cream by Gas Chromatography with Electron Capture Detection: Lab Project Number: RES94107: 379C-108. Unpublished study prepared by Wildlife International Ltd. 22 p.

43356405 Olberding, E.; Foster, D. (1994) Determination of Residues of 6-Chloropyridine-2-Carboxylic Acid in Sorghum Grain, Flour, and Starch by Capillary Gas Chromatography with Mass Selective Detection: Lab Project Number: RES94040. Unpublished study prepared by DowElanco North American Environmental Chemistry Lab. 45 p.

43356406 Olberding, E.; Foster, D. (1994) Determination of Residues of 6-Chloropyridine-2-Carboxylic Acid in Sweet Corn and Processed Products by Capillary Gas Chromatography with Mass Selective Detection: Lab Project Number: RES94039. Unpublished study prepared by DowElanco North American Environmental Chemistry Lab. 49 p.

43356407 Schwake, J.; Foster, D.; Olberding, E. (1994) Magnitude of the Residue of Nitrapyrin and its Metabolite in Sorghum Processed Commodities: Lab Project Number: RES93027. Unpublished study prepared by DowElanco and Texas A&M University. 142 p.

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43810601 Sorenson, B. (1995) Determination of Nitrapyrin in Beef Tissues (Muscle, Liver, Kidney, and Fat), Milk, Cream, and Chicken Eggs Using Gas Chromatography with Electron Capture Detection: Lab Project Number: RES94118: GRM 94.08. Unpublished study prepared by Wildlife International Ltd. 46 p.

43849001 McKellar, R. (1995) Determination of the Frozen Storage Stability of 6-Chloropicolinic Acid in Field Corn Grain, Forage, and Fodder: Lab Project Number: RES92065. Unpublished study prepared by DowElanco North American Environmental Chemistry Lab. 63 p.

43849002 Atkin, L. (1995) Frozen Storage Stability Study of 6-Chloropicolinic Acid in Field Processed Fractions: Lab Project Number: RES92094. Unpublished study prepared by DowElanco North American Environmental Chemistry Lab. 80 p.

43843003 Atkin, L. (1995) Frozen Storage Stability Study of Nitrapyrin in Field Corn Process Fractions, Sweet Corn, Sorghum, and Wheat: Lab Project Number: RES92110. Unpublished study prepared by DowElanco North American Environmental Chemistry Lab. 152 p.

44231801 Yano, B.; McFadden, L. (1996) Nitrapyrin (N-Serve Nitrogen Stabilizer): Quantitation of Hepatocyte Proliferation and Apoptosis in a 2-Week Dietary Toxicity Study in B6C3F1 Mice--A Retrospective Study: Lab Project Number: K-031304-038. Unpublished study prepared by The Dow Chemical Co. 22 p.

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44231803 Stebbins, K.; Cosse, P. (1997) Nitrapyrin (N-Serve Nitrogen Stabilizer): Two-Year Dietary Oncogenicity Study in B6C3F1 Mice: (Final Report): Lab Project Number: K-031304-036. Unpublished study prepared by The Dow Chemical Co. 946 p. (Relates to L0000134).

44282501 Domoradzki, J.; Gibson, K. (1997) Nitrapyrin: Dermal Absorption of (carbon-14)-Nitrapyrin in Male Fischer 344 Rats: Lab Project Number: HET K-031304-039: 17706. Unpublished study prepared by The Dow Chemical Co. 41 p.

44679301 Domoradzki, J.; Brzak, K. (1998) Nitrapyrin: Metabolism and Tissue Distribution of 14C-Labeled Nitrapyrin in B6C3F1 Mice: Lab Project Number: 971119. Unpublished study prepared by The Dow Chemical Company. 56 p. {OPPTS 870.7485}

Appendix E. Generic Data Call-In

The Generic Data Call-In will be posted at a later date. See Chapter V of the nitrapyrin RED for a list of studies required.

Appendix F. Product Specific Data Call-In

The product specific Data Call-In will be posted at a later date

Appendix G. EPA's Batching of Nitrapyrin Products for Meeting Acute Toxicity Data Requirements for Reregistration

EPA'S BATCHING OF NITRAPYRIN 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 Nitrapyrin 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. Notwithstanding 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.

Four products were found which contain Nitrapyrin as the active ingredient. These products have been placed into 1 batch and a "No Batch" category in accordance with the active and inert ingredients and type of formulation.

- No Batch: Each product in this Batch should have its own data generated.

NOTE: The technical acute toxicity values included in this document are for informational purposes only. The data supporting these values may or may not meet the current acceptance criteria.

Batch 1	EPA Reg. No.	% Active Ingredient
	34704-804	22.0
	62719-19	21.9
	62719-20	22.2

No Batch	EPA Reg. No.	% Active Ingredient
	62719-21	90.0

Appendix H. List of Registrants Sent This Data Call-In

A list of registrants sent this Data Call-In will be posted at a later date.

Appendix I. List of Available Related Documents and Electronically Available Forms

Pesticide Registration Forms are available at the following EPA internet site:

http://www.epa.gov/opprd001/forms/

Pesticide Registration Forms (These forms are in PDF format and require the Acrobat reader)

Instructions

1. Print out and complete the forms. (Note: Form numbers that are bolded can be filled out on your computer then printed.)

2. The completed form(s) should be submitted in hardcopy in accord with the existing policy.

3. Mail the forms, along with any additional documents necessary to comply with EPA regulations covering your request, to the address below for the Document Processing Desk.

DO NOT fax or e-mail any form containing 'Confidential Business Information' or 'Sensitive Information.'

If you have any problems accessing these forms, please contact Nicole Williams at (703) 308-5551 or by e-mail at williams.nicole@epa.gov.

The following Agency Pesticide Registration Forms are currently available via the internet:
at the following locations:

8570-1	Application for Pesticide Registration/Amendment	http://www.epa.gov/opprd001/forms/8570-1.pdf
8570-4	Confidential Statement of Formula	http://www.epa.gov/opprd001/forms/8570-4.pdf
8570-5	Notice of Supplemental Registration of Distribution of a Registered Pesticide Product	http://www.epa.gov/opprd001/forms/8570-5.pdf
8570-17	Application for an Experimental Use Permit	http://www.epa.gov/opprd001/forms/8570-17.pdf
8570-25	Application for/Notification of State Registration of a Pesticide To Meet a Special Local Need	http://www.epa.gov/opprd001/forms/8570-25.pdf
8570-27	Formulator's Exemption Statement	http://www.epa.gov/opprd001/forms/8570-27.pdf

8570-28	Certification of Compliance with Data Gap Procedures	http://www.epa.gov/opprd001/forms/8570-28.pdf
8570-30	Pesticide Registration Maintenance Fee Filing	http://www.epa.gov/opprd001/forms/8570-30.pdf
8570-32	Certification of Attempt to Enter into an Agreement with other Registrants for Development of Data	http://www.epa.gov/opprd001/forms/8570-32.pdf
8570-34	Certification with Respect to Citations of Data (PR Notice 98-5)	http://www.epa.gov/opppmsd1/PR_Notices/pr98-5.pdf
8570-35	Data Matrix (PR Notice 98-5)	http://www.epa.gov/opppmsd1/PR_Notices/pr98-5.pdf
8570-36	Summary of the Physical/Chemical Properties (PR Notice 98-1)	http://www.epa.gov/opppmsd1/PR_Notices/pr98-1.pdf
8570-37	Self-Certification Statement for the Physical/Chemical Properties (PR Notice 98-1)	http://www.epa.gov/opppmsd1/PR_Notices/pr98-1.pdf

Pesticide Registration Kit www.epa.gov/pesticides/registrationkit/

Dear Registrant:

For your convenience, we have assembled an online registration kit which contains the following pertinent forms and information needed to register a pesticide product with the U.S. Environmental Protection Agency's Office of Pesticide Programs (OPP):

1. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug and Cosmetic Act (FFDCA) as Amended by the Food Quality Protection Act (FQPA) of 1996.

2. Pesticide Registration (PR) Notices

   a. 83-3 Label Improvement Program – Storage and Disposal Statements
   b. 84-1 Clarification of Label Improvement Program
   c. 86-5 Standard Format for Data Submitted under FIFRA
   d. 87-1 Label Improvement Program for Pesticides Applied Through Irrigation Systems (Chemigation)
   e. 87-6 Inert Ingredients in Pesticide Products Policy Statement
   f. 90-1 Inert Ingredients in Pesticide Products; Revised Policy Statement
   g. 95-2 Notifications, Non-notifications, and Minor Formulation Amendments
   h. 98-1 Self Certification of Product Chemistry Data with Attachments (This document is in PDF format and requires Acrobat reader.)

Other PR Notices can be found at http://www.epa.gov/opppmsd1/PR_NoticesPesticide Product Registration Application Forms (These forms are in PDF format and will require the Acrobat reader).

a. EPA Form No. 8570-1, Application for Pesticide Registration/Amendment
b. EPA Form No. 8570-4, Confidential Statement of Formula
c. EPA Form No. 8570-27, Formulator's Exemption Statement
d. EPA Form No. 8570-34, Certification with Respect to Citations of Data
e. EPA Form No. 8570-35, Data Matrix

4. General Pesticide Information (Some of these forms are in PDF format and will require the Acrobat reader).

a. Registration Division Personnel Contact List
b. Biopesticides and Pollution Prevention Division (BPPD) Contacts
c. Antimicrobials Division Organizational Structure/Contact List
d. 53 F.R. 15952, Pesticide Registration Procedures; Pesticide Data Requirements (PDF format)
e. 40 CFR Part 156, Labeling Requirements for Pesticides and Devices (PDF format)
f. 40 CFR Part 158, Data Requirements for Registration (PDF format)
g.. 50 F.R. 48833, Disclosure of Reviews of Pesticide Data (November 27, 1985)

Before submitting your application for registration, you may wish to consult some additional sources of information. These include:

1. The Office of Pesticide Programs' website.

2. The booklet "General Information on Applying for Registration of Pesticides in the United States", PB92-221811, available through the National Technical Information Service (NTIS) at the following address:

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22161

The telephone number for NTIS is (703) 605-6000.

3. The National Pesticide Information Retrieval System (NPIRS) of Purdue University's Center for Environmental and Regulatory Information Systems. This service does charge a fee for subscriptions and custom searches. You can contact NPIRS by telephone at (765) 494-6614 or through their website.

4. The National Pesticide Telecommunications Network (NPTN) can provide information on active ingredients, uses, toxicology, and chemistry of pesticides. You can contact NPTN by telephone at (800) 858-7378 or through their website: ace.orst.edu/info/nptn.

The Agency will return a notice of receipt of an application for registration or amended registration, experimental use permit, or amendment to a petition if the applicant or petitioner encloses with his submission a stamped, self-addressed postcard. The postcard must contain the following entries to be completed by OPP:

1. Date of receipt;
2. EPA identifying number; and
3. Product Manager assignment.

Other identifying information may be included by the applicant to link the acknowledgment of receipt to the specific application submitted. EPA will stamp the date of receipt and provide the EPA identifying file symbol or petition number for the new submission. The identifying number should be used whenever you contact the Agency concerning an application for registration, experimental use permit, or tolerance petition.

To assist us in ensuring that all data you have submitted for the chemical are properly coded and assigned to your company, please include a list of all synonyms, common and trade names, company experimental codes, and other names which identify the chemical (including "blind" codes used when a sample was submitted for testing by commercial or academic facilities). Please provide a chemical abstract system (CAS) number if one has been assigned.

Documents Associated with this RED

The following documents are part of the Administrative Record for this RED document and may be 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 respective Chemical Status Sheet.

1. Health Effects Division and Environmental Fate and Effects Division Science Chapters, which include the complete risk assessments and supporting documents.
2. Detailed Label Usage Information System (LUIS) Report.