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HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
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Propazine
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Dietary Exposure Assessment

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

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

MEMORANDUM

DATE: 8/31/05

SUBJECT: **Propazine.** Acute and Chronic Dietary Exposure Assessment for the Reregistration Eligibility Decision which includes a New Use on Sorghum.

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Executive Summary

An acute and chronic dietary (food+water) risk assessment was conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™, Version 2.03), which uses food consumption data from the USDA's Continuing Surveys of Food Intakes by Individuals (CSFII) from 1994-1996 and 1998. The analysis was performed to support the reregistration eligibility decision which includes a new use on sorghum. The acute and chronic dietary exposure/risk analyses were conducted using tolerance values, predicted market share value of 29% for all sorghum commodities for the acute and chronic assessments; and point estimate values, the peak concentration for acute dietary risk assessment, and the average mean concentration and 90-day concentration for chronic dietary risk assessment, from PRZM/EXAMS for drinking water contribution to exposure. Based on this Tier 1 (partially refined) assessment, the team selected the 99.9th percentile of exposure to estimate acute dietary risk from food and water. No monitoring data are available for propazine.

The Estimated Drinking Water Concentrations (EDWCs) were calculated using the Texas and Kansas scenarios, as TX and KS are the two states with the most harvested acreage of sorghum. Note that **this drinking water assessment was based on parent propazine only**, as insufficient data exist to fully assess the persistence and mobility of propazine's major degradate, hydroxy-propazine [2-hydroxy-4,6,bis(isopropylamino)-s-triazine] in the environment. Furthermore, based on the risk assessment of the atrazine and simazine, this hydroxy-propazine [2-hydroxy-4,6,bis(isopropylamino)-s-triazine] was not considered to be of toxicological concern to human health. The minor degradates DEA and DACT, although of equal potency toxicologically compared to parent propazine, were also not included in this assessment mostly based on their low detection in the laboratory soil metabolism studies and in the terrestrial field studies (less than 5% of Total Applied Radioactivity (TAR)). For atrazine and simazine, these chlorinated degradates were formed at much higher percentage, and ample monitoring data were available to adequately estimate their concentrations versus those of the parents. For propazine, minimal monitoring data exist for an adequate quantitative assessment of the chlorinated degradates. Additionally, as mentioned above, laboratory and field studies indicate that DEA and DACT, if formed in the environment, would not be present nor would persist at any significant concentration compared to parent propazine to adversely impact the results of the drinking water assessment, as presented in this document.

Monitoring data, although available, were not abundant in the areas of high propazine use and high run off potential, such as the coastal areas of Texas. Furthermore, the quality of the available monitoring data are not sufficiently reliable and at times could not be adequately or reasonably

assessed. Therefore, EFED recommends the use of modeling data for use in the human health risk assessment.

Acute Dietary Exposure Results and Characterization

A conservative acute dietary (food + water) assessment was performed using DEEM-FCID™ for females 13-49 yrs only since no toxic effect attributable to a single dose was identified for the general US population. The dietary exposure and risk assessment includes propazine and its 2 chlorinated metabolites (for sorghum only). Tolerance level residues (0.25 ppm) for sorghum grain and syrup, and a predicted market share value of 29% were used. The predicted market share value is based on projections of market share by the Biological and Economic Analysis Division (BEAD). Although a market share value was included in this assessment and therefore a 99.9th percentile value for exposure has been used to estimate dietary risk, this value is considered conservative and protective, and possibly overestimates the actual market share should propazine be registered for use on sorghum. Although field trial data were available, and residues in sorghum grain were <0.05 ppm, tolerance level residues were used for sorghum commodities because this is a new use. The combination of tolerance level residues and market share makes this dietary assessment very conservative for food. Results are shown below for the acute dietary assessments. Drinking water exposures are the driver in the dietary assessment. Exposures through food (sorghum grain and syrup) are minimal. The acute assessment includes a maximum estimated drinking water concentration (for parent propazine only) from EFED's PRZM-EXAMS model (77 ppb). Risk estimates for females 13-49 are below HED's level of concern. The major contributor to the risk was water (contribution to the risk was 99.08%) and minimal contribution from sorghum (0.92%). Results are shown in the Table below.

Table I. Results of the Acute Assessment for Propazine and its Chloro-Metabolites

Population Subgroup	Exposure at 95% (mg/kg/day)	Exposure at 95% (%aPAD)	Exposure at 99% (mg/kg/day)	Exposure at 99% (%aPAD)	Exposure at 99.9% (mg/kg/day)	Exposure at 99.9% (%aPAD)
Females 13-49	0.003748	3.75	0.006032	6.03	0.010697	10.70

Chronic Dietary Exposure Results and Characterization

A conservative chronic dietary (food + water) assessment was performed using DEEM-FCID™. The dietary exposure and risk assessment includes propazine and its 2 chlorinated metabolites (for sorghum only). Tolerance level residues (0.25 ppm) for

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sorghum grain and syrup, and a predicted market share value of 29% were used. The predicted market share value is based on projections of market share by the Biological and Economic Analysis Division (BEAD). There are 2 chronic assessments: one includes the 90th percentile 90-day average concentration (56 ppb, parent only) for propazine in drinking water from an Oklahoma scenario for sorghum using an 80% percent cropped area (PCA), and the other includes the 90th percentile annual average concentration (25 ppb, parent only) of propazine in drinking water from the same scenario. The 90-day average concentration was included as the triazines have been typically detected in surface water in pulses lasting several weeks to months after application. The 90-day average concentration represents the exposure duration resulting in the highest exposures to triazines in drinking water. As can be seen in the tables below, the chronic assessment using a 90-day average water concentration value results in a %cPAD that does not exceed HED's level of concern for infants (65%, highest exposed population subgroup). The major contributor to the risk was water (100%). There was no significant contribution from sorghum to the dietary exposure. All other populations under the chronic assessment show risk estimates that are below HED's level of concern.

Table II. Results of the Chronic Assessment for Propazine and its Chloro-Metabolites using a 90-Day Average Drinking Water Concentration.

Population Subgroup	Exposure mg/kg/day	Exposure %cPAD
General Population	0.001180	20
All infants	0.003870	65
Children 1-2 years	0.001753	30
Children 3-5 years	0.001641	28
Children 6-12 years	0.001132	19
Youth 13-19 years	0.000853	14
Females 13-49 years	0.001097	18
Adults 20-49 years	0.001102	18
Adults 50+	0.001159	20

Table III. Results of the Chronic Assessment for Propazine and its Chloro-Metabolites using an Annual Mean Drinking Water Concentration.

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Population Subgroup	Exposure mg/kg/day	Exposure %cPAD
General Population	0.000527	9
All infants	0.001728	29
Children 1-2 years	0.000782	13
Children 3-5 years	0.000733	12
Children 6-12 years	0.000505	9
Youth 13-19 years	0.000381	6
Females 13-49 years	0.000490	8
Adults 20-49 years	0.000492	8
Adults 50+	0.000518	9

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I. Introduction

Dietary risk assessment incorporates both exposure and toxicity of a given pesticide. For acute and chronic assessments, the risk is expressed as a percentage of a maximum acceptable dose (i.e., the dose which HED has concluded will result in no unreasonable adverse health effects). This dose is referred to as the population-adjusted dose (PAD). The PAD is equivalent to the reference dose (RfD) divided by the special Food Quality Protection Act (FQPA) Safety Factor.

For acute and non-cancer chronic exposures, HED is concerned when estimated dietary risk exceeds 100% of the PAD. HED is generally concerned when estimated cancer risk exceeds one in one million (i.e., the risk exceeds 1×10^{-6}). References which discuss the acute and chronic risk assessments in more detail are available on the EPA/pesticides web site: "Available Information on Assessing Exposure from Pesticides, A User's Guide," 6/21/2000, web link: <http://www.epa.gov/fedrgstr/EPA-PEST/2000/July/Day-12/6061.pdf>; or see SOP 99.6 (8/20/99).

II. Residue Information

Propazine Use:

Propazine (2-chloro-4,6-bis (isopropylamino)-s-triazine) is a member of the chloro triazine class of herbicides. Other members of this pesticide class include atrazine, cyanazine, and simazine. Propazine is a selective herbicide that can be applied before planting, at planting, and after crop emergence for the preemergence control of annual broadleaf weeds. Currently, the only registered uses are for weed control of ornamental plants grown in containers under greenhouse conditions. There are presently no registered food/feed uses of propazine.

Propazine was previously registered for use on sorghum. The 5/19/87 Propazine Residue Chemistry Chapter along with the 12/88 Propazine Reregistration Standard (Guidance Document) identified several data deficiencies for the reregistration of propazine. Ciba-Geigy, which was then the basic manufacturer of propazine, elected to cancel its registrations of propazine. Another petitioner, Griffin Corporation, is now supporting the previously cancelled uses of propazine on

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grain sorghum and has submitted residue chemistry data which have been evaluated by HED as a “new active ingredient.”

The proposed use of propazine on grain sorghum will be supported at a maximum single application rate of 1.2 lb ai/A with a preharvest interval of 60 days. Following HED review of the proposed use directions and the submitted residue field trial data, the following label amendments are required for sorghum: (i) a maximum of one preemergence application per growing season; (ii) a maximum seasonal rate of 1.2 lb ai/A; (iii) a preharvest interval of 70 days for sorghum forage; and (iv) a preharvest interval of 90 days for sorghum grain and stover.

The EPA’s Office of Pesticide Programs (OPP) has determined that atrazine, propazine, simazine, and degradants, diaminochlorotriazine (DACT), desisopropyl s-atrazine (DIA), and desethyl s-atrazine (DEA) should be considered as a Common Mechanism Group due to their ability to suppress the pituitary LH surge and produce consequent effects on reproductive function and reproductive development. For purposes of a cumulative risk assessment and as part of the tolerance reassessment process for these pesticides, they should be considered as a Common Mechanism Group (OPP Office Director Memo on Grouping Triazines, 3/31/2002).

Tolerances are currently established [40 CFR §180.243] for residues of propazine *per se* in/on sorghum commodities (forage, grain, stover, and sweet sorghum) at 0.25 ppm. There are no tolerances established for propazine residues in animal commodities. The Federal Register (Vol. 70, No. 119, June 22, 2005) has recently announced that Griffin Corporation has filed a petition, PP#7F4837, to amend 40 CFR §180.243, by establishing tolerances for residues of propazine and its two chlorometabolites: 2-amino-4-chloro, 6-isopropylamino-s-triazine (G-30033) and 2,4-diamino-6-chloro-s-triazine (G-28273) in/on sorghum stover, forage, and grain at 0.25 ppm.

Residue Data used for Acute and Chronic Assessments

Residue Data for crops

The acute and chronic dietary exposure/risk analyses were conducted using tolerance level residues and a predicted market share value of 29%.

Following a single preemergence broadcast application of a representative FIC formulation of propazine at 1.47-2.43 lb ai/A (1.2-2.0x the proposed single application rate), the results of the sorghum field trials indicate the following: In **sorghum forage** harvested at a PHI range of 69-117 days, residues of propazine and G-30033 were each less than the LOQ (<0.05 ppm) in/on 26 treated samples. Residues of G-28273 ranged 0.050-0.087 ppm in/on four treated forage samples but were <0.05 ppm in/on 22 treated samples. In **sorghum grain and stover** harvested at a PHI

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range of 86-152 days, residues of propazine, G-30033, and G-28273 were each <0.05 ppm in/on 26 treated samples. These data support the proposed tolerance of 0.25 ppm each for the combined residues of propazine and its two chlorometabolites (G-30033 and G-28273) in/on sorghum stover, forage, and grain. Residue data on the aspirated grain fractions of sorghum are not required since the proposed use of propazine on grain sorghum is for preemergence or preplant application. No PDP data exist for propazine in sorghum as this is a proposed new use.

The available goat and poultry metabolism data suggest a Category 3 situation with regard to the need for animal commodity tolerances as per 40 CFR §180.6. There is no expectation of finite residues of propazine and its chlorometabolites in animal commodities as a result of the proposed use on sorghum. Thus, animal feeding studies are not needed, and tolerances need not be established for meat, milk, poultry, and eggs. A summary of propazine tolerance reassessment is presented in Table IV.

Table IV: Established and Reassessed Tolerances for Propazine

Table IV. Tolerance Reassessment Summary for Propazine.			
Commodity	Current Tolerance Listed in 40 CFR §180.243 (ppm)	Reassessed Tolerance (ppm)	Comments [Correct Commodity Definition]
Sorghum, forage	0.25 (N)	0.25	
Sorghum, grain	0.25 (N)	0.25	
Sorghum, grain, stover	0.25 (N)	0.25	
Sorghum, sweet	0.25 (N)	Revoke	No registered uses on sweet sorghum.

Drinking Water Data

The values used in the dietary risk assessment were provided by the Environmental Fate and Effects Division (EFED) in the following memo: *Drinking Water Assessment for Propazine Use on Sorghum and Green House Ornamentals*, memo from Thuy Nguyen to Jim Tompkins, 8/31/05, DP#XXXXXX. Water residues were incorporated in the DEEM-FCID™ into the food categories “water, direct, all sources” and “water, indirect, all sources”.

Drinking water concentrations were estimated for propazine only and included in the DEEM runs. EFED estimates that the chlorinated degradates of propazine account for less than 5% of the parent compound in soil dissipation studies and recommends they not be included in the assessment as their contribution to drinking water exposure is expected to be insignificant. The

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fate parameters used in PRZM-EXAMS modeling are conservative and have been estimated at the 90th percentile. Percent cropped area (PCA) has been refined for this assessment since the sorghum production area where propazine may be needed is within the states of Colorado, New Mexico, Kansas, Oklahoma, and Texas, and further refinement was possible using the regional PCA values: 67% for Texas, 80% for Kansas and Oklahoma, 7-11% for Colorado, and 28% for New Mexico. The table below reflects the surface water drinking water estimated concentrations (DWECS) predicted by PRZM-EXAMS and adjusted with the regional PCAs. Note that the DWEC values for Colorado, Oklahoma, and New Mexico were based on the values estimated from the TX sorghum scenario.

Sorghum 1.2 lb ai/A; 1 aerial app/yr	90th percent	96 hr	21-day	60-day	90-day	Annual Mean	Yearly Average
	Peak						
Surface Water - <u>Texas</u> (0.67 Regional PCA adj)	65	64	59	52	47	21	10
Surface Water - <u>Kansas</u> (0.80 Regional PCA adj)	35	35	33	29	27	13	9
Surface Water - <u>Oklahoma</u> (0.80 Regional PCA adj)	77	76	70	62	56	25	12
Surface Water - <u>Colorado</u> (0.11 Regional PCA adj)	11	11	10	9	8	3	2
Surface Water - <u>New Mexico</u> (0.28 Regional PCA adj)	27	27	24	22	20	9	4

The groundwater model SCI-GROW2 estimates likely groundwater concentrations if the pesticide is used at the maximum allowable rate (or in the case of propazine, the maximum rate that results in the highest contamination level) in areas where groundwater is vulnerable to contamination. Characteristics of such vulnerable areas include high rainfall, rapidly permeable soil, and a shallow aquifer. 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-GROW2 estimate.

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Using one aerial application of 1.2 lb ai/A of propazine on sorghum, the lowest lowest Koc of 65 mL/g and the average aerobic metabolism half-life of 197 days, SCI-GROW2 estimates a ground water EDWC of 6.9 ug/L. This value can be used for both acute and chronic (i.e., peak and mean) in determining potential risk to human health from drinking water from ground water sources contaminated with propazine.

III. DEEM-FCID™ Program and Consumption Information

Acute and chronic dietary exposure assessments were conducted for propazine using DEEM-FCID™, Version 2.03, which incorporates consumption data from USDA's CSFII, 1994-1996 and 1998. The 1994-96, 98 data are based on the reported consumption of more than 20,000 individuals over two non-consecutive survey days. Foods "as consumed" (e.g., apple pie) are linked to EPA-defined food commodities (e.g. apples, peeled fruit - cooked; fresh or N/S; baked; or wheat flour - cooked; fresh or N/S, baked) using publicly available recipe translation files developed jointly by USDA/ARS and EPA. For chronic exposure assessments, consumption data are averaged for the entire U.S. population and within population subgroups, but for acute exposure assessment are retained as individual consumption events. Based on analysis of the 1994-96, 98 CSFII consumption data, which took into account dietary patterns and survey respondents, HED concluded that it is most appropriate to report risk for the following population subgroups: the general U.S. population, all infants (<1 year old), children 1-2, children 3-5, children 6-12, youth 13-19, adults 20-49, females 13-49, and adults 50+ years old.

For chronic dietary exposure assessment, an estimate of the residue level in each food or food-form (e.g., orange or orange juice) on the food commodity residue list is multiplied by the average daily consumption estimate for that food/food form to produce a residue intake estimate. The resulting residue intake estimate for each food/food form is summed with the residue intake estimates for all other food/food forms on the commodity residue list to arrive at the total average estimated exposure. Exposure is expressed in mg/kg body weight/day and as a percent of the cPAD. This procedure is performed for each population subgroup.

IV. Toxicological Information

The propazine risk assessment team reviewed the recommendations of the toxicology reviewer for propazine with regard to the acute and chronic Reference Doses (RfDs) and the toxicological endpoint selection for use as appropriate in occupational and residential exposure risk assessments. The potential for increased susceptibility of infants and children from exposure to propazine was also evaluated as required by the Food Quality Protection Act (FQPA) of 1996 according to the 2002 Office of Pesticide Programs (OPP) 10X Guideline Document. Results are summarized in the Table below.

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Table V. Summary of Toxicological Doses and Endpoints for Propazine			
Exposure Scenario	Dose used in Risk Assessment, UF	Special FQPA SF* and Level of Concern for Risk Assessment	Study and Toxicological Effects
Acute Dietary (females 13-49)	Developmental NOAEL = 10 mg/kg/day UF = 100 Acute RfD = 0.1 mg/kg/day	1X for Hazard-based concerns. aPAD = aRfD/FQPA SF aPAD = 0.1 mg/kg/day* 3X for Exposure -based concerns when monitoring data is being used. No monitoring data were used in this assessment.	Development study in rats w/ propazine LOAEL = 100 mg/kg/day based on decreased ossification
Acute Dietary (general population)	NA	NA	No toxic effect attributable to a single dose was identified for the general population
Chronic RfD (all populations)	NOAEL = 1.8 mg/kg/day UF = 100 Chronic RfD = 0.018 mg/kg/day	3X for residual Hazard-based and 3X for Exposure-based uncertainties when monitoring data is being used. cPAD = cRfD/FQPA SF cPAD = 0.006 mg/kg/day	6-month LH surge study in rat w/ Atrazine LOAEL = 3.65 mg/kg/day based on estrous cycle alterations and LH surge suppression
Cancer (oral, dermal, inhalation)	Current Classification: Group C Carcinogen (possible human carcinogen) with $Q^*_1 = 1.7 \times 10^{-1}$. Pending reclassification by CARC to "Not Likely to be Carcinogenic to Humans" as per common mode of toxicity with atrazine.		

UF = uncertainty factor, FQPA SF = Special FQPA safety factor, NOAEL = no observed adverse effect level, LOAEL = lowest observed adverse effect level, PAD = population adjusted dose (a = acute, c = chronic) RfD = reference dose, MOE = margin of exposure, LOC = level of concern.

V. Results/Discussion

An acute and chronic dietary (food+water) risk assessment was conducted using the Dietary Exposure Evaluation Model software with the Food Commodity Intake Database (DEEM-FCID™, Version 2.03), which uses food consumption data from the USDA's Continuing Surveys of Food Intakes by Individuals (CSFII) from 1994-1996 and 1998. The analysis was performed to support the reregistration eligibility decision which includes a new use on sorghum. The acute

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and chronic dietary exposure/risk analyses were conducted using tolerance values, predicted market share value of 29% for all sorghum commodities for the acute and chronic assessments; and point estimate values, the peak concentration for acute dietary risk assessment, and the average mean concentration and 90-day concentration for chronic dietary risk assessment, from PRZM/EXAMS for drinking water contribution to exposure. Based on this Tier 1 (partially refined) assessment, the team selected the 99.9th percentile of exposure to estimate acute dietary risk from food and water. No monitoring data are available for propazine.

The Estimated Drinking Water Concentrations (EDWCs) were calculated using the Texas and Kansas scenarios, as TX and KS are the two states with the most harvested acreage of sorghum. Note that **this drinking water assessment was based on parent propazine only**, as insufficient data exist to fully assess the persistence and mobility of propazine's major degradate, hydroxy-propazine [2-hydroxy-4,6,bis(isopropylamino)-s-triazine] in the environment. Furthermore, based on the risk assessment of the atrazine and simazine, this hydroxy-propazine [2-hydroxy-4,6,bis(isopropylamino)-s-triazine] was not considered to be of toxicological concern to human health. The minor degradates DEA and DACT, although of equal potency toxicologically compared to parent propazine, were also not included in this assessment mostly based on their low detection in the laboratory soil metabolism studies and in the terrestrial field studies (less than 5% of Total Applied Radioactivity (TAR)). For atrazine and simazine, these chlorinated degradates were formed at much higher percentage, and ample monitoring data were available to adequately estimate their concentrations versus those of the parents. For propazine, minimal monitoring data exist for an adequate quantitative assessment of the chlorinated degradates. Additionally, as mentioned above, laboratory and field studies indicate that DEA and DACT, if formed in the environment, would not be present nor would persist at any significant concentration compared to parent propazine to adversely impact the results of the drinking water assessment, as presented in this document.

Monitoring data, although available, were not abundant in the areas of high propazine use and high run off potential, such as the coastal areas of Texas. Furthermore, the quality of the available monitoring data are not sufficiently reliable and at times could not be adequately or reasonably assessed. Therefore, EFED recommends the use of modeling data for use in the human health risk assessment.

Acute Dietary Exposure Results and Characterization

A conservative acute dietary (food + water) assessment was performed using DEEM-FCID™ for females 13-49 yrs only since no toxic effect attributable to a single dose was identified for the general US population. The dietary exposure and risk assessment includes

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propazine and its 2 chlorinated metabolites (for sorghum only). Tolerance level residues (0.25 ppm) for sorghum grain and syrup, and a predicted market share value of 29% were used. The predicted market share value is based on projections of market share by the Biological and Economic Analysis Division (BEAD). Although a market share value was included in this assessment and therefore a 99.9th percentile value for exposure has been used to estimate dietary risk, this value is considered conservative and protective, and possibly overestimates the actual market share should propazine be registered for use on sorghum. Although field trial data were available, and residues in sorghum grain were <0.05 ppm, tolerance level residues were used for sorghum commodities because this is a new use. The combination of tolerance level residues and market share makes this dietary assessment very conservative for food. Results are shown below for the acute dietary assessments. Drinking water exposures are the driver in the dietary assessment. Exposures through food (sorghum grain and syrup) are minimal. The acute assessment includes a maximum estimated drinking water concentration (for parent propazine only) from EFED's PRZM-EXAMS model (77 ppb). Risk estimates for females 13-49 are below HED's level of concern. The major contributor to the risk was water (contribution to the risk was 99.08%) and minimal contribution from sorghum (0.92%). Results are shown in the Table below.

Table I. Results of the Acute Assessment for Propazine and its Chloro-Metabolites

Population Subgroup	Exposure at 95% (mg/kg/day)	Exposure at 95% (%aPAD)	Exposure at 99% (mg/kg/day)	Exposure at 99% (%aPAD)	Exposure at 99.9% (mg/kg/day)	Exposure at 99.9% (%aPAD)
Females 13-49	0.003748	3.75	0.006032	6.03	0.010697	10.70

Chronic Dietary Exposure Results and Characterization

A conservative chronic dietary (food + water) assessment was performed using DEEM-FCID™. The dietary exposure and risk assessment includes propazine and its 2 chlorinated metabolites (for sorghum only). Tolerance level residues (0.25 ppm) for sorghum grain and syrup, and a predicted market share value of 29% were used. The predicted market share value is based on projections of market share by the Biological and Economic Analysis Division (BEAD). There are 2 chronic assessments: one includes the 90th percentile 90-day average concentration (56 ppb, parent only) for propazine in drinking water from an Oklahoma scenario for sorghum using an 80% percent cropped area (PCA), and the other includes the 90th percentile annual average concentration (25 ppb, parent only) of propazine in drinking water from the same scenario. The 90-day average concentration was included as the triazines have been typically detected in surface water in pulses lasting several weeks to months after application. The 90-day average concentration represents the exposure

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duration resulting in the highest exposures to triazines in drinking water. As can be seen in the tables below, the chronic assessment using a 90-day average water concentration value results in a %cPAD that does not exceed HED's level of concern for infants (65%, highest exposed population subgroup). The major contributor to the risk was water (100%). There was no significant contribution from sorghum to the dietary exposure. All other populations under the chronic assessment show risk estimates that are below HED's level of concern.

Table II. Results of the Chronic Assessment for Propazine and its Chloro-Metabolites using a 90-Day Average Drinking Water Concentration.

Population Subgroup	Exposure mg/kg/day	Exposure %cPAD
General Population	0.001180	20
All infants	0.003870	65
Children 1-2 years	0.001753	30
Children 3-5 years	0.001641	28
Children 6-12 years	0.001132	19
Youth 13-19 years	0.000853	14
Females 13-49 years	0.001097	18
Adults 20-49 years	0.001102	18
Adults 50+	0.001159	20

Table III. Results of the Chronic Assessment for Propazine and its Chloro-Metabolites using an Annual Mean Drinking Water Concentration.

Population Subgroup	Exposure mg/kg/day	Exposure %cPAD
General Population	0.000527	9
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Children 6-12 years	0.000505	9
Youth 13-19 years	0.000381	6
Females 13-49 years	0.000490	8

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Population Subgroup	Exposure mg/kg/day	Exposure %cPAD
Adults 20-49 years	0.000492	8
Adults 50+	0.000518	9

VI. Conclusions

This assessment concludes that for all supported commodities, the acute dietary exposure estimates are below HED's level of concern for females 13-49 years of age at 11 % of the aPAD at the 99.9th percentile.

This assessment concludes that for all supported commodities, the chronic dietary exposure estimates are below HED's level of concern for the all infants population subgroups at 65% of the cPAD, using an 90-day average drinking water concentration.

This assessment concludes that for all supported commodities, the chronic dietary exposure estimates are below HED's level of concern for all the all infants population subgroups at 29% of the cPAD, using the annual mean drinking water concentration.

VII. List of Attachments

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- Attachment 1: Acute Food Residue Input file.
- Attachment 2: Acute Results file.
- Attachment 3: Chronic residue input file using an 90-day average drinking water concentration.
- Attachment 4: Chronic result file using an 90-day average drinking water concentration.
- Attachment 5: Chronic residue input file using the annual mean drinking water concentration.
- Attachment 6: Chronic result file using the annual mean drinking water concentration.

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Attachment 1. Acute Food Residue Input file

U.S. Environmental Protection Agency Ver. 2.02
DEEM-FCID Acute analysis for PROPAZINE
Residue file name: C:\My.DEEM\Propazine\Acute.R98
Analysis Date 08-17-2005 Residue file dated: 08-11-2005/13:09:44/8
Reference dose (aRfD) = 0.1 mg/kg bw/day
Comment: Acute Endpoint for Sorghum based on Propazine endpoint

EPA Code	Crop Grp	Food Name	Def Res (ppm)	Adj.Factors #1	Adj.Factors #2	Comment
15003440	15	Sorghum, grain	0.250000	0.290	1.000	
15003450	15	Sorghum, syrup	0.250000	0.290	1.000	
86010000	0	Water, direct, all sources	0.077000	1.000	1.000	
86020000	0	Water, indirect, all sources	0.077000	1.000	1.000	

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Attachment 2. Acute Results file

U.S. Environmental Protection Agency Ver. 2.02
 DEEM-FCID ACUTE Analysis for PROPAZINE (1994-98 data)
 Residue file: Acute.R98 Adjustment factor #2 used.
 Analysis Date: 08-17-2005/11:00:39 Residue file dated: 08-11-2005/13:09:44/8
 Daily totals for food and foodform consumption used.
 Run Comment: "Acute Endpoint for Sorghum based on Propazine endpoint"

Summary calculations (per capita):

	95th Percentile		99th Percentile		99.9th Percentile	
	Exposure	% aRfD	Exposure	% aRfD	Exposure	% aRfD
Females 13-49 yrs:	0.003748	3.75	0.006032	6.03	0.010697	10.70

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Attachment 3: Chronic residue input file using an 90-day average drinking water concentration.

U.S. Environmental Protection Agency Ver. 2.00
DEEM-FCID Chronic analysis for PROPAZINE 1994-98 data
Residue file: C:\My DEEM\Propazine\chronic.R98 Adjust. #2 NOT used
Analysis Date 08-17-2005 Residue file dated: 08-11-2005/13:47:04/8
Reference dose (RfD) = 0.0018 mg/kg bw/day
Comment:Chronic Propazine Endpoint

Food Crop			Residue (ppm)	Adj. Factors		Comment
EPA Code	Grp	Food Name		#1	#2	
15003440	15	Sorghum, grain	0.250000	0.290	1.000	
15003450	15	Sorghum, syrup	0.250000	0.290	1.000	
86010000	0	Water, direct, all sources	0.056000	1.000	1.000	
86020000	0	Water, indirect, all sources	0.056000	1.000	1.000	

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Attachment 4: Chronic result file using an 90-day average drinking water concentration.

U.S. Environmental Protection Agency Ver. 2.00
DEEM-FCID Chronic analysis for PROPAZINE (1994-98 data)
Residue file name: C:\My DEEM\Propazine\Chronic.R98
Adjustment factor #2 NOT used.
Analysis Date 08-17-2005/11:55:15 Residue file dated: 08-11-2005/13:47:04/8
Reference dose (RfD, Chronic) = .0018 mg/kg bw/day
COMMENT 1: Chronic Propazine Endpoint

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Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.001180	20.0%
U.S. Population (spring season)	0.001170	20.0%
U.S. Population (summer season)	0.001268	21.3%
U.S. Population (autumn season)	0.001141	19.2%
U.S. Population (winter season)	0.001141	19.2%
Northeast region	0.001077	18.1%
Midwest region	0.001193	20.1%
Southern region	0.001122	18.9%
Western region	0.001352	22.8%
Hispanics	0.001340	22.5%
Non-hispanic whites	0.001152	19.4%
Non-hispanic blacks	0.001120	18.8%
Non-hisp/non-white/non-black	0.001447	24.4%
All infants (< 1 year)	0.003870	65.0%
Nursing infants	0.001435	24.2%
Non-nursing infants	0.004794	80.6%
Children 1-6 yrs	0.001649	27.8%
Children 7-12 yrs	0.001072	18.1%
Females 13-19 (not preg or nursing)	0.000831	13.9%
Females 20+ (not preg or nursing)	0.001178	19.8%
Females 13-50 yrs	0.001142	21.1%
Females 13+ (preg/not nursing)	0.001148	19.3%
Females 13+ (nursing)	0.001635	27.5%
Males 13-19 yrs	0.000868	14.6%
Males 20+ yrs	0.001058	17.8%
Seniors 55+	0.001159	19.5%
Children 1-2 yrs	0.001753	29.5%
Children 3-5 yrs	0.001641	27.6%
Children 6-12 yrs	0.001132	19.1%
Youth 13-19 yrs	0.000853	14.4%
Adults 20-49 yrs	0.001102	18.5%
Adults 50+ yrs	0.001159	19.5%
Females 13-49 yrs	0.001097	18.5%

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Attachment 5: Chronic residue input file using the annual mean drinking water concentration.

U.S. Environmental Protection Agency Ver. 2.00
 DEEM-FCID Chronic analysis for PROPAZINE 1994-98 data
 Residue file: C:\My DEEM\Propazine\chronic1.R98 Adjust. #2 used
 Analysis Date 08-17-2005 Residue file dated: 08-11-2005/13:47:29/8
 Reference dose (RfD) = 0.0018 mg/kg bw/day
 Comment:Chronic Propazine Endpoint

Food Crop			Residue (ppm)	Adj.Factors		Comment
EPA Code	Grp	Food Name		#1	#2	
15003440	15	Sorghum, grain	0.250000	0.290	1.000	
15003450	15	Sorghum, syrup	0.250000	0.290	1.000	
86010000	0	Water, direct, all sources	0.025000	1.000	1.000	
86020000	0	Water, indirect, all sources	0.025000	1.000	1.000	

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Attachment 6: Chronic result file using the annual mean drinking water concentration.

U.S. Environmental Protection Agency Ver. 2.00
DEEM-FCID Chronic analysis for PROPAZINE (1994-98 data)
Residue file name: C:\My DEEM\Propazine\chronic1.R98
Adjustment factor #2 used.
Analysis Date 08-17-2005/12:03:34 Residue file dated: 08-11-2005/13:47:29/8
Reference dose (RfD, Chronic) = .0018 mg/kg bw/day
COMMENT 1: Chronic Propazine Endpoint

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Total exposure by population subgroup

Population Subgroup	Total Exposure	
	mg/kg body wt/day	Percent of Rfd
U.S. Population (total)	0.000527	8.9%
U.S. Population (spring season)	0.000522	8.9%
U.S. Population (summer season)	0.000566	9.5%
U.S. Population (autumn season)	0.000509	8.5%
U.S. Population (winter season)	0.000509	8.5%
Northeast region	0.000481	8.1%
Midwest region	0.000533	8.9%
Southern region	0.000501	8.4%
Western region	0.000604	10.1%
Hispanics	0.000598	10.1%
Non-hispanic whites	0.000514	8.7%
Non-hispanic blacks	0.000500	8.3%
Non-hisp/non-white/non-black	0.000646	10.9%
All infants (< 1 year)	0.001728	29.0%
Nursing infants	0.000641	10.8%
Non-nursing infants	0.002140	36.0%
Children 1-6 yrs	0.000736	12.4%
Children 7-12 yrs	0.000479	8.1%
Females 13-19 (not preg or nursing)	0.000371	6.2%
Females 20+ (not preg or nursing)	0.000526	8.8%
Females 13-50 yrs	0.000510	8.6%
Females 13+ (preg/not nursing)	0.000512	8.6%
Females 13+ (nursing)	0.000730	12.3%
Males 13-19 yrs	0.000388	6.5%
Males 20+ yrs	0.000472	7.9%
Seniors 55+	0.000517	3.7%
Children 1-2 yrs	0.000782	13.1%
Children 3-5 yrs	0.000733	12.3%
Children 6-12 yrs	0.000505	7.6%
Youth 13-19 yrs	0.000381	6.4%
Adults 20-49 yrs	0.000492	8.3%
Adults 50+ yrs	0.000518	8.7%
Females 13-49 yrs	0.000490	8.2%

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Chemical: Propazine

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