Appendix K
Simazine Aquatic Incidents and Plant Incidents

K.1 Aquatic Incidents

A review of the Ecological Incident Information System (EIIS, version 2.1), the 'Aggregate Incident Reports' (v. 1.0) database was completed on May 22, 2006 and another on May 13, 2010. A summary of the nine aquatic incidents reported for simazine is provided below.

On July 29, 1976, approximately 5,000 to 10,000 top smelt and bay shrimp were killed in lagoons in San Mateo County, California, following application of Princep 80W to control algae. The legality of use for this incident was listed as "misuse". A sample of top smelt contained 0.2 ppm of simazine. The certainty index for this incident (#B0000-216-18) is highly probable.

On August 13, 1980, approximately 200 mullet, 50 menhaden, 25 croaker, 25 pinfish, 25 flounder, 25 sea trout, and 25 bass were killed, two days after application of simazine to a water body in Hilton Head, South Carolina. The legality of this use was cited as "undetermined". Fish tissue residues were not measured; however, simazine concentrations of 232 ppm were measured in the surface water two days after application. According to the incident report, fish were gulping air at the surface, indicating that a deficiency in dissolved oxygen (DO) may have attributed to the fish kill. The certainty index for this incident (#B0000-502-10) is possible.

On April 7, 1982, 12 mullet were killed in Beaufort County, South Carolina, following application of simazine to a lake. Fish tissue residues were not measured. The certainty index for this incident (#B0000-300-31) is probable. The legality of this use was reported as "undetermined".

On May 19, 1989, 75 fathead minnow, three yellow perch, one black bullhead catfish, and an unknown number of northern pike were killed in Holt County, Nebraska. Simazine use along railroad tracks, two days prior to the fish kill, was identified as the cause. According to the report, spray drift from a Princep application entered the pond, killed the algae, and subsequently caused low DO. Conditions of low DO in the pond are likely to have caused the fish kill. Fish tissue residues were not measured. The certainty index for this incident (#I000598-011) is unlikely.

On July 11, 1990, an unknown number of dead bluegills and channel catfish were reported in Buffalo County, Nebraska. Simazine use on corn was assumed to be the cause of this incident. No residue analysis of fish tissue was conducted. The certainty index for this incident (#I000598-015) is unlikely.

On March 7, 1992, an incident was reported in Tennessee associated with a simazine-treated pond. The legality of this use was reported as "registered use", although the size

of the pond was not reported. The certainty index of this incident (#I005895-026) is listed as probable.

On June 24, 1993, a large fish kill was reported following simazine treatment of a lake in Alameda County, California. The legality of this use was reported as "registered use", although the size of the lake was not reported. Aquazine was applied at 13 lb ai/A to control widgeon grass. Approximate fish kills estimates include 1,000 smelt, 1,000 bullheads, 1,000 sticklebacks, and 100 striped bass. Fish tissue residues were not measured. According to the incident report, it is likely that the fish kill was caused by a combination of hot ambient water and oxygen deficiency in the lake. The certainty index for this incident (#I003249-010) is probable.

An unknown number of fish were killed on September 14, 1994 in a California incident related to the use of simazine in a pond. Tissue analysis was not conducted. The legality of this use was reported as "registered use", although the size of the pond was not reported. The certainty index for this incident (#I005895-027) is probable.

On June 14, 1995, an unknown number of fish were killed in Reny, Michigan following application of simazine to a pond for weed control. The legality of use for this incident was listed as "misuse". Fish tissue residues were not measured. The certainty index for this incident (#I005895-402) is listed as probable.

K.2 Plant Incidents

Three simazine incidents had been reported for terrestrial plants at the time of the simazine CRLF risk assessment (2007). In the first incident, water from a simazine-treated swimming pool affected a section of lawn grass. The certainty index for the lawn incident (# I003567-001) is "highly probable." Both of the remaining two incidents occurred on May 9, 2000, in a corn field in Virginia (#I012366-022 and #I12366-023). Following aerial broadcast application of simazine and atrazine, plant damage was observed to approximately 130 acres of corn. Reported observations of corn plant damage included shortened internodes, and reduced root structure, plant height and ear production, which led to a reduction in the final yield of corn. The certainty index for both incidents was reported as "unlikely."

One new plant incident was found in the 2010 EIIS query involving damage to corn and hay (#I016790-007) in New York after aerial spray. The acreage damaged was not reported and the certainty index reported as "possible."

K.3 Uncertainties Related to the Use of Incident Information from the Ecological Incident Information System

Incident data are used in risk assessments to provide evidence that the risk predictions from the screening level assessment are supported by actual effects in the field. Incident reports submitted to EPA since approximately 1994 have been tracked by assignment of incident numbers in an Incident Data System (IDS), microfiched, and then entered to a

second database, the Ecological Incident Information System (EIIS). Additionally, there is an on-going effort to enter information to EIIS on incident reports received prior to establishment of current databases. Incident reports are not received in a consistent format (*e.g.*, states and various labs usually have their own formats), may involve multiple incidents involving multiple chemicals in one report, and may report on only part of a given incident investigation (*e.g.*, residues).

Incidents entered into EIIS are categorized into one of several certainty levels regarding the likelihood that a particular pesticide is associated with the incident: highly probable, probable, possible, unlikely, or unrelated. In brief, "highly probable" incidents usually require carcass residues and/or clear circumstances regarding the exposure. "Probable" incidents include those where residues were not available and/or circumstances were less clear than for "highly probable." "Possible" incidents include those where multiple chemicals may have been involved and it is not clear what the contribution was of a given chemical. The "unlikely" category is used, for example, where a given chemical is practically nontoxic to the category of organism killed and/or the chemical was tested for but not detected in samples. "Unrelated" incidents are those that have been confirmed to be not pesticide-related.

Incidents entered into the EIIS are also categorized as to use/misuse. Unless specifically confirmed by a state or federal agency to be misuse, or there was very clear misuse such as intentional baiting to kill wildlife, incidents are not typically considered misuse.

The number of documented kills in EIIS is believed to be a small fraction of total mortality caused by pesticides. Mortality incidents must be seen, reported, investigated, and have investigation reports submitted to EPA to have the potential for entry into the database. Incidents often are not seen, due to scavenger removal of carcasses, decay in the field, or simply because carcasses may be hard to see on many sites and/or few people are systematically looking. Poisoned animals may also move off-site to less conspicuous areas before dying. Incidents may not get reported to appropriate authorities capable of investigating the incident for a variety of reasons including the finder may not know of the importance of reporting incidents, may not know who to call, may not feel they have the time or desire to call, or may hesitate to call because of their own involvement in the kill. Incidents reported may not get investigated if resources are limited or may not get investigated thoroughly, with residue analyses, for example. Also, if kills are not reported and investigated promptly, there will be little chance of documenting the cause, since tissues and residues may deteriorate quickly. Reports of investigated incidents often do not get submitted to EPA, since reporting by states is voluntary.

Furthermore, the database relies heavily on registrant-submitted incident reports, and registrants are currently only required to submit detailed information on 'major' ecological incidents, while 'minor' incidents are reported aggregately.

Based on the 40 CFR (§159.184 Toxic or adverse effect incident reports), an ecological incident is considered 'major' if any of the following criteria are met:

Fish or wildlife:

(A) Involves any incident caused by a pesticide currently in Formal Review for ecological concerns.

(B) Fish: Affected 1,000 or more individuals of a schooling species or 50 or more individuals of a non-schooling species.

(C) Birds: Affected 200 or more individuals of a flocking species, or 50 or more individuals of a songbird species, or 5 or more individuals of a predatory species.

(D) Mammals, reptiles, amphibians: Affected 50 or more individuals of a relatively common or herding species or 5 or more individuals of a rare or solitary species.

(E) Involves effects to, or illegal pesticide treatment (misuse) of a substantial tract of habitat (greater than or equal to 10 acres, terrestrial or aquatic).

Plants:

(A) The effect is alleged to have occurred on more than 45 percent of the acreage exposed to the pesticide.

All other ecological incidents are considered 'minor' and only need to be aggregately reported. 'Minor' incidents reported by the registrants are not included in the EIIS database. Therefore, for example, an incident could affect 900 fish, 150 birds, 45 mammals, and 40% of an exposed crop and not be included in the EIIS database [unless is it reported by a non-registrant (*e.g.*, an incident submitted by a state agency – which are not systematically collected)]. Therefore, because the number of documented kills in EIIS is believed to be a small fraction of total mortality caused by pesticides, absence of reports does not necessarily provide evidence of an absence of incidents.