Attachment 1B

EXPLANATION FOR COLUMN E LISTING

ICD: 9192 **Registration Number:** 93-R-0433

Animal Study Proposal Title: Secondary Toxicity of Diphacinone in California Ground Squirrels.

Number and Species of Animals Listed in Column E:
Species: Squirrel Number: 48

Brief description of project including reason(s) for species selection:
The primary objectives of this study are to determine if residual concentrations of Rodent Bait Diphacinone Treated Grain (0.005%) vary in California ground squirrels based on spot treatment, broadcast, or bait station applications and to determine efficacy of spot treatment, broadcast, or bait station applications of Rodent Bait Diphacinone Treated Grain (0.005%) using both ground squirrel counts and radiotransmittered ground squirrels to determine if the two methods provide similar results.

California ground squirrels (Otospermophilus spp.) cause tremendous damage to agricultural lands, residential areas, and natural ecosystems. This damage includes consumption of plants or plant parts leading to direct mortality of high dollar crops or landscape plants; consumption of nuts, fruits, and vegetables intended for harvest; damage to dikes and levees that could pose a substantial hazard to human-health and result in massive economic losses; and human-health risks associated with zoonotic diseases. First-generation anticoagulants (e.g., diphacinone and chlorophacinone) are a common tool used to manage ground squirrels. Three application strategies are allowable for use when distributing these baits to ground squirrels: 1.) spot treatment, 2.) broadcast application, and 3.) bait stations. Spot treatments involve spreading a designated amount of bait (usually around 1/3 cup) over a 40–50 square foot area around burrow entrances, while broadcast applications involve the use of a seed spreader to distribute bait over a wide area. Both approaches take advantage of the ground squirrels foraging ability to pick up relatively small amounts of grain over broad areas. Spot treatments are usually used for small areas, while broadcast applications are used over larger areas. Bait stations are used when nontarget access to bait needs to be minimized. Bait stations house bait within a device that limits access to species smaller than the opening of the station. All treatment options have proven highly effective (Salmon et al. 2007, Whisson and Salmon 2009).

Ground squirrels chosen as they are the species of interest. Ground squirrels are the agricultural field pest for which anticoagulants most commonly used for.

This is an operational pest control project for which effective control of California ground squirrels is warranted given their status as pests in crop areas, rangeland, and pastures, and the damage their burrows can cause to livestock and agriculture equipment. Additionally, ground squirrels are known to be a vector of diseases that can infect humans.

Justification for unrelieved pain or distress:

Diphacinone is an anticoagulant rodenticide that causes the animal to bleed to death internally. This will cause some discomfort and potentially pain in the animal.

Monitoring of ground squirrels will be impractical and essentially impossible; therefore, the above-listed effects cannot be ameliorated or alleviated. Moribund ground squirrels will not be euthanized given that such animals can sometimes recover from intoxication. Euthanizing moribund ground squirrels could artificially inflate efficacy values, potentially rendering the study less accurate.

For tests of products claimed to kill vertebrate pests, death is the response that must be assessed as it is the endpoint claimed on the label and desired by the user. In efficacy studies involving rodenticide toxicants, it is fundamental that observations of animals continue until the animal succumbs completely to the poison (i.e., dies) or recovers.

Federal regulations requiring procedure:
The U.S. EPA requires, as a condition of registration for pesticide products labeled for their control, field efficacy data on pests identified as public health concerns (for the purpose of this study, that pest is identified as the California ground squirrel). However, little is known about the residual levels of these anticoagulants in intoxicated rodents, if this varies via application strategy, if time to death varies via application strategy (shorter time to death equates to less secondary toxicity risk), what proportion of ground squirrels die above ground (i.e., those that die below ground are considered unavailable to most scavengers), and if intoxicated ground squirrels exhibit different behaviors (e.g., less vigilant) that make them more susceptible to predation. This information is strongly needed given increasing scrutiny on the use of anticoagulant rodenticides that is driven by concerns about secondary toxicity of predators and scavengers from consuming intoxicated rodents (e.g., Assembly Bills 2596 and 1687 seeking to ban anticoagulants from many uses statewide). Therefore, the primary purpose of this study is to determine how diphacinone (most common anticoagulant used as field rodenticide) bait application strategies impact residual levels of this anticoagulant in ground squirrels, as well as to determine the availability of intoxicated ground squirrels to predators/scavengers.