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TO: CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD

SUBJECT: WASTE TIRES, MOSQUITOES, AND PUBLIC HEALTH

The California Department of Health Services (DHS) is requesting that the \$350,000 currently allocated to DHS and the Mosquito and Vector Control Association of California in year 2005-06 of the Five-Year Plan for the Waste Tire Recycling Management Program (revised plan for fiscal years 2003/04 through 2007/08) be maintained.

As stated in the initial proposal submitted by DHS (January 23, 2003), DHS plans to 1) obtain information on mosquito production in waste tires, and 2) integrate that information into public education materials and effective mosquito management techniques. It is anticipated that implementation of this proposal will result in a reduction in the number of tires that are discarded improperly because Californians are concerned about protecting their health and comfort, and minimizing their risk of getting sick from West Nile virus.

Background

An estimated three million used tires remain stockpiled at various locations throughout California. When water collects in these waste tires, an excellent habitat is created for the immature, aquatic stages of the mosquito to develop. Based on preliminary surveillance data, several of California's 50 species of mosquitoes breed in tires and emerge to infest surrounding areas, bite people and animals, and potentially spread disease.

Of immediate concern is the potential role of waste tires in the further spread and establishment of West Nile virus (WNV) in California. This mosquito-borne virus was first detected in the United States in 1999 in New York City and has since spread to 48 states. The virus was first detected in California in Imperial County in July, 2003, and by year's end, had spread to six southern California counties. Nationally in 2003, almost 10,000 human cases with 264 deaths were reported, including three cases from California. In 2004, WNV has spread from southern California to virtually all regions of

the state. To date, WNV has been detected in 56 of California's 58 counties and almost 600 human cases have been identified; sixteen people have died. WNV also severely affects horses (almost 300 cases in California to date in 2004; half of the cases have been fatal) and birds (over 150 species infected, including endangered species). WNV is carried by several species of mosquitoes, including those that develop in tires. In addition to WNV, there are also several other mosquito-borne viruses, such as St. Louis encephalitis and western equine encephalitis viruses, that are currently found in California and provide an ongoing disease threat.

Tires can also play a role in the introduction, spread, and establishment of exotic mosquito species. In 2001, the Asian tiger mosquito, an important transmitter of human viruses in Asia, was introduced into California from China. Despite eradication efforts, a cryptic population was discovered in discarded tires in Los Angeles in 2003 and in an Orange County neighborhood in 2004.

Waste tires pose a public health threat. To minimize this threat, surveillance and educational activities need to be conducted by DHS, in collaboration with the Mosquito and Vector Control Association of California (MVCAC) and local agencies, as described below.

Objectives

1. *Enhance our knowledge regarding mosquito production in waste tires and integrate this information into a comprehensive management program to be conducted by local agencies.*

Information on mosquito production in waste tires in California is limited. Although mosquitoes are known to breed in tires, comprehensive surveillance needs to be conducted to determine: 1) which mosquito species are found in tires, 2) the relative abundance of tire-breeding mosquito species, and 3) how mosquito abundance and species composition are influenced by regional and seasonal climatic and ecologic conditions. Correlating mosquito abundance and species composition with climatic and ecologic conditions throughout the state will enable local mosquito and vector control districts to target their control efforts against mosquitoes in waste tires. For instance, if production of an important disease-carrying mosquito peaks in April in Central Valley agricultural regions, then mosquito surveillance and control efforts need to be intensified at that time in and around agriculture lands. Targeted mosquito control uses resources efficiently while protecting and promoting public health.

DHS proposes to coordinate mosquito surveillance in waste tires with approximately 50 local mosquito and vector control agencies. One staff person is needed to provide

oversight, coordination, consultation, and training to local agencies. Specifically, the following activities will be conducted over a three-year period, beginning in 2005:

- Development of surveillance guidelines so that surveillance is conducted systematically statewide (for instance with the same sampling frequency and effort)
- Development of a geo-referenced surveillance database and determination of climatic and ecologic variables to be collected; development of field surveillance forms
- Dissemination of guidelines; consultation and training to local agencies; ongoing site visits
- Systematic collection and analysis of data received from local agencies using Geographic Information System software and techniques
- Dissemination of data and findings in reports, maps, and presentations; integration of findings into public education materials
- Development of mosquito management guidelines for local agencies based on findings to ensure resource use is maximized and public health is protected.

The MVCAC proposes to award two research grants to examine the role of waste tires in the transmission cycle of WNV and other mosquito-borne diseases, and to evaluate the efficacy and persistence of mosquito control products and techniques against tire-breeding mosquitoes. The DHS surveillance coordinator described above will also serve as liaison with the researchers to insure that information is shared and findings and recommendations are integrated when appropriate.

2. Develop a comprehensive, statewide education campaign to inform the public about the health hazards associated with waste tires and the steps that can be taken to reduce mosquito numbers, protect public health, and minimize their risk of getting WNV.

Although the public may be aware that waste tires pose a threat to the environment, few Californians associate waste tires with mosquitoes and the ensuing threat to the health of their families and neighbors. By developing and broadly disseminating information on the hazards associated with discarded tires, Californians will be more likely to dispose of tires properly to reduce their risk of annoyance and disease from mosquitoes.

DHS proposes to develop and disseminate educational materials regarding waste tires and public health, and provide recommendations on 1) proper disposal of waste tires, and, 2) when appropriate, proper storage or handling of tires to reduce mosquito production. DHS will develop and implement this program in collaboration with the MVCAC and local mosquito and vector control agencies. One staff person is needed to develop materials and coordinate the program. Specifically, the following activities will be conducted over a three-year period, beginning in 2005:

- Catalogue and evaluate existing public educational materials from California and elsewhere regarding waste tires and tire disposal
- Identify key public health and preventive messages
- Evaluate the potential effectiveness of various materials and methodologies to educate the public; incorporate a cost-benefit analysis into the decision making process and prioritize materials and methodologies
- Determine which segments of the California populace most frequently dispose of tires improperly, and target educational materials to these groups
- Develop public education materials, such as brochures, posters, and public service announcements
- Disseminate materials to local mosquito and vector control agencies and other public health agencies for production and printing with local contact information; target materials to those groups and regions of the state where waste tires pose the biggest problem
- Evaluate the effectiveness of the public education campaign through surveys and make modifications as needed.

Budget

A total of \$238,000 per year for 3 years is requested to carry-out the programs outlined above. The budget includes: \$147,000 for personnel (2 PYs) and \$91,000 for operating expenses (printing, postage, office automation, supplies, training, travel, and overhead). Funds would be dispersed through Public Health Foundation Enterprises (City of Industry, California).

Conclusion

The millions of waste tires in California pose a significant risk to public health and the environment. DHS requests that the California Integrated Waste Management Board maintain the funding currently allocated in the Five-Year Plan for the Waste Tire Recycling Management Program (revised plan for fiscal years 2003/04 through 2007/08). The proposed funding of \$350,000 to DHS and MVCAC for three years beginning in 2005-06 will serve to minimize the threat posed by mosquitoes to human health and comfort, especially in light of the recent spread and establishment of West Nile virus in California. Communities throughout the state will benefit by implementation of this proposal and a subsequent decrease in the number of waste tires on and around their homes and businesses.

Contact Information

For additional information, please contact Vicki Kramer, Ph.D., Chief of the DHS Vector-Borne Disease Section at (916) 552-9748 or vkramer@dhs.ca.gov.