

**PESTICIDE ACTION PLAN ADDENDUM**

1. **Target Areas:** Several maps of major water bodies the District could discharge to have been enclosed. A map of the District's boundaries was previously sent. Surface waters and waters of the U.S. within the boundaries of the Kern Mosquito and Vector Control District are listed below.

In prior years, the District has applied larvicides and/or adulticides directly to or in the vicinity of the following water bodies:

- Kern River (Map A-1)
- Kern River Flood Control Channel (Map A-2)
- City of Bakersfield's "2800" acre groundwater recharge area (Map A-3)
- Kern Country Water Agency ground water recharge area (Map A-3)
- Kern Water Bank Authority ground water recharge area (Map A-3)
- Kern National Wildlife Refuge (Map A-4)

In prior years, the District has applied larvicides and/or adulticides directly to or in the vicinity of canals, ditches or other conveyance facilities owned or controlled by:

**Name of Conveyance**

- Arvin/Edison Canal
- Beardsley Canal
- Calloway Canal
- Lerdo Canal
- Kern Island Canal
- Farmer's Canal
- Buena Vista Canal (Bakersfield)
- East-Side Canal
- Stine Canal
- (Map B-1 and B-2)

**Name of Owner/Operator**

- Arvin-Edison Water Storage District
- North Kern Water Storage District
- North Kern Water Storage District
- North Kern Water Storage District
- Kern Delta Water Storage District
- Kern Delta Water Storage District
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**2. Discussion of the factors influencing the decision to select pesticide applications for mosquito control.** Please see the *Best Management Practices for Mosquito Control in California* specifically pages 26 through 34. In regard to mosquito control, each property is unique whether it is located in a residential or a rural area and therefore, each area can have its own unique mosquito-breeding situations. As with any source of mosquito breeding, the Kern Mosquito & Vector Control District's first goal is to look for ways to eliminate the source, or if that is not possible, for ways to reduce the potential for mosquito emergence. If other control methods are not feasible, than pesticides will be used to control mosquitoes in the larval or adult stage. When pesticides must be used, the District relies upon larvicides for the vast majority of its applications.

While the District does consider and evaluate the use of other methods to control mosquitoes rather than apply pesticides, some methods have distinct limitations in their effectiveness. For example, mosquito fish (*Gambusia affinis*) cannot control mosquitoes in locations where thick vegetation or shallow water prevents them from preying upon mosquito larvae. Mosquito fish cannot survive in polluted water and so they cannot be used in types of situations such as some sewage treatment facilities. Mosquito fish are useful in permanent or semi-permanent water bodies, but in places where the water is only temporary, fish will have to be continually reintroduced which reduces their effectiveness. In the early spring when the temperatures are cool, *Gambusia* reproduction is at a minimum, so the number of fish available is limited. In seasons of above-normal rainfall or snowpack, there are not sufficient numbers of *Gambusia* available for every situation. The District does not have the financial resources to raise mosquito fish, so the District must capture *Gambusia* from local sources and transfer them to areas that require attention. In years of below-normal precipitation, *Gambusia*-breeding sources are few, so the fish available for stocking are limited.

Another method used to control mosquitoes besides the application of pesticides involves physical control such as vegetation control and/or removal of soil in order to make an area deeper which impedes vegetative growth and enables mosquito fish and other predators of mosquitoes to flourish. Unfortunately, physical control cannot be utilized in some areas because of the presence of endangered species. In other situations, physical control will not completely control mosquito breeding to a sufficient level, so pesticide applications must be used for more effective results.

**8. Evaluation of available BMPs to determine if there are feasible alternatives to the selected pesticide project that could reduce potential water quality impacts.** Please see the *Best Management Practices for Mosquito Control in California* pages 5 through 20. As was mentioned previously, the District does not take the application of pesticides lightly. Besides potential environmental impacts, pesticide applications are expensive and time consuming. Factors noted in "Item 2" help evaluate feasible alternatives to pesticide applications in order to reduce potential water quality impacts. Upon locating a mosquito-breeding source, District technicians evaluate whether the source is substantial enough to require treatment.

8. (continued) The evaluation takes into consideration: the number of larvae or adult mosquitoes present; physical size of the breeding source (e.g. bucket or 10 acre basin); the Genus and species of mosquito present (some mosquito types are more efficient vectors of disease); the amount of encephalitis virus activity currently present; and the proximity to populated areas. In some situations, the water source might actually dry up before substantial numbers of adult mosquitoes emerge which would preclude the need for a pesticide application.

10.b **Identify target vector species to develop species-specific pest management strategies based on development and behavioral considerations for each species.** The lower elevations of Kern County are endemic to West Nile virus. This District has had human cases of WNV since 2004 which includes fatalities. This District considers West Nile virus a serious public health threat and will, therefore, make applications of pesticides in a responsible manner in order to protect residents from this disease.

Culex tarsalis and Culex quinquefasciatus mosquitoes are the major disease-carrying mosquitoes within District boundaries. Culex tarsalis mosquitoes are found mainly in rural, ag-related locations while quinquefasciatus are normally associated with urban locations. Aedes nigromaculis and Aedes melanomon are species of mosquitoes that are active day-biters (bite during daylight hours) and can be such a nuisance that residents must seek shelter indoors or apply repellent. Seeking shelter indoors is not a solution for individuals who must work outdoors.

The District uses several criteria to determine when applications of pesticides are necessary. The District sets out and collects adult mosquito abundance traps (around 117) on a weekly basis. The District utilizes 3 different types of traps: carbon dioxide-baited (CO<sub>2</sub>), Gravid traps (collects blood-fed adult female mosquitoes) and New Jersey Light traps. The decision to make a pesticide application is based upon: mosquito abundance numbers, density of mosquito larvae, resident complaints, proximity of breeding source to residential (populated) areas, size of breeding source and the level of encephalitis virus activity. Obviously, a collection consisting of a high number of Culex tarsalis from a remote location 30 miles from the nearest residential area would not receive the attention that a "high" count from a trap site one mile from a residential area would receive.

Since West Nile virus is endemic to Kern County, the District will generally implement adult mosquito control operations when populations of Culex tarsalis or Culex quinquefasciatus adult mosquitoes exceed 10 females per trap night. The District will generally initiate larvicide applications when the immature mosquito population reaches 0.1 larvae per dip.

10.b (continued) The District relies upon the application of target-specific larvicide (methoprenc, Bacillus thuringiensis, Bacillus sphaericus) in its mosquito control program. Applications of materials to control adult mosquitoes are only conducted in situations where other control strategies have not been effective or in emergency situations where West Nile virus activity is extremely high.

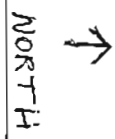
Please see the *Best Management Practices for Mosquito Control in California*, pages 42 through 45, and the *California Mosquito-borne Virus Surveillance and Response Plan*, pages 3 through 17.

**11.b Examination of Alternatives. Dischargers shall continue to examine alternatives to pesticide use in order to reduce the need for applying larvicide that contain temephos and for applying adulticides. Such methods include applying pesticides only when vectors are present at a level that will constitute a nuisance.** The District does not apply larvicide that contain temephos. Applying adulticides is not the District's control method of choice. As has been previously stated, the District relies upon the use of target-specific larvicide in its mosquito control program. Controlling mosquitoes in the immature stages (larval stages) involves treating a smaller area because adult mosquitoes have not dispersed to infest a wider area.

The District practices Integrated Pest Management which combines biological, chemical, legal abatement, natural and physical control methods in a manner that minimizes environmental risks. Besides environmental concerns, target-specific larvicide are expensive (much more expensive than organophosphate materials), therefore, the District does not make applications unless they are necessary because of financial concerns.

Please see response to item number 2a.

# Kern County Online Mapping

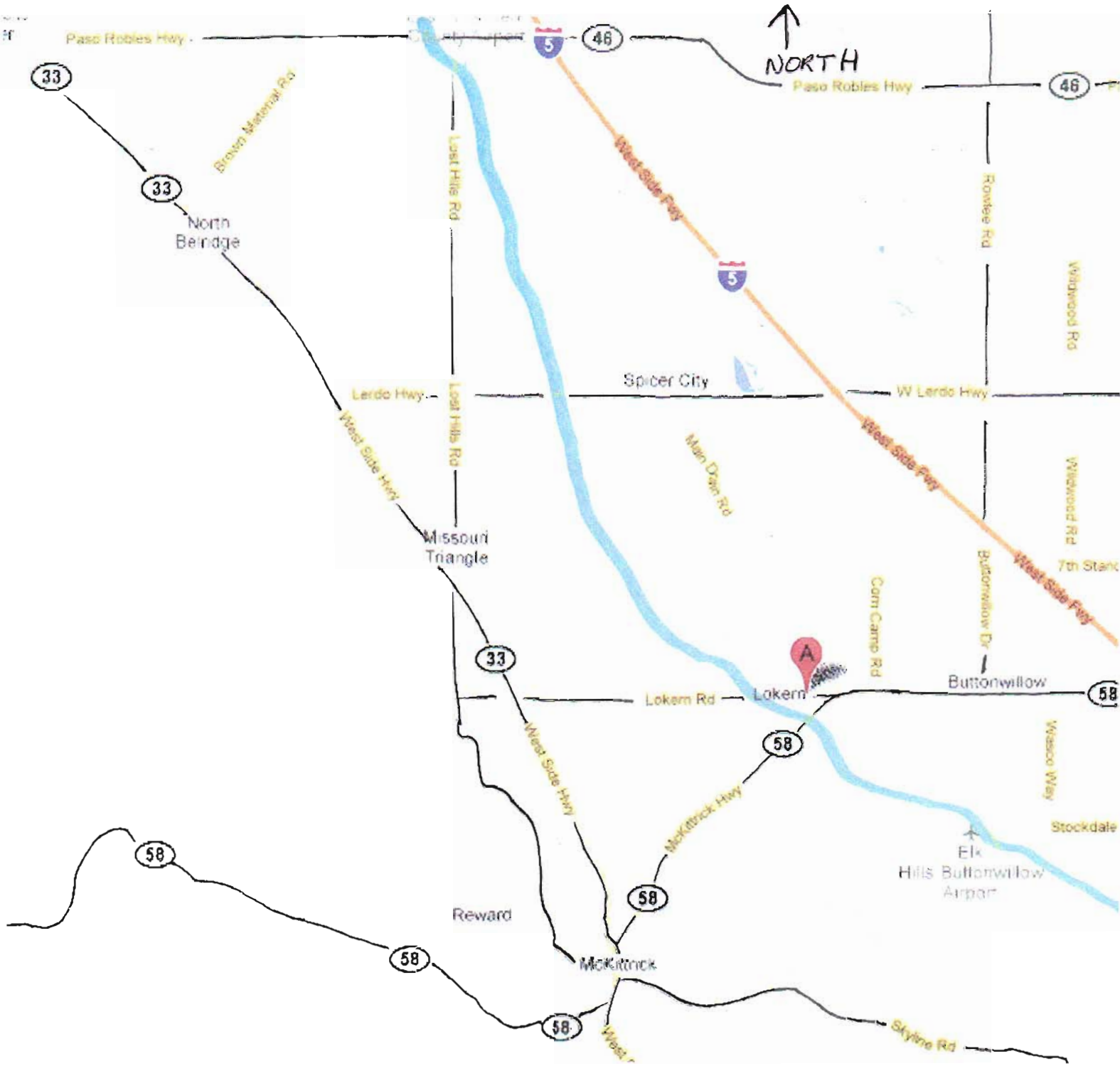


 = Kern River (Map A-1)

Kern Mosquito & Vector Control District  
4705 Allen Road, Bakersfield 93314

\*certain areas in the River sometimes require larvicide treatments.

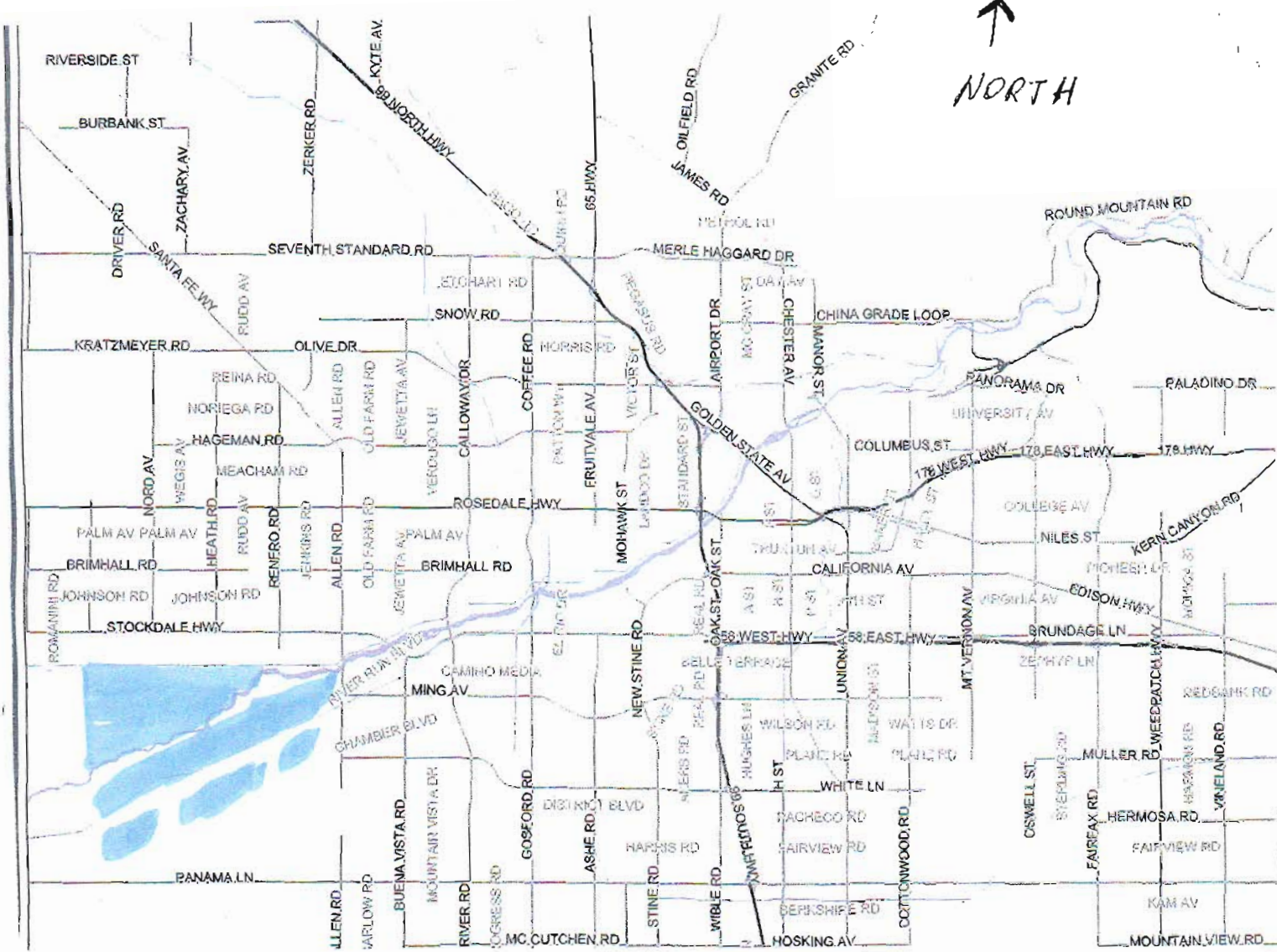




**■ = Kern River Flood Control Channel (Map A-2)**

Kern Mosquito & Vector Control District  
 4705 Allen Road, Bakersfield 93314

\*certain areas in the Flood Control Channel sometimes require larvicide treatments during seasons of above-normal rainfall and/or snowpack.



↑  
NORTH

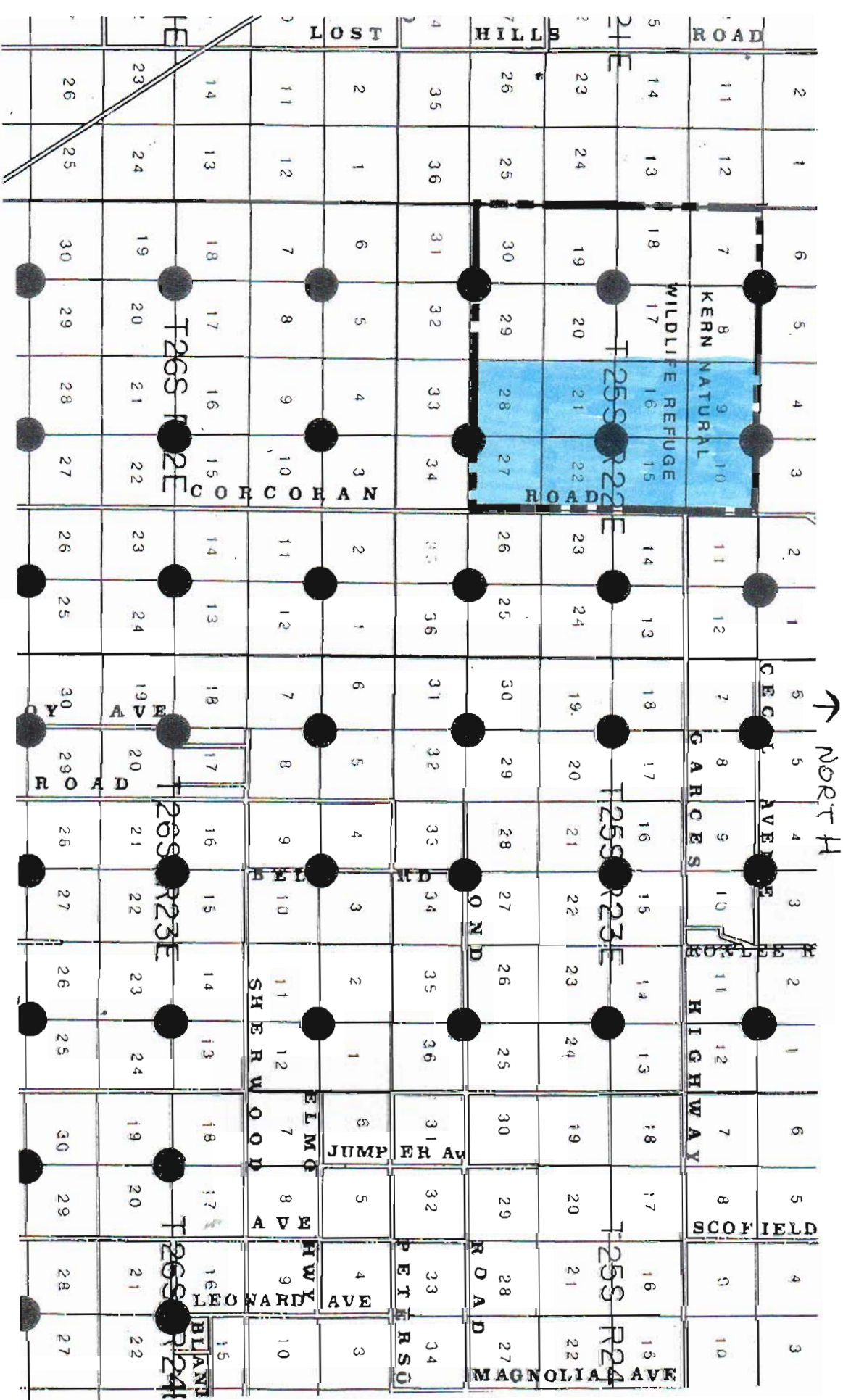


**= Ground Water Recharge Areas**

(Map A-3)

Kern Mosquito & Vector Control District  
4705 Allen Road, Bakersfield 93314

\*certain areas north and south of the Kern River can sometimes be used for "recharging" the underground aquifer.



= Kern National Wildlife Refuge

(Map A-4)

Kern Mosquito & Vector Control District  
4705 Allen Road, Bakersfield 93314

\*certain areas on the Refuge sometimes require larvicide treatments during the spring and/or fall for water fowl.





= **Calloway Canal** (Map B-1)

Kern Mosquito & Vector Control District  
4705 Allen Road, Bakersfield 93314

\*certain non-maintained areas on the Canal  
can sometimes require larvicide treatments  
when water is available.

# Kern Mosquito & Vector Control District

4705 Allen Road  
Bakersfield California 93314  
(661) 589-2744

Canals in the Bakersfield Metropolitan areas that have required "spot" treatments in the past. (Map B-2)

