ADDENDUM TO
Pesticide Application Plan (PAP) for the NPDES Vector Control Permit Application of the Solano County Mosquito Abatement District

1. Description of ALL target areas: surface waters and waters of the U.S. within Solano County, CA. Map of Solano County enclosed.

   In prior years, the District has either applied larvicides directlv to, Dr adulticides within the vicinity of the following water bodies:

   Lake Solano
   West fork of McCune Creek-tributary to Putah Creek
   Miller Canyon Creek-tributary to Putah Creek
   Putah South Canal
   Pleasant Creek, tributary to Putah Creek
   Southeast fork of McCune Creek-tributary to Sweeney Creek
   Gibson Canyon Creek-tributary to Sweeney Creek
   West fork of Sweeney Creek-tributary to Putah Creek
   English Creek-tributary to Putah South Canal
   Southeast branch of Sweeney Creek-tributary to Ulatis Creek
   Ulatis Creek-tributary to Main Prairie Slough
   Alamo Creek-tributary to Ulatis Creek
   Encinosa Creek-tributary to Alamo Creek
   Laguna Creek-tributary to Alamo Creek
   Hass Slough-tributary to Cache Slough
   Main Prairie Slough-tributary to Cache Slough
   Soda Springs-tributary to Laurel Creek
   Laurel Creek-tributary to McCoy Creek
   McCoy Creek-tributary to Hill Slough
   Ledgewood Creek-tributary to Peytonia Slough
   Union Creek-tributary to Hill Slough
   Dry Road Creek-tributary to Wildhorse Creek
   Wildhorse Creek-tributary to Green Valley Creek
   Dan Wilson Creek-tributary to Green Valley Creek
   Green Valley Creek-tributary to Cordelia Slough
   Suisun Creek-tributary to Suisun Slough
   Boynton Slough-tributary to Suisun Slough
   Well Slough-tributary to Suisun Slough

Shelldrake Slough-tributary to Suisun Slough
Volanti Slough-tributary to Suisun Slough
Denverton Slough-tributary to Nurse Slough
Loco Slough-tributary to Nurse Slough
Hastings Slough-tributary to Nurse Slough
Nurse Slough-tributary to Little Honker Bay
Hornan Slough-tributary to Suisun Slough
Hastings Slough-tributary to Montezuma Slough (se)
Suisun Slough-tributary to Grizzly Bay (upper portion of Suisun Bay)
Montezuma Slough (sw-tributary to Grizzly Bay)
Montezuma Slough (se-tributary to Sacramento River)
Goodyear Slough
Southampton Bay
North Rindler Creek- tributary to Lake Chabot
Lake Chabot- drains to Chabot Creek
Central Rindler Creek- tributary to Lake Chabot
South Rindler Creek- tributary to Lake Chabot
Turner Creek-tributary to Lake Chabot
San Pablo Bay

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

California Department of Fish and Game properties in the Suisun Marsh
Collinsville Levee Maintenance District
Solano Irrigation District
2068Reclamation District
Main Prairie Water District
Rural North Vacaville Water District
Private Duck Clubs in the Suisun Marsh
Reclamation District No. 501 (Ryer Island)
Reclamation District 536 (Egbert Tract)
Reclamation District 1607 (Van Sickle Island)
Reclamation District 2034
Reclamation District 2060 (Hastings Tract)
Reclamation District 2068
Reclamation District 2084

Reclamation District 2093 (Liberty Island)
Reclamation District 2098
Reclamation District 2104 (Peters Pocket Tract)
Reclamation District 2112 (Schafer Pintail)
Reclamation District 2127 (Simmons Wheeler)
Reclamation District 2129 (Frost Lake)

circulation ditches, repair of existing water control structures, removal of debris, weeds and emergent vegetation in natural channels, clearance of brush for access to streams tributary to wetland areas and filling of existing, non-functional water circulation ditches to achieve required water circulation dynamics and restore ditched wetlands. The District contracts with another agency having suitable equipment and expertise to perform the necessary maintenance on existing drainageways.

Examples areas within the District where maintenance has been done within the last 3 years are:

(1) Removal of vegetation and sediment from 1,700 ft. of "Type A ditches" (small ditches up to 18 x 24 inch max.) lateral circulation ditches located 3.5 miles west of Mare Island in Vallejo and south ofHwy. 37, along the San Pablo Bay marsh in order to improve water circulation and reduce mosquito production.
(2) Removal of vegetation and sediment from 4,300 ft. of "Type A ditches" located on the south end of Mare Island near the Carquinez Strait and along the San Pablo Bay marsh in order to improve water circulation and reduce mosquito production.

Annual meetings are held with the California Department of Fish and Game (Grizzly Island/Suisun Marsh) prior to the upcoming waterfowl season to discuss the District's findings from the previous season and any subsequent recommendations for maintenance and "cultural practices" such as water management to help reduce mosquito production problems.

A similar meeting is held with the Suisun Resource Conservation District to discuss the District's recommendations for maintenance and water management practices on seasonal wetland habitat that is privately owned in the Suisun Marsh.
Recommendations were made to one Reclamation District that involved the removal of excessive vegetation from supply ditches, disking areas with excessive picldeweed cover and the creation of a swale which in combination should facilitate the drain-down of a significant portion of the ponds. This in turn is intended to reduce the amount of acreage requiring pesticide treatment.

District staff reviews proposals for wetlands construction to assess their impact on mosquito production. Any necessary comments are made and appropriate guidelines are submitted regarding design and maintenance that will eliminate or greatly reduce the production of mosquitoes.

2. Please see the following enclosed references that identify the factors influencing the decision to select pesticide applications for vector control:

In order to access documents (a)-(e) it is necessary to first go to the California Department of Public Health Website first by typing : http://westnile.ca.gov/

Then choose The California Department of Public Health West Nile Virus/Resources/

a. **Best Management Practices for Mosquito Control in California**. **2011.** California Department of Health Services, Vector-Borne Disease Section
http://westnile.ca.gov/
The California Department of Public Health West Nile Virus/Resources/Mosquito Control and Repellent Information/Best Management Practices for Mosquito Control in California-June 2011.pdf

b. **California Mosquito-Borne Virus Surveillance & Response Plan. 2011.** California Department of Health Services, Vector-Borne Disease Section
http://westnile.ca.gov/
The California Department of Public Health West Nile Virus/Resources/Response Plans and Guidelines/2011 California Mosquito-borne Virus Surveillance and Response Plan.pdf

c. **Operational Plan for Emergency Response to Mosquito-Borne Disease Outbreaks. 2010**. California Department of Health Services, Vector-Borne Disease Section.
http://westnile.ca.gov/
The California Department of Public Health West Nile Virus/Resources/Response Plans and Guidelines/2011 California Mosquito-borne Virus Surveillance and Response Plan.pdf

d. **Overview of Mosquito Control Practices in California. 2008.** California Department of Health Services, Vector-Borne Disease Section
http://westnile.ca.gov/
The California Department of Public Health West Nile Virus/Resources/Mosquito Control and Repellent Information/Overview of Mosquito Control Practices in California.pdf

e. **Epidemic/Epizootic West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control. 2003.** U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
http://westnile.ca.gov/
The California Department of Public Health West Nile Virus/Resources/Response Plans and Guidelines/CDC Guidelines for WNV Surveillance, Prevention, and Control.pdf

2.

f. **Pesticides and Public Health: Integrated Methods of Mosquito Management. 2001.** U.S. Environmental Protection Agency. **(http://wwwnc.cdc.gov/eid/article/7/1/70-0017_article.htm)**

g. Solano County Mosquito Abatement District Integrated Management Practices. 2011 (previously included as attachment g.)

3. **Pesticide products or types that may be** used and the method in which they may be applied:

Pesticide Product	EPA Reg. #	Method of Application
ADULTICIDES		
M.G.K. Pyrocide Mosquito Adulticiding Concentrate for ULV Fogging 7396	1021-1569	Ultra low volume (ULV), vehicle (ground) and aircraft (air)
Pyrenone 25-5 Public Health Insecticide	432-1050	ULV ground and air
Kontrol 4-4	73748-4	ULV ground and air
Scourge 18%+54%	432-667	ULV ground
Biomist 4%+12%	8329-34	ULV ground
Evergreen Crop Protection EC 60-6	1021-1770	ULV ground and air
Aquahalt Water-Based Adulticide	1021-1803	ULV ground
Pyrenone Crop Spray	432-1033	ULV ground and air

Pesticide Product	EPA Reg. #	Method of Application
ADULTICIDES (contin.)		
Prentox Pyronyl Oil Concentrate #525	655-471	ULV ground and air
Anvil 10+10 ULV	1021-1688	ULV ground and air
Prentox Pyronyl Crop Spray	655-489	ULV ground and air
LARVICIDES		
Vectobac 12AS Biological Larvicide	73049-38	ATV ground/hand/air
Vectobac G Biological Larvicide Granules	73949-10	ATV ground/hand/air
Vectolex-CG Biological Larvicide Granules	73049-20	ATV ground/hand/air
Vectolex-WSP Biological Larvicide	73049-20	hand
Teknar HP-D	73049-404	ATV ground/hand/air
Vectomax CG Biological Larvicide	73049-429	ATV ground/hand/air
Vectomax WSP Biological Larvicide	73049-429	hand
Vectomax G Biological Larvicide	73949-429	ATV ground/hand/air
Zoecon Altosid Pellets Mosquito Growth Regulator	2724-448	ATV ground/hand/air
Zoecon Altosid Liquid Larvicide Mosquito Growth Regulator	2724-392	ATV ground/hand/air
Zoecon Altosid XR Extended Residual Briquets	2724-421	hand
Zoecon Altosid XR-G	2724-451	ATV ground/hand/air
Zoecon Altosid SBG Single Brood Granule	2724-489	ATV ground/hand/air
FourStar Sustained Release 180 Day Microbial Briquets	83362-3	hand
Mosquito Larvicide GB-1111	8329-72	ATV ground/hand
BVA 2 Mosquito Larvicide Oil	70589-1	ATV ground/hand
Agnique MMF Mosquito Larvicide & Pupacide	53263-28	ATV ground/hand/air
Agnique MMF G	53263-30	ATV ground/hand/air

Natular 2EC	8329-82	ATV ground/hand/air
Natular G	8329-80	ATV ground/hand/air
Natular XRG	8329-83	ATV ground/hand/air
Natular XRT	8329-84	hand

4. Following is a general description of the types of application areas (also known as "Source Types" in Solano County that are being planned to be applied or may be applied:

Swimming Pool	Pasture Ditch	Valve Box
Ponds	Flooded Pasture	Waste/Sewer Pond
Water Trough	Strip Check Pasture	Roadside Ditch
Retention Basin	Sump	Depression/Swale
Manmade Pond	Tail Water Drain	Duck Club
Fish Ponds	Septic Tank	Tidal Marsh
Dredge Spoil Pond	Container	Reclaimed Marsh
Permanent Pond	Tires	Streams/Creeks
Alfalfa	Waterline Leak	Treehole
Row Crop	Electrical Box	
Contour Pasture	Catch Basin	

5. The other control strategies used and their limitations include:

A. Biological control

Biological control is the intentional use of natural predators, pathogens or parasites to reduce the size of target mosquito populations to tolerable levels. Biological control agents of mosquito larvae include predatory fish, predatory aquatic invertebrates and mosquito pathogens. Of these only mosquitofish are available in sufficient quantity for use in mosquito control programs. Natural predators may sometimes be present in numbers sufficient to reduce larval mosquito populations. Biological control is sometimes used in conjunction with selective bacterial or chemical insecticides. The use of biological control is a primary method of control if the use of other control methods presents environmental concern and current vector populations are low or tolerable. The use of biological control organisms and strategies is limited to those that have been researched and field-tested against target and non-target organisms. In addition, any biological control organism to be considered for use by the District will also be recognized and authorized by appropriate federal, state, and local agencies.

B. Legal abatement

Legal abatement is the process of preventing vectors through the enactment of legislation that enforces control measures or imposes regulations to prevent the production, introduction, or spread of pests and vectors. Legal abatement includes the use of federal, state and local guidelines and laws

designed to prevent the creation and/or harborage of pests and vectors. The District regularly enforces the California Health and Safety Code, which specifically addresses the creation and/or harborage of vectors and vector breeding sites.

C. Natural control

Natural control is a pest management strategy in which the environment is disturbed as little as possible. Reliance is placed on naturally occurring parasites, predators, and diseases to control vectors. One scientific definition of natural control is "…the maintenance of a fluctuating population density within definable upper and lower limits over a period by the combined effects of abiotic and biotic elements in the environment." Natural control is sometimes difficult to implement or assess due to the amount of man-made or manipulated vector sources found in the District. Natural control is advocated for sites that are remote and undisturbed, to the least amount practical, for the individual vector species being contemplated for control.

D. Physical control

Physical control, or habitat modification, is achieved by altering the major ecological components of the vector's environment associated with the establishment and production of the mosquito's immature stages. The primary operational objective of physical control is to reduce the vector carrying capacity of a site to preclude the use of control methods that would adversely impact the environment and wildlife. The District no longer performs any physical control work itself. When cleaning of existing drainageways becomes necessary, the work is performed by another agency having suitable equipment and expertise. Additionally, the District routinely reviews and comments on proposed projects within Solano County being considered by various public entities, thus providing opportunities to "design out" mosquito breeding conditions prior to construction and development.

Limitations to the usage of alternative larval control methods include:

- Mosquitofish may not be suitable due to water quality issues.

- In ponds that are seasonally flooded for waterfowl habitat mosquitofish have not been found to successfully control Aedes melanimon larvae due to the enormous number of eggs (previously deposited on damp soil or at the base of vegetation) that hatch synchronously when inundated.

- A lack ofresources for physical control or habitat manipulation, legal restrictions prohibiting the necessary improvements due to the presence of endangered species.

6. The amount and type of product needed and how this amount was determined is difficult to project on a prospective basis, however, the District can provide the amount and type of products used in 2010 as an estimate of what may be used in 2011 and future years. Below is the 2010 information:

Product Name	EPA REG. #	AMOUNT USED	# OF APPLICATIONS	ACRES TREATED
ADULTICIDES				
M.G.K. Pyrocide for ULV Fogging 7396	1021-1569	115.4086 gal	315	16,979.6561
Pyrenone 25-5 Public Health Insecticide	432-1050	1.4625 gal	2	215.1724
Biomist 4%+12%	8329-34	0.0500 gal	3	3.2000
Aquahalt Water-Based Adulticide	1021-1083	1.0938 gal	3	194.4533
LARVICIDES (see next page)				
LARVICIDES				
Vectolex-WSP Biological Larvicide	73049-20	5.9000 lb.	12	0.2937
Zoecon Altosid Pellets Mosquito Growth Regulator	2724-448	2,465.3720 lb.	169	821.7907
Zoecon Altosid Liquid Larvicide Mosquito Growth Regulator	2724-392	218.4689 gal.	114	6,991.0048
Zoecon Altosid XR Extended Residual Briquets	2724-421	281.4452 lb.	263	7.7397
Zoecon Altosid SBG Single Brood Granule	2724-489	1,470.00 lb.	4	210.0000
Mosquito Larvicide GB-1111	8329-72	240.5630 lb.	35	48.0300
Agnique MMF Mosquito Larvicide & Pupacide	53263-28	0.3852 gal	4	0.6360

7. Representative monitoring locations and justification for selecting these locations are provided in the MVCAC Coalition Monitoring Plan.

8. Items 2a. through 2g. (above) were used in the evaluation of available BMP's for the determination of feasible alternatives to selected pesticide applications that could reduce potential water quality impacts.
   2 a. pages 4-20 and 26-34
   b. pages 4-20 and 22-34
   c. pages 4-10 and 19
   d. pages 10-25
   e. pages 7-17 and 27-35
   f. pages 2- 4
   g. pages 5- 9

9. Items 2a. through 2g. (above) describe the BMP's to be implemented.
   2 a. pages 4-20 and 26-34
   b. pages 4-20 and 22-34
   c. pages 4-10 and 19
   d. pages 10-29
   e. pages 7-17 and 27-35

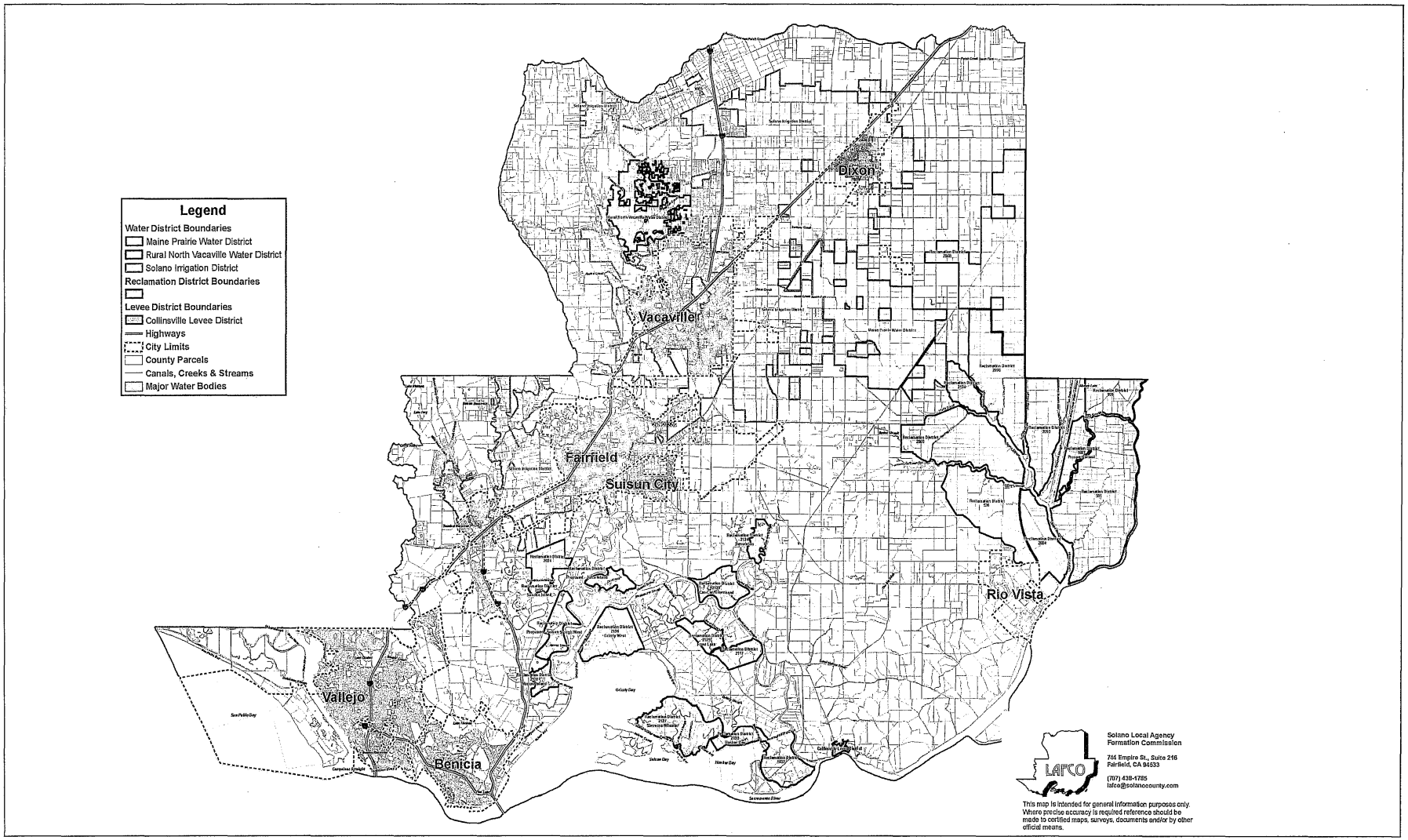
f. pages 2- 4
g. pages 4- 14

10. Prior to the first pesticide application covered under the permit that will result in a discharge of biological and residual pesticides to waters of the U.S., and at least once each calendar year thereafter prior to the first pesticide application for that calendar year the District will do the following for each vector management area:
    a. Utilize vector identification and surveillance techniques identified in the Best Management Practices for Mosquito Control in California (item 2.a. above-pages 4-20 and 26-34), the California Mosquito-Borne Disease Surveillance and Response Plan (item 2.b. above-pages 4-20 and 22-34) to identify vector species in the development of species-specific pest management strategies;
    b. Utilize the District's mosquito surveillance and control record keeping system (Access database), Department of Health's data sets to analyze existing surveillance data for the identification of new or unidentified sources of vector problems as well as areas that may have recurring vector problems.

11. The District will utilize the resources identified in 2a. pages 4-20 and 26-27, 2b. page 8, 2c. pages 4-10 and 19, 2d. pages 11-14, 2e. pages 30-32, 2f. page 2, and 2g. pages 6-9 (above) in the examination of the alternatives to pesticides. If there are no alternatives to pesticides, the District, to the extent practical, will use the least toxic pesticide necessary to control the target vector, and will only apply pesticides when vectors are present at levels identified in CDPH BMP's (item 2a. above, pages 26-34.) and CDPH Mosquito-Borne Disease Surveillance and Response Plan (item 2b. above, pages 9-15).

12. The District will ensure that all reasonable precautions are taken to minimize the impacts caused by pesticide applications, and will comply with all regulations related to pesticide application, mixing, storing, and transport. The District is signatory to a Cooperative Agreement administered by the California Department of Public Health (copy attached) regarding pesticides, and agrees to: 1) calibrate all application equipment, 2) seek assistance from the Solano County Agricultural Commissioner (SCAC) for the interpretation of pesticide labeling, 3) maintain records of each pesticide application for two or more years, 4) to submit monthly pesticide use reports to the SCAC. 5) to report to the SCAC and CDPH-VBDS any suspected adverse issues resulting from a pesticide application, 6) to certify and routinely train pesticide applicators, and 7) to be inspected by the SCAC to ensure that our activities are in compliance with the laws and regulations related to pesticide application.

13. Public notices specified in Section VIII.B. of the permit will be posted on the District's *website, www.solanomosquito.com.*



Source: Solano County LAFCO

NORTH NOT TO SCALE

Michael Brandman Associates

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Exhibit 1
Solano County Water, Irrigation, Reclamation, and Flood Management Agencies