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**ATTACHMENT 8****ECONOMIC ANALYSIS – FLOOD DAMAGE REDUCTION COSTS AND BENEFITS**

Tables 16, 11, and 12 are included in this attachment and the narrative below describes the flood damage reduction costs and benefits.

**I. Narrative Description of the Project's Economic Costs**

The Project's economic costs consist of costs contained in the project budget (Attachment 4), as well as annual administration, maintenance and replacement costs associated with the Ortega Reservoir Project. Maintenance and replacement costs are associated with removal of sediment accumulation, clearing, making adjustments or replacements to appurtenant measurement devices (as described in Attachment 6), and periodic inspections. Administration costs are associated with SMWD's management of annual maintenance and reporting realized benefits to DWR.

**II. Cost details for the Project**

Budget categories (a) through (h) are included in the cost details as described in Table 6.

**III. Narrative Description of All of the Project's Expected Flood Damage Reduction Benefits - *Estimates of Historical Flood Damage Data***

The entire region has been subject to higher flow rates from urbanization as a result of development. In fact, SMWD has experienced damage to existing pipeline right-of ways and RMV has established a permanent photo monitoring station to document post storm event erosion. Historic RMV accounts document the excessive surface and groundwater. Ongoing water quality monitoring associated with the San Juan Creek Watershed/Western San Mateo Creek Watershed Special Area Management Plan ("SAMP") and Southern Sub-region Natural Communities Conservation Plan ("NCCP") has documented the degraded water quality of both urban runoff and storm flows. Limited positive changes to the existing conditions have occurred through education of homeowner associations and golf courses on proper irrigation management and pesticide use.

December 2010 storms caused widespread erosion, exposing a concrete curtain that protects nearly all local critical utilities, and required emergency measures to protect against further damage. Exhibit A contains SMWD's FEMA report for such damage, and Exhibits B and C contain photos of the exposed utilities and erosion. The 2010 floods caused \$310,000 in damages, but the effects could have been catastrophic if the response to initial damages had been slower.

**IV. Estimates of Existing without-Project Conditions**

Infrastructure that is at-risk for unmitigated flows, wash out, and temporary removal from service include, but are not limited, to:

1. Electric Transmission lines that reinforce the electric grid in southeast Orange County
2. Sewer Forcemains

3. Reclaimed Water Lines
4. Various Municipal Water Lines

#### **V. Estimates of Existing With-Project Conditions**

The Ortega Reservoir would increase protection from 25-year to 100-year storm events by limiting stormwater flows and providing continuous access to critical utilities; those utilities included with, adjacent to, leading away from, serving, and associated with the Project site. It would also protect the local habitat from damage caused by erosion, thereby preventing the disturbance and potential relocation of local wildlife, and in particular, endangered species.

The benefits would be in addition to the flood control benefits provided by other regional projects given the existing size and projected growth of the Project area. The Project is located in the impact area of the Ranch Plan Planned Community's Planning Area 4. The Ranch Plan is a comprehensive community plan for Rancho Mission Viejo ("RMV"). Beginning in 1991, detailed scientific studies have been conducted in partnership with state and federal wildlife agencies and shaped by public input for the Ranch Plan. RMV created a balanced plan for the remaining **23,000 acres** based on these studies. RMV's comprehensive approach to land use planning is founded on more than 13 years of scientific data.

#### **VI. Description of Methods Used to Estimate Without- and With-Project Conditions**

With and without project conditions are based on discussions with the project engineer, Orange County Flood Control, various Project proponents, and SMWD, as well as information contained in the attached Exhibits described below.

#### **VII. Description of the Distribution of Local, Regional, and Statewide Benefits**

Benefits are primarily local in nature. However, protection of the critical utilities and avoidance of loss of service impacts thousands of homes across Southern California. Strain would be placed on State, regional, and local agencies to respond to the crisis, and the economic impacts of such an event would be felt State-wide.

#### **VIII. Identification of Beneficiaries**

Residents and businesses within the County of Orange, Southern California Edison users, SMWD water and sewer users, State and local emergency response agencies, and more generally, residents and businesses throughout California.

#### **IX. When the Benefits will be Received**

Benefits will be conferred on the affected parties as of the completion date of the Project.

#### **X. Uncertainty of the Benefits**

The benefits were calculated based on damages experienced during a December 2010 storm event, a 2005 storm event, precipitation estimates, and storm classifications provided by Orange County Flood Control. Although the damages will be roughly proportional to the level of storms that occur, there is uncertainty in the benefits based on the amount and intensity of the flow rates, variations in urbanization and upstream erosion, and other variables. Despite this uncertainty, damages incorporated into the numerical analysis are based on historical damage

and conservative predictions on how future damage will be mitigated. These estimates do not include the economic costs of low-risk, high cost impacts such as loss of water or sewer service, decimation of habitat, large-scale blackouts, or damage to downstream treatment facilities. As a result, the actual annual impacts are expected to be greater than the numerical estimates contained herein.

#### **XI. Description of any Adverse Effects**

There will be no adverse effects other than short term inconvenience to hikers and construction noise.

#### **XII. Narrative Discussion that Describes, Qualifies, and Supports the Values Entered in the Tables**

Damage estimates for erosion caused by flood events is based on the \$310,000 in repairs necessary to protect vital utilities after a December 2010 storm event, which would be approximately classified as a 10-year storm event. However, this figure has since been updated to \$500,000 to more fully capture the various administrative and employee costs associated with similar repairs (much of which were shifted toward the other California Emergency Management Agency petition for Landslide Assistance). Erosion for other flood events is assumed to be **proportional** to the peak 24-hour rainfall for the storm event, as measured at the Santiago Peak Station. Again, the benefits would be in addition to the flood control benefits provided by other regional projects given the existing size and projected growth of the Project area. The various precipitation records for Santiago Peak Station are attached as Exhibit D, and the relevant calculations are attached as Exhibit E.

As supported by the FEMA application and photos of the exposed utilities after the December 2010 storms, there is significant risk to all critical utilities described above during larger storm events. Scientech Magazine estimates that utility undergrounding projects in California cost approximately \$500,000 per mile. If the pipes containing the critical utilities are damaged, it would be necessary to replace or relocate at least **1.0 miles** of utilities. Due to the critical nature of the utilities when compared with local street utilities, this estimate is very conservative.

This conservative modeling more than likely balances out the benefits established and offered by the Gobernadora Multi-Purpose Basin Project, a prior South Orange County WMA project developed by SMWD. The Gobernadora Multi-Purpose Basin offered a Present Value of Expected Annual Flood Damage of \$1,973,377. This sum accounts for less than 20% of the benefits described in Table 12 below. Moreover, total elimination of that sum would still leave over \$8 million in current FDR benefits, a figure that would only slightly impact the overall Cost-Benefit Summary described in Table 17 (reducing it from 1.40 to 1.35). *See also Section X.*

#### **XIII. If Possible, Quantify Estimates of Economic Flood Damage Reduction Benefits using Table 12**

Assuming a useful life of 30 years for the flood control facilities described in this application and a discount rate of 6%, the present value of estimated flood control benefits is equal to approximately \$9,995,330.

**XIV. Documentation to Support Information Presented**

See Exhibit A - FEMA Request for Emergency Funding, Exhibits B and C - photographic evidence of erosion and utility exposure, Exhibit D - Annual Precipitation Tables for Santiago Peak Station, and Exhibit E – Santiago Peak Station Flood Event Table.

**XV. Describe Qualitatively: Other Flood Damage Reduction Benefits**

The utilities described above provide electricity, water, and sewer service to thousands of homes in Southern California. A total loss of service for any amount of time would have economic impacts in the tens of millions of dollars in lost wages, business revenues, emergency repairs, and user inconvenience (as described in the National Economic Development Analysis Manual, Army Corps of Engineers). Unfortunately, a defensible estimate of these impacts is not possible without performing additional studies.

**Resources**

Further information concerning how to conduct flood risk management benefit-cost analyses can be found at:

- Department of Water Resources Draft Economic Analysis Guidelines for Flood Risk Management (<http://www.water.ca.gov/economics/guidance.cfm>)
- US Army Corps of Engineers National Economic Development Manuals: <http://www.iwr.usace.army.mil/ned/>

**Table 16- Annual Cost of Project  
Project: Ortega Reservoir**

	Initial Costs	Operations and Maintenance Costs <sup>(1)</sup>					Discounting Calculations		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 5 (row (i), column(d))	Admin	Operations (1)	Maintenance (1)	Replacement	Other	Total Costs (a) +...+ (f)	Discount Factor	Discounted Costs(g) x (h)
2012	\$0	\$0	\$0	\$0	\$0	\$0	\$0	1.000	\$0
2013	\$3,087,500	\$0	\$0	\$0	\$0	\$0	\$3,087,500	0.943	\$2,912,736
2014	\$6,787,500	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$6,987,500	0.890	\$6,218,850
2015	\$8,500,000	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$8,700,000	0.840	\$7,304,688
2016	\$25,250,000	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$25,450,000	0.792	\$20,158,784
2017	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.747	\$149,452
2018	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.705	\$140,992
2019	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.665	\$133,011
2020	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.627	\$125,482
2021	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.592	\$118,380
2022	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.558	\$111,679
2023	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.527	\$105,358
2024	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.497	\$99,394
2025	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.469	\$93,768
2026	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.442	\$88,460
2027	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.417	\$83,453
2028	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.394	\$78,729

17	2029	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.371	\$74,273
18	2030	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.350	\$70,069
19	2031	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.331	\$66,103
20	2032	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.312	\$62,361
21	2033	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.294	\$58,831
22	2034	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.278	\$55,501
23	2035	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.262	\$52,359
24	2036	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.247	\$49,396
25	2037	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.233	\$46,600
26	2038	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.220	\$43,962
27	2039	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.207	\$41,474
28	2040	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.196	\$39,126
29	2041	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.185	\$36,911
30	2042	\$0	\$10,000	\$150,000	\$15,000	\$25,000	\$0	\$200,000	0.174	\$34,822
<b>Total Present Value of Discounted Costs (Sum of Column (i))</b>										<b>\$38,655,003</b>
<b>Comments:</b>										

- (1) Based on opportunity costs, sunk costs, and associated costs. Source: SMWD, Orange County Public Works, David Taussig & Associates, Inc.
- (2) The incremental change in O&M costs attributable to the project. Source: SMWD, Orange County Public Works, David Taussig & Associates, Inc.

**Table 11 - Event Damage**

Hydrologic Event	Exceedance Probability	Volume of Rainfall (in) <sup>(1)</sup>	Emergency Maintenance due to Flooding and Erosion <sup>(2)</sup>		Repair and Replacement of Utilities <sup>(3)</sup>		Total Event Damage		Interval Probability	Average Damage in Interval		Average Damage in Interval Times (x) Interval	
			Without Project	With Project	Without Project	With Project	Without Project	With Project		Without Project	With Project	Without Project	With Project
			(d)	(e)	(f)	(g)	(h)	(i)		(j)	(k)	(h)	(i)
							(d)+(f)	(e)+(g)					
1-Year	1.00		\$0	\$0	\$0	\$0	\$0	\$0					
2-Year	0.50	3.96	\$689,895	\$0	\$0	\$0	\$689,895	\$0	0.50	\$344,948	\$0	\$172,474	\$0
5-Year	0.20	5.24	\$912,892	\$0	\$0	\$0	\$912,892	\$0	0.30	\$801,394	\$0	\$240,418	\$0
10-Year	0.10	8.39	\$1,461,672	\$0	\$250,000	\$0	\$1,711,672	\$0	0.10	\$1,312,282	\$0	\$131,228	\$0
25-Year	0.04	10.40	\$1,811,847	\$0	\$250,000	\$0	\$2,061,847	\$0	0.06	\$1,886,760	\$0	\$113,206	\$0
50-Year	0.02	12.00	\$2,090,592	\$0	\$250,000	\$0	\$2,340,592	\$0	0.02	\$2,201,220	\$0	\$44,024	\$0
100-Year	0.01	13.60	\$2,369,338	\$0	\$250,000	\$0	\$2,619,338	\$0	0.01	\$2,479,965	\$0	\$24,800	\$0
<b>Expected Annual Damage (4)</b>							<b>\$0</b>	<b>\$0</b>				<b>\$726,150</b>	<b>\$0</b>

(1) See Exhibit E.

(2) "Without Project" figures based on SMWD request for public assistance from FEMA dated 2/10/11 (See Exhibit A). Damage from flooding and erosion projected to be proportional to peak rainfall at the Santiago Peak Station (Exhibit D).

(3) "Without Project" figures based on historical flood damage, undermining, and likely damage to utilities. See Exhibits B and C for images of undermined utilities in December 2010 flood event. Scientech Magazine reported average cost of utility undergrounding projects in California equal to \$500,000 per mile. Based on 50% chance of utility replacement and one (1.0) mile of additional pipeline needed for repairs.

(4) Expected Annual Damage calculated based on incremental exceedance probability and average event-related damage, as described in DWR's December 2012 workshop.

Table 12 - Present Value of Expected Annual Damage Benefits			
Project: Ortega Reservoir			
(a)	Expected Annual Damage Without Project		\$726,150
(b)	Expected Annual Damage With Project		\$0
(c)	Expected Annual Damage Benefit	(a) - (b)	\$726,150
(d)	Present Value Coefficient <sup>(1)</sup>		13.76
(e)	Present Value of Future Benefits	(c) x (d)	\$9,995,330

(1) 6% discount rate; 30-year analysis period.

DEPARTMENT OF HOMELAND SECURITY FEDERAL EMERGENCY MANAGEMENT AGENCY REQUEST FOR PUBLIC ASSISTANCE		O.M.B. No. 1660-0017 Expires October 31, 2008	
<b>PAPERWORK BURDEN DISCLOSURE NOTICE</b> Public reporting burden for this form is estimated to average 10 minutes. Burden means the time, effort and financial resources expended by persons to generate, maintain, disclose, or to provide information to us. You may send comments regarding the burden estimate or any aspect of the collection, including suggestions for reducing the burden to: Information Collections Management, U.S. Department of Homeland Security, Federal Emergency Management Agency, 500 C Street, SW, Washington, DC 20472, Paperwork Reduction Project (OMB Control Number 1660-0017). You are not required to respond to this collection of information unless a valid OMB number appears in the upper right corner of this form. <b>NOTE: Do not send your completed questionnaire to this address.</b>			
APPLICANT <i>(Political subdivision or eligible applicant.)</i>			DATE SUBMITTED
Santa Margarita Water District FEMA 059-1C6FF-00 (CA P.A. No. 059-91038)			February 10, 2011
COUNTY <i>(Location of Damages. If located in multiple counties, please indicate.)</i>			
Orange County California SMWD DUNNS Number 072528813			
<b>APPLICANT PHYSICAL LOCATION</b>			
STREET ADDRESS 26111 Antonio Parkway			
CITY Rancho Santa Margarita	COUNTY Orange County	STATE CA	ZIP CODE 92688
<b>MAILING ADDRESS <i>(If different from Physical Location)</i></b>			
STREET ADDRESS			
POST OFFICE BOX 7005	CITY Mission Viejo	STATE California	ZIP CODE 92690-7005
<b>Primary Contact/Applicant's Authorized Agent</b>		<b>Alternate Contact</b>	
NAME Ron H. Meyer		NAME Daniel R. Feron	
TITLE Engineering Associate		TITLE Chief Engineer	
BUSINESS PHONE (949) 459-6594		BUSINESS PHONE (949) 459-6590	
FAX NUMBER (949) 589-6243		FAX NUMBER (949) 459-6463	
HOME PHONE <i>(Optional)</i>		HOME PHONE <i>(Optional)</i>	
CELL PHONE		CELL PHONE	
E-MAIL ADDRESS ronm@smwd.com		E-MAIL ADDRESS danf@smwd.com	
PAGER & PIN NUMBER		PAGER & PIN NUMBER	
Did you participate in the Federal/State Preliminary Damage Assessment (PDA)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Private Non-Profit Organization? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, which of the facilities identified below best describe your organization? <u>utility (water &amp; waste water) FEMA 059-1C6FF-00 (CA P.A. No. 059-91038)</u>			
Title 44 CFR, part 206.221(e) defines an eligible private non-profit facility as: "... any private non-profit educational, utility, emergency, medical or custodial care facility, including a facility for the aged or disabled, and other facility providing essential governmental type services to the general public, and such facilities on Indian reservations." "Other essential governmental service facility means museums, zoos, community centers, libraries homeless shelters, senior citizen centers, rehabilitation facilities, shelter workshops and facilities which provide health and safety services of a governmental nature. All such facilities must be open to the general public."			
Private Non-Profit Organizations must attach copies of their Tax Exemption Certificate and Organization Charter or By-Laws. If your organization is a school or educational facility, please attach information on accreditation or certification.			
<b>Official Use Only: FEMA-_____ -DR- _____ - _____ FIPS# _____</b>			<b>Date Received:</b>

State of California  
OFFICE OF EMERGENCY SERVICES

059-91038

OES ID No.: \_\_\_\_\_

**PROJECT APPLICATION FOR FEDERAL ASSISTANCE**SUBGRANTEE'S NAME: Santa Marguerita Water District  
(Name of Organization)ADDRESS: P.O. Box 7005CITY: Mission Viejo STATE: CA ZIP CODE: 92690-7005TELEPHONE: 949-459-6590 FAX NUMBER: 949-459-6463AUTHORIZED AGENT: Daniel R. Ferons TITLE: Chief EngineerEMAIL ADDRESS: danf@smwd.com**ASSURANCES - CONSTRUCTION PROGRAMS**

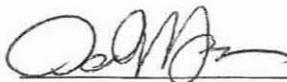
Note: Certain of these assurances may not be applicable to all of your projects. If you have questions, please contact the Governor's Office of Emergency Services. Further, certain federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant I certify that the subgrantee named above:

1. Has the legal authority to apply for federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-federal share of project costs) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States, and if appropriate, the state, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title, or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the federal interest in the title of real property in accordance with awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with federal assistance funds to assure nondiscrimination during the useful life of the project.
4. Will comply with the requirements of the assistance-awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progress reports and such other information as may be required by the assistance awarding agency or state.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gains.
8. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§ 4801 et seq.), which prohibits the use of lead based paint in construction or rehabilitation of residence structures.
9. Will comply with all federal statues relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§ 1681-1683 and 1685-1686) which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794) which prohibit discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101-6107) which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 93-255) as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616) as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§ 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records;

- (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. § 3601 et seq.), as amended, relating to nondiscrimination in the sale rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for federal assistance is being made, and (j) the requirements on any other nondiscrimination statute(s) which may apply to the application.
10. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provides for fair and equitable treatment of persons displaced or whose property is acquired as a result of federal and federally assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of federal participation in purchases.
  11. Will comply with the flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$5,000 or more.
  12. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.O. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved state management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§ 1451 et seq.); (f) conformity of federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. § 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended, (P.L. 93-523); and (h) protection of endangered species under the Endangered Species Act of 1973, as amended, (P.O. 93-205).
  13. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§ 1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
  14. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), EO 11593 (identification and preservation of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a-1 et seq.).
  15. Will comply with Standardized Emergency Management (SEMS) requirements as stated in the California Emergency Services Act, Government Code, Chapter 7 of Division 1 of Title 2, Section 8607.1(e) and CCR Title 19, Sections 2445, 2446, 2447 and 2448.
  16. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act of 1984 and the Single Audit Act Amendments of 1996.
  17. Will comply with all applicable requirements of all other federal laws, Executive Orders, regulations and policies governing this program.
  18. Has requested through the State of California, federal financial assistance to be used to perform eligible work approved in the subgrantee application for federal assistance. Will, after the receipt of federal financial assistance, through the State of California, agree to the following:
    - a. The state warrant covering federal financial assistance will be deposited in a special and separate account, and will be used to pay only eligible costs for projects described above;
    - b. To return to the State of California such part of the funds so reimbursed pursuant to the above numbered application, which are excess to the approved actual expenditures as accepted by final audit of the federal or state government.
    - c. In the event the approved amount of the above numbered project application is reduced, the reimbursement applicable to the amount of the reduction will be promptly refunded to the State of California.
  19. Will not make any award or permit any award (subgrant or contract) to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs under Executive Order 12549 and 12689, "Debarment and Suspension."

The undersigned represents that he/she is authorized by the above named subgrantee to enter into this agreement for and on behalf of the said subgrantee.



SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL

Chief Engineer

February 10, 2011

OES 89 (Rev 1/05)

TITLE

DATE

P.A. No.: 059-91038

### DESIGNATION OF APPLICANT'S AGENT RESOLUTION

BE IT RESOLVED BY THE Board of Directors OF THE Santa Margarita Water District  
 (Governing Body) (Name of Applicant)

THAT Chief Engineer, OR  
 (Title of Authorized Agent)

Operations Manager, OR  
 (Title of Authorized Agent)

General Manager  
 (Title of Authorized Agent)

is hereby authorized to execute for and in behalf of the Santa Margarita Water District, a public entity established under the laws of the State of California, this application and to file it in the Office of Emergency Services for the purpose of obtaining certain federal financial assistance under P.L. 93-288 as amended by the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, and/or state financial assistance under the Natural Disaster Assistance Act.

THAT the Santa Margarita Water Dist, a public entity established under the laws of the State of California, hereby authorizes its agent(s) to provide to the State Office of Emergency Services for all matters pertaining to such state disaster assistance the assurances and agreements required.

Passed and approved this 15th day of January, 1999

  
Saundra Jacobs (Name and Title) President

\_\_\_\_\_  
 (Name and Title)

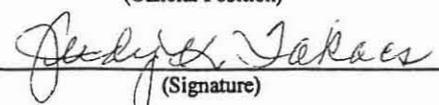
\_\_\_\_\_  
 (Name and Title)

#### CERTIFICATION

I, Judy K. Takacs, duly appointed and Secretary of  
 (Name) (Title)  
Santa Margarita Water District, do hereby certify that the above is a true and correct copy of a  
 resolution passed and approved by the Board of Directors of the Santa Margarita Water Dist on the  
 (Governing body) (Name of Applicant)  
15th day of January, 1999.

Date: January 15, 1999

Secretary  
 (Official Position)

  
 (Signature)



**Cal E·M·A**  
CALIFORNIA EMERGENCY  
MANAGEMENT AGENCY

*For Internal Use Only*

Cal EMA APPLICATION NO.: \_\_\_\_\_

DISASTER NO.: \_\_\_\_\_

**PROJECT APPLICATION**  
**CALIFORNIA DISASTER ASSISTANCE ACT PROGRAM**

**1. APPLICANT'S NAME AND ADDRESS**

APPLICANT Santa Marguerita Water District  
ADDRESS P.O. Box 7005  
CITY & ZIP Mission Viejo, CA 92690-7005  
PHONE (949) 459-6590

**2. APPLICANT'S AUTHORIZED AGENT**  
(Attach Resolution of Designation unless an accurate "universal" resolution is on file.)

NAME Daniel R. Ferons  
TITLE Chief Engineer  
ADDRESS Same  
CITY & ZIP Same  
PHONE (949) 459-6590  
FACSIMILE (949) 459-6463  
E-MAIL danf@smwd.com

**3. PROJECT SUMMARY** – Attach a List of Projects as defined in Title 19 of the California Code of Regulations, Section 2970(a)(4).

**ASSURANCES AND AGREEMENTS**

- A. The applicant certifies (to the best of his knowledge and belief) the disaster relief work herein described for which state financial assistance is requested, is eligible in accordance with the criteria contained in the Disaster Assistance Act (Government Code, Section 8680 et seq.)
- B. The applicant is the legal entity responsible under law for the performance of the work detailed and accepts such responsibility.
- C. The applicant certifies that the disaster relief work herein described for which state assistance is requested hereunder does not, or will not duplicate benefits received for the same loss from another source.
- D. The applicant certifies that they have undertaken to recover maximum federal participation in funding street and highway project and public facility projects.
- E. The applicant certifies that all information given herein is to the best of its knowledge and belief, true and correct.
- F. The applicant agrees to (1) provide without cost to the state all lands, easements, and rights-of-way necessary for accomplishment of the approved work;  
(2) hold and save the State of California, its officers, agents and employees free from damages due to the approved work.
- G. (1) The applicant agrees to comply with Section 3700 of the Labor Code which requires every employee to be insured against liability for Workmen's Compensation, or to undertake self insurance in accordance with provisions of the code; and will comply with such provisions before commencing the performance of the work.  
(2) The applicant agrees to comply with the Fair Practices Act in connection with the performance of work under this agreement wherein it agrees it will not willfully discriminate against any employee or applicant for employment because of race, color, religion, ancestry, sex, age or national origin; and it agrees to take affirmative action to insure that applicants for employment are employed, and that employees are treated during employment, without regard to their race, color, religion, ancestry, sex, age or national origin, and hereby gives assurance that it will immediately take any measures necessary to effectuate this agreement.  
(3) If any real property or structure thereon is provided or improved with the aid of the state financial assistance extended to the applicant, this assurance shall obligate the applicant, or in the case of such property, any transferee for the period during which the provision of similar services of benefits. If any personal property is so provided, this assurance shall obligate the applicant for the period during which it retains ownership or possession of the property. In all other case, this assurance shall obligate the applicant for the period during which the state financial assistance is extended to it by the agency.

(4) This assurance is given in consideration of, and for the purpose of obtaining any and all state grants, loans, reimbursement, advances, contracts, property, discount, or other state financial assistance extended after the date hereon to the applicant. The applicant recognizes and agrees that such state financial assistance will be extended in reliance on the representations and agreements made in this assurance and that the state shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the applicant, its successors, transferees and assignees, and a person or persons whose signatures appear on the reverse, or authorized to sign this assurance on behalf of the applicant.

- H. The applicant certifies that all financial assistance received under this application will be, or has been expended in accordance with applicable laws and regulations. The applicant certifies that any work performed by a state agency at their request shall be agreed upon in writing and be subject to the State Contract Act. The applicant certifies that the work performed, or to be performed is in accordance with the state and local laws governing the performance of such work.
- I. The applicant certifies compliance with Standardized Emergency Management (SEMS) requirements as stated in the California Emergency Services Act, Government Code, Chapter 7 of Division 1 of Title 2, Section 8607.1(e) and CCR Title 19, Section 2445, 2446, 2447 and 2448.
- J. The applicant certifies that on contracts involving expenditures in excess of \$25,000, it obtained from the contractor a payment bond in accordance with Sections 3247 through 3252 of the Civil Code.
- K. **BY ACCEPTING THESE FUNDS, THE APPLICANT IS NOT FORFEITING ANY RIGHTS WHATSOEVER, INCLUDING THE RIGHT TO A FAIR HEARING.**

---

**4. SIGNATURE OF APPLICANT'S AUTHORIZED AGENT**

(Indicates concurrence with assurances and agreements)

SIGNATURE:  DATE: February 10, 2011  
 TITLE: Chief Engineer

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**5. Cal EMA APPROVAL**

SIGNATURE: \_\_\_\_\_ DATE APPROVED: \_\_\_\_\_  
 TITLE: \_\_\_\_\_

List of Projects

Disaster Number 1952

APPLICANT: Santa Margarita Water District P.A. No. 059-91038 (FEMA 059-1C6FF-00) DATE COMPLETED: February 10, 2011

CONTACT NAME AND PHONE NUMBER: Ron Meyer, Ronm@smwd.com (949)459-6594 IS THIS AN AMENDED LIST OF PROJE No

ITEM #	DR -1952 Location	DESCRIPTION OF DAMAGE AND SCOPE OF WORK	COST ESTIMATE	CATEGORY*	WAS WORK COMPLETED BY FORCE ACCT. (FA), CONTRACT (C) OR BOTH (F/C)?	ENTER "ENV" IF THERE ARE ENVIRONMENTAL ISSUES OR "HIST" FOR HISTORIC ISSUES, OR BOTH	WAS THERE INSURANCE COVERAGE? IF YES, ENTER DEDUCTIBLE AMOUNT	WAS THE FACILITY DAMAGED IN A PRIOR DISASTER(S)? IF YES, ENTER DISASTER NAME(S) OR NUMBER(S)	ARE THERE COST EFFECTIVE HAZARD MITIGATION MEASURES THAT MAY PREVENT FUTURE DAMAGE?
1	Upper Chiquiat Reservoir	LandSlides	\$810,000	A/D	C	No	No	No	No
2	Gobernadora Creek/Ortega Force Main	Flooding and errosion	\$310,000	A/E	F/C	No	No	No	Yes
			\$				\$		
			\$				\$		
			\$				\$		
			\$				\$		
			\$				\$		
			\$				\$		

CATEGORY: A) Debris Clearance; B) Protective Measures; C) Road System; D) Water Control Facility; E) Buildings and Equipment;  
F) Public Utility System; G) Other. (Note: if a single site has more than one category, indicate the category that  
represents the majority of damage.)

South Orange County IRMM Prop 1E Grant Proposal

February 1, 2013

At8\_SWF\_BenCost\_1 of 3

Ortega Reservoir Project  
Santa Margarita Water District

**EXHIBIT B**

**EROSION**



## EXHIBIT C

### EROSION



Print

Close

Cooperative Observer Rainfall Data

Year to Date: Annual Daily Precipitation Accumulations

Note: Period times are 8:00 AM Pacific Standard Time

Output 07/16/2012

Site SANTIAGOPEAK Santiago Peak  
Variable 11.01 Rainfall in Inches, Daily  
Figures are for period ending 800 hours. Year Table

Day	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1		0.20								0.35	
2											
3											
4					0.08						
5					0.59						
6			0.08	2.87							
7				0.04	0.39						
8											
9											
10											
11										0.47	
12					0.08					0.16	
13					0.08	0.24		0.04			
14								0.31		0.43	
15											
16								0.75			
17							0.15		0.24		
18									1.73		
19									0.04		
20											
21					0.94		0.16				
22							0.39				
23											
24							0.75				
25											
26									0.98	0.79	0.39
27										0.35	0.04
28								0.20			
29											
30											
31	0.31										
Mean	0.01	0.01	0.00	0.09	0.07	0.01	0.05	0.04	0.10	0.09	0.01
Maximum	0.31	0.20	0.08	2.87	0.94	0.24	0.75	0.75	1.73	0.79	0.39
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.31	0.20	0.08	2.91	2.16	0.24	1.45	1.30	2.99	2.55	0.43

Summaries

----- Notes -----  
All recorded data is continuous and reliable

Annual Mean 0.04  
Annual Total 14.62

Daily Maximum 2.87  
Minimum 0.00

**EXHIBIT D-2**

**NOAA Atlas 14, Volume 6, Version 2 SANTIAGO  
PEAK**



**Station ID: 82-0201**  
**Location name: Corona, California, US\***  
**Coordinates: 33.7108, -117.5331**  
**Elevation:**  
**Elevation (station metadata): 5660 ft\***  
\* source: Google Maps



**POINT PRECIPITATION FREQUENCY ESTIMATES**

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aeriels](#)

**PF tabular**

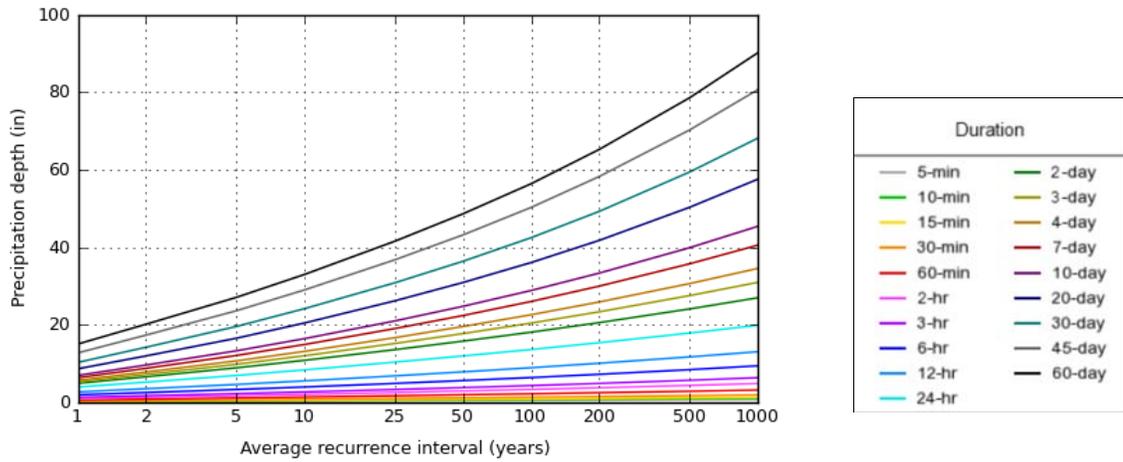
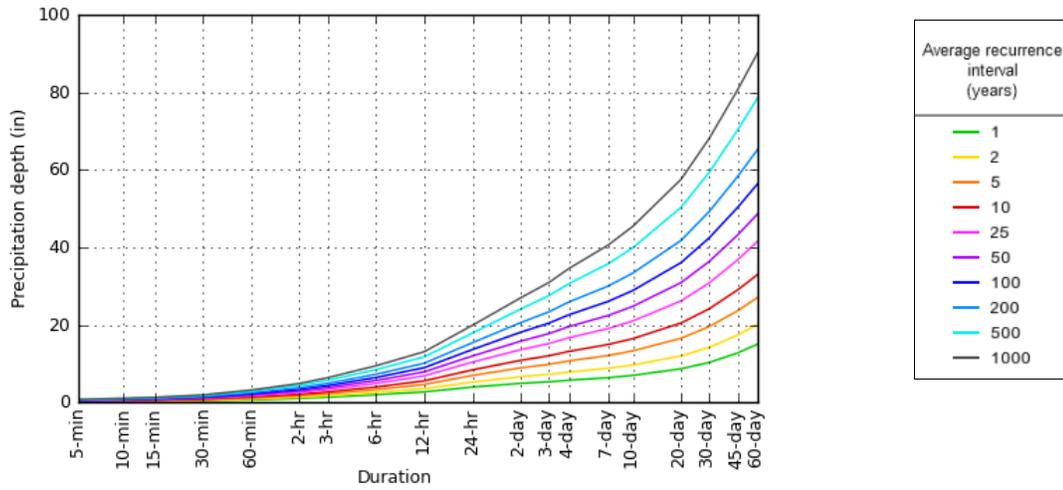
<b>PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
<b>Duration</b>	<b>Average recurrence interval (years)</b>									
	<b>1</b>	<b>2</b>	<b>5</b>	<b>10</b>	<b>25</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>1000</b>
<b>5-min</b>	<b>0.156</b> (0.131-0.188)	<b>0.208</b> (0.174-0.251)	<b>0.276</b> (0.230-0.334)	<b>0.332</b> (0.275-0.405)	<b>0.408</b> (0.326-0.515)	<b>0.467</b> (0.365-0.604)	<b>0.527</b> (0.401-0.700)	<b>0.591</b> (0.437-0.808)	<b>0.680</b> (0.481-0.972)	<b>0.752</b> (0.513-1.11)
<b>10-min</b>	<b>0.224</b> (0.187-0.269)	<b>0.298</b> (0.250-0.360)	<b>0.395</b> (0.330-0.478)	<b>0.476</b> (0.394-0.580)	<b>0.584</b> (0.467-0.739)	<b>0.669</b> (0.523-0.865)	<b>0.756</b> (0.575-1.00)	<b>0.847</b> (0.626-1.16)	<b>0.975</b> (0.689-1.39)	<b>1.08</b> (0.735-1.60)
<b>15-min</b>	<b>0.270</b> (0.227-0.326)	<b>0.360</b> (0.302-0.435)	<b>0.478</b> (0.399-0.578)	<b>0.575</b> (0.476-0.702)	<b>0.707</b> (0.564-0.894)	<b>0.809</b> (0.632-1.05)	<b>0.914</b> (0.696-1.21)	<b>1.02</b> (0.757-1.40)	<b>1.18</b> (0.834-1.68)	<b>1.30</b> (0.889-1.93)
<b>30-min</b>	<b>0.402</b> (0.337-0.485)	<b>0.537</b> (0.449-0.647)	<b>0.712</b> (0.594-0.861)	<b>0.856</b> (0.709-1.04)	<b>1.05</b> (0.840-1.33)	<b>1.20</b> (0.941-1.56)	<b>1.36</b> (1.03-1.81)	<b>1.52</b> (1.13-2.09)	<b>1.75</b> (1.24-2.51)	<b>1.94</b> (1.32-2.88)
<b>60-min</b>	<b>0.662</b> (0.555-0.798)	<b>0.883</b> (0.740-1.07)	<b>1.17</b> (0.978-1.42)	<b>1.41</b> (1.17-1.72)	<b>1.73</b> (1.38-2.19)	<b>1.98</b> (1.55-2.56)	<b>2.24</b> (1.70-2.97)	<b>2.51</b> (1.85-3.43)	<b>2.89</b> (2.04-4.13)	<b>3.19</b> (2.18-4.73)
<b>2-hr</b>	<b>1.03</b> (0.862-1.24)	<b>1.34</b> (1.12-1.62)	<b>1.75</b> (1.46-2.12)	<b>2.10</b> (1.74-2.56)	<b>2.58</b> (2.06-3.26)	<b>2.96</b> (2.31-3.83)	<b>3.36</b> (2.56-4.46)	<b>3.78</b> (2.80-5.17)	<b>4.39</b> (3.10-6.27)	<b>4.89</b> (3.33-7.24)
<b>3-hr</b>	<b>1.35</b> (1.13-1.62)	<b>1.74</b> (1.46-2.10)	<b>2.27</b> (1.89-2.75)	<b>2.71</b> (2.25-3.31)	<b>3.33</b> (2.66-4.21)	<b>3.83</b> (2.99-4.95)	<b>4.35</b> (3.31-5.77)	<b>4.91</b> (3.63-6.71)	<b>5.71</b> (4.04-8.16)	<b>6.38</b> (4.35-9.46)
<b>6-hr</b>	<b>1.98</b> (1.66-2.39)	<b>2.56</b> (2.14-3.08)	<b>3.33</b> (2.78-4.03)	<b>3.98</b> (3.30-4.86)	<b>4.90</b> (3.91-6.20)	<b>5.64</b> (4.40-7.29)	<b>6.42</b> (4.88-8.52)	<b>7.25</b> (5.36-9.92)	<b>8.45</b> (5.97-12.1)	<b>9.45</b> (6.44-14.0)
<b>12-hr</b>	<b>2.72</b> (2.28-3.28)	<b>3.54</b> (2.96-4.27)	<b>4.64</b> (3.87-5.61)	<b>5.56</b> (4.60-6.79)	<b>6.85</b> (5.47-8.66)	<b>7.88</b> (6.15-10.2)	<b>8.96</b> (6.82-11.9)	<b>10.1</b> (7.47-13.8)	<b>11.7</b> (8.30-16.8)	<b>13.1</b> (8.92-19.4)
<b>24-hr</b>	<b>3.96</b> (3.50-4.57)	<b>5.24</b> (4.63-6.06)	<b>6.96</b> (6.13-8.06)	<b>8.39</b> (7.33-9.80)	<b>10.4</b> (8.80-12.5)	<b>12.0</b> (9.94-14.7)	<b>13.6</b> (11.1-17.2)	<b>15.4</b> (12.1-19.9)	<b>17.9</b> (13.5-24.1)	<b>19.9</b> (14.6-27.7)
<b>2-day</b>	<b>4.92</b> (4.35-5.68)	<b>6.63</b> (5.85-7.66)	<b>8.92</b> (7.86-10.3)	<b>10.9</b> (9.49-12.7)	<b>13.6</b> (11.5-16.4)	<b>15.8</b> (13.1-19.4)	<b>18.1</b> (14.7-22.8)	<b>20.6</b> (16.2-26.7)	<b>24.1</b> (18.3-32.5)	<b>27.0</b> (19.8-37.6)
<b>3-day</b>	<b>5.32</b> (4.70-6.14)	<b>7.24</b> (6.39-8.37)	<b>9.83</b> (8.65-11.4)	<b>12.0</b> (10.5-14.1)	<b>15.2</b> (12.9-18.3)	<b>17.8</b> (14.7-21.8)	<b>20.5</b> (16.6-25.8)	<b>23.4</b> (18.4-30.3)	<b>27.5</b> (20.9-37.1)	<b>31.0</b> (22.7-43.1)
<b>4-day</b>	<b>5.73</b> (5.06-6.61)	<b>7.85</b> (6.93-9.07)	<b>10.7</b> (9.43-12.4)	<b>13.2</b> (11.5-15.4)	<b>16.7</b> (14.1-20.1)	<b>19.6</b> (16.2-24.1)	<b>22.6</b> (18.3-28.5)	<b>25.9</b> (20.4-33.5)	<b>30.6</b> (23.2-41.3)	<b>34.6</b> (25.3-48.1)
<b>7-day</b>	<b>6.38</b> (5.64-7.37)	<b>8.80</b> (7.77-10.2)	<b>12.1</b> (10.7-14.0)	<b>14.9</b> (13.1-17.4)	<b>19.0</b> (16.1-23.0)	<b>22.4</b> (18.6-27.6)	<b>26.0</b> (21.1-32.8)	<b>30.0</b> (23.6-38.8)	<b>35.7</b> (27.1-48.2)	<b>40.6</b> (29.7-56.5)
<b>10-day</b>	<b>6.98</b> (6.17-8.05)	<b>9.65</b> (8.52-11.2)	<b>13.3</b> (11.7-15.4)	<b>16.5</b> (14.4-19.2)	<b>21.0</b> (17.8-25.3)	<b>24.8</b> (20.6-30.5)	<b>28.9</b> (23.4-36.4)	<b>33.4</b> (26.3-43.2)	<b>39.9</b> (30.2-53.8)	<b>45.4</b> (33.3-63.3)
<b>20-day</b>	<b>8.67</b> (7.66-10.0)	<b>12.0</b> (10.6-13.9)	<b>16.5</b> (14.6-19.2)	<b>20.5</b> (17.9-23.9)	<b>26.2</b> (22.2-31.6)	<b>30.9</b> (25.6-38.0)	<b>36.1</b> (29.2-45.5)	<b>41.8</b> (32.9-54.1)	<b>50.3</b> (38.1-67.8)	<b>57.6</b> (42.2-80.2)
<b>30-day</b>	<b>10.3</b> (9.12-11.9)	<b>14.2</b> (12.6-16.5)	<b>19.6</b> (17.2-22.7)	<b>24.2</b> (21.1-28.2)	<b>30.8</b> (26.1-37.2)	<b>36.4</b> (30.2-44.8)	<b>42.5</b> (34.4-53.5)	<b>49.3</b> (38.8-63.8)	<b>59.4</b> (45.0-80.1)	<b>68.1</b> (49.9-94.9)
<b>45-day</b>	<b>12.8</b> (11.3-14.7)	<b>17.4</b> (15.3-20.1)	<b>23.6</b> (20.8-27.4)	<b>29.0</b> (25.4-33.9)	<b>36.8</b> (31.1-44.3)	<b>43.2</b> (35.8-53.1)	<b>50.3</b> (40.7-63.4)	<b>58.3</b> (45.9-75.4)	<b>70.3</b> (53.2-94.7)	<b>80.6</b> (59.1-112)
<b>60-day</b>	<b>15.1</b> (13.3-17.4)	<b>20.2</b> (17.8-23.3)	<b>27.1</b> (23.9-31.4)	<b>33.0</b> (28.8-38.5)	<b>41.6</b> (35.2-50.1)	<b>48.6</b> (40.3-59.8)	<b>56.4</b> (45.7-71.1)	<b>65.3</b> (51.4-84.5)	<b>78.6</b> (59.5-106)	<b>90.2</b> (66.0-126)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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**PF graphical**

PDS-based depth-duration-frequency (DDF) curves  
Coordinates: 33.7108, -117.5331



NOAA/NWS/OHD/HDSC

Created (GMT): Tue Jan 22 04:02:50 2013

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### Maps & aerials

#### Small scale terrain



#### Large scale terrain



**EXHIBIT E**

<b>Exhibit E - Santiago Peak Station #156 Flood Events <sup>(1)</sup></b>		
<b>T-YR.</b>	<b>24-H Rainfall (inches)</b>	<b>Notes</b>
100	13.6	
50	12.0	
25	10.4	
10	8.39	Minimum flows to undermine utilities
5	5.24	
2	3.96	
<b>Peak Rainfall</b>	<b>2.87</b>	<b>Between a 5 and 10-year storm</b>

*(1) Source: National Oceanic and Atmospheric Administration, 2013.*