

# Eastern Sandoval County Arroyo Flood Control Authority

INTERIM PRELIMINARY NEEDS ASSESSMENT



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## I. INTRODUCTION

During the 2007 Legislative session, the New Mexico Legislature passed House Bill 939 creating the Eastern Sandoval County Arroyo Flood Control Authority (ESCAFCA). Governor Bill Richardson then appointed Debbie Kilfoy, Bill Sapien, Wayne Sandoval, Dan Dennison, and Salvador Reyes as the first ESCAFCA board members.

Also known as the “Eastern Sandoval County Arroyo Flood Control Act,” HB 939 declares as a matter of legislative determination

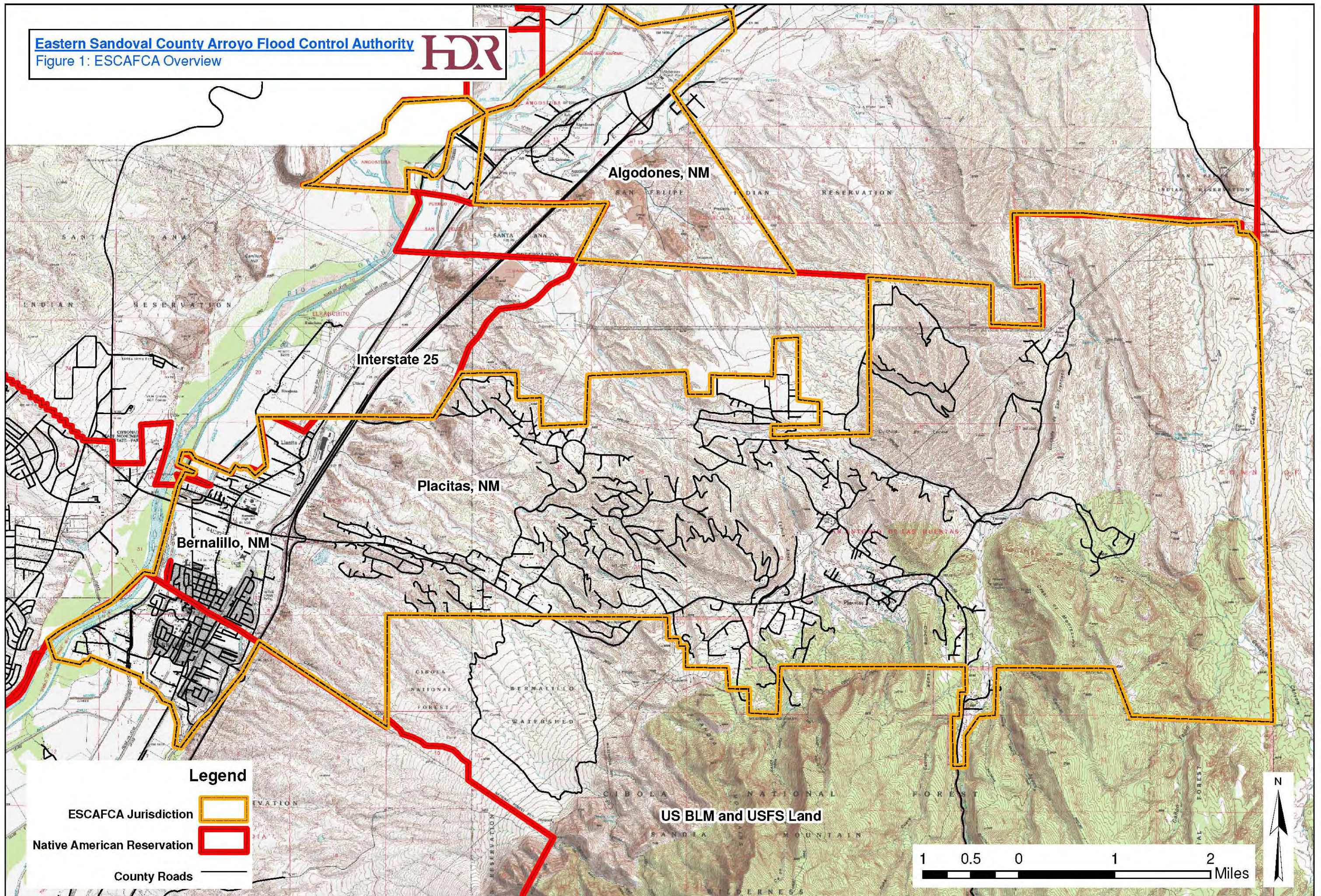
“that the organization of the authority hereby created having the purposes, powers, duties, privileges, immunities, rights, liabilities and disabilities provided in the Eastern Sandoval County Act will serve a public use and will promote the health, safety, prosperity, security, and general welfare of the inhabitants thereof and of the state.”

The ESCAFCA Board of Commissioners hired HDR Engineering, Inc., to produce a preliminary needs assessment. To accomplish this, HDR:

1. Performed a planning-level hydrologic analysis of the watersheds affecting the ESCAFCA jurisdictional area.
2. Interviewed each commissioner and toured their representative area.
3. Interviewed the Sandoval County Road Department.
4. Held three public meetings for input from residents of the Towns of Bernalillo, Algodones, and Placitas.

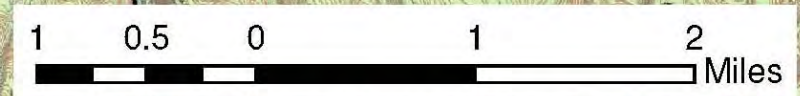
## II. JURISDICTIONAL AREA

Boundaries of the Eastern Sandoval County Arroyo Flood Control Authority’s jurisdiction can be generally described as the foothills watershed that affects southern Sandoval County excluding land held in trust or ownership by the federal government or by an Indian Pueblo. See Figure 1.



**Legend**

- ESCAFCA Jurisdiction
- Native American Reservation
- County Roads



### III. HYDROLOGY

In order to determine the overall drainage conditions for the ESCAFCA jurisdictional areas, HDR performed a planning-level hydrologic analysis of contributory watersheds. See Figure 2.

A summary of the major flow paths and preliminary flow rates are presented in Figure 3. Unnamed arroyos are indicated by the mile marker, as “Arroyo MP \_\_\_\_”. See Appendix A for detailed calculations and analysis methodologies.

#### Climate

The geographic area defined by the ESCAFCA boundary is semiarid as described in Table 1. Although the area is in eastern Sandoval County, the climate closely resembles that of Bernalillo County, for which there is published data and can be extrapolated with reasonable accuracy.

**Table 1: Average annual climatic data for Albuquerque, NM (NOAA, 2005).**

Item	Value
Daily Maximum Temperature	70.4°F
Daily Minimum Temperature	43.2°F
Daily Mean Temperature	56.8°F
Precipitation	9.47 inches
Days with Precipitation 0.01 inch or more	60 days
Snowfall Total	11.0 inches

Lastly, average annual relative humidity is approximately 58% and 29% for morning and afternoon hours, respectively.

All of these parameters influence soils through various mechanisms. Plant life, animal life, and chemical composition vary by area and depth, such that during storm events, rainfall runoff can be increased, consequently affecting drainage structures and residences.

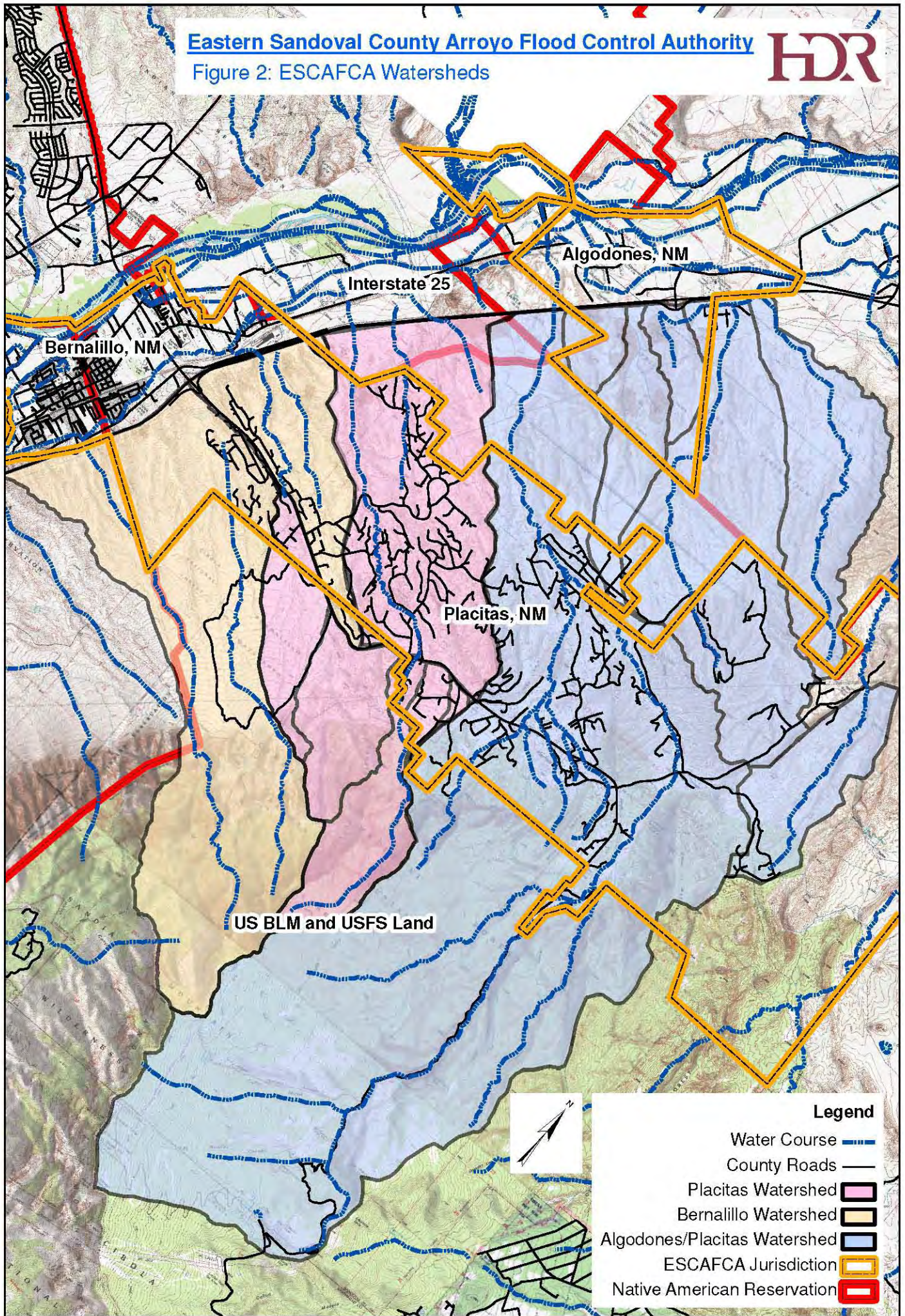
#### Previous Studies

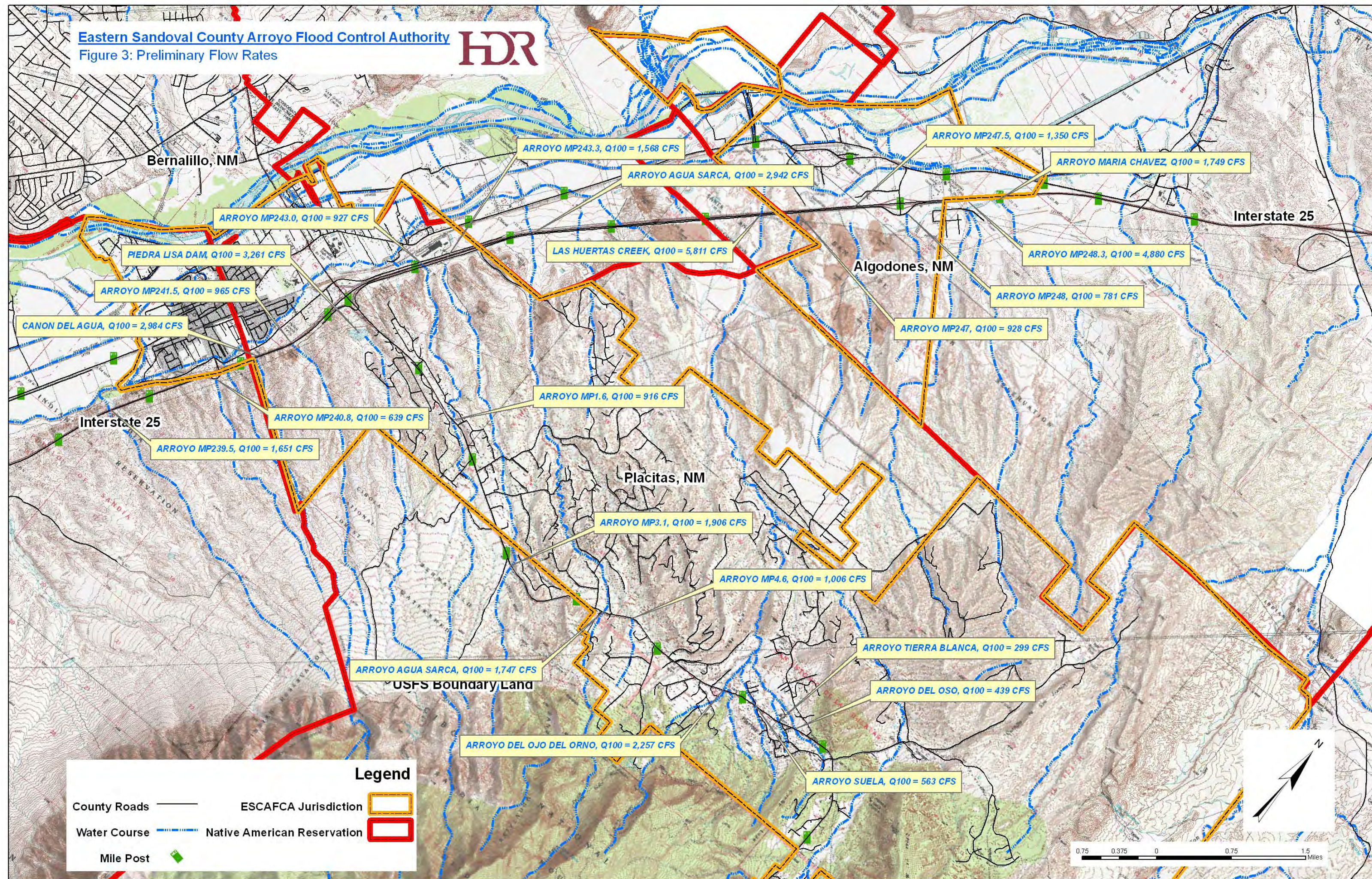
HDR reviewed the *Flood Insurance Study- Sandoval County, New Mexico and Incorporated Area*, dated July 16, 1996 as published by the Federal Emergency Management Agency (FEMA). Flood Insurance Rate Maps are included in Appendix D.

#### Rainfall Data

Rainfall depths for each duration and recurrence interval were computed using the recently published National Oceanographic and Atmospheric Administration (NOAA) Atlas 14 which is available on the internet in an interactive data extraction format (<http://hdsc.nws.noaa.gov/hdsc/pfds>). NOAA 14 was prepared by the National Weather Service to replace NOAA Atlas 2.

Figure 2: ESCAFCA Watersheds





### Topographic and Soils Data

Topographic mapping for the project site originated from USGS topographic quadrangle maps. The mapping was prepared using New Mexico State Plane Coordinate System-Central Zone, and based on the North American Vertical Datum of 1983. A field survey was conducted in June 2007 by HDR personnel in order to catalog existing conditions and key terrain; reference Appendix E. Aerial survey and other GIS data were obtained from Sandoval County. Soils within the watershed were identified using geographic information system (GIS) capabilities and the digital Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SURRGO).

### Soil Conditions

Although the aerial extent of specific soil units was derived from GIS data, soil type is typically derived from the NRCS soil surveys. These surveys classify soils into one of four hydrologic soil groups; A, B, C and D. Type A soils have a low runoff potential and are typically very porous soils such as sand and cobbles. Type D soils have a high runoff potential such as a very rocky soils, soils with a well developed desert pavement, or soils with a shallow impervious layer. The majority of the jurisdiction, as shown in Figure 4, is comprised of soils within hydrologic soil groups B and C. A summary of the soils is provided in Appendix B.

## IV. PUBLIC INPUT

On June 15, HDR toured the area with Mr. Chris Miller of the Sandoval County Road Department to discuss the department's experience with drainage problems. Mr. Miller then provided HDR with the GIS data points shown on Figures 5, 5a and 5b. These data points represent approximately 140 road related drainage issues occurring between June and September, 2006. Please note that several of the points represent multiple incidents concerning the same location or structure. The Storm Event Table in Appendix E gives the date of each occurrence.

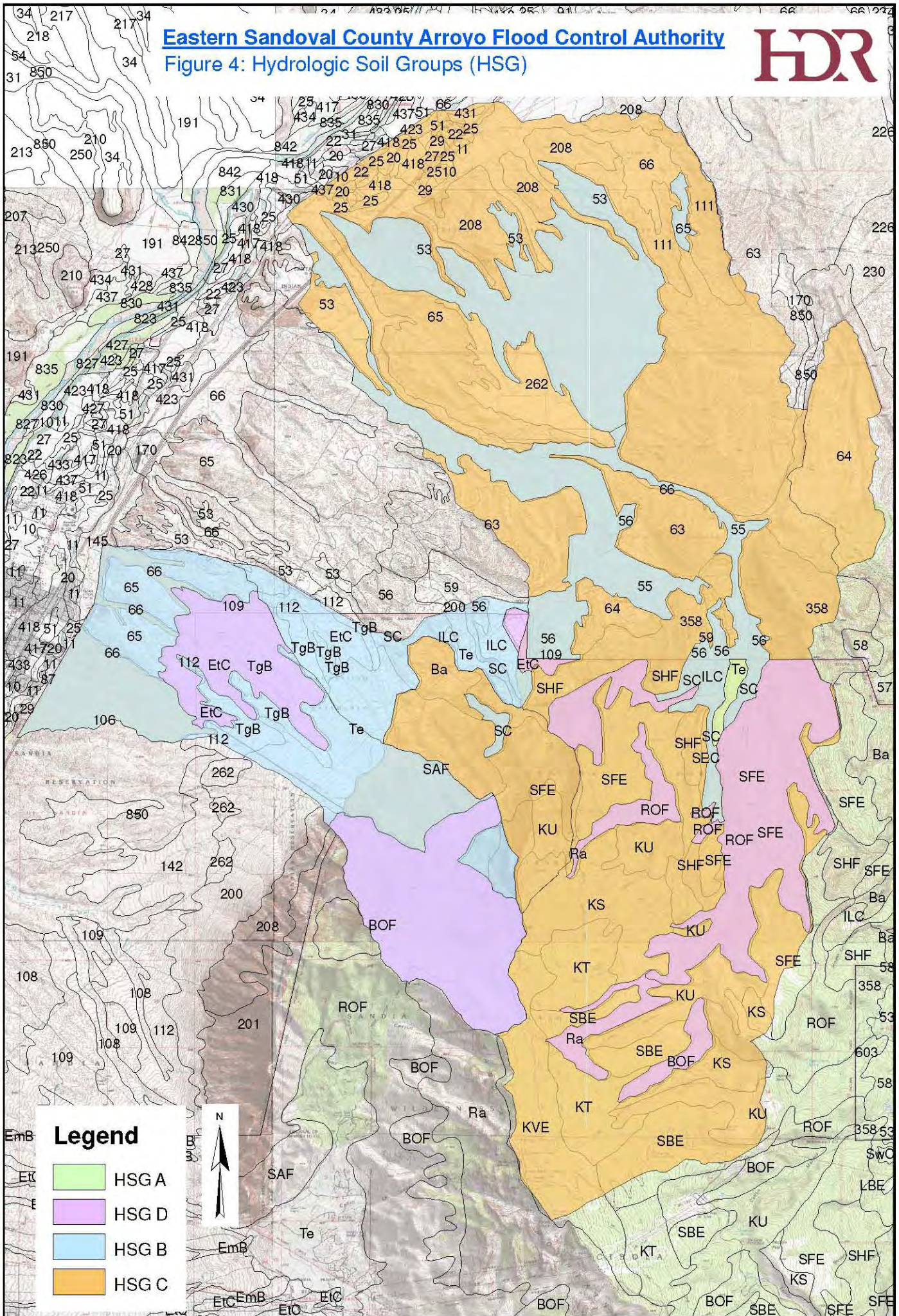
On June 19, 20, and 21, HDR conducted public meetings for input from residents in the ESCAFCA jurisdictional area. HDR provided large scale aerial mapping from November 2006 for each meeting. The public was invited to identify areas having drainage problems by placing red dots on the maps. HDR staff recorded descriptions of what the residents experienced. See Appendix E for exhibit reproductions, detailed comments, and area photographs. A summary of comments made at the public meetings follows:

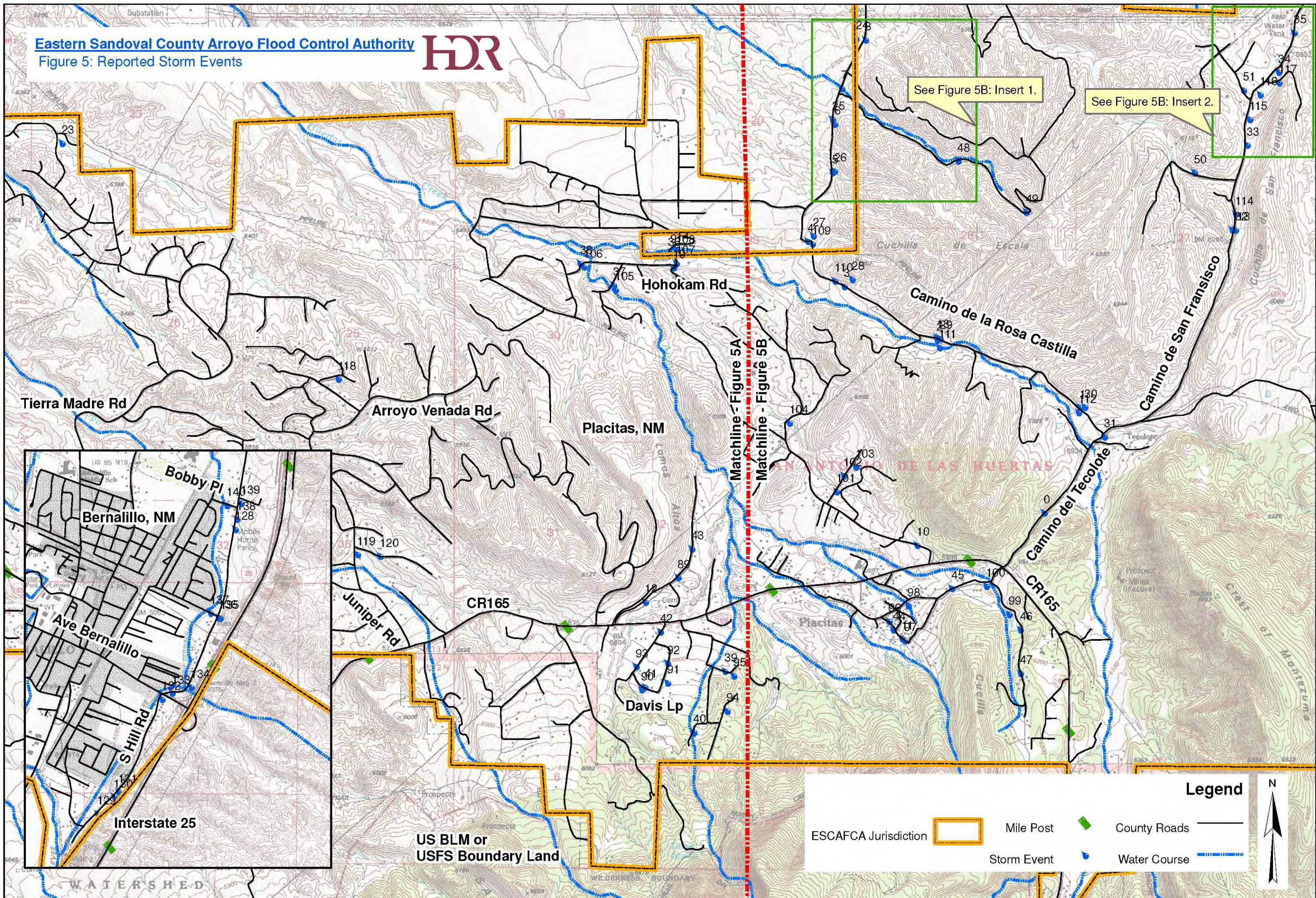
### Town of Bernalillo (June 19, 2007)

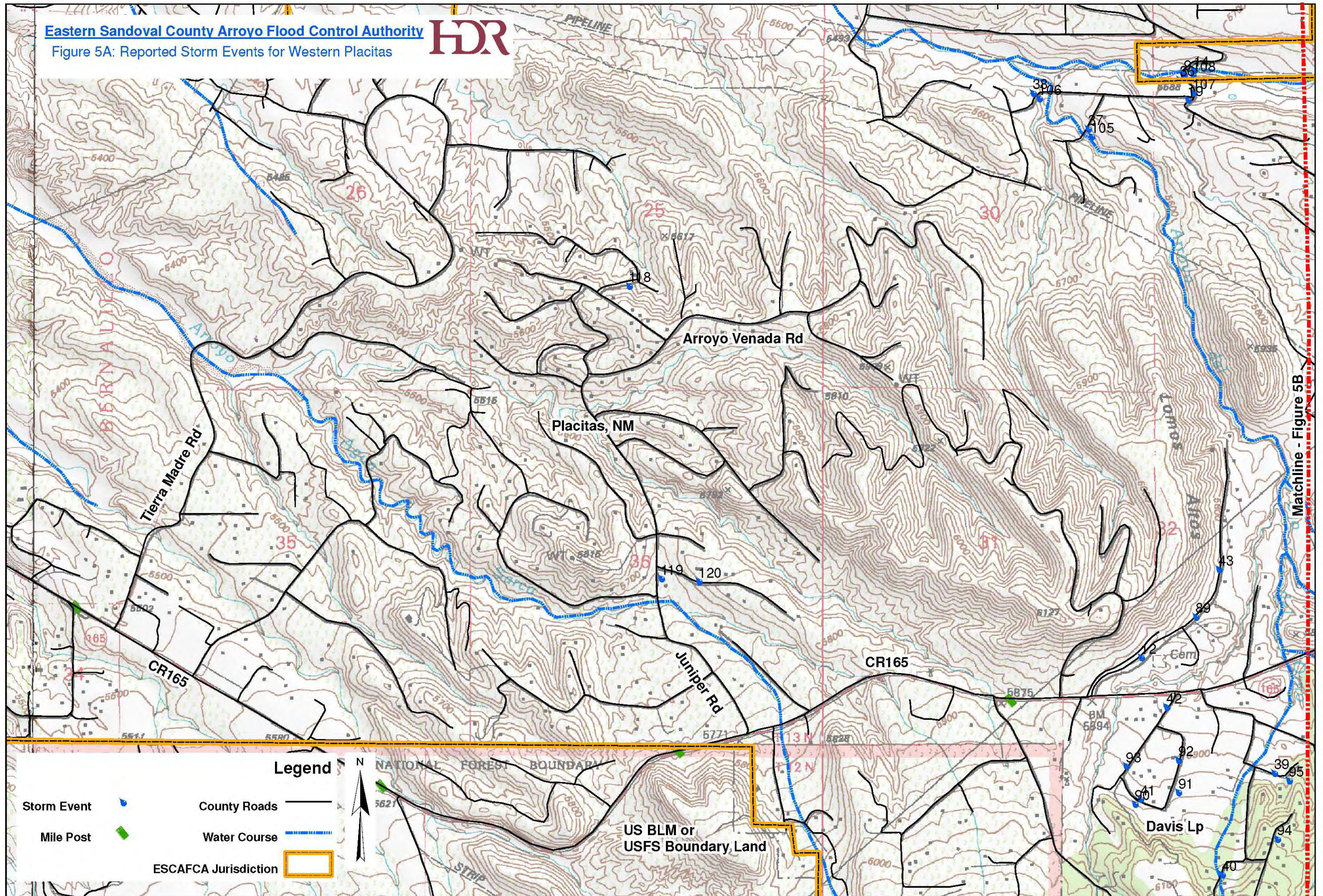
The meeting was held at the Bernalillo Council Chambers. Attendees included HDR employees, ESCAFCA board members and approximately 10 residents. Residents discussed the disruption of natural drainage channels from the foothills leading Placitas towards Bernalillo. Road construction (Interstate 25) provided box culverts into natural channels, i.e., Los Huertas Creek. Drainage structures built under the interstate funnel water towards existing holding ponds in Bernalillo east of the irrigation ditch. Both businesses and residences are affected by flooding and ponding between I-25 and the ditch. Many believe culverts were not built to handle as much water as a good storm generates. South Hill Rd. is consistently flooded after most rainstorms. Attempting to control runoff,



**Eastern Sandoval County Arroyo Flood Control Authority**  
**Figure 4: Hydrologic Soil Groups (HSG)**







Matchline - Figure 5B



residents have walled off properties. Roads act as channels and existing holding ponds are repeatedly breached. Re-grading of private property also re-directs runoff which floods roads, homes and fields. Some residences were built in drainage channels. Several instances were cited where developers did not develop per approved plan and drainage shortfalls have not been addressed.

#### **Algodones (June 20, 2007)**

The meeting was held at the Algodones Elementary School. Attendees included HDR employees, ESCAFCA board members and approximately 4 residents. Undersized culverts cannot accommodate the volume of water draining from the foothills underneath the interstate and then into alfalfa fields. Storm sewers need to be designed. Last summer, hay bales floated after berms broke, the conservancy dyke failed and the ditch was breached. The south-flowing ditch then ran north and flooded properties. One resident suggested a retention pond be built along NM 474 right-of-way or its intersection with I-25.

#### **Placitas (June 21, 2007)**

Approximately 16 Placitas residents met with HDR and ESCAFCA board members at the Presbyterian Church. Most were not in favor of disrupting the Las Huertas Canyon ecosystem with a flood control structure and some believe that new development and road paving are the cause of flooding. Many stated they are upset that new homes are being built in arroyos.

Residents worry that erosion and storm water control measures will not be environmentally sensitive. They would prefer measures with riparian and wildlife corridor potential, not just the typical concrete channel solution.

Several residents noted strong safety concerns about the existing pipelines adjacent to and crossing arroyos in the area. Residents were also concerned about the adequacy of current repairs on arroyo crossings.

Erosion and undercutting of natural drainage channels and road wash outs are the primary concerns in Placitas. Residents are not happy about new subdivisions and do not generally support an Arroyo Authority to mitigate existing problems. Most feel they would be taxed for services that would primarily benefit Bernalillo residents and that Placitas has minimal flood problems.

## **V. SUMMARY OF FINDINGS**

ESCAFCA's communities—Algodones, Bernalillo, and Placitas—are each affected by a contributing watershed. Most of the sub-basins originate in the Sandia Mountains, which comprise a large amount of the eastern portion of Sandoval County. The storm water runoff from these watersheds flows primarily from the south-east to north-west. Major man-made structures that affect drainage in the jurisdiction are Interstate 25, the Piedra Lisa Dam, the Middle Rio Grande Conservancy District irrigation ditch, and the State-owned railroad tracks that run in a north-south direction east of the Rio Grande.

The Town of Bernalillo has experienced the following problems:

- Flooding on South Hill Road and Bobby Place
- Neighborhoods between the irrigation ditch and the rail tracks prone to ponding
- Intersections along NM 313 and along Camino Don Tomas frequently flood

The Village of Algodones has experienced the following problems:

- Concentrated flows from culverts underneath I-25 with no well-defined flow path to follow
- Flooding of the frontage road south of NM 474 and west of I-25

The Area of Placitas has experienced the following problems:

- Culvert replacement on Gringo Gulch Rd.
- Roadway erosion at several locations
- Pipeline washout adjacent to Windmill Rd.
- Road washout on Camino de las Huertas Rd.
- Pipeline washout adjacent to Windmill Rd. and in areas of Las Huertas Creek easements

The granular, non-cohesive soils found in the region are extremely prone to transport during a rainfall event, as illustrated in Appendix B. Therefore, any prudent drainage solutions must address sediment transport, channel aggradation / degradation, and long-term maintenance.

## VI. PROPOSED FLOOD CONTROL SYSTEM PROGRAM

In order to carry out ESCAFCA's Mission Statement "to minimize impacts and protect life and property from flooding," the following comprehensive program is proposed:

- To set minimum Design Criteria and Drainage Standards for new development and construction. At a minimum, the 100-year 24-hour rainfall event as accepted by FEMA should be followed.
- To formulate a Master Drainage Plan for the jurisdiction which will quantify the effects of historic structures and future development on drainage conditions.
- To address the storm water impacts of areas with multiple platted home sites that have not yet been developed.
- To review and update the Design Criteria, Drainage Standards and Floodplain Regulations as necessary to reflect current engineering and regulatory standards.
- To maintain flood control structures and an inventory of drainage problems to be addressed, and prepare an annual Flood Control Assessment Report. Currently this inventory includes, but is not limited to:
  - South Hill Road in the Town of Bernalillo
  - Bobby Place in the Town of Bernalillo

- Residential flooding on the frontage road west of I-25 in Algodones
  - Flood water breaching of the MRGCD ditch in Algodones
  - The Gringo Gulch Rd. in Placitas
  - The Camino de las Huertas Road in Placitas
- Perform a thorough hydraulic and scour analysis of pipeline crossings in the area and explore and advocate long term solutions including accountability for remediation and fiscal responsibility.
  - To plan and develop solutions to existing flooding and drainage problems and needs of the jurisdiction.
  - To formulate, adopt and enforce a watershed management approach to storm water control emphasizing detention and infiltration while de-emphasizing the traditional concrete canalization approach.
  - To develop a mutually beneficial, cooperative relationship with watershed controlling entities outside ESCAFCA's boundaries.
  - To identify available open space and BLM area which could be used for storm water and mitigation.
  - To formulate and complete an outline of projects in a Flood Control Capital Improvement Plan.
  - To encourage developers to include dual purpose flood control / recreational areas in future developments.
  - To formulate, administer, and enforce Floodplain Regulations for the jurisdiction.
  - To manage and operate storm drainage facilities in a safe, efficient manner.
  - To provide assistance, where possible, in answering inquiries relating to flood control and drainage issues.
  - To provide a customer-friendly permit processing procedure.
  - To review grading plans and drainage reports and issue Grading Permits for new developments and construction.
  - To comply with current EPA National Pollutant Discharge Elimination System requirements.
  - To evaluate selected stream flow information from historical data and determine if recent storm event flows were significantly different.

## VII. REFERENCES

1. New Mexico State Highway and Transportation Department, *Drainage Manual, Volume I, Hydrology*, 1995.
2. New Mexico State Highway and Transportation Department, *Drainage Manual, Volume II, Hydraulics, Sedimentation and Erosion*, 1998.
3. United States Department of the Interior, *Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico*, 1977.
4. Federal Emergency Management Agency, *Flood Insurance Study–Sandoval County, New Mexico and Incorporated Area*, July 16, 1996.

### Special Thanks To:

Mr. Stephen Jerge and the Town of Bernalillo

Mr. Chris Miller and Sandoval County

Mr. David Stoliker and Southern Sandoval County Arroyo Flood Control Authority

Bernalillo Public Schools

Las Placitas Presbyterian Church



## APPENDIX A: Hydrology

### Methodology

All hydrologic calculations were performed in accordance with the NMDOT *Drainage Manual Volume I Hydrology* 1995 (NMDOT, 1995). The 100-year frequency storm was used to determine the inlet capacity and the computed flow rates for the 50-year, 100-year and 500-year frequency storms. Hydrologic analysis methods chosen were dependent on basin size of rural conditions as described in the selection flow chart of the NMDOT manual. Basin and hydrologic soil group delineation was accomplished with AutoCAD Land Enabled Map; rainfall runoff calculations were made using Microsoft Excel and MathCAD software. Output data has been provided and can be found in Appendix C. ESCAFCA's communities—Algodones, Bernalillo, and Placitas—each have a contributing watershed, described below.

Basin	Area (ac)	Q <sub>P50</sub> (cfs)	Q <sub>P100</sub> (cfs)	Q <sub>P500</sub> (cfs)	Method**	
Placitas	101	890	753	916	1,091	SPF
	102	1,119	1,585	1,906	2,247	SPF
	103	1,249	1,445	1,747	2,069	SPF
	104	203	482	585	696	SPF
	105	52	332	392	454	SPF
	106	499	831	1,006	1,193	SPF
	107	1,060	1,886	2,257	2,650	SPF
	108	268	464	563	669	SPF
	109	61	248	299	354	SPF
	110	223	360	439	524	SPF
	*111	61	--	--	--	--
	*112	31	--	--	--	--
	113	162	319	385	456	SPF
	114	27	--	--	--	--
	115	2,439	3,106	3,721	4,374	SPF
	*116	29	--	--	--	--
	*117	294	--	--	--	--
	118	214	732	866	1,006	SPF
Algodones	201	19,235	4,425	5,811	9,766	RRE
	202	367	761	928	1,107	SPF
	203	1,051	1,126	1,350	1,589	SPF
	204	433	659	781	910	SPF
	205	4,306	3,820	4,880	7,692	RRE
	206	2,199	1,477	1,749	2,035	SPF
Bernalillo	301	701	1,990	2,393	3,383	SPF
	302	1,009	2,740	3,308	4,709	SPF
	303	2,676	2,883	3,409	4,682	SPF
	304	907	1,002	1,195	1,666	SPF
	305	2,547	2,584	3,051	4,181	SPF
	306	653	919	1,084	1,485	SPF
	307	206	748	879	1,194	SPF

\*Basins with no outlet; require further investigation.

\*\*SPF – Simplified Peak Flow; RRE – USGS Regional Regression Equations

Based upon the analysis presented above, HDR provides the following conclusions and recommendations:

1. Some of the estimates of peak discharge used in the analysis are based upon regional regression methods which have a fairly large degree of estimate uncertainty. Therefore, these values should be considered approximate. A more detailed hydrologic assessment would require additional field reconnaissance and analysis in order to generate a method using HEC-RAS or HEC-HMS platforms.

### Soil Type

Although the aerial extent of specific soil units was derived from GIS data, soil type is typically derived from the NRCS soil surveys. These surveys classify soils into one of four “hydrologic soil groups”; A, B, C and D. Type A soils have a very low runoff potential and are typically very porous soils such as sandy and cobbly soils. Type D soils are soils which have a high runoff potential such as a very rocky soils, soils with a well developed desert pavement or soils with a shallow impervious layer. Soils from this study were identified using the NRCS soil survey of Bernalillo County (NRCS, 1977) and the NRCS website for Sandoval County (NRCS, 2007). The data includes a description of each major association and its characteristics and hydrologic soil group. The majority of the site is comprised of soils that are within hydrologic soil group B and C. A summary of the soils in the water shed are provided in Table 1B (see next page).

### Soil Group

Another factor that impacts the curve number estimate is relative soil moisture content. This factor is described by the SCS using a relative term described as “antecedent moisture condition” (AMC). The SCS has identified three different antecedent moisture conditions; AMC I, AMC II, and AMC III. AMC I is a condition in which the soil moisture has been depleted by a relatively long period of no rainfall and is assumed to be the condition that represents the condition when the soil has its highest infiltration rate. AMC II is an average condition and is the condition usually assumed to be present in the watershed for most hydrologic studies for drainage design. AMC III is the condition in which soil moisture is high due to recent rainfall or snowmelt. This condition is assumed to be the condition in which the soil infiltration capacity is at its lowest point and is usually used for probable maximum discharge studies which will need to be performed for the design of some of the detention basins identified as a part of this Master Plan. AMC II is the condition used for this study.

**TABLE 1B: NRCS SOIL SUMMARY WITHIN THE ESCAFCA BOUNDARY.**

Soil Symbol	Map Unit Name	Hydrologic Soil Group*
Te	Tesajo-Millet, stony-sandy loams.	A
53	Witt-Harvey association, 1 to 7 percent slopes	B
55	La Fonda loam, 1 to 5 percent slopes	B
56	Ildefonso cobbly loam, 15 to 35 percent slopes	B
59	<i>Harvey-Ildefonso-La Fonda association, 3 to 15 percent slopes</i>	<i>B</i>
65	Ildefonso-Harvey association, 10 to 35 percent slopes	B
109	Embudo-Tijeras association, 1 to 9 percent slopes	B
112	Tijeras gravelly fine sandy loam, 1 to 5 percent slopes	B
ILC	Ildefonso, gravelly-sandy loam, 1 to 9 percent slopes	B
SC	Scholle-Ildefonso association	B
TgB	Tijeras, gravelly fine sandy loam, 1 to 5 percent slopes	B
10	<i>Trail silty clay loam, 0 to 1 percent slopes</i>	<i>C</i>
21	<i>Rock outcrop-Hackroy complex, 1 to 8 percent slopes</i>	<i>C</i>
22	<i>Aga silty clay loam, 0 to 1 percent slopes</i>	<i>C</i>
25	<i>Gilco loam, 0 to 1 percent slopes</i>	<i>C</i>
25	<i>Unlisted in this index (Jurado)</i>	<i>C</i>
27	<i>Aga loam, 0 to 1 percent slopes</i>	<i>C</i>
29	<i>Trail loamy sand, 0 to 1 percent slopes</i>	<i>C</i>
63	<i>Placitas gravelly loam, 8 to 40 percent slopes</i>	<i>C</i>
64	<i>Skyvillage-Ildefonso association, 8 to 40 percent slopes</i>	<i>C</i>
66	<i>Zia sandy loam, 3 to 6 percent slopes</i>	<i>C</i>
106	<i>Stumble association, 1 to 40 percent slopes</i>	<i>C</i>
111	<i>Rock outcrop-Zia complex, 8 to 25 percent slopes</i>	<i>C</i>
145	<i>Grieta-Sheppard loamy fine sands, 2 to 9 percent slopes</i>	<i>C</i>
208	<i>Sedillo very gravelly fine sandy loam, 25 to 55 percent slopes</i>	<i>C</i>
262	<i>Pastura loam, 1 to 4 percent slopes</i>	<i>C</i>
358	<i>Deama-Elpedro-Rock outcrop complex, 10 to 55 percent slopes</i>	<i>C</i>
418	<i>Jocity clay loam, 0 to 2 percent slopes</i>	<i>C</i>
431	<i>Trail loamy sand, 1 to 4 percent slopes</i>	<i>C</i>
BA	Badland	C
KS	Kolob, stony loam	C
KT	Kolob-Rock, outcrop association	C
Ku	Kolob-Sandia association	C
KVE	Kolob, stony loam, cold variant, 15 to 40 percent slopes	C
SAF	Salas complex, 20 to 80 percent slopes	C
SBE	Sandia-Kolob complex, 15 to 40 percent slopes	C
SFE	Seis, stony loam, 15 to 60 percent slopes	C
SHF	Seis complex, 30 to 80 percent slopes	C
201	Rock outcrop-Sedgran association, 25 to 55 percent slopes	D
BOF	Borolls-Rock outcrop association, hilly	D
EtC	Embudo-Tijeras association, 1 to 9 percent slopes	D
Ra	Rock outcrop	D
ROF	Rock outcrop-Orthids complex, 40 to 80 percent slopes	D

\*Soils in italics are assumed to be Type C classification.

## APPENDIX C: CALCULATIONS

The stated equations were used throughout all calculations.

$$q_u = 0.543 \cdot T_c^{-0.812} \cdot 10 \cdot \frac{[|\log(T_c)+0.3| - \log(T_c) - 0.3]^5}{10}$$

$$Q_d = \frac{[P_{24} - (200 / CN) + 2]^2}{P_{24} + (800 / CN) - 8}$$

$$Q_p = A \cdot q_u \cdot Q_d$$

**TABLE 1C: PLACITAS FLOWS\***

P<sub>24,50</sub> (in) = 3.16    P<sub>24,100</sub> (in) = 3.52    P<sub>24,500</sub> (in) = 3.89

Basin No.	Area (ft <sup>2</sup> )	Area (ac)	Area (sq mi)	Stream Length, L (ft)	High Elevation (ft)	Low Elevation (ft)	?H (ft)	Slope, S (ft/ft)	T <sub>C</sub> (min)	T <sub>C</sub> (hr)	CN	q <sub>u</sub> (cfs)	Q <sub>d50</sub> (in)	Q <sub>d100</sub> (in)	Q <sub>d500</sub> (in)	Q <sub>P50</sub> (cfs)	Q <sub>P100</sub> (cfs)	Q <sub>P500</sub> (cfs)
100																		
101	38757819	890	1.39	17714	6300	5350	950	5.4%	44.9	0.7	78	0.69	1.23	1.50	1.78	753	916	1091
102	48732909	1119	1.75	12712	6840	5630	1210	9.5%	27.9	0.5	80	1.01	1.40	1.68	1.99	1585	1906	2247
103	54407976	1249	1.95	20662	9060	5770	3290	15.9%	33.3	0.6	79	0.88	1.32	1.60	1.89	1445	1747	2069
104	8830608	203	0.32	3836	6060	5810	250	6.5%	12.8	0.2	78	1.90	1.25	1.52	1.81	482	585	696
105	2265870	52	0.08	1112	5920	5870	50	4.5%	5.7	0.1	85	3.67	1.74	2.05	2.38	332	392	454
106	21747807	499	0.78	7785	6460	5870	590	7.6%	20.9	0.3	79	1.28	1.30	1.57	1.87	831	1006	1193
107	46171333	1060	1.66	12030	7590	5800	1790	14.9%	22.5	0.4	82	1.20	1.48	1.77	2.08	1886	2257	2650
108	11657064	268	0.42	7099	6400	5840	560	7.9%	19.1	0.3	78	1.37	1.26	1.53	1.82	464	563	669
109	2636227	61	0.09	1636	6000	5910	90	5.5%	7.1	0.1	79	3.07	1.33	1.61	1.90	248	299	354
110	9712895	223	0.35	6675	6340	5910	430	6.4%	19.7	0.3	77	1.34	1.21	1.47	1.76	360	439	524
111	2656898	61	0.10								75							
112	1350871	31	0.05								72							
113	7071183	162	0.25	7116	6940	6220	720	10.1%	17.4	0.3	79	1.48	1.33	1.60	1.90	319	385	456
114	1180829	27	0.04								72							
115	106227714	2439	3.81	18696	8720	6310	2410	12.9%	33.4	0.6	81	0.87	1.46	1.75	2.05	3106	3721	4374
116	1270425	29	0.05								81							
117	12803803	294	0.46								81							
118	9343149	214	0.34	5890	7960	6850	1110	18.8%	11.9	0.2	85	2.03	1.69	1.99	2.32	732	866	1006

\*Basins without data have no outlet and require further investigation.

**TABLE 2C: PLACITAS CURVE NUMBERS.**

Basin No.	Area (ft <sup>2</sup> )	Area (ac)	Area (sq mi)	% Soil Type A	% Soil Type B	% Soil Type C	% Soil Type D	Area Soil A	CN A	Area Soil B	CN B	Area Soil C	CN C	Area Soil D	CN D	CN*Area Soil A	CN*Area Soil B
<b>100</b>																	
101	38757819	890	1.39	0.00	0.90	0.10	0.00	0.0	63	800.8	77	89.0	85	0.0	88	0.00	61660.17
102	48732909	1119	1.75	0.00	0.30	0.70	0.00	0.0	59	335.6	75	783.1	83	0.0	87	0.00	25004.14
103	54407976	1249	1.95	0.00	0.20	0.80	0.00	0.0	55	249.8	72	999.2	81	0.0	86	0.00	17986.11
104	8830608	203	0.32	0.00	0.90	0.00	0.10	0.0	63	182.5	77	0.0	85	20.3	88	0.00	14048.69
105	2265870	52	0.08	0.00	0.25	0.00	0.75	0.0	63	13.0	77	0.0	85	39.0	88	0.00	1001.33
106	21747807	499	0.78	0.00	0.40	0.30	0.30	0.0	55	199.7	72	149.8	81	149.8	86	0.00	14378.72
107	46171333	1060	1.66	0.00	0.10	0.60	0.30	0.0	55	106.0	72	636.0	81	318.0	86	0.00	7631.63
108	11657064	268	0.42	0.00	0.30	0.70	0.00	0.0	55	80.3	72	187.3	81	0.0	86	0.00	5780.36
109	2636227	61	0.09	0.00	0.70	0.30	0.00	0.0	63	42.4	77	18.2	85	0.0	88	0.00	3262.00
110	9712895	223	0.35	0.00	0.40	0.60	0.00	0.0	55	89.2	72	133.8	81	0.0	86	0.00	6421.75
111	2656898	61	0.10	0.00	0.90	0.10	0.00	0.0	59	54.9	75	6.1	83	0.0	87	0.00	4089.65
112	1350871	31	0.05	0.00	1.00	0.00	0.00	0.0	55	31.0	72	0.0	81	0.0	86	0.00	2232.84
113	7071183	162	0.25	0.00	0.30	0.50	0.20	0.0	55	48.7	72	81.2	81	32.5	86	0.00	3506.37
114	1180829	27	0.04	0.00	1.00	0.00	0.00	0.0	55	27.1	72	0.0	81	0.0	86	0.00	1951.78
115	106227714	2439	3.81	0.00	0.05	0.80	0.15	0.0	55	121.9	72	1950.9	81	365.8	86	0.00	8779.15
116	1270425	29	0.05	0.05	0.05	0.60	0.30	1.5	55	1.5	72	17.5	81	8.7	86	80.20	104.99
117	12803803	294	0.46	0.00	0.05	0.85	0.10	0.0	55	14.7	72	249.8	81	29.4	86	0.00	1058.17
118	9343149	214	0.34	0.00	0.00	0.30	0.70	0.0	55	0.0	72	64.3	81	150.1	86	0.00	0.00
			<b>AVG</b>	<b>0.00</b>	<b>0.43</b>	<b>0.40</b>	<b>0.16</b>										
	Poor	Fair	Good														
CN A	63	55	49														
CN B	77	72	68														
CN C	85	81	79														
CN D	88	86	84														

**TABLE 3C: ALGODONES FLOWS.**

	P <sub>24,50</sub> (in) =	3.16	P <sub>24,100</sub> (in) =	3.52	P <sub>24,500</sub> (in) =	3.89												
	I <sub>24,10</sub> (in) =	2.36																
Basin No.	Area (ft <sup>2</sup> )	Area (ac)	Area (sq mi)	Stream Length, L (ft)	High Elevation (ft)	Low Elevation (ft)	?H (ft)	Slope, S (ft/ft)	E <sub>10</sub> (ft)	E <sub>85</sub> (ft)	E <sub>c</sub> (ft)	t <sub>c</sub> (min)	T <sub>c</sub> (hr)	CN	q <sub>u</sub> (cfs)	Q <sub>d50</sub> (in)	Q <sub>d100</sub> (in)	Q <sub>d500</sub> (in)
200																		
201	837862340	19235	30.05	80346	9880	5170	4710	5.9%	5320	7560	6440							
202	15970245	367	0.57	4025	5400	5190	210	5.2%				14.5	0.2	77	1.72	1.21	1.47	1.76
203	45800088	1051	1.64	11868	5510	5140	370	3.1%				40.7	0.7	81	0.74	1.44	1.72	2.03
204	18875753	433	0.68	8917	5440	5120	320	3.6%				30.9	0.5	84	0.93	1.63	1.94	2.26
205	187565353	4306	6.73	31053	6090	5140	950	3.1%	5230	5890	5560							
206	95779273	2199	3.44	28447	5870	5150	720	2.5%				86.4	1.4	84	0.40	1.66	1.97	2.29

**TABLE 4C: ALGODONES CURVE NUMBERS.**

Basin No.	Area (ft <sup>2</sup> )	Area (ac)	Area (sq mi)	% Soil Type A	% Soil Type B	% Soil Type C	% Soil Type D	Area Soil A	CN A	Area Soil B	CN B	Area Soil C	CN C	Area Soil D	CN D	CN*Area Soil A	CN*Area Soil B
100																	
201	837862340	19235	30.05	0.00	0.15	0.70	0.15	0.0	59	2885.2	75	13464.3	83	2885.2	87	0.00	214947.47
202	15970245	367	0.57	0.00	0.95	0.05	0.00	0.0	63	348.3	77	18.3	85	0.0	88	0.00	26818.72
203	45800088	1051	1.64	0.00	0.50	0.50	0.00	1.6	63	525.7	77	525.7	85	0.0	88	0.00	40479.88
204	18875753	433	0.68	0.00	0.15	0.85	0.00	0.0	63	65.0	77	368.3	85	0.0	88	0.00	5004.93
205	187565353	4306	6.73	0.00	0.55	0.45	0.00	0.0	63	2368.2	77	1937.7	85	0.0	88	0.00	182355.20
206	95779273	2199	3.44	0.00	0.10	0.90	0.00	0.0	63	219.9	77	1978.9	85	0.0	88	0.00	16930.68
			<b>AVG</b>	<b>0.00</b>	<b>0.40</b>	<b>0.58</b>	<b>0.03</b>										
	Poor	Fair	Good														
CN A	63	55	49														
CN B	77	72	68														
CN C	85	81	79														
CN D	88	86	84														

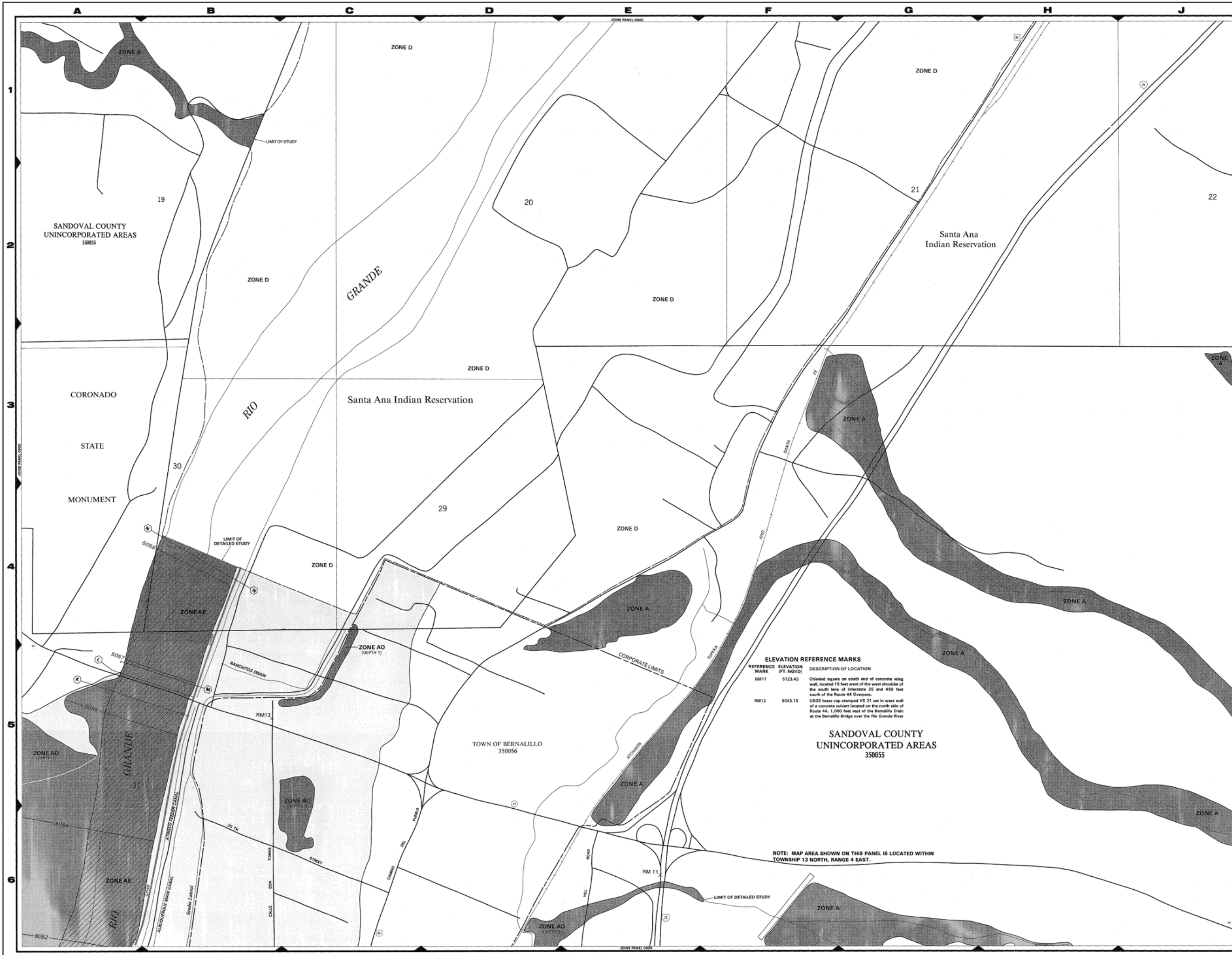
**TABLE 5C: BERNALILLO FLOWS.**

P<sub>24,50</sub> (in) = 3.56 P<sub>24,100</sub> (in) = 3.97 P<sub>24,500</sub> (in) = 4.93

Basin No.	Area (ft <sup>2</sup> )	Area (ac)	Area (sq mi)	Stream Length, L (ft)	High Elevation (ft)	Low Elevation (ft)	?H (ft)	Slope, S (ft/ft)	t <sub>c</sub> (min)	T <sub>C</sub> (hr)	Weighted CN	q <sub>u</sub> (cfs)	Q <sub>d50</sub> (in)	Q <sub>d100</sub> (in)	Q <sub>d500</sub> (in)	Q <sub>P50</sub> (cfs)	Q <sub>P100</sub> (cfs)
300	304366224.1	6987	10.92														
303	116552637.1	2676	4.18	34142	8600	5120	3480	10.2%	58.1	1.0	83	0.56	1.93	2.29	3.14	2883	3409
304	39498709	907	1.42	18375	5900	5110	790	4.3%	50.3	0.8	81	0.63	1.76	2.10	2.93	1002	1195
305	110935212	2547	3.98	38094	8900	5100	3800	10.0%	63.8	1.1	84	0.52	1.96	2.32	3.18	2584	3051
306	28427749	653	1.02	14381	5685	5110	575	4.0%	42.8	0.7	84	0.71	1.97	2.33	3.19	919	1084
307	8951916	206	0.32	3865	5300	5100	200	5.2%	14.1	0.2	85	1.76	2.07	2.43	3.30	748	879
301	30555324.6	701	1.10	3865	5300	5100	200	5.2%	14.1	0.2	79	1.76	1.61	1.94	2.74	1990	2393
302	43962465.02	1009	1.58	3865	5300	5100	200	5.2%	14.1	0.2	78	1.76	1.54	1.86	2.65	2740	3308

**TABLE 6C: BERNALILLO CURVE NUMBERS.**

Basin No.	Area (ft <sup>2</sup> )	Area (ac)	Area (sq mi)	% Soil Type A	% Soil Type B	% Soil Type C	% Soil Type D	Area Soil A	CN A	Area Soil B	CN B	Area Soil C	CN C	Area Soil D	CN D	CN*Area Soil A	CN*Area Soil B
300	304366224	6987	10.92														
303	116552637	2676	4.18	0.00	0.33	0.33	0.33	0.0	63	891.8	77	891.8	85	891.8	88	0.00	68668.93
304	39498709	907	1.42	0.00	0.60	0.10	0.30	0.0	63	544.1	77	90.7	85	272.0	88	0.00	41892.57
305	110935212	2547	3.98	0.00	0.20	0.20	0.60	0.0	59	509.3	75	509.3	83	1528.0	87	0.00	37946.16
306	28427749	653	1.02	0.00	0.15	0.85	0.00	0.0	63	97.9	77	554.7	85	0.0	88	0.00	7537.66
307	8951916	206	0.32	0.00	0.00	1.00	0.00	0.0	63	0.0	77	205.5	85	0.0	88	0.00	0.00
301	30555325	701	1.10	0.00	0.80	0.20	0.00	0.0	63	561.2	77	140.3	85	0.0	88	0.00	43209.55
302	43962465	1009	1.58	0.00	0.90	0.10	0.00	0.0	63	908.3	77	100.9	85	0.0	88	0.00	69940.29
			<b>AVG</b>	<b>0.00</b>	<b>0.43</b>	<b>0.40</b>	<b>0.18</b>										
	Poor	Fair	Good														
CN A	63	55	49														
CN B	77	72	68														
CN C	85	81	79														
CN D	88	86	84														



### LEGEND

**SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD**

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of sheet flow flooding, vehicles also determined.
- ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

**FLOODWAY AREAS IN ZONE AE**

**OTHER FLOOD AREAS**

- ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

**OTHER AREAS**

- ZONE X** Areas determined to be outside 500-year flood plain.
- ZONE D** Areas in which flood hazards are undetermined.

**BOUNDARIES**

- Flood Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

**SYMBOLS**

- E13— Base Flood Elevation Line; Elevation in Feet\*
- (D) Cross Section Line
- (EL 987) Base Flood Elevation in Feet Where Uniform Within Zone\*
- RM7<sub>x</sub> Elevation Reference Mark

\*Referenced to the National Geodetic Vertical Datum of 1929

### NOTES

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Areas of special flood hazard (100-year flood) include Zones A, A1-30, AE, AH, AO, A99, V, VE, 30 AND VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were compiled at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Coastal base flood elevations apply only landward of the shoreline.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of the map.

For community map revision history prior to countywide mapping, see Section 4.0 of the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

**MAP REPOSITORY**  
Refer to Repository Listing on Index Map

**EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP:**  
JULY 16, 1996

**EFFECTIVE DATE (S) OF REVISION (S) TO THIS PANEL:**

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actual rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6626.

↑

APPROXIMATE SCALE IN FEET

500 0 500

#### ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM11	5123.43	Chiseled square on south end of concrete wing wall, located 15 feet west of the west shoulder of the south lane of Interstate 25 and 450 feet south of the Route 44 Overpass.
RM12	5053.15	USGS brass cap stamped V9 21 set in west wall of a concrete culvert located on the north side of Route 44, 1,000 feet east of the Bernalillo Drain at the Bernalillo Bridge over the Rio Grande River

**SANDOVAL COUNTY UNINCORPORATED AREAS 350055**

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 NORTH, RANGE 4 EAST.

**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM FLOOD INSURANCE RATE MAP**

**SANDOVAL COUNTY, NEW MEXICO AND INCORPORATED AREAS**

(SEE MAP INDEX FOR PANELS NOT PRINTED)

**CONTAINS**

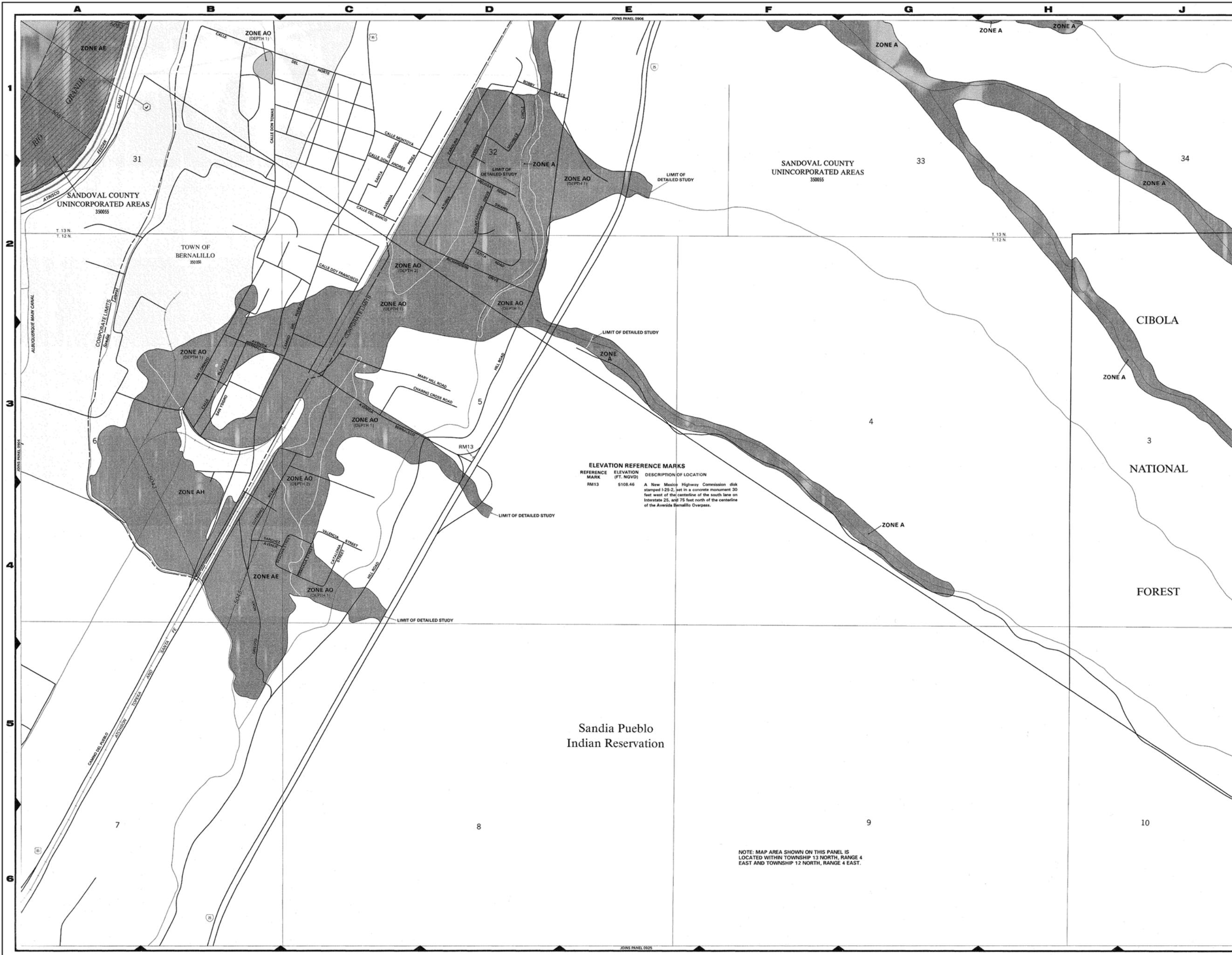
COMMUNITY	NUMBER	PANEL	SUFFIX
BERNALILLO, TOWN OF	350056	0905	C
UNINCORPORATED AREAS	350055	0906	C

**MAP NUMBER 35043C0906 C**

**EFFECTIVE DATE: JULY 16, 1996**

Federal Emergency Management Agency





### LEGEND

**SPECIAL FLOOD HAZARD AREAS INUNDED BY 100-YEAR FLOOD**

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponds); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually areas of ponds); base flood elevations determined. For areas of shallow flow (usually areas of ponds); average depths determined. For areas of shallow flow (usually areas of ponds); average depths determined. For areas of shallow flow (usually areas of ponds); average depths determined.
- ZONE A99** To be protected from 100-year flood by Federal flood protection system, under construction; no base elevations determined.
- ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

**FLOODWAY AREAS IN ZONE AE**

**OTHER FLOOD AREAS**

- ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

**OTHER AREAS**

- ZONE D** Areas determined to be outside 500-year flood plain.
- ZONE D** Areas in which flood hazards are undetermined.

**Boundaries**

- Flood Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

**Reference Marks**

- 513 Base Flood Elevation Line; Elevation in Feet
- (EL 987) Base Flood Elevation in Feet Where Uniform Within Zone\*
- RM7<sub>x</sub> Elevation Reference Mark

\*Referenced to the National Geodetic Vertical Datum of 1929

### NOTES

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage courses of small size, or all planimetric features outside Special Flood Hazard Areas.

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Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

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Coastal base flood elevations apply only landward of the shoreline.

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For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index

MAP REPOSITORY  
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP: JULY 16, 1996

EFFECTIVE DATE (S) OF REVISION (S) TO THIS PANEL:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6626.

APPROXIMATE SCALE IN FEET

500 0 500

### ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM13	5108.46	A New Mexico Highway Commission disk stamped 1-25-2, set in a concrete monument 30 feet west of the centerline of the south lane on Interstate 25, and 75 feet north of the centerline of the Arroyo Bernalillo Overpass.

Sandia Pueblo Indian Reservation

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 13 NORTH, RANGE 4 EAST AND TOWNSHIP 12 NORTH, RANGE 4 EAST.

**NATIONAL FLOOD INSURANCE PROGRAM**

**FIRM FLOOD INSURANCE RATE MAP**

SANDOVAL COUNTY, NEW MEXICO AND INCORPORATED AREAS

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS	COMMUNITY	NUMBER	PANEL	SUFFIX
	BERNALILLO, TOWN OF	350066	0908	C
	UNINCORPORATED AREAS	350055	0908	C

MAP NUMBER 35043C0908 C

EFFECTIVE DATE: JULY 16, 1996

Federal Emergency Management Agency

APPENDIX E: Public Comment Record and Photos

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**Ongoing erosion conditions at I-25 and Avenida Bernalillo**

**Erosion due to high waters crossing South Hill Rd. at Avenida Bernalillo**





**Replacement culverts due to 2006 road washout on Camino de las Huertas**

**Arroyo meander encroaching on commercial site**





**Sediment-laden reaches that contributes to South Hill Rd.**





**Sediment deposition on South Hill Rd.**



**Storm water damage to private residence along Avenida Bernalillo**



**Utility pipeline markers looking southwest from Windmill Trail just west of Indian Flats Rd**

**Concrete erosion control blanket over utility pipelines just west of Camino de las Huertas between Cedar Creek Rd. and Windmill Trail**





**Exposed pipelines on Las Huertas Creek**



Storm Event											
FID	ID	WHEN	EVENT	FID	ID	WHEN	EVENT	FID	ID	WHEN	EVENT
0	1	62606	rain	50	27	70606	rain	100	12	70506	rain
1	2	62606	rain	51	28	70606	rain	101	13	70506	rain
2	3	62606	rain	52	1	70606	rain	102	14	70506	rain
3	4	62606	rain	53	2	70606	rain	103	15	70506	rain
4	5	62606	rain	54	3	70606	rain	104	16	70506	rain
5	6	62606	rain	55	4	70606	rain	105	17	70506	rain
6	7	62606	rain	56	5	70606	rain	106	18	70506	rain
7	8	62606	rain	57	6	70606	rain	107	19	70506	rain
8	9	62606	rain	58	7	70606	rain	108	20	70506	rain
9	10	62606	rain	59	8	70606	rain	109	21	70506	rain
10	11	62606	rain	60	9	70606	rain	110	22	70506	rain
11	12	62606	rain	61	10	70606	rain	111	23	70506	rain
12	1	62706	rain	62	11	70606	rain	112	24	70506	rain
13	2	62706	rain	63	1	70506	rain	113	25	70506	rain
14	3	62706	rain	64	2	70506	rain	114	26	70506	rain
15	1	62806	rain	65	3	70506	rain	115	27	70506	rain
16	2	62806	rain	66	4	70506	rain	116	28	70506	rain
17	3	62806	rain	67	5	70506	rain	117	29	70506	rain
18	4	62806	rain	68	6	70506	rain	118	30	70506	rain
19	4	62706	rain	69	7	70506	rain	119	31	70506	rain
20	1	70606	rain	70	8	70506	rain	120	32	70506	rain
21	2	70606	rain	71	9	70506	rain	121	1	70706	rain
22	3	70606	rain	72	10	70506	rain	122	2	70706	rain
23	4	70606	rain	73	11	70506	rain	123	3	70706	rain
24	1	70606	rain	74	12	70506	rain	124	4	70706	rain
25	2	70606	rain	75	13	70506	rain	125	5	70706	rain
26	3	70606	rain	76	14	70506	rain	126	6	70706	rain
27	4	70606	rain	77	15	70506	rain	127	0	70606	rain
28	5	70606	rain	78	16	70506	rain	128	0	70706	rain
29	6	70606	rain	79	17	70506	rain	129	0	70706	
30	7	70606	rain	80	18	70506	rain	130	0	70706	rain
31	8	70606	rain	81	19	70506	rain	131	0	70706	rain
32	9	70606	rain	82	20	70506	rain	132	0	70706	
33	10	70606	rain	83	21	70506	rain	133	0	70706	
34	11	70606	rain	84	22	70506	rain	134	0	70706	
35	12	70606	rain	85	23	70506	rain	135	0	70706	rain
36	13	70606	rain	86	24	70506	rain	136	0	70706	rain
37	14	70606	rain	87	25	70506	rain	137	0	70706	rain
38	15	70606	rain	88	26	70506	rain	138	0	70706	rain
39	16	70606	rain	89	1	70506	rain	139	0	70706	
40	17	70606	rain	90	2	70506	rain	140	0	70706	rain
41	18	70606	rain	91	3	70506	rain				
42	19	70606	rain	92	4	70506	rain				
43	20	70606	rain	93	5	70506	rain				
44	21	70606	rain	94	6	70506	rain				
45	22	70606	rain	95	7	70506	rain				
46	23	70606	rain	96	8	70506	rain				
47	24	70606	rain	97	9	70506	rain				
48	25	70606	rain	98	10	70506	rain				
49	26	70606	rain	99	11	70506	rain				



## Public Comment Record

ESCAFCA Public Meeting–Bernalillo  
June 19, 2007

**Map 1** received the following comments, see numbered dots, page 2:  
Comment #1–south ponding at high school

Comment #2–ponding also occurs in front of Days Inn.

Comment #3–church floods every rain.

**Map 2** received no comments on flooding.

**Map 3** received the following comments, see numbered dots on map:  
Comment #3–flooding at commercial driveways.

Comment #5–street adjacent to school floods, Del Norte houses don't flood but yards do.

Comment #6–floods on east side of road all the way to 550. General street flow issues.





## Public Comment Record

Map 4 received the following comments, see numbered dots, page 6:

Comment #1- area had 4 to 5 inches of standing water in September 2006.

Comment #2-Intersection floods.

Comment #3-xxxxx: 34 years in residence, made comments 1-5.

Comment #4-neighbor replaced floor in mobile home after flooding 20 years ago.

Comment #5-Floods at Bobby Place and Athena.

Comments #6, 7-Mountain View area: arroyo from I-25 cuts to west. MRGCD ditch breaks in 5 places. South-running ditch will run north in a hard rain.

Comments #8, 9-Area where there is constant breakage.

Comments #10, 11-fills pond, #10 is 5 feet deep {see Budagher vs. AMREP lawsuit}

Comments #12, 13-Supposed to be a pond area but privately-created diversions move water towards #13. Rain used to split and run both sides of railroad tracks.

Comments #14, 15-Holding pond not functioning as a pond at this time. Water moving towards #13. Piedra Lisa dam (#15) rip-rap being installed. Possible area of development.

Comment #16-Sandia Pueblo holding ponds built by Corps of Engineers in the late 1960s for cattle; ponds are not functioning; silt problems. USFS was involved; the site is now a wilderness.

Comment #17-Site was not graded according to plans when it was built; causing run-off. State culverts on I-25 get gunked up with concrete.

Comment #18- Boulders blocking natural arroyo east of I-25; loose fill to south; sand and gravel plant covered culverts east of I-25.

Comments #19, 20-City reservoir is the high point, water flows north, east and south. County buildings to the south towards #20pond area has been

## Public Comment Record

breached and water has been 6 feet from the top of the drainage structure. County was supposed to work with MCT {new business located west of I-25} to create a pond that will hold.

Comment #21-xxxxx sold sand and gravel plant.

Comment # 22-Site of former dump (40-50 years ago), currently filled in. It was a pauper's graveyard.

Comment #23-street floods almost every [rainfall], there is a pump station on the church property. Street is a low point.

**Map 5** received no comments.



Map 6 received the following comment(s) , see numbered dots, page 9:

Comment A – xxxx (attended the June 21<sup>st</sup> meeting in Placitas to record her drainage issues). Her address is: xxx West Avenida Bernalillo– the street has flooded her yard every rainfall since the road was repaved about 10 years ago. Last time, there was a “lake” out front for 8 months. She cannot walk in her front yard at all because the ground is too soft or too wet. When attempting to walk there, people either sink or slide. Water has been up to two feet at the house entrance and has cracked the stucco vertically up the wall. She has put rock in the back yard so the back door can be used to exit the house, and dumped pea gravel in the yards several times. Most of the gravel gets sucked into the ground, especially in the driveway. The roadway Calle San Lorenzo is so muddy that people walk in the street instead of on the shoulder, which is too soft to navigate after a rainstorm.

Avenida Bernalillo and San Felipe Road north to Vivian Lane and then west along Vivian Lane: floods. Getting water in yard (flooded) because road was moved to the south when it was last re-paved; and intersection to the east floods to the north.

Comment B – Intersections and driveways flood.

Comment #1– (Avenida Bernalillo, east of railroad tracks). Ponding. Old irrigation ditch (along north side of Avenue Bernalillo) that fills up [with water] and doesn’t go anywhere. South corner lot along Avenue Bernalillo at railroad tracks also is under water.

Comment #2 – ( eastbound ramp from Avenue Bernalillo to I-25 southbound) flooding starts along south side of ramp off of Avenue Bernalillo on both sides . Undersized culverts.

Comment #3 – (Northwest corner of Avenue Bernalillo at Railroad Track Road.) long-term ponding and mosquitoes [at this location].

Comment #4 – (Calle San Lorenzo at intersection with Calle Don Rodrigo) Calle San Lorenzo – lots of problems driving during long duration storms. 1-foot water.

Comment #5 – (Calle del Bosque at intersection with Calle Placitas) – bar ditch from sticker to ditch floods . Water ponds and stays for days. West of ditch [is] incorporated. July 2006 – backed up significantly.

## Public Comment Record

Comment #6 – (El Camino Real south of intersection with Calle Industrial on east side of road) road side ditches don't dry up for days.

Comment #7 – ( Los Arboles Road west of its intersection with South Hill Road and across the irrigation ditch) culvert washes out. Silt and sediment.

Comment #8 – (Ezequiel Lane – west of Los Arboles Road near the dead end) French drains now silted in because [of] culvert at Comment #7 [location].

Comment #9 – Los Arboles Road – just west of South Hill Road at intersection with irrigation ditch) Bridge overtopped last summer (xxxx ).

Comment #10 – (Interstate 25, west side, north of Avenue Bernalillo) Arroyo flow under I-25 then south. Blows out North Hill road and ditch.

Comment #11 – (arroyo drainage north of I-25 and Avenue Bernalillo interchange on east side of I-25) [precipitation] fills MRGC ditch.

Comment #12 – (Avenida Bernalillo west of irrigation ditch between South Hill Road and Charring Cross Drive) xxxx; County built small berm on north side. Room washed away (adobe).

Comment #12 A-xxxx, flooded.

Comment #13 – (West of Camino Real and South of Calle Industrial) Cement plant dumping into ditch.

Comment #14 – (xxxx's former business with lease to Giant Gas Station). Bernalillo Avenue corner at Hwy 313. Floods even with a little bit of rain.

Comment #15 –undersized culvert; development upstream of dam 27 acres of commercial, 20 feet [of] base of dam. Biggest problem is other side of highway.; 2 flood[s] resulting in culverts failing.









# Eastern Sandoval County Arroyo Flood Control Authority

# PUBLIC MEETING

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Bernalillo—Tuesday, June 19, 2007    Algodones—Wednesday, June 20, 2007    Placitas—Thursday, June 21, 2007

**Your input is very important to the ESCAFCA Board of Directors. Please fill out this questionnaire and place it at the back of the room at the end of the meeting.**

**1. Which of the following issues have you noticed in your community?**

- flooding     soil erosion (holes)  
 poor drainage (ponding)                       soil movement (soil on the roadway, etc.)

**2. How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?**

- in favor       somewhat in favor       somewhat against       against

**3. How often have you had problems due to stormwater runoff?**

- every time       occasionally       rarely       never

**4. How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area? \$ \_\_\_\_\_**

**5. How would you feel about granting easements across you property for flood control?**

- acceptable       willing to discuss       not fond of the idea       against

**6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.**

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**Thank you!**

# Eastern Sandoval County Arroyo Flood Control Authority

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 poor drainage (ponding)    soil movement (soil on the roadway, etc.)
- How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?  
 in favor    somewhat in favor    somewhat against    against
- How often have you had problems due to stormwater runoff?  
 every time    occasionally    rarely    never  
 Frequently
- How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area? \$50.00
- How would you feel about granting easements across you property for flood control?  
 acceptable    willing to discuss    not fond of the idea    against  
*IF I am compensated for easement*
- Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.  
I know major Flood control is needed  
in Bernalillo, hope fully it will take place  
before we get another storm season like  
last year.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Thank you!

Eastern Sandoval County Arroyo Flood Control Authority

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- soil erosion (holes)
- soil movement (soil on the roadway, etc.)

2. How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?

- in favor
- somewhat in favor
- somewhat against
- against

3. How often have you had problems due to stormwater runoff?

- every time
- occasionally
- rarely
- never

4. How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area? \$ \_\_\_\_\_

5. How would you feel about granting easements across you property for flood control?

- acceptable
- willing to discuss
- not fond of the idea
- against

NA ↗

6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.

My concern are through out areas of the town.

My concerns are general. I feel the town in general is in need of Stat attention in more ways than one. South Hill Rd, Main Street and side roads are my concerns.

Thank you!

Eastern Sandoval County Arroyo Flood Control Authority

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- flooding
- soil erosion (holes)
- poor drainage (ponding)
- soil movement (soil on the roadway, etc.)

2. How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?

- in favor
- somewhat in favor
- somewhat against
- against

3. How often have you had problems due to stormwater runoff?

- every time (now)
- occasionally
- rarely
- never

4. How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area?

*is a Town, County or State responsibility*

5. How would you feel about granting easements across you property for flood control?

- acceptable
- willing to discuss
- not fond of the idea
- against

*sale for holding pond.*

6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.

*not real impressed w/ SSCAFCA at this time*

*sewer pipes, etc*

*- built house in 1970's (adobe)  
- last flooding hit his shop & sanded inside of*

*Thank you! had to sell lost \$100k } '36 Chevy & '66 Austin Healy*

# Eastern Sandoval County Arroyo Flood Control Authority

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 poor drainage (ponding)    soil movement (soil on the roadway, etc.)

2. How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?

- in favor    somewhat in favor    somewhat against    against

3. How often have you had problems due to stormwater runoff?

- every time    occasionally    rarely    never

4. How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area?   \$25<sup>00</sup>

5. How would you feel about granting easements across you property for flood control?

- acceptable    willing to discuss    not fond of the idea    against

6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.

12a 12 7 6b

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Thank you!



**Algodones is one whole section (640 acres) with about 115 families. Population is about 675.** Las Huertas arroyo is the only one that makes it to the Rio Grande.

Map 1 received the following comments, see numbered dot, page 2:

Comment #1–Intersection of Los Romeros and 474: property owner diverted water successfully 6 months ago. The area flooded last summer, but not before.

Map 2 received the following comments, see numbered dots, page 3:

Comment #1– broken berms from runoff; MRGCD dikes fail and breach flooding channels that run westward into fields.

Comment #2–flooding in fields. Hay bales floated last summer after alfalfa was cut.

Comment #3–flooded areas.

Map 3 received no comments.

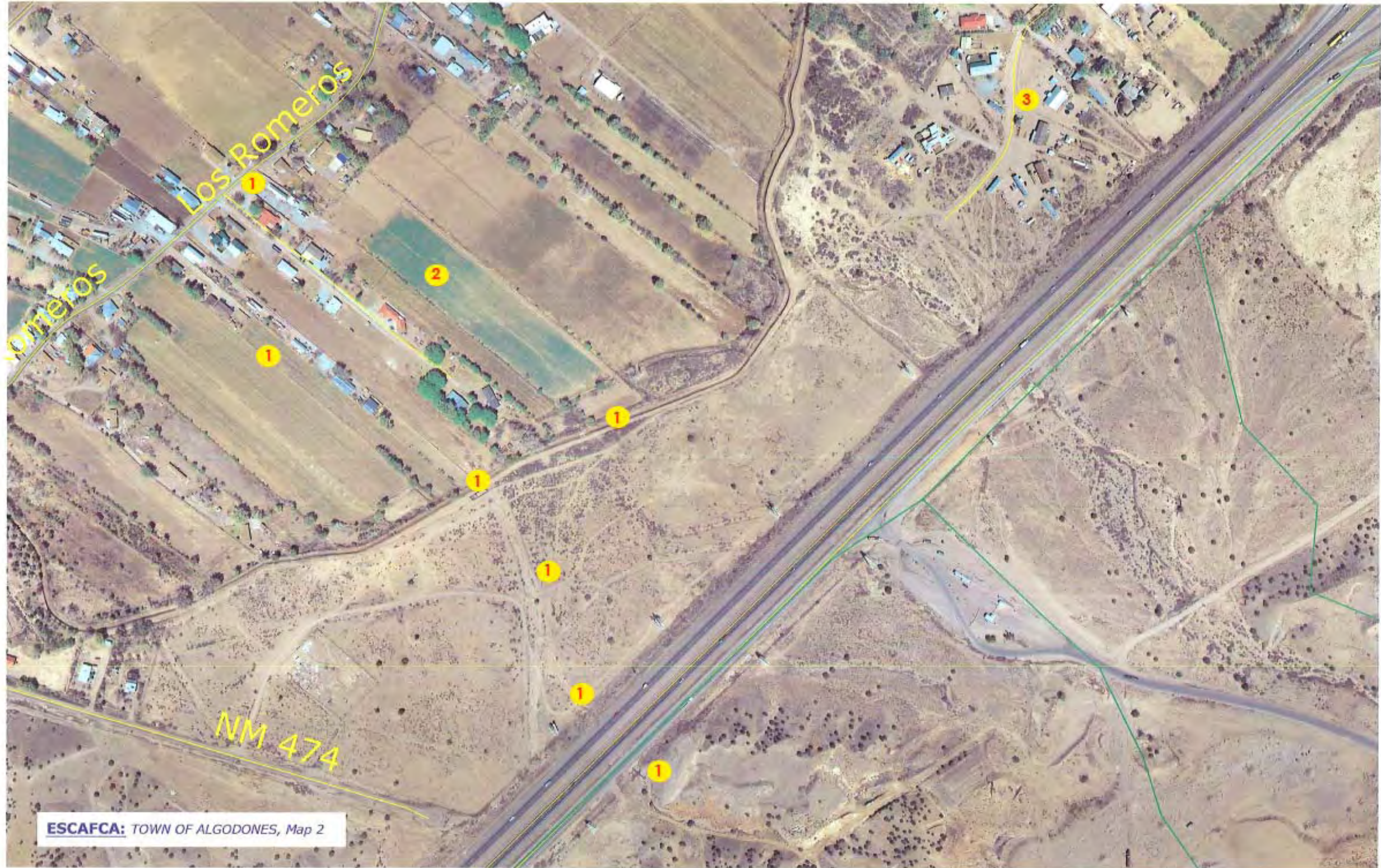
Map 4 received the following comments, see numbered dots, Page 4:

Comment #1–6 foot box culvert handle 2 ½ to 3 feet of water, road acts as a dike so water is trapped between I-25 and lined road. In 1963 the interstate was not yet built in Algodones.

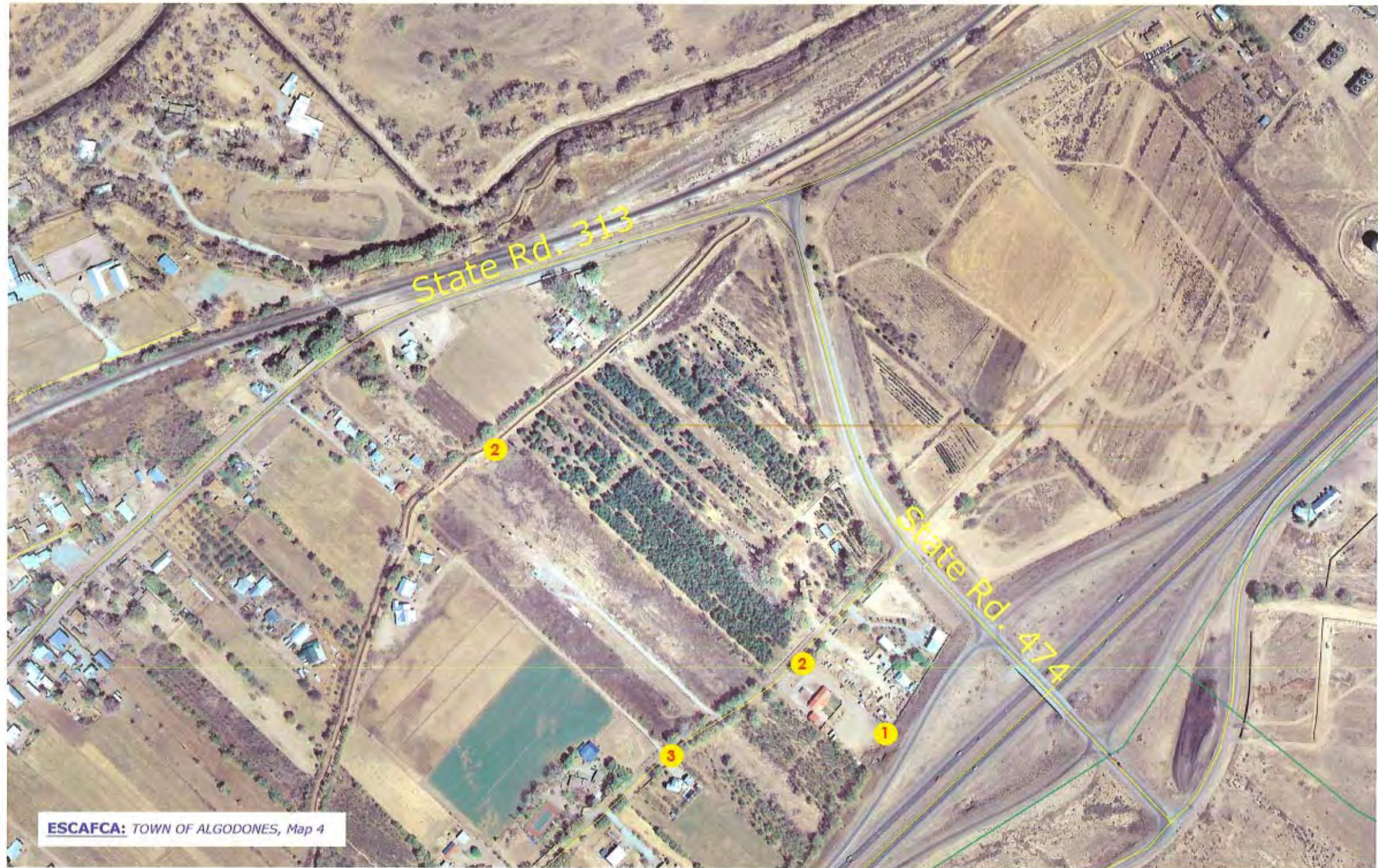
Comment #2–There are 4 inch to 24 inch culverts to handle 3 large box culverts [that move water from under I-25 to the west]. Ditch over flows because eastern drainage fills ditch and forces the water to run north; it breaks the ditch and floods areas to the east of the ditch.

Comment #3–area where basement flooded.





ESCAFCA Public Meeting–Algodones  
June 20, 2007



ESCAFCA Public Meeting–Algodones  
June 20, 2007

# Eastern Sandoval County Arroyo Flood Control Authority

# PUBLIC MEETING

Please check which meeting you are attending:

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- Which of the following issues have you noticed in your community?  
 flooding  soil erosion (holes)  
 poor drainage (ponding)  soil movement (soil on the roadway, etc.)
- How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?  
 in favor  somewhat in favor  somewhat against  against
- How often have you had problems due to stormwater runoff?  
 every time  occasionally  rarely  never *neighbors have problems; we have not*
- How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area? \$ \_\_\_\_\_ *at a minimum, enough to pay for flood control needed over 10-20 years*
- How would you feel about granting easements across your property for flood control?  
 acceptable  willing to discuss  not fond of the idea  against
- Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.  
*Water flowing under freeway flooding properties adjacent to I-25 on the west side; water flowing from arroyos into ditches, then overflowing into fields, ruining crops & flooding low lying houses.*

Thank you!

## Public Comment Record

**Map 1** received no comments.

**Map 2** received the following comments, see numbered dots, page 2:

Comment #1—who takes care of new culvert?

Comment #2 pipeline corridor erosion problems, pipeline washes at crossing of arroyo. 4,000cfs on July 4 and August 19, 2006, and on July 15, 1990 (when 2 or 3 culverts washed away). Cedar Creek Subdivision. Also, a possible 16 inch wide pipeline ROW {see map notation}.

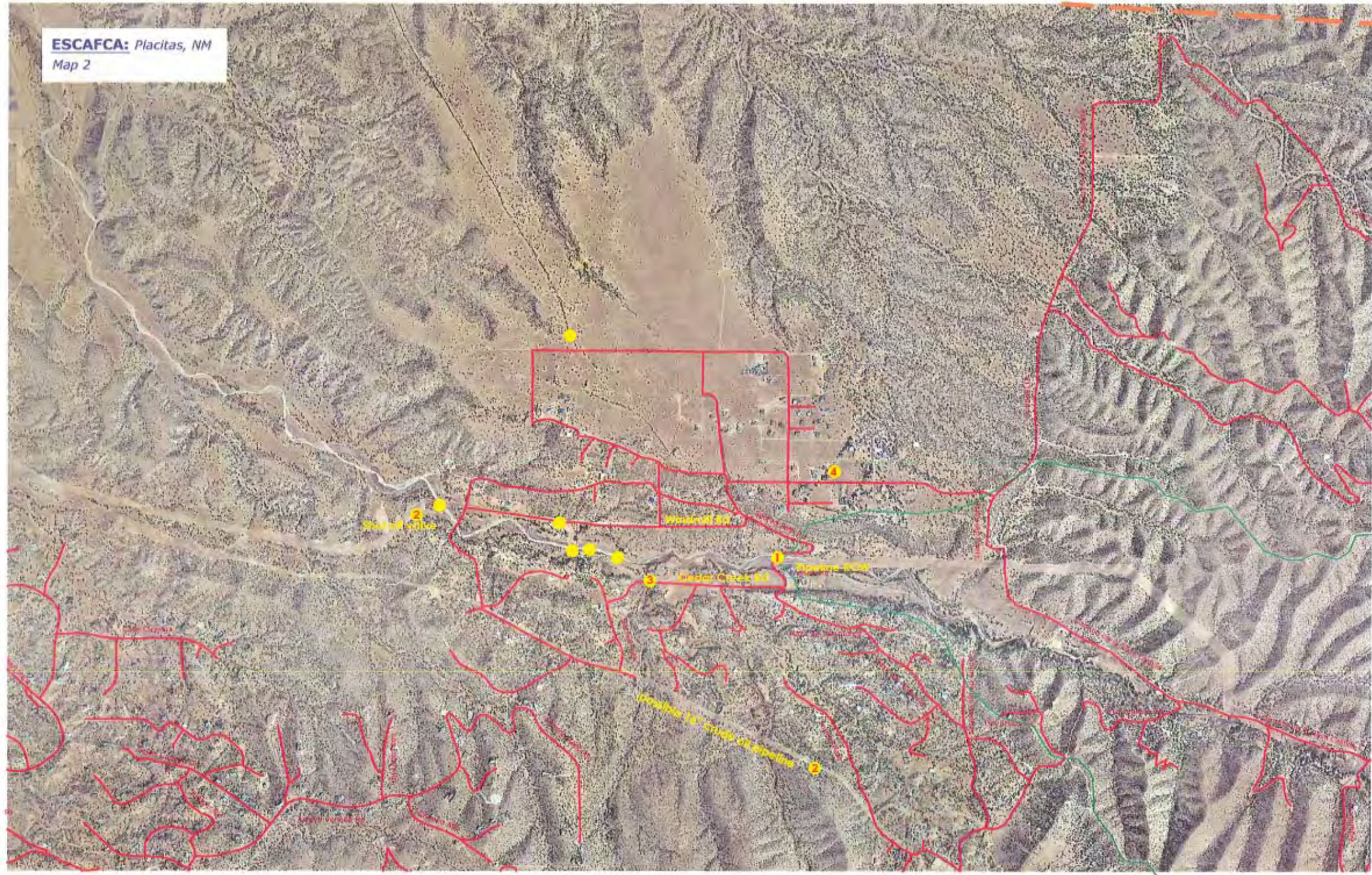
Comment #3—pipeline [shut-off valve] is not readily accessible; pipe in a road that can wash out.

Comment #4—historic levees or dams at Indian Fats. Architectural report says downstream lines are roads but residents believe it's a channel. Flood occurred at homes near levee. xxxx, 20 year residents, have a website with movie [on flooding]:  
sandovalsignpost.com

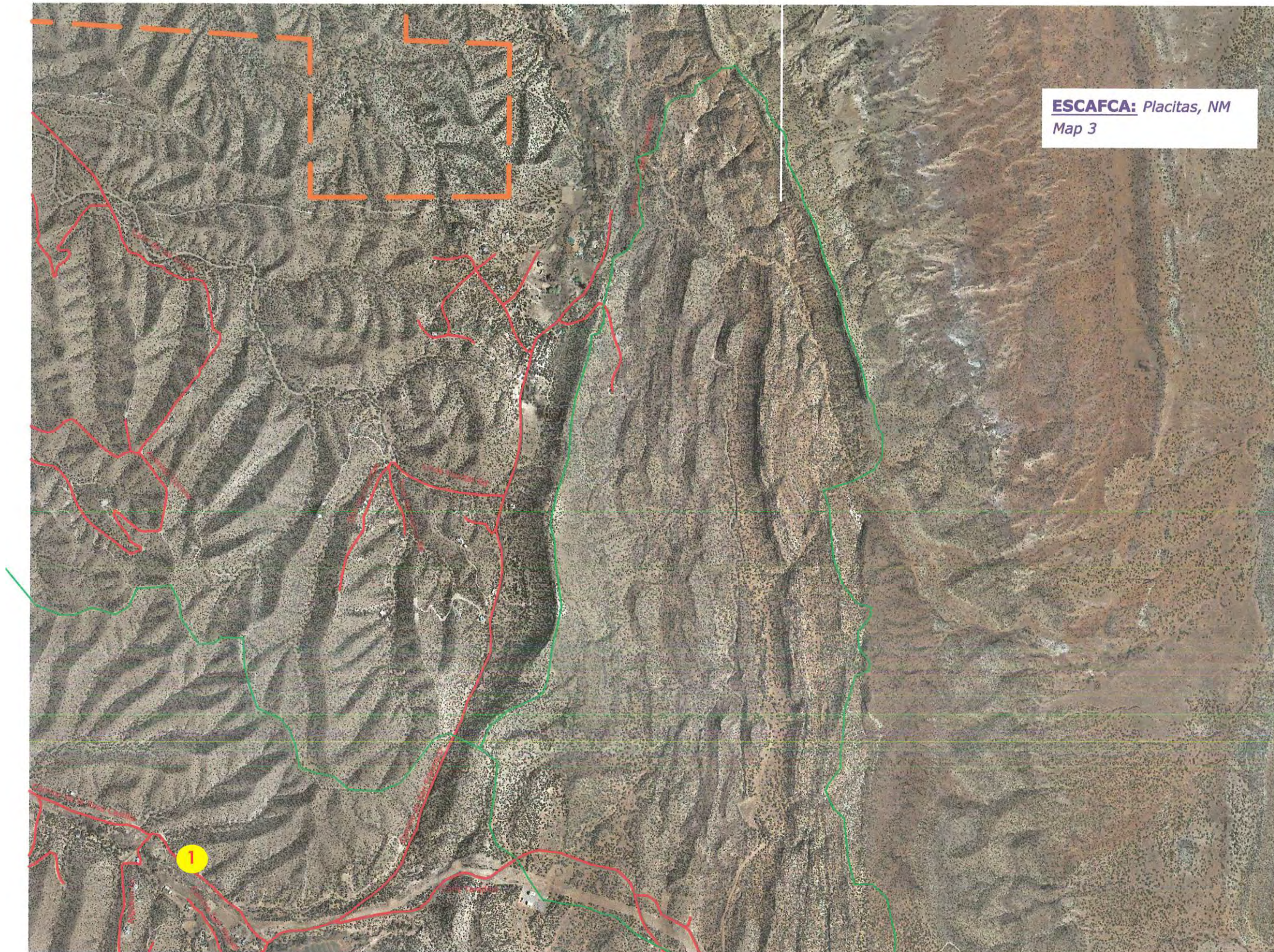
**Map 3** received the following comments, see numbered dots, Page 3:

Comment #1—Camino de la Rosa Castilla (road) washed out

**Map 4** received no comments.



ESCAFCA Public Meeting-Placitas  
June 21, 2007



ESCAFCA Public Meeting-Placitas  
June 21, 2007



## Public Comment Record

Map 5 received the following comments, see numbered dots, page 6:

Comment #1–Aspen Rd. east side of arroyo [floods]

Comment #2–Juniper Rd. culvert

Comment #3–need better drainage design especially for bar ditch.

Map 6 received the following comment(s) , see numbered dots, page 7:

Comment #1–County culverts silted for several years and in August 2006; then blew out.

Comment #2 –commenter was the Chairman of the Coronado Town Dam @ I-25.

Comment #3 – xxxx is concerned about condemnation of land for drainage. Is in favor of erosion control but wants a natural design, not concrete. Wants to help plan erosion control and be assured that problems won't increase. When the arroyo runs, it carves into bluff and the whole length of her property (5.5 acres) is affected. There is currently a home and a pump house. Reference to xxxx. He works with Las Placitas Association to control erosion with stream meanders.

Comment #4 –trailer almost lost in summer of 2006 from rains.

Comment #5 – (El Camino Real south of intersection with Calle Industrial on east side of road) road side ditches don't dry up for days.

Comment #6 – ( Los Arboles Road west of its intersection with South Hill Road and across the irrigation ditch) culvert washes out. Silt and sediment.

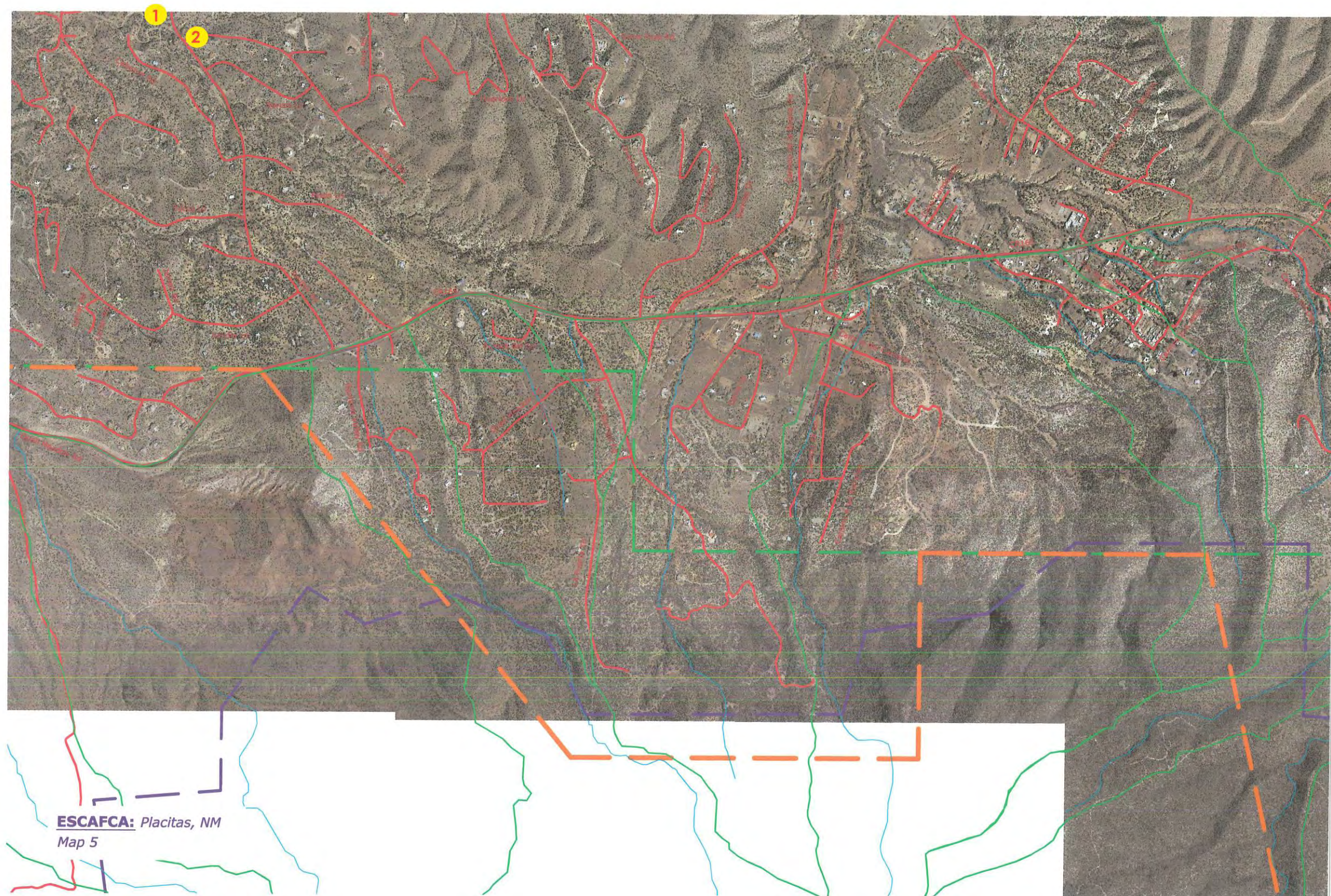
Comment #7 – (Ezequiel Lane – west of Los Arboles Road near the dead end) French drains now silted in because [of] culvert at Comment #7 [location].

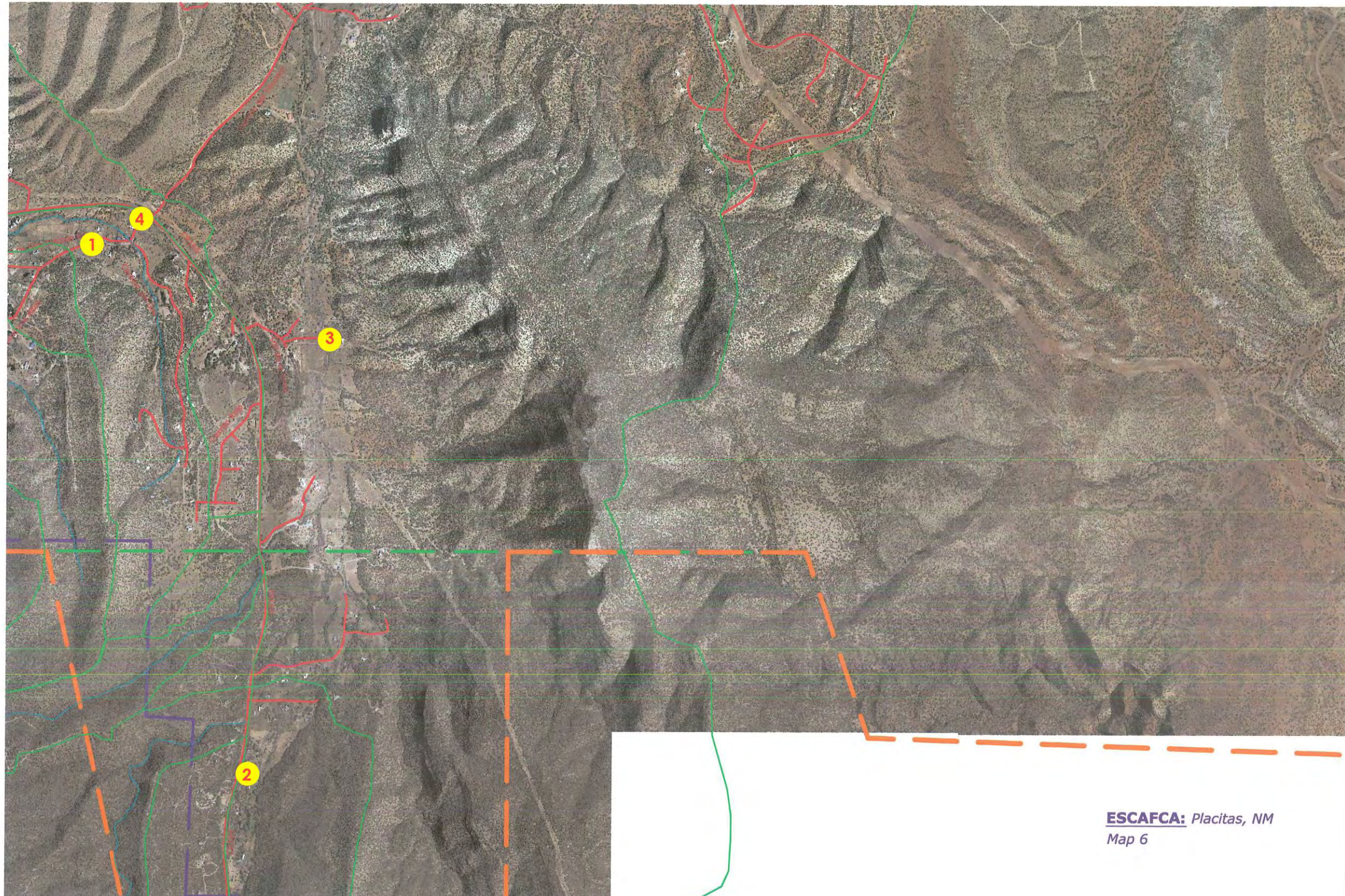
Comment #8 – Los Arboles Road – just west of South Hill Road at intersection with irrigation ditch) Bridge overtopped last summer (Ronnie Sisneros).

## Public Comment Record

Comment #9 – (Interstate 25, west side, north of Avenue Bernalillo) Arroyo flow under I-25 then south. Blows out North Hill road and ditch.

Comment #10 – (arroyo drainage north of I-25 and Avenue Bernalillo interchange on east side of I-25) [precipitation] fills MRGC ditch





Eastern Sandoval County Arroyo Flood Control Authority

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1. Which of the following issues have you noticed in your community?

- flooding
- soil erosion (holes)
- poor drainage (ponding)
- soil movement (soil on the roadway, etc.)

2. How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?

- in favor
- somewhat in favor
- somewhat against
- against

3. How often have you had problems due to stormwater runoff?

- every time
- occasionally
- rarely
- never

4. How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area? \$ 10

5. How would you feel about granting easements across you property for flood control?

- acceptable
- willing to discuss
- not fond of the idea
- against

6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.

TAXATION WITHOUT ANY BENEFITS

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Thank you!

Eastern Sandoval County Arroyo Flood Control Authority

# PUBLIC MEETING

*Placitas*

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- flooding
- poor drainage (ponding)
- soil erosion (holes)
- soil movement (soil on the roadway, etc.)

*no major flooding*

2. How do you feel about having an elected flood control commission that is responsible for addressing area flood control issues?

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- somewhat in favor
- somewhat against
- against

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- occasionally
- rarely
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- not fond of the idea
- against

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*culverts not built to handle water + plug w/ debris*

*blew out road - culverts need to be resized + cleaned*

*Cedar Creek<sup>1</sup> culverts in 1980s was carried away.*

Thank you!

Eastern Sandoval County Arroyo Flood Control Authority

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- rarely
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- acceptable
- willing to discuss
- not fond of the idea
- against

6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.

My concern is not flooding but the disruption  
of the ecosystem of Las Huertas Canyon  
by any "flood" control mechanism.

Sandoval Cty needed and needs to control runoff  
from development - that and paving is the  
cause of the flooding

Thank you!

Eastern Sandoval County Arroyo Flood Control Authority

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- in favor
- somewhat in favor
- somewhat against
- against

3. How often have you had problems due to stormwater runoff?

- every time
- occasionally
- rarely
- never

4. How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area? \$ -0-

5. How would you feel about granting easements across you property for flood control?

- acceptable
- willing to discuss
- not fond of the idea
- against

6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.

I do not see ~~any~~ a need for a flood control authority in Placitas. There are minimal areas in Placitas that ever flood; when they have, the frequency is about once in every 10-15 years & then it is limited to a few areas where homes perhaps should not have been built. For example, the number of houses that have been built in arroyos is astounding.

I urge the county to insist that developers do not build in arroyos and on other lands that cannot accommodate housing or other traffic!

Thank you!



Eastern Sandoval County Arroyo Flood Control Authority

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- in favor
- somewhat in favor
- somewhat against
- against

3. How often have you had problems due to stormwater runoff?

- every time
- occasionally
- rarely
- never

4. How much do you feel would be a fair amount to collect yearly from property owners to address flood-control issues in the area? \$ see #6

5. How would you feel about granting easements across you property for flood control?

- acceptable
- willing to discuss
- not fond of the idea
- against

6. Please use the space below to tell us about any other flood control problems you have seen or concerns you may have. Feel free to continue on the back of this page.

*I will only vote to tax myself if I get something in return. I want a design that keeps stormwater on the land and allows it to be absorbed back into the aquifer (sp?). No concrete lining of arroyos!*

Thank you!