

VENTURA COUNTY



PUBLIC WORKS AGENCY
RONALD C. COONS
Agency Director

WATERSHED PROTECTION DISTRICT

March 20, 2006

City of Ventura
Public Works Agency
P. O. Box 99
Ventura, CA 93002-0099

**SUBJECT: PRINCE BARRANCA PRELIMINARY DRAINAGE DESIGN STUDY
Ventura, California**

Dear Sir/Madam:

This letter is to advise you that the Ventura County Watershed Protection District is conducting a 30% drainage improvement pre-design study for Prince Barranca/Hall Canyon in the City of Ventura. A location map showing the proposed study areas is enclosed for your reference.

To assist our project study, please advise us if you have any major facilities located within the proposed facility alignments and the basin area, as identified on the location map.

Please send your response to CDM Inc., our engineering consultant:

CDM Inc.
Attn: Jun Wang
18581 Teller Avenue, Suite 200
Irvine, CA 92612
Phone: (949) 752-5452; Fax: (949) 752-1307

If you have any questions, please do not hesitate to call me at (805) 654-2454 or Jun Wang (949) 752-5452.

Sincerely,

Denny Tuan, P.E.
Manager, Advanced Planning

Enclosure

\$ 6.8M DAM.

\$ 10-45 MIL. ABATE.

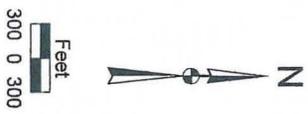
Jeff Pratt
District Director

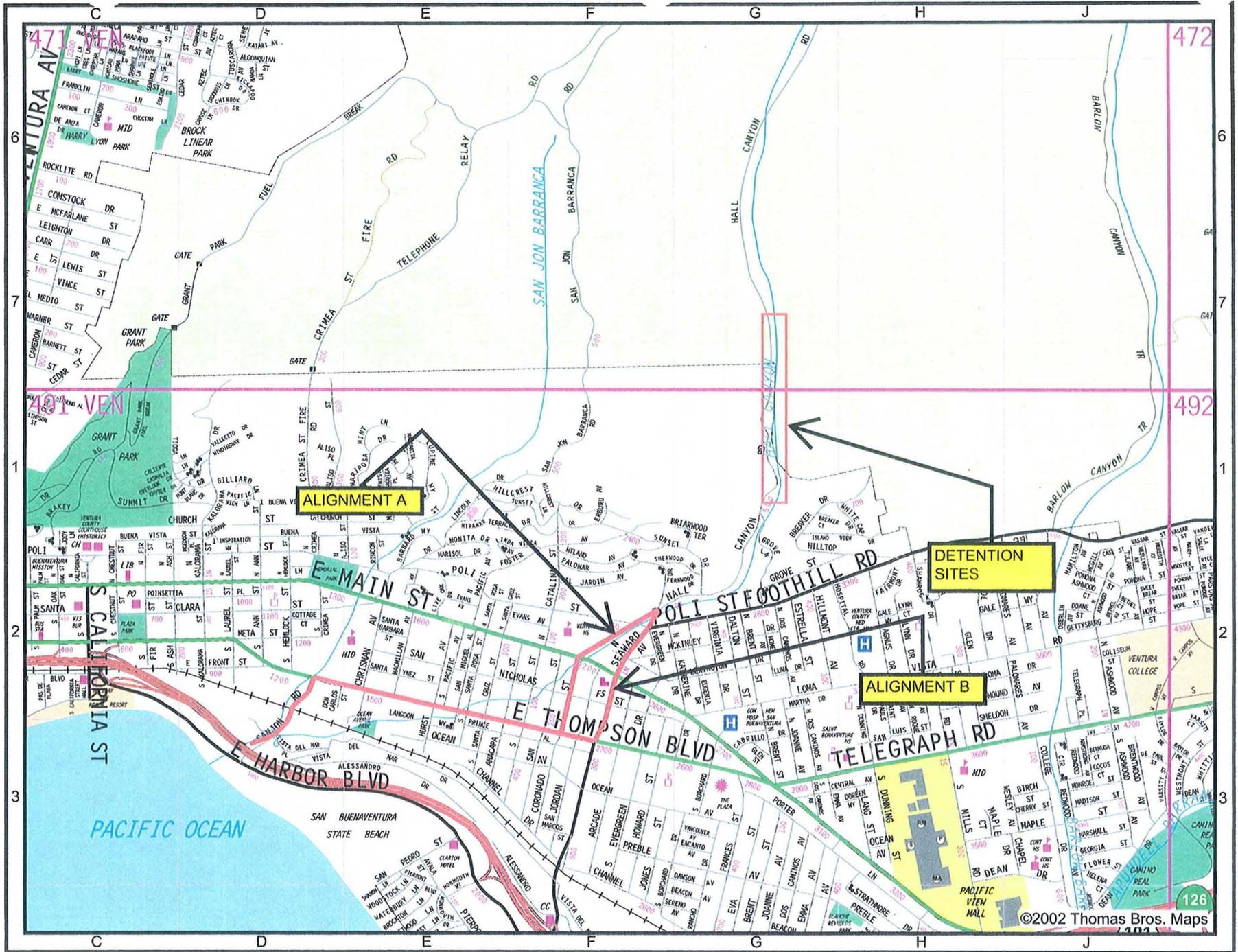
Gerhardt Hubner
Water/Environmental Resources

Peter Sheydayi
Design/Construction

Sergio Vargas
Planning/Regulatory

Tom Lagier
Operations/Maintenance







Memorandum

To: Yunsheng Su, Ph.D., P.E.
Ventura County Watershed Protection District (VCWPD)

From: Jun Wang, P.E., CDM

Date: March 20, 2006 (Revised May 3, 2006)

Subject: Prince Barranca Drainage Improvement Alternatives

We have completed our preliminary evaluation of drainage improvement alternatives for the Prince Barranca channel. The results of our analyses are summarized as follows:

Flood Damage Estimate

Prince Barranca is mostly a reinforced concrete box (RCB) channel located within a highly urbanized area in the City of Ventura. The channel begins from the confluence with the San Jon Barranca channel and ends immediately upstream of Poli Street and Hall Canyon Road intersection. The channel has a drainage area of approximately 6 square miles. The existing Prince Barranca channel was constructed in 1965 and repaired in 1974 and 1992. According to a VCWPD estimate, over 80% of the existing facility is underground and about 25% below buildings. The existing flood carrying capacity of Prince Barranca is less than 2,000 cfs, which is equivalent to a 10-year event. Floods higher than the 10-year level would spill and inundate the adjacent properties. The table below compares the channel's design capacity with current hydrology:

Location	Design Capacity (cfs)	10-year Flood Peak (cfs)	50-year Flood Peak (cfs)	100-year Flood Peak (cfs)
At Main Street	1,670	1,660	2,770	3,600
At Thompson Blvd.	1,700	1,670	2,780	3,620
At San Jon Barranca	1,700	1,670	2,780	3,620

We have estimated the areas of flood inundation under the 25-, 50-, and 100-year events using hydraulic models and GIS tools. The flood inundation area as well as affected property parcels were mapped for each flood and are attached as Appendix A with this memo. Based upon the estimated flood depth and current property value, the flood damage at each property was computed following a procedure used by the United States Department of Housing and Urban Development (HUD Curve):

Event	Total Damage
25-year	\$41,100,000
50-year	\$55,000,000
100-year	\$68,600,000
Expected Annual	\$2,220,000
Present Value	\$30,600,000

The expected annual damage cost was also estimated as well as the present value assuming a 7 percent interest rate. Detailed damage estimates are provided in Appendix B.

Improvement Alternatives

To alleviate flooding, five improvement alternatives were considered, ranging from constructing an upstream flood detention basin to relocating the existing Prince Barranca facility:

Alternative 1: Upstream Detention

An upstream detention basin was studied that would limit the peak flow through the urbanized area to the existing capacities. It was determined that with an upstream flood storage volume of 180 acre-feet during the 100-year event, the peak flow downstream would be 1,700 cfs, equivalent to a 10-year event.

Two sites were identified that would be appropriate for detaining flows and they are shown on Figure 1 in the attached Appendix C. Site 1 is at the existing debris dam near the relatively sharp bend in the Prince Barranca channel. Site 2 is approximately 1,000 feet upstream of Site 1. Both sites were studied and it was determined that Site 2 was the most appropriate site. It would be difficult at Site 1 to construct a dam to create the detention basin because the tributary from the east would require considerable earthwork. The recommended dam for

Site 2 is shown on Figure 2. Figure 3 shows the cross-section of the dam. Key design parameters are estimated as follows:

Dam Crest Elevation	272 ft
Spillway Elevation	266 ft
Invert Elevation at Channel Center Line	228 ft
Emergency Spillway	20 ft w x 25 ft h
Low Flow Outlet Pipe	60 in RCP
Drainage Area	4 square miles
100-year Flood Water Surface Elevation	266 ft
Inundated Surface Area	13 ac
Flood Storage	180 ac-ft
Debris Storage	42,000 cubic yards

Another reason to avoid Site 1 for the proposed basin is that there is an existing 30 ft high debris dam at Site 1. The foundation and structural conditions of this dam are unknown and may require substantial retrofit work if it was utilized for the proposed detention basin. In addition, adding another 44 feet to the existing 30 ft high dam could result in very expensive construction and a difficult permitting process.

Preliminary quantities and cost were estimated for the detention basin facility by comparing with other local projects with similar design (Appendix C). The total cost including engineering and construction is **\$19 million**. The cost of land for the basin is not included.

Alternative 2: New Channel Construction (Alignment A)

To prevent flooding, the existing Prince Barranca channel must be enlarged to convey the 100-year event discharge. However, improving the existing channel along its current alignment would be extremely difficult since the facility mostly lies under private properties. Alternative 2 proposes to create a new channel with an updated design capacity. This new system would be constructed within the right-of-way of public streets from its upstream end at the intersection of Park Avenue and Poli Street to Harbor Blvd prior to discharging at the beach outlet. The proposed channel alignment (shown as Alignment A in Appendix D) would

first follow its original route through a school site and then turn south on Coronado Street. The channel would then turn west along Thompson Blvd and south on San Jon Road before terminating at the San Jon Barranca outlet.

The proposed realigned Prince Barranca channel would be 14 ft wide by 14 ft high RCB culvert and run approximately 1.6 miles. A conceptual plan and profile for the proposed facility is provided in Appendix D.

The total cost for the new facility was estimated to be **\$45 million**, including construction and engineering. Detailed cost breakdown is provided in Appendix D.

Alternative 3: New Channel Construction (Alignment B)

Alternative 3 is similar to Alternative 2 with a slight change of alignment at the upstream end. Instead of running through the school site, the channel would run south along Seaward Avenue before turning west on Thompson Blvd. An alignment map for this alternative is included in Appendix E.

The channel would have the same geometry as that of Alternative 2. The total estimated cost is **\$46 million** due to a slightly increased length.

Alternative 4: Relocation of Existing Channel

This alternative considered relocation of the existing Prince Barranca channel to follow either Alignment A or Alignment B introduced above. The relocated channel would maintain its original size in order to reduce the required right of way area and cost. In addition, since the facility would be located below public streets, maintenance would be much easier and less costly than for the existing system. However, the upstream detention basin must also be built along with the relocated channel in order to meet the 100-year flood design requirement.

The estimated cost to relocate the existing channel is \$39 million. The total cost including the upstream detention basin would be **\$58 million**. The itemized cost is included in Appendix E.

Alternative 5: Flow Diversion

Instead of upstream flood detention, Alternative 5 considered the option of adding a second channel to divert flows that would spill from the existing facility. The channel, shown as Alignment C in Appendix E, would start from the upstream end of the existing channel and run west along Poli Street first. It would turn south along Catalina Street and then west along Main Street. The channel again turns south on Santa Rosa Street and west on Thompson Avenue. Like Alternatives 1 and 2, the channel would then turn south on San Jon Road to end at Harbor Blvd. A plan and profile concept drawing of Alternative 5 is provided in Appendix F. The total estimated cost for this alternative is **\$36 million**.

For comparison purposes, key characteristics of the above proposed improvement alternatives are summarized in the following table:

Key Characteristics of Improvement Alternatives

Alternative	1	2	3	4	5
Facility Description	Detention Basin	8,300 LF 14'wx14'h RCB	8,500 LF 14'wx14'h RCB	8,500 LF 10'wx12'h RCB	8,800 LF 10'wx10'h RCB
Design Capacity	206 ac.ft.	3,600 cfs	3,600 cfs	1,900 cfs	1,700 cfs
Existing Channel Required	Yes	No	No	No	Yes
Upstream Detention Required	N/A	No	No	Yes	No
Land Acquisition Required	Yes	No	No	No	No
Cost (\$ million)	\$19	\$46	\$47	\$58	\$36

Benefit/Cost Ratios

To assess the economic feasibility of the drainage improvement project, a benefit-cost analysis was conducted using the estimated present value cost of flood damage to represent the project benefit. The estimated project benefit was divided by the project cost to determine a benefit/ cost ratio (B/C ratio). The b/c ratios associated with Alternatives 1 through 5 are summarized in the table below:

Alternative	Project Cost (\$ million)	Project Benefit (\$ million)	B/C Ratio
1. Upstream Detention	19	30.6	1.61
2. New Channel (A)	46	30.6	0.66
3. New Channel (B)	47	30.6	0.65
4. Existing Channel Relocation	58	30.6	0.53
5. Flow Diversion	36	30.6	0.85

It should be noted that Alternatives 1 and 5 would require proper functioning of the existing Prince Barranca channel. According to Ventura County Watershed Protection District, the facility underwent a major repair in 1992 due to erosion of its concrete bottom. This type of repair is expected to take place periodically. If rehabilitation of the existing facility is required, the cost should be included in the above alternative evaluation. The land required to construct an upstream detention basin needs to be purchased. The project costs for Alternatives 1 and 4 should include the cost of land acquisition.

Environmental Assessment

An initial environmental assessment for the Prince Barranca drainage improvement has been prepared by Padre Associates. The assessment focused on the alternative sites for the proposed detention basin (Alternative 1). As stated in Padre's report, environmental issues of concern would involve impacts to biological resources (native vegetation, wetlands, wildlife habitat, special-status species) and coastal beach replenishment. The following paragraphs are quoted here which conclude the study findings:

"Biological impacts associated with the Basin 1 site (also called Site 1) would be less than for Basin 2 (Site 2), as Basin 1 would be located in the same location to be affected by planned sediment removal from the existing basin. However, most of the biological impacts are associated with periodic sediment removal, which would be the same for either basin site. It is expected that mitigation would be required for impacts associated with both dam construction and sediment removal.

Sediment transport in Hall Canyon may be an important issue as it appears to contribute a substantial amount of the sand that maintains San Buenaventura State Beach. A high dam as proposed would trap sediments that appear to replenish the State Beach. This impact cannot be readily assessed or mitigated. Therefore, an environmental impact report appears to be required, including a sediment transport analysis.

Cultural resources of the project site are unknown; and resources may be discovered during construction and/or maintenance of the proposed basin. No reported archeological surveys have been conducted in close proximity to the basin sites, and resources may be present. However, the potential to find cultural resources is much higher at the Basin 2 site, as it was not affected by construction of the existing basin in 1973 and planned sediment removal in 2006."

According to Padre's report, in addition to sand supply and cultural resources, other environmental issues that may be significantly impacted by the detention basin alternative include surface water quality, wetland habitat, and hazardous waste. The report indicated that the project's environmental mitigation associated with revegetation and stream bank stabilization may involve a potential cost of \$325,000 for Site 2 (preferred site). However, issues regarding beach sand supply and cultural resources including the cost of mitigation

would require the work of an EIR. Padre's initial environmental assessment report is attached as Appendix G.

For Alternatives 2 through 5, although their project sites were not covered by the initial environmental evaluation, major environmental issues are not anticipated because the proposed routes are all within a heavily urbanized area.

Alternative Selection

A comparison of the relative importance of the major construction and environmental criteria for each alternative is provided in following table. A ranking score of 1 to 5 (which measure how well the alternative is perceived to achieve the project goal relative to the project criteria) was assigned to each alternative. The ranking scores were then summed up to generate a total score based upon the relative importance of the issue to the project success. The No Project alternative (Alternative 0) was also included in the comparison. Alternative 1, which calls for constructing an upstream detention basin, has the highest overall ranking, although is not rated favorably for environmental issues. It is also the least expensive option. Alternatives 2 through 5 would face tremendous conflicts with existing utilities and traffic during construction. They also have much lower benefit/cost ratios. However, in terms of operation and maintenance, Alternatives 2 through 5 appear to be more favorable than Alternative 1.

Project Ranking Criteria	Weighting Factor	Project Ranking					
		Alternative 0	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
		No Project	Upstream Detention	New Channel (Alignment A)	New Channel (Alignment B)	Existing Channel Relocation	Flow Diversion
Flood Reduction	3	1	5	5	5	5	5
Cost	3	3	5	1	1	1	3
Schedule of Completion	2	5	5	2	2	2	2
Reliability	3	1	4	5	5	5	5
Operation & Maintenance	2	1	2	5	5	3	3
Traffic and Utility Impacts	2	1	5	1	1	1	1
Lateral Reconnections	2	1	5	1	1	1	5
Existing Facility Rehabilitation	2	1	4	5	5	5	4
Environmental Impact	2	5	2	4	4	2	4
Regulatory Permitting	2	5	3	4	4	3	4
Aesthetics	1	5	2	4	4	2	4
Total Weighted Score		58	96	81	81	69	89
Ranking		5	1	3	3	4	2

Project Ranking Score:

- 1: Does not meet objective
- 2: Marginally meets objective
- 3: Somewhat meets objective
- 4: More strongly meets objective
- 5: Fully meets objective

Weighting Factor

- 1: Low level of importance
- 2: Mid-level of importance
- 3: High level of importance

Total Weighted Score

Total Score x Weighting Factor

Cost Estimate for Improvement Alternative 1

Construct a detention basin upstream of existing Prince Barranca channel:

Approved by Stiles

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)*</i>				
Water Control	1	\$200,000	LS	\$200,000
Basin Excavation	75,000	\$15	CY	\$1,125,000
Dam and Spillway Foundation Excavation*	50,000	\$15	CY	\$750,000
Dam Embankment Fill	110,000	\$15	CY	\$1,650,000
Structural Concrete	4,000	\$800	CY	\$3,200,000
Emergency Spillway	350	\$1,000	LF	\$350,000
60" RCP Low Flow Outlet	500	\$200	LF	\$100,000
Access Road	5,000	\$25	SY	\$125,000
Cobble Facing (12 in thick)	1,300	\$60	CY	\$78,000
Rock Riprap (1/4 ton)	4,000	\$210	CY	\$840,000
Misc. Items	1	\$750,000	LS	\$750,000
Total				\$9,168,000
Mobilization(8%)	1	\$733,440	LS	\$733,440
Bond(3%)	1	\$275,040	LS	\$275,040
Total Construction				\$10,176,480
<i>Land Acquisition</i>	1		LS	\$0
<i>Traffic Control (\$100,000/St./mon)</i>	1	\$600,000	LS	\$600,000
<i>Environmental Mitigation(\$150,000/ac)</i>	1	\$4,500,000	LS	\$4,500,000
<i>Environmental Permits</i>	1	\$400,000	LS	\$400,000
<i>Utility Relocation/Protection (10%)</i>	1	\$1,017,648	LS	\$1,017,648
<i>Engineering Design (5%)</i>	1	\$508,824	LS	\$508,824
<i>Construction Contingency (15%)</i>				\$1,526,472
TOTAL				\$18,729,424

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design. Unit cost information were provided by VCWPD.

Alternative 1
5/10/06

VENTURA COUNTY WATERSHED PROTECTION DISTRICT ENGINEER'S ESTIMATE OF COST FOR CONSTRUCTION

DATE 05-08-2006

PROJECT: Prince Barranca

LOCATION: City of Verntura

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	ESTIMATE AMOUNT
1	MOBILIZATION 5%	1.00	L. S.	306,050.00	306,050.00
2	CLEARING & GRUBBING	1.00	L. S.	20,000.00	20,000.00
3	DIVERSION & CONTROL OF WATER	1.00	L. S.	180,000.00	180,000.00
4	EXCAVATION SAFETY	1.00	L. S.	3,000.00	3,000.00
5	BASIN EXCAVATION	75,000.00	CY	7.00	525,000.00
6	DAM EXCAVATION	50,000.00	CY	10.00	500,000.00
7	DAM EMBANKMENT FILL	110,000.00	CY	12.00	1,320,000.00
8	STRUCTURAL CONCRETE	3,150.00	CY	800.00	2,520,000.00
9	EMERGENCY SPILLWAY	350.00	CY	800.00	280,000.00
10	60" RCP LOW FLOW OUTLET	500.00	LF	450.00	225,000.00
11	ACCESS ROAD (CMB)	5,000.00	SY	14.00	70,000.00
12	COBBLE FACING	1,300.00	CY	60.00	78,000.00
13	ROCK RIPRAP	4,000.00	CY	100.00	400,000.00
TOTAL CONSTRUCTION					6,427,050.00
LAND ACQUISITION					
	Traffic CONTROL	1.00	LS	250,000.00	250,000.00
	ENVIRONMENTAL MITIGATION	1.00	LS	750,000.00	750,000.00
	ENVIRONMENTAL PERMIT	1.00	LS	145,000.00	145,000.00
	UTILITIES RELOCATION	1.00	LS	200,000.00	200,000.00
	ENGINEERING DESIGN 5%	1.00	ls	306,050.00	306,050.00
Total					8,078,100.00

Cost Estimate for Improvement Alternative 2 (Alignment A)

Construct 14-ft wide x 14 ft high Concrete Box Culvert To Replace Existing System

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	187,000	\$15	SY	\$2,805,000
Demolition of Existing Roads/Sidewalks	18,444	\$15	SY	\$276,667
Repave Road Crossings	18,444	\$50	SY	\$922,222
Curb/Gutter/Sidewalks	8,300	\$50	LF	\$415,000
Misc. Items	1	\$250,000	LS	\$250,000
RCB 14x14 Assume 1.5 ft Thickness	25,822	\$800	CY	\$20,657,778
Total Construction				\$25,526,667
Mobilization(8%)	1	\$2,042,133		\$2,042,133
Bond(3%)	1	\$765,800		\$765,800
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Traffic Control (\$100,000/St./mon)</i>	1	\$2,400,000	LS	\$2,400,000
<i>Lateral Drain Reconnection (10%)</i>	1	\$2,552,667	LS	\$2,552,667
<i>Utility Relocation/Protection (30%)</i>	1	\$7,658,000	LS	\$7,658,000
<i>Environmental Permitting(\$125,000)</i>	1	\$125,000	LS	\$125,000
<i>Engineering Design(3%)</i>	1	\$765,800	LS	\$765,800
<i>Construction Contingency (15%)</i>				\$3,829,000
TOTAL				\$45,665,067

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design. Unit cost information were provided by VCWPD.

8/10/06

VENTURA COUNTY WATERSHED PROTECTION DISTRICT ENGINEER'S ESTIMATE OF COST FOR CONSTRUCTION

DATE 05-08-2006

PROJECT: Prince Barranca

Alternative 2, New Channel, Alignment A

LOCATION: City of Verntura

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	ESTIMATE AMOUNT
1	MOBILIZATION 5%	1.00	L. S.	1,189,173.00	1,189,173.00
2	CLEARING & GRUBBING	1.00	L. S.	20,000.00	20,000.00
3	DIVERSION & CONTROL OF WATER	1.00	L. S.	180,000.00	180,000.00
4	EXCAVATION SAFETY	1.00	L. S.	3,000.00	3,000.00
5	EXCAVATION/BACKFILL	187,000.00	CY	7.00	1,309,000.00
6	DEMOLITION EXSTG. ROADS/SIDEWALKS	18,444.00	CY	15.00	276,660.00
7	REPAVE ROAD CROSSINGS	18,444.00	CY	50.00	922,200.00
8	RCB 14 X 14 1.5 FT THICK	25,822.00	CY	800.00	20,657,600.00
9	CURBS/GUTTERS/SIDEWALKS	8,300.00	LF	50.00	415,000.00
TOTAL CONSTRUCTION					24,972,633.00
LAND ACQUISITION					
	TRAFFIC CONTROL	1.00	LS	1,200,000.00	1,200,000.00
	LATERAL DRAIN CONNECTION (10%)	1.00	LS	2,497,263.30	2,497,263.30
	ENVIRONMENTAL PERMIT	1.00	LS	125,000.00	125,000.00
	UTILITIES RELOCATION (30%)	1.00	LS	7,491,789.90	7,491,789.90
	ENGINEERING DESIGN 3%	1.00	LS	713,503.80	713,503.80
TOTAL:					37,000,190.00

Cost Estimate for Improvement Alternative- 3 (Alignment B)

Construct 14-ft wide x 14 ft high Concrete Box Culvert To Replace Existing System

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	209,000	\$15	SY	\$3,135,000
Demolition of Existing Roads/Sidewalks	18,767	\$15	SY	\$281,500
Repave Road Crossings	18,767	\$50	SY	\$938,333
Curb/Gutter/Sidewalks	8,445	\$50	LF	\$422,250
Misc. Items	1	\$250,000	LS	\$250,000
RCB 14x14 Assume 1.5 ft Thickness	26,273	\$800	CY	\$21,018,667
Total Construction				\$26,245,750
Mobilization(8%)	1	\$2,099,660		\$2,099,660
Bond(3%)	1	\$787,373		\$787,373
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Traffic Control (\$100,000/St./mon)</i>	1	\$2,400,000	LS	\$2,400,000
<i>Lateral Drain Reconnection (10%)</i>	1	\$2,624,575	LS	\$2,624,575
<i>Utility Relocation/Protection (30%)</i>	1	\$7,873,725	LS	\$7,873,725
<i>Environmental Permitting(\$125,000)</i>	1	\$125,000	LS	\$125,000
<i>Engineering Design(3%)</i>	1	\$787,373	LS	\$787,373
<i>Construction Contingency (15%)</i>				\$3,936,863
TOTAL				\$46,880,318

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design. Unit cost information were provided by VCWPD.

5/10/06

VENTURA COUNTY WATERSHED PROTECTION DISTRICT ENGINEER'S ESTIMATE OF COST FOR CONSTRUCTION

DATE 05-08-2006

PROJECT: Prince Barranca

Alternative 3, New Channel, Alignment B

LOCATION: City of Verntura

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	ESTIMATE AMOUNT
1	MOBILIZATION 5%	1.00	L. S.	1,216,325.25	1,216,325.25
2	CLEARING & GRUBBING	1.00	L. S.	20,000.00	20,000.00
3	DIVERSION & CONTROL OF WATER	1.00	L. S.	180,000.00	180,000.00
4	EXCAVATION SAFETY	1.00	L. S.	3,000.00	3,000.00
5	EXCAVATION/BACKFILL	209,000.00	CY	7.00	1,463,000.00
6	DEMOLITION EXSTG. ROADS/SIDEWALKS	18,767.00	CY	15.00	281,505.00
7	REPAVE ROAD CROSSINGS	18,767.00	CY	50.00	938,350.00
8	RCB 14 X 14 1.5 FT THICK	26,273.00	CY	800.00	21,018,400.00
9	CURBS/GUTTERS/SIDEWALKS	8,445.00	LF	50.00	422,250.00
TOTAL CONSTRUCTION					25,542,830.25
LAND ACQUISITION					
	TRAFFIC CONTROL	1.00	LS	1,200,000.00	1,200,000.00
	LATERAL DRAIN CONNECTION (10%)	1.00	LS	2,554,283.03	2,554,283.03
	ENVIRONMENTAL PERMIT	1.00	LS	125,000.00	125,000.00
	UTILITIES RELOCATION (30%)	1.00	LS	7,662,849.08	7,662,849.08
	ENGINEERING DESIGN 3%	1.00	LS	729,795.15	729,795.15
TOTAL:					37,814,757.50

Cost Estimate for Improvement Alternative 4 (Either Alignment A or B)

Relocate Existing Storm Drain Culvert (10 ft W x 12 ft H Box) (with upstream detention)

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	209,000	\$15	SY	\$3,135,000
Demolition of Existing Roads/Sidewalks	18,767	\$15	SY	\$281,500
Repave Road Crossings	18,767	\$50	SY	\$938,333
Curb/Gutter/Sidewalks	8,445	\$50	LF	\$422,250
Misc. Items	1	\$250,000	LS	\$250,000
RCB 10x12 Assume 1.5 ft Thickness	20,643	\$800	CY	\$16,514,667
Total Construction				\$21,741,750
Mobilization(8%)	1	\$1,739,340		\$1,739,340
Bond(3%)	1	\$652,253		\$652,253
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Traffic Control (\$100,000/St./mon)</i>	1	\$2,400,000	LS	\$2,400,000
<i>Lateral Drain Reconnection (10%)</i>	1	\$2,174,175	LS	\$2,174,175
<i>Utility Relocation/Protection (30%)</i>	1	\$6,522,525	LS	\$6,522,525
<i>Environmental Permitting(\$125,000)</i>	1	\$125,000	LS	\$125,000
<i>Engineering Design(3%)</i>	1	\$652,253	LS	\$652,253
<i>Construction Contingency (15%)</i>				\$3,261,263
TOTAL				\$39,268,558

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design. Unit cost information were provided by VCWPD.

5/10/06

VENTURA COUNTY WATERSHED PROTECTION DISTRICT ENGINEER'S ESTIMATE OF COST FOR CONSTRUCTION

DATE 05-08-2006

PROJECT: Prince Barranca

Alternative 4, Existing Channel Relocation

LOCATION: City of Verntura

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	ESTIMATE AMOUNT
1	MOBILIZATION 5%	1.00	L. S.	991,125.25	991,125.25
2	CLEARING & GRUBBING	1.00	L. S.	20,000.00	20,000.00
3	DIVERSION & CONTROL OF WATER	1.00	L. S.	180,000.00	180,000.00
4	EXCAVATION SAFETY	1.00	L. S.	3,000.00	3,000.00
5	EXCAVATION/BACKFILL	209,000.00	CY	7.00	1,463,000.00
6	DEMOLITION EXSTG. ROADS/SIDEWALKS	18,767.00	CY	15.00	281,505.00
7	REPAVE ROAD CROSSINGS	18,767.00	CY	50.00	938,350.00
8	RCB 10 X 12 1.5 FT THICK	20,643.00	CY	800.00	16,514,400.00
9	CURBS/GUTTERS/SIDEWALKS	8,445.00	LF	50.00	422,250.00
TOTAL CONSTRUCTION					20,813,630.25
LAND ACQUISITION					
	TRAFFIC CONTROL	1.00	LS	1,200,000.00	1,200,000.00
	LATERAL DRAIN CONNECTION (10%)	1.00	LS	2,081,363.03	2,081,363.03
	ENVIRONMENTAL PERMIT	1.00	LS	125,000.00	125,000.00
	UTILITIES RELOCATION (30%)	1.00	LS	6,244,089.08	6,244,089.08
	ENGINEERING DESIGN 3%	1.00	LS	594,675.15	594,675.15
TOTAL:					31,058,757.50

Cost Estimate for Improvement Alternative 5 (Alignment C)

Construct a diversion box culvert (10 ft w x 10 ft h) to convey excess flow (no upstream detention) Q = 1,700 cfs

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	209,000	\$15	SY	\$3,135,000
Demolition of Existing Roads/Sidewalks	19,473	\$15	SY	\$292,100
Repave Road Crossings	19,473	\$50	SY	\$973,667
Curb/Gutter/Sidewalks	8,763	\$50	LF	\$438,150
Misc. Items	1	\$250,000	LS	\$250,000
RCB 10x10 Assume 1.5 ft Thickness	19,473	\$800	CY	\$15,578,667
Total Construction				\$20,867,583
Mobilization(8%)	1	\$1,669,407		\$1,669,407
Bond(3%)	1	\$626,028		\$626,028
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Traffic Control (\$100,000/St./mon)</i>	1	\$3,000,000	LS	\$3,000,000
<i>Lateral Drain Reconnection</i>	1	\$0	LS	\$0
<i>Utility Relocation/Protection (30%)</i>	1	\$6,260,275	LS	\$6,260,275
<i>Environmental Permitting(\$125,000)</i>	1	\$125,000	LS	\$125,000
<i>Engineering Design(3%)</i>	1	\$626,028	LS	\$626,028
<i>Construction Contingency (15%)</i>				\$3,130,138
TOTAL				\$36,304,458

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design. Unit cost information were provided by VCWPD.

5/10/06

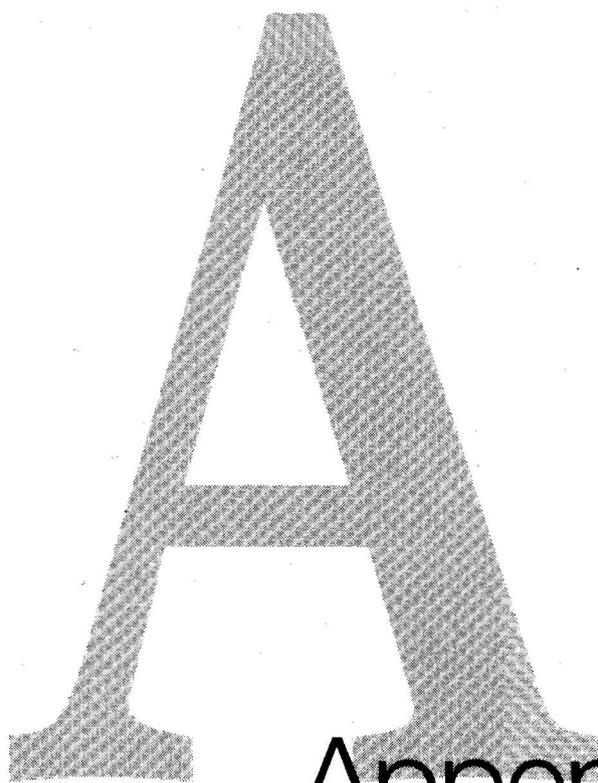
VENTURA COUNTY WATERSHED PROTECTION DISTRICT ENGINEER'S ESTIMATE OF COST FOR CONSTRUCTION

DATE 05-08-2006

PROJECT: Prince Barranca
LOCATION: City of Verntura

Alternative 5, Flow Diversion

ITEM NO.	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	ESTIMATE AMOUNT
1	MOBILIZATION 5%	1.00	LS	947,414.75	947,414.75
2	CLEARING & GRUBBING	1.00	LS	20,000.00	20,000.00
3	DIVERSION & CONTROL OF WATER	1.00	LS	180,000.00	180,000.00
4	EXCAVATION SAFETY	1.00	LS	3,000.00	3,000.00
5	EXCAVATION/BACKFILL	209,000.00	CY	7.00	1,463,000.00
6	DEMOLITION EXSTG. ROADS/SIDEWALKS	19,473.00	CY	15.00	292,095.00
7	REPAVE ROAD CROSSINGS	19,473.00	CY	50.00	973,650.00
8	RCB 10X10 1.5 FT THICK	19,473.00	CY	800.00	15,578,400.00
9	CURBS/GUTTERS/SIDEWALKS	8,763.00	LF	50.00	438,150.00
TOTAL CONSTRUCTION					19,895,709.75
LAND ACQUISITION					
	TRAFFIC CONTROL	1.00	LS	1,500,000.00	1,500,000.00
	ENVIRONMENTAL PERMIT	1.00	LS	125,000.00	125,000.00
	UTILITIES RELOCATION	1.00	LS	6,260,275.00	6,260,275.00
	ENGINEERING DESIGN 3%	1.00	LS	568,448.85	568,448.85
TOTAL:					28,349,433.60



Appendix
A



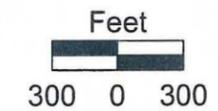
25-year floodplain

- Box
- Channel
- 10' contours

Depth of flooding (ft)

High : 16

Low : 0





25-year

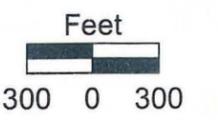
Prince Barranca

Box

Channel

25-year flooded parcels

- 0.000001 - 2.000000
- 2.000001 - 4.000000
- 4.000001 - 6.000000
- 6.000001 - 8.000000
- 8.000001 - 10.000000
- 10.000001 - 12.000000



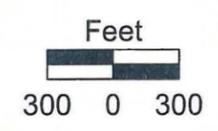


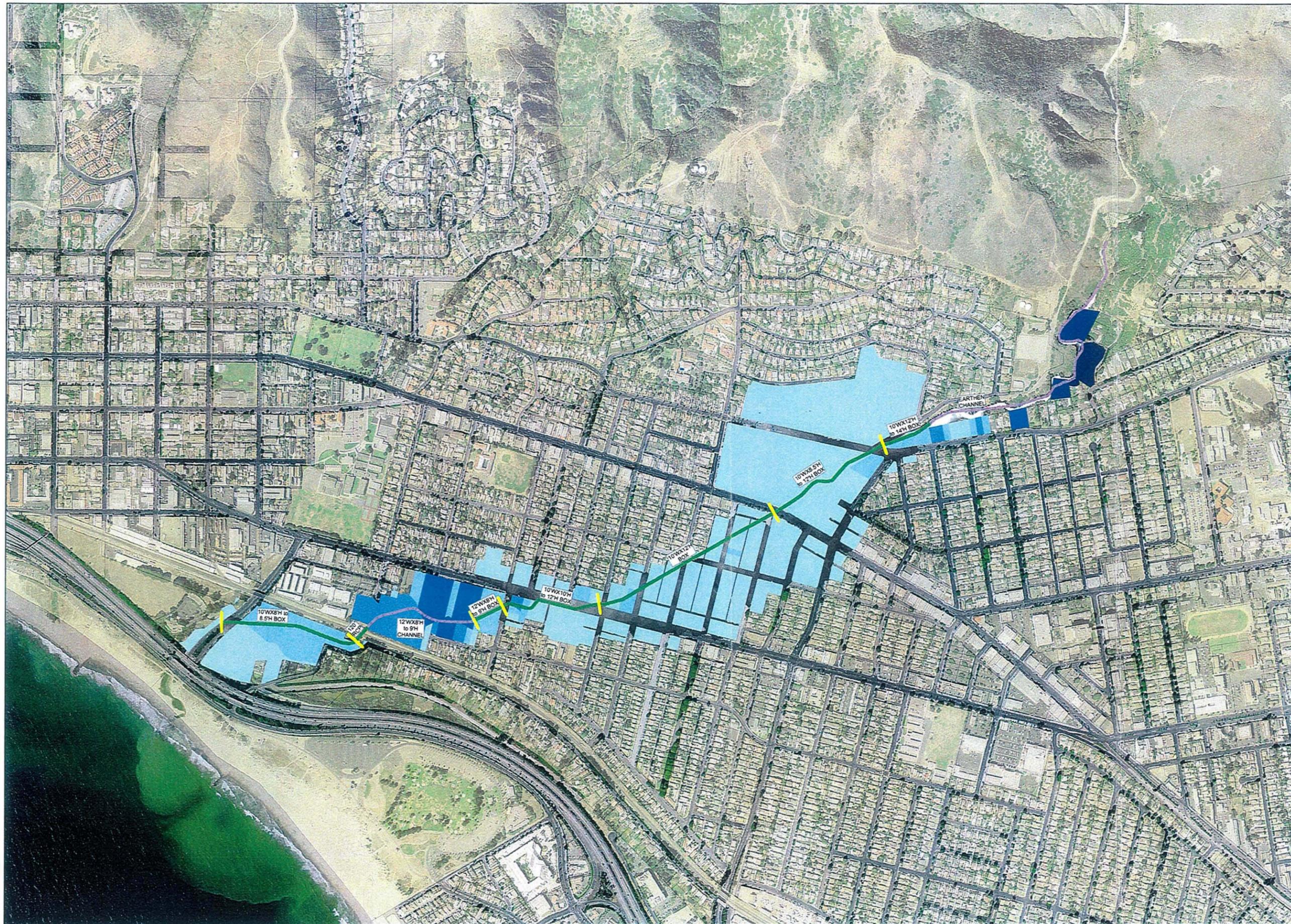
50-year floodplain

- Box
- Channel
- 10' contours

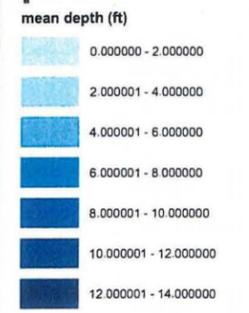
Depth of flooding (ft)

High : 17
Low : 0

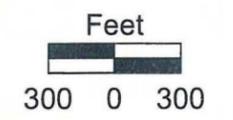




50-year 50-year flooded parcels



Prince Barranca

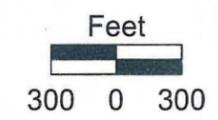
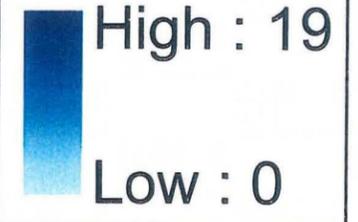


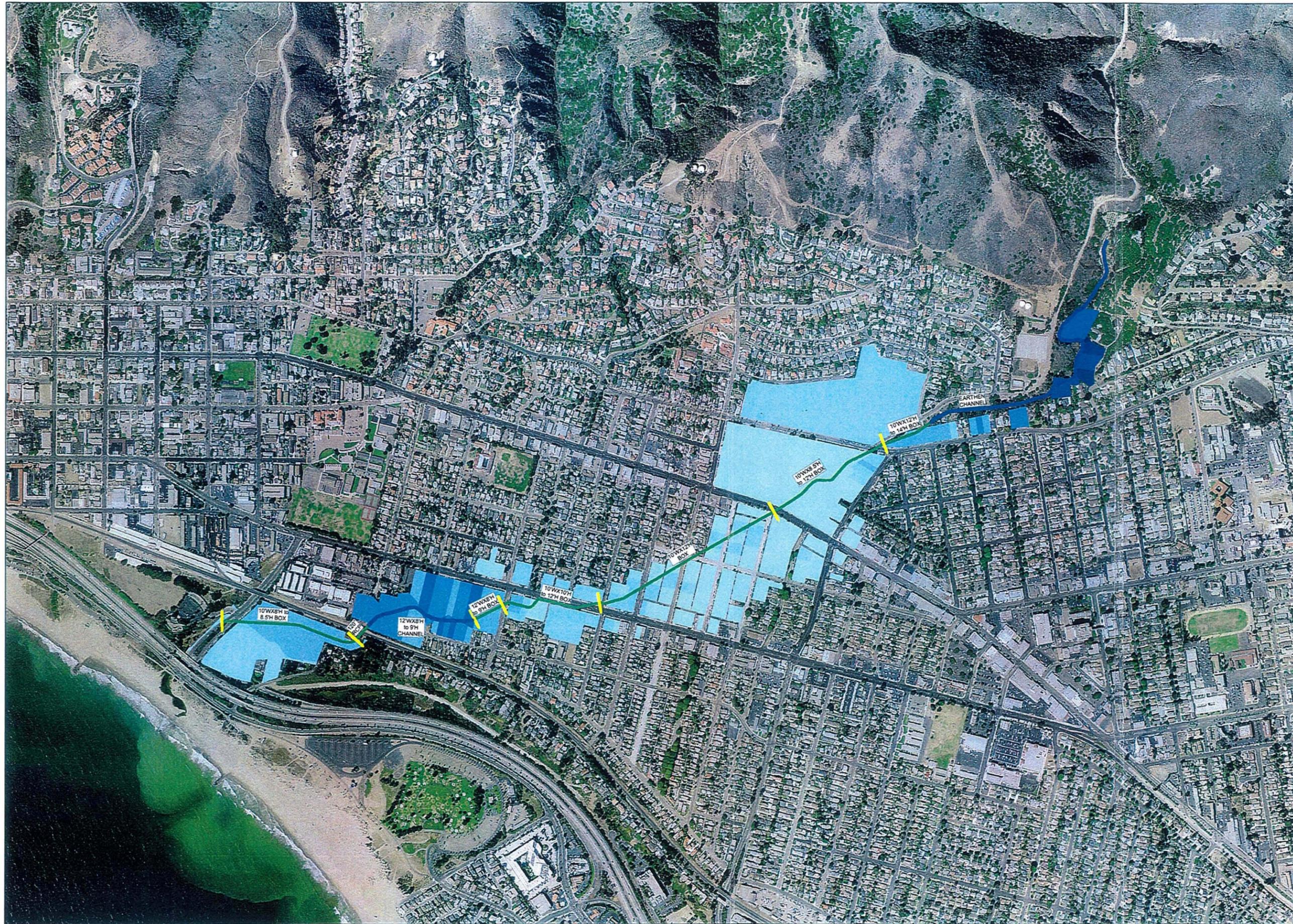


100-year floodplain

- BOX
- CHANNEL
- 10' contours

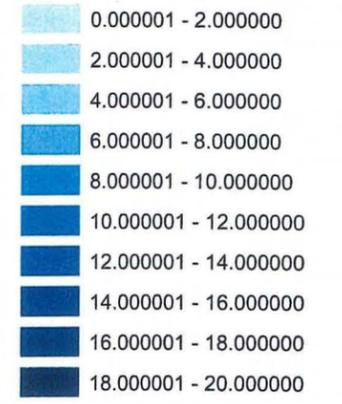
Depth of flooding (ft)



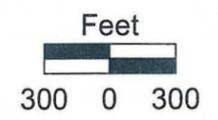


100-year

100-year flooded parcels
mean depth (ft)



Prince Barranca



B

Appendix
B

Prince Barranca Flood Damage Estimate
Ventura County, California

Summary Table

Event	Total Assessed Estate	Total Structure Value	Building Damages	Content Damages	Total Damages
100-yr	\$ 549,033,550	\$ 219,613,420	\$ 46,574,964	\$ 22,004,468	\$ 68,579,432
50-yr	\$ 483,948,100	\$ 193,579,240	\$ 37,365,522	\$ 17,647,753	\$ 55,013,275
25-yr	\$ 455,852,225	\$ 182,340,890	\$ 26,887,119	\$ 14,213,527	\$ 41,100,646

100-Year Analysis

Categories	Units Flooded	Total Building Replacement Value	Building Damages	Content Damages	Total Damages
		(\$)	(\$)	(\$)	(\$)
One Story Residential	207	\$ 56,500,000	\$ 8,875,200	\$ 4,642,820	\$ 13,518,020
Two Story Residential	12	\$ 3,600,000	\$ 661,600	\$ 325,780	\$ 987,380
Commercial Unit	84	\$ 154,969,020	\$ 36,401,948	\$ 16,670,044	\$ 53,071,992
School Unit	2	\$ 4,544,400	\$ 636,216	\$ 365,824	\$ 1,002,040
Total	305	\$ 219,613,420	\$ 46,574,964	\$ 22,004,468	\$ 68,579,432

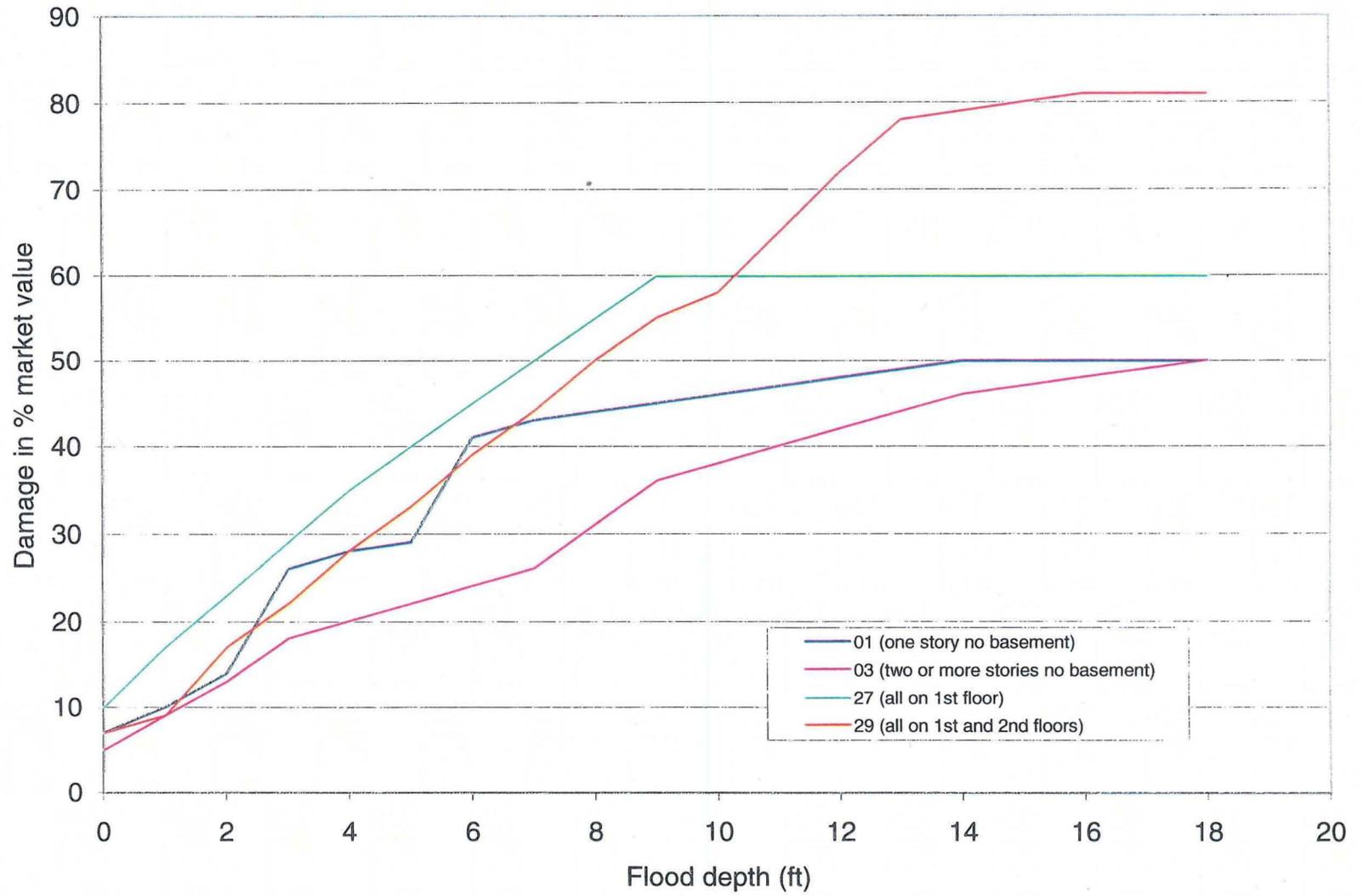
50-Year Analysis

Categories	Units Flooded	Total Building Replacement Value	Building Damages	Content Damages	Total Damages
		(\$)	(\$)	(\$)	(\$)
One Story Residential	157	\$ 43,120,000	\$ 6,750,800	\$ 3,469,830	\$ 10,220,630
Two Story Residential	12	\$ 3,600,000	\$ 629,600	\$ 304,640	\$ 934,240
Commercial Unit	75	\$ 142,314,840	\$ 29,447,074	\$ 13,558,997	\$ 43,006,071
School Unit	2	\$ 4,544,400	\$ 538,048	\$ 314,286	\$ 852,334
Total	246	\$ 193,579,240	\$ 37,365,522	\$ 17,647,753	\$ 55,013,275

25-Year Analysis

Categories	Units Flooded	Total Building Replacement Value	Building Damages	Content Damages	Total Damages
		(\$)	(\$)	(\$)	(\$)
One Story Residential	140	\$ 38,380,000	\$ 5,416,000	\$ 2,874,130	\$ 8,290,130
Two Story Residential	11	\$ 3,340,000	\$ 513,000	\$ 246,330	\$ 759,330
Commercial Unit	65	\$ 136,076,490	\$ 20,503,679	\$ 10,822,675	\$ 31,326,355
School Unit	2	\$ 4,544,400	\$ 454,440	\$ 270,392	\$ 724,832
Total	218	\$ 182,340,890	\$ 26,887,119	\$ 14,213,527	\$ 41,100,646

HUD Curves



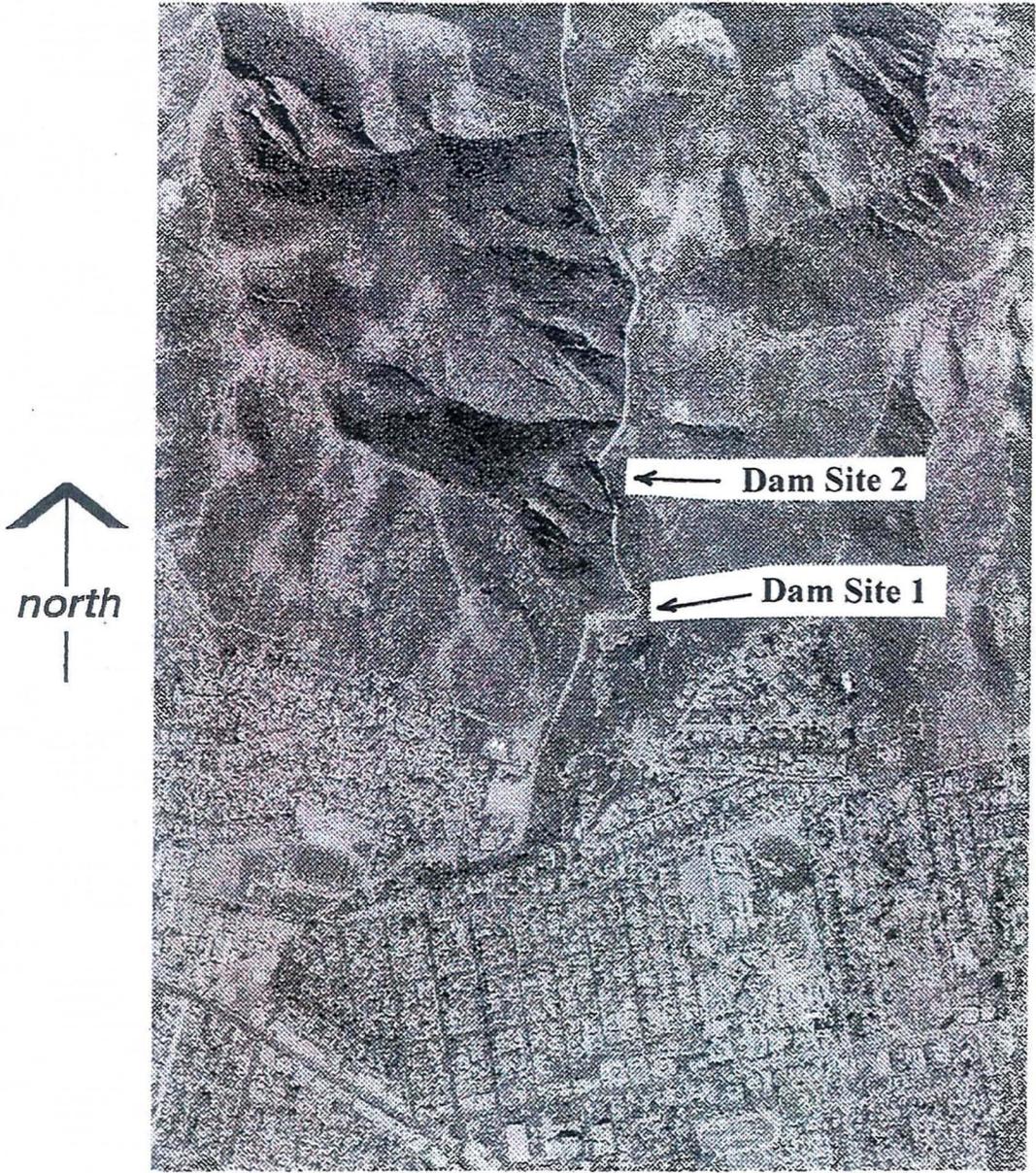
Landuse	Flood depth (ft)	Number of Residential Units Flooded or SF of Commercial Units Flooded or Acres of School Flooded				Total Assessed Estate	Total Structure Value	Building Damages (\$)	Content Damages (\$)	Total Damages (\$)
		Upstream from Poli Street	Between Poli St and Main St	Between Main St and Thompson St	Downstream of Thompson St					
One Story Residential	1	1	4	102	5	\$ 73,450,000	\$ 29,380,000	\$ 2,938,000	\$ 1,748,110	\$ 4,686,110
	2	5	1	2	2	\$ 7,850,000	\$ 3,140,000	\$ 439,600	\$ 252,770	\$ 692,370
	3	4	2	0	1	\$ 5,750,000	\$ 2,300,000	\$ 598,000	\$ 233,450	\$ 831,450
	4	1	0	0	0	\$ 900,000	\$ 360,000	\$ 100,800	\$ 44,100	\$ 144,900
	5	0	0	0	0	\$ 1,300,000	\$ 520,000	\$ 150,800	\$ 72,800	\$ 223,600
	6	0	0	0	0	\$ 1,300,000	\$ 520,000	\$ 213,200	\$ 81,900	\$ 295,100
	7	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	8	2	0	0	0	\$ 1,800,000	\$ 720,000	\$ 316,800	\$ 138,600	\$ 455,400
	9	2	0	0	0	\$ 1,800,000	\$ 720,000	\$ 324,000	\$ 151,200	\$ 475,200
	10	1	0	0	0	\$ 900,000	\$ 360,000	\$ 165,600	\$ 75,600	\$ 241,200
	11	1	0	0	0	\$ 900,000	\$ 360,000	\$ 169,200	\$ 75,600	\$ 244,800
	12	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
Two Story Residential	1	1	2	4	1	\$ 5,650,000	\$ 2,260,000	\$ 203,400	\$ 71,190	\$ 274,590
	2	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	3	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	4	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	5	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	6	1	0	0	0	\$ 900,000	\$ 360,000	\$ 86,400	\$ 49,140	\$ 135,540
	7	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	8	2	0	0	0	\$ 1,800,000	\$ 720,000	\$ 223,200	\$ 126,000	\$ 349,200
	9	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	10	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	12	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
Commercial	1	0	31970	375395	436812	\$ 189,939,825	\$ 75,975,930	\$ 7,597,593	\$ 4,520,568	\$12,118,161
	2	0	0	0	350365	\$ 78,832,125	\$ 31,532,850	\$ 4,414,599	\$ 2,538,394	\$ 6,952,993
	3	0	0	0	42590	\$ 9,582,750	\$ 3,833,100	\$ 996,606	\$ 389,060	\$ 1,385,666
	4	0	0	0	93595	\$ 21,058,875	\$ 8,423,550	\$ 2,358,594	\$ 1,031,885	\$ 3,390,479
	5	0	0	0	143634	\$ 32,317,650	\$ 12,927,060	\$ 3,748,847	\$ 1,809,788	\$ 5,558,636
	6	0	0	0	37600	\$ 8,460,000	\$ 3,384,000	\$ 1,387,440	\$ 532,980	\$ 1,920,420
	7	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	8	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	9	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	10	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
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	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
School	1	14.93	17.53	0	0	\$ 11,361,000	\$ 4,544,400	\$ 454,440	\$ 270,392	\$ 724,832
	2	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	3	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	4	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
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	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
						\$ 455,852,225	\$ 182,340,890	\$ 26,887,119	\$ 14,213,527	\$ 41,100,646

Landuse	Flood depth (ft)	Number of Residential Units Flooded or SF of Commercial Units Flooded or Acres of School Flooded				Total Assessed Estate	Total Structure Value	Building Damages (\$)	Content Damages (\$)	Total Damages (\$)
		Upstream from Poli Street	Between Poi St and Main St	Between Main St and Thompson St	Downstream of Thompson St					
One Story Residential	1	2	6	87	8	\$ 68,050,000	\$ 27,220,000	\$ 2,722,000	\$ 1,819,590	\$ 4,341,590
	2	1	1	23	0	\$ 16,600,000	\$ 6,640,000	\$ 929,600	\$ 534,520	\$ 1,464,120
	3	5	2	0	3	\$ 7,950,000	\$ 3,180,000	\$ 826,800	\$ 322,770	\$ 1,149,570
	4	4	1	0	2	\$ 5,650,000	\$ 2,260,000	\$ 632,800	\$ 276,850	\$ 909,650
	5	1	0	0	1	\$ 1,550,000	\$ 620,000	\$ 179,800	\$ 86,800	\$ 266,600
	6	0	0	0	1	\$ 650,000	\$ 260,000	\$ 106,600	\$ 40,950	\$ 147,550
	7	0	0	0	2	\$ 1,300,000	\$ 520,000	\$ 223,600	\$ 91,000	\$ 314,600
	8	1	0	0	1	\$ 1,550,000	\$ 620,000	\$ 272,800	\$ 119,350	\$ 392,150
	9	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	10	1	0	0	0	\$ 900,000	\$ 360,000	\$ 165,600	\$ 75,600	\$ 241,200
	11	2	0	0	0	\$ 1,800,000	\$ 720,000	\$ 338,400	\$ 151,200	\$ 489,600
	12	1	0	0	0	\$ 900,000	\$ 360,000	\$ 172,800	\$ 75,600	\$ 248,400
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	1	0	0	0	\$ 900,000	\$ 360,000	\$ 180,000	\$ 75,600	\$ 255,600
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
Two Story Residential	1	0	2	4	1	\$ 4,750,000	\$ 1,900,000	\$ 171,000	\$ 59,850	\$ 230,850
	2	0	0	1	0	\$ 650,000	\$ 260,000	\$ 33,800	\$ 15,470	\$ 49,270
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	4	1	0	0	0	\$ 900,000	\$ 360,000	\$ 72,000	\$ 35,280	\$ 107,280
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	7	1	0	0	0	\$ 900,000	\$ 360,000	\$ 93,600	\$ 55,440	\$ 149,040
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	9	2	0	0	0	\$ 1,800,000	\$ 720,000	\$ 259,200	\$ 138,600	\$ 397,800
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	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
Commercial	1	0	31970	294457	110305	\$ 98,264,700	\$ 39,305,880	\$ 3,930,588	\$ 2,338,700	\$ 6,269,288
	2	0	0	111317	345778	\$ 102,846,375	\$ 41,138,550	\$ 5,759,397	\$ 3,311,653	\$ 9,071,050
	3	0	0	0	353254	\$ 79,482,150	\$ 31,792,860	\$ 8,266,144	\$ 3,226,975	\$11,493,119
	4	0	0	0	59366	\$ 13,357,350	\$ 5,342,940	\$ 1,496,023	\$ 654,510	\$ 2,150,533
	5	0	0	0	29185	\$ 6,566,625	\$ 2,626,650	\$ 761,729	\$ 367,731	\$ 1,129,460
	6	0	0	0	170594	\$ 38,383,650	\$ 15,353,460	\$ 6,294,919	\$ 2,418,170	\$ 8,713,089
	7	0	0	0	37450	\$ 8,426,250	\$ 3,370,500	\$ 1,449,315	\$ 589,838	\$ 2,039,153
	8	0	0	0	37600	\$ 8,460,000	\$ 3,384,000	\$ 1,488,960	\$ 651,420	\$ 2,140,380
	9	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	10	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	12	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
School	1	0	17.53	0	0	\$ 6,135,500	\$ 2,454,200	\$ 245,420	\$ 146,025	\$ 391,445
	2	14.93	0	0	0	\$ 5,225,500	\$ 2,090,200	\$ 292,628	\$ 168,261	\$ 460,889
	3	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	4	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	5	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	6	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	7	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	8	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	9	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	10	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	12	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
						\$ 483,948,100	\$ 193,579,240	\$ 37,365,522	\$ 17,647,753	\$ 55,013,275

Landuse	Flood depth (ft)	Number of Residential Units Flooded or SF of Commercial Units Flooded or Acres of School Flooded				Total Assessed Estate	Total Structure Value	Building Damages (\$)	Content Damages (\$)	Total Damages (\$)
		Upstream from Poli Street	Between Poli St and Main St	Between Main St and Thompson St	Downstream of Thompson St					
One Story Residential	1	3	13	58	40	\$ 76,150,000	\$ 30,460,000	\$ 3,046,000	\$ 1,812,370	\$ 4,858,370
	2	0	1	60	1	\$ 40,400,000	\$ 16,160,000	\$ 2,262,400	\$ 1,309,880	\$ 3,563,280
	3	1	1	1	1	\$ 2,950,000	\$ 1,180,000	\$ 306,800	\$ 119,770	\$ 426,570
	4	3	2	0	0	\$ 4,850,000	\$ 1,940,000	\$ 543,200	\$ 237,650	\$ 780,850
	5	4	0	0	0	\$ 4,900,000	\$ 1,960,000	\$ 568,400	\$ 274,400	\$ 842,800
	6	3	0	0	0	\$ 3,350,000	\$ 1,340,000	\$ 549,400	\$ 211,050	\$ 760,450
	7	1	0	0	0	\$ 2,200,000	\$ 880,000	\$ 378,400	\$ 154,000	\$ 532,400
	8	0	0	0	0	\$ 1,300,000	\$ 520,000	\$ 228,800	\$ 100,100	\$ 328,900
	9	0	0	0	0	\$ 650,000	\$ 260,000	\$ 117,000	\$ 54,600	\$ 171,600
	10	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	12	3	0	0	0	\$ 2,700,000	\$ 1,080,000	\$ 518,400	\$ 226,800	\$ 745,200
	13	1	0	0	0	\$ 900,000	\$ 360,000	\$ 176,400	\$ 75,600	\$ 252,000
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	1	0	0	0	\$ 900,000	\$ 360,000	\$ 180,000	\$ 75,600	\$ 255,600
Two Story Residential	1	0	2	3	1	\$ 4,100,000	\$ 1,640,000	\$ 147,600	\$ 51,660	\$ 199,260
	2	0	0	2	0	\$ 1,300,000	\$ 520,000	\$ 67,600	\$ 30,940	\$ 98,540
	3	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	4	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	5	1	0	0	0	\$ 900,000	\$ 360,000	\$ 79,200	\$ 41,580	\$ 120,780
	6	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	7	1	0	0	0	\$ 900,000	\$ 360,000	\$ 93,600	\$ 55,440	\$ 149,040
	8	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	9	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	10	2	0	0	0	\$ 1,800,000	\$ 720,000	\$ 273,600	\$ 146,160	\$ 419,760
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	12	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
Commercial	1	0	38220	165515	144520	\$ 78,357,375	\$ 31,342,950	\$ 3,134,295	\$ 1,864,906	\$ 4,999,201
	2	0	0	212215	160502	\$ 83,861,325	\$ 33,544,530	\$ 4,696,234	\$ 2,709,335	\$ 7,396,569
	3	0	0	66656	246801	\$ 70,527,825	\$ 28,211,130	\$ 7,334,894	\$ 2,863,430	\$ 10,198,323
	4	0	0	0	353254	\$ 79,482,150	\$ 31,792,860	\$ 8,902,001	\$ 3,894,625	\$ 12,796,626
	5	0	0	0	59366	\$ 13,357,350	\$ 5,342,940	\$ 1,549,453	\$ 748,012	\$ 2,297,464
	6	0	0	0	5777	\$ 1,299,825	\$ 519,930	\$ 213,171	\$ 81,889	\$ 295,060
	7	0	0	0	129332	\$ 29,099,700	\$ 11,639,880	\$ 5,005,148	\$ 2,036,979	\$ 7,042,127
	8	0	0	0	102120	\$ 22,977,000	\$ 9,190,800	\$ 4,043,952	\$ 1,769,229	\$ 5,813,181
	9	0	0	0	37600	\$ 8,460,000	\$ 3,384,000	\$ 1,522,800	\$ 710,640	\$ 2,233,440
	10	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	12	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
School	1	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	2	14.93	17.53	0	0	\$ 11,361,000	\$ 4,544,400	\$ 636,216	\$ 365,824	\$ 1,002,040
	3	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	4	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	5	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	6	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	7	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	8	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	9	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	10	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	11	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	12	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	13	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	14	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	15	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
	16	0	0	0	0	\$ -	\$ -	\$ -	\$ -	\$ -
						\$ 549,033,550	\$ 219,613,420	\$ 46,574,964	\$ 22,004,468	\$ 68,579,432

C

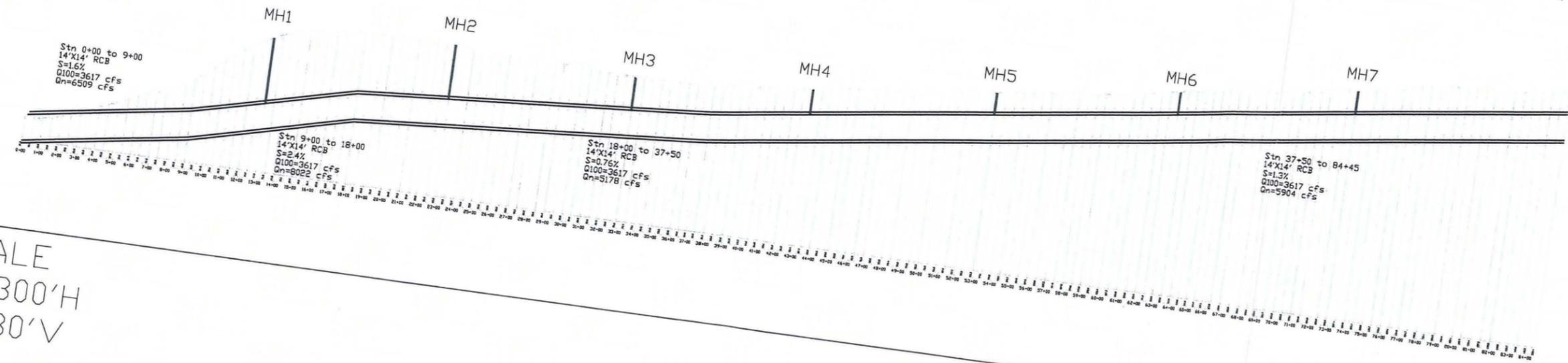
Appendix
C



Location Map

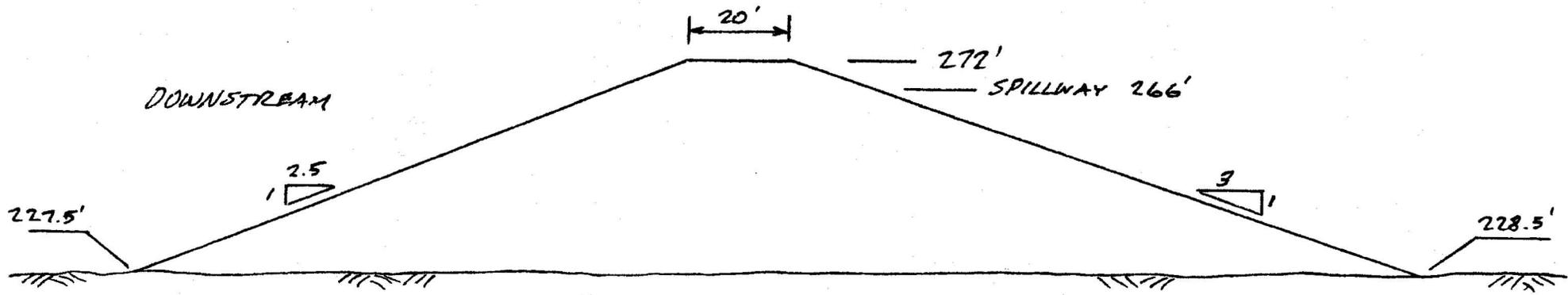
Scale: 1"= 1,320 feet

Figure 1



SCALE
 1"=300'H
 1"=30'V

PRINCE BARRANCA
 PRELIMINARY DESIGN - ALIGNMENT B
 Station 0+00 to 84+45



Proposed Prince Barranca Dam
Cross Section along Creek Centerline

Scale: 1" = 30 feet

Figure 3

Cost Estimate for Storm Drain Alternative 1

Construct a detention basin upstream of existing Prince Barranca channel:

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)*</i>				
Mobilization	1	\$300,000	LS	\$300,000
Water Control	1	\$60,000	LS	\$60,000
Basin Excavation	75,000	\$3	CY	\$225,000
Dam and Spillway Foundation Excavation*	50,000	\$3	CY	\$150,000
Dam Embankment Fill	110,000	\$6	CY	\$660,000
Structural Concrete	4,000	\$500	CY	\$2,000,000
Emergency Spillway	350	\$1,000	LF	\$350,000
60" RCP Low Flow Outlet	500	\$200	LF	\$100,000
Access Road	5,000	\$25	SY	\$125,000
Cobble Facing (12 in thick)	1,300	\$60	CY	\$78,000
Rock Riprap (1/4 ton)	4,000	\$80	CY	\$320,000
Misc. Items	1	\$750,000	LS	\$750,000
Total				\$5,118,000
Cost Escalation (20%)	1	\$1,023,600	LS	\$1,023,600
Total Construction				\$6,141,600
<i>Land Acquisition</i>	1		LS	\$0
<i>Construction Mitigation (10%)</i>	1	\$1,228,320	LS	\$1,228,320
<i>Lateral Drain Reconnection</i>	1	\$0	LS	\$0
<i>Utility Relocation/Protection (10%)</i>	1	\$614,160	LS	\$614,160
<i>Planning/Permitting/Engineering (10%)</i>	1	\$614,160	LS	\$614,160
<i>Contingency (25%)</i>				\$1,535,400
TOTAL				\$10,133,640

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design'

D

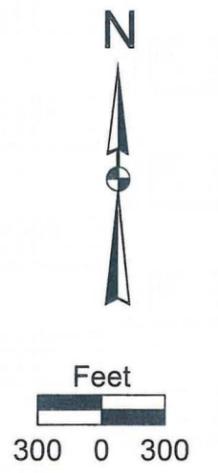
Appendix
D

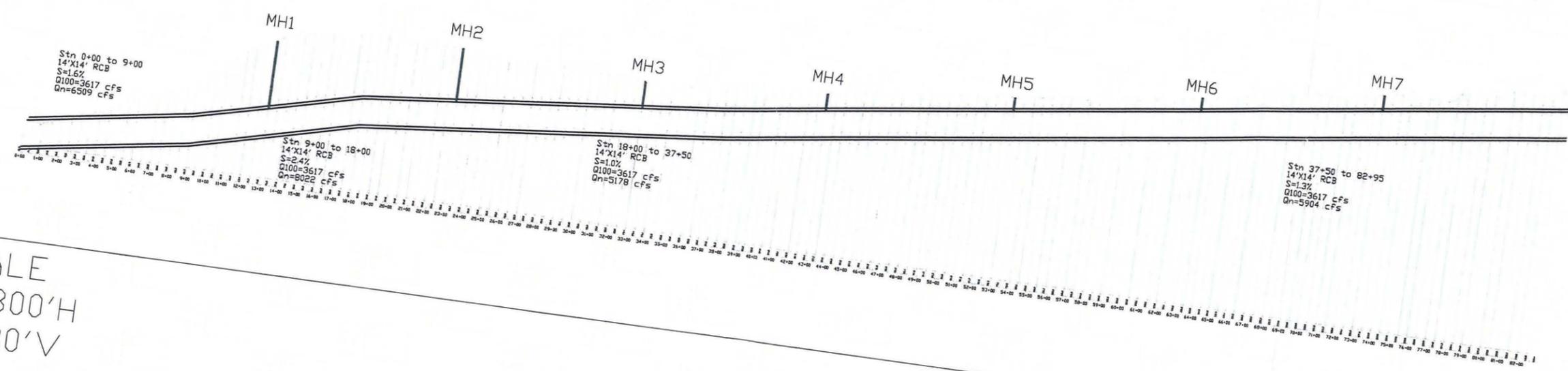


Prince Barranca Conveyance Alignment

Prince Barranca (Existing)

- Box
- Channel
- Alternative A
- 10' contours





Stn 0+00 to 9+00
 14"x14" RCB
 S=1.6%
 Q100=3617 cfs
 Qn=6509 cfs

Stn 9+00 to 18+00
 14"x14" RCB
 S=2.4%
 Q100=3617 cfs
 Qn=8022 cfs

Stn 18+00 to 37+50
 14"x14" RCB
 S=1.0%
 Q100=3617 cfs
 Qn=5178 cfs

Stn 37+50 to 82+95
 14"x14" RCB
 S=1.3%
 Q100=3617 cfs
 Qn=5904 cfs

SCALE
 1"=300'H
 1"=30'V

PRINCE BARRANCA
 PRELIMINARY DESIGN - ALIGNMENT A
 Station 0+00 to 82+95

Cost Estimate for Storm Drain Alternative 2 (Alignment A)

Construct 14-ft wide x 14 ft high Concrete Box Culvert To Replace Existing System

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Mobilization	1	\$300,000	LS	\$300,000
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	187,000	\$15	SY	\$2,805,000
Demolition of Existing Roads/Sidewalks	18,444	\$15	SY	\$276,667
Repave Road Crossings	18,444	\$50	SY	\$922,222
Curb/Gutter/Sidewalks	8,300	\$50	LF	\$415,000
Misc. Items	1	\$250,000	LS	\$250,000
RCB 14x14 Assume 1.5 ft Thickness	25,822	\$600	CY	\$15,493,333
Total Construction				\$20,662,222
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Construction Mitigation (Traffic Detour, etc.)(20%)</i>	1	\$4,132,444	LS	\$4,132,444
<i>Lateral Drain Reconnection (10%)</i>	1	\$2,066,222	LS	\$2,066,222
<i>Utility Relocation/Protection (30%)</i>	1	\$6,198,667	LS	\$6,198,667
<i>Planning/Permitting/Engineering (10%)</i>	1	\$2,066,222	LS	\$2,066,222
<i>Contingency (25%)</i>				\$5,165,556
TOTAL				\$40,291,333

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design'

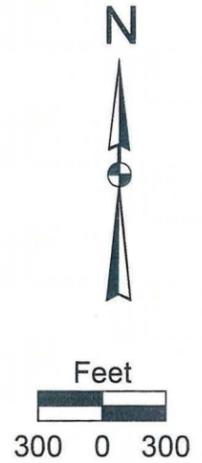
E

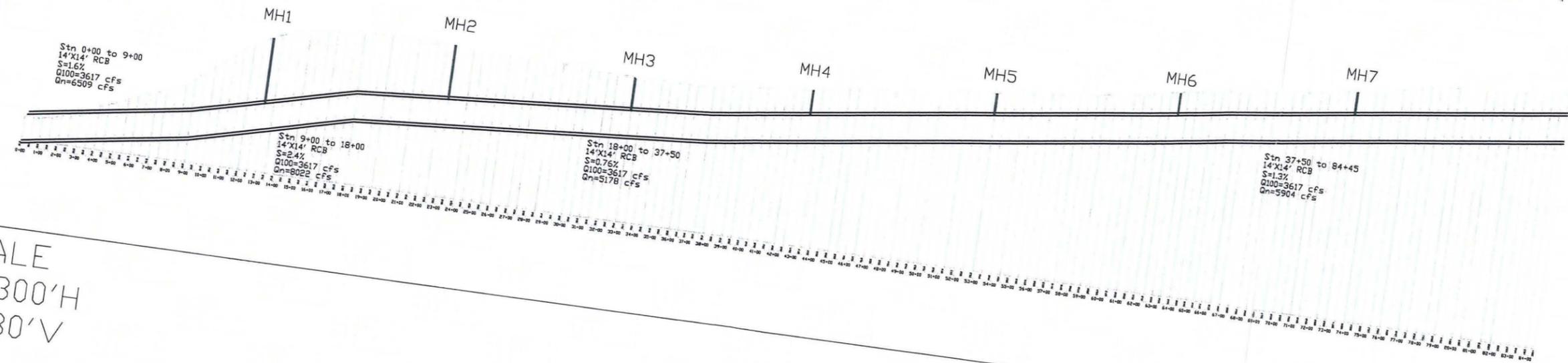
Appendix
E



Prince Barranca Conveyance Alignment

- Prince Barranca (Existing)
- Box
 - Channel
 - Alternative B
 - 10' contours





SCALE
 1"=300'H
 1"=30'V

PRINCE BARRANCA
 PRELIMINARY DESIGN - ALIGNMENT B
 Station 0+00 to 84+45

Cost Estimate for Storm Drain Alternative 4 (Either Alignment A or B)

Relocate Existing Storm Drain Culvert (10 ft W x 12 ft H Box) (with upstream detention)

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Mobilization	1	\$300,000	LS	\$300,000
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	209,000	\$15	SY	\$3,135,000
Demolition of Existing Roads/Sidewalks	18,767	\$15	SY	\$281,500
Repave Road Crossings	18,767	\$50	SY	\$938,333
Curb/Gutter/Sidewalks	8,445	\$50	LF	\$422,250
Misc. Items	1	\$250,000	LS	\$250,000
RCB 10x12 Assume 1.5 ft Thickness	20,643	\$600	CY	\$12,386,000
Total Construction				\$17,913,083
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Construction Mitigation (Traffic Detour, etc.)(20%)</i>	1	\$3,582,617	LS	\$3,582,617
<i>Lateral Drain Reconnection (10%)</i>	1	\$1,791,308	LS	\$1,791,308
<i>Utility Relocation/Protection (30%)</i>	1	\$5,373,925	LS	\$5,373,925
<i>Planning/Permitting/Engineering (10%)</i>	1	\$1,791,308	LS	\$1,791,308
<i>Contingency (25%)</i>				\$4,478,271
TOTAL				\$34,930,513

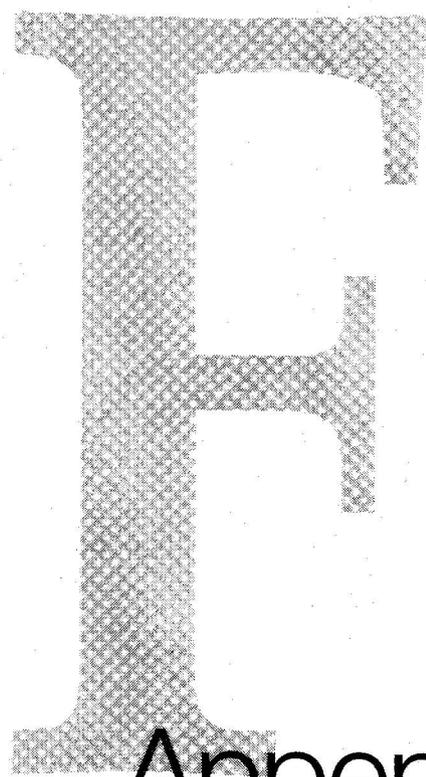
* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design'

Cost Estimate for Storm Drain Alternative- 3 (Alignment B)

Construct 14-ft wide x 14 ft high Concrete Box Culvert To Replace Existing System

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Mobilization	1	\$300,000	LS	\$300,000
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	209,000	\$15	SY	\$3,135,000
Demolition of Existing Roads/Sidewalks	18,767	\$15	SY	\$281,500
Repave Road Crossings	18,767	\$50	SY	\$938,333
Curb/Gutter/Sidewalks	8,445	\$50	LF	\$422,250
Misc. Items	1	\$250,000	LS	\$250,000
RCB 14x14 Assume 1.5 ft Thickness	26,273	\$600	CY	\$15,764,000
Total Construction				\$21,291,083
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Construction Mitigation (Traffic Detour, etc.)(20%)</i>	1	\$4,258,217	LS	\$4,258,217
<i>Lateral Drain Reconnection (10%)</i>	1	\$2,129,108	LS	\$2,129,108
<i>Utility Relocation/Protection (30%)</i>	1	\$6,387,325	LS	\$6,387,325
<i>Planning/Permitting/Engineering (10%)</i>	1	\$2,129,108	LS	\$2,129,108
<i>Contingency (25%)</i>				\$5,322,771
TOTAL				\$41,517,613

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design'



Appendix
F

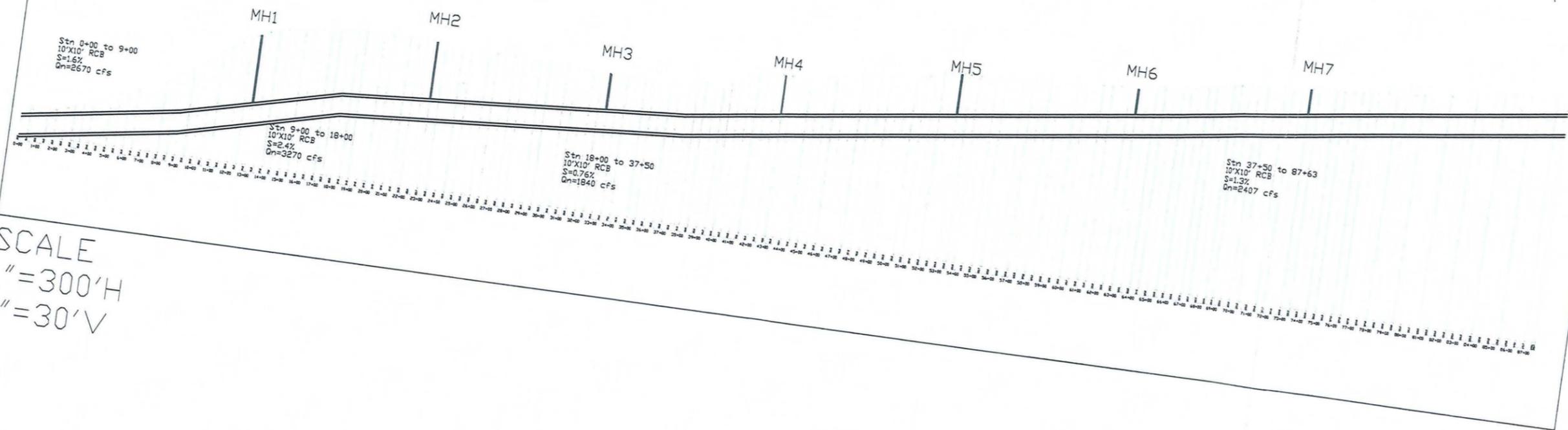


**Prince Barranca
Conveyance Alignment**

Prince Barranca (Existing)

- Box
- Channel
- Alternative C
- 10' contours





SCALE
 1"=300'H
 1"=30'V

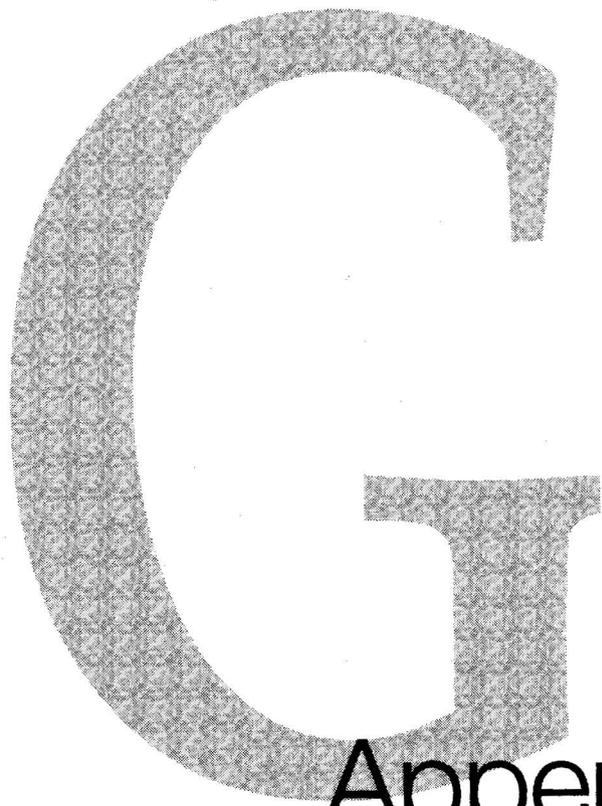
PRINCE BARRANCA
 PRELIMINARY DESIGN - ALIGNMENT C
 Station 0+00 to 87+63

Cost Estimate for Storm Drain Alternative 5 (Alignment C)

Construct a diversion box culvert (10 ft w x 10 ft h) to convey excess flow (no upstream detention) Q = 1,700 cfs

<u>Activity</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Unit</u>	<u>Item Cost</u>
<i>Construction (Labor, Material, & Equipment)</i>				
Mobilization	1	\$300,000	LS	\$300,000
Water Control	1	\$200,000	LS	\$200,000
Excavation/Backfill	209,000	\$15	SY	\$3,135,000
Demolition of Existing Roads/Sidewalks	19,473	\$15	SY	\$292,100
Repave Road Crossings	19,473	\$50	SY	\$973,667
Curb/Gutter/Sidewalks	8,763	\$50	LF	\$438,150
Misc. Items	1	\$250,000	LS	\$250,000
RCB 10x10 Assume 1.5 ft Thickness	19,473	\$600	CY	\$11,684,000
Total Construction				\$17,272,917
<i>Land Acquisition</i>	1	\$0	LS	\$0
<i>Construction Mitigation (Traffic Detour, etc.)(20%)</i>	1	\$3,454,583	LS	\$3,454,583
<i>Lateral Drain Reconnection</i>	1	\$0	LS	\$0
<i>Utility Relocation/Protection (30%)</i>	1	\$5,181,875	LS	\$5,181,875
<i>Planning/Permitting/Engineering (10%)</i>	1	\$1,727,292	LS	\$1,727,292
<i>Contingency (25%)</i>				\$4,318,229
TOTAL				\$31,954,896

* Construction quantities are only rough estimates based on similar recently constructed projects and must be finalized based on engineering design'



Appendix
G

**PRELIMINARY ENVIRONMENTAL REVIEW
FOR THE
PRINCE BARRANCA WATERSHED STUDY**

Prepared for:

Ventura County Watershed Protection District
800 S. Victoria Avenue
Ventura, California, 93009
Contact: Mr. Tony Chen
(805) 654-3795

Prepared by:

Padre Associates, Inc.
1861 Knoll Drive
Ventura, CA 93003
(805) 644-2220

February 23, 2006
Project No. 0502-1312

INTRODUCTION

The purpose of this Report is to provide a preliminary environmental review of proposed improvements to Prince Barranca, Ventura, California. The Prince Barranca watershed includes a urban area within the City of Ventura, and a large undeveloped area (Hall Canyon). Recent hydraulic and hydrologic studies indicate urban portions of the Barranca (composed of mostly underground culverts) do not have sufficient capacity to convey 100-year storm flow. A consultant to the District (CDM) identified two detention basin sites in Hall Canyon as a solution to reduce peak storm flow rates into the urban portion of the watershed. A Ventura County Initial Study Checklist has been completed for both basin sites (see attached) to identify the significance of potential environmental impacts.

SUMMARY

Environmental issues of concern involve impacts to biological resources (native vegetation, wetlands, wildlife habitat, special-status species) and coastal beach replenishment.

Biological impacts associated with the Basin 1 site would be less than for Basin 2, as Basin 1 would be located in the same location to be affected by planned sediment removal from the existing basin. However, most of the biological impacts are associated with periodic sediment removal, which would be the same for either basin site. It is expected that mitigation would be required for impacts associated with both dam construction and sediment removal.

Sediment transport in Hall Canyon may be an important issue as it appears to contribute a substantial amount of the sand that maintains San Buenaventura State Beach. A high dam as proposed would trap sediments that appear to replenish the State Beach. This impact cannot be readily assessed or mitigated. Therefore, an environmental impact report appears to be required, including a sediment transport analysis.

Cultural resources of the project site are unknown; and resources may be discovered during construction and/or maintenance of the proposed basin. No reported archeological surveys have been conducted in close proximity to the basin sites, and resources may be present. However, the potential to find cultural resources is much higher at the Basin 2 site, as it was not affected by construction of the existing basin in 1973 and planned sediment removal in 2006.

BACKGROUND

A debris basin currently exists in Hall Canyon, with the dam located approximately 3,300 feet northeast of the Poli Street/Hall Canyon Road intersection. The Hall Canyon Debris Basin was constructed in 1973 by the installation of a debris dam and excavation of about 34,000 cubic yards of earth material, to form a 1,000 foot-long basin with a maximum depth of approximately 20 feet. The Hall Canyon Debris Basin was originally constructed by the Corps of Engineers to capture sediment generated by post-fire erosion following a declared disaster in 1972/1973. The Hall Canyon Debris Basin has been full of sediment for a number of years, as indicated by sediment accumulation up to the top of the debris dam.

Most of the Hall Canyon watershed burned on November 18, 2005 as part of the School Canyon Fire. Erosion of burned slopes is expected to occur during major rain events during the 2005/2006 rainy season, which will result in sediment transport by storm flow into the City of Ventura storm drain system. Sediment will accumulate in storm drains, reducing capacity and result in flooding of residential areas. Existing accumulated sediment is planned to be removed from the Hall Canyon Debris Basin in summer 2006 to allow increased sediment loads associated with the School Canyon Fire to be captured prior to reaching the City's storm drain system.

ALTERNATIVES

BASIN 1

This Basin would utilize the same dam site as the existing Hall Canyon Debris Basin, and would not involve any excavation except that needed to construct a dam. The water surface elevation associated with a 100-year storm would extend about 3,100 feet upstream and inundate an area of about 12 acres. Right-of-way acquisition would be required for a portion of the inundation area.

BASIN 2

The dam for Basin 2 would be located approximately 1,000 feet upstream of the existing dam (and the Basin 1 dam site). Similar to Basin 1, construction would not involve any excavation except that needed to construct a dam. The water surface elevation associated with a 100-year storm would extend about 3,000 feet upstream and inundate an area of about 11 acres. Right-of-way acquisition would be required for a portion of the inundation area.

PRELIMINARY IMPACT ANALYSIS

BASIN 1

General

Loss of wetlands may be inconsistent with Policy 1.5.1.3 of the Ventura County General Plan.

Land Use

The proposed basin would not significantly affect community character. Right-of-way acquisition would not substantially affect existing land use and is considered a less than significant impact. The project would not induce population growth.

Resources

Air Quality. The project would have temporary, insignificant air quality impacts associated with construction.

Water Quality. Hall Canyon Creek is perennial, it is expected that temporary stream diversion would be required to construct the dam. The project would have temporary surface water quality impacts associated with dam construction, including increases in turbidity and siltation. These impacts would be less than significant with implementation of standard best management practices.

Biology. The Hall Canyon Creek corridor in the vicinity of the Basin 1 site supports mulefat scrub, coyote brush scrub, arroyo willow riparian forest, and purple sage scrub. The Basin 1 site has undergone high levels of past disturbance, including construction of the existing Hall Canyon Debris Basin in 1973, high density cattle grazing, leaching of hydrocarbons and salts into surface waters due to upstream soil contamination by oil production activities; and oil and gas exploration and production in the surrounding area, and associated erosion and sediment production. Sediment removal from the existing Hall Canyon Debris Basin planned for summer 2006 would result in temporary loss of sensitive riparian vegetation and temporary loss of wetlands. The proposed basin would be constructed several years after sediment removal, such that riparian vegetation would have recovered to some extent prior to basin construction.

Assuming new dam construction occurs within 5 years of sediment removal from the existing Basin, about 0.1 acres of immature riparian vegetation (mulefat and arroyo willow) and about one acre of coyote brush scrub would be affected by dam construction.

A small amount of wetlands (less than 0.1 acres) would be disturbed by dam construction, but would become re-established following construction. The new dam is not expected to displace wetlands, as the dam would be located at the existing dam site. Additional wetlands would be affected by periodic sediment removal.

The 12 acre basin inundation area primarily supports native vegetation and wildlife habitat, and inundation following storm events lasting more than a few days would result in mortality of much of the vegetation. However, about 3 acres of this vegetation will have been already removed as part of planned sediment removal from the existing Hall Canyon Debris Basin. Maintenance of the proposed Basin would involve periodic sediment removal, and would result in loss of vegetation. The area of sediment removal is not known, but is expected to be much less than the 12 acre inundation area. Mitigation would be required for loss of vegetation associated with dam construction and periodic sediment removal. Mitigation may consist of bank stabilization and revegetation of adjacent portions of the Hall Canyon Creek corridor.

No threatened, endangered or rare species have been reported from Hall Canyon or observed by Padre Associates biologists during past surveys. However, raptors (Cooper's hawk, red-tailed hawk, red-shouldered hawk) protected under the California Fish and Game Code were observed in the vicinity of the Basin 1 site by Padre Associates biologists during past surveys. However, no evidence of nesting was found, and excavation of the Hall Canyon Debris Basin planned in summer 2006 would remove suitable habitat for these species.

Riparian-dependent special-status bird species including yellow warbler and yellow-breasted chat are not known or expected in the immediate area due to the absence of riparian forests, and presence of a high density of parasitic bird species. In addition, excavation of the Hall Canyon Debris Basin planned in summer 2006 would remove suitable habitat for these species. Therefore, no significant impacts to yellow warbler, yellow-breasted chat or other riparian special-status bird species are expected.

Impacts to coastal resources may include siltation of nearshore habitats during dam construction and/or basin maintenance (sediment removal) near the mouth of Prince Barranca at the Pacific Ocean. However, implementation of standard best management practices to protect water quality would prevent significant impacts.

The Hall Canyon stream corridor provides cover and habitat that may be used by wildlife traversing the area. However, the Basin site is located immediately adjacent to the City of Ventura where the stream transitions into an underground culvert. Therefore, the Basin site does not link two habitat areas and is not considered part of an important wildlife movement corridor. Dam construction and periodic sediment removal would not significantly reduce the value of Hall Canyon as a wildlife movement corridor.

Permits from the California Department of Fish and Game (CDFG), Regional Water Quality Control Board and Corps of Engineers would be required for dam construction. These permits would require mitigation in the form of revegetation/restoration of disturbed areas. Stabilization of banks along Hall Canyon Creek would be the most likely mitigation, as bank erosion is excessive in this area.

Agricultural Resources. No farmland or other agricultural resources would be affected.

Visual Resources. The Hall Canyon Creek corridor may be considered a scenic feature, as it provides green vegetation and surface water in contrast to surrounding dry hillsides. The dam site is located on private land, with access controlled by a locked gate. The site is visible from the rear windows of a few residences on Breaker Drive, located above Hall Canyon. There are no public areas with views of the dam site. No scenic roadways or scenic areas would be affected by dam construction or operation. Views of exposed soils, stockpiles and heavy equipment associated with dam construction may reduce the visual quality of the Hall Canyon Creek corridor. However, the impact would be visible to only a few residences, limited to a few acres and would be temporary. Therefore, visual impacts are considered less than significant.

Cultural Resources. A records search was conducted on February 13, 2006 at the South Central Coastal Information Center at California State University, Fullerton. The search included a review of all recorded archaeological sites within a ½-mile radius of the project site as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest, the California Historical Landmarks, the California Register of Historical Places, the National Register of Historic Places, and the California State Historic Resources Inventory listings were reviewed for the project site.

No archaeological sites or isolates have been identified within a ½-mile radius of the project area. No historical resources have been identified within a ½-mile radius of the project area. However, no previous cultural resource studies or surveys have been conducted within a ½-mile radius of the project area, and streams typically attract native American populations. Unreported cultural resources may occur at the project site. Field surveys by a qualified archeologist would be conducted as part of preparation of an environmental document. Standard measures to stop work and evaluate any cultural resources encountered would prevent significant impacts.

Energy Resources. No energy resources would be affected.

Coastal Beaches and Sand Dunes. Sediments from the Hall Canyon watershed are discharged to the Pacific Ocean at San Buenaventura State Beach. Hall Canyon is characterized by extensive and numerous landslides and slope erosion, and resulting sandy sediments are likely important in maintaining the sand substrate of this regionally important beach. Sediment transport rates are not available, but the 34,000 cubic yard Hall Canyon Debris Basin excavated in 1973 was entirely filled with sediment within a few years. The proposed dam would trap sediment and may affect replenishment rates of sand at San Buenaventura State Beach. This impact is considered potentially significant. Mitigation could include periodic removal of sediment and ocean discharge in up-current areas to allow beach deposition. However, ocean discharge would be cost prohibitive and sediments may be considered unsuitable due to contamination related to upstream oilfield operations. Alternatively, some method to allow sediment to pass through the basin outlet during smaller storm events may be feasible.

Seismic Hazards. The project consists of flood control facilities that would be designed to withstand expected seismic-related stresses. No project-related increase in seismic hazards to the local community would occur.

Geologic Hazards. The project consists of flood control facilities that would be designed to withstand expected geologic stresses. The proposed dam would impound water only during major storm events. No project-related increase in geologic hazards to the local community would occur.

Hydraulic Hazards. The proposed dam would impound storm water and reduce peak flow rates to a level that the existing City storm drain system may convey run-off from a 100-year storm. Impacts would be beneficial.

Aviation Hazards. The nearest airport to the project site is the Oxnard Airport, located 7 miles to the southeast. No project-related increase in aviation hazards would occur.

Fire Hazards. The project site is located in a high fire hazard area. However, the project does not include any flammable structures or other activities that would increase the frequency or severity of fire.

Hazardous Materials. Hydrocarbon soil contamination has been documented in Hall Canyon, upstream of the project site, and may be encountered during dam construction or sediment removal. Several oil pipelines traverse Hall Canyon in the project area, and could be damaged during construction and lead to an oil spill. Mitigation measures may include mapping pipeline locations in coordination with the owner (Aera Energy), and evaluation of the extent and type of contamination (if found during excavation), and removal and appropriate off-site disposal or remediation.

Noise. Construction activities would generate temporary noise that may exceed the noise limits of Section 10.650 of the City's Municipal Code. However, construction is exempt from Section 10.650 of the Municipal Code if work is conducted between 7 a.m. and 8 p.m. It is expected that construction would occur between 7 a.m. and 6 p.m., in compliance with the Municipal Code. Therefore, noise impacts are considered less than significant.

Public Facilities/Services

Transportation. Construction-related truck traffic may cause congestion at the Hall Canyon Road/Poli Road intersection. A traffic management plan would reduce impacts to a level of less than significant, through routing and scheduling.

Water Supply. The project would require water only during the construction phase, for dust control and soil compaction. No adverse effect to the quantity or quality of water supplies would occur.

Waste Treatment. The project would generate a small amount of sewage during the construction period, which would be handled by portable self-contained units and trucked off-site for proper disposal.

Utilities. Utilities are unlikely to be encountered during excavation, but would be avoided or relocated as appropriate. No new service would be required, and no disruption of existing service would occur.

Flood Control. The project consists of improvements to existing facilities, impacts would be beneficial.

Law Enforcement. The project does not involve any new housing or any increase in demand for law enforcement.

Fire Protection. The project does not involve any flammable structures, new housing or any increase in demand for fire protection.

Education. The project would not affect existing facilities or result in an increase in demand for new educational facilities.

Recreation. No parks are located in close proximity to the proposed work area. The project would not affect existing facilities or result in an increase in demand for new recreational facilities.

BASIN 2

General

Loss of wetlands may be inconsistent with Policy 1.5.1.3 of the Ventura County General Plan.

Land Use

The proposed basin would not significantly affect community character. Right-of-way acquisition would not substantially affect existing land use and is considered a less than significant impact. The project would not induce population growth.

Resources

Air Quality. The project would have temporary, insignificant air quality impacts associated with construction.

Water Quality. Hall Canyon Creek is perennial, it is expected that temporary stream diversion would be required to construct the dam. The project would have temporary surface water quality impacts associated with dam construction, including increases in turbidity and siltation. These impacts would be less than significant with implementation of standard best management practices.

Biology. The Hall Canyon Creek corridor in the vicinity of the Basin 2 site supports mulefat scrub, coyote brush scrub, arroyo willow riparian forest, and purple sage scrub. The Basin 2 site has undergone high levels of past disturbance, including construction of the existing Hall Canyon Debris Basin in 1973, high density cattle grazing, leaching of hydrocarbons and salts into surface waters due to upstream soil contamination by oil production activities; and oil and gas exploration and production in the surrounding area, and associated erosion and sediment production.

Sediment removal from the existing Hall Canyon Debris Basin planned for summer 2006 is likely to extend upstream to the Basin 2 dam site, and would result in temporary loss of sensitive riparian vegetation and temporary loss of wetlands. The proposed basin would be constructed several years after sediment removal, such that riparian vegetation would have recovered to some extent prior to basin construction.

Assuming new dam construction occurs within 5 years of sediment removal from the existing Basin, about 0.1 acres of immature riparian vegetation (mulefat and arroyo willow) and about one acre of coyote brush scrub would be affected by dam construction.

A small amount of wetlands (less than 0.1 acres) would be permanently displaced by the proposed dam. Additional wetlands would be affected by periodic sediment removal.

The 11 acre basin inundation area primarily supports native vegetation and wildlife habitat, and inundation following storm events lasting more than a few days would result in mortality of much of the vegetation. Maintenance of the proposed Basin would involve periodic sediment removal, and would result in loss of vegetation. The area of sediment removal is not known, but is expected to be much less than the 11 acre inundation area. Mitigation would be required for loss of vegetation associated with dam construction and periodic sediment removal. Mitigation may consist of bank stabilization and revegetation of adjacent portions of the Hall Canyon Creek corridor.

No threatened, endangered or rare species have been reported from Hall Canyon or observed by Padre Associates biologists during past surveys. However, raptors (Cooper's hawk, red-tailed hawk, red-shouldered hawk) protected under the California Fish and Game Code were observed in the vicinity of the Basin 2 site by Padre Associates biologists during past surveys. Habitat loss associated with dam construction and periodic sediment removal may significantly affect these species. Mitigation for raptor impacts may involve pre-construction surveys and avoidance of active nests during construction.

Riparian-dependent special-status bird species including yellow warbler and yellow-breasted chat are not known or expected in the immediate area due to the absence of riparian forests, and presence of a high density of parasitic bird species. Therefore, no significant impacts to yellow warbler, yellow-breasted chat or other riparian special-status bird species are expected.

Impacts to coastal resources may include siltation of nearshore habitats during dam construction and/or basin maintenance (sediment removal) near the mouth of Prince Barranca at the Pacific Ocean. However, implementation of standard best management practices to protect water quality would prevent significant impacts.

The Hall Canyon stream corridor provides cover and habitat that may be used by wildlife traversing the area. However, the Basin site is located immediately adjacent to the City of Ventura where the stream transitions into an underground culvert. Therefore, the Basin site does not link two habitat areas and is not considered part of an important wildlife movement corridor. Dam construction and periodic sediment removal would not significantly reduce the value of Hall Canyon as a wildlife movement corridor.

Permits from the California Department of Fish and Game, Regional Water Quality Control Board and Corps of Engineers would be required for dam construction. These permits would require mitigation in the form of revegetation/restoration of disturbed areas. Stabilization of banks along Hall Canyon Creek would be the most likely mitigation, as bank erosion is excessive in this area.

Agricultural Resources. No farmland or other agricultural resources would be affected.

Visual Resources. The Hall Canyon Creek corridor may be considered a scenic feature, as it provides green vegetation and surface water in contrast to surrounding dry hillsides. The dam site is located on private land, with access controlled by a locked gate. The site is not visible from any public areas, private residences, scenic roadways or scenic areas. Therefore, no visual impacts are expected.

Cultural Resources. A records search was conducted on February 13, 2006 at the South Central Coastal Information Center at California State University, Fullerton. The search included a review of all recorded archaeological sites within a ½-mile radius of the project site as well as a review of cultural resource reports on file. In addition, the California Points of Historical Interest, the California Historical Landmarks, the California Register of Historical Places, the National Register of Historic Places, and the California State Historic Resources Inventory listings were reviewed for the project site.

No archaeological sites or isolates have been identified within a ½-mile radius of the project area. No historical resources have been identified within a ½-mile radius of the project area. However, no previous cultural resource studies or surveys have been conducted within a ½-mile radius of the project area, and streams typically attract native American populations. Unreported cultural resources may occur at the project site. Field surveys by a qualified archeologist would be conducted as part of preparation of an environmental document. Standard measures to stop work and evaluate any cultural resources encountered would prevent significant impacts.

Energy Resources. No energy resources would be affected.

Coastal Beaches and Sand Dunes. Sediments from the Hall Canyon watershed are discharged to the Pacific Ocean at San Buenaventura State Beach. Hall Canyon is characterized by extensive and numerous landslides and slope erosion, and resulting sandy sediments are likely important in maintaining the sand substrate of this regionally important beach. Sediment transport rates are not available, but the 34,000 cubic yard Hall Canyon Debris Basin excavated in 1973 was entirely filled with sediment within a few years. The proposed dam would trap sediment and may affect replenishment rates of sand at San Buenaventura State Beach. This impact is considered potentially significant. Mitigation could include periodic removal of sediment and ocean discharge in up-current areas to allow beach deposition. However, ocean discharge would be cost prohibitive and sediments may be considered unsuitable due to contamination related to upstream oilfield operations. Alternatively, some method to allow sediment to pass through the basin outlet during smaller storm events may be feasible.

Seismic Hazards. The project consists of flood control facilities that would be designed to withstand expected seismic-related stresses. No project-related increase in seismic hazards to the local community would occur.

Geologic Hazards. The project consists of flood control facilities that would be designed to withstand expected geologic stresses. The proposed dam would impound water only during major storm events. No project-related increase in geologic hazards to the local community would occur.

Hydraulic Hazards. The proposed dam would impound storm water and reduce peak flow rates to a level that the existing City storm drain system may convey run-off from a 100-year storm. Impacts would be beneficial.

Aviation Hazards. The nearest airport to the project site is the Oxnard Airport, located 7 miles to the southeast. No project-related increase in aviation hazards would occur.

Fire Hazards. The project site is located in a high fire hazard area. However, the project does not include any flammable structures or other activities that would increase the frequency or severity of fire.

Hazardous Materials. Hydrocarbon soil contamination has been documented in Hall Canyon, upstream of the project site, and may be encountered during dam construction. Several oil pipelines traverse Hall Canyon in the project area, and could be damaged during construction and lead to an oil spill. Mitigation measures may include mapping pipeline locations in coordination with the owner (Aera Energy and Southern California Gas), and evaluation of the extent and type of contamination (if found during excavation), and removal and appropriate off-site disposal or remediation.

Noise. Construction activities would generate temporary noise that may exceed the noise limits of Section 10.650 of the City's Municipal Code. However, construction is exempt from Section 10.650 of the Municipal Code if work is conducted between 7 a.m. and 8 p.m. It is expected that construction would occur between 7 a.m. and 6 p.m., in compliance with the Municipal Code. Therefore, noise impacts are considered less than significant.

Public Facilities/Services

Transportation. Construction-related truck traffic may cause congestion at the Hall Canyon Road/Poli Road intersection. A traffic management plan would reduce impacts to a level of less than significant, through routing and scheduling.

Water Supply. The project would require water only during the construction phase, for dust control and soil compaction. No adverse effect to the quantity or quality of water supplies would occur.

Waste Treatment. The project would generate a small amount of sewage during the construction period, which would be handled by portable self-contained units and trucked off-site for proper disposal.

Utilities. Utilities are unlikely to be encountered during excavation, but would be avoided or relocated as appropriate. No new service would be required, and no disruption of existing service would occur.

Flood Control. The project consists of improvements to existing facilities, impacts would be beneficial.

Law Enforcement. The project does not involve any new housing or any increase in demand for law enforcement.

Fire Protection. The project does not involve any flammable structures, new housing or any increase in demand for fire protection.

Education. The project would not affect existing facilities or result in an increase in demand for new educational facilities.

Recreation. No parks are located in close proximity to the proposed work area. The project would not affect existing facilities or result in an increase in demand for new recreational facilities.

RELATIVE ENVIRONMENTAL COST ESTIMATES

Crude estimates of environmental costs for both basins considered is provided in the following Table. The estimates are necessarily crude as the basins are conceptual. The purpose of this information is primarily as a comparison of basin sites, and not absolute costs to be used in securing funding. Environmental issues of concern involve impacts to biological resources (native vegetation, wetlands, wildlife habitat, special-status species) and coastal beach replenishment. Cultural resources of the project site are unknown; and artifacts may be discovered during construction and/or maintenance of the proposed basin.

Biological impacts associated with the Basin 1 site would be less than for Basin 2, as Basin 1 would be located in the same location to be affected by planned sediment removal from the existing basin. However, most of the biological impacts are associated with periodic sediment removal, which would be the same for either basin site. It is expected that mitigation would be required for impacts associated with both dam construction and sediment removal. Mitigation costs are based on a 3 acre impact area, with a 1.5:1 mitigation ratio of Basin 1 (previously disturbed) and a 2:1 mitigation ratio for Basin 2 (undisturbed). Mitigation implementation (bank stabilization, revegetation) was assumed to cost \$50,000 per acre, with an additional \$25,000 for development of detailed mitigation plans.

No reported archeological surveys have been conducted in close proximity to the basin sites, and resources may be present. However, the potential to find cultural resources is much higher at the Basin 2 site, as it was not affected by construction of the existing basin in 1973 and planned sediment removal in 2006.

Sediment transport in Hall Canyon may be a substantial issue as it appears to contribute a substantial amount of sand that maintains San Buenaventura State Beach. A high dam as proposed would trap sediments that appear to replenish the State Beach. This impact cannot be readily assessed or mitigated. Therefore, an environmental impact report appears to be required, including a sediment transport analysis.

Conceptual Cost Comparison

Item	Basin 1	Basin 2
Environmental Document (EIR)	\$100,000	\$100,000
Permitting (Corps, CDFG, Regional Board)	\$15,000	\$15,000
Mitigation Plan & Implementation (on-site and off-site restoration)	\$250,000	\$325,000
Mitigation Monitoring & Reporting (5 years)	\$30,000	\$40,000
Beach Sand Mitigation (may include additional engineering, construction and maintenance costs)	unknown	unknown

ATTACHMENT A

**CALIFORNIA ENVIRONMENTAL QUALITY ACT
INITIAL STUDY CHECKLIST**

		BASIN	
		1	2
GENERAL:	1. <u>General Plan Environmental Goals and Policies:</u>	PS-M	PS-M
LAND USE:	2. <u>Land Use:</u>		
	a. Community Character	N	N
	b. Housing	N	N
	c. Growth Inducement	N	N
RESOURCES:	3. <u>Air Quality:</u>		
	a. Regional	LS	LS
	b. Local	LS	LS
	4. <u>Water Resources:</u>		
	a. Groundwater Quantity	N	N
	b. Groundwater Quality	N	N
	c. Surface Water Quantity	LS	LS
	d. Surface Water Quality	PS-M	PS-M
	5. <u>Mineral Resources:</u>		
	a. Aggregate	N	N
	b. Petroleum	N	N
	6. <u>Biological Resources:</u>		
	a. Endangered, Threatened, or Rare Species	N	N
	b. Wetland Habitat	PS-M	PS-M
	c. Coastal Habitat	LS	LS
	d. Migration corridors	LS	LS
	e. Locally Important Species/ Communities	LS	PS-M
	7. <u>Agricultural Resources:</u>		
	a. Soils	N	N
	b. Water	N	N
	c. Air Quality/Micro-Climate	N	N
	d. Pests/Diseases	N	N
	e. Land Use Incompatibility	N	N
	8. <u>Visual Resources:</u>		
	a. Scenic Highway	N	N
	b. Scenic Area/Feature	LS	N
	9. <u>Paleontological Resources:</u>	N	N
	10. <u>Cultural Resources:</u>		
	a. Archaeological	PS-M	PS-M
	b. Historical	N	N
	c. Ethnic, Social, or Religious	N	N
	11. <u>Energy Resources:</u>	N	N
	12. <u>Coastal Beaches & Sand Dunes:</u>	PS	PS
HAZARDS:	13. <u>Seismic Hazards:</u>		
	a. Fault Rupture	N	N
	b. Ground-shaking	N	N
	c. Tsunami	N	N
	d. Seiche	N	N
	e. Liquefaction	N	N
	14. <u>Geologic Hazards:</u>		
	a. Subsidence	N	N
	b. Expansive Soils	N	N

		BASIN	
		1	2
	c. Landslides/Mudslides	N	N
	15. <u>Hydraulic Hazards:</u>		
	a. Erosion/Siltation	PS-M	PS-M
	b. Flooding	N	N
	16. <u>Aviation Hazards:</u>	N	N
	17. <u>Fire Hazards:</u>	N	N
	18. <u>Hazardous Materials/Waste:</u>		
	a. Above-Ground Hazardous Materials	N	N
	b. Below-Ground Hazardous Materials	N	N
	c. Hazardous Waste	PS-M	PS-M
	19. <u>Noise and Vibration:</u>	LS	LS
	20. <u>Glare:</u>	N	N
	21. <u>Public Health:</u>	N	N
PUBLIC FACILITIES/ SERVICES	22. <u>Transportation/Circulation</u>		
	a. Public Roads and Highways		
	(1) Level of Service	LS	LS
	(2) Safety/Design	N	N
	(3) Tactical Access	N	N
	b. Private Roads and Driveways		
	(1) Safety/Design	N	N
	(2) Tactical Access	N	N
	c. Pedestrian/Bicycle		
	(1) Public Facilities	N	N
	(2) Private Facilities	N	N
	d. Parking	N	N
	e. Bus Transit	N	N
	f. Railroads	N	N
	g. Airports	N	N
	h. Harbors	N	N
	i. Pipelines	N	N
	23. <u>Water Supply</u>		
	a. Quality	N	N
	b. Quantity	N	N
	c. Fire Flow	N	N
	24. <u>Waste Treatment/Disposal</u>		
	a. Individual Sewage Disposal System	N	N
	b. Sewage Collection/Treatment Facilities	N	N
	c. Solid Waste Management	N	N
	d. Solid Waste Facilities	N	N
	25. <u>Utilities</u>		
a. Electric	N	N	
b. Gas	N	N	
c. Communications	N	N	
26. <u>Flood Control/Drainage</u>			
a. FCD Facility	N	N	
b. Other Facilities	N	N	
27. <u>Law Enforcement/Emergency Services</u>			

		BASIN	
		1	2
	a. Personnel/Equipment	N	N
	b. Facilities	N	N
28	<u>Fire Protection</u>		
	a. Distance/Response Time	N	N
	b. Personnel/Equipment/Facilities	N	N
29	<u>Education</u>		
	a. Schools	N	N
	b. Libraries	N	N
30	<u>Recreation</u>		
	a. Local Parks/Facilities	N	N
	b. Regional Parks/Facilities	N	N
	c. Regional Trails/Corridors	N	N
N =	No Effect		
LS =	Less Than Significant Effect		
PS-M =	Potentially Significant Impact Unless Mitigation is Incorporated		
PS=	Potentially Significant Impact		