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CABEZON COMMUNITIES PHASE 2
DRAINAGE MANAGEMENT PLAN
UNIT 16

August 2004

PREPARED FOR:

Curb North Inc.
5160 San Francisco NE
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SUBMITTED TO:

City Of Rio Rancho &
Southern Sandoval County Arroyo Flood Control Authority

PREPARED BY:

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WCEA File No. X4-218-012

WILSON & COMPANY

DR-6

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I, Daniel S. Aguirre, do hereby certify that this report was prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Daniel S. Aguirre, P.E.
NM No. 11955

9/17/04
Date

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9/17/04

CABEZON COMMUNITIES PHASE 2

DRAINAGE MANAGEMENT PLAN

UNIT 16

By: _____ Date: 9/20/04

Bo Johnson, P.E.
Curb North Inc., Executive Vice President

By: _____ Date: 11/30/04

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DRAINAGE MANAGEMENT PLAN – CABEZON PHASE 2 DEVELOPMENT

Introduction

This report is based on the drainage section of the approved Cabezon Communities Master Plan (Master Plan), 2003, and specifically outlines the drainage plan for Phase 2 of Cabezon development. It addresses requirements of the Master Plan and is consistent with both the Black Arroyo Drainage Management Plan (BLWMP) (ASCG, 2002) and the Cabezon Phase 1 Drainage Management Plan. A Drainage Implementation Plan, detailing the major infrastructure proposed for the development and identifying its phasing, has also been submitted.

Although the Master Plan for the 912 acre community scheduled three phases of development, Phases 2 and 3 will now be combined into Phase 2. Phase 2 comprises approximately 625 acres of the Cabezon Communities Development. *Figure 1* shows the entire Cabezon Community Development, with Phase 2 development in green. Phase 1 development is in yellow, while an alternate area, in orange, is not currently part of Cabezon but could be included in the future. Finally, the two large tracts in the southwest corner of Unit 16, uncolored in *figure 1*, are not part of the Cabezon development.

Drainage Constraints

Drainage conditions placed on Cabezon come from two sources. First, although the Southern Sandoval County Arroyo Flood Control Authority (SSCAFCA) Board of Directors approved the Master Plan, they left two items for discussion. Second, the BLWMP, which has been approved by SSCAFCA, the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), and the City of Rio Rancho (CORR), governs how drainage within the Black Arroyo Watershed will be managed. Therefore, new development must address BLWMP requirements, and any changes to it must be approved by all three entities.

The two discussion items the SSCAFCA Board left from the Master Plan were proposed improvements for the East Branch of the Black Arroyo, and conveyance of flows through the project from the West Branch of Black Arroyo. This DMP proceeds with the assumption that a hard-lined channel capable of conveying the 100-year, 24-hour storm on the East Branch is acceptable. Further, it assumes that the Modified BLWMP Ultimate Conditions Model approved for use in the Phase 1 DMP is also valid for this Phase 2 DMP. The Phase 1 DMP altered the percent land treatment types for BLWMP sub-basin 211 (*figure 2*), and also modeled several off-site commercial basins within Unit 16 with ponds that limit runoff to historic levels. These basins were 211B (Southern Plaza), Off_1A, Off_1B, Off_2A, and Off_2B. This was only done for properties where field investigation verified the existence of the detention facilities. Photographic documentation and a map are provided in the Phase 1 DMP.

The West Branch briefly crosses Cabezon, before entering the off-site southwest corner of Unit 16 (shown uncolored in *figure 2*). The Cabezon developers have agreed to provide a means of insuring the safety of this crossing. Two options are available. One is to build a structure with the capacity to convey the ultimate conditions flow downstream of Unser Boulevard. The other is to provide an upstream means of attenuating peak flows before they reach this point, most likely by expanding or creating a detention facility. The decision on how to proceed will be made during later discussions with SSCAFCA and CORR.

Finally, the BLWMP places two drainage constraints on Cabezon development. First is that the Black Dam shall not, in the present nor under assumed ultimate build-out conditions, be permitted to overtop its emergency spillway in a 100-year 24-hour storm event. This means that the amount of runoff that may be directed to the Black Dam, owned by AMAFCA, must not exceed available storage capacity. This criterion must be met not only at the conclusion of total build-out of the Cabezon Community, but also at any time during construction. The other requirement is that the "first flush" (initial 0.25 inches of runoff) be treated to the maximum extent practicable to remove floatables and sediment.

Hydrology Methodology

Hydrologic Analysis for Phase 2 conforms to Section 22.2, Hydrology, of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, January 1993 (COA DPM), and to the BLWMP. Hydrologic modeling was performed using the Arid-lands Hydrologic Model (AHYMO_97), distributed by Anderson Hydro. The 100-year 24-hour return frequency storm was used as the basis of this analysis. Assumptions regarding land treatments, storm duration and intensity, and water quality requirements established in the BLWMP were followed in this analysis. The sediment bulk rate and routing method differed from the BLWMP, and are discussed further in the *Proposed Conditions Hydrology* section below.

Existing Conditions Hydrology

Existing conditions are taken from the the FEMA floodplain mapping study (RTI, 1994). The original AHYMO files created for that study were used as a foundation for further detailed analysis by the BLWMP, which modeled developed existing conditions. Developed existing conditions assume full development, but with existing platting and facilities. A summary of the FEMA floodplains and key flowrates from RTI's FIS model for the area are shown in *figure 4*. *Table 1* compares historic, developed existing, and fully developed flows for key locations in the area.

Table 1: Historic, Developed Existing, and Fully Developed Flows at Key Locations

Location	Historic Conditions from FIS	Devex Conditions from BLWMP, Aug 02	Fully Developed Conditions from Cabezon model
West Branch at Unser	2687	5105	5004
West Branch at Dam/ Westside Boulevard	2986	5934	5991
East Branch at Southern Blvd.	1406	2137	2252
East Branch at Dam/ Westside Boulevard	1876	3160	3733

Figure 7 is the Black Dam's current topography. The corresponding table in this figure shows the stage-storage relationship of the facility. Of note is that the existing storage in the Dam, 294 AF, is only slightly less than the State Engineer's permitted storage volume

of 304 AF, which was used in the Modified BLWMP Ultimate Conditions Model.

Proposed Conditions Hydrology

The Modified BLWMP Ultimate Conditions Model, dated January 20, 2004, provides the basis for the Cabezon Phase 2 Model. The Modified BLWMP is based on the FEMA study, but adjusts routing and land treatment types of some sub-basins to represent managed full development in the Black Arroyo Watershed. In an attempt to assess the effect that Cabezon development will have on the Black Dam, both Phase 1 and 2 development were added to the Modified BLWMP model. *Appendix A* contains a printout of the Cabezon Phase 2 Model summary output file, as well the electronic file on diskette.

The Phase 1 DMP described other changes made to the Modified BLWMP Model in Phase 1 to reflect fully developed, current conditions in the watershed. For Phase 2, BLWMP sub-basins 160, 161, 218A, 218B, 219, 220, 253, 255, 256, and 620 were removed to account for the insertion of Phase 2 development. Also, parts of BLWMP sub-basins 550 and 650, which overlap Cabezon at its southern border, were removed to match proposed boundaries. *Figure 2* shows overlapping Cabezon and BLWMP sub-basin boundaries. *Figures 5A* and *5B* are routing schematics for the Cabezon Phase 2 Model, including the Modified BLWMP Model, with the portions pasted in for Phase 1 and 2 circled in *figure 5B*.

The initial Cabezon Phase 2 DMP, submitted May 2004, asked for approval of two methodology differences from the Modified BLWMP. These were a reduced sediment bulk rate, and use of the Muskingum-Cunge, rather than the Variable Storage Coefficient (VSC), routing method. Discussion with SSCAFCA and CORR on July 22, 2004, determined what would be used in Cabezon's final hydrology.

As a result of that discussion, two changes to the BLWMP were agreed upon for Cabezon

modeling. First, sediment bulk rates for the Cabezon model will be set to 6% to represent fully developed conditions with paved roads. This differs from the Modified BLWMP, which uses sediment bulk rates of 6% and 18%.

Second, all flow routing in the Cabezon Phase 2 Model uses the *ROUTE MCUNGE* command in AHYMO. In the Modified BLWMP, the two commands *COMPUTE TRAVEL TIME* and then *ROUTE* are used almost exclusively. At the July meeting, Clifford Anderson—developer of AHYMO_97—presented results from a report he prepared at SSCAFCA's request comparing the two methods. Following Mr. Anderson's suggestion, the Cabezon model uses the *ROUTE MCUNGE* command, but decreases the time step from 0.05 hr (3 minutes) to 0.01 hr (36 seconds) for obtaining peak flows.

This change should more accurately catch peak flow for a given hydrograph. This is because many reach lengths are short, while flow velocity is high. Therefore, flow may leave some reaches in less than three minutes, and hence those peak flows will not be accurately represented using the three minute time step. Because AHYMO_97 can only store 600 points for each hydrograph, however, this model does not accurately depict runoff volume, which is important in assessing Cabezon's effect on the Black Dam.

Therefore, two models were developed for Cabezon design. The two are identical in all ways, except that the first, QP72204.txt, uses a time step of 0.01 hours while the second, VOL72204.txt, uses a time step of 0.05 hours. The first was used to characterize peak flow within the watershed, while the second was used to assess runoff volume. The AHYMO summary output files for both models are in *Appendix A*.

These changes affect flow throughout the entire model, not only within Cabezon. *Table 2* presents the differences for locations discussed in an April 9, 2004, meeting between SSCAFCA, ASCG, and Wilson & Company representatives.

Table 2: Comparison of BLWMP and Cabezon Off-site Flows

Location	BLWMP Flow, cfs	Cab Ph 2 Flow,cfs dt = 0.05 hr	Cab Ph 2 Flow,cfs dt = 0.01 hr
East Branch South of Southern	2167	2099	2252
Golf Course Rd SD North	75	75	77
Golf Course Rd SD South	77	81	83
23rd Avenue Ponds North	50	53	54
24th Avenue Ponds South	48	48	48
West Branch at Unser	4978	4210	5004
Gateway at Unser	656	600	604
West Branch at Dam	5879	5097	5991
East Branch at Dam	5194	3485	3748

Flow on the West Branch is more strongly influenced by the lower sediment bulk rate, which can reduce peaks by as much as 12%. On the East Branch, however, the routing method is primarily responsible for the change in peak flows. Most East Branch sub-basins upstream from Cabezon are developed, so sediment bulking rates in the Modified BLWMP were already 6%.

The results of the hydrologic analysis are presented below. The allowable discharge from each Phase 2 tract is given, as well as modeling parameters and assumptions used to derive that discharge. Currently undeveloped or partially developed sub-basins were modeled for developed conditions following methodology established in the BLWMP, as indicated in the final column of *Table 3*.

Table 3. Cabezon Drainage Basins-Phase 2

				Land Treatments				Q_{peak}	Volume	
Sub-basin	Acres	DUs/Acre	T_P	A	B	C	D	(cfs)	(ac-ft)	Methodology/Notes
5B	12.5	6.00	0.13	0.0	28.1	15.0	56.9	46	1.9	D per DPM; B & C per SSCAFCA
5C	18.5	6.00	0.13	0.0	28.1	15.0	56.9	67	2.8	"
7D	50.8	5.20	0.13	0.0	31.9	17.1	51.0	178	5.9	"
1	71.5	4.00	0.13	0	30.0	28.0	42.0	242	9.0	"
2	20.6	4.00	0.13	0	30.0	28.0	42.0	70	3.0	"
6	61.2	6.00	0.13	0.0	28.1	15.0	56.9	222	9.3	"
8	19.0	6.06	0.13	0.0	27.8	14.9	57.3	69	2.9	"
9	28.7	6.18	0.13	0.0	27.2	14.6	58.2	105	4.4	"
10	83.1	6.00	0.13	0.0	28.1	15.0	56.9	301	12.6	"
12	9.7	Commercial	0.13	0	0	15	85	43	1.9	Free Discharge Allowed
13	50.5	Off-site Commercial	0.13	0	0	15	85	218	10.0	BLWMP
14	58.2	Offsite	0.13	0	10	10	80	231	10.9	BLWMP
15	14.7	Mixed Use	0.13	0	10	10	80	61	2.8	BLWMP
16	19.8	School	0.13	0	25	25	50	70	2.8	Free Discharge Allowed
18	5.0	Park	0.13	0.0	85.0	0.0	15.0	13	0.4	SSCAFCA
19	5.0	Park	0.13	0.0	85.0	0.0	15.0	13	0.4	SSCAFCA
20	5.0	Park	0.13	0	85	0	15	13	0.4	SSCAFCA
21	15.0	WWTP	0.13	0	10	10	80	62	2.8	Wastewater Treatment Plant
OFF_4	31.9	Off-site	0.13	1	29	28	42	108	4.2	BLWMP
OFF_5	16.3	Off-site	0.13	3	20	25	52	58	2.4	BLWMP
OFF_6	16.8	Off-site	0.13	1	29	28	42	57	2.2	BLWMP
OFF_7	6.8	Off-site	0.13	1	29	28	42	23	0.9	BLWMP
OFF_8	9.6	School	0.13	1	29	28	42	32	1.3	BLWMP
A_1	20.3	Arroyo/Channel	0.13	0	20	30	50	73	2.9	Based on arroyo cross-section
A_2	5.2	Arroyo/Channel	0.13	0	20	30	50	19	0.8	"
A_3	5.1	Arroyo/Channel	0.13	0	20	30	50	18	0.7	"
A_4	4.0	Arroyo/Channel	0.13	0	20	30	50	14	0.6	"
A_5	7.7	Arroyo/Channel	0.13	0	20	30	50	28	1.1	"
A_6	29.6	Arroyo/Channel	0.13	0	20	30	50	107	4.3	"
R_4	6.3	Roadway	0.13	0	5	29	66	26	1.1	Based on roadway cross-section
R_5	4.9	Roadway	0.13	0	5	29	66	19	0.8	"
R_7	1.1	Roadway	0.13	0	3	17	80	5	0.2	"
R_8	7.6	Roadway	0.13	0	4	22	74	31	1.4	"
R_9	9.9	Roadway	0.13	0	4	22	74	41	1.8	"

Peak flow directions and quantities for both on and off-site sub-basins used in the hydrologic modeling are presented graphically in *figure 6*. The major off-site flow entering Phase 2 is in the East Branch of Black Arroyo, crossing Southern Boulevard and entering north of off-site sub-basin 6 (Off_6 in *figure 6*). As this modeling is intended to represent conditions with the Cabezon development, flows listed coorespond to fully developed conditions.

Phase 2 of Cabezon contains only one commercially zoned tract, Tract 12. One other change from the initial submission of the Phase 2 DMP is that it erroneously held commercial properties to historic discharge. This is not required by CORR, and the sole commercial tract in Phase 2, Tract 12, is therefore allowed free discharge.

Hydraulics

Phase 2 has several significant hydraulic features, including two storm drains. Haested Methods' StormCAD v5.5 was used to perform a hydraulic grade line analysis. Friction losses were calculated using Manning's equation, while junction and bend losses were calculated using StormCAD's Standard Method, which multiplies a user-input loss coefficient by the velocity head. Loss coefficients were determined using the COA DPM procedure.

The main Phase 2 storm drain connects to an existing 60 inch RCP, which carries Phase 1 outflow from the pond in Tract 17. Prior to Phase 2 construction, this outflow will be released into Tributary B near the southwest corner of Tract 15 (*figure 3*). In Phase 2, 66 to 72 inch RCP will connect to two 40" x 65" RCP arch pipes approximately 200 feet before flow is released to the to the East Branch Channel (*figure 8*). The of the storm drain line varies between 1.9% and 2.8%. This storm drain, in the Trail Side Road R-O-W and an easement between tracts, will also collect flow from Tracts 7C, 7D, 15, 16, 18, and 8. It will enter the East Branch Channel between Tracts 8 and 9. *Figure 3* shows the location of these facilities, and *figure 8* is a plan and profile of the line.

The other storm drain consists of 36 inch RCP that follows the Cabezon Boulevard R-O-W. It will begin near the southern-most corner of Tract 5C, and convey flows to the release point in the East Branch Channel as it crosses Cabezon Boulevard. The slope of the storm drain line is initially 2.1%, and then approximately 3% to its terminus. Flow from Tract 5C and Cabezon Boulevard is collected in this line. Again, refer to *figure 3* for locations. *Figure 9* is a plan and profile of the storm drain. *Appendix B* contains further design details for both storm drain lines.

For subdivision design, allowable peak flowrates and their entrance locations into the storm drain network are shown in *figure 6*. Each subdivision is permitted free discharge to the major drainage network. If a subdivision drainage plan should call for a higher discharge rate than identified in this plan, the subdivision plan must receive approval

from CORR, SSCAFCA, and AMAFCA for this excess discharge, or else use on-site detention. In the former case, the subdivision drainage plan must show that downstream systems can safely convey this additional flow, and also that the water surface elevation at Black Dam will not be increased. The latter case requires meeting the drainage policies of the CORR and SSCAFCA.

Most of the off-site flows that enter Cabezon Phase 2 are conveyed to the Black Dam in the East Branch Channel. The largest flow, 2252 cfs, is in the East Branch Channel itself, entering Cabezon on the north, near 27th Street. The other East Branch flows enter Cabezon along its eastern edge, and cross one of its sub-basins before entering the East Branch (*figure 6*). The *Golf Course Road Improvements Final Drainage Report* (Wilson & Company, February 2002) was consulted to insure that Cabezon improvements would enhance previously constructed facilities.

As mentioned previously, the East Branch, which carries these flows, will be improved per the discussion surrounding the approval of the Cabezon Master Plan. The proposed trapezoidal channel will be concrete, with a 10 foot bottom, 2:1 side slopes, and a total width between 28 and 34 feet. A multi-use trail will be constructed in the channel R-O-W. The channel was designed to convey the 100 year, 24 hour storm, while the overbank area will provide the necessary freeboard. *Figure 12* shows a typical cross-section.

Based on BLWMP requirements, a structure will be incorporated into Phase 2 to both improve water quality and detain runoff, reducing peak flow into the Black Dam. The Water Quality Structure will be off-site, immediately upstream of the Black Dam, and will treat flow from the entire Black Arroyo Watershed. The structure is designed to remove both floatables and sediment.

Water Quality facilities are generally designed to treat what is called the "first flush" of a storm. The first flush is considered to be the initial ¼" of runoff. As the Cabezon Development encompasses approximately 900 acres, the volume of runoff that must be treated can be quantified in this way:

$$\text{WQ Volumetric Runoff (acre-ft)} = \frac{\frac{1}{4}\text{ in}}{12\text{ in/ft}} \times 900\text{ acres} = 18.75\text{ AF}$$

The approved Cabezon Master Plan calls for 43.3 AF of water quality. Water quality features were originally master-planned in three possible locations: 1) 2 AF adjacent to Tract 19, 2) 7 AF within Tract 17, and 3) 25 AF immediately upstream of Black Dam within AMAFCA right-of-way.

Aggressive interest from homebuilders has accelerated the development schedule from 7 years to 3-4 years. This unforeseen market demand influenced the final locations of the water quality structures. First, Tract 17, originally planned to treat 7 AF, has been designed and approved for 26.5 AF as part of Phase 1 construction. Second, a preliminary drainage study of the 2 AF structure adjacent to Tract 19 showed it was not cost effective and it will not be constructed. Finally, the water quality structure upstream of the Black Dam will remain, and will provide a minimum of 25 AF (*figure 10*).

The total volumetric runoff to be treated within Cabezon when it is fully developed is approximately 50 AF. That number exceeds both the initial volume from the Cabezon Master Plan and also the first flush from the Cabezon Development.

The Water Quality Structure in Phase 2, near the Black Dam, is designed to treat runoff from both the West and East Branch (*figure 10*). The structure will detain a volume of +/- 25 AF using a +/- 350-foot long, stepped weir, 15 feet wide at its top (*Appendix B*). It will be constructed of soil cement. Again, the majority of floatables and sediment will be held behind the weir, and can later be removed from the WQ structure.

In addition, this structure will also increase both detention time and storage volume, serving multiple purposes. The increased detention time again gives opportunity for natural processes to treat runoff to the maximum extent practicable. Also, the volume of runoff entering the Black Dam is reduced for several reasons. Initial abstractions will increase, and the structure also serves as a settling pond, reducing the sediment load that

reaches the Black Dam. More importantly, the structure increases available detention storage. This is because, when the water surface rises above the top of the stepped weir, both the WQ Structure and the Black Dam act to detain stormwater in a single, larger dam.

For this reason, the stage-storage-discharge curve for the Black Dam was adjusted in the Cabezon Phase 2 Model. A 20" x 28" arch pipe allows low flows to exit the new structure and enter the Black Dam relatively unaffected by the WQ Structure. As the water surface rises above the pipe, the WQ Structure will detain water to the top of its weir, 5165'. However, once the water surface elevation overtops the weir, the weir no longer affects the Black Dam hydraulically, and the WQ Structure acts to enlarge storage behind the Black Dam.

Also of note is that the Black Dam stage elevations, originally given in NGVD29, were adjusted to NAVD88, which is used in all work within Cabezon. Using the more current NAVD88 vertical datum adjusts NGVD29 elevations up by 2.8 feet in this geographic area. Current survey data can be reviewed in *figure 7*. Further details can be found in the AHYMO model on diskette in *Appendix A*.

Water Quality Structure Maintenance and Operation

While the Cabezon Development is located within Sandoval County, some of its infrastructure is in Bernalillo County. For example, the Black Dam—to which the East Branch Channel drains—is in Bernalillo County and hence owned by AMAFCA. The proposed +/- 25 AF Water Quality Structure will be located within AMAFCA right-of-way. AMAFCA will own the structure and will be responsible for the structural inspection and maintenance, as well as sediment monitoring and removal.

The East Branch Channel is in Sandoval County, and therefore SSCAFCA and CORR will most likely maintain it, to include trash and debris removal within the channel reach.

The developer, Curb North LLC, is working closely with all agencies in preparation for a turnkey agreement that will outline the details of design, construction, ownership, and M&O of the proposed facility. Final responsibilities for the Water Quality Structure are contingent upon the final agreement.

Conclusion

One of the most important objectives of the Cabezon Communities' Drainage Management Plan is minimizing impact on the Black Dam, both currently and in the BLWMP ultimate build-out scenario. The Black Dam is near its permitted volume when the Modified BLWMP is used to model ultimate conditions. As large portions of the watershed remain undeveloped, however, the Dam it not at risk under current conditions. To help minimize Cabezon's impact, Phase 1 provided 25 AF of detention in Tract 17.

The true measure of impact on the Black Dam is the water surface elevation at the Dam, as predicted for the 100 year, 24 hour storm. *Table 4* compares this water surface elevation as predicted by the Modified BLWMP Ultimate Conditions Model and both the Cabezon Phase 1 and Phase 2 Models. Note that the elevation listed for full development of Cabezon is from the AHYMO model using the 0.05 hour time step (VOL72204.txt). Also, the vertical datum used below is NAVD88, which differs from that used in the Modified BLWMP (NGVD29). The Modified BLWMP Ultimate Conditions Model—essentially the standard—places it at 5167.02 feet, 1.53 feet below the emergency spillway.

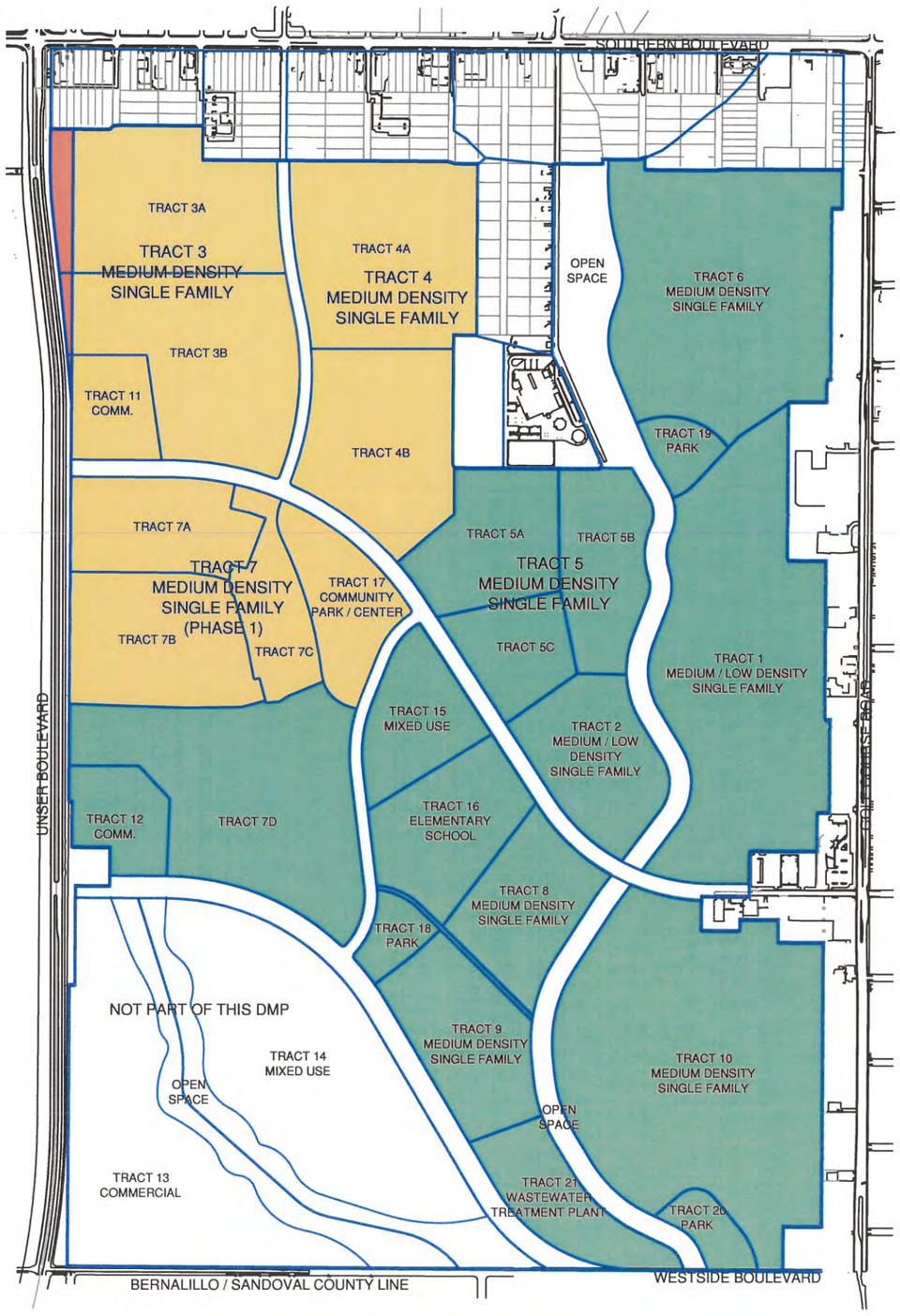
Table 4 - Comparison of Water Surface Elevations at Black Dam

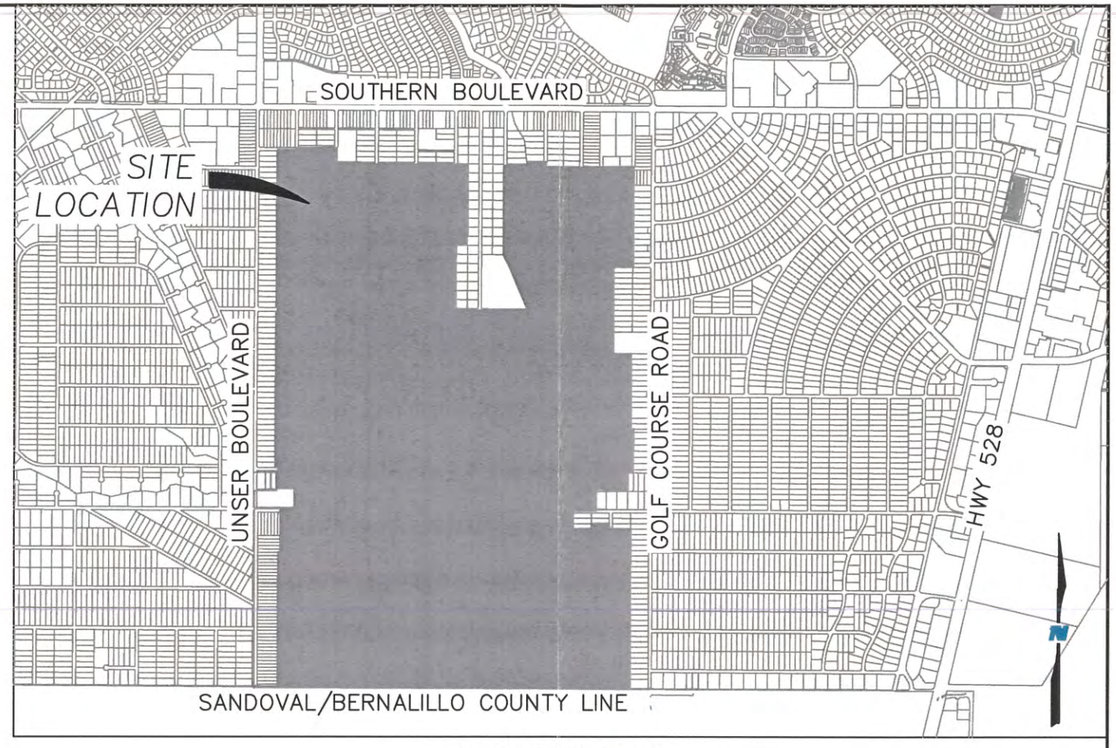
Emergency Spillway Elevation	**5168.55**	**Remaining Storage Depth Prior to Overflow**
NOTE: All elevations in NAVD88		
MAX. WATER SURFACE ELEVATION for:	**Elevation**	
	(ft)	**(ft)**
BLWMP Ultimate Conditions Model	5167.02	1.53
Cabezon Model (Mod. BLWMP w/Ph 1 only)	5167.81	0.74
Cabezon Model (Mod. BLWMP w/Ph 1 and 2)	5165.13	3.42

The Cabezon Model (Phase 1) shows a water surface elevation of 5167.81 feet, an increase of 0.79 feet, leaving 0.74 feet of freeboard. Finally, the Cabezon Phase 2 Model has a water surface elevation of 5165.13 feet. This lowers the water surface by 1.89 feet, as compared to the Modified BLWMP Model.

This is accomplished by the addition of the two large detention ponds, the Phase 1 pond in Tract 17 and the Water Quality Structure adjacent to the Black Dam. Together, these facilities increase storage in the watershed by approximately 50 AF. Just as with the Tract 17 pond, the Office of the State Engineer must also approve the facility, and preliminary contact has already been made.

Together, these facilities should not only improve the quality of runoff from the Black Arroyo Watershed, but also increase the capacity of the Black Dam. This will result in a lower water surface elevation at the Dam. Therefore, the improvements outlined in this document will protect the Cabezon Communities from flooding and erosion damage, and will further safeguard the entire watershed.





VICINITY MAP

LEGEND

- ALTERNATE
- PHASE 1
- PHASE 2

1000 0 500 1000 2000

GRAPHIC SCALE (IN FEET) 1" = 1000 ft.

N

CITY OF RIO RANCHO

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FIGURE 1
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

CABEZON
VICINITY MAP

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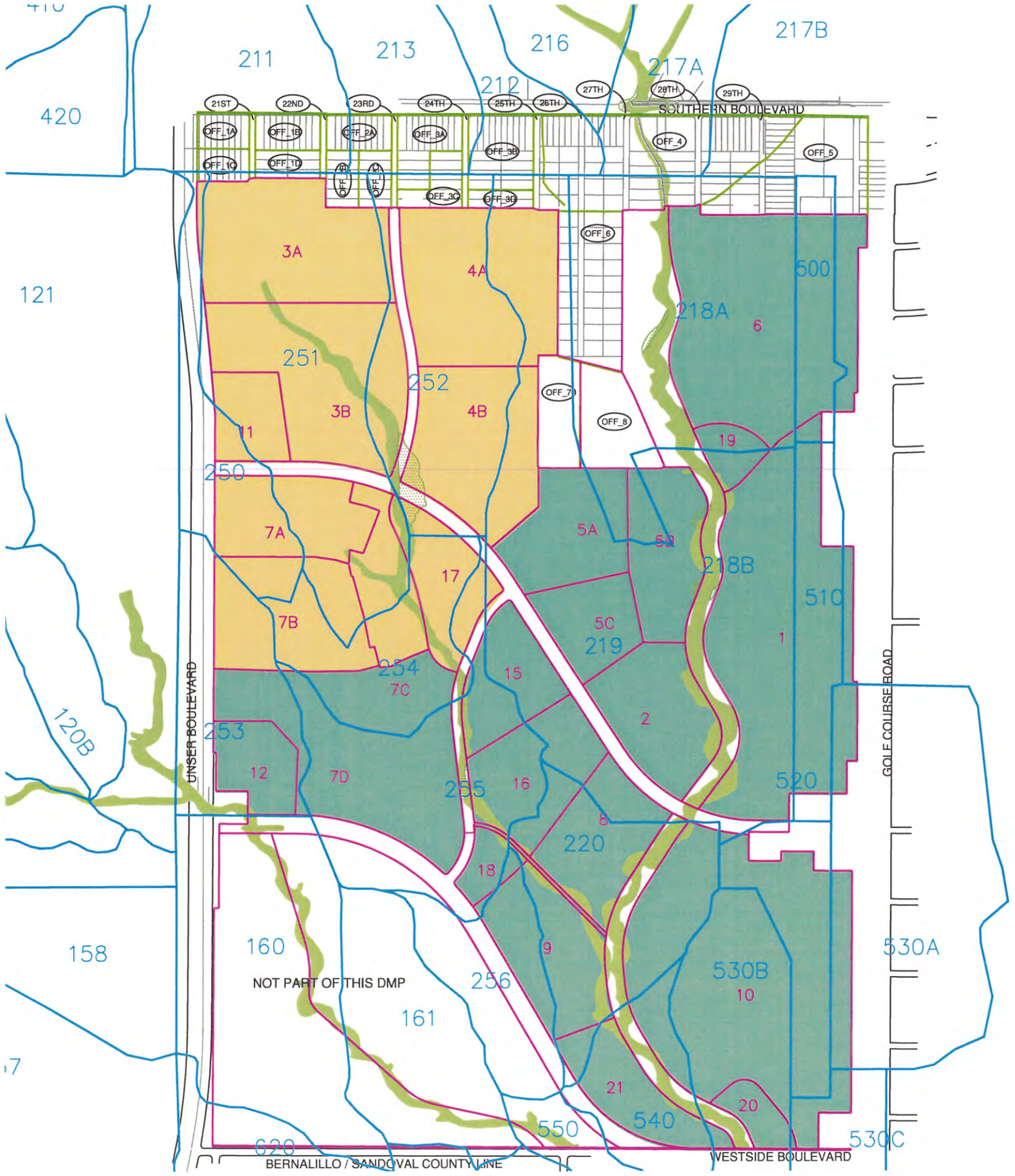

LEGEND

- SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD (ZONE AE) AS DEFINED BY FEMA
- OTHER FLOOD AREAS (AREAS OF 500 YEAR FLOOD)

NOTE: TAKEN FROM FLOOD INSURANCE RATE MAP (FIRM)
MAP NUMBER: 35043C0894 C
EFFECTIVE DATE: JULY 16, 1996

- CABEZON PHASE 1
- CABEZON PHASE 2
- CABEZON SITE BOUNDARY
- CABEZON SUB-BASIN BOUNDARY
- BLWMP SUB-BASIN BOUNDARY
- CABEZON OFF-SITE SUB-BASIN BOUNDARY
- 17 — CABEZON TRACT/SUB-BASIN LABEL
- 254 — BLWMP SUB-BASIN LABEL
- (OFF_5) — CABEZON OFF-SITE SUB-BASIN LABEL

N

1000 0 500 1000 2000
GRAPHIC SCALE (IN FEET) 1" = 1000 ft.

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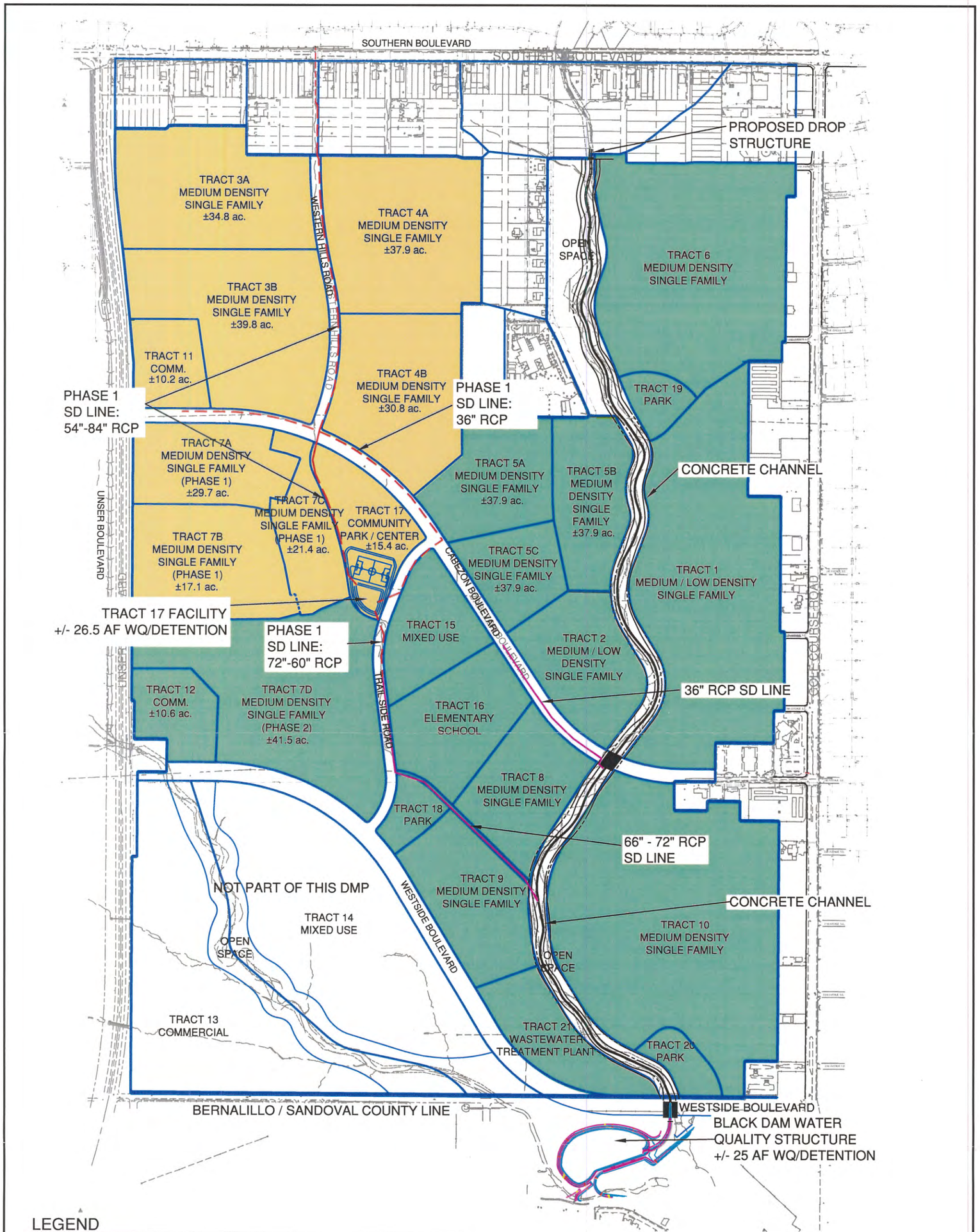
FIGURE 2
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

BLWMP SUB-BASINS
THAT OVERLAP CABEZON



LEGEND

- PHASE 1
- PHASE 2
- EXISTING SD LINE
- PROPOSED SD LINE
- WQ/DETENTION FACILITY BOUNDARY
- SITE/SUB-BASIN BOUNDARY
- EAST BRANCH CONCRETE CHANNEL

N

800 0 400 800 1600

GRAPHIC SCALE (IN FEET) 1" = 800 ft.

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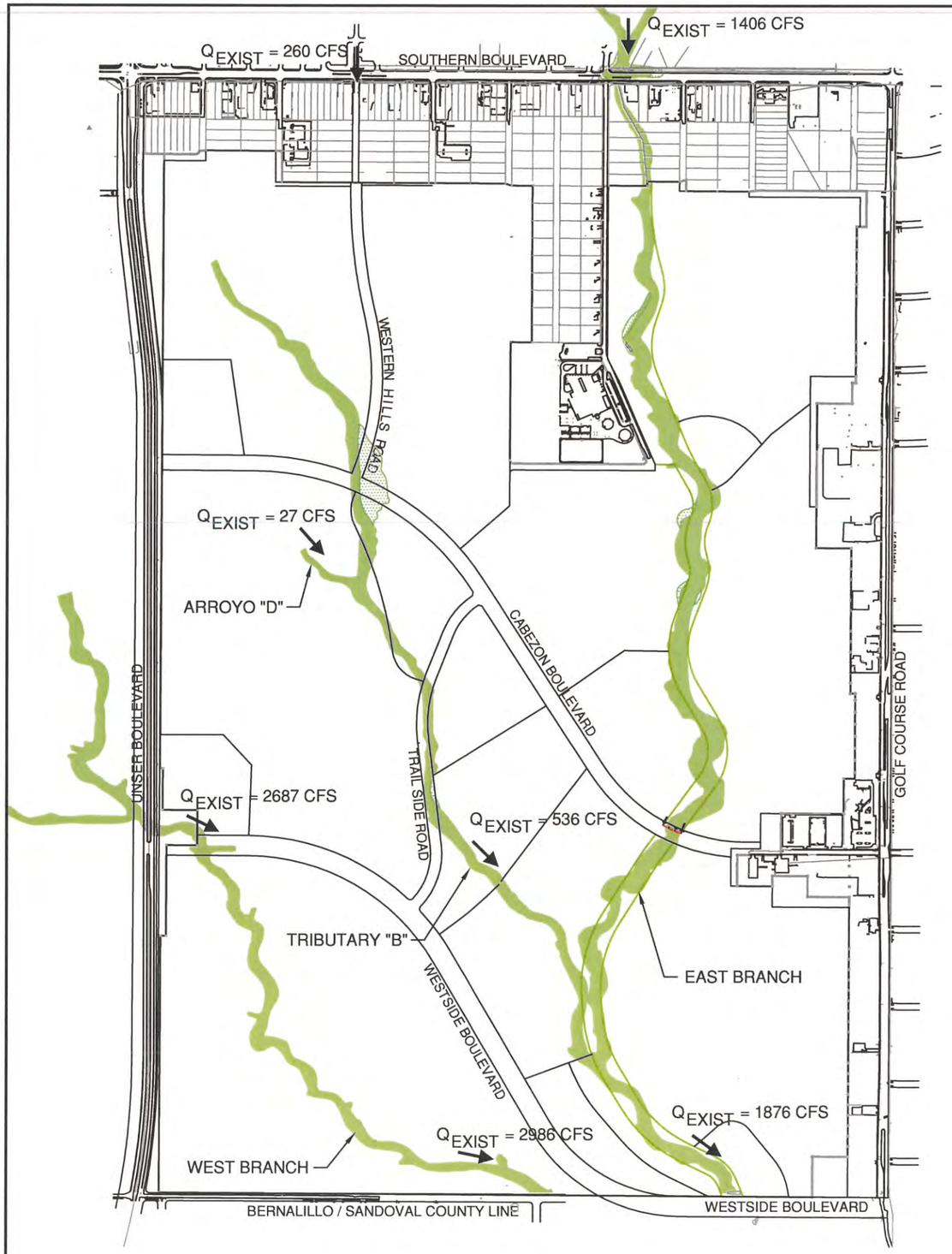
FIGURE 3
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

PROPOSED IMPROVEMENTS

T:\Projects\X4218012\M\Exhibits\8412FIG03.dwg 9/17/2004 11:20:37 AM MDT



LEGEND

SPECIAL FLOOD HAZARD AREAS
INUNDATED BY 100-YEAR FLOOD (ZONE AE)
AS DEFINED BY FEMA

OTHER FLOOD AREAS
(AREAS OF 500 YEAR FLOOD)

NOTE: TAKEN FROM FLOOD INSURANCE RATE MAP (FIRM)
MAP NUMBER: 35043C0894 C
EFFECTIVE DATE: JULY 16, 1996

NOTE

EXISTING FLOWS BASED ON FLOOD INSURANCE STUDY
PERFORMED BY RESOURCE TECHNOLOGY INC., 1994

1000 0 500 1000 2000
GRAPHIC SCALE (IN FEET) 1" = 1000 ft.

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FIGURE 4
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

EXISTING FLOWS &
FEMA FLOOD PLAINS

T:\Projects\X4218012\M\Exhibits\8412FIG04.dwg 9/17/2004 11:21:54 AM MDT

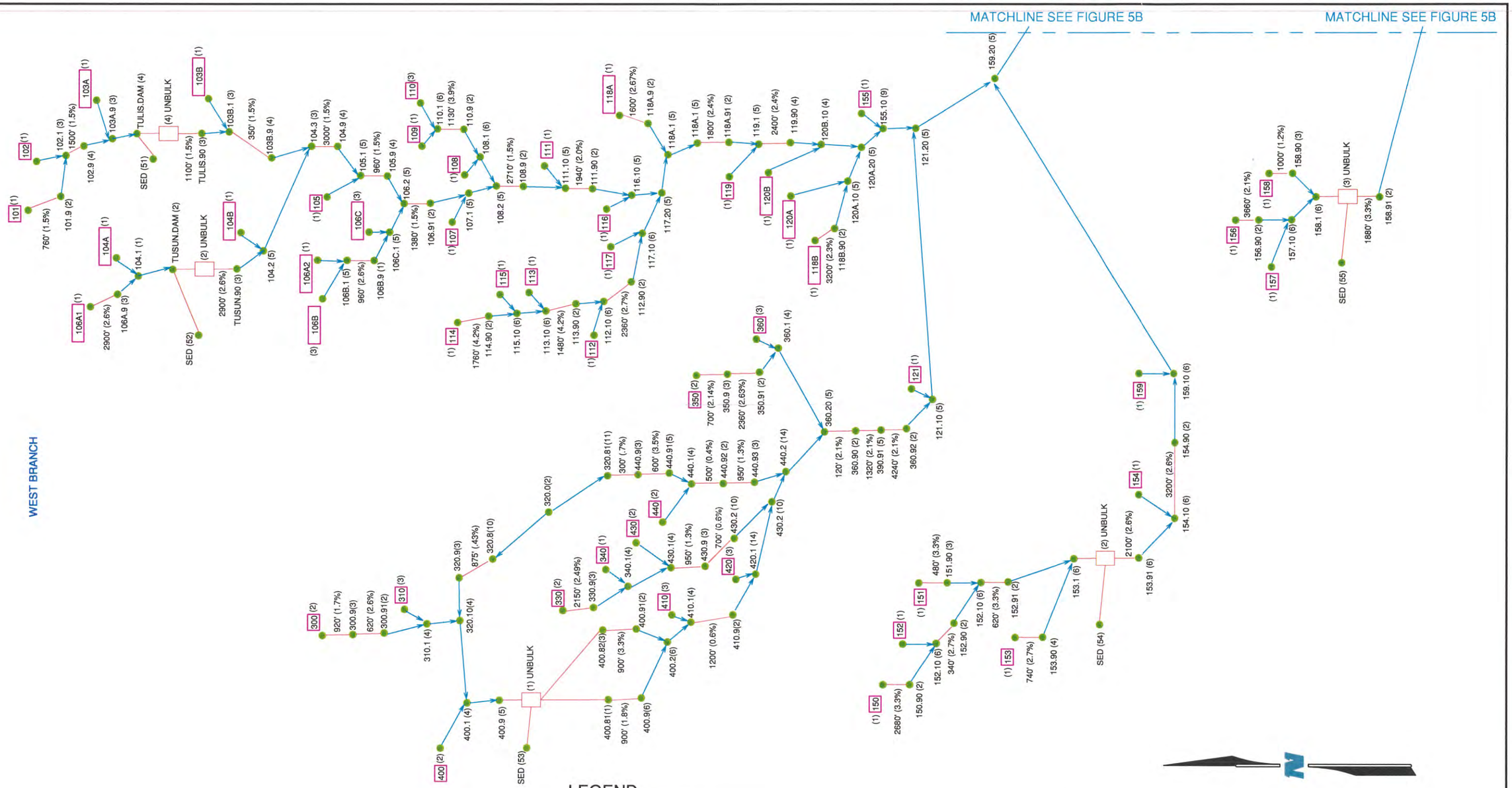

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FIGURE 5A
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

PROPOSED CONDITIONS HYDROLOGIC ROUTING

T:\Projects\X4218012M\Exhibits\8412FIG05.dwg 9/17/2004 11:29:50 AM MDT

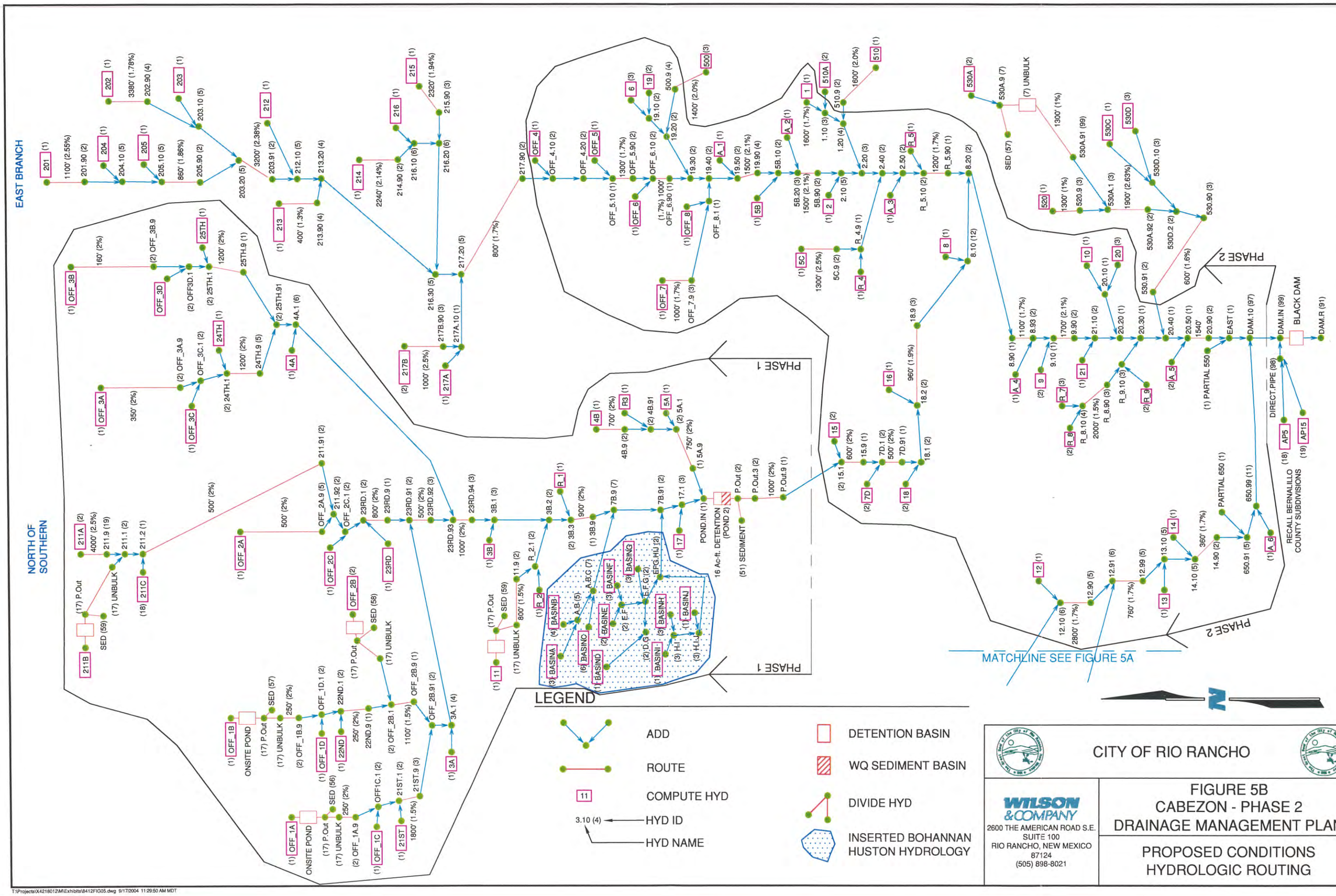

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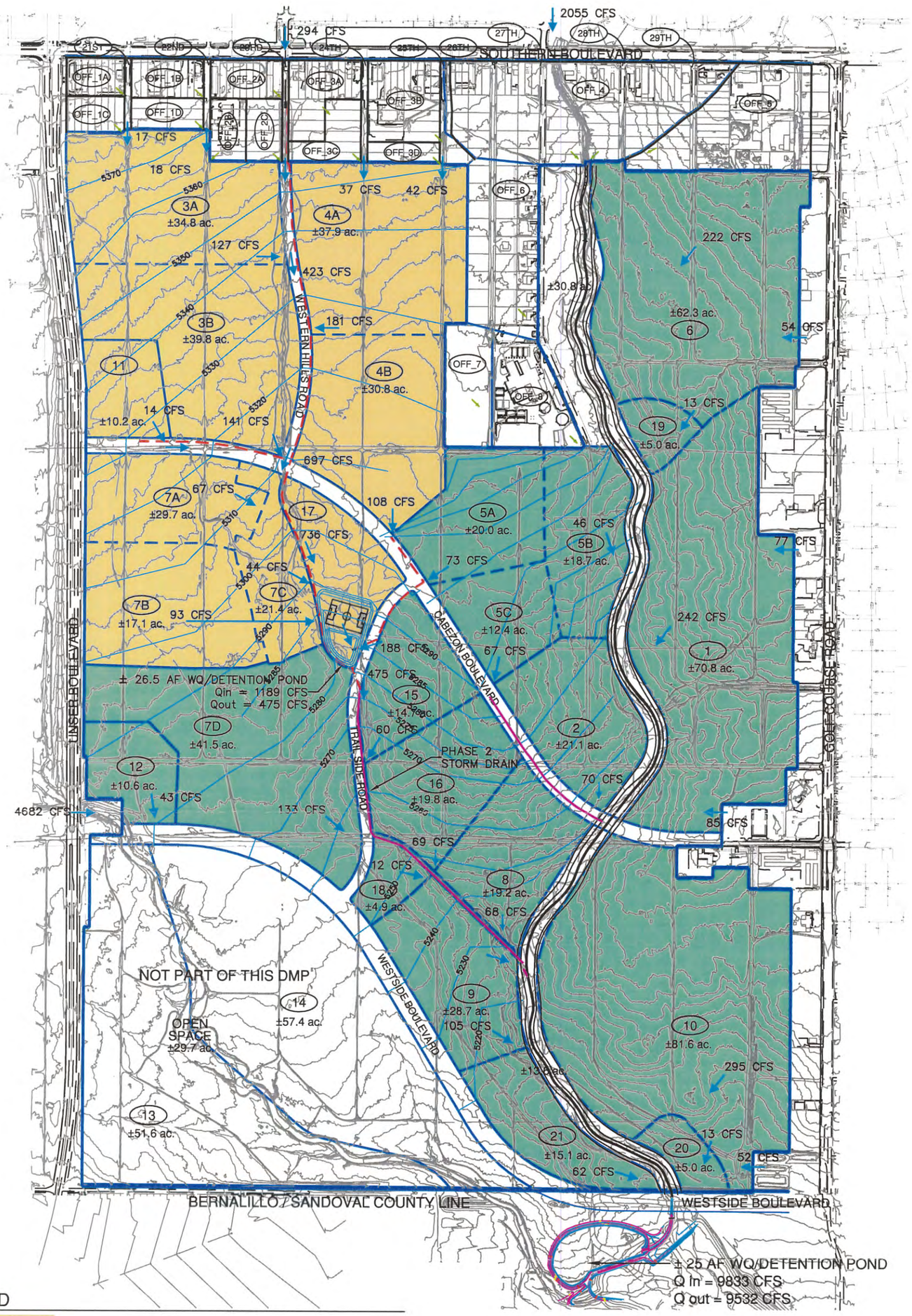
FIGURE 5B
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

PROPOSED CONDITIONS HYDROLOGIC ROUTING

T:\Projects\X4218012\M\Exhibits\8412FIG05.dwg 9/17/2004 11:29:50 AM MDT



LEGEND

- PHASE 1
- PHASE 2
- 7A — PROPOSED BASIN BOUNDARY LABEL
- PROPOSED BASIN BOUNDARY
- FLOW ARROW
- FLOW ARROW
- PHASE 2 STORM DRAIN LINE
- EXISTING STORM DRAIN
- 5300 — MAJOR ROUGH GRADING CONTOUR (10' INTERVAL)

NOTE: ALL FLOWS SHOWN ARE PEAK FLOWS FOR THE 100 YEAR RETURN FREQUENCY EVENT, AND ARE TAKEN FROM CABEZON HYDROLOGIC MODELING. FLOWS REFLECT FULLY DEVELOPED CONDITIONS.

N

800 0 400 800 1600

GRAPHIC SCALE (IN FEET) 1" = 800 ft.

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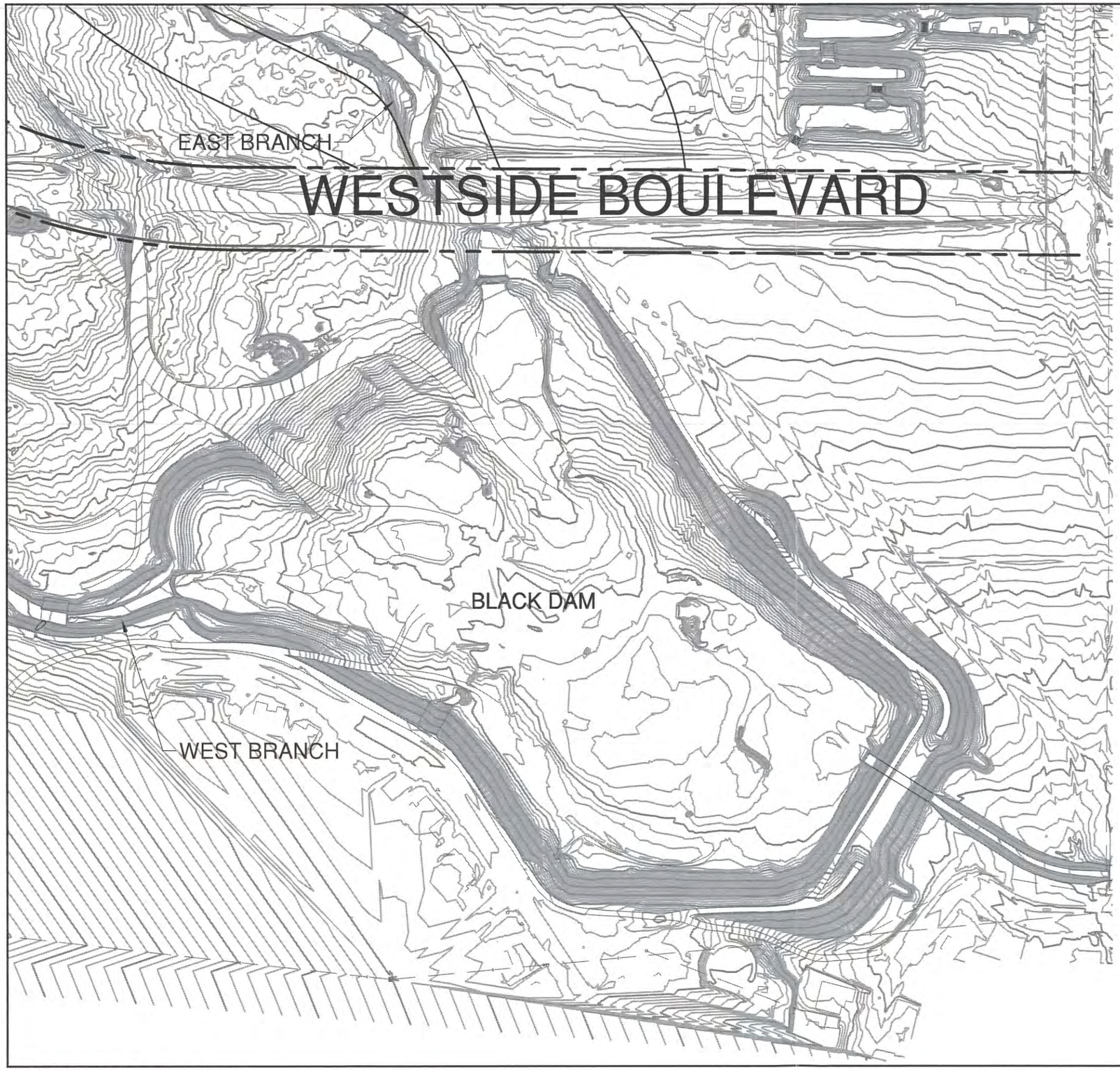
FIGURE 6
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

PHASE 2 BASIN & PEAK FLOW LOCATIONS

T:\Projects\X4218012\M\Exhibits\8412FIG06.dwg 9/17/2004 11:34:59 AM MDT



STORAGE RATING CURVE TABLE

Elevation (feet)	Incremental Volume (cubic feet)	Cumulative Volume (cubic feet)	Acre-Feet (feet)	SurfaceArea (square feet)
5148.00	2902.10	2902.10	0.10	8935.60
5149.00	207701.40	210603.50	4.80	205637.90
5150.00	220139.60	430743.10	9.90	319357.00
5151.00	393872.70	824615.70	18.90	451569.50
5152.00	406166.30	1230782.00	28.30	494995.40
5153.00	451813.90	1682595.80	38.60	530895.70
5154.00	500511.30	2183107.10	50.10	572649.40
5155.00	543290.50	2726397.60	62.60	603091.20
5156.00	581581.60	3307979.20	75.90	633021.10
5157.00	617944.30	3925923.60	90.10	670280.10
5158.00	655630.60	4581554.10	105.20	712476.40
5159.00	693088.10	5274642.20	121.10	752977.90
5160.00	723941.80	5998584.00	137.70	771818.90
5161.00	747001.30	6745585.30	154.90	788731.90
5162.00	767851.00	7513436.30	172.50	808768.80
5163.00	788759.50	8302195.80	190.60	828446.70
5164.00	811694.80	9113890.60	209.20	857403.10
5165.00	832995.70	9946886.30	228.30	889818.60
5166.00	853634.40	10800520.80	247.90	914272.00
5167.00	876263.40	11676784.10	268.10	936044.60
5168.00	896379.80	12573163.90	288.60	952232.30
5168.25	226971.30	12800135.30	293.90	956111.60

*ELEVATIONS IN NAVD88

SPILLWAY

N

200 0 100 200 400

GRAPHIC SCALE (IN FEET) 1" = 200 ft.

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FIGURE 7
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

BLACK DAM
CURRENT TOPOGRAPHY

T:\Projects\X4218012\M\Exhibits\8412FIG07.dwg 9/17/2004 11:43:16 AM MDT

PLAN

SCALE:
HORIZ: 1" = 400'
VERT: 1" = 40'

PROFILE

LEGEND (PLAN)

- STORM DRAIN
- POND EXTENTS
- EXISTING STORM DRAIN

KEYED NOTES:

Ⓐ 66" STORM DRAIN @ 2.42%
Ⓑ 72" STORM DRAIN @ 2.80% – 1.94%
Ⓒ 2 – 40" X 65" STORM DRAIN @ 0.54%

LEGEND (PROFILE)

- STORM DRAIN
- EXISTING GRADE
- HYDRAULIC GRADE LINE
- FINISH GRADE (APPROXIMATE)

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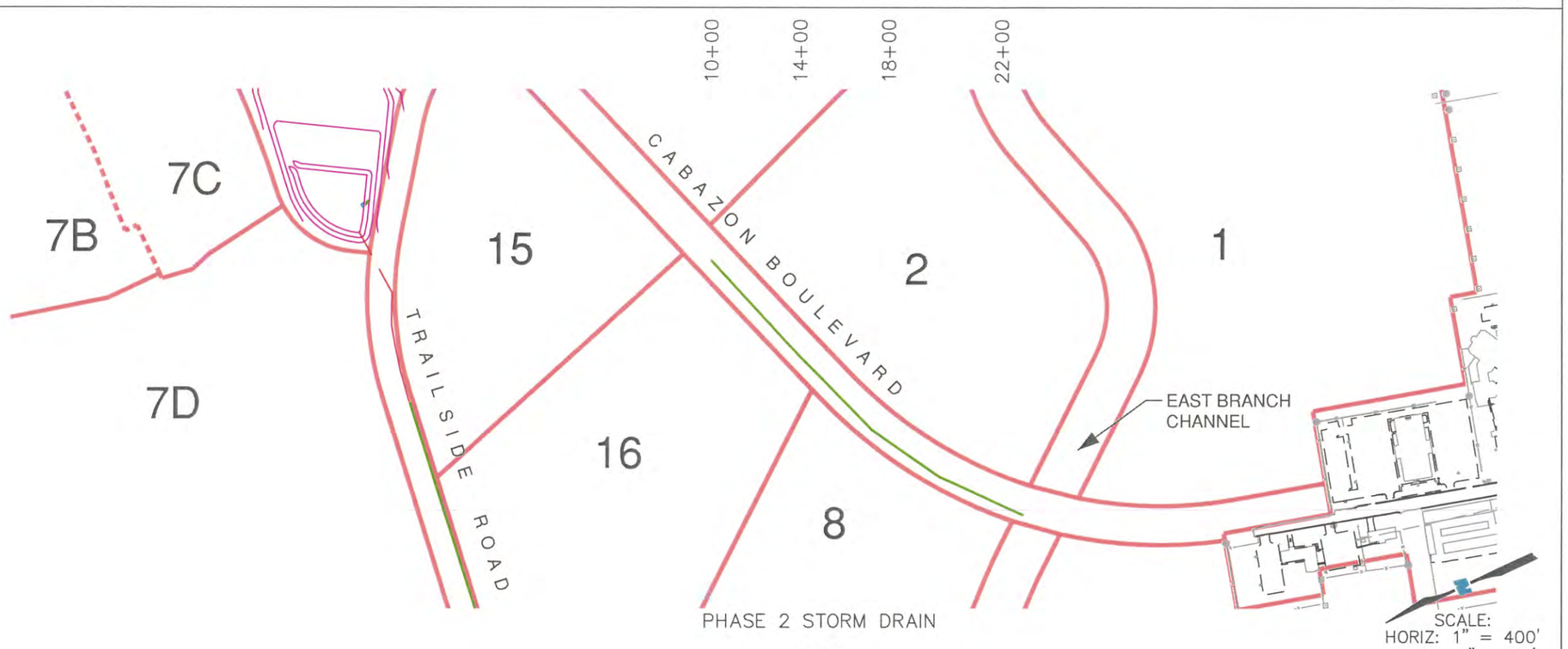
FIGURE 8
CABEZON-PHASE 2
DRAINAGE MANAGEMENT PLAN

PHASE 2 STORM DRAIN
STA 10+00 TO STA 34+06.11

T:\Projects\X4218012\M\Exhibits\8412FIG-PP.dwg 9/17/2004 11:48:43 AM MDT

WCEA# X4218012
MAY 2004

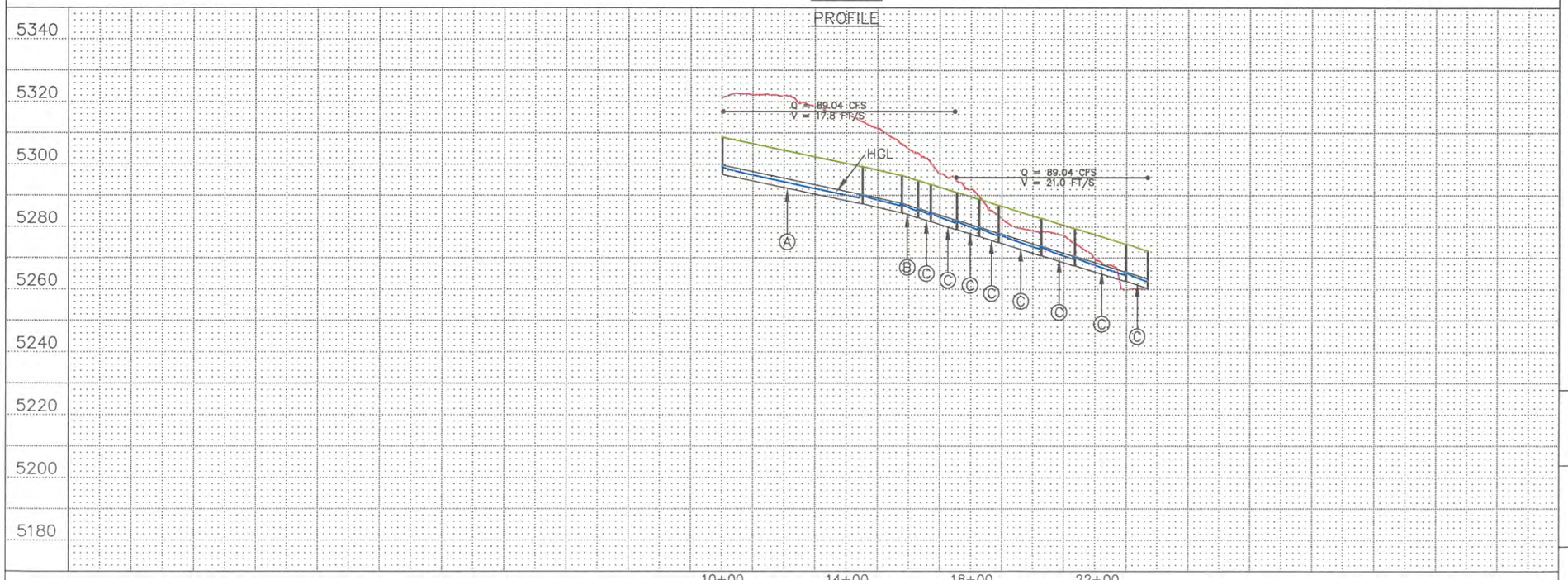


PHASE 2 STORM DRAIN

PLAN

SCALE:
HORIZ: 1" = 400'
VERT: 1" = 40'

PROFILE



LEGEND (PLAN)

- STORM DRAIN
- POND EXTENTS
- EXISTING STORM DRAIN

KEYED NOTES:

Ⓐ 36" STORM DRAIN @ 2.1%
Ⓑ 36" STORM DRAIN @ 2.2%
Ⓒ 36" STORM DRAIN @ 3.0%

LEGEND (PROFILE)

- STORM DRAIN
- EXISTING GRADE
- HYDRAULIC GRADE LINE
- FINISH GRADE (APPROXIMATE)

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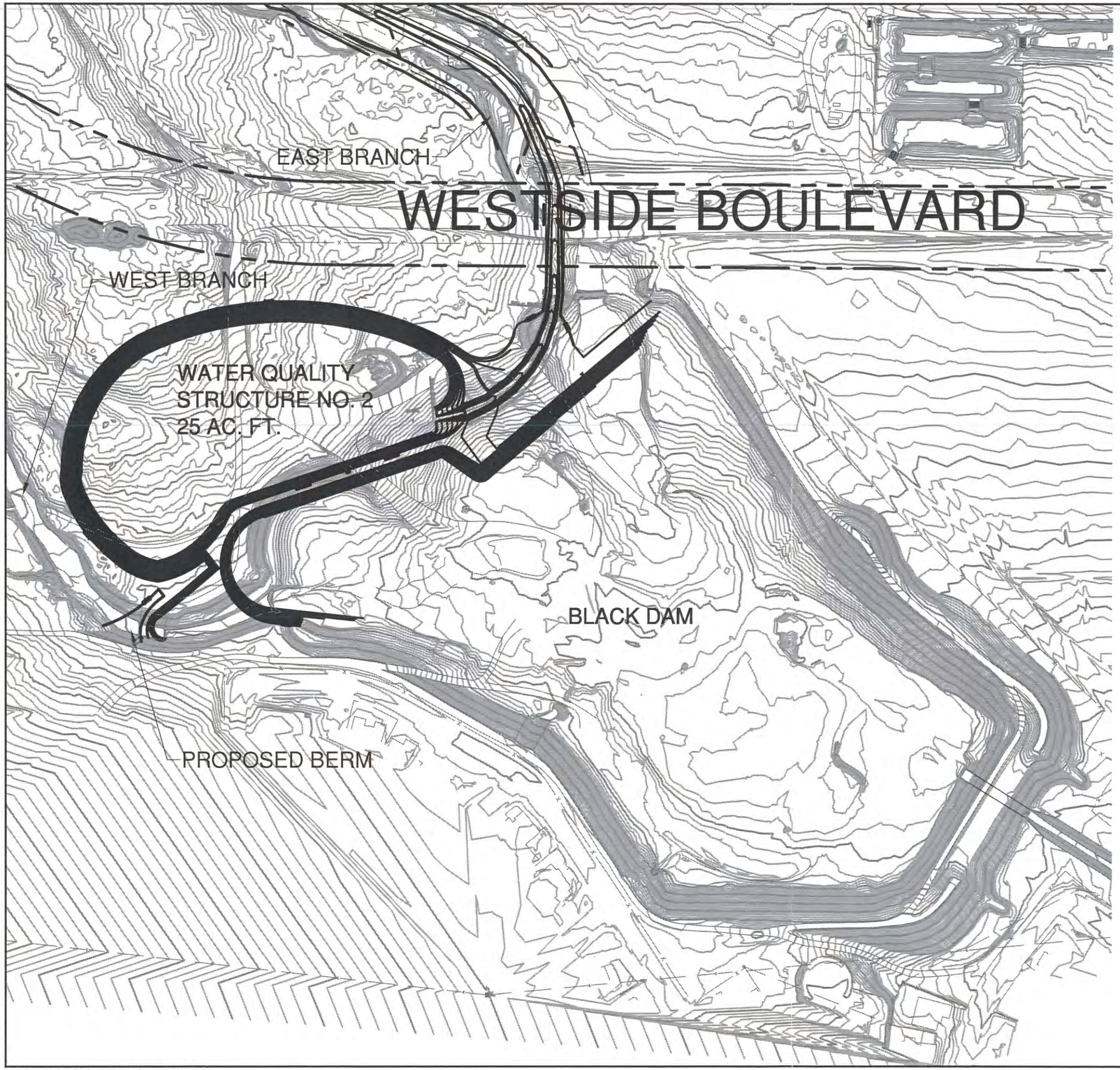
FIGURE 9
CABEZON-PHASE 2
DRAINAGE MANAGEMENT PLAN

PHASE 2 STORM DRAIN
STA 10+00 TO STA 23+67.59

T:\Projects\X4218012\M\Exhibits\8412FIG-PP.dwg 9/17/2004 11:48:43 AM MDT

WCEA# X4218012
MAY 2004



STORAGE RATING CURVE TABLE

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5149.00	207701.40	210603.50	4.80	205637.90
5150.00	220139.60	430743.10	9.90	319357.00
5151.00	393872.70	824615.70	18.90	451569.50
5152.00	406166.30	1230782.00	28.30	494995.40
5153.00	451813.90	1682595.80	38.60	530895.70
5154.00	500511.30	2183107.10	50.10	572649.40
5155.00	543290.50	2726397.60	62.60	603091.20
5156.00	581581.60	3307979.20	75.90	633021.10
5157.00	617944.30	3925923.60	90.10	670280.10
5158.00	655630.60	4581554.10	105.20	712476.40
5159.00	693088.10	5274642.20	121.10	752977.90
5160.00	723941.80	5998584.00	137.70	771818.90
5161.00	747001.30	6745585.30	154.90	788731.90
5162.00	767851.00	7513436.30	172.50	808768.80
5163.00	788759.50	8302195.80	190.60	828446.70
5164.00	811694.80	9113890.60	209.20	857403.10
5165.00	832995.70	9946886.30	228.30	889818.60
5166.00	853634.40	10800520.80	247.90	914272.00
5167.00	876263.40	11676784.10	268.10	936044.60
5168.00	896379.80	12573163.90	288.60	952232.30
5168.25	226971.30	12800135.30	293.90	956111.60

*ELEVATIONS IN NAVD88

SPILLWAY

N

200 0 100 200 400

GRAPHIC SCALE (IN FEET) 1" = 200 ft.

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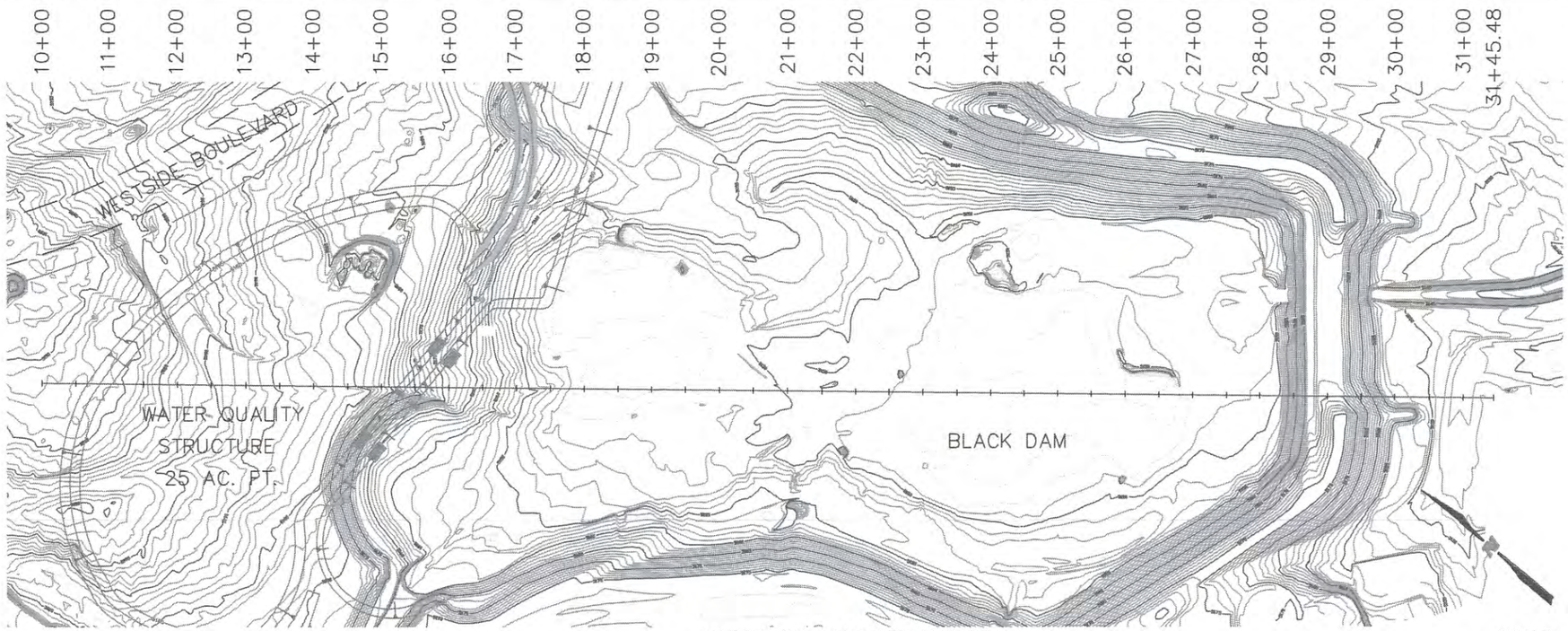
FIGURE 10
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

BLACK DAM
PROPOSED WATER QUALITY
STRUCTURE

T:\Projects\X4218012\M\Exhibits\8412FIG09.dwg 9/17/2004 11:48:44 AM MDT

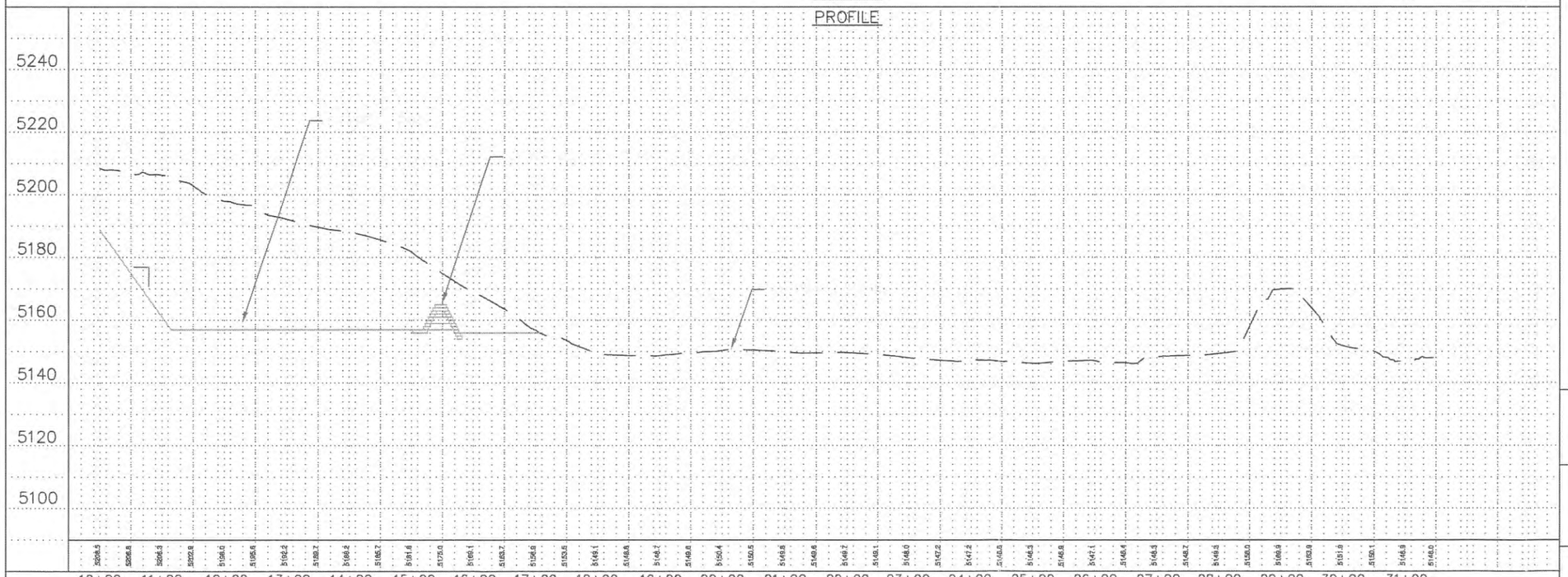


WATER QUALITY STRUCTURE

PLAN

SCALE:
HORIZ: 1" = 200'
VERT: 1" = 40'

PROFILE



T:\Projects\X4218012\M\Exhibits\8412FIG11A.dwg 9/17/2004 12:09:31 PM MDT

WCEA# X4218012
JULY 2004

LEGEND (PLAN)

POND EXTENTS

LEGEND (PROFILE)

EXISTING GRADE

FINISH GRADE (APPROXIMATE)

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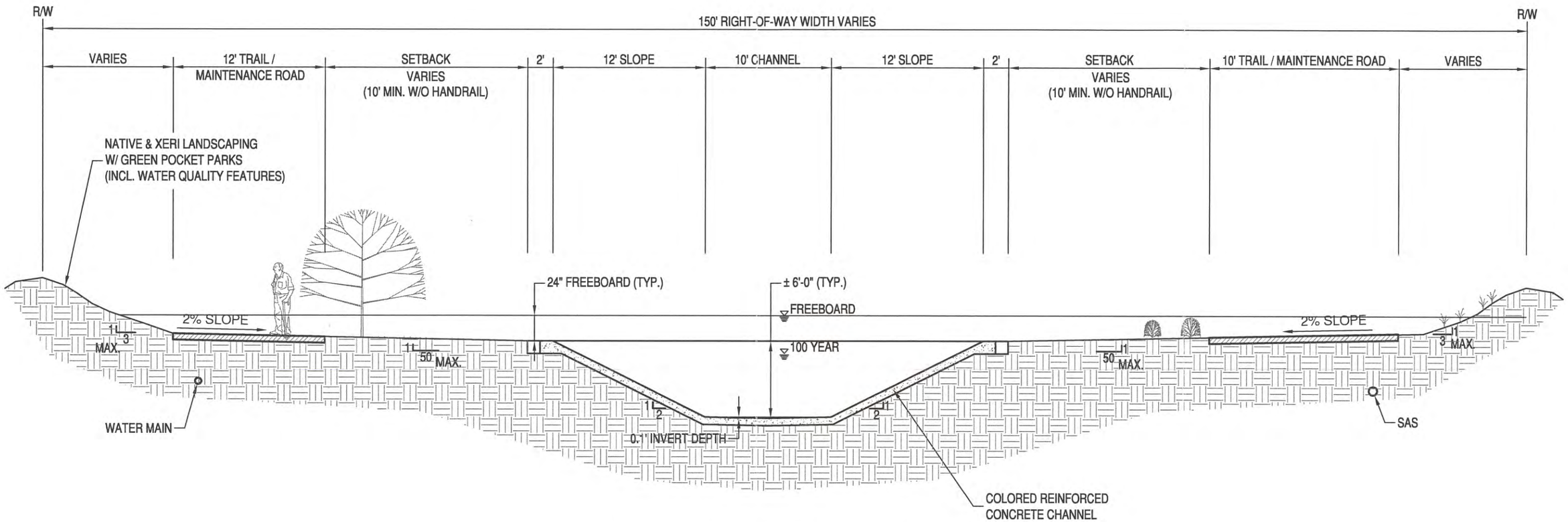
FIGURE 11
CABEZON-PHASE 2
DRAINAGE MANAGEMENT PLAN

WATER QUALITY STRUCTURE
STA 10+00 TO STA 31+45.48



NATURALIZED COMPOSITE CHANNEL SECTION

SCALE: NTS

(CHANNEL MEANDERS WITHIN R-O-W)

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FIGURE 12
CABEZON - PHASE 2
DRAINAGE MANAGEMENT PLAN

BLACK ARROYO EAST BRANCH
TYPICAL CHANNEL SECTION

T:\Projects\X4218012\M\Exhibits\8412FIG12.dwg 9/17/2004 12:08:04 PM MDT

APPENDIX A

Hydrology

QP81604.SUM

```
(s16.66H
 AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -                                                                   RUN DATE (MON/DAY/YR) =09/08/2004
 INPUT FILE = T:\Projects\X4218012\Eng\AHYMO\rev_dmp\QP81604.txt          - VERSION:  1997.02c            USER NO.= AHYMO-I-9702a01000C05-AH

                                FROM  TO                 PEAK        RUNOFF                TIME TO    CFS      PAGE =   1
            HYDROGRAPH          ID    ID      AREA     DISCHARGE     VOLUME     RUNOFF       PEAK     PER
 COMMAND    IDENTIFICATION      NO.   NO.   (SQ MI)      (CFS)       (AC-FT)   (INCHES)    (HOURS)    ACRE      NOTATION

 START
 *S     7/22/04                                                                                              TIME=        .00
 *S     WILSON & CO.'S CABEZON COMMUNITIES DRAINAGE MASTER PLAN, PHASE 2 OF
 *S     DEVELOPMENT: THIS MODEL TAKES BOTH CABEZON PHASE 1 AND 2 INTO THE
 *S     MODIFIED BLWMP MODEL DEVELOPED BY ASCG (1/20/04) TO ASSESS CABEZON'S
 *S     IMPACT ON BLACK DAM. IT MODELS DEVELOPED CONDITIONS IN ALL SUBBASINS;
 *S     SEDIMENT BULKING ADJUSTED TO 6% REFLECT THIS; ALSO, MUSKINGHAM CUNGE
 *S     ROUTING (COMMAND: ROUTE MCUNGE) CONSISTENTLY USED WITH A TIME
 *S     STEP OF 0.01 HR (36 SEC) TO MORE ACCURATELY ASSESS PEAK FLOW
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *S  01/20/2004 ADJUSTMENTS TO THIS MODEL FROM THE BLWMP
 *S  "DOUBLE" COUNTING OF STREETS IN LAND TREATMENT REMOVED
 *S  SUB-BASIN 211 ROUTED ADJUSTED TO EXISTING FIELD CONDITIONS (XING SOUTHERN)
 *S  NOTHING ELSE HAS BEEN ADJUSTED - USER ACCEPTS THIS MODEL AS IS AND TAKES THE
 *S  RESPONSIBILITY FOR CHECKING IT FOR ACCURACY PRIOR TO USE...
 *S * * * FUTURE CONDITIONS MODEL - ALTERNATE B  * * * * * * * * * * * * * * *
 *S * * * 3 DAMS ON THE WEST BRANCH                          * * * * * * * * * *
 *S * * * UNSER GATEWAY DAM, AND WATER QUALITY DIVERSIONS    * * * * * * * * * *
 *S * * * ROUTING WITH MCUNGE METHOD AFTER WATER QUALITY DIVERSIONS ARE  * * * *
 *S * * * UTILIZED TO ADJUST FOR THE UNSTABLE HYDROGRAPHS WITH A STEEP SLOPE * *
 *S * * * AFTER MODIFICATION TO REDIRECT THE FIRST FLUSH OF 0.25" RUNOFF FOR SWQ
 RAINFALL  TYPE= 2                                                                                           RAIN24=    2.703
 *S*****************************************************************************
 *S  BEGINNING OF THE BLACK ARROYO WEST BRANCH
 *S*****************************************************************************
 *S  LISBON CHANNEL NORTH OF TULIP
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 SEDIMENT BULK                                                                                               PK BF =      1.06
 COMPUTE NM HYD      101.00   -    1    .33970     545.73     24.330   1.34290    1.590    2.510 PER IMP=   48.00
 ROUTE MCUNGE        101.90   1    2    .33970     545.79     24.322   1.34249    1.600    2.510 CCODE =      .2
 COMPUTE NM HYD      102.00   -    1    .25390     348.10     13.951   1.03023    1.580    2.142 PER IMP=   26.00
 ADD HYD             102.10  1& 2  3    .59360     891.45     38.273   1.20892    1.590    2.347
 ROUTE MCUNGE        102.90   3    4    .59360     891.59     38.252   1.20826    1.610    2.347 CCODE =      .2
 COMPUTE NM HYD      103A     -    1    .18030     275.69     10.691   1.11184    1.570    2.389 PER IMP=   28.00
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *S START OF LISBON CHANNEL AT TULIP AND INFLOW TO DAM
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 ADD HYD            103A.90  1& 4  3    .77390    1158.07     48.943   1.18579    1.600    2.338
 *S  ROUTE 103A.90 THRU LISBON @ TULIP DAM/POND
 ROUTE RESERVOIR    TULIS.DAM  3   4    .77390       3.97      1.354    .03281    5.990     .008 AC-FT=    47.588
 *S *************DIVIDE HYD TO UNBULK BY 3% *********************
 DIVIDE HYD           UNBULK   4   4    .75068       3.85      1.314    .03281    5.990     .008
                    SEDIMENT  and  51   .02322        .12       .041    .03281    5.990     .008
 *S ROUTE IN PIPE TO LISBON CHANNEL
 *S * * * * * AP=TULIS.90 * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 ROUTE MCUNGE       TULIS.90   4   3    .75068       3.85      1.299    .03243    5.990     .008 CCODE =      .2
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *S START OF LISBON CHANNEL AT TULIP
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 SEDIMENT BULK                                                                                               PK BF =      1.06
 COMPUTE NM HYD      103B     -    1    .08950     165.72      5.311   1.11274    1.520    2.893 PER IMP=   28.00
 *S ADD 103B TO PREVIOUS HYDROGRAPHS FOR TOTAL Q IN LISBON CHANNEL AT
 *S DOWNSTREAM END OF BASIN 103B
```

```
ADD HYD              103B.10  1& 3   3      .84018      165.89      6.610     .14751    1.520     .309
*S ROUTE 103B.10 THRU 104B TO 103B.90
ROUTE MCUNGE         103B.90   3     4      .84018      165.68      6.603     .14736    1.520     .308 CCODE =       .2
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                FROM  TO                 PEAK        RUNOFF                TIME TO   CFS      PAGE =    2
                  HYDROGRAPH    ID    ID      AREA      DISCHARGE    VOLUME     RUNOFF      PEAK     PER
COMMAND         IDENTIFICATION  NO.   NO.    (SQ MI)     (CFS)      (AC-FT)   (INCHES)   (HOURS)   ACRE      NOTATION

*S START OF SUNSET CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
SEDIMENT BULK                                                                                            PK BF =      1.06
COMPUTE NM HYD        106A1    -     1      .11660      174.60      7.012    1.12758    1.570    2.340 PER IMP=   33.00
ROUTE MCUNGE         106A.90   1     3      .11660      174.55      7.006    1.12660    1.600    2.339 CCODE =       .2
COMPUTE NM HYD         104A    -     1      .18340      383.74     13.084    1.33762    1.520    3.269 PER IMP=   45.00
ADD HYD              104.10   3& 1   1      .30000      524.32     20.090    1.25560    1.540    2.731
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S ROUTE 104.10 THROUGH PROPOSED SUNSET @ TULIP POND/DAM
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ROUTE RESERVOIR     TUSUN.DAM   1    2      .30000        4.28      1.507     .09419    3.570     .022 AC-FT=    18.814
*S *************DIVIDE HYD TO UNBULK BY 3% *********************
DIVIDE HYD            UNBULK    2    2      .29100        4.15      1.462     .09419    3.570     .022
                    SEDIMENT   and   52     .00900         .13       .045     .09419    3.570     .022
*S ROUTE IN PIPE TO LISBON CHANNEL
ROUTE MCUNGE        TUSUN.90    2    3      .29100        4.15      1.428     .09202    3.650     .022 CCODE =       .2
SEDIMENT BULK                                                                                            PK BF =      1.06
COMPUTE NM HYD         104B    -     1      .03550       74.14      2.533    1.33768    1.520    3.263 PER IMP=   45.00
ADD HYD              104.20   1& 3   5      .32650       74.28      3.961     .22746    1.520     .355
*S LISBON CHANNEL AFTER SUNSET CHANNEL CONFLUENCE (HYD=104B.1)
ADD HYD              104.30   5& 4   3     1.16668      239.96     10.564     .16978    1.520     .321
ROUTE MCUNGE         104.90    3     4     1.16668      239.73     10.491     .16861    1.560     .321 CCODE =       .2
SEDIMENT BULK                                                                                            PK BF =      1.06
COMPUTE NM HYD       105.00    -     1      .15090      235.54     11.059    1.37411    1.620    2.439 PER IMP=   44.00
*S LISBON CHANNEL AFTER SUB-BASIN 105
ADD HYD              105.10   1& 4   5     1.31758      461.84     21.550     .30667    1.580     .548
ROUTE MCUNGE         105.90    5     4     1.31758      461.69     21.524     .30630    1.590     .548 CCODE =       .2
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S START OF SUGAR CHANNEL AT TULIP
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD        106A2    -     1      .13590      231.95      8.178    1.12830    1.540    2.667 PER IMP=   33.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S BALI CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD         106B    -     3      .15220      267.63     10.944    1.34821    1.570    2.747 PER IMP=   45.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S SUGAR CHANNEL INCLUDING CONFLUENCE WITH BALI CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              106B.10  1& 3   5      .28810      494.45     19.122    1.24448    1.550    2.682
*S   ROUTE 106B.10 TO 106C.90 (TO CONFLUENCE OF LISBON & SUGAR CHLS) (106C)
ROUTE MCUNGE         106B.90   5     1      .28810      494.44     19.117    1.24413    1.560    2.682 CCODE =       .2
COMPUTE NM HYD         106C    -     3      .04840       64.56      2.372     .91889    1.550    2.084 PER IMP=   22.00
ADD HYD              106C.10  1& 3   5      .33650      558.92     21.488    1.19735    1.560    2.595
*S * * * * AP 106.90 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON CHANNEL AFTER CONFLUENCE WITH SUGAR CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              106.20   5& 4   5     1.65408     1009.09     43.012     .48757    1.570     .953
ROUTE MCUNGE         106.91    5     2     1.65408     1007.70     42.964     .48702    1.600     .952 CCODE =       .1
COMPUTE NM HYD       107.00    -     1      .03580       79.05      2.732    1.43071    1.520    3.450 PER IMP=   49.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON CHANNEL AFTER ADDING SUB-BASIN 107
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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ADD HYD              107.10  1& 2   5      1.68988    1068.93     45.696     .50702   1.590    .988
COMPUTE NM HYD       109.00   -     1       .08640     146.45      6.552    1.42186   1.600   2.648 PER IMP=  49.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S  BALTIC CHANNEL
*S  FLOW AT CASCADE RD @ 600 FT. W. OF COMANCHE RD.  (HYD. 109)
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                              FROM   TO                 PEAK      RUNOFF               TIME TO   CFS      PAGE =   3
                 HYDROGRAPH    ID    ID       AREA    DISCHARGE   VOLUME     RUNOFF     PEAK     PER
COMMAND        IDENTIFICATION  NO.   NO.    (SQ MI)     (CFS)     (AC-FT)   (INCHES)  (HOURS)   ACRE      NOTATION

COMPUTE NM HYD       110.00   -     3       .05090      96.74      3.758    1.38444   1.550   2.970 PER IMP=  46.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S  ARKANSAS CHANNEL INCLUDING FLOW FROM BALTIC CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              110.10  1& 3   6       .13730     239.38     10.310    1.40799   1.580   2.724
ROUTE MCUNGE         110.90    6    2       .13730     239.35     10.306    1.40739   1.590   2.724 CCODE =        .2
COMPUTE NM HYD       108.00   -     1       .06720     130.16      5.542    1.54624   1.570   3.026 PER IMP=  59.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    ARKANSAS CHANNEL INCLUDING FLOW FROM BALTIC CHANNEL BEFORE CONFLUENCE
*S    WITH LISBON CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON AVE. @ 250 FT.  N. OF HOOD RD.
*S
ADD HYD              108.10  1& 2   6       .20450     368.93     15.848    1.45302   1.580   2.819
*S * * * * AP 108.91 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON CHANNEL AFTER ADDING ARKANSAS CHANNEL FLOWS
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              108.20  5& 6   5      1.89438    1437.01     61.543     .60914   1.590   1.185
ROUTE MCUNGE         108.90    5    2      1.89438    1435.64     61.468     .60839   1.610   1.184 CCODE =        .2
COMPUTE NM HYD       111.00   -     1       .11590     214.48      9.107    1.47330   1.570   2.891 PER IMP=  54.00
*S * * * * * * * * * * * *  AP 111.10 * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON CHANNEL DISCHARGE @ SOUTHERN BLVD
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              111.10  1& 2   5      2.01028    1641.75     70.575     .65826   1.610   1.276
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S START OF LISBON ARROYO
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ROUTE MCUNGE         111.90    5    2      2.01028    1640.72     70.511     .65766   1.620   1.275 CCODE =        .2
SEDIMENT BULK                                                                                       PK BF =      1.06
COMPUTE NM HYD       116.00   -     1       .03190      75.61      2.687    1.57953   1.520   3.703 PER IMP=  61.00
ADD HYD              116.10  1& 2   5      2.04218    1691.28     73.198     .67206   1.620   1.294
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * *  END LISBON CHANNEL AND LISBON ARROYO WATERSHED * * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * *  START IVORY WATERSHED                    * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
SEDIMENT BULK                                                                                       PK BF =      1.06
*S * * * PECOS/RODEO CHANNEL                                   * * * * * * * * * * *
COMPUTE NM HYD       114.00   -     1       .06980     126.88      4.917    1.32086   1.560   2.840 PER IMP=  41.00
ROUTE MCUNGE         114.90    1    2       .06980     126.67      4.912    1.31960   1.600   2.836 CCODE =        .1
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * SPUR CHANNEL                           * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD       115.00   -     1       .12520     216.57      9.752    1.46049   1.600   2.703 PER IMP=  52.00
ADD HYD              115.10  1& 2   6       .19500     343.24     14.665    1.41005   1.600   2.750
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * IVORY CHANNEL                          * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD       113.00   -     1       .04770     107.66      3.867    1.52010   1.520   3.527 PER IMP=  57.00
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*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * CONFLUENCE OF IVORY AND SPUR                        * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              113.10  1& 6   6        .24270      431.78      18.532     1.43168    1.580    2.780
*S ******    AP 113.90 * * * *********************
ROUTE MCUNGE         113.90    6    2        .24270      431.75      18.524     1.43106    1.590    2.780 CCODE =       .2
COMPUTE NM HYD       112.00    -    1        .07360      146.55       5.751     1.46519    1.550    3.111 PER IMP=   52.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    SOUTHERN BLVD. @ 1900 FT. E. OF PECOS LP.
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                  FROM  TO                   PEAK        RUNOFF                TIME TO   CFS        PAGE =   4
                    HYDROGRAPH     ID   ID       AREA      DISCHARGE     VOLUME      RUNOFF     PEAK     PER
COMMAND           IDENTIFICATION   NO.  NO.    (SQ MI)       (CFS)       (AC-FT)    (INCHES)  (HOURS)   ACRE        NOTATION

*S    IVORY CHANNEL @ SOUTHERN BLVD
*S ****************** AP 112.10 ********************************************
ADD HYD              112.10  1& 2   6        .31630      572.14      24.275     1.43900    1.580    2.826
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * IVORY ARROYO                                        * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ROUTE MCUNGE         112.90    6    2        .31630      571.90      24.260     1.43813    1.600    2.825 CCODE =       .2
SEDIMENT BULK                                                                                             PK BF =     1.06
COMPUTE NM HYD       117.00    -    1        .12590      266.58       9.116     1.35757    1.520    3.308 PER IMP=   46.00
ADD HYD              117.10  1& 2   6        .44220      790.31      33.376     1.41519    1.570    2.793
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * CONFLUENCE OF IVORY AND LISBON ARROYOS IN PARK      * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              117.20  5& 6   5       2.48438     2444.76     106.574      .80433    1.610    1.538
COMPUTE NM HYD         118A    -    1        .17330      349.42      11.600     1.25507    1.520    3.150 PER IMP=   38.00
ROUTE MCUNGE        118A.90    1    2        .17330      348.77      11.593     1.25431    1.530    3.145 CCODE =       .2
*S *****************  AP 118A.10 *******************************************
ADD HYD             118A.10  5& 2   5       2.65768     2724.19     118.167      .83367    1.600    1.602
*S PUNCH AND ADJUST HYDROGRAPH TO DELETE "FIRST FLUSH" RUNOFF AND SEND TO
*S WATER QUALITY PONDS WHICH IS ESSENTIALLY OUT OF THE SYSTEM THROUGH TIMING.
RECALL HYD          118A.10    -    5       2.65770     2724.19     118.167      .83367    1.600    1.602
ROUTE MCUNGE         118.91    5    2       2.65770     2723.15     118.100      .83320    1.610    1.601 CCODE =       .2
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * START OF WEST BRANCH ARROYO                         * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD       119.00    -    1        .08640      146.95       5.112     1.10943    1.540    2.657 PER IMP=   28.00
ADD HYD              119.10  1& 2   5       2.74410     2846.82     123.213      .84189    1.610    1.621
COMPUTE NM HYD         120B    -    1        .08640      179.04       5.962     1.29385    1.520    3.238 PER IMP=   39.00
ROUTE MCUNGE         119.90    5    4       2.74410     2845.36     123.122      .84127    1.630    1.620 CCODE =       .2
ADD HYD             120B.10  1& 4   4       2.83050     2965.97     129.084      .85508    1.620    1.637
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * START OF TRIBUTARY "C"                              * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD         118B    -    1        .06200      124.61       4.150     1.25511    1.520    3.140 PER IMP=   38.00
ROUTE MCUNGE        118B.90    1    2        .06200      124.42       4.146     1.25378    1.550    3.136 CCODE =       .2
COMPUTE NM HYD         120A    -    1        .12780      264.93       8.819     1.29383    1.520    3.239 PER IMP=   39.00
ADD HYD             120A.10  2& 1   5        .18980      382.53      12.965     1.28075    1.530    3.149
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * CONFLUENCE OF TRIBUTARY "C" WITH WEST BRANCH ARROYO  * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD             120A.20  4& 5   5       3.02030     3251.46     142.048      .88183    1.620    1.682
SEDIMENT BULK                                                                                             PK BF =     1.06
COMPUTE NM HYD       155.00    -    1        .12450      254.36      10.215     1.53839    1.550    3.192 PER IMP=   57.00
ADD HYD              155.10  1& 5   9       3.14480     3479.70     152.263      .90783    1.610    1.729
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * URBAN AREA WEST OF UNSER, EAST OF LISBON CHANNEL, NORTH OF * * * *
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*S * * * SOUTHERN AND SOUTH OF TULIP                                    * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
SEDIMENT BULK
*S ALL 300 AND 400 SERIES BASINS ARE COMPUTED WITH ORIGINAL TP's FROM       * * *
*S THE FEMA RESTUDY MODEL                                                  * * *
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	300.00	-	2	.14830	226.79	12.829	1.62201	1.690	2.389	PER IMP= 65.00
ROUTE MCUNGE	300.90	2	3	.14830	226.74	12.818	1.62064	1.710	2.389	CCODE = .2
ROUTE MCUNGE	300.91	3	2	.14830	226.69	12.812	1.61985	1.730	2.388	CCODE = .2
COMPUTE NM HYD	310.00	-	3	.08000	192.75	6.905	1.61833	1.520	3.765	PER IMP= 64.00
ADD HYD	310.10	2& 3	4	.22830	315.94	19.717	1.61932	1.670	2.162	
COMPUTE NM HYD	320.00	-	2	.07690	138.08	6.186	1.50835	1.590	2.805	PER IMP= 57.00
DIVIDE HYD	320.80	2	10	.06960	106.23	5.599	1.50835	1.590	2.385	
	320.81	and	11	.00730	31.85	.587	1.50835	1.590	6.818	
ROUTE MCUNGE	320.90	10	3	.06960	105.86	5.589	1.50563	1.640	2.376	CCODE = .2
ADD HYD	320.10	4& 3	4	.29790	420.74	25.306	1.59276	1.660	2.207	
COMPUTE NM HYD	400.00	-	2	.00410	6.67	.182	.83155	1.520	2.541	PER IMP= .00
ADD HYD	400.10	4& 2	4	.30200	424.62	25.488	1.58242	1.660	2.197	
*S ******** AP 400.30 **********INFLOW INTO WEXFORD POND**********										
*S**										
ROUTE RESERVOIR	400.90	4	5	.30200	142.59	25.483	1.58211	2.170	.738	AC-FT= 11.496
*S ********** AP 400.OUT (BEFORE DIVIDE) **********										
*S **********DIVIDE HYD TO UNBULK TO 3% **********										
DIVIDE HYD	UNBULK	5	1	.29294	138.31	24.718	1.58211	2.170	.738	
	SEDIMENT	and	53	.00906	4.28	.764	1.58211	2.170	.738	
*S DIVIDE INTO PIPE AND SPILLWAY FLOWS AP 400.OUT PIPE AND SPILL **********										
DIVIDE HYD	400.81	1	1	.29178	135.00	24.621	1.58211	1.940	.723	
	400.82	and	3	.00116	3.31	.098	1.58213	2.170	4.470	
ROUTE MCUNGE	400.90	1	6	.29178	135.00	24.608	1.58132	2.010	.723	CCODE = .2
ROUTE MCUNGE	400.91	3	2	.00116	3.33	.098	1.58604	2.230	4.497	CCODE = .2
ADD HYD	400.20	2& 6	6	.29294	138.33	24.706	1.58134	2.230	.738	
COMPUTE NM HYD	410.00	-	3	.03630	77.42	3.124	1.61368	1.550	3.332	PER IMP= 64.00
ADD HYD	410.10	6& 3	4	.32924	177.12	27.830	1.58491	1.570	.841	
ROUTE MCUNGE	410.90	4	2	.32924	176.27	27.804	1.58341	1.610	.837	CCODE = .2
COMPUTE NM HYD	420.00	-	3	.05160	141.08	5.264	1.91280	1.510	4.272	PER IMP= 85.00
ADD HYD	420.10	2& 3	14	.38084	298.72	33.068	1.62804	1.540	1.226	
COMPUTE NM HYD	330.00	-	2	.06330	140.67	5.590	1.65595	1.540	3.472	PER IMP= 67.00
ROUTE MCUNGE	330.90	2	3	.06330	140.04	5.577	1.65186	1.640	3.457	CCODE = .1
COMPUTE NM HYD	340.00	-	1	.04580	102.90	3.943	1.61432	1.530	3.510	PER IMP= 64.00
ADD HYD	340.10	1& 3	4	.10910	217.16	9.520	1.63610	1.610	3.110	
COMPUTE NM HYD	430.00	-	2	.00440	10.18	.358	1.52352	1.520	3.615	PER IMP= 57.00
ADD HYD	430.10	2& 4	4	.11350	224.35	9.877	1.63174	1.610	3.089	
ROUTE MCUNGE	430.90	4	3	.11350	224.07	9.871	1.63073	1.620	3.085	CCODE = .2
ROUTE MCUNGE	430.91	3	2	.11350	223.11	9.862	1.62919	1.640	3.071	CCODE = .2
ADD HYD	430.20	2&14	10	.49434	493.27	42.930	1.62830	1.590	1.559	
COMPUTE NM HYD	440.00	-	2	.01060	24.66	.869	1.53749	1.520	3.635	PER IMP= 58.00
ROUTE MCUNGE	440.90	11	3	.00730	31.76	.587	1.50867	1.610	6.799	CCODE = .2
ROUTE MCUNGE	440.91	3	5	.00730	31.68	.587	1.50701	1.660	6.783	CCODE = .1
ADD HYD	440.10	5& 2	4	.01790	45.63	1.456	1.52505	1.650	3.983	
ROUTE MCUNGE	440.92	4	2	.01790	45.15	1.454	1.52282	1.660	3.941	CCODE = .2
ROUTE MCUNGE	440.93	2	3	.01790	45.16	1.453	1.52222	1.680	3.943	CCODE = .2
ADD HYD	440.20	3&10	14	.51224	526.34	44.383	1.62459	1.620	1.605	
COMPUTE NM HYD	350.00	-	2	.04750	103.54	4.835	1.90867	1.590	3.406	PER IMP= 85.00
ROUTE MCUNGE	350.90	2	3	.04750	103.52	4.833	1.90792	1.600	3.405	CCODE = .2
ROUTE MCUNGE	350.91	3	2	.04750	103.48	4.827	1.90543	1.630	3.404	CCODE = .2
COMPUTE NM HYD	360.00	-	3	.01450	32.82	1.165	1.50621	1.520	3.536	PER IMP= 56.00
ADD HYD	360.10	2& 3	4	.06200	126.02	5.992	1.81206	1.610	3.176	

PK BF = 1.06

PAGE = 5

```
*S ADD THE TOTAL FLOW IN 20TH STREET AT THE NORTH SIDE OF SOUTHERN TO THE
*S TOTAL FLOW ROUTED TO THE INTERSECTION FROM THE NORTH AND THE WEST
*S THIS FLOW IS ROUTED UNDER SOUTHERN TO THE UNSER CHANNEL
*S ****************************  AP 360.20  ************************************
ADD HYD              360.20  4&14   5        .57424       652.14       50.375     1.64483   1.620   1.774
ROUTE MCUNGE         360.90    5    2        .57424       652.14       50.375     1.64483   1.620   1.774 CCODE =      .0
*S CONCRETE LINED PORTION OF UNSER CHANNEL
ROUTE MCUNGE         360.91    2    5        .57424       651.95       50.342     1.64377   1.630   1.774 CCODE =      .2
*S EARTH LINED PORTION OF UNSER CHANNEL
ROUTE MCUNGE         360.92    5    2        .57424       650.85       50.196     1.63899   1.710   1.771 CCODE =      .2
SEDIMENT BULK                                                                                             PK BF =    1.06
COMPUTE NM HYD       121.00    -    1        .25810       541.88       23.545     1.71042   1.570   3.280 PER IMP=   70.00
ADD HYD              121.10  1& 2   5        .83234      1086.71       73.740     1.66114   1.630   2.040
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * CONFLUENCE OF UNSER CHANNEL WITH WEST BRANCH ARROYO  * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
										PAGE = 6
ADD HYD	121.20	5& 9	5	3.97714	4554.17	226.004	1.06548	1.620	1.789	
*S *										
*S * * * START OF TRIBUTARY "A"						* * * * * * * * * *				
*S *										
COMPUTE NM HYD	153.00	-	1	.14660	191.66	9.880	1.26361	1.660	2.043	PER IMP= 38.00
ROUTE MCUNGE	153.90	1	4	.14660	191.67	9.877	1.26328	1.670	2.043	CCODE = .2
COMPUTE NM HYD	150.00	-	1	.08730	162.70	5.319	1.14230	1.520	2.912	PER IMP= 32.00
ROUTE MCUNGE	150.90	1	2	.08730	162.53	5.315	1.14149	1.540	2.909	CCODE = .2
COMPUTE NM HYD	152.00	-	1	.19840	297.64	12.195	1.15248	1.580	2.344	PER IMP= 32.00
ADD HYD	152.10	1& 2	6	.28570	453.53	17.510	1.14913	1.560	2.480	
ROUTE MCUNGE	152.90	6	2	.28570	453.51	17.505	1.14883	1.570	2.480	CCODE = .1
COMPUTE NM HYD	151.00	-	1	.15130	286.88	9.701	1.20217	1.530	2.963	PER IMP= 34.00
ROUTE MCUNGE	151.90	1	3	.15130	286.57	9.699	1.20191	1.530	2.959	CCODE = .1
ADD HYD	152.10	2& 3	6	.43700	729.64	27.204	1.16721	1.560	2.609	
ROUTE MCUNGE	152.91	6	2	.43700	729.23	27.198	1.16695	1.560	2.607	CCODE = .1
*S **************************** AP 153.10 ************************************										
ADD HYD	153.10	4& 2	6	.58360	884.06	37.075	1.19115	1.580	2.367	
*S *										
*S ROUTE HYD. THROUGH TRIBUTARY "A" DAM										
*S *										
ROUTE RESERVOIR	TRIBA.DAM	6	2	.58360	3.58	1.233	.03963	5.990	.010	AC-FT= 35.841
*S ************DIVIDE HYD TO UNBULK BY 3% **********************										
DIVIDE HYD	UNBULK	2	2	.56609	3.48	1.196	.03963	5.990	.010	
	SEDIMENT	and	54	.01751	.11	.037	.03963	5.990	.010	
ROUTE MCUNGE	153.91	2	6	.56609	3.48	1.175	.03891	5.990	.010	CCODE = .2
COMPUTE NM HYD	154.00	-	1	.21910	357.58	13.089	1.12011	1.550	2.550	PER IMP= 29.00
ADD HYD	154.10	1& 6	6	.78519	357.73	14.263	.34060	1.550	.712	
ROUTE MCUNGE	154.90	6	2	.78519	357.31	14.231	.33983	1.590	.711	CCODE = .2
COMPUTE NM HYD	159.00	-	1	.06000	146.57	5.303	1.65712	1.520	3.817	PER IMP= 67.00
ADD HYD	159.10	1& 2	6	.84519	479.84	19.534	.43334	1.570	.887	
*S * * * CONFLUENCE OF TRIB. "A" WITH WEST BRANCH ARROYO * * * * * *										
*S BLACK ARROYO @ UNSER BLVD. (WEST BRANCH)										
*S ****************************** BLWMP AP 159.20 **************************										
ADD HYD	159.20	5& 6	5	4.82233	5003.86	245.537	.95469	1.610	1.621	
*S PUNCH AND ADJUST HYDROGRAPH TO DELETE "FIRST FLUSH" RUNOFF AND SEND TO										
*S WATER QUALITY PONDS WHICH IS ESSENTIALLY OUT OF THE SYSTEM THROUGH TIMING.										
RECALL HYD	159.20	-	5	4.82230	5003.86	245.537	.95469	1.610	1.621	
*S CABEZON REVISIONS PHASE 2 BEGIN HERE; BLWMP SUBBASINS 253,160 ARE REMOVED										
*S 253 REPLACED BY CABEZON COMMERCIAL TRACT 12 (DRAINS TO WEST BRANCH)										
*S AND 7A, 7B, 7C (ALL DRAIN TO POND IN TRACT 17 WHICH GOES TO EAST										

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*S  BRANCH); 160 IS WEST BRANCH, REPLACED BY A_6
*S  Commercial Unit 12
COMPUTE NM HYD          12.00   -     1        .01560        43.14        1.592      1.91297    1.510    4.321 PER IMP=  85.00
ADD HYD                 12.10  1& 5   6       4.83790      5032.68      247.129       .95779    1.610    1.625
ROUTE MCUNGE            12.90    6    5       4.83790      5031.78      246.904       .95691    1.630    1.625 CCODE =      .2
*S  BLWMP FILE RESUMES BELOW
COMPUTE NM HYD         156.00   -     1        .22940       467.47       15.354      1.25499    1.520    3.184 PER IMP=  36.00
ROUTE MCUNGE           156.90    1    2        .22940       465.95       15.337      1.25357    1.550    3.174 CCODE =      .2
COMPUTE NM HYD         157.00   -     1        .18890       395.16       13.688      1.35868    1.520    3.269 PER IMP=  45.00
ADD HYD                157.10  1& 2   6        .41830       849.19       29.025      1.30104    1.540    3.172
COMPUTE NM HYD         158.00   -     1        .08160       210.24        7.766      1.78439    1.520    4.026 PER IMP=  77.00
ROUTE MCUNGE           158.90    1    3        .08160       210.24        7.761      1.78323    1.530    4.026 CCODE =      .2
ADD HYD                158.10  3& 6   6        .49990      1057.67       36.786      1.37975    1.540    3.306
*S UNSER GATEWAY DAM
ROUTE RESERVOIR    GATE.POND    6    3        .49990       622.62       36.697      1.37641    1.670    1.946 AC-FT=   10.452
*S **************DIVIDE HYD TO UNBULK BY 3% **********************
DIVIDE HYD             UNBULK   3    3        .48490       603.94       35.596      1.37641    1.670    1.946
                     SEDIMENT  and   55        .01500        18.68        1.101      1.37641    1.670    1.946
ROUTE MCUNGE           158.91   3    2        .48490       603.98       35.581      1.37585    1.690    1.946 CCODE =      .2
*S  CABEZON REVISIONS PHASE 2 RESUME BELOW; BLWMP SUBBASINS 620,161 REMOVED
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION


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*S  620 REPLACED BY OFFSITE TRACT 13, 161 REPLACED BY OFFSITE TRACT 14
*S  (ALL DRAIN TO WEST BRANCH); PART OF BLWMP 650 ALSO REMOVED
*S  THIS TAKES WEST BRANCH TO DAM
ADD HYD                 12.91  5& 2   6       5.32280      5612.00      282.486       .99508    1.630    1.647
ROUTE MCUNGE            12.99    6    5       5.32280      5613.00      282.387       .99473    1.640    1.648 CCODE =      .2
*S ADJUST SEDIMENT BULK
SEDIMENT BULK                                                                                              PK BF =    1.06
*S COMPUTE CABEZON SUBBASIN 13
COMPUTE NM HYD          13.00   -     1        .07890       217.79        8.050      1.91294    1.510    4.313 PER IMP=  85.00
ADD HYD                 13.10  1& 5   5       5.40170      5738.23      290.437      1.00814    1.640    1.660
*S COMPUTE CABEZON SUBBASIN 14
COMPUTE NM HYD          14.00   -     1        .09090       231.21        8.837      1.82276    1.520    3.974 PER IMP=  80.00
ADD HYD                 14.10  1& 5   5       5.49260      5887.80      299.273      1.02162    1.630    1.675
ROUTE MCUNGE            14.90    5    2       5.49260      5887.27      299.192      1.02135    1.640    1.675 CCODE =      .1
*S  Area of 650 is reduced by area that it overlaps
*S   CABEZON basins
COMPUTE NM HYD         650.00   -     1        .03730        64.55        1.866       .93821    1.520    2.704 PER IMP=   9.00
ADD HYD                650.91  1& 2   5       5.52990      5928.51      301.059      1.02079    1.640    1.675
*S WEST BRANCH ARROYO BETWEEN 13 AND 14, SOUTH FROM WESTSIDE BLVD
COMPUTE NM HYD           A_6   -     1        .04620       106.58        3.618      1.46839    1.510    3.605 PER IMP=  50.00
*S   BLACK'S ARROYO (WEST BRANCH) @ DAM
ADD HYD                650.99  1& 5  11       5.57610      5991.48      304.677      1.02450    1.640    1.679
*S  END OF THE BLACK'S ARROYO WEST BRANCH
*S  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S  BEGINING OF THE BLACK'S ARROYO EAST BRANCH
*S   End of West Branch-  Beginning of East Branch
*S   THE FOLLOWING ARE CABEZON PHASE 1 REVISIONS
*S   BEGIN WITH CABEZON SUBBASINS THAT DRAIN TO WESTERN HILLS SD
*S   WHICH REPLACE TRIBUTARY B AND ARROYO D
*S   BLWMP SUBBASINS 251,252,250,254 REMOVED
*S   251 REPLACED BY TRACTS 3A,3B; 252 REPLACED BY TRACTS 4A,4B;
*S   250 REPLACED BY TRACTS 3B,11,7A; 254 REPLACED BY 17,7A,7C
SEDIMENT BULK                                                                                              PK BF =    1.06
*S Following is the Northwest corner of offsites and Subbasin 3A
*S It will be held on ID=4
COMPUTE NM HYD         Off_1A   -     1        .00540        14.95         .551      1.91298    1.510    4.324 PER IMP=  85.00
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*S  ROUTE OFF_1A through existing pond
*S  Pond Exists in field; Volume and outflow assumed to
*S  limit flowrate to predevelopment level
*S
ROUTE RESERVOIR        P.Out    1   17        .00540          5.19          .551      1.91268    1.800    1.501 AC-FT=      .201
*S **************DIVIDE HYD TO UNBULK BY 3% ***********************
DIVIDE HYD            UNBULK   17   17        .00524          5.03          .534      1.91266    1.800    1.501
                    SEDIMENT  and   56        .00016           .16          .017      1.91266    1.800    1.501
ROUTE MCUNGE        Off_1A.9   17    2        .00524          5.03          .534      1.91272    1.820    1.501 CCODE =      .2
COMPUTE NM HYD        Off_1C    -    1        .00540         11.21          .361      1.25307    1.510    3.244 PER IMP=   34.30
ADD HYD              Off1C.1  1& 2    2        .01064         15.26          .894      1.57614    1.520    2.241
COMPUTE NM HYD          21ST    -    1        .00100          2.83          .105      1.96588    1.510    4.423 PER IMP=   90.00
ADD HYD              21ST.1  1& 2    2        .01164         18.07          .999      1.60963    1.520    2.427
ROUTE MCUNGE         21ST.9    2    3        .01164         18.08          .995      1.60297    1.610    2.428 CCODE =      .2
COMPUTE NM HYD        Off_1B    -    1        .00560         15.50          .571      1.91298    1.510    4.324 PER IMP=   85.00
*S  ROUTE OFF_1B through existing pond
*S  Pond Exists in field; Total volume = 0.22 ac-ft
*S  limited flowrate to predevelopment level
*S
ROUTE RESERVOIR        P.Out    1   17        .00560          5.26          .571      1.91279    1.820    1.469 AC-FT=      .212
*S **************DIVIDE HYD TO UNBULK BY 3% ***********************
DIVIDE HYD            UNBULK   17   17        .00543          5.11          .554      1.91277    1.820    1.469
                    SEDIMENT  and   57        .00017           .16          .017      1.91278    1.820    1.469
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 8 NOTATION
ROUTE MCUNGE	Off_1B.9	17	2	.00543	5.11	.554	1.91282	1.840	1.469	CCODE = .2
COMPUTE NM HYD	Off_1D	-	1	.00470	8.90	.279	1.11394	1.520	2.959	PER IMP= 27.00
ADD HYD	Off1D.1	1& 2	2	.01013	13.03	.832	1.54038	1.530	2.010	
COMPUTE NM HYD	22ND	-	1	.00100	2.83	.105	1.96588	1.510	4.423	PER IMP= 90.00
ADD HYD	22ND.1	1& 2	2	.01113	15.83	.937	1.57860	1.520	2.222	
ROUTE MCUNGE	22ND.9	2	1	.01113	15.83	.937	1.57768	1.540	2.222	CCODE = .2
COMPUTE NM HYD	Off_2B	-	2	.00470	13.01	.480	1.91299	1.510	4.325	PER IMP= 85.00
*S ROUTE OFF_2B through existing pond										
*S Pond Exists in field; Total volume = 0.18 ac-ft										
*S limited flowrate to predevelopment level										
ROUTE RESERVOIR	P.Out	2	17	.00470	4.90	.479	1.91284	1.760	1.629	AC-FT= .163
*S **************DIVIDE HYD TO UNBULK BY 3% ***********************										
DIVIDE HYD	UNBULK	17	17	.00456	4.75	.465	1.91282	1.760	1.629	
	SEDIMENT	and	58	.00014	.15	.014	1.91282	1.760	1.629	
ADD HYD	Off2B.1	1&17	2	.01569	20.06	1.401	1.67445	1.540	1.998	
ROUTE MCUNGE	OFF2B.9	2	1	.01569	20.08	1.398	1.67014	1.600	1.999	CCODE = .2
*S ADD 21ST and 22ND STs offsite routed flows										
ADD HYD	Off2B.91	1& 3	2	.02733	38.07	2.393	1.64154	1.610	2.177	
COMPUTE NM HYD	3A	-	1	.05440	125.52	4.343	1.49678	1.510	3.605	PER IMP= 55.40
ADD HYD	3A.1	1& 2	4	.08173	144.75	6.735	1.54519	1.530	2.767	
*S										
*S Area coming down 24th to project										
COMPUTE NM HYD	Off_3A	-	1	.00880	24.34	.898	1.91297	1.510	4.322	PER IMP= 85.00
*S Use roadway cross-section to route Off_3A thru Off_3C although there is										
*S not one presently there										
ROUTE MCUNGE	OFF3A.9	1	2	.00880	24.32	.897	1.91128	1.530	4.318	CCODE = .2
COMPUTE NM HYD	Off_3C	-	1	.00630	11.93	.374	1.11393	1.520	2.958	PER IMP= 27.00
ADD HYD	Off3C.1	1& 2	2	.01510	36.21	1.271	1.57862	1.520	3.747	
COMPUTE NM HYD	24th	-	1	.00140	3.96	.147	1.96585	1.510	4.415	PER IMP= 90.00
ADD HYD	24TH.1	1& 2	2	.01650	40.15	1.418	1.61147	1.520	3.802	
ROUTE MCUNGE	24TH.9	2	5	.01650	40.12	1.416	1.60898	1.560	3.799	CCODE = .2
COMPUTE NM HYD	Off_3B	-	1	.01190	32.91	1.214	1.91297	1.510	4.322	PER IMP= 85.00
ROUTE MCUNGE	Off_3B.9	1	2	.01190	32.90	1.214	1.91227	1.520	4.320	CCODE = .2

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	Off_3D	-	1	.00310	5.88	.184	1.11395	1.520	2.962	PER IMP= 27.00
ADD HYD	OFF3D.1	1& 2	2	.01500	38.78	1.398	1.74728	1.520	4.039	
COMPUTE NM HYD	25th	-	1	.00140	3.96	.147	1.96585	1.510	4.415	PER IMP= 90.00
ADD HYD	25TH.1	1& 2	2	.01640	42.71	1.545	1.76594	1.520	4.069	
ROUTE MCUNGE	25TH.9	2	1	.01640	42.70	1.542	1.76296	1.560	4.068	CCODE = .2
ADD HYD	25TH.91	1& 5	2	.03290	82.82	2.958	1.68574	1.560	3.933	
COMPUTE NM HYD	4A	-	1	.05920	135.39	4.665	1.47738	1.510	3.573	PER IMP= 53.90
ADD HYD	4A.1	1& 2	6	.09210	210.68	7.622	1.55181	1.530	3.574	
*S **********										
*S STORM DRAIN MAIN LINE										
*S **********										
*S SUBBASIN 211 from BLWMP (Modified 9/03)										
COMPUTE NM HYD	211A	-	2	.13920	294.47	12.909	1.73882	1.570	3.305	PER IMP= 73.00
ROUTE MCUNGE	211.90	2	19	.13920	257.35	12.533	1.68822	1.740	2.889	CCODE = .2
*S Run predevelopment for 211B										
*S Field investigation shows extensive detention/retention										
*S on this site										
COMPUTE NM HYD	211B	-	1	.03670	33.03	.917	.46846	1.530	1.406	PER IMP= .00
*S Current condition of 211B										
COMPUTE NM HYD	211B	-	1	.03670	100.35	3.744	1.91280	1.510	4.272	PER IMP= 85.00
*S ROUTE 211B through EXISTING POND										
*S Southern Plaza has ponds, as do the other										
*S individual businesses										
*S Limited flowrate to predevelopment level										
*S										
ROUTE RESERVOIR	P.Out	1	17	.03670	32.62	3.744	1.91258	1.840	1.389	AC-FT= 1.540
*S **********DIVIDE HYD TO UNBULK BY 3% **********										
DIVIDE HYD	UNBULK	17	17	.03560	31.64	3.631	1.91258	1.840	1.389	
	SEDIMENT	and	59	.00110	.98	.112	1.91257	1.840	1.389	
COMPUTE NM HYD	211C	-	18	.00520	14.48	.545	1.96562	1.510	4.352	PER IMP= 90.00
ADD HYD	211.10	17&19	2	.17480	288.69	16.154	1.73275	1.740	2.581	
ADD HYD	211.20	2&18	1	.18000	294.62	16.699	1.73948	1.740	2.558	
ROUTE MCUNGE	211.91	1	2	.18000	294.29	16.694	1.73899	1.740	2.555	CCODE = .2
COMPUTE NM HYD	Off_2A	-	1	.00560	15.50	.571	1.91298	1.510	4.324	PER IMP= 85.00
ROUTE MCUNGE	OFF2A.9	1	5	.00560	15.49	.571	1.91029	1.540	4.322	CCODE = .2
ADD HYD	211.92	5& 2	2	.18560	301.20	17.265	1.74416	1.740	2.536	
COMPUTE NM HYD	Off_2C	-	1	.00470	8.90	.279	1.11394	1.520	2.959	PER IMP= 27.00
ADD HYD	OFF2C.1	1& 2	2	.19030	304.53	17.544	1.72860	1.740	2.500	
COMPUTE NM HYD	23RD	-	1	.00140	3.96	.147	1.96585	1.510	4.415	PER IMP= 90.00
ADD HYD	23RD.1	1& 2	2	.19170	306.12	17.691	1.73033	1.740	2.495	
ROUTE MCUNGE	23RD.9	2	1	.19170	305.88	17.683	1.72961	1.750	2.493	CCODE = .2
ADD HYD	23RD.91	1& 4	2	.27343	428.94	24.419	1.67449	1.580	2.451	
ROUTE MCUNGE	23RD.92	2	3	.27343	428.74	24.414	1.67413	1.580	2.450	CCODE = .2
*S Bring in the Flow from Subbasin 4A										
ADD HYD	23RD.93	3& 6	2	.36553	625.87	32.036	1.64331	1.560	2.675	
ROUTE MCUNGE	23RD.94	2	3	.36553	622.63	32.014	1.64218	1.580	2.662	CCODE = .2
COMPUTE NM HYD	3B	-	1	.06210	143.86	4.987	1.50563	1.510	3.620	PER IMP= 56.10
ADD HYD	3B.1	1& 3	3	.42763	742.99	37.001	1.62235	1.560	2.715	
*S Run a predevelopment for commercial lot (11) to determine										
*S the maximum permissible pond outflow										
COMPUTE NM HYD	11.00	-	1	.01560	14.32	.390	.46846	1.530	1.434	PER IMP= .00
*S Real Unit 11										
COMPUTE NM HYD	11.00	-	1	.01560	43.14	1.592	1.91297	1.510	4.321	PER IMP= 85.00
*S ROUTE Unit 11 through pond that will be required										
*S limit flowrate to predevelopment level										
*S										

ROUTE RESERVOIR	P.Out	1	17	.01560	14.16	1.592	1.91293	1.820	1.418	AC-FT= .616
*S ***********DIVIDE HYD TO UNBULK BY 3% **********										
DIVIDE HYD	UNBULK	17	17	.01513	13.73	1.544	1.91293	1.820	1.418	
	SEDIMENT	and	59	.00047	.42	.048	1.91293	1.820	1.418	
ROUTE MCUNGE	11.90	17	2	.01513	13.73	1.544	1.91285	1.840	1.418	CCODE = .2
COMPUTE NM HYD	R_2	-	1	.00670	17.11	.605	1.69262	1.510	3.990	PER IMP= 66.00
ADD HYD	R_2.1	1& 2	2	.02183	27.42	2.147	1.84380	1.530	1.963	
ADD HYD	3B.2	2& 3	2	.44946	769.72	39.148	1.63311	1.560	2.676	
COMPUTE NM HYD	R_1	-	1	.00660	17.82	.651	1.84836	1.510	4.220	PER IMP= 80.00
ADD HYD	3B.3	1& 2	2	.45606	785.36	39.798	1.63623	1.560	2.691	
ROUTE MCUNGE	3B.9	2	1	.45606	780.51	39.765	1.63487	1.580	2.674	CCODE = .2
*S INSERT BHI HYDROLOGY										
COMPUTE NM HYD	BASINA	-	3	.00680	15.30	.532	1.46814	1.520	3.516	PER IMP= 53.20
*S**********										
*S BASIN B										
COMPUTE NM HYD	BASINB	-	4	.01506	33.87	1.179	1.46812	1.520	3.514	PER IMP= 53.20
*S**********										
*S ADD BASINS A AND B										
ADD HYD	A.B	3& 4	5	.02186	49.17	1.712	1.46813	1.520	3.514	
*S**********										
*S BASIN C										
COMPUTE NM HYD	BASINC	-	6	.00834	18.76	.653	1.46813	1.520	3.515	PER IMP= 53.20
*S**********										
*S ADD BASINS A, B, AND C (INTO MH 15)										
ADD HYD	A.B.C	5& 6	7	.03020	67.93	2.365	1.46813	1.520	3.515	
*S**********										
*S ADD 3B.9 AND BHI A.B.C										
ADD HYD	7B.9	1& 7	7	.48626	837.67	42.130	1.62452	1.570	2.692	
*S BASIN D										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	PAGE = 10
COMPUTE NM HYD	BASIND	-	1	.00659	14.96	.523	1.48753	1.520	3.548	PER IMP= 54.70	
*S**********											
*S BASIN E											
COMPUTE NM HYD	BASINE	-	2	.01501	34.06	1.191	1.48752	1.520	3.545	PER IMP= 54.70	
*S**********											
*S BASIN F											
COMPUTE NM HYD	BASINF	-	3	.00745	16.91	.591	1.48753	1.520	3.547	PER IMP= 54.70	
*S**********											
*S ADD BASINS E AND F											
ADD HYD	E.F	2& 3	2	.02246	50.97	1.782	1.48752	1.520	3.546		
*S**********											
*S BASIN G											
COMPUTE NM HYD	BASING	-	3	.01266	28.73	1.004	1.48752	1.520	3.546	PER IMP= 54.70	
*S**********											
*S ADD BASINS E,F,AND G											
ADD HYD	E.F.G	3& 2	2	.03512	79.70	2.786	1.48752	1.520	3.546		
*S**********											
*S ADD BASINS D,E,F,AND G											
ADD HYD	D.G	2& 1	2	.04171	94.66	3.309	1.48752	1.520	3.546		
*S**********											
*S BASIN H											
COMPUTE NM HYD	BASINH	-	3	.01263	27.90	.963	1.42964	1.520	3.452	PER IMP= 50.20	
*S**********											
*S BASIN I											
COMPUTE NM HYD	BASINI	-	1	.00596	13.18	.454	1.42965	1.520	3.455	PER IMP= 50.20	
*S**********											
*S ADD BASINS H AND I											

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ADD HYD              H.I  1& 3   3        .01859        41.08        1.417      1.42964    1.520    3.453
*S*************************************************************************************
*S                          BASIN J
COMPUTE NM HYD     BASINJ    -     1        .00170         3.84         .133      1.46819    1.520    3.528 PER IMP=  53.20
*S*************************************************************************************
*S                          ADD BASINS H,I AND J
ADD HYD            H.I.J  1& 3   3        .02029        44.92        1.551      1.43287    1.520    3.459
*S*************************************************************************************
*S                          ADD BASINS D,E,F,G AND H,I,J (INTO MH 18)
ADD HYD          EFG.HIJ  2& 3   2        .06200       139.58        4.860      1.46964    1.520    3.518
*S   END BHI HYDROLOGY, FOLLOWING WCEA BASINS OMITTED**************************
*S  ADD BHI EFG.HIJ AND PREVIOUSLY ADDED 7B.9
ADD HYD             7B.91  2& 7   2        .54826       962.16       46.990      1.60700    1.560    2.742
COMPUTE NM HYD      17.00    -    1        .02340        37.57        1.110       .88923    1.520    2.509 PER IMP=  15.00
ADD HYD             17.10  1& 2   3        .57166       996.91       48.099      1.57762    1.550    2.725
COMPUTE NM HYD         4B    -    1        .04810       110.52        3.816      1.48762    1.510    3.590 PER IMP=  54.70
*S  Route 4B to the Intersection of Cabezon and Trailside
ROUTE MCUNGE         4B.9    1    2        .04810       110.33        3.814      1.48669    1.530    3.584 CCODE =     .2
COMPUTE NM HYD        R_3    -    1        .00520        13.28         .469      1.69263    1.510    3.991 PER IMP=  66.00
*S  Add 4B and Road Section 3
ADD HYD             4B.91  1& 2   2        .05330       123.35        4.283      1.50679    1.530    3.616
COMPUTE NM HYD         5A    -    1        .03130        72.52        2.513      1.50563    1.510    3.620 PER IMP=  56.10
*S  Add 4B.91 and 5A at Intersection of Cabezon and Trailside
ADD HYD             5A.1  1& 2   2        .08460       195.66        6.797      1.50636    1.520    3.614
ROUTE MCUNGE        5A.9    2    1        .08460       195.09        6.793      1.50559    1.530    3.603 CCODE =     .2
ADD HYD           POND.IN  1& 3   1        .65626      1189.09       54.893      1.56833    1.550    2.831
*S  ROUTE FLOWS THROUGH Pond/Park in Unit 17
*S  Pond Based on final design grades with 7 ac-ft of
*S  low storage/WQ and then filling remainder of park/field
*S  graded at 2%
ROUTE RESERVOIR      P.Out    1    2        .65626       475.42       54.264      1.55038    1.900    1.132 AC-FT=   20.297
*S *************DIVIDE HYD TO UNBULK BY 3% ***********************
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
DIVIDE HYD	P.Out.3	2	2	.63657	461.15	52.636	1.55038	1.900	1.132	
	SEDIMENT	and	51	.01969	14.26	1.628	1.55038	1.900	1.132	
*S Route unbulked pond outflow at 17 to east end of 15										
*S through a 60" pipe										
ROUTE MCUNGE	P.Out.9	2	1	.63657	460.35	52.572	1.54850	1.960	1.130	CCODE = .2
*S END OF CABEZON PHASE 1, BEGIN PHASE 2 DEVELOPMENT										
*S BLWMP SUBBASINS 255,256,540,530B REMOVED;										
*S 255 REPLACED BY TRACTS 15,16; 256 REPLACED BY 8,9,18;										
*S 540 REPLACED BY 10,20; 530B REPLACED BY 10,20										
COMPUTE NM HYD	15.00	-	2	.02300	61.11	2.237	1.82340	1.510	4.152	PER IMP= 80.00
ADD HYD	15.10	1& 2	2	.65957	475.98	53.399	1.51800	1.900	1.128	
ROUTE MCUNGE	15.90	2	1	.65957	475.99	53.382	1.51752	1.920	1.128	CCODE = .2
COMPUTE NM HYD	7D	-	2	.07932	178.24	6.092	1.43997	1.510	3.511	PER IMP= 51.00
ADD HYD	7D.1	1& 2	2	.73889	588.86	59.474	1.50919	1.550	1.245	
ROUTE MCUNGE	7D.91	2	1	.73889	588.25	59.462	1.50889	1.560	1.244	CCODE = .2
COMPUTE NM HYD	18.00	-	2	.00780	12.54	.370	.88924	1.520	2.511	PER IMP= 15.00
ADD HYD	18.10	1& 2	2	.74669	599.80	59.832	1.50242	1.560	1.255	
COMPUTE NM HYD	16.00	-	1	.03090	70.39	2.392	1.45146	1.510	3.560	PER IMP= 50.00
ADD HYD	18.20	1& 2	2	.77759	664.23	62.224	1.50039	1.550	1.335	
*S Route combined flow at 18 to East Branch										
*S through a 78" pipe										
ROUTE MCUNGE	18.90	2	3	.77759	662.80	62.198	1.49977	1.570	1.332	CCODE = .2
COMPUTE NM HYD	8.00	-	1	.02970	69.29	2.410	1.52115	1.510	3.645	PER IMP= 57.30
ADD HYD	8.10	3& 1	12	.80729	723.38	64.607	1.50056	1.560	1.400	

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*S  ABOVE IS ALL FLOW TO EAST BRANCH VIA TRIBUTARY B CONTRIBUTING AREA
*S  RESUME BLWMP FILE
*S*********************************************************************************
*S     East Branch Main Channel
*S*************************************************************************
*S * * * START OF LEMA CHANNEL                                          * * * * * * *
SEDIMENT BULK                                                                                                    PK BF =      1.06
COMPUTE NM HYD          201.00   -     1        .24840      492.25       19.609     1.48017     1.550      3.096 PER IMP=   54.00
ROUTE MCUNGE            201.90   1     2        .24840      492.14       19.597     1.47927     1.570      3.096 CCODE =       .2
COMPUTE NM HYD          204.00   -     1        .01500       36.36        1.303     1.62914     1.520      3.788 PER IMP=   65.00
ADD HYD                 204.10  1& 2   5        .26340      523.81       20.901     1.48780     1.560      3.107
*S * * * START OF SNEAD CHANNEL                                         * * * * * * *
COMPUTE NM HYD          205.00   -     1        .09140      163.45        7.382     1.51440     1.590      2.794 PER IMP=   57.00
*S * * * CONFLUENCE OF LEMA AND SNEAD                                   * * * * * * *
ADD HYD                 205.10  5& 1   5        .35480      684.20       28.283     1.49466     1.570      3.013
ROUTE MCUNGE            205.90   5     2        .35480      683.84       28.269     1.49394     1.580      3.012 CCODE =       .2
COMPUTE NM HYD          202.00   -     1        .12390      238.31       11.112     1.68166     1.600      3.005 PER IMP=   69.00
ROUTE MCUNGE            202.90   1     4        .12390      238.17       11.073     1.67562     1.680      3.004 CCODE =       .2
COMPUTE NM HYD          203.00   -     1        .05390       89.39        4.549     1.58239     1.640      2.591 PER IMP=   62.00
*S    WESTERN HILLS DR. @ BLACK'S ARROYO (EAST BRANCH)
*S * * * AP 203.10 * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                 203.10  4& 1   5        .17780      325.61       15.621     1.64736     1.670      2.861
ADD HYD                 203.20  5& 2   5        .53260      954.01       43.891     1.54516     1.610      2.799
ROUTE MCUNGE            203.91   5     2        .53260      952.98       43.836     1.54325     1.640      2.796 CCODE =       .2
COMPUTE NM HYD          212.00   -     1        .09950      182.73        8.389     1.58080     1.600      2.870 PER IMP=   62.00
ADD HYD                 212.10  1& 2   5        .63210     1129.66       52.225     1.54916     1.630      2.792
COMPUTE NM HYD          213.00   -     1        .10800      199.46        9.345     1.62238     1.600      2.886 PER IMP=   65.00
ROUTE MCUNGE            213.90   1     4        .10800      199.45        9.342     1.62184     1.610      2.886 CCODE =       .2
ADD HYD                 213.20  5& 4   4        .74010     1326.76       61.567     1.55976     1.630      2.801
*S * * * START OF NICKLAUS CHANNEL                            * * * * * * * *
COMPUTE NM HYD          214.00   -     1        .19090      318.14       15.689     1.54100     1.630      2.604 PER IMP=   59.00
ROUTE MCUNGE            214.90   1     2        .19090      317.53       15.670     1.53906     1.680      2.599 CCODE =       .1
COMPUTE NM HYD          216.00   -     1        .09660      179.81        7.821     1.51801     1.580      2.908 PER IMP=   57.00
*S    COMBINE HYD.'S  214.9     AND    216        AT  216.1
*S
*S    CASPER DR. @ 150 FT. W. OF NICKLAUS DR.

                                  FROM   TO                  PEAK        RUNOFF                TIME TO    CFS      PAGE =  12
                    HYDROGRAPH     ID    ID       AREA     DISCHARGE     VOLUME     RUNOFF      PEAK      PER
COMMAND           IDENTIFICATION   NO.   NO.    (SQ MI)      (CFS)      (AC-FT)    (INCHES)   (HOURS)    ACRE       NOTATION

*S * * * * * AP 216.10 * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                 216.10  1& 2   6        .28750      471.74       23.490     1.53199     1.650      2.564
COMPUTE NM HYD          215.00   -     1        .11020      170.19        9.130     1.55347     1.670      2.413 PER IMP=   60.00
ROUTE MCUNGE            215.90   1     3        .11020      170.15        9.109     1.54986     1.730      2.413 CCODE =       .2
ADD HYD                 216.20  6& 3   6        .39770      626.16       32.600     1.53694     1.670      2.460
*S * * * AFTER SNEAD AND NICKLAUS CONFLUENCE                            * * * * * * *
*S  *************************** AP 216.30 *************************************
ADD HYD                 216.30  6& 4   5       1.13780     1938.16       94.167     1.55179     1.640      2.662
COMPUTE NM HYD            217B   -     2        .06660       73.79        3.741     1.05324     1.660      1.731 PER IMP=   26.00
*S ROUTE 217B DOWN SOUTHERN TO THE PLAYERS CHANNEL
ROUTE MCUNGE           217B.90   2     3        .06660       73.79        3.738     1.05223     1.690      1.731 CCODE =       .2
COMPUTE NM HYD            217A   -     1        .19020      243.63       12.120     1.19479     1.650      2.001 PER IMP=   36.00
*S    COMBINE HYD.'S 217A AND 217B AT PLAYERS CHANNEL
ADD HYD                217A.10  1& 3   1        .25680      315.58       15.857     1.15782     1.660      1.920
*S * * * EAST BRANCH CROSSING SOUTHERN BLVD.                            * * * * * * *
*S   SOUTHERN BLVD. @ 2100 FT. W. OF GOLF COURSE RD.
*S  ************************** BLWMP AP 217.20 ******************************
ADD HYD                 217.20  5& 1   5       1.39460     2251.93      110.024     1.47924     1.640      2.523
*S  CABEZON PHASE 2 REVISIONS RESUME BELOW; FLOW FROM EAST BRANCH NORTH OF
*S  SOUTHERN BLVD ROUTED IN IMPROVED EAST BRANCH
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*S SEDIMENT BULK AT 6% FOR CABEZON LINED CHANNEL
SEDIMENT BULK                                                                                          PK BF =     1.06
ROUTE MCUNGE           217.90    5    2       1.39460      2251.58      109.989     1.47877    1.660    2.523 CCODE =      .1
*S  CABEZON PHASE 2 REVISIONS: BLWMP SUBBASINS 218A,218B,219,220 REMOVED;
*S  218A REPLACED BY OFF_4,OFF_5,TRACT 6; 218B REPLACED BY TRACTS 19,1;
*S  219 REPLACED BY TRACTS 5A,5B,5C,2,OFF_4,OFF_6,OFF_7,OFF_8,A_1(CHANNEL);
*S  220 REPLACED BY TRACTS 8,2
COMPUTE NM HYD          Off_4    -    1        .04980       107.82        3.574     1.34573    1.510    3.383 PER IMP=  42.00
ADD HYD              Off_4.10  2& 1   2       1.44440      2309.92      113.564     1.47419    1.660    2.499
COMPUTE NM HYD          Off_5    -    1        .02540        58.18        1.991     1.46970    1.510    3.579 PER IMP=  52.00
ADD HYD              Off_5.10  2& 1   1       1.46980      2341.40      115.554     1.47411    1.650    2.489
ROUTE MCUNGE         Off_5.90    1    2       1.46980      2341.46      115.500     1.47341    1.680    2.489 CCODE =      .2
COMPUTE NM HYD          Off_6    -    1        .02620        56.73        1.880     1.34573    1.510    3.383 PER IMP=  42.00
ADD HYD              Off_6.10  2& 1   2       1.49600      2369.40      117.380     1.47118    1.680    2.475
ROUTE MCUNGE         Off_6.90    2    1       1.49600      2369.15      117.342     1.47070    1.690    2.474 CCODE =      .1
COMPUTE NM HYD           6.00    -    3        .09570       222.48        7.737     1.51585    1.510    3.632 PER IMP=  56.90
COMPUTE NM HYD          19.00    -    2        .00780        12.54         .370      .88924    1.520    2.511 PER IMP=  15.00
ADD HYD                 19.10  3& 2   2        .10350       234.96        8.107     1.46863    1.510    3.547
*S * * * START OF GOLF COURSE CHANNEL                                  * * * * * * *
SEDIMENT BULK                                                                                          PK BF =     1.06
*S GOLF COURSE ROAD STORM DRAIN SYSTEM WITH TWO OUTFALLS UPSTREAM OF
*S 23RD AVENUE PONDS
*S  BLWMP SUBBASIN 500, SW CORNER OF SOUTHERN AND GOLF COURSE
COMPUTE NM HYD         500.00    -    3        .02610        53.84        2.200     1.58042    1.560    3.223 PER IMP=  60.00
*S ROUTE 500 IN TYPICAL ROADWAY CROSS-SECTION TO EAST BRANCH
ROUTE MCUNGE           500.90    3    4        .02610        53.83        2.196     1.57762    1.600    3.223 CCODE =      .2
*S  COMBINE 19.10 AND 500.90 AT 19.20
ADD HYD                 19.20  4& 2   2        .12960       272.92       10.303     1.49058    1.530    3.290
ADD HYD                 19.30  2& 1   2       1.62560      2523.49      127.645     1.47229    1.690    2.426
COMPUTE NM HYD          Off_7    -    1        .01060        22.96         .761     1.34574    1.510    3.385 PER IMP=  42.00
*S Route Off_7 through Off_8 to the East Branch
ROUTE MCUNGE         Off_7.90    1    3        .01060        22.98         .760     1.34353    1.560    3.387 CCODE =      .2
COMPUTE NM HYD          Off_8    -    1        .01500        32.49        1.077     1.34573    1.510    3.384 PER IMP=  42.00
ADD HYD               Off_8.1  1& 3   1        .02560        53.52        1.836     1.34482    1.540    3.267
ADD HYD                 19.40  2& 1   2       1.65120      2553.46      129.481     1.47031    1.690    2.416
COMPUTE NM HYD            A_1    -    1        .03170        73.14        2.483     1.46839    1.510    3.605 PER IMP=  50.00
ADD HYD                 19.50  2& 1   2       1.68290      2587.76      131.964     1.47027    1.690    2.403
*S ROUTE UNBULKED THROUGH A_2 (EAST BRANCH) TO SOUTHERN END OF 5

                                FROM  TO                     PEAK        RUNOFF                TIME TO   CFS      PAGE =  13
                   HYDROGRAPH    ID   ID         AREA      DISCHARGE     VOLUME      RUNOFF      PEAK    PER
COMMAND        IDENTIFICATION    NO.  NO.      (SQ MI)       (CFS)      (AC-FT)    (INCHES)    (HOURS)   ACRE      NOTATION

ROUTE MCUNGE            19.90    2    4       1.68290      2586.90      131.884     1.46938    1.700    2.402 CCODE =      .2
COMPUTE NM HYD             5B    -    1        .01960        45.62        1.585     1.51588    1.510    3.637 PER IMP=  56.90
ADD HYD                 5B.10  4& 1   2       1.70250      2607.48      133.468     1.46991    1.700    2.393
*S PORTION OF EAST BRANCH WITHIN CABEZON
COMPUTE NM HYD            A_2    -    1        .00810        18.70         .634     1.46840    1.510    3.608 PER IMP=  50.00
ADD HYD                 5B.20  2& 1   3       1.71060      2615.90      134.102     1.46990    1.700    2.389
*S ROUTE 5B.20 TO EAST BRANCH CROSSING CABEZON BLVD VIA A_3
ROUTE MCUNGE            5B.90    3    2       1.71060      2616.12      134.041     1.46923    1.710    2.390 CCODE =      .2
COMPUTE NM HYD           2.00    -    1        .03220        69.92        2.317     1.34900    1.510    3.393 PER IMP=  42.00
ADD HYD                  2.10  2& 1   5       1.74280      2646.29      136.358     1.46701    1.710    2.373
COMPUTE NM HYD           1.00    -    1        .11170       242.40        8.036     1.34898    1.510    3.391 PER IMP=  42.00
*S  510A is small area between Cabezon Subbasin 1 and
*S  BLWMP Subbasin 510- Used same treatments as 510
COMPUTE NM HYD           510A    -    2        .01320        32.89        1.186     1.68464    1.520    3.894 PER IMP=  68.00
ADD HYD                  1.10  1& 2   3        .12490       275.29        9.222     1.38445    1.510    3.444
COMPUTE NM HYD         510.00    -    1        .04080        76.81        3.129     1.43810    1.560    2.941 PER IMP=  51.00
*S ROUTE 510 IN TYPICAL ROADWAY CROSS-SECTION TO EAST BRANCH
ROUTE MCUNGE           510.90    1    2        .04080        76.75        3.124     1.43579    1.600    2.939 CCODE =      .2
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ADD HYD	1.20	3& 2	4	.16570	329.73	12.347	1.39709	1.530	3.109	
ADD HYD	2.20	4& 5	3	1.90850	2824.94	148.704	1.46094	1.710	2.313	
COMPUTE NM HYD	5C	-	1	.02890	67.27	2.336	1.51588	1.510	3.637	PER IMP= 56.90
ROUTE MCUNGE	5C.9	1	2	.02890	67.16	2.334	1.51456	1.530	3.631	CCODE = .2
COMPUTE NM HYD	R_4	-	1	.00990	25.27	.894	1.69262	1.510	3.988	PER IMP= 66.00
ADD HYD	R_4.9	1& 2	1	.03880	91.93	3.228	1.55999	1.530	3.702	
ADD HYD	2.40	3& 1	2	1.94730	2868.96	151.933	1.46292	1.700	2.302	
COMPUTE NM HYD	A_3	-	1	.00800	18.47	.627	1.46840	1.510	3.608	PER IMP= 50.00
ADD HYD	2.50	2& 1	2	1.95530	2877.27	152.559	1.46294	1.700	2.299	
COMPUTE NM HYD	R_5	-	1	.00760	19.40	.686	1.69262	1.510	3.989	PER IMP= 66.00
ADD HYD	R_5.10	2& 1	2	1.96290	2885.98	153.245	1.46383	1.700	2.297	
*S ROUTE R_5.10 TO R_5.90 VIA EAST BRANCH PROPOSED CHANNEL										
*S TO DOWNSTREAM END OF SUBBASIN 8										
ROUTE MCUNGE	R_5.90	2	1	1.96290	2885.87	153.212	1.46351	1.720	2.297	CCODE = .2
*S CONFLUENCE OF TRIBUTARY B AND EAST BRANCH										
ADD HYD	8.20	1&12	2	2.77019	3487.16	217.819	1.47431	1.710	1.967	
*S ROUTE 8.20 TO END OF SUBBASIN 9 VIA EAST BRANCH CHANNEL (8.90)										
ROUTE MCUNGE	8.90	2	1	2.77019	3486.92	217.749	1.47383	1.730	1.967	CCODE = .2
COMPUTE NM HYD	A_4	-	2	.00620	14.32	.486	1.46841	1.510	3.609	PER IMP= 50.00
ADD HYD	8.93	2& 1	1	2.77639	3492.66	218.234	1.47381	1.730	1.966	
COMPUTE NM HYD	9.00	-	2	.04480	105.06	3.662	1.53279	1.510	3.664	PER IMP= 58.20
ADD HYD	9.10	2& 1	1	2.82119	3535.08	221.896	1.47475	1.730	1.958	
*S ROUTE 9.10 TO 9.90 (DS end of CAB SUBBASIN 21 in EAST BRANCH)										
ROUTE MCUNGE	9.90	1	2	2.82119	3533.75	221.787	1.47402	1.750	1.957	CCODE = .2
COMPUTE NM HYD	21.00	-	1	.02340	62.17	2.276	1.82340	1.510	4.152	PER IMP= 80.00
ADD HYD	21.10	2& 1	2	2.84459	3557.91	224.062	1.47690	1.750	1.954	
COMPUTE NM HYD	10.00	-	1	.12980	301.44	10.494	1.51583	1.510	3.629	PER IMP= 56.90
COMPUTE NM HYD	20.00	-	3	.00780	12.54	.370	.88924	1.520	2.511	PER IMP= 15.00
ADD HYD	20.10	1& 3	1	.13760	313.93	10.864	1.48031	1.510	3.565	
ADD HYD	20.20	2& 1	1	2.98219	3678.33	234.926	1.47705	1.740	1.927	
COMPUTE NM HYD	R_8	-	2	.01180	31.10	1.121	1.78106	1.510	4.118	PER IMP= 74.00
COMPUTE NM HYD	R_7	-	3	.00170	4.60	.168	1.84841	1.510	4.232	PER IMP= 80.00
ADD HYD	R_8.10	2& 3	4	.01350	35.70	1.288	1.78954	1.510	4.132	
*S Route combined flows at R_8.10 through 36" pipe IN ROADWAY TO DS END OF 14										
ROUTE	R_8.90	4	3	.01350	32.64	1.285	1.78408	1.550	3.778	
COMPUTE NM HYD	R_9	-	2	.01540	40.58	1.463	1.78105	1.510	4.117	PER IMP= 74.00
ADD HYD	R_9.10	3& 2	3	.02890	72.01	2.747	1.78247	1.530	3.893	
ADD HYD	20.30	1& 3	9	3.01109	3711.14	237.673	1.47999	1.740	1.926	
*S RESUME BLWMP WITH SUBBASINS WEST OF GOLF COURSE, IN UNIT 16 BUT										
*S NOT PART OF CABEZON										
*S REMAINDER OF GOLF COURSE ROAD STORM DRAIN SYSTEM										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
SEDIMENT BULK										PK BF = 1.06
COMPUTE NM HYD	520.00	-	1	.04090	84.56	2.923	1.34014	1.520	3.230	PER IMP= 43.00
*S ROUTE 520 TO 530C AT 520.90										
ROUTE MCUNGE	520.90	1	3	.04090	82.67	2.912	1.33507	1.570	3.158	CCODE = .2
COMPUTE NM HYD	530A	-	2	.14730	298.97	10.484	1.33454	1.530	3.171	PER IMP= 41.00
*S ************************** AP 530A.90 (20PP.IN) **********										
*S ROUTE 530A THROUGH 20TH AVENUE PARK POND SIZE AND VOLUME ARE ASSUMED										
*S BASED ON FIELD INVESTIGATION BUT NOT ON A COMPREHENSIVE SURVEY.										
*S THIS POND HAS AN OVERFLOW ON THE TWO LOTS ON THE SOUTH EDGE AND										
*S IS MODELED WITH THE PROPOSED EXPANSION.										
ROUTE RESERVOIR	530A.90	2	7	.14730	61.60	10.476	1.33349	1.980	.653	AC-FT= 5.400
*S**********DIVIDE HYD TO UNBULK TO 3% **********										
DIVIDE HYD	UNBULK	7	7	.14288	59.75	10.162	1.33349	1.980	.653	
	SEDIMENT and		57	.00442	1.85	.314	1.33349	1.980	.653	
*S ************************** AP 20PP.OUT **********										

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*S ROUTE 530A.90 "UNBULKED" THROUGH STORM DRAIN TO GOLF COURSE ROAD SYSTEM.
*S OUTFALL PIPE IS 48" CMP.
ROUTE MCUNGE          530A.91    7   99        .14288        59.75       10.147      1.33153    2.030     .653 CCODE =      .2
*S PUNCH HYDROGRAPH FOR FOR GOLF COURSE ROAD STORM DRAIN DESIGN MODEL
*S COMBINE 530A.91 AND 520.90 AT STORM DRAIN OUTFALL TO GCR SYSTEM
ADD HYD               530A.10 99& 3   3        .18378       139.51       13.059      1.33232    1.580    1.186
*S ROUTE COMBINED HYDROGRAPHS IN PIPE TO 23RD AVENUE
ROUTE MCUNGE          530A.92    3    2        .18378       139.39       13.047      1.33110    1.610    1.185 CCODE =      .2
*S COMPUTE 530C
COMPUTE NM HYD          530C     -    1        .02530        51.48        1.688      1.25071    1.520    3.179 PER IMP=   35.00
*S COMPUTE 530D 23RD AVE. POND BASIN
COMPUTE NM HYD          530D     -    3        .01000        16.25         .443       .83155    1.520    2.539 PER IMP=    .00
*S   ADD 530D TO 530C
ADD HYD               530D.10  1& 3   3        .03530        67.72        2.131      1.13196    1.520    2.998
*S ADD ROUTED 520 AND 530A TO 530C
ADD HYD               530D.20  2& 3   2        .21908       193.84       15.178      1.29902    1.580    1.382
*S  ****************************  AP 530.90 (GC.OUT)  **********************
*S ROUTE COMBINED FLOW THROUGH 23RD AVENUE PONDS
*S THE PONDS ARE COMBINED AND TREATED AS ONE TEN ACRE FOOT POND FOR
*S FOR THIS MODEL.
ROUTE RESERVOIR       530.90     2    3        .21908        47.87       10.254       .87759    3.380     .341 AC-FT=     9.389
*S THIS RESERVOIR NOT UNBULKED
ROUTE MCUNGE          530.91     3    2        .21908        47.87       10.186       .87178    3.410     .341 CCODE =      .2
*S  CABEZON PHASE 2 RESUMES BELOW: PART OF BLWMP SUBBASIN 550 IS REPLACED BY
*S  TRACT 21 AND A_5 (WEST BRANCH)
*S COMBINE ROUTED FLOW WITH EAST BRANCH FLOW:
*S ADD 20.30 and 530.91 At 20.40
ADD HYD               20.40  9& 2   1     3.23017      3728.28      247.859      1.43874    1.740    1.803
COMPUTE NM HYD          A_5    -    2      .01210        27.93         .948      1.46840    1.510    3.606 PER IMP=   50.00
ADD HYD               20.50  1& 2   1     3.24227      3739.07      248.807      1.43885    1.740    1.802
*S  ROUTE IN EAST BRANCH TO BLACK DAM
ROUTE MCUNGE          20.90     1    2     3.24227      3733.05      248.512      1.43714    1.780    1.799 CCODE =      .2
*S  Area of 550 is reduced by area that it overlaps
*S  CABEZON basins
COMPUTE NM HYD        550.00     -    1      .02760        48.65        1.440       .97797    1.520    2.754 PER IMP=   13.00
ADD HYD                 EAST   2& 1   1     3.26987      3747.95      249.952      1.43327    1.780    1.791
ADD HYD               DAM.10   1&11  97     8.84598      9313.70      554.629      1.17560    1.650    1.645
*S  RECALL HYDROGRAPHS FROM BERNALILLO COUNTY SUBDIVISIONS
*S  THESE ARE PUNCH HYDROGRAPHS AND FLOWS DRAIN DIRECTLY TO THE DAM POOL
*S  VIA PIPES.
*S                    TEXT TAKEN FROM MODEL RECEIVED 1/9/02 * * * * * * * * *
*S  Ridgeview Village(DB4), Los Suenos(DB3), and the Park Hill(DB2)
*S Subdivisions have free developed discharge based on R-1, 5 du/acre density.
*S Flow from some commercial sites east of Unser between Mcmahon and
*S Black Arroyo Blvd. is restricted to historic as per Ridgeview Unit 1 Plan.
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION


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*S Developed flow is accommodated from the residential tracts and
*S other commercial tracts. * * * * ** *
RECALL HYD              AP5    -   18      .38090       850.60       31.937      1.57209    1.550    3.489
*S  STONEBRIDGE SUBDIVISON FROM MODEL RECEIVED 1/15/02
RECALL HYD             AP15    -   19      .23850       359.51       17.620      1.38518    1.500    2.355
*S  ADD RECALL HYDROGRAPHS
ADD HYD          DIRECT.PIPE 18&19  98      .61940      1191.72       49.556      1.50012    1.550    3.006
*S  ADD RECALL HYDS TO EAST AND WEST BRANCH FLOWS FOR TOTAL INTO BLACK DAM
ADD HYD              DAM.IN 98&97  99     9.46538     10152.29      603.502      1.19548    1.640    1.676
*S  ROUTE FLOWS THROUGH WQ STRUCTURE NO. 2
*S  BEFORE ENTERING BLACK DAM
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   *S
   *S
   ROUTE RESERVOIR        P.Out   99   98       9.46538     10142.62      582.419      1.15372    1.640    1.674 AC-FT=   30.908
   *S *************DIVIDE HYD TO UNBULK BY 3% ************************
   DIVIDE HYD           P.Out.3   98   98       9.18141      9838.34      564.946      1.15371    1.640    1.674
                      SEDIMENT  and   51        .28396       304.28       17.473      1.15371    1.640    1.674
   *S  ROUTE FLOWS THROUGH BLACK DAM RATING CURVE TAKEN FROM BLACK DAM
   *S  FILING SHEET RECORD DRAWINGS - BLARD-51  Stamp dated 9/14/91
   *S   Record Dwg Stamp 11/9/92 AMAFCA Ref # NW-04-114 Calabacillas
   *S  THIS IS THE FUTURE CONDITIONS RATING CURVE
   *S                  5/04/04 BLACK DAM RATING CURVE ADJUSTED FOR CABEZON MODEL:
   *S                  ELEVATIONS CONVERTED TO NAVD88 FROM NGVD29; ALSO
   *S                  STORAGE INCREASED TO REFLECT WQ STRUCTURE NO.2
   ROUTE RESERVOIR        DAM.R   98   91       9.18141      2419.22      564.920      1.15366    2.320     .412 AC-FT=  296.979
   *S EMERGENCY SPILLWAY CREST IS AT ELEV 5168.55 FT (NAVD88)
   FINISH
□(s10H
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VOL81604.SUM

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(s16.66H
 AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -
 INPUT FILE = T:\Projects\x4218012\Eng\AHYMO\rev_dmp\VOL72204.txt           - VERSION:  1997.02c      RUN DATE (MON/DAY/YR) =08/16/2004
                                                                                                    USER NO.= AHYMO-I-9702a01000C05-AH

                                  FROM  TO                   PEAK        RUNOFF                 TIME TO    CFS       PAGE =   1
                     HYDROGRAPH    ID   ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK      PER
 COMMAND           IDENTIFICATION  NO.  NO.     (SQ MI)      (CFS)      (AC-FT)    (INCHES)   (HOURS)    ACRE       NOTATION

 START                                                                                                           TIME=       .00
 *S      7/22/04
 *S      WILSON & CO.'S CABEZON COMMUNITIES DRAINAGE MASTER PLAN, PHASE 2 OF
 *S      DEVELOPMENT: THIS MODEL TAKES BOTH CABEZON PHASE 1 AND 2 INTO THE
 *S      MODIFIED BLWMP MODEL DEVELOPED BY ASCG (1/20/04) TO ASSESS CABEZON'S
 *S      IMPACT ON BLACK DAM. IT MODELS DEVELOPED CONDITIONS IN ALL SUBBASINS;
 *S      SEDIMENT BULKING ADJUSTED TO 6% REFLECT THIS; ALSO, MUSKINGHAM CUNGE
 *S      ROUTING (COMMAND: ROUTE MCUNGE) CONSISTENTLY USED
 *S      THIS MODEL USES A STEP OF 0.05 HR (3 MIN) SO THAT THE ENTIRE 24 HR
 *S      HYDROGRAPH IS CAPTURED AND VOLUMETRIC RUNOFF IS MORE COMPLETELY
 *S      ACCOUNTED FOR
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *S  01/20/2004 ADJUSTMENTS TO THIS MODEL FROM THE BLWMP
 *S  "DOUBLE" COUNTING OF STREETS IN LAND TREATMENT REMOVED
 *S  SUB-BASIN 211 ROUTED ADJUSTED TO EXISTING FIELD CONDITIONS (XING SOUTHERN)
 *S  NOTHING ELSE HAS BEEN ADJUSTED - USER ACCEPTS THIS MODEL AS IS AND TAKES THE
 *S  RESPONSIBILITY FOR CHECKING IT FOR ACCURACY PRIOR TO USE...
 *S * * * FUTURE CONDITIONS MODEL - ALTERNATE B  * * * * * * * * * * * * * * *
 *S * * * 3 DAMS ON THE WEST BRANCH                           * * * * * * * * * *
 *S * * * UNSER GATEWAY DAM, AND WATER QUALITY DIVERSIONS      * * * * * * * * * *
 *S * * * ROUTING WITH MCUNGE METHOD AFTER WATER QUALITY DIVERSIONS ARE  * * * *
 *S * * * UTILIZED TO ADJUST FOR THE UNSTABLE HYDROGRAPHS WITH A STEEP SLOPE * *
 *S * * * AFTER MODIFICATION TO REDIRECT THE FIRST FLUSH OF 0.25" RUNOFF FOR SWQ
 RAINFALL  TYPE= 2                                                                                               RAIN24=    2.703
 *S*****************************************************************************
 *S  BEGINNING OF THE BLACK ARROYO WEST BRANCH
 *S*****************************************************************************
 *S  LISBON CHANNEL NORTH OF TULIP
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 SEDIMENT BULK                                                                                                   PK BF =      1.06
 COMPUTE NM HYD      101.00    -    1     .33970     533.20      29.037    1.60274    1.600    2.453   PER IMP=    48.00
 ROUTE MCUNGE        101.90    1    2     .33970     531.48      28.988    1.60002    1.600    2.445   CCODE =        .1
 COMPUTE NM HYD      102.00    -    1     .25390     342.13      15.836    1.16946    1.550    2.105   PER IMP=    26.00
 ADD HYD             102.10   1& 2  3     .59360     865.45      44.824    1.41586    1.600    2.278
 ROUTE MCUNGE        102.90    3    4     .59360     864.33      44.831    1.41606    1.600    2.275   CCODE =        .2
 COMPUTE NM HYD       103A     -    1     .18030     273.36      12.146    1.26312    1.550    2.369   PER IMP=    28.00
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *S START OF LISBON CHANNEL AT TULIP AND INFLOW TO DAM
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 ADD HYD            103A.90   1& 4  3     .77390    1121.03      56.977    1.38043    1.600    2.263
 *S  ROUTE 103A.90 THRU LISBON @ TULIP DAM/POND
 ROUTE RESERVOIR    TULIS.DAM   3   4     .77390       4.12       9.428     .22843   20.750     .008   AC-FT=      49.486
 *S *************DIVIDE HYD TO UNBULK BY 3% *********************
 DIVIDE HYD            UNBULK   4   4     .75068       4.00       9.145     .22843   20.750     .008
                     SEDIMENT  and 51     .02322        .12        .283     .22842   20.750     .008
 *S ROUTE IN PIPE TO LISBON CHANNEL
 *S * * * * * AP=TULIS.90 * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 ROUTE MCUNGE         TULIS.90  4   3     .75068       4.00       9.130     .22805   20.800     .008   CCODE =        .2
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 *S START OF LISBON CHANNEL AT TULIP
 *S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
 SEDIMENT BULK                                                                                                   PK BF =      1.06
 COMPUTE NM HYD        103B    -    1     .08950     162.97       6.029    1.26312    1.500    2.845   PER IMP=    28.00
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*S ADD 103B TO PREVIOUS HYDROGRAPHS FOR TOTAL Q IN LISBON CHANNEL AT
*S DOWNSTREAM END OF BASIN 103B
ADD HYD              103B.10  1& 3   3      .84018      163.13      15.160     .33831    1.500     .303
*S ROUTE 103B.10 THRU 104B TO 103B.90

                             FROM   TO                    PEAK        RUNOFF                TIME TO    CFS       PAGE =    2
                  HYDROGRAPH  ID    ID        AREA      DISCHARGE     VOLUME     RUNOFF      PEAK      PER
COMMAND       IDENTIFICATION  NO.   NO.      (SQ MI)      (CFS)       (AC-FT)   (INCHES)   (HOURS)    ACRE       NOTATION

ROUTE MCUNGE         103B.90   3     4      .84018      163.13      15.160     .33831    1.500     .303 CCODE =        .0
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S START OF SUNSET CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
SEDIMENT BULK                                                                                        PK BF =      1.06
COMPUTE NM HYD        106A1    -     1      .11660      172.56       8.114    1.30471    1.550    2.312 PER IMP=   33.00
ROUTE MCUNGE         106A.90   1     3      .11660      171.74       8.116    1.30509    1.600    2.301 CCODE =       .2
COMPUTE NM HYD         104A    -     1      .18340      376.90      15.452    1.57974    1.500    3.211 PER IMP=   45.00
ADD HYD              104.10  3& 1    1      .30000      506.36      23.568    1.47299    1.500    2.637
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S ROUTE 104.10 THROUGH PROPOSED SUNSET @ TULIP POND/DAM
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ROUTE RESERVOIR    TUSUN.DAM   1     2      .30000        4.27       9.143     .57141    3.600     .022 AC-FT=    18.802
*S *************DIVIDE HYD TO UNBULK BY 3% **********************
DIVIDE HYD           UNBULK    2     2      .29100        4.14       8.868     .57141    3.600     .022
                   SEDIMENT  and    52      .00900         .13        .274     .57141    3.600     .022
*S ROUTE IN PIPE TO LISBON CHANNEL
ROUTE MCUNGE        TUSUN.90   2     3      .29100        4.14       8.840     .56960    3.650     .022 CCODE =        .2
SEDIMENT BULK                                                                                        PK BF =      1.06
COMPUTE NM HYD          104B   -     1      .03550       72.78       2.991    1.57974    1.500    3.203 PER IMP=   45.00
ADD HYD              104.20  1& 3    5      .32650       72.92      11.831     .67943    1.500     .349
*S LISBON CHANNEL AFTER SUNSET CHANNEL CONFLUENCE (HYD=104B.1)
ADD HYD              104.30  5& 4    3     1.16668      236.05      26.991     .43377    1.500     .316
ROUTE MCUNGE         104.90    3     4     1.16668      232.85      26.915     .43256    1.600     .312 CCODE =        .1
SEDIMENT BULK                                                                                        PK BF =      1.06
COMPUTE NM HYD       105.00    -     1      .15090      233.80      12.980    1.61284    1.600    2.421 PER IMP=   44.00
*S LISBON CHANNEL AFTER SUB-BASIN 105
ADD HYD              105.10  1& 4    5     1.31758      466.65      39.895     .56774    1.600     .553
ROUTE MCUNGE         105.90    5     4     1.31758      465.21      39.872     .56740    1.600     .552 CCODE =        .2
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S START OF SUGAR CHANNEL AT TULIP
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD        106A2    -     1      .13590      224.60       9.457    1.30471    1.500    2.582 PER IMP=   33.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S BALI CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD         106B    -     3      .15220      265.08      12.921    1.59175    1.550    2.721 PER IMP=   45.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S SUGAR CHANNEL INCLUDING CONFLUENCE WITH BALI CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD             106B.10  1& 3    5      .28810      484.54      22.377    1.45634    1.550    2.628
*S   ROUTE 106B.10 TO 106C.90 (TO CONFLUENCE OF LISBON & SUGAR CHLS) (106C)
ROUTE MCUNGE        106B.90    5     1      .28810      484.54      22.377    1.45634    1.550    2.628 CCODE =        .0
COMPUTE NM HYD         106C    -     3      .04840       63.20       2.672    1.03493    1.550    2.040 PER IMP=   22.00
ADD HYD             106C.10  1& 3    5      .33650      547.74      25.049    1.39573    1.550    2.543
*S * * * * AP 106.90 * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S   LISBON CHANNEL AFTER CONFLUENCE WITH SUGAR CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD              106.20  5& 4    5     1.65408      952.87      64.920     .73591    1.600     .900
ROUTE MCUNGE         106.91    5     2     1.65408      949.11      64.825     .73483    1.600     .897 CCODE =        .1
COMPUTE NM HYD       107.00    -     1      .03580       77.45       3.234    1.69355    1.500    3.380 PER IMP=   49.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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*S    LISBON CHANNEL AFTER ADDING SUB-BASIN 107
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                 107.10  1& 2   5       1.68988      1003.90       68.058      .75514    1.600      .928
COMPUTE NM HYD          109.00   -     1        .08640       143.67        7.775     1.68735    1.600     2.598 PER IMP=  49.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S  BALTIC CHANNEL
*S  FLOW AT CASCADE RD @ 600 FT. W. OF COMANCHE RD.  (HYD. 109)

                                 FROM  TO                    PEAK        RUNOFF                TIME TO    CFS       PAGE =   3
                  HYDROGRAPH     ID    ID         AREA     DISCHARGE     VOLUME      RUNOFF     PEAK      PER
COMMAND         IDENTIFICATION   NO.   NO.      (SQ MI)      (CFS)      (AC-FT)    (INCHES)   (HOURS)    ACRE      NOTATION

*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD          110.00   -     3        .05090        94.74        4.431     1.63237    1.550     2.908 PER IMP=  46.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S  ARKANSAS CHANNEL INCLUDING FLOW FROM BALTIC CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                 110.10  1& 3   6        .13730       236.46       12.207     1.66696    1.550     2.691
ROUTE MCUNGE            110.90    6    2        .13730       234.54       12.207     1.66707    1.550     2.669 CCODE =      .2
COMPUTE NM HYD          108.00   -     1        .06720       128.69        6.686     1.86551    1.550     2.992 PER IMP=  59.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    ARKANSAS CHANNEL INCLUDING FLOW FROM BALTIC CHANNEL BEFORE CONFLUENCE
*S    WITH LISBON CHANNEL
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON AVE. @ 250 FT.  N. OF HOOD RD.
*S
ADD HYD                 108.10  1& 2   6        .20450       363.23       18.893     1.73227    1.550     2.775
*S * * * * AP 108.91 * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON CHANNEL AFTER ADDING ARKANSAS CHANNEL FLOWS
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                 108.20  5& 6   5       1.89438      1356.80       86.952      .86062    1.600     1.119
ROUTE MCUNGE            108.90    5    2       1.89438      1339.62       86.911      .86022    1.650     1.105 CCODE =      .2
COMPUTE NM HYD          111.00   -     1        .11590       212.18       10.915     1.76575    1.550     2.861 PER IMP=  54.00
*S * * * * * * * * * * * AP 111.10 * * * * * * * * * * * * * * * * * * * * * * *
*S    LISBON CHANNEL DISCHARGE @ SOUTHERN BLVD
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                 111.10  1& 2   5       2.01028      1534.69       97.826      .91243    1.600     1.193
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S START OF LISBON ARROYO
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ROUTE MCUNGE            111.90    5    2       2.01028      1532.02       97.721      .91145    1.650     1.191 CCODE =      .1
SEDIMENT BULK                                                                                              PK BF =     1.06
COMPUTE NM HYD          116.00   -     1        .03190        74.06        3.245     1.90729    1.500     3.628 PER IMP=  61.00
ADD HYD                 116.10  1& 2   5       2.04218      1572.19      100.966      .92701    1.650     1.203
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * *   END LISBON CHANNEL AND LISBON ARROYO WATERSHED * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * *   START IVORY WATERSHED                     * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
SEDIMENT BULK                                                                                              PK BF =     1.06
*S * * * PECOS/RODEO CHANNEL                                            * * * * * * * * * *
COMPUTE NM HYD          114.00   -     1        .06980       124.84        5.739     1.54175    1.550     2.795 PER IMP=  41.00
ROUTE MCUNGE            114.90    1    2        .06980       124.44        5.737     1.54123    1.600     2.786 CCODE =      .1
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * SPUR CHANNEL                                * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD          115.00   -     1        .12520       212.43       11.634     1.74233    1.600     2.651 PER IMP=  52.00
ADD HYD                 115.10  1& 2   6        .19500       336.86       17.372     1.67034    1.600     2.699
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * IVORY CHANNEL                               * * * * * * * * * *
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*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD         113.00   -    1       .04770      105.53      4.647      1.82682    1.500     3.457 PER IMP=  57.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * CONFLUENCE OF IVORY AND SPUR                  * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                113.10  1& 6  6       .24270      423.95     22.019      1.70110    1.550     2.729
*S ******     AP 113.90 * * * *********************
ROUTE MCUNGE           113.90   6    2       .24270      420.47     22.020      1.70120    1.600     2.707 CCODE =       .2
COMPUTE NM HYD         112.00   -    1       .07360      143.11      6.851      1.74541    1.550     3.038 PER IMP=  52.00
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                                FROM  TO                  PEAK       RUNOFF                TIME TO   CFS        PAGE =   4
                     HYDROGRAPH  ID   ID       AREA     DISCHARGE    VOLUME      RUNOFF      PEAK    PER
COMMAND            IDENTIFICATION NO.  NO.    (SQ MI)     (CFS)      (AC-FT)    (INCHES)   (HOURS)   ACRE        NOTATION

*S    SOUTHERN BLVD. @ 1900 FT. E. OF PECOS LP.
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S    IVORY CHANNEL @ SOUTHERN BLVD
*S ****************** AP 112.10 ********************************************
ADD HYD                112.10  1& 2  6       .31630      561.76     28.872      1.71148    1.550     2.775
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * IVORY ARROYO                                  * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ROUTE MCUNGE           112.90   6    2       .31630      561.49     28.876      1.71172    1.600     2.774 CCODE =       .2
SEDIMENT BULK                                                                                         PK BF =      1.06
COMPUTE NM HYD         117.00   -    1       .12590      261.81     10.777      1.60507    1.500     3.249 PER IMP=  46.00
ADD HYD                117.10  1& 2  6       .44220      780.19     39.653      1.68135    1.550     2.757
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * CONFLUENCE OF IVORY AND LISBON ARROYOS IN PARK    * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD                117.20  5& 6  5      2.48438     2223.60    140.619      1.06127    1.650     1.398
COMPUTE NM HYD           118A   -    1       .17330      343.42     13.489      1.45944    1.500     3.096 PER IMP=  38.00
ROUTE MCUNGE          118A.90   1    2       .17330      336.28     13.491      1.45961    1.500     3.032 CCODE =       .2
*S *****************   AP 118A.10 ******************************************
ADD HYD               118A.10  5& 2  5      2.65768     2427.60    154.110      1.08725    1.650     1.427
*S PUNCH AND ADJUST HYDROGRAPH TO DELETE "FIRST FLUSH" RUNOFF AND SEND TO
*S WATER QUALITY PONDS WHICH IS ESSENTIALLY OUT OF THE SYSTEM THROUGH TIMING.
RECALL HYD            118A.10   -    5      2.65770     2427.60    154.110      1.08724    1.650     1.427
ROUTE MCUNGE           118.91   5    2      2.65770     2425.84    153.987      1.08637    1.650     1.426 CCODE =       .1
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * START OF WEST BRANCH ARROYO                   * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD         119.00   -    1       .08640      141.95      5.807      1.26018    1.500     2.567 PER IMP=  28.00
ADD HYD                119.10  1& 2  5      2.74410     2521.28    159.794      1.09185    1.650     1.436
COMPUTE NM HYD           120B   -    1       .08640      175.65      6.926      1.50305    1.500     3.177 PER IMP=  39.00
ROUTE MCUNGE           119.90   5    4      2.74410     2519.39    159.703      1.09123    1.700     1.435 CCODE =       .1
ADD HYD               120B.10  1& 4  4      2.83050     2596.39    166.629      1.10380    1.700     1.433
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * START OF TRIBUTARY "C"                        * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD           118B   -    1       .06200      122.41      4.826      1.45944    1.500     3.085 PER IMP=  38.00
ROUTE MCUNGE          118B.90   1    2       .06200      120.93      4.818      1.45717    1.600     3.048 CCODE =       .1
COMPUTE NM HYD           120A   -    1       .12780      259.96     10.245      1.50305    1.500     3.178 PER IMP=  39.00
ADD HYD               120A.10  2& 1  5       .18980      339.59     15.063      1.48806    1.550     2.796
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * CONFLUENCE OF TRIBUTARY "C" WITH WEST BRANCH ARROYO  * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD               120A.20  4& 5  5      3.02030     2795.11    181.693      1.12795    1.700     1.446
SEDIMENT BULK                                                                                         PK BF =      1.06
COMPUTE NM HYD         155.00   -    1       .12450      249.30     12.257      1.84595    1.550     3.129 PER IMP=  57.00
ADD HYD                155.10  1& 5  9      3.14480     2944.12    193.950      1.15637    1.700     1.463
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*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * URBAN AREA WEST OF UNSER, EAST OF LISBON CHANNEL, NORTH OF * * * *
*S * * * SOUTHERN AND SOUTH OF TULIP                                 * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
SEDIMENT BULK                                                                                                   PK BF =     1.06
*S ALL 300 AND 400 SERIES BASINS ARE COMPUTED WITH ORIGINAL TP'S FROM          * * *
*S THE FEMA RESTUDY MODEL                                               * * *
COMPUTE NM HYD        300.00   -    2     .14830     224.36     15.649    1.97855    1.650    2.364 PER IMP=   65.00
ROUTE MCUNGE          300.90   2    3     .14830     224.29     15.645    1.97807    1.700    2.363 CCODE =      .1
ROUTE MCUNGE          300.91   3    2     .14830     224.15     15.640    1.97737    1.750    2.362 CCODE =      .1
COMPUTE NM HYD        310.00   -    3     .08000     188.80      8.372    1.96228    1.500    3.688 PER IMP=   64.00
ADD HYD               310.10  2& 3  4     .22830     295.33     24.012    1.97208    1.750    2.021

                              FROM  TO                PEAK      RUNOFF               TIME TO   CFS       PAGE =    5
              HYDROGRAPH       ID   ID      AREA    DISCHARGE   VOLUME    RUNOFF      PEAK     PER
COMMAND     IDENTIFICATION    NO.  NO.    (SQ MI)     (CFS)     (AC-FT)  (INCHES)   (HOURS)   ACRE       NOTATION

COMPUTE NM HYD        320.00   -    2     .07690     134.73      7.455    1.81771    1.550    2.737 PER IMP=   57.00
DIVIDE HYD            320.80   2   10     .07087     104.89      6.871    1.81770    1.550    2.312
                      320.81  and  11     .00603      29.84       .584    1.81770    1.550    7.736
ROUTE MCUNGE          320.90  10    3     .07087     104.35      6.856    1.81386    1.650    2.301 CCODE =      .1
ADD HYD               320.10  4& 3  4     .29917     393.79     30.868    1.93460    1.700    2.057
COMPUTE NM HYD        400.00   -    2     .00410       6.55       .181     .82952    1.500    2.495 PER IMP=     .00
ADD HYD               400.10  4& 2  4     .30327     396.57     31.050    1.91966    1.700    2.043
*S ********  AP 400.30 ***********INFLOW INTO WEXFORD POND*********************
*S****************************************************************************
ROUTE RESERVOIR       400.90   4    5     .30327     142.05     31.050    1.91966    2.200     .732 AC-FT=   11.270
*S ******************  AP 400.OUT  (BEFORE DIVIDE) ***************************
*S *************DIVIDE HYD TO UNBULK TO 3% **********************
DIVIDE HYD            UNBULK   5    1     .29418     137.79     30.118    1.91965    2.200     .732
                    SEDIMENT  and  53     .00910       4.26       .931    1.91965    2.200     .732
*S DIVIDE INTO PIPE AND SPILLWAY FLOWS  AP 400.OUT PIPE AND SPILL **************
DIVIDE HYD            400.81   1    1     .29348     135.00     30.047    1.91965    2.000     .719
                      400.82  and   3     .00070       2.79       .071    1.91967    2.200    6.256
ROUTE MCUNGE          400.90   1    6     .29348     135.00     30.037    1.91900    2.050     .719 CCODE =      .1
ROUTE MCUNGE          400.91   3    2     .00070       2.77       .071    1.92548    2.400    6.226 CCODE =      .1
ADD HYD               400.20  2& 6  6     .29418     137.77     30.108    1.91901    2.400     .732
COMPUTE NM HYD        410.00   -    3     .03630      75.54      3.793    1.95920    1.550    3.251 PER IMP=   64.00
ADD HYD               410.10  6& 3  4     .33048     168.97     33.901    1.92342    1.550     .799
ROUTE MCUNGE          410.90   4    2     .33048     168.31     33.884    1.92244    1.600     .796 CCODE =      .1
COMPUTE NM HYD        420.00   -    3     .05160     137.89      6.523    2.37033    1.500    4.176 PER IMP=   85.00
ADD HYD               420.10  2& 3 14     .38208     279.82     40.407    1.98293    1.550    1.144
COMPUTE NM HYD        330.00   -    2     .06330     135.65      6.810    2.01732    1.550    3.348 PER IMP=   67.00
ROUTE MCUNGE          330.90   2    3     .06330     134.48      6.800    2.01417    1.650    3.320 CCODE =      .1
COMPUTE NM HYD        340.00   -    1     .04580      99.84      4.786    1.95920    1.500    3.406 PER IMP=   64.00
ADD HYD               340.10  1& 3  4     .10910     198.47     11.585    1.99108    1.650    2.842
COMPUTE NM HYD        430.00   -    2     .00440       9.97       .429    1.82988    1.500    3.542 PER IMP=   57.00
ADD HYD               430.10  2& 4  4     .11350     203.89     12.015    1.98483    1.650    2.807
ROUTE MCUNGE          430.90   4    3     .11350     203.53     12.015    1.98485    1.650    2.802 CCODE =      .2
ROUTE MCUNGE          430.91   3    2     .11350     201.13     12.012    1.98441    1.650    2.769 CCODE =      .2
ADD HYD               430.20  2&14 10     .49558     448.95     52.419    1.98326    1.600    1.416
COMPUTE NM HYD        440.00   -    2     .01060      24.16      1.045    1.84923    1.500    3.562 PER IMP=   58.00
ROUTE MCUNGE          440.90  11    3     .00603      29.79       .581    1.80734    1.600    7.725 CCODE =      .1
ROUTE MCUNGE          440.91   3    5     .00603      29.65       .579    1.80077    1.700    7.687 CCODE =      .1
ADD HYD               440.10  5& 2  4     .01663      40.33      1.624    1.83161    1.700    3.790
ROUTE MCUNGE          440.92   4    2     .01663      39.40      1.623    1.83052    1.700    3.703 CCODE =      .2
ROUTE MCUNGE          440.93   2    3     .01663      39.33      1.622    1.82880    1.750    3.696 CCODE =      .1
ADD HYD               440.20  3&10 14     .51220     472.50     54.041    1.97825    1.600    1.441
COMPUTE NM HYD        350.00   -    2     .04750     100.75      6.005    2.37033    1.550    3.314 PER IMP=   85.00
ROUTE MCUNGE          350.90   2    3     .04750     100.75      5.996    2.36679    1.600    3.314 CCODE =      .1
ROUTE MCUNGE          350.91   3    2     .04750     100.04      5.987    2.36319    1.700    3.291 CCODE =      .1
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COMPUTE NM HYD        360.00   -    3        .01450       32.16       1.398     1.80748    1.500    3.466 PER IMP=   56.00
ADD HYD               360.10  2& 3  4        .06200      114.63       7.384     2.23321    1.700    2.889
*S ADD THE TOTAL FLOW IN 20TH STREET AT THE NORTH SIDE OF SOUTHERN TO THE
*S TOTAL FLOW ROUTED TO THE INTERSECTION FROM THE NORTH AND THE WEST
*S THIS FLOW IS ROUTED UNDER SOUTHERN TO THE UNSER CHANNEL
*S ***************************** AP 360.20 ************************************
ADD HYD               360.20  4&14  5        .57420      573.11      61.425     2.00578    1.650    1.560
ROUTE MCUNGE          360.90   5    2        .57420      573.11      61.425     2.00578    1.650    1.560 CCODE =         .0
*S CONCRETE LINED PORTION OF UNSER CHANNEL
ROUTE MCUNGE          360.91   2    5        .57420      571.28      61.427     2.00584    1.650    1.555 CCODE =         .2
*S EARTH LINED PORTION OF UNSER CHANNEL
ROUTE MCUNGE          360.92   5    2        .57420      571.07      61.448     2.00652    1.750    1.554 CCODE =         .2
SEDIMENT BULK                                                                                          PK BF =       1.06
COMPUTE NM HYD        121.00   -    1        .25810      535.81      28.758     2.08916    1.550    3.244 PER IMP=   70.00
ADD HYD               121.10  1& 2  5        .83230      981.89      90.206     2.03215    1.650    1.843
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

                              FROM  TO                    PEAK        RUNOFF              TIME TO    CFS       PAGE =    6
                 HYDROGRAPH    ID   ID        AREA      DISCHARGE     VOLUME    RUNOFF      PEAK     PER
COMMAND        IDENTIFICATION  NO.  NO.     (SQ MI)       (CFS)      (AC-FT)   (INCHES)   (HOURS)   ACRE        NOTATION

*S * * * CONFLUENCE OF UNSER CHANNEL WITH WEST BRANCH ARROYO  * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD               121.20  5& 9  5       3.97710     3863.44     284.155     1.33965    1.700    1.518
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S * * * START OF TRIBUTARY "A"                          * * * * * * * * * *
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
COMPUTE NM HYD        153.00   -    1        .14660      190.73      11.505     1.47151    1.650    2.033 PER IMP=   38.00
ROUTE MCUNGE          153.90   1    4        .14660      190.73      11.505     1.47151    1.650    2.033 CCODE =         .0
COMPUTE NM HYD        150.00   -    1        .08730      159.64       6.118     1.31403    1.500    2.857 PER IMP=   32.00
ROUTE MCUNGE          150.90   1    2        .08730      157.14       6.120     1.31450    1.550    2.813 CCODE =         .2
COMPUTE NM HYD        152.00   -    1        .19840      293.39      14.028     1.32570    1.550    2.311 PER IMP=   32.00
ADD HYD               152.10  1& 2  6        .28570      450.53      20.148     1.32227    1.550    2.464
ROUTE MCUNGE          152.90   6    2        .28570      450.53      20.148     1.32227    1.550    2.464 CCODE =         .0
COMPUTE NM HYD        151.00   -    1        .15130      281.60      11.177     1.38513    1.500    2.908 PER IMP=   34.00
ROUTE MCUNGE          151.90   1    3        .15130      281.60      11.177     1.38513    1.500    2.908 CCODE =         .0
ADD HYD               152.10  2& 3  6        .43700      713.84      31.325     1.34403    1.550    2.552
ROUTE MCUNGE          152.91   6    2        .43700      713.84      31.325     1.34403    1.550    2.552 CCODE =         .0
*S  *************************  AP 153.10  ************************************
ADD HYD               153.10  4& 2  6        .58360      872.04      42.830     1.37606    1.550    2.335
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S   ROUTE HYD.  THROUGH TRIBUTARY "A" DAM
*S * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
ROUTE RESERVOIR     TRIBA.DAM  6    2        .58360        3.65       8.397      .26977   14.700     .010 AC-FT=   36.532
*S *************DIVIDE HYD TO UNBULK BY 3% *********************
DIVIDE HYD            UNBULK   2    2        .56609        3.54       8.145      .26977   14.700     .010
                     SEDIMENT and  54        .01751         .11        .252      .26977   14.700     .010
ROUTE MCUNGE          153.91   2    6        .56609        3.54       8.124      .26907   14.800     .010 CCODE =         .2
COMPUTE NM HYD        154.00   -    1        .21910      351.39      14.917     1.27655    1.550    2.506 PER IMP=   29.00
ADD HYD               154.10  1& 6  6        .78519      351.73      23.041      .55020    1.550     .700
ROUTE MCUNGE          154.90   6    2        .78519      347.55      23.019      .54967    1.550     .692 CCODE =         .2
COMPUTE NM HYD        159.00   -    1        .06000      143.53       6.455     2.01732    1.500    3.738 PER IMP=   67.00
ADD HYD               159.10  1& 2  6        .84519      474.68      29.474      .65386    1.550     .878
*S * * * CONFLUENCE OF TRIB. "A" WITH WEST BRANCH ARROYO    * * * * * * *
*S   BLACK ARROYO @ UNSER BLVD. (WEST BRANCH)
*S  ***************************** BLWMP AP 159.20 *************************
ADD HYD               159.20  5& 6  5       4.82229     4210.18     313.629     1.21945    1.650    1.364
*S PUNCH AND ADJUST HYDROGRAPH TO DELETE "FIRST FLUSH" RUNOFF AND SEND TO
*S WATER QUALITY PONDS WHICH IS ESSENTIALLY OUT OF THE SYSTEM THROUGH TIMING.
RECALL HYD            159.20   -    5       4.82230     4210.18     313.629     1.21945    1.650    1.364
*S  CABEZON REVISIONS PHASE 2 BEGIN HERE; BLWMP SUBBASINS 253,160 ARE REMOVED
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*S  253 REPLACED BY CABEZON COMMERCIAL TRACT 12 (DRAINS TO WEST BRANCH)
*S  AND 7A, 7B, 7C (ALL DRAIN TO POND IN TRACT 17 WHICH GOES TO EAST
*S  BRANCH); 160 IS WEST BRANCH, REPLACED BY A_6
*S  Commercial Unit 12
COMPUTE NM HYD          12.00   -     1        .01560       42.02       1.972      2.37033    1.500    4.209 PER IMP=  85.00
ADD HYD                 12.10  1& 5   6       4.83790     4232.10     315.601      1.22316    1.650    1.367
ROUTE MCUNGE            12.90    6    5       4.83790     4228.84     315.448      1.22257    1.700    1.366 CCODE =      .1
*S  BLWMP FILE RESUMES BELOW
COMPUTE NM HYD         156.00   -     1        .22940       458.88      17.717      1.44807    1.500    3.126 PER IMP=  36.00
ROUTE MCUNGE           156.90    1    2        .22940       456.44      17.722      1.44852    1.550    3.109 CCODE =      .2
COMPUTE NM HYD         157.00   -     1        .18890       387.95      16.128      1.60081    1.500    3.209 PER IMP=  45.00
ADD HYD                157.10  1& 2   6        .41830       811.07      33.850      1.51729    1.550    3.030
COMPUTE NM HYD         158.00   -     1        .08160       205.84       9.569      2.19867    1.500    3.941 PER IMP=  77.00
ROUTE MCUNGE           158.90    1    3        .08160       203.95       9.569      2.19876    1.500    3.905 CCODE =      .2
ADD HYD                158.10  3& 6   6        .49990      1013.35      43.419      1.62853    1.500    3.167
*S UNSER GATEWAY DAM
ROUTE RESERVOIR    GATE.POND    6    3        .49990       619.15      43.419      1.62853    1.650    1.935 AC-FT=   10.383
*S ************DIVIDE HYD TO UNBULK BY 3% ***********************
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
DIVIDE HYD	UNBULK	3	3	.48490	600.58	42.116	1.62853	1.650	1.935	
	SEDIMENT	and	55	.01500	18.57	1.303	1.62853	1.650	1.935	
ROUTE MCUNGE	158.91	3	2	.48490	600.32	42.119	1.62863	1.650	1.934	CCODE = .2


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*S  CABEZON REVISIONS PHASE 2 RESUME BELOW; BLWMP SUBBASINS 620,161 REMOVED
*S  620 REPLACED BY OFFSITE TRACT 13, 161 REPLACED BY OFFSITE TRACT 14
*S  (ALL DRAIN TO WEST BRANCH); PART OF BLWMP 650 ALSO REMOVED
*S  THIS TAKES WEST BRANCH TO DAM
ADD HYD                 12.91  5& 2   6       5.32280     4824.85     357.567      1.25956    1.700    1.416
ROUTE MCUNGE            12.99    6    5       5.32280     4824.85     357.567      1.25956    1.700    1.416 CCODE =      .0
*S ADJUST SEDIMENT BULK
SEDIMENT BULK                                                                                              PK BF =     1.06
*S COMPUTE CABEZON SUBBASIN 13
COMPUTE NM HYD          13.00   -     1        .07890       212.18       9.974      2.37034    1.500    4.202 PER IMP=  85.00
ADD HYD                 13.10  1& 5   5       5.40170     4917.75     367.541      1.27578    1.700    1.423
*S COMPUTE CABEZON SUBBASIN 14
COMPUTE NM HYD          14.00   -     1        .09090       226.41      10.926      2.25374    1.500    3.892 PER IMP=  80.00
ADD HYD                 14.10  1& 5   5       5.49260     5025.36     378.467      1.29197    1.700    1.430
ROUTE MCUNGE            14.90    5    2       5.49260     5025.36     378.467      1.29197    1.700    1.430 CCODE =      .0
*S  Area of 650 is reduced by area that it overlaps
*S   CABEZON basins
COMPUTE NM HYD         650.00   -     1        .03730       63.36       1.959       .98475    1.500    2.654 PER IMP=   9.00
ADD HYD                650.91  1& 2   5       5.52990     5052.43     380.427      1.28990    1.700    1.428
*S WEST BRANCH ARROYO BETWEEN 13 AND 14, SOUTH FROM WESTSIDE BLVD
COMPUTE NM HYD            A_6   -     1        .04620       104.14       4.279      1.73643    1.500    3.522 PER IMP=  50.00
*S   BLACK'S ARROYO (WEST BRANCH) @ DAM
ADD HYD                650.99  1& 5  11       5.57610     5097.04     384.705      1.29360    1.700    1.428
*S  END OF THE BLACK'S ARROYO WEST BRANCH
*S  * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*S  BEGINING OF THE BLACK'S ARROYO EAST BRANCH
*S   End of West Branch-  Beginning of East Branch
*S   THE FOLLOWING ARE CABEZON PHASE 1 REVISIONS
*S   BEGIN WITH CABEZON SUBBASINS THAT DRAIN TO WESTERN HILLS SD
*S   WHICH REPLACE TRIBUTARY B AND ARROYO D
*S   BLWMP SUBBASINS 251,252,250,254 REMOVED
*S   251 REPLACED BY TRACTS 3A,3B; 252 REPLACED BY TRACTS 4A,4B;
*S   250 REPLACED BY TRACTS 3B,11,7A; 254 REPLACED BY 17,7A,7C
SEDIMENT BULK                                                                                              PK BF =     1.06
*S Following is the Northwest corner of offsites and Subbasin 3A
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*S It will be held on ID=4
COMPUTE NM HYD        Off_1A   -     1        .00540        14.55         .683      2.37034    1.500    4.211 PER IMP=  85.00
*S  ROUTE OFF_1A through existing pond
*S  Pond Exists in field; Volume and outflow assumed to
*S  limit flowrate to predevelopment level
*S
ROUTE RESERVOIR        P.Out    1   17        .00540         5.18         .682      2.36893    1.800    1.499 AC-FT=    .200
*S **************DIVIDE HYD TO UNBULK BY 3% ************************
DIVIDE HYD           UNBULK    17   17        .00524         5.03         .662      2.36891    1.800    1.499
                    SEDIMENT   and   56        .00016          .16         .020      2.36892    1.800    1.499
ROUTE MCUNGE        Off_1A.9    17    2        .00524         5.02         .662      2.36826    1.900    1.499 CCODE =      .1
COMPUTE NM HYD        Off_1C   -     1        .00540        10.98         .414      1.43633    1.500    3.178 PER IMP=  34.30
ADD HYD              Off1C.1  1& 2    2        .01064        14.08        1.075      1.89503    1.500    2.069
COMPUTE NM HYD          21ST   -     1        .00100         2.75         .131      2.45016    1.500    4.303 PER IMP=  90.00
ADD HYD              21ST.1   1& 2    2        .01164        16.84        1.206      1.94270    1.500    2.261
ROUTE MCUNGE         21ST.9     2    3        .01164        16.40        1.204      1.93931    1.800    2.202 CCODE =      .1
COMPUTE NM HYD        Off_1B   -     1        .00560        15.09         .708      2.37034    1.500    4.211 PER IMP=  85.00
*S  ROUTE OFF_1B through existing pond
*S  Pond Exists in field; Total volume = 0.22 ac-ft
*S  limited flowrate to predevelopment level
*S
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE RESERVOIR	P.Out	1	17	.00560	5.26	.709	2.37246	1.800	1.467	AC-FT= .211
*S **************	DIVIDE HYD TO UNBULK BY 3% **********									
DIVIDE HYD	UNBULK	17	17	.00543	5.10	.687	2.37245	1.800	1.467	
	SEDIMENT	and	57	.00017	.16	.021	2.37245	1.800	1.467	
ROUTE MCUNGE	Off_1B.9	17	2	.00543	5.10	.687	2.37182	1.900	1.467	CCODE = .1
COMPUTE NM HYD	Off_1D	-	1	.00470	8.76	.316	1.25884	1.500	2.911	PER IMP= 27.00
ADD HYD	Off1D.1	1& 2	2	.01013	11.92	1.003	1.85535	1.500	1.838	
COMPUTE NM HYD	22ND	-	1	.00100	2.75	.131	2.45016	1.500	4.303	PER IMP= 90.00
ADD HYD	22ND.1	1& 2	2	.01113	14.67	1.133	1.90875	1.500	2.059	
ROUTE MCUNGE	22ND.9	2	1	.01113	14.42	1.133	1.90904	1.550	2.025	CCODE = .2
COMPUTE NM HYD	Off_2B	-	2	.00470	12.67	.594	2.37033	1.500	4.212	PER IMP= 85.00
*S ROUTE OFF_2B through existing pond										
*S Pond Exists in field; Total volume = 0.18 ac-ft										
*S limited flowrate to predevelopment level										
ROUTE RESERVOIR	P.Out	2	17	.00470	4.88	.595	2.37213	1.800	1.623	AC-FT= .160
*S **************	DIVIDE HYD TO UNBULK BY 3% **********									
DIVIDE HYD	UNBULK	17	17	.00456	4.73	.577	2.37212	1.800	1.623	
	SEDIMENT	and	58	.00014	.15	.018	2.37212	1.800	1.623	
ADD HYD	Off2B.1	1&17	2	.01569	18.74	1.710	2.04352	1.550	1.866	
ROUTE MCUNGE	OFF2B.9	2	1	.01569	18.45	1.708	2.04142	1.700	1.837	CCODE = .1
*S ADD 21ST and 22ND STs offsite routed flows										
ADD HYD	Off2B.91	1& 3	2	.02733	33.41	2.912	1.99788	1.750	1.910	
COMPUTE NM HYD	3A	-	1	.05440	122.81	5.207	1.79465	1.500	3.528	PER IMP= 55.40
ADD HYD	3A.1	1& 2	4	.08173	126.90	8.119	1.86261	1.500	2.426	
*S										
*S Area coming down 24th to project										
COMPUTE NM HYD	Off_3A	-	1	.00880	23.71	1.112	2.37034	1.500	4.210	PER IMP= 85.00
*S Use roadway cross-section to route Off_3A thru Off_3C although there is										
*S not one presently there										
ROUTE MCUNGE	OFF3A.9	1	2	.00880	23.55	1.112	2.36943	1.550	4.182	CCODE = .1
COMPUTE NM HYD	Off_3C	-	1	.00630	11.73	.423	1.25884	1.500	2.909	PER IMP= 27.00
ADD HYD	Off3C.1	1& 2	2	.01510	33.98	1.535	1.90601	1.550	3.517	
COMPUTE NM HYD	24th	-	1	.00140	3.85	.183	2.45015	1.500	4.297	PER IMP= 90.00
ADD HYD	24TH.1	1& 2	2	.01650	37.29	1.718	1.95216	1.550	3.531	
ROUTE MCUNGE	24TH.9	2	5	.01650	36.94	1.715	1.94857	1.650	3.498	CCODE = .1

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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
COMPUTE NM HYD	Off_3B	-	1	.01190	32.06	1.504	2.37034	1.500	4.209	PER IMP= 85.00
ROUTE MCUNGE	Off_3B.9	1	2	.01190	31.99	1.505	2.37056	1.500	4.201	CCODE = .2
COMPUTE NM HYD	Off_3D	-	1	.00310	5.78	.208	1.25884	1.500	2.913	PER IMP= 27.00
ADD HYD	OFF3D.1	1& 2	2	.01500	37.77	1.713	2.14074	1.500	3.935	
COMPUTE NM HYD	25th	-	1	.00140	3.85	.183	2.45015	1.500	4.297	PER IMP= 90.00
ADD HYD	25TH.1	1& 2	2	.01640	41.62	1.896	2.16713	1.500	3.966	
ROUTE MCUNGE	25TH.9	2	1	.01640	41.28	1.896	2.16814	1.550	3.933	CCODE = .2
ADD HYD	25TH.91	1& 5	2	.03290	66.41	3.611	2.05798	1.600	3.154	
COMPUTE NM HYD	4A	-	1	.05920	132.50	5.580	1.76716	1.500	3.497	PER IMP= 53.90
ADD HYD	4A.1	1& 2	6	.09210	181.37	9.191	1.87104	1.500	3.077	
*S **********										
*S STORM DRAIN MAIN LINE										
*S **********										
*S SUBBASIN 211 from BLWMP (Modified 9/03)										
COMPUTE NM HYD	211A	-	2	.13920	291.02	15.844	2.13414	1.550	3.267	PER IMP= 73.00
ROUTE MCUNGE	211.90	2	19	.13920	282.57	15.810	2.12959	1.650	3.172	CCODE = .2
*S Run predevelopment for 211B										
*S Field investigation shows extensive detention/retention										
*S on this site										
COMPUTE NM HYD	211B	-	1	.03670	32.25	.912	.46598	1.500	1.373	PER IMP= .00
*S Current condition of 211B										
COMPUTE NM HYD	211B	-	1	.03670	98.08	4.640	2.37034	1.500	4.176	PER IMP= 85.00
*S ROUTE 211B through EXISTING POND										
*S Southern Plaza has ponds, as do the other										
*S individual businesses										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S Limited flowrate to predevelopment level										
*S										
ROUTE RESERVOIR	P.Out	1	17	.03670	32.57	4.636	2.36875	1.800	1.387	AC-FT= 1.535
*S **********DIVIDE HYD TO UNBULK BY 3% **********										
DIVIDE HYD	UNBULK	17	17	.03560	31.59	4.497	2.36874	1.800	1.387	
	SEDIMENT	and	59	.00110	.98	.139	2.36875	1.800	1.387	
COMPUTE NM HYD	211C	-	18	.00520	14.15	.680	2.45015	1.500	4.253	PER IMP= 90.00
ADD HYD	211.10	17&19	2	.17480	312.86	20.307	2.17829	1.650	2.797	
ADD HYD	211.20	2&18	1	.18000	320.41	20.987	2.18615	1.650	2.781	
ROUTE MCUNGE	211.91	1	2	.18000	320.41	20.987	2.18615	1.650	2.781	CCODE = .0
COMPUTE NM HYD	Off_2A	-	1	.00560	15.09	.708	2.37034	1.500	4.211	PER IMP= 85.00
ROUTE MCUNGE	OFF2A.9	1	5	.00560	14.79	.708	2.37079	1.550	4.126	CCODE = .2
ADD HYD	211.92	5& 2	2	.18560	329.57	21.695	2.19171	1.650	2.775	
COMPUTE NM HYD	Off_2C	-	1	.00470	8.76	.316	1.25884	1.500	2.911	PER IMP= 27.00
ADD HYD	OFF2C.1	1& 2	2	.19030	334.29	22.010	2.16867	1.650	2.745	
COMPUTE NM HYD	23RD	-	1	.00140	3.85	.183	2.45015	1.500	4.297	PER IMP= 90.00
ADD HYD	23RD.1	1& 2	2	.19170	336.29	22.193	2.17073	1.650	2.741	
ROUTE MCUNGE	23RD.9	2	1	.19170	336.29	22.193	2.17073	1.650	2.741	CCODE = .0
ADD HYD	23RD.91	1& 4	2	.27343	422.98	30.312	2.07863	1.650	2.417	
ROUTE MCUNGE	23RD.92	2	3	.27343	422.98	30.312	2.07863	1.650	2.417	CCODE = .0
*S Bring in the Flow from Subbasin 4A										
ADD HYD	23RD.93	3& 6	2	.36553	588.85	39.503	2.02632	1.550	2.517	
ROUTE MCUNGE	23RD.94	2	3	.36553	580.69	39.438	2.02300	1.600	2.482	CCODE = .1
COMPUTE NM HYD	3B	-	1	.06210	140.74	5.986	1.80728	1.500	3.541	PER IMP= 56.10
ADD HYD	3B.1	1& 3	3	.42763	697.15	45.424	1.99167	1.550	2.547	
*S Run a predevelopment for commercial lot (11) to determine										
*S the maximum permissible pond outflow										
COMPUTE NM HYD	11.00	-	1	.01560	14.02	.388	.46598	1.500	1.405	PER IMP= .00
*S Real Unit 11										
COMPUTE NM HYD	11.00	-	1	.01560	42.02	1.972	2.37033	1.500	4.209	PER IMP= 85.00
*S ROUTE Unit 11 through pond that will be required										

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*S  limit flowrate to predevelopment level
*S
ROUTE RESERVOIR        P.Out    1   17        .01560        14.14        1.961    2.35714   1.800   1.416 AC-FT=      .614
*S ************DIVIDE HYD TO UNBULK BY 3% **********************
DIVIDE HYD           UNBULK    17   17        .01513        13.72        1.902    2.35714   1.800   1.416
                    SEDIMENT   and  59        .00047          .42         .059    2.35714   1.800   1.416
ROUTE MCUNGE          11.90    17    2        .01513        13.71        1.900    2.35483   1.900   1.415 CCODE =       .1
COMPUTE NM HYD          R_2    -     1        .00670        16.68         .732    2.04713   1.500   3.890 PER IMP=    66.00
ADD HYD               R_2.1    1& 2  2        .02183        23.95        2.632    2.26033   1.500   1.714
ADD HYD                3B.2    2& 3  2        .44946       720.80       48.056    2.00472   1.550   2.506
COMPUTE NM HYD          R_1    -     1        .00660        17.36         .802    2.27858   1.500   4.111 PER IMP=    80.00
ADD HYD                3B.3    1& 2  2        .45606       735.75       48.858    2.00868   1.550   2.521
ROUTE MCUNGE           3B.9     2    1        .45606       735.75       48.858    2.00868   1.550   2.521 CCODE =       .0
*S  INSERT BHI HYDROLOGY
COMPUTE NM HYD        BASINA    -     3        .00680        15.00         .636    1.75423   1.500   3.447 PER IMP=    53.20
*S*****************************************************************************
*S                          BASIN B
COMPUTE NM HYD        BASINB    -     4        .01506        33.20        1.409    1.75423   1.500   3.445 PER IMP=    53.20
*S*****************************************************************************
*S                          ADD BASINS A AND B
ADD HYD                 A.B   3& 4   5        .02186        48.20        2.045    1.75421   1.500   3.445
*S*****************************************************************************
*S                          BASIN C
COMPUTE NM HYD        BASINC    -     6        .00834        18.40         .780    1.75423   1.500   3.446 PER IMP=    53.20
*S*****************************************************************************
*S                          ADD BASINS A, B, AND C (INTO MH 15)
ADD HYD                 A.B.C   5& 6   7        .03020        66.60        2.825    1.75420   1.500   3.446
*S*****************************************************************************
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S ADD 3B.9 AND BHI A.B.C										
ADD HYD	7B.9	1& 7	7	.48626	794.88	51.683	1.99288	1.550	2.554	
*S	BASIN D									
COMPUTE NM HYD	BASIND	-	1	.00659	14.67	.626	1.78172	1.500	3.478	PER IMP= 54.70
*S	BASIN E									
COMPUTE NM HYD	BASINE	-	2	.01501	33.39	1.426	1.78172	1.500	3.475	PER IMP= 54.70
*S	BASIN F									
COMPUTE NM HYD	BASINF	-	3	.00745	16.58	.708	1.78172	1.500	3.477	PER IMP= 54.70
*S	ADD BASINS E AND F									
ADD HYD	E.F	2& 3	2	.02246	49.97	2.134	1.78170	1.500	3.476	
*S	BASIN G									
COMPUTE NM HYD	BASING	-	3	.01266	28.16	1.203	1.78172	1.500	3.476	PER IMP= 54.70
*S	ADD BASINS E,F,AND G									
ADD HYD	E.F.G	3& 2	2	.03512	78.13	3.337	1.78170	1.500	3.476	
*S	ADD BASINS D,E,F,AND G									
ADD HYD	D.G	2& 1	2	.04171	92.79	3.963	1.78170	1.500	3.476	
*S	BASIN H									
COMPUTE NM HYD	BASINH	-	3	.01263	27.36	1.145	1.69956	1.500	3.385	PER IMP= 50.20
*S	BASIN I									
COMPUTE NM HYD	BASINI	-	1	.00596	12.92	.540	1.69956	1.500	3.387	PER IMP= 50.20

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*S*************************************************************************
*S                          ADD BASINS H AND I
ADD HYD                  H.I  1& 3   3        .01859        40.28        1.685      1.69952    1.500    3.386
*S*************************************************************************
*S                          BASIN J
COMPUTE NM HYD        BASINJ   -      1        .00170         3.76         .159      1.75423    1.500    3.458 PER IMP=  53.20
*S*************************************************************************
*S                          ADD BASINS H,I AND J
ADD HYD                H.I.J  1& 3   3        .02029        44.04        1.844      1.70409    1.500    3.392
*S*************************************************************************
*S                          ADD BASINS D,E,F,G AND H,I,J (INTO MH 18)
ADD HYD              EFG.HIJ  2& 3   2        .06200       136.84        5.808      1.75630    1.500    3.449
*S   END BHI HYDROLOGY, FOLLOWING WCEA BASINS OMITTED**************************
*S  ADD BHI EFG.HIJ AND PREVIOUSLY ADDED 7B.9
ADD HYD                 7B.91  2& 7   2        .54826       916.39       57.491      1.96613    1.550    2.612
COMPUTE NM HYD          17.00   -     1        .02340        36.85        1.209       .96836    1.500    2.460 PER IMP=  15.00
ADD HYD                 17.10  1& 2   3        .57166       949.67       58.699      1.92528    1.550    2.596
COMPUTE NM HYD             4B   -     1        .04810       108.15        4.571      1.78172    1.500    3.513 PER IMP=  54.70
*S  Route 4B to the Intersection of Cabezon and Trailside
ROUTE MCUNGE            4B.9    1     2        .04810       107.17        4.571      1.78180    1.500    3.481 CCODE =     .2
COMPUTE NM HYD           R_3    -     1        .00520        12.95         .568      2.04713    1.500    3.891 PER IMP=  66.00
*S  Add 4B and Road Section 3
ADD HYD                 4B.91  1& 2   2        .05330       120.12        5.139      1.80767    1.500    3.521
COMPUTE NM HYD             5A   -     1        .03130        70.94        3.017      1.80728    1.500    3.541 PER IMP=  56.10
*S  Add 4B.91 and 5A at Intersection of Cabezon and Trailside
ADD HYD                  5A.1  1& 2   2        .08460       191.06        8.156      1.80752    1.500    3.529
ROUTE MCUNGE             5A.9    2    1        .08460       187.66        8.156      1.80756    1.500    3.466 CCODE =     .2
ADD HYD                POND.IN  1& 3   1        .65626      1131.32       66.855      1.91010    1.550    2.694
*S  ROUTE FLOWS THROUGH Pond/Park in Unit 17
*S  Pond Based on final design grades with 7 ac-ft of
*S  low storage/WQ and then filling remainder of park/field
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COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
										PAGE = 11
*S graded at 2%										
ROUTE RESERVOIR	P.Out	1	2	.65626	474.74	66.541	1.90115	1.900	1.130	AC-FT= 20.179
*S **********DIVIDE HYD TO UNBULK BY 3% **********										
DIVIDE HYD	P.Out.3	2	2	.63657	460.50	64.545	1.90115	1.900	1.130	
	SEDIMENT	and	51	.01969	14.24	1.996	1.90115	1.900	1.130	
*S Route unbulked pond outflow at 17 to east end of 15										
*S through a 60" pipe										
ROUTE MCUNGE	P.Out.9	2	1	.63657	460.50	64.545	1.90115	1.900	1.130	CCODE = .0
*S END OF CABEZON PHASE 1, BEGIN PHASE 2 DEVELOPMENT										
*S BLWMP SUBBASINS 255,256,540,530B REMOVED;										
*S 255 REPLACED BY TRACTS 15,16; 256 REPLACED BY 8,9,18;										
*S 540 REPLACED BY 10,20; 530B REPLACED BY 10,20										
COMPUTE NM HYD	15.00	-	2	.02300	59.57	2.765	2.25374	1.500	4.047	PER IMP= 80.00
ADD HYD	15.10	1& 2	2	.65957	477.95	66.947	1.90312	1.800	1.132	
ROUTE MCUNGE	15.90	2	1	.65957	477.95	66.947	1.90312	1.800	1.132	CCODE = .0
COMPUTE NM HYD	7D	-	2	.07932	174.52	7.251	1.71412	1.500	3.438	PER IMP= 51.00
ADD HYD	7D.1	1& 2	2	.73889	586.79	74.198	1.88283	1.550	1.241	
ROUTE MCUNGE	7D.91	2	1	.73889	586.79	74.198	1.88283	1.550	1.241	CCODE = .0
COMPUTE NM HYD	18.00	-	2	.00780	12.29	.403	.96836	1.500	2.462	PER IMP= 15.00
ADD HYD	18.10	1& 2	2	.74669	597.90	74.601	1.87328	1.550	1.251	
COMPUTE NM HYD	16.00	-	1	.03090	68.82	2.834	1.71966	1.500	3.480	PER IMP= 50.00
ADD HYD	18.20	1& 2	2	.77759	660.77	77.435	1.86717	1.500	1.328	
*S Route combined flow at 18 to East Branch										
*S through a 78" pipe										
ROUTE MCUNGE	18.90	2	3	.77759	660.77	77.435	1.86717	1.500	1.328	CCODE = .0

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COMPUTE NM HYD          8.00   -    1     .02970      67.78      2.898    1.82927   1.500   3.566 PER IMP=   57.30
ADD HYD                 8.10  3& 1  12    .80729     728.54     80.332    1.86578   1.500   1.410
*S  ABOVE IS ALL FLOW TO EAST BRANCH VIA TRIBUTARY B CONTRIBUTING AREA
*S  RESUME BLWMP FILE
*S**************************************************************************
*S     East Branch Main Channel
*S*********************************************************************
*S * * * START OF LEMA CHANNEL                                    * * * * * * *
SEDIMENT BULK                                                                                         PK BF =     1.06
COMPUTE NM HYD        201.00   -    1     .24840     482.06     23.473    1.77184   1.550   3.032 PER IMP=   54.00
ROUTE MCUNGE          201.90   1    2     .24840     478.40     23.458    1.77071   1.600   3.009 CCODE =       .1
COMPUTE NM HYD        204.00   -    1     .01500      35.61      1.583    1.97855   1.500   3.710 PER IMP=   65.00
ADD HYD               204.10  1& 2  5     .26340     502.85     25.041    1.78254   1.600   2.983
*S * * * START OF SNEAD CHANNEL                                   * * * * * * *
COMPUTE NM HYD        205.00   -    1     .09140     159.75      8.890    1.82377   1.600   2.731 PER IMP=   57.00
*S * * * CONFLUENCE OF LEMA AND SNEAD                             * * * * * * *
ADD HYD               205.10  5& 1  5     .35480     662.59     33.931    1.79316   1.600   2.918
ROUTE MCUNGE          205.90   5    2     .35480     655.44     33.890    1.79098   1.600   2.886 CCODE =       .1
COMPUTE NM HYD        202.00   -    1     .12390     233.94     13.588    2.05625   1.600   2.950 PER IMP=   69.00
ROUTE MCUNGE          202.90   1    4     .12390     230.31     13.552    2.05086   1.800   2.904 CCODE =       .1
COMPUTE NM HYD        203.00   -    1     .05390      87.87      5.521    1.92050   1.600   2.547 PER IMP=   62.00
*S    WESTERN HILLS DR. @ BLACK'S ARROYO (EAST BRANCH)
*S * * * AP 203.10 * * * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD               203.10  4& 1  5     .17780     291.61     19.073    2.01133   1.800   2.563
ADD HYD               203.20  5& 2  5     .53260     829.79     52.963    1.86454   1.650   2.434
ROUTE MCUNGE          203.91   5    2     .53260     826.49     52.984    1.86528   1.700   2.425 CCODE =       .2
COMPUTE NM HYD        212.00   -    1     .09950     179.17     10.175    1.91744   1.600   2.814 PER IMP=   62.00
ADD HYD               212.10  1& 2  5     .63210     982.05     63.159    1.87348   1.650   2.428
COMPUTE NM HYD        213.00   -    1     .10800     196.80     11.379    1.97548   1.600   2.847 PER IMP=   65.00
ROUTE MCUNGE          213.90   1    4     .10800     196.80     11.379    1.97548   1.600   2.847 CCODE =       .0
ADD HYD               213.20  5& 4  4     .74010    1162.70     74.538    1.88837   1.650   2.455
*S * * * START OF NICKLAUS CHANNEL                       * * * * * * * *
COMPUTE NM HYD        214.00   -    1     .19090     315.82     18.962    1.86246   1.600   2.585 PER IMP=   59.00

                                 FROM  TO                 PEAK      RUNOFF               TIME TO   CFS      PAGE =  12
               HYDROGRAPH         ID   ID      AREA    DISCHARGE    VOLUME    RUNOFF      PEAK     PER
COMMAND      IDENTIFICATION      NO.  NO.    (SQ MI)     (CFS)     (AC-FT)   (INCHES)   (HOURS)   ACRE      NOTATION

ROUTE MCUNGE          214.90   1    2     .19090     314.83     18.966    1.86284   1.650   2.577 CCODE =       .2
COMPUTE NM HYD        216.00   -    1     .09660     177.20      9.412    1.82682   1.550   2.866 PER IMP=   57.00
*S    COMBINE HYD.'S  214.9   AND  216       AT  216.1
*S
*S    CASPER DR. @ 150 FT. W. OF NICKLAUS DR.
*S * * * * * AP 216.10 * * * * * * * * * * * * * * * * * * * * * * * * *
ADD HYD               216.10  1& 2  6     .28750     480.08     28.378    1.85074   1.600   2.609
COMPUTE NM HYD        215.00   -    1     .11020     169.42     11.060    1.88180   1.650   2.402 PER IMP=   60.00
ROUTE MCUNGE          215.90   1    3     .11020     169.40     11.067    1.88297   1.700   2.402 CCODE =       .2
ADD HYD               216.20  6& 3  6     .39770     623.04     39.445    1.85966   1.650   2.448
*S * * * AFTER SNEAD AND NICKLAUS CONFLUENCE                      * * * * * * *
*S  **************************  AP 216.30  ****************************************
ADD HYD               216.30  6& 4  5    1.13780    1785.73    113.982    1.87833   1.650   2.452
COMPUTE NM HYD          217B   -    2     .06660      73.38      4.246    1.19525   1.650   1.722 PER IMP=   26.00
*S ROUTE 217B DOWN SOUTHERN TO THE PLAYERS CHANNEL
ROUTE MCUNGE         217B.90   2    3     .06660      72.96      4.247    1.19562   1.700   1.712 CCODE =       .2
COMPUTE NM HYD          217A   -    1     .19020     240.60     14.113    1.39127   1.650   1.977 PER IMP=   36.00
*S    COMBINE HYD.'S 217A AND 217B AT PLAYERS CHANNEL
ADD HYD              217A.10  1& 3  1     .25680     313.07     18.360    1.34053   1.650   1.905
*S * * * EAST BRANCH CROSSING SOUTHERN BLVD.                      * * * * * * *
*S    SOUTHERN BLVD. @ 2100 FT. W. OF GOLF COURSE RD.
*S  **************************  BLWMP AP 217.20  *****************************
ADD HYD               217.20  5& 1  5    1.39460    2098.80    132.342    1.77930   1.650   2.351
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*S  CABEZON PHASE 2 REVISIONS RESUME BELOW; FLOW FROM EAST BRANCH NORTH OF
*S  SOUTHERN BLVD ROUTED IN IMPROVED EAST BRANCH
*S SEDIMENT BULK AT 6% FOR CABEZON LINED CHANNEL
SEDIMENT BULK                                                                                          PK BF =     1.06
ROUTE MCUNGE       217.90    5   2     1.39460    2098.80    132.342   1.77930   1.650   2.351 CCODE =        .0
*S  CABEZON PHASE 2 REVISIONS: BLWMP SUBBASINS 218A,218B,219,220 REMOVED;
*S  218A REPLACED BY OFF_4,OFF_5,TRACT 6; 218B REPLACED BY TRACTS 19,1;
*S  219 REPLACED BY TRACTS 5A,5B,5C,2,OFF_4,OFF_6,OFF_7,OFF_8,A_1(CHANNEL);
*S  220 REPLACED BY TRACTS 8,2
COMPUTE NM HYD      Off_4    -    1     .04980     105.55      4.171   1.57058   1.500   3.312 PER IMP=  42.00
ADD HYD          Off_4.10  2& 1   2    1.44440    2154.93    136.514   1.77211   1.650   2.331
COMPUTE NM HYD      Off_5    -    1     .02540      56.89      2.369   1.74862   1.500   3.500 PER IMP=  52.00
ADD HYD          Off_5.10  2& 1   1    1.46980    2185.06    138.882   1.77170   1.650   2.323
ROUTE MCUNGE     Off_5.90    1    2    1.46980    2182.75    138.877   1.77164   1.650   2.320 CCODE =        .2
COMPUTE NM HYD      Off_6    -    1     .02620      55.54      2.195   1.57059   1.500   3.312 PER IMP=  42.00
ADD HYD          Off_6.10  2& 1   2    1.49600    2212.28    141.072   1.76811   1.650   2.311
ROUTE MCUNGE     Off_6.90    2    1    1.49600    2205.75    141.047   1.76780   1.650   2.304 CCODE =        .2
COMPUTE NM HYD       6.00    -    3     .09570     217.66      9.299   1.82184   1.500   3.554 PER IMP=  56.90
COMPUTE NM HYD      19.00    -    2     .00780      12.29       .403    .96836   1.500   2.462 PER IMP=  15.00
ADD HYD             19.10  3& 2   2     .10350     229.95      9.701   1.75752   1.500   3.472
*S * * * START OF GOLF COURSE CHANNEL                     * * * * * * *
SEDIMENT BULK                                                                                          PK BF =     1.06
*S GOLF COURSE ROAD STORM DRAIN SYSTEM WITH TWO OUTFALLS UPSTREAM OF
*S 23RD AVENUE PONDS
*S  BLWMP SUBBASIN 500, SW CORNER OF SOUTHERN AND GOLF COURSE
COMPUTE NM HYD     500.00    -    3     .02610      52.98      2.651   1.90437   1.550   3.172 PER IMP=  60.00
*S ROUTE 500 IN TYPICAL ROADWAY CROSS-SECTION TO EAST BRANCH
ROUTE MCUNGE       500.90    3    4     .02610      52.79      2.653   1.90565   1.600   3.161 CCODE =        .2
*S  COMBINE 19.10 AND 500.90 AT 19.20
ADD HYD             19.20  4& 2   2     .12960     268.57     12.354   1.78734   1.500   3.238
ADD HYD             19.30  2& 1   2    1.62560    2375.40    153.401   1.76935   1.650   2.283
COMPUTE NM HYD      Off_7    -    1     .01060      22.48       .888   1.57058   1.500   3.313 PER IMP=  42.00
*S Route Off_7 through Off_8 to the East Branch
ROUTE MCUNGE     Off_7.90    1    3     .01060      21.99       .886   1.56759   1.650   3.241 CCODE =        .1
COMPUTE NM HYD      Off_8    -    1     .01500      31.80      1.256   1.57059   1.500   3.313 PER IMP=  42.00
ADD HYD           Off_8.1  1& 3   1     .02560      41.81      2.143   1.56930   1.600   2.552

                            FROM  TO                 PEAK      RUNOFF             TIME TO  CFS      PAGE =  13
              HYDROGRAPH     ID   ID      AREA     DISCHARGE   VOLUME    RUNOFF    PEAK    PER
COMMAND     IDENTIFICATION   NO.  NO.   (SQ MI)      (CFS)     (AC-FT)  (INCHES)  (HOURS)  ACRE      NOTATION

ADD HYD             19.40  2& 1   2    1.65120    2414.30    155.543   1.76625   1.650   2.285
COMPUTE NM HYD        A_1    -    1     .03170      71.46      2.936   1.73643   1.500   3.522 PER IMP=  50.00
ADD HYD             19.50  2& 1   2    1.68290    2452.08    158.479   1.76569   1.650   2.277
*S ROUTE UNBULKED THROUGH A_2 (EAST BRANCH) TO SOUTHERN END OF 5
ROUTE MCUNGE        19.90    2    4    1.68290    2446.60    158.469   1.76558   1.700   2.272 CCODE =        .1
COMPUTE NM HYD         5B    -    1     .01960      44.63      1.904   1.82184   1.500   3.558 PER IMP=  56.90
ADD HYD             5B.10  4& 1   2    1.70250    2465.82    160.374   1.76623   1.700   2.263
*S PORTION OF EAST BRANCH WITHIN CABEZON
COMPUTE NM HYD        A_2    -    1     .00810      18.27       .750   1.73643   1.500   3.524 PER IMP=  50.00
ADD HYD             5B.20  2& 1   3    1.71060    2473.65    161.124   1.76609   1.700   2.259
*S ROUTE 5B.20 TO EAST BRANCH CROSSING CABEZON BLVD VIA A_3
ROUTE MCUNGE        5B.90    3    2    1.71060    2453.09    161.133   1.76619   1.700   2.241 CCODE =        .2
COMPUTE NM HYD       2.00    -    1     .03220      68.44      2.703   1.57390   1.500   3.321 PER IMP=  42.00
ADD HYD              2.10  2& 1   5    1.74280    2482.24    163.836   1.76263   1.700   2.225
COMPUTE NM HYD       1.00    -    1     .11170     237.29      9.376   1.57391   1.500   3.319 PER IMP=  42.00
*S  510A is small area between Cabezon Subbasin 1 and
*S  BLWMP Subbasin 510- Used same treatments as 510
COMPUTE NM HYD       510A    -    2     .01320      32.19      1.443   2.05017   1.500   3.811 PER IMP=  68.00
ADD HYD              1.10  1& 2   3     .12490     269.49     10.820   1.62423   1.500   3.371
COMPUTE NM HYD     510.00    -    1     .04080      75.92      3.729   1.71381   1.550   2.907 PER IMP=  51.00
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*S ROUTE 510 IN TYPICAL ROADWAY CROSS-SECTION TO EAST BRANCH
ROUTE MCUNGE          510.90    1    2        .04080        74.66        3.722    1.71059    1.700    2.859 CCODE =      .1
ADD HYD                 1.20  3& 2    4        .16570       287.12       14.542    1.64549    1.500    2.707
ADD HYD                 2.20  4& 5    3       1.90850      2672.22      178.377    1.75246    1.700    2.188
COMPUTE NM HYD            5C    -     1        .02890        65.80        2.808    1.82184    1.500    3.557 PER IMP=    56.90
ROUTE MCUNGE            5C.9    1     2        .02890        64.44        2.808    1.82205    1.500    3.484 CCODE =      .2
COMPUTE NM HYD           R_4    -     1        .00990        24.64        1.081    2.04713    1.500    3.889 PER IMP=    66.00
ADD HYD                R_4.9  1& 2    1        .03880        89.08        3.889    1.87945    1.500    3.587
ADD HYD                 2.40  3& 1    2       1.94730      2713.83      182.267    1.75499    1.700    2.178
COMPUTE NM HYD           A_3    -     1        .00800        18.05         .741    1.73643    1.500    3.524 PER IMP=    50.00
ADD HYD                 2.50  2& 1    2       1.95530      2721.56      183.007    1.75492    1.700    2.175
COMPUTE NM HYD           R_5    -     1        .00760        18.92         .830    2.04712    1.500    3.890 PER IMP=    66.00
ADD HYD               R_5.10  2& 1    2       1.96290      2729.73      183.837    1.75605    1.700    2.173
*S ROUTE R_5.10 TO R_5.90 VIA EAST BRANCH PROPOSED CHANNEL
*S TO DOWNSTREAM END OF SUBBASIN 8
ROUTE MCUNGE          R_5.90    2     1       1.96290      2721.59      183.831    1.75599    1.750    2.166 CCODE =      .1
*S  CONFLUENCE OF TRIBUTARY B AND EAST BRANCH
ADD HYD                 8.20 1&12    2       2.77019      3311.29      264.163    1.78798    1.750    1.868
*S ROUTE 8.20 TO END OF SUBBASIN 9 VIA EAST BRANCH CHANNEL (8.90)
ROUTE MCUNGE            8.90    2     1       2.77019      3311.29      264.163    1.78798    1.750    1.868 CCODE =      .0
COMPUTE NM HYD           A_4    -     2        .00620        13.99         .574    1.73643    1.500    3.525 PER IMP=    50.00
ADD HYD                 8.93  2& 1    1       2.77639      3316.32      264.737    1.78787    1.750    1.866
COMPUTE NM HYD          9.00    -     2        .04480       102.75        4.410    1.84577    1.500    3.584 PER IMP=    58.20
ADD HYD                 9.10  2& 1    1       2.82119      3353.69      269.147    1.78879    1.750    1.857
*S ROUTE 9.10 TO 9.90 (DS end of CAB SUBBASIN 21 in EAST BRANCH)
ROUTE MCUNGE            9.90    1     2       2.82119      3335.75      269.124    1.78863    1.800    1.847 CCODE =      .2
COMPUTE NM HYD         21.00    -     1        .02340        60.61        2.813    2.25374    1.500    4.047 PER IMP=    80.00
ADD HYD                21.10  2& 1    2       2.84459      3356.16      271.937    1.79246    1.800    1.843
COMPUTE NM HYD         10.00    -     1        .12980       294.96       12.612    1.82184    1.500    3.551 PER IMP=    56.90
COMPUTE NM HYD         20.00    -     3        .00780        12.29         .403     .96836    1.500    2.462 PER IMP=    15.00
ADD HYD                20.10  1& 3    1        .13760       307.25       13.015    1.77345    1.500    3.489
ADD HYD                20.20  2& 1    1       2.98219      3451.24      284.952    1.79158    1.800    1.808
COMPUTE NM HYD           R_8    -     2        .01180        30.31        1.371    2.17883    1.500    4.013 PER IMP=    74.00
COMPUTE NM HYD           R_7    -     3        .00170         4.48         .207    2.27858    1.500    4.120 PER IMP=    80.00
ADD HYD               R_8.10  2& 3    4        .01350        34.79        1.578    2.19135    1.500    4.027
*S  Route combined flows at R_8.10 through 36" pipe IN ROADWAY TO DS END OF 14
ROUTE                 R_8.90    4     3        .01350        32.28        1.578    2.19140    1.550    3.736
COMPUTE NM HYD           R_9    -     2        .01540        39.55        1.790    2.17882    1.500    4.013 PER IMP=    74.00
ADD HYD               R_9.10  3& 2    3        .02890        70.47        3.367    2.18467    1.500    3.810
```



```
ADD HYD                20.30  1& 3    9       3.01109      3477.62      288.319    1.79536    1.800    1.805
*S  RESUME BLWMP WITH SUBBASINS WEST OF GOLF COURSE, IN UNIT 16 BUT
*S  NOT PART OF CABEZON
*S REMAINDER OF GOLF COURSE ROAD STORM DRAIN SYSTEM
SEDIMENT BULK                                                                                                  PK BF =    1.06
COMPUTE NM HYD        520.00    -     1        .04090        82.95        3.427    1.57126    1.500    3.169 PER IMP=    43.00
*S  ROUTE 520 TO 530C AT 520.90
ROUTE MCUNGE          520.90    1     3        .04090        81.34        3.423    1.56905    1.550    3.107 CCODE =      .2
COMPUTE NM HYD          530A    -     2        .14730       291.77       12.212    1.55444    1.500    3.095 PER IMP=    41.00
*S ************************  AP 530A.90 (20PP.IN)  ********************
*S ROUTE 530A THROUGH 20TH AVENUE PARK POND SIZE AND VOLUME ARE ASSUMED
*S BASED ON FIELD INVESTIGATION BUT NOT ON A COMPREHENSIVE SURVEY.
*S THIS POND HAS AN OVERFLOW ON THE TWO LOTS ON THE SOUTH EDGE AND
*S IS MODELED WITH THE PROPOSED EXPANSION.
ROUTE RESERVOIR     530A.90    2     7        .14730        61.58       12.212    1.55444    1.950     .653 AC-FT=     5.377
*S**************DIVIDE HYD TO UNBULK TO 3% ************************
DIVIDE HYD          UNBULK     7     7        .14288        59.73       11.845    1.55444    1.950     .653
```

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
	SEDIMENT and	57		.00442	1.85	.366	1.55444	1.950	.653	
*S	********** AP 20PP.OUT **********									
*S	ROUTE 530A.90 "UNBULKED" THROUGH STORM DRAIN TO GOLF COURSE ROAD SYSTEM.									
*S	OUTFALL PIPE IS 48" CMP.									
ROUTE MCUNGE	530A.91	7	99	.14288	59.73	11.842	1.55398	2.000	.653	CCODE = .2
*S	PUNCH HYDROGRAPH FOR FOR GOLF COURSE ROAD STORM DRAIN DESIGN MODEL									
*S	COMBINE 530A.91 AND 520.90 AT STORM DRAIN OUTFALL TO GCR SYSTEM									
ADD HYD	530A.10	99& 3	3	.18378	137.78	15.264	1.55733	1.550	1.171	
*S	ROUTE COMBINED HYDROGRAPHS IN PIPE TO 23RD AVENUE									
ROUTE MCUNGE	530A.92	3	2	.18378	136.48	15.249	1.55574	1.650	1.160	CCODE = .1
*S	COMPUTE 530C									
COMPUTE NM HYD	530C	-	1	.02530	50.49	1.940	1.43793	1.500	3.118	PER IMP= 35.00
*S	COMPUTE 530D 23RD AVE. POND BASIN									
COMPUTE NM HYD	530D	-	3	.01000	15.95	.442	.82952	1.500	2.493	PER IMP= .00
*S	ADD 530D TO 530C									
ADD HYD	530D.10	1& 3	3	.03530	66.44	2.383	1.26557	1.500	2.941	
*S	ADD ROUTED 520 AND 530A TO 530C									
ADD HYD	530D.20	2& 3	2	.21908	174.23	17.631	1.50898	1.600	1.243	
*S	********** AP 530.90 (GC.OUT) **********									
*S	ROUTE COMBINED FLOW THROUGH 23RD AVENUE PONDS									
*S	THE PONDS ARE COMBINED AND TREATED AS ONE TEN ACRE FOOT POND FOR									
*S	FOR THIS MODEL.									
ROUTE RESERVOIR	530.90	2	3	.21908	47.77	17.607	1.50686	3.400	.341	AC-FT= 9.382
*S	THIS RESERVOIR NOT UNBULKED									
ROUTE MCUNGE	530.91	3	2	.21908	47.77	17.606	1.50678	3.450	.341	CCODE = .2
*S	CABEZON PHASE 2 RESUMES BELOW: PART OF BLWMP SUBBASIN 550 IS REPLACED BY									
*S	TRACT 21 AND A_5 (WEST BRANCH)									
*S	COMBINE ROUTED FLOW WITH EAST BRANCH FLOW:									
*S	ADD 20.30 and 530.91 At 20.40									
ADD HYD	20.40	9& 2	1	3.23017	3495.49	305.925	1.77578	1.800	1.691	
COMPUTE NM HYD	A_5	-	2	.01210	27.29	1.121	1.73643	1.500	3.524	PER IMP= 50.00
ADD HYD	20.50	1& 2	1	3.24227	3503.88	307.045	1.77564	1.800	1.689	
*S	ROUTE IN EAST BRANCH TO BLACK DAM									
ROUTE MCUNGE	20.90	1	2	3.24227	3474.91	306.973	1.77522	1.850	1.675	CCODE = .2
*S	Area of 550 is reduced by area that it overlaps									
*S	CABEZON basins									
COMPUTE NM HYD	550.00	-	1	.02760	47.77	1.540	1.04601	1.500	2.704	PER IMP= 13.00
ADD HYD	EAST	2& 1	1	3.26987	3484.61	308.513	1.76907	1.850	1.665	
ADD HYD	DAM.10	1&11	97	8.84598	8392.24	693.218	1.46935	1.750	1.482	
*S	RECALL HYDROGRAPHS FROM BERNALILLO COUNTY SUBDIVISIONS									
*S	THESE ARE PUNCH HYDROGRAPHS AND FLOWS DRAIN DIRECTLY TO THE DAM POOL									
*S	VIA PIPES.									
*S	TEXT TAKEN FROM MODEL RECEIVED 1/9/02 * * * * * * * * *									

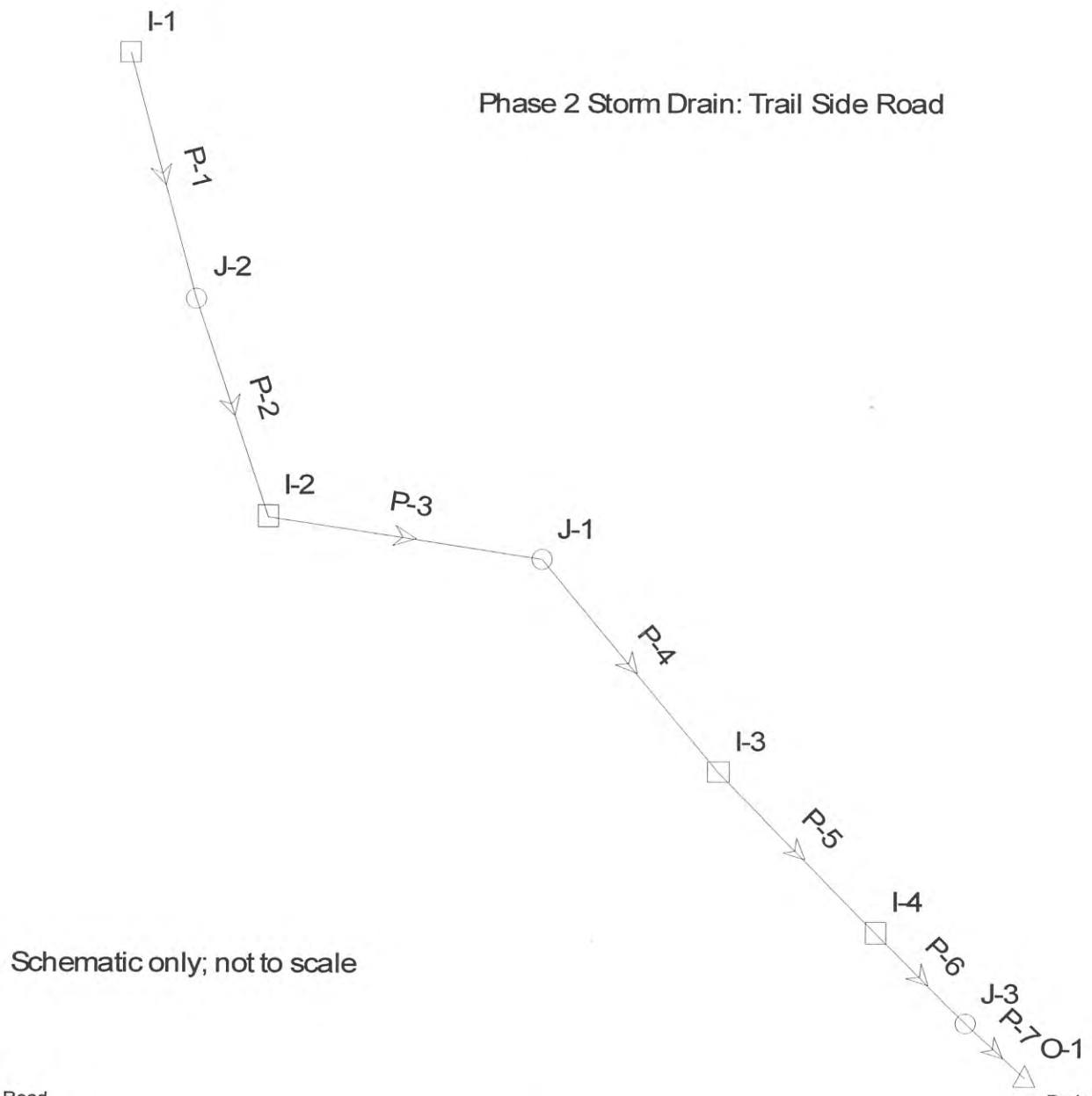
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
*S	Ridgeview Village(DB4), Los Suenos(DB3), and the Park Hill(DB2)									
*S	Subdivisions have free developed discharge based on R-1, 5 du/acre density.									
*S	Flow from some commercial sites east of Unser between Mcmahon and									
*S	Black Arroyo Blvd. is restricted to historic as per Ridgeview Unit 1 Plan.									
*S	Developed flow is accommodated from the residential tracts and									
*S	other commercial tracts. * * * * ** *									
RECALL HYD	AP5	-	18	.38090	850.60	31.937	1.57209	1.550	3.489	
*S	STONEBRIDGE SUBDIVISON FROM MODEL RECEIVED 1/15/02									
RECALL HYD	AP15	-	19	.23850	359.51	17.620	1.38518	1.500	2.355	
*S	ADD RECALL HYDROGRAPHS									
ADD HYD	DIRECT.PIPE 18&19	98		.61940	1191.72	49.556	1.50012	1.550	3.006	
*S	ADD RECALL HYDS TO EAST AND WEST BRANCH FLOWS FOR TOTAL INTO BLACK DAM									
ADD HYD	DAM.IN 98&97	99		9.46538	9047.84	742.774	1.47136	1.700	1.494	

```
*S  ROUTE FLOWS THROUGH WQ STRUCTURE NO. 2
*S  BEFORE ENTERING BLACK DAM
*S
*S
ROUTE RESERVOIR        P.Out   99   98       9.46538      9352.09      762.355      1.51015    1.700    1.544 AC-FT=   30.625
*S *************DIVIDE HYD TO UNBULK BY 3% ************************
DIVIDE HYD           P.Out.3   98   98       9.18141      9071.53      739.484      1.51015    1.700    1.544
                   SEDIMENT  and   51        .28396       280.56       22.871      1.51015    1.700    1.544
*S  ROUTE FLOWS THROUGH BLACK DAM RATING CURVE TAKEN FROM BLACK DAM
*S  FILING SHEET RECORD DRAWINGS - BLARD-51  Stamp dated 9/14/91
*S   Record Dwg Stamp 11/9/92 AMAFCA Ref # NW-04-114 Calabacillas
*S  THIS IS THE FUTURE CONDITIONS RATING CURVE
*S                  5/04/04 BLACK DAM RATING CURVE ADJUSTED FOR CABEZON MODEL:
*S                  ELEVATIONS CONVERTED TO NAVD88 FROM NGVD29; ALSO
*S                  STORAGE INCREASED TO REFLECT WQ STRUCTURE NO.2
ROUTE RESERVOIR        DAM.R   98   91       9.18141      2524.35      739.084      1.50933    2.400     .430 AC-FT=  314.594
*S EMERGENCY SPILLWAY CREST IS AT ELEV 5168.55 FT (NAVD88)
FINISH
□(s10H
```

APPENDIX B

Hydraulics

Scenario: Base



Phase 2 Storm Drain: Trail Side Road

Schematic only; not to scale

Wilson & Company Inc.
37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Scenario: Base

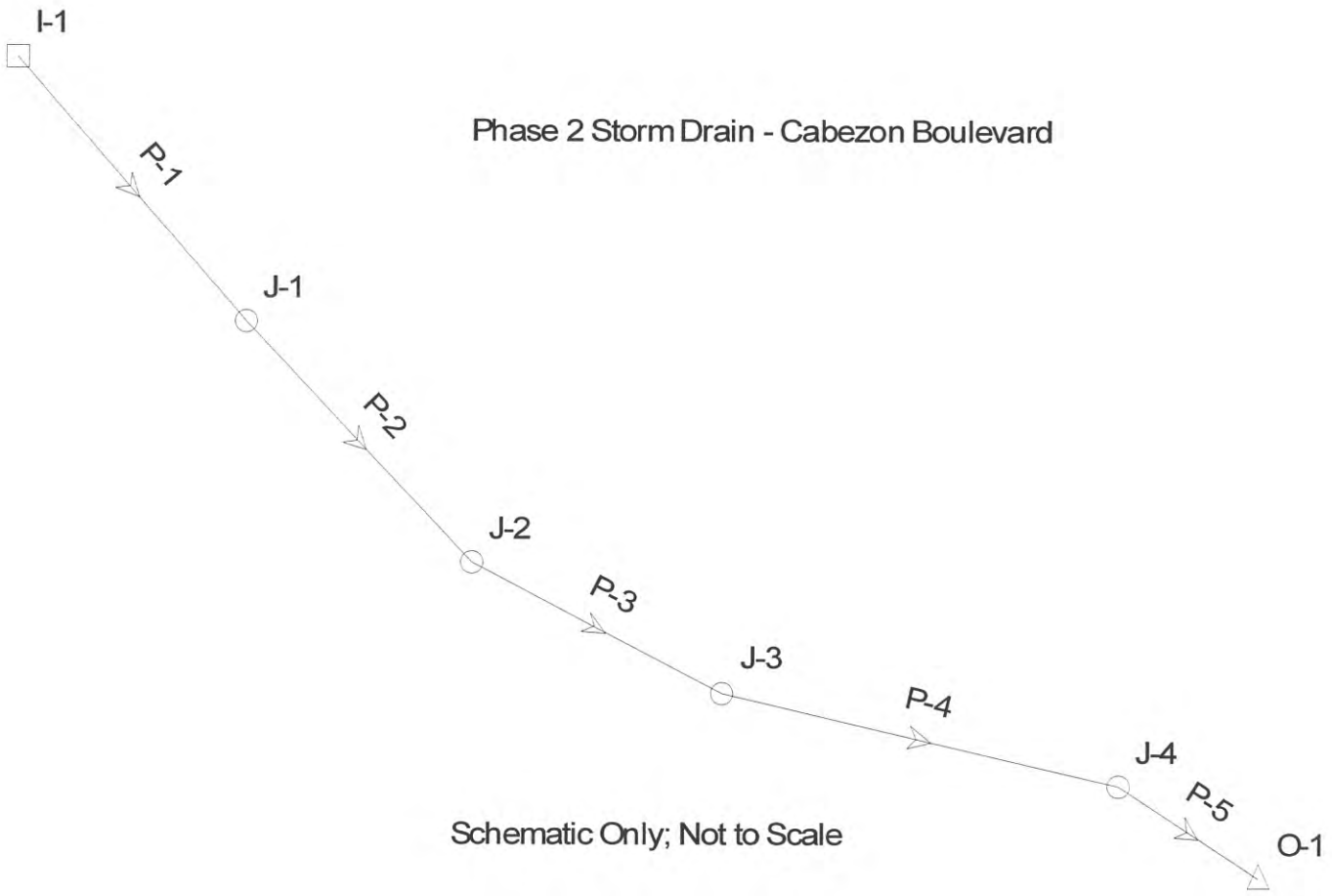
Pipe Report

Label	Length (ft)	Section Size	Constructed Slope (ft/ft)	Bend Angle (degrees)	Average Velocity (ft/s)	Total System Flow (cfs)	Depth In (ft)	Depth Out (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Ground Elevation (ft)	Gravity Element Headloss (ft)	Mannings n
P-1	300.00	66 inch	0.022567	0.00	21.21	504.00	5.55	5.56	5,265.05	5,258.29	5,259.50	5,252.73	5,263.63	5,270.00	6.76	0.013
P-2	500.00	72 inch	0.024460	64.00	25.78	504.00	5.96	11.12	5,258.19	5,251.12	5,252.23	5,240.00	5,253.00	5,263.63	7.07	0.013
P-3	252.00	72 inch	0.022659	26.00	21.68	613.00	9.88	10.31	5,249.88	5,244.60	5,240.00	5,234.29	5,251.09	5,253.00	5.28	0.013
P-4	500.00	72 inch	0.027420	1.00	21.68	613.00	9.36	12.59	5,243.65	5,233.17	5,234.29	5,220.58	5,239.55	5,251.09	10.48	0.013
P-5	502.50	72 inch	0.021453	0.00	24.37	689.00	12.32	9.79	5,232.90	5,219.59	5,220.58	5,209.80	5,229.75	5,239.55	13.30	0.013
P-6	93.00	72 inch	0.019355	0.00	26.77	757.00	9.68	8.51	5,219.48	5,216.51	5,209.80	5,208.00	5,228.75	5,229.75	2.97	0.013
P-7	200.00	8 x 4 ft	0.017500	0.00	23.66	757.00	6.34	4.00	5,214.34	5,208.50	5,208.00	5,204.50	5,217.00	5,228.75	5.84	0.013

Junction Report

Label	Ground Elevation (ft)	Rim Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Structure Diameter (ft)	Headloss Coefficient	Headloss Method	Depth In (ft)	Depth Out (ft)
J-1	5,251.09	5,251.09	5,244.60	5,243.65	4.00	0.13	Standarc	10.31	9.36
J-2	5,263.63	5,263.63	5,258.29	5,258.19	4.00	0.02	Standarc	6.06	5.96
J-3	5,228.75	5,228.75	5,216.51	5,214.34	4.00	0.25	Standarc	8.51	6.34

Scenario: Base



Scenario: Base

Inlet Report

Label	Ground Elevation (ft)	Rim Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Sump Elevation (ft)	Known Flow (cfs)	Headloss Method	Headloss Coefficient	Depth In (ft)	Depth Out (ft)
I-4	5,229.75	5,229.75	5,219.59	5,219.48	5,209.80	757.00	Standard	0.01	9.79	9.68
I-3	5,239.55	5,239.55	5,233.17	5,232.90	5,220.58	689.00	Standard	0.03	12.59	12.32
I-2	5,253.00	5,253.00	5,251.12	5,249.88	5,240.00	613.00	Standard	0.17	11.12	9.88
I-1	5,270.00	5,270.00	5,265.40	5,265.05	5,259.50	504.00	Standard	0.05	5.90	5.55

Scenario: Base

Pipe Report

Label	Length (ft)	Section Size	Constructed Slope (ft/ft)	Bend Angle (degrees)	Average Velocity (ft/s)	Total System Flow (cfs)	Depth In (ft)	Depth Out (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Ground Elevation (ft)	Gravity Element Headloss (ft)	Mannings n
P-1	375.00	36 inch	0.028987	2.00	17.78	89.04	2.84	2.92	5,285.42	5,274.63	5,282.58	5,271.71	5,279.54	5,287.08	10.79	0.013
P-2	350.00	36 inch	0.029000	3.00	17.79	89.04	2.84	3.05	5,274.55	5,264.61	5,271.71	5,261.56	5,268.62	5,279.54	9.94	0.013
P-3	250.00	36 inch	0.044000	10.00	20.97	89.04	2.84	3.05	5,264.40	5,253.61	5,261.56	5,250.56	5,260.36	5,268.62	10.79	0.013
P-4	290.00	36 inch	0.044000	17.00	20.97	89.04	2.84	3.12	5,253.40	5,240.92	5,250.56	5,237.80	5,253.09	5,260.36	12.48	0.013
P-5	65.00	36 inch	0.044000	0.00	20.97	89.04	2.84	2.02	5,240.64	5,236.96	5,237.80	5,234.94	5,248.00	5,253.09	3.68	0.013

Wilson & Company Inc.
37 Brookside Road Waterbury, CT 06708 USA +1-203-755-1666

Scenario: Base

Inlet Report

Label	Ground Elevation (ft)	Rim Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Sump Elevation (ft)	Known Flow (cfs)	Headloss Method	Headloss Coefficient	Depth In (ft)	Depth Out (ft)
I-1	5,287.08	5,287.08	5,285.45	5,285.42	5,282.58	89.04	Standard	0.01	2.87	2.84

Junction Report

Label	Ground Elevation (ft)	Rim Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Structure Diameter (ft)	Headloss Coefficient	Headloss Method	Depth In (ft)	Depth Out (ft)
J-4	5,253.09	5,253.09	5,240.92	5,240.64	4.00	0.11	Standard	3.12	2.84
J-3	5,260.36	5,260.36	5,253.61	5,253.40	4.00	0.08	Standard	3.05	2.84
J-2	5,268.62	5,268.62	5,264.61	5,264.40	4.00	0.08	Standard	3.05	2.84
J-1	5,279.54	5,279.54	5,274.63	5,274.55	4.00	0.03	Standard	2.92	2.84

WILSON &COMPANY	State: New Mexico	Project: Cabezon Phase II	
By: MJI	Date: Sep-04	Checked By: MJI	Date: 4/30/2004

Subject: Water Quality Structure

Procedure for determing "Broad Crested Rectangular Weir" discharge (Q)

$Q = C_v C_d\ 2/3\ [2/3\ g]^{1/2}\ L\ H^{3/2}$ (EQ. 2.47)

Given:

C_v =	1	(assumed)
C_d =	0.848	(Figure 2.25(b))
l (ft) =	15	
L (ft) =	350.00	
H_{up} El. (ft) =	5168.80	
H_{dn} El. (ft) =	5165.00	
H (ft) =	3.80	
Upstream Inv. El. (ft) =	5160.00	
P (ft) =	5.00	

Find: a. Determine if weir is "broad", "short" or "sharp"
b. Stage-Storage-Discharge

Soln: a. Sharp, Broad, or Sharp Crested? (see Figure 2.25)

H/l = 0.253333333
Weir is Broad Crested
therefore, use Equation 2.47 to solve for Q

b. Stage-Storage Discharge

Elevation (ft)	Stage (ft)	Area (acre)	Storage (acre-ft)	ΔH(ft)	Q (ft^3/s)
5160.00	0.00	4.910	0.000	0	0
5160.20	0.20	4.932	0.984	0	0
5160.40	0.40	4.954	1.973	0	0
5160.60	0.60	4.976	2.966	0	0
5160.80	0.80	4.998	3.963	0	0
5161.00	1.00	5.020	4.965	0	0
5161.20	1.20	5.042	5.971	0	0
5161.40	1.40	5.064	6.982	0	0
5161.60	1.60	5.086	7.997	0	0
5161.80	1.80	5.108	9.016	0	0
5162.00	2.00	5.130	10.040	0	0
5162.20	2.20	5.152	11.068	0	0
5162.40	2.40	5.174	12.101	0	0
5162.60	2.60	5.196	13.138	0	0
5162.80	2.80	5.218	14.179	0	0
5163.00	3.00	5.240	15.225	0	0
5163.20	3.20	5.264	16.275	0	0
5163.40	3.40	5.288	17.331	0	0
5163.60	3.60	5.312	18.391	0	0
5163.80	3.80	5.336	19.455	0	0
5164.00	4.00	5.360	20.525	0	0
5164.20	4.20	5.382	21.599	0	0
5164.40	4.40	5.404	22.678	0	0
5164.60	4.60	5.426	23.761	0	0
5164.80	4.80	5.448	24.848	0	0
5165.00	5.00	5.470	25.940	0	0
5165.20	5.20	0.000	26.487	0.20	81.99737
5165.40	5.40	0.000	26.614	0.40	231.9236
5165.60	5.60	0.000	26.742	0.60	426.0708
5165.80	5.80	0.000	26.869	0.80	655.979
5166.00	6.00	0.000	26.997	1.00	916.7585
5166.20	6.20	0.000	27.201	1.20	1205.11
5166.40	6.40	0.000	27.405	1.40	1518.613
5166.60	6.60	0.000	27.609	1.60	1855.389
5166.80	6.80	0.000	27.813	1.80	2213.929
5167.00	7.00	0.000	28.017	2.00	2592.985
5167.20	7.20	0.000	28.215	2.20	2991.5
5167.40	7.40	0.000	28.413	2.40	3408.567
5167.60	7.60	0.000	28.603	2.60	3843.395
5167.80	7.80	0.000	28.793	2.80	4295.285
5168.00	8.00	0.000	28.983	3.00	4763.617
5168.20	8.20	0.000	29.135	3.20	5247.832
5168.40	8.40	0.000	29.287	3.40	5747.425
5168.60	8.60	0.000	29.466	3.60	6261.937
5168.80	8.80	0.000	29.645	3.80	6790.947
5169.00	9.00	0.000	29.824	4.00	7334.068
5169.20	9.20	0.000	30.069	4.20	7890.943
5169.40	9.40	0.000	30.314	4.40	8461.239
5169.60	9.60	0.000	30.559	4.60	9044.648
5169.80	9.80	0.000	30.804	4.80	9640.883