LA CUEVA AND
SOUTH EL CAMINO ARROYOS
LOMR
VOLUME 2

January 1997

LA CUEVA AND SOUTH EL CAMINO ARROYOS LOMR VOLUME 2: APPENDICES

Prepared for:

AMAFCA
2600 PROSPECT NE
ALBUQUERQUE, NM 87107

BOHANNAN-HUSTON INC.
ENGINEERS ▪ PLANNERS ▪ PHOTOGRAMMETRISTS ▪ SURVEYORS ▪ LANDSCAPE ARCHITECTS
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ALBUQUERQUE — LAS CRUCES — SANTA FE

APPENDICES

Appendix A	Form 3: Hydrologic Analysis Form Backup Data
Appendix B	Form 4: Riverine Hydraulic Analysis Form #1 Backup Data North La Cueva Arroyo, East of I-25
Appendix C	Form 4: Riverine Hydraulic Analysis Form #2 Backup Data North La Cueva Arroyo, West of I-25
Appendix D	Form 4: Riverine Hydraulic Analysis Form #3 Backup Data South La Cueva Arroyo, East of I-25
Appendix E	Form 4: Riverine Hydraulic Analysis Form #4 Backup Data South La Cueva Arroyo, West of I-25
Appendix F	Form 7: Bridge/Culvert Form #1 Backup Data Three-10' x 10' CBC Under I-25 (Structure 11)
Appendix G	Form 8: Levee/Floodwall System Analysis Form #2 South El Camino Diversion

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Appendix A

APPENDIX A

Form 3 : Hydrologic Analysis Form
Backup Data

1. Disk #1 containing the AHYMO computer model files for the 100-year recurrence interval.

2. Effective FIS for the City of Albuquerque, September 1983: a copy of the Summary of Discharges Table for the Camino and La Cueva arroyos and the Hydraulic Analysis text pertaining to areas designated as shallow flooding.

3. Northeast Heights Drainage Management Plan, Leonard Rice, April 1975

4. A letter from Resource Technology, Inc. (RTI) explaining the bulking factor equation for sediment.

5. Spreadsheet containing the AHYMO model flows, calculated bulking factors, and the final flows for the locations reported in Explanation 3.4, Table 3.2.

6. Copy of the approved LOMRs for the Nor Este Estates Subdivision.

7. AHYMO summary output for the 100-year, existing conditions model of the North and South La Cueva arroyos.

8. AHYMO summary output for the 100-year, existing conditions model of the South El Camino Arroyo.

9. Documentation of AHYMO model: copy of the users manual cover and certification of acceptance by AMAFCA.

10. Supporting documentation for the AHYMO models used in this LOMR. The hydrology for this area was completed by RTI, Albuquerque, NM.

11. San Pedro Storm Drain Diversion notes and calculations.

APPENDIX A: Section 1

Ahymo Computer Model Files
For The 100-Year Recurrence Interval

The AHYMO model files used in this LOMR are provided on Disk #1. Table A1 summarizes the file names and contents.

Table A1: Summary of AHYMO Files

Input File Name	Output File Name	Summary Output File Name	Contents
LC100C2.HYM	LC100C2.OUT	LC100C2.SUM	This is the hydrology for the North and South La Cueva for the 100-year storm under existing conditions.
EC100CNC.HYM	EC100CNC.OUT	EC100CNC.SUM	This is the hydrology for the South El Camino, including flow from the Sandia Mountains, east of Tramway Blvd. This is also for the 100-year storm under existing conditions.
LC100CBF.HYM	LC100CBF.OUT	LC100CBF.SUM	This file was used for the analysis at I-25 (refer to form 7, #1). The recall hydrographs at I-25 for the South El Camino and the North La Cueva include the sediment bulking factors.

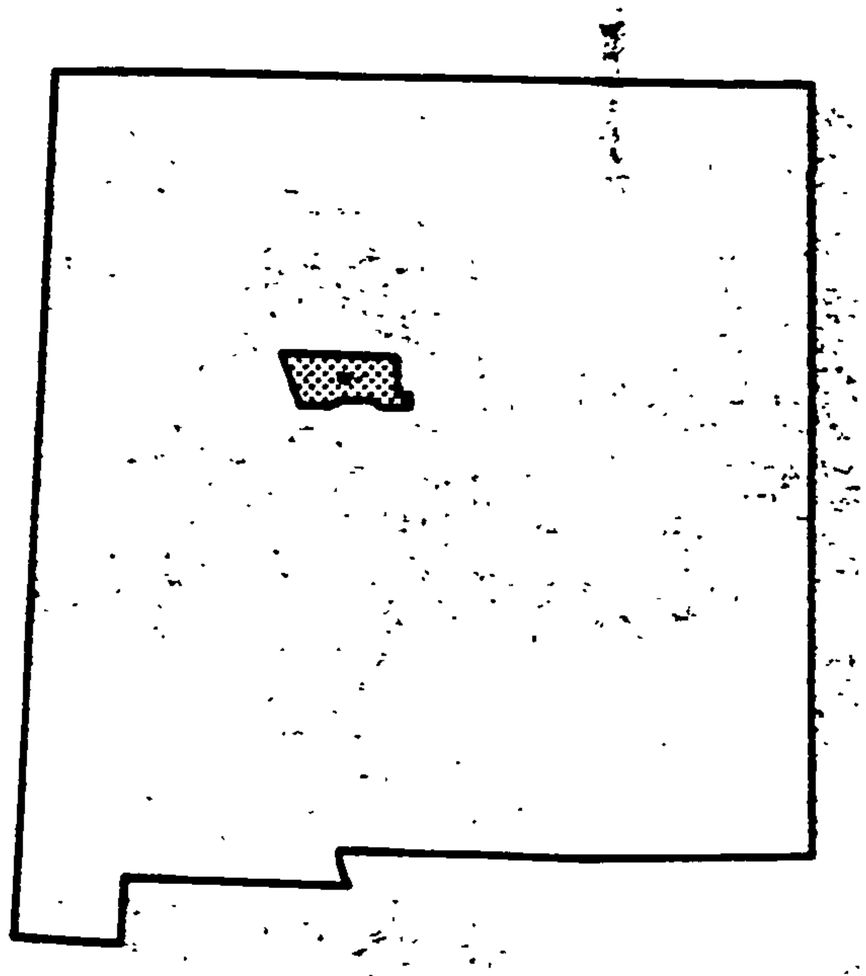
APPENDIX A: Section 2

Effective Flood Insurance Study
City of Albuquerque
September 1983

FLOOD INSURANCE STUDY



CITY OF ALBUQUERQUE, NEW MEXICO
BERNALILLO COUNTY



FINAL-SEPTEMBER 15, 1983

Federal Emergency Management Agency

COMMUNITY NUMBER - 350002

F521

OFFICE COPY

TABLE 3 (Continued)

SUMMARY OF DISCHARGES FOR SHALLOW FLOODING AREAS

Flooding Source and Location	Drainage Area (Sq. Mi.)	100-Year Peak Discharge (C.F.S.)
[1]Borrega Arroyo		
at Confluence of Borrega Arroyo "A"	0.32	171
at Outfall	1.26	614*
[2]Camino Arroyo		
at Tramway Boulevard	1.85	2853
at Ventura Street	2.59	3301
at Interstate 25	3.36	3033
at North Diversion Channel	3.52	2721
[2]La Cueva Arroyo		
at Tramway Boulevard	2.81	3759
at Ventura Street	3.54	3494
at Interstate 25	6.40	3302
at North Diversion Channel	7.10	2975
[2]Arroyo De Domingo Baca		
at Confluence with Baca Tributary	3.26	2550
Dam Inflow	4.43	3845
Dam Outflow	4.43	761
at Ventura Street	5.84	1142
at Interstate 25	7.33	2146
at North Diversion Channel	12.73	3620
[2]North Arroyo De Domingo Baca		
at Tramway Boulevard	0.95	1047
at Ventura Street	2.15	1002
at Interstate 25	3.01	903
at Confluence with Domingo Baca	3.06	885
[3]Embudito Channel		
at Montgomery Boulevard	NA	110
at Juan Tabo Boulevard	NA	241
Downstream of confluence with North Glenwood Hills Channel	NA	454
at Menaul Boulevard	NA	1557
at Confluence with Embudo Channel	NA	1680

[1]Flows from Matotan, 1975
[2]Flows from Northeast Heights Drainage Management Plan – Leonard Rice – April 1975
[3]Flows from Albuquerque Master Drainage Study – Volume III – Bohannan-Huston, Inc. Appendix E
NA – Drainage areas not applicable because of interbasin transfer via roads and storm sewers.
*By Regression Analysis

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail in Albuquerque were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of the flood sources.

Most flooding in Albuquerque is either shallow flooding along the many small braided streams and along roads that flow near critical depth or shallow ponding in the valley areas. Because the flows are at shallow depths, the AO designation (shallow flooding) was used to delineate flood areas with average depths given at 1, 2, or 3 feet (Reference 12). Only the 100-year flood was analyzed for these areas and no profiles were computed. Estimated depths were based on normal or critical depth calculations, which agree closely to each other.

Step-backwater analyses of braided streams and ponding areas did not necessarily improve the accuracy of flood plain delineation. The step-backwater computer analysis of shallow flow near critical depths tends to produce an oscillation between adjacent cross sections of low stage and high velocity and then high stage and low velocity. Within the valley areas, various types of embankments, rather than hydraulic characteristics, are very often the controlling features.

There are several concrete lined channels within the study area that are designed to carry the 100-year discharge with freeboard. Evaluation of 500 year flooding along these channels is not economically justified and profiles for the constructed channels were not computed. These channels are shown and noted as constructed channels on the flood maps.

The Rio Grande, Arroyo de las Calabacillas, and Tijeras Arroyos were studied by detailed methods and the 10-, 50-, 100- and 500-year profiles were developed.

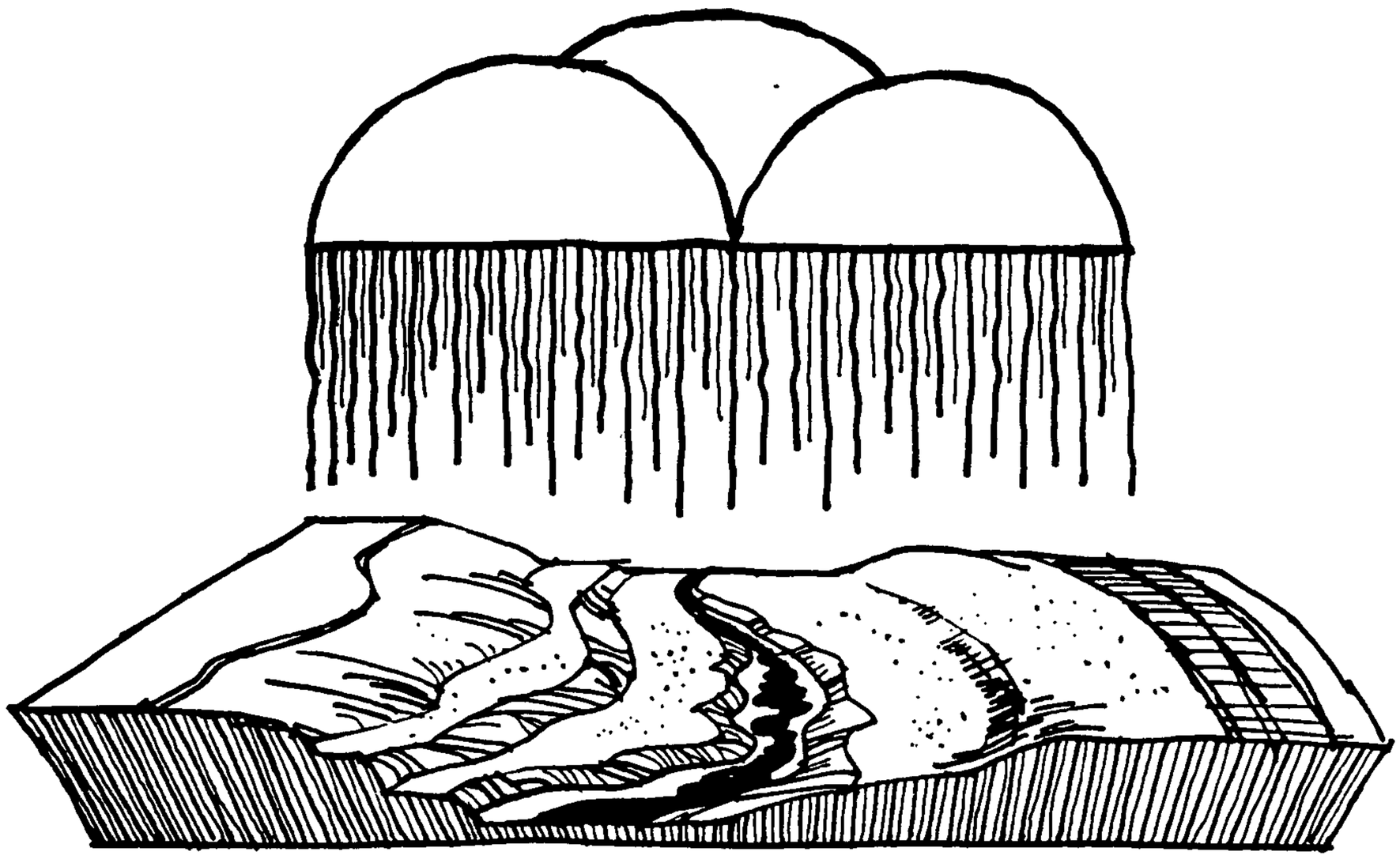
Cross-sections for the backwater analyses were obtained from the following aerial photographs:

Flooding Source	Date of Photography	Scale of Negative
Rio Grande	December 19, 1979	1:24000
Arroyo de las Calabacillas	March 21, 1980	1:10800
Tijeras Arroyo	October 26, 1979	1:12000

APPENDIX A: Section 3

Northeast Heights DMP
Leonard Rice, April 1975

Albuquerque
Metropolitan Arroyo Flood Control Authority



VOLUME I

Northeast Heights
Drainage Management Plan

Leonard Rice Consulting Water Engineers, Inc.

APRIL 1975

Leonard Rice Consulting Water Engineers, Inc.
(303) 455-9589 / 2785 North Speer Boulevard / Denver, Colorado 80211

Leonard Rice
Harold F. ~~Bishop~~
Marianne McGalliard

OFFICES IN
Denver, Colorado
Albuquerque, N.M.

Reply to:
7009 Prospect Avenue NE
Albuquerque, N.M. 87110
(505) 292-1909

April 15, 1975

Mr. John B. Robert
Albuquerque Metropolitan Arroyo
Flood Control Authority
P.O. Box 25851
Albuquerque, New Mexico 87125

Dear Mr. Robert:

The Northeast Heights Drainage Management Plan, presented in two volumes, has been completed in accordance with our Agreement dated July 26, 1973.

The report presents the alternative selected by your Board on August 22, 1974 as amended by your written directions.

We wish to thank you and the many agencies and individuals who provided assistance, information and cooperation during the extended period of this study.

Very truly yours,

LEONARD RICE CONSULTING WATER ENGINEERS, INC.

Kleston H. Laws

Kleston H. Laws

Leonard Rice

Leonard Rice

KHL/db

The technical material contained in this report was prepared by or under the supervision and direction of the undersigned, whose seals as professional engineers are affixed below.

Kleston H. Laws

Kleston H. Laws, Project Engineer

Leonard Rice, Principal

The following members of the Leonard Rice Consulting Water Engineers, Inc. staff assisted in the preparation of this drainage management plan.

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Project Engineers	Kleston H. Laws
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	Ron McElrath

TABLE OF CONTENTS

Title	Page Number
LETTER OF TRANSMITTAL	
TABLE OF CONTENTS	
SUMMARY AND RECOMMENDATIONS	1
Summary	1
Recommendation	2
INTRODUCTION	4
REVIEW OF PHASE A WORK	7
Summary of Phase A Recommendations	7
Terrain and Geology	9
Hydrology	10
MITCAT Model	15
Definition of Flood Hazard Areas	16
Analysis of Future Conditions	17
Potential Flood Damage	17
DRAINAGE MANAGEMENT PLAN	19
Master Plan Drawings	21
Bear Canyon Arroyo	25
Arroyo del Pino	29
North Arroyo del Pino	32
Arroyo de Domingo Baca	33
North Arroyo de Domingo Baca	36
La Cueva Arroyo	38
Camino Arroyo	38
Effective Drainage Basin Management	40
Recommended Implementation Sequence	43
DRAINAGE CRITERIA	46
Improved Channels	46
Natural Channels	46
Improved Natural Channels	47
Lined Open Channels	48
Detention Dams	48
Culverts	48
Energy Dissipators	49
Drop Structures	49
Check Dams	50
Utilities	50

Title	Page Number
ESTIMATED COSTS	51
Maintenance Costs	55

LIST OF TABLES

Table Number	Title	Page Number
1	Basin Area and Peak Runoff, Existing Condition	12
2	Basin Area and Peak Runoff, Implemented Drainage Management Plan	22
3	Unit Costs	52
4	Annual Maintenance Costs	56

LIST OF FIGURES

Figure Number	Title	Page Number
1	Design Rainfall	11
2	Bear Canyon Arroyo	26
3	Bear Canyon Arroyo	28
4	Arroyo del Pino	30
5	Arroyo del Pino	31
6	Arroyo de Domingo Baca	35
7	North Arroyo de Domingo Baca	37
8	Camino Arroyo	39

SUMMARY AND RECOMMENDATIONS

Summary

In August of 1974, after several public hearings and review by interested parties, the Albuquerque Metropolitan Arroyo Flood Control Authority, (AMAFCA), stated their intent to proceed with a drainage management plan based on a desired combination of alternatives presented in the "Phase A Report, Northeast Heights Drainage Management Plan" prepared by Leonard Rice Consulting Water Engineers, Inc. The selected alternative, presented in this report, emphasizes detention storage and combining arroyos to minimize right-of-way requirements; following natural alignments using soft-lined channels with drop structures. Hard-lined channel treatment is used only where the right-of-way is limited by existing physical features or easements. Sediment collection basins are provided at Tramway Boulevard and other feasible locations.

A valuable feature of this study is it can be implemented in phases and it offers the community flexibility in its development sequence. This will allow improvements to be constructed when needed to protect development.

The estimated cost for all improvements is $10.684 million, which includes $4.4 million for dams and diversion channels. The remaining costs will be assumed or shared by developers as they make improvements necessary for their developments.

The annual benefits, outlined in the initial phase of the study for the three alternatives presented, was $7.3 million each.

Amortizing the 10.684 million over the fifty year project life at 5 3/4 percent discount rate and using $265 thousand as the cost of operation and maintainance results in an annual cost of $919 thousand which results in a benefit to cost of 7.94.

Recommendation

This report should be widely distributed to the financial, real estate and development entities to inform them of the existing flood burden which presently exists in the area and allow them to appraise the value of land and improvements necessary to allow safe development.

A floodplain zoning regulation must be passed to protect existing drainageways from encroachment and to effectively implement the plan.

Auxillary outlets are needed on the Arroyo del Oso and Pino detention dams. The spillways for these dams should be analyzed under probable maximum precipitation conditions and upgraded to meet the requirements of the State Engineer. Spillway discharge should be directed to ensure the water returns to the channel below the dams. Sediment removal will be necessary to restore the dams to the volume required to detain the 100 year flood.

Construct flood control dikes at inter basin transfer points to insure flows continue in the arroyo in which they originated.

Construct five new detention dams, and the diversions which allow the dams to effectively reduce peak flows and function

at maximum efficiency. While the improvements can be constructed as necessary, land acquisition for the dams should proceed as rapidly as possible. The areas below detention dams and diversions should be reserved as open space for passage of floods greater than the 100 year event.

Adopt a policy and implement regulations which require developers to construct improvements west of the dams, since the dams reduce peak flows to local drainage levels.

Enact sediment and erosion control regulations, especially during development periods when the natural earth is being disturbed.

Experiment with different kinds of drop structures, made with different materials, to determine the style which is most efficient and acceptable.

Maintain flexibility in implementation, but examine all variances from the plan to determine the hydrologic and hydraulic effect on the downstream peak flow and channel capacity.

Plan development east of Interstate 25 to minimize runoff. West of the freeway, however, drainage should be planned to direct runoff to the North Diversion Channel as rapidly as possible.

INTRODUCTION

Recognizing that preventing drainage problems before they occur is an effective way to optimize public expenditures for urban drainage, the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) in 1973 undertook the development of a major drainage management plan for the area north and east of Albuquerque, New Mexico. This area includes the North Albuquerque Acres subdivision and the area south to Montgomery Boulevard and presently is largely undeveloped. Definition of major drainage requirements allows consideration of preventive management schemes which will not be practical after the area develops.

A high flood potential created by the Sandia Mountains on the east and the ephemeral character of the arroyos draining the area necessitated drainage planning proceed and be coordinated with other planning for the area. Due to rapid urbanization of the southern third and heavy development pressures on the west, AMAFCA initiated a two phase drainage management study for the area to provide a cost effective method of integrating major drainage with other urban systems as the area develops. The following is a general outline of the study undertaken:

- Meet with AMAFCA, local government, and other agencies having an interest in the area for future land planning and collect basic data and other pertinent information relating to present conditions and past studies.

- Perform hydrologic studies to determine the peak rate and volume of storm runoff for each watershed and each significant subbasin for the 10 and 100-year recurrence interval storms and prepare flood hydrographs and appropriate hydraulic computations. Define the flood damage potential for each frequency.

- Develop three alternative flood management solutions, and determine right-of-way requirements for each.

- Define maintenance requirement and costs.

- Prepare a benefit-cost analysis for each of the three alternatives, including tangible benefits and assumed or estimated intangible benefits reduced to a dollar value.

- Review legal aspects of each alternative plan.

- Prepare a written report to summarize the above steps and obtain community approval as to which alternative is desired for implementation.

- Prepare a second report which describes the selected alternative in enough detail to serve as a basis for final design and construction drawings to be prepared under other contracts, as desired by AMAFCA.

This report is the first of two volumes which completes the second phase and describes the selected plan in sufficient

detail to allow its implementation. The two volumes contain engineering drawings which define location, size and functional requirements of the elements of the plan. They provide a basis for reviewing development proposals and maintaining the functional integrity of the major drainage system as the area continues to urbanize. The alternative selected for preliminary design and implementation conforms essentially to Alternative Number 2 below the existing Pino detention reservoir and to Alternative Number 3 in the remainder of the area, as presented in "Phase A Report, Northeast Heights Drainage Management Plan", April, 1974, prepared by Leonard Rice Consulting Water Engineers, Inc. as modified by AMAFCA. It emphasizes detention storage, utilizes soft-lined channels, drop structures, and combining arroyos to reduce right-of-way requirements. The combined arroyos use natural alignment where feasible, and the plan provides sediment collection basins at key locations.

REVIEW OF PHASE A WORK

In the initial phase, the magnitude of the drainage problem was defined, flood hazard maps were prepared, and three different management concepts were developed to meet the major drainage needs. For each alternative drainage management plan, the benefits to be derived were measured in terms of reduced flood damage, increased land utilization, and amount of open space, and compared to the cost of the facilities, land operation and maintenance required to implement the plan. The corresponding benefits and costs were compared to provide a technical assessment of the relative value of the three alternatives as a basis for final selection. Following a review and evaluation of the alternatives by concerned groups and the public, one plan was selected for preliminary design and master drainage planning.

Summary of Phase A Recommendations

Among the actions and policies recommended in the Phase A report are the following:

- Enact a floodplain regulation to protect existing drainageways from encroachment until the drainage management plan is implemented.

- Reserve areas below detention dams as open space for spillway discharges from floods greater than the 100-year event.

the Rio Grande is separated from the East Mesa by a bluff which is breached by the arroyos draining from the Sandia Mountains.

Hydrology

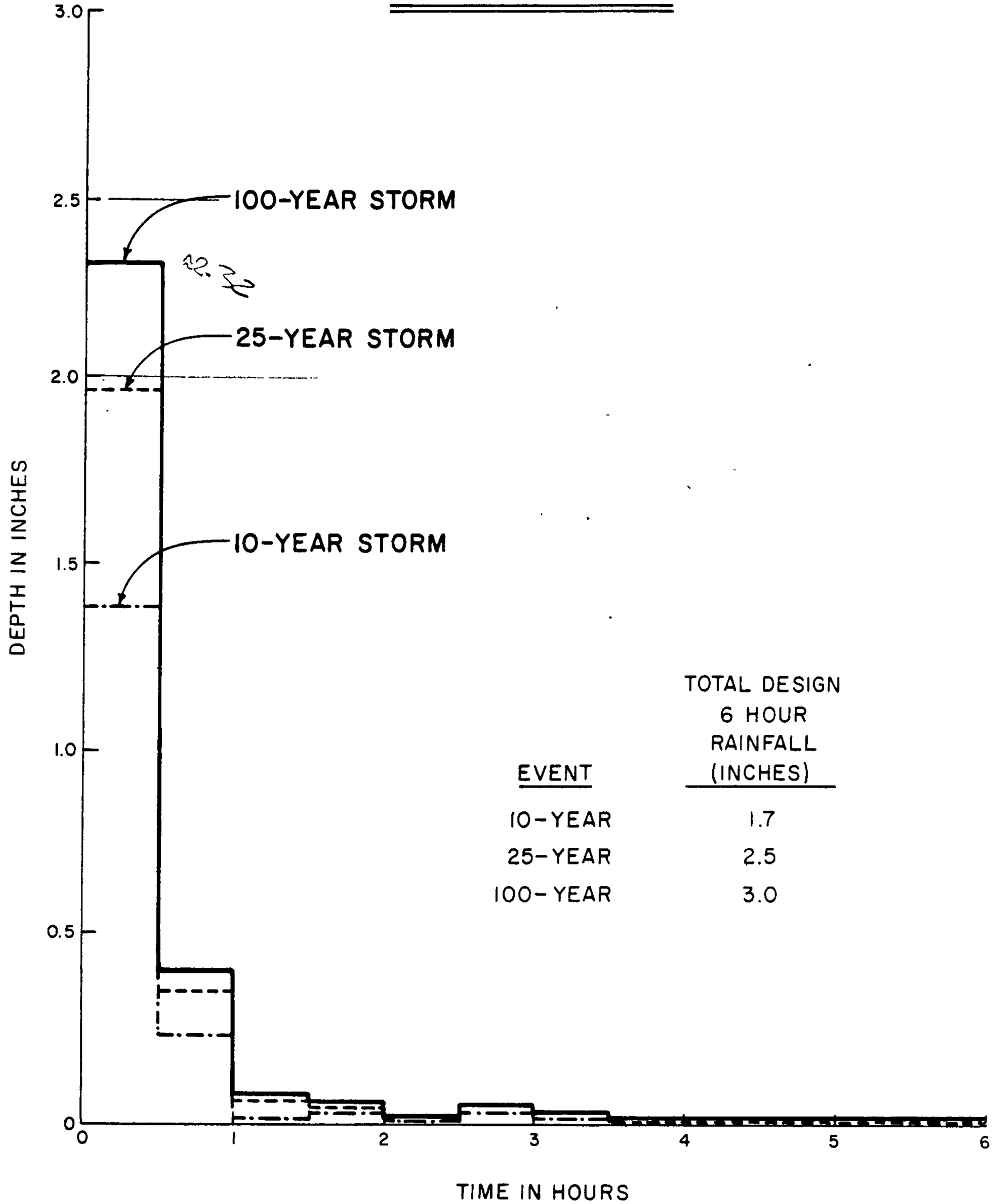
The hydrology of the area is complicated by the ephemeral character of the arroyos, the effect of the Sandia Mountains on the rainfall distribution patterns, and the variations in soil infiltration rates. For planning purposes, it was necessary to predict flood flows for existing conditions, and various possible future developments. In addition, various combinations of channel configuration, ponding volumes, and structural types had to be investigated.

The AMAFCA Board has adopted a resolution which allows the topography, drainage patterns or perviousness to be changed only if the storm waters emanating from the land or higher land will discharge and pass through the land at such rate of flow, velocity, quantity and location as does not exceed the capacity of the storm drainage facilities downstream, or than existed before such alteration occurred.

A detailed review of past studies was made to provide a basis for simulating the rainfall-runoff behavior of the project area. This included consultations with the Corps of Engineer, Soil Conservation Service, United States Geological Survey, and the United States Weather Bureau and review of past drainage studies for the Albuquerque area. Design rainfall is summarized in Figure 1. An analysis of soil maps and consultations with

FIGURE 1

DESIGN RAINFALL



EVENT	TOTAL DESIGN 6 HOUR RAINFALL (INCHES)
10-YEAR	1.7
25-YEAR	2.5
100-YEAR	3.0

TABLE 1
BASIN AREA AND PEAK RUNOFF, EXISTING CONDITION

ARROYO/LOCATION	AREA (acres)	100-YEAR FLOWS (cfs)	10-YEAR FLOWS (cfs)
EMBUDITO ARROYO			
Diversion to Bear Canyon	1914	2596	935
BEAR CANYON ARROYO			
Tramway Boulevard	4171	4700	1677
Total including Embudito Diversion	6085	7200	2612
Juan Tabo Boulevard	6272	6879	2335
Eubank Blvd.at conf.of Bear Arroyo	6475	6543	2169
Total including Bear Arroyo	7005	7391	2358
Wyoming Boulevard	7736	7051	2252
At confluence of Bear Arroyo Tributary	7803	6630	2122
Total including Bear Arroyo Tributary	9361	7900	2321
Arroyo del Oso Dam inflow	9603	7911	2325
Arroyo del Oso Dam outflow	9603	3806	111
San Mateo Boulevard	10148	3597	118
Interstate 25	10170	3395	118
North Diversion Channel	10233	3263	1..
BEAR ARROYO			
Tramway Boulevard	194	407	133
Juan Tabo Boulevard	443	864	187
Confluence at Bear Canyon Arroyo	530	848	19(
BEAR ARROYO TRIBUTARY			
Tramway Boulevard	814	1132	3'
Eubank-Juan Tabo Intersection	1195	1326	3..
Wyoming Boulevard	1517	1397	3 :
Confluence at Bear Canyon Arroyo	1558	1336	3 3
ARROYO DEL PINO			
Tramway Boulevard	3185	4649	975
Hamilton Boulevard (extended)	3573	4230	1(10
Pino Dam inflow	3757	3939	(37
Pino Dam outflow	3757	1407	57
Wyoming Boulevard	4049	1375	62
Interstate 25	4246	1320	63
At confluence of trib. nr. Jefferson	4264	1312	64
Tributary near Jefferson Street	693	882	392
Total including trib. nr. Jefferson	4057	1342	394
North Diversion Channel	5052	1323	343
NORTH ARROYO DEL PINO			
Tramway Boulevard	161	390	69
Hamilton Boulevard	515	740	99
Ventura Street	852	673	109
Barstow Street	1084	654	114
Interstate 25	1484	779	302
North Diversion Channel	1730	940	304

Table 1 continued

ARROYO DE DOMINGO BACA			
Tramway Boulevard	1910	2500	729
At confluence of Baca Tributary	2218	2376	430
Total including Baca Tributary	3385	3845	619
Ventura Street	3726	3827	571
Barstow Street	4211	3555	519
Interstate 25	6763	3500	514
At confluence of North Baca	4792	3490	509
Total including North Baca*	6752	3950	708
North Diversion Channel*	6851	3903	683
ARROYO DE DOMINGO BACA TRIBUTARY			
Tramway Boulevard	785	1340	203
Confluence at Baca	1167	1469	188
NORTH ARROYO DE DOMINGO BACA			
Tramway Boulevard	606	1047	252
Hamilton Boulevard	1036	945	142
Ventura Street*	1374	1002	133
Barstow Street*	1641	942	119
Interstate 25*	1926	903	182
Confluence at Domingo Baca*	1960	885	204
LA CUEVA ARROYO			
Tramway Boulevard	1796	3759	1537
Hamilton Boulevard	2149	3742	846
At confluence of Middle Tributary	2267	3494	892
Total including Middle Tributary	3285	3660	904
Barstow Street	3538	3994	683
Interstate 25	4094	3302	485
North Diversion Channel	4541	2975	488
Middle Tributary:			
Tramway Boulevard	289	632	314
Juan Tabo Blvd. at conf. of S. Trib.	403	467	235
Total including South Tributary	690	800	406
Ventura St., confluence at main br.	1018	774	68
South Tributary:			
Tramway Boulevard	150	280	110
At confluence of Middle Tributary	287	333	167
CAMINO ARROYO			
Tramway Boulevard	1186	2853	956
Hamilton Boulevard	1417	3208	908
Ventura Street	1658	3301	642
Barstow Street	1932	3230	405
Interstate 25 3.35	2150	3033	377
North Diversion Channel	2253	2721	387

*Without La Cueva inter-basin transfer

personnel of the Soil Conservation Service provided the data used as basis for infiltration estimates. Peak rates of runoff revised from the Phase A report are tabulated for the existing conditions in Table 1.

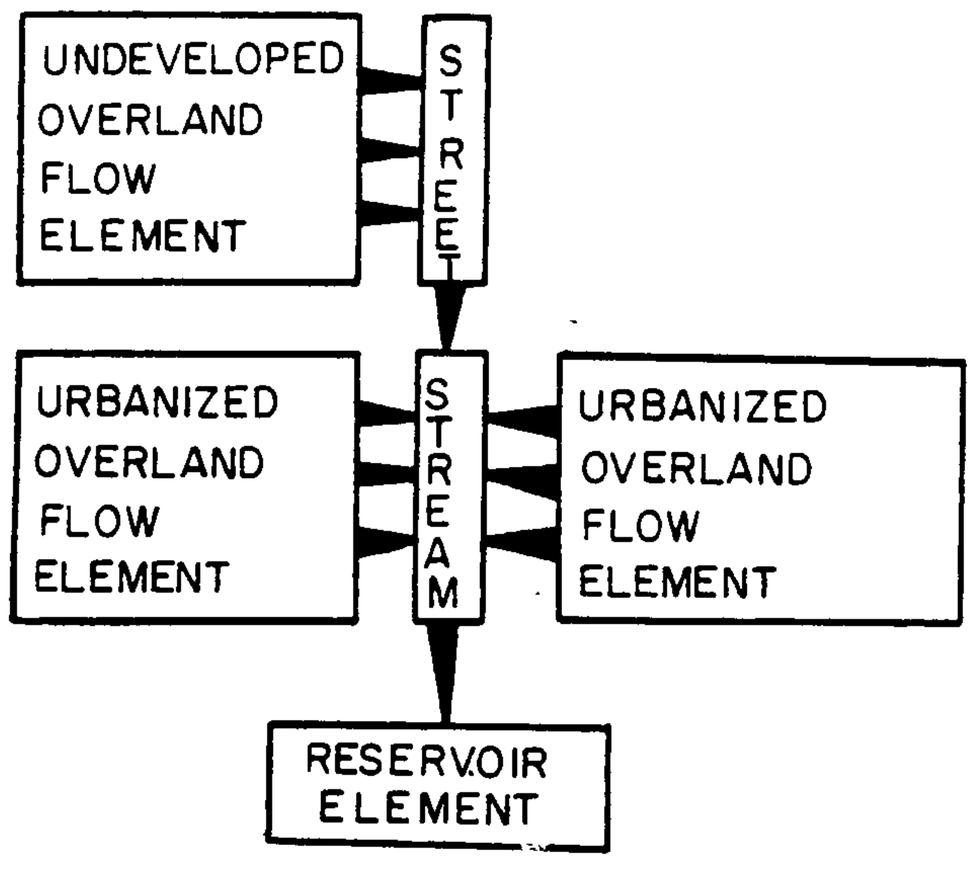
Important to determinations of drainage management alternatives is the effect of channel storage on flows derived from storms of different sizes, extent and durations. This is particularly important in the portion of the basin below the ten percent slope line, where the main watersheds become narrow for approximately two-thirds of their total length. In narrow basins, the attenuation of the floodwave by in-channel storage is critical because of the fast response time of the contributing areas, which sometimes result in multiple peaked hydrographs at the outfall points. The inclusion of urbanization, the subsequent shorter basin response time, and the location of the urban development within the basin becomes very important in determining the most economical drainage management alternative.

Consideration of several detention dams, including the need to determine adequacy of size and efficiency of location, required the generation, combination and routing of design flow hydrographs at several alternative dam sites. Hydrologic analysis, including selection of the most effective location for dam sites and the most effective drainage management alternatives, was accomplished by using the MIT Catchment Model for rainfall-runoff analysis and channel routing.

MITCAT Model

The MIT Catchment Model (MITCAT) is a general purpose watershed simulation model developed at the Massachusets Institute of Technology. The model is formulated in a problem-oriented language with a flexible command structure offering many input/output and computation options. Flow simulation is based on the kinematic wave function which allows the model to accurately duplicate the non-linear behavior of runoff from urban and non-urban areas.

Generally, a basin is modeled as a synthesized network of overland flow planes, stream reaches, pipes and reservoirs, as diagrammed below. By segmenting the basin, the various hydrologic features can be analyzed as they vary at different points in space and time.



TYPICAL SEGMENTATION
OF
HYDROLOGIC ELEMENTS

Definition of Flood Hazard Areas

Both the hydrologic and flood channel hydraulic characteristics of the project are unique. Flood-producing storms are generally of high intensity and short duration that produce flash floods with extremely high peak flows lasting for relatively short periods of time. The steep slopes of the area from the Sandia Mountains to the Rio Grande cause the flood runoff to travel at velocities up to 20 feet per second.

When steep open channels flow through sand and silt, the erosive power of the super-critical flow causes the material forming the bed and banks of the channel to be in motion with the water, continuously altering the cross-section and hydraulic characteristics of the channel. As a result, flood flows in the arroyos of the project area are accompanied by braiding of the channel, transition of the flow from super-critical to sub-critical and back again, extreme instability of the water surface, and scouring and filling of the channel bed. Artifical obstructions, such as houses and bridges, cause temporary ponding, sediment deposition, and diversion of the flow path.

Because of the highly variable and unpredictable nature of these flood flow conditions, the arroyos do not have "floodplains" in the usual sense of the word. Instead, the location and physical configuration of each arroyo is the result of the last major flood, modified by wind erosion and channel carving by small intermittent flows. Using detailed topographic mapping of the area, and the flood flows generated with the MITCAT Model, flood hazard areas were delineated. Maps of these

flood hazard areas for the 10-year and 100-year recurrence interval events were prepared for review and evaluation by local government agencies and the public, and are also contained in Volume 2 of this report.

Analysis of Future Conditions

Future conditions were analyzed by examining probable urban expansion throughout the entire project. Land use plans developed by the firm of Dean & Hunt, Associates, Ltd., Albuquerque, and the City and County Planning Department were used in determining a reasonable degree of development for runoff determination. To determine the viable alternatives for drainage management, the conditions of future development and existing channels were first analyzed to give an idea of the effect of further urbanization on hydrology. It was generally found, with existing channel conditions, that future development increased the runoff about ten percent. This analysis used the assumption that all the developments would be designed to minimize increase in urban runoff in accordance with the previously mentioned AMAFCA regulations.

Potential Flood Damage

Flood depth versus acre damage curves were estimated for each of several land uses. These were used with the orthographic mapping and field inspection to compute the existing flood damages.

Under future development condition, depth versus damage curves were estimated considering the likely land use breakdown and no additional flood protection. Both sets of depth versus damage curves are included in the Phase A report. The potential flood damage for the existing and future conditions are summarized below for various flood events.

SUMMARY OF POTENTIAL FLOOD DAMAGES

Flood Recurrence Interval in Years	Flood Damage Potential for Indicated Event in Millions for Existing Conditions	Flood Damage Potential for Indicated Event In Millions for Future Development Conditions
10	$0.1	$ 15
25	$2.6	$ 94
100	$3.9	$133

DRAINAGE MANAGEMENT PLAN

Each watershed is presented separately to discuss the items pertaining to that watershed and provide specific information at one location. The proposed alignment for the improvements is intended to stay within lands presently burdened with flood hazards. The incline of the East Mesa and poorly defined condition of most arroyos will allow alternate alignments. For example, with the present platting of the North Albuquerque Acres, the outlets from the proposed dams can be directed to flow along the back lot lines of any of three consecutive north-south blocks. This would allow ease of right-of-way definition, however, acquisition may be more expensive since the properties may not presently be burdened with a flood hazard.

There are instances when an alignment change could avoid a development or be advantageous to a particular property owner. Such changes could be allowed in the final design if the concept of the master plan is not adversely affected.

Each improved channel is planned with a maintenance access which can serve as a hiker-biker path north of the channel. The location was selected to allow maximum exposure to the sun and quickly melt snow and ice, and allows use during winter months and periods of flood flow.

The AMAFCA Board has adopted a resolution which states major diversions should be designed for the standard project flood. The Executive Engineer of the Authority has stated in writing,

there are no major diversions in the area covered by this report. The diversions included are all designed to divert the 100-year storm. During flows greater than the 100-year event, the diversion design permits spill down the historic channels. As the areas develop below the diversions, consideration must be given to the effect of the overflows.

Flexibility and caution is urged in the use of this plan; developers and government agencies should realize a major change in land use planning or development techniques could change the basis of this report.

As the area develops and the plan is implemented, the design of each segment should consider the needs of the community and current technology.

Peak rates of runoff at design points for the drainage management plan are tabulated in Table 2. The plotted hydrographs, which are presented with the discussion of each watershed as Figures 2 through 8, show the hydrographs entering and leaving the dams, and at Interstate 25. The hydrographs illustrate three important points:

- The dams effectively reduce peak flows and allow reduced right-of-way and improved channel sections west of the dams.

- The urbanizing area west of the dams generates peak flows which exceed the outflow from the dams.

- The peak outflows from the dams are delayed enough that the urban areas west of the dams no longer contribute significantly.

The hydrology in Table 2 was refined with specific attention given to the effect of the management plan and reflects changes in data presented in the Phase A report.

Master Plan Drawings

Volume 2 of this report presents major drainage way planning drawings in the form of plan and profile, which show recommended improvements and full plan sheets which show existing flood hazard areas only. It is important that the user of the drawings understand the accuracy, intended use and limitations of the drawings. Each drawing contains the statement, "This drawing is a master planning sheet representing preliminary conceptual engineering. It shall not be used for construction purposes" which summarizes the intent. The information portrayed on the sheets is of sufficient accuracy and detail to allow staged implementation in separate portions of the area with assurance that the constructed facilities will be compatible with the overall system when completed. Some order in the staged implementation is required. The dams must be constructed before the smaller channels, culverts, and rights-of-ways west of the dams are allowed. Otherwise, the proposed capacity could be exceeded. Several diversions are required east of the dams to make full use of the facilities and reduce or eliminate flows down existing arroyos. Where the improved channel is proposed at a location not in the historic flow path a segment cannot be constructed

TABLE 2

BASIN AREA AND PEAK RUNOFF IMPLEMENTED DRAINAGE MANAGEMENT PLAN

ARROYO/LOCATION	AREA (acres)	100-YEAR FLOWS (cfs)	10-YEAR FLOWS (cfs)
EMBUDITO ARROYO			
Diversion to Bear Canyon Arroyo	1914	2496	934
BEAR CANYON ARROYO			
Tramway Boulevard	4171	4704	1753
Total including Embudito Diversion	6085	7200	2687
At confluence Bear Arroyo Diversion	6152	7250	2705
Total including Bear Arroyo Diversion	6411	7840	2881
Juan Tabo Dam inflow	6502	7840	2888
Juan Tabo Dam outflow	6502	1875	783
Eubank Blvd., at conf. Bear Arroyo	6705	1866	783
Total including Bear Arroyo	7005	1924	797
Wyoming Boulevard	7736	2005	818
At conf. of Bear Arroyo Tributary	7803	2010	821
Total including Bear Arroyo Tributary	9361	3209	1364
Arroyo del Oso Dam inflow	9603	3232	1381
Arroyo del Oso Dam outflow	9603	1295	763
San Mateo Boulevard	10148	1297	768
Interstate 25	10170	1297	768
North Diversion Channel	10233	1297	768
BEAR ARROYO			
Tramway Boulevard	194	410	195
Diversion at Bear Canyon Arroyo	303	608	226
Juan Tabo Boulevard	169	210	141
Confluence at Bear Canyon Arroyo	256	295	198
BEAR ARROYO TRIBUTARY			
Tramway Boulevard	814	1206	575
Eubank-Juan Tabo intersection	1195	1400	705
Wyoming Boulevard	1517	1519	760
Confluence at Bear Canyon Arroyo	1558	1449	725
ARROYO DEL PINO			
Tramway Dam inflow	3235	4990	975
Tramway Dam outflow	3235	384	211
At confluence North Pino Diversion	3319	628	318
Total including North Pino Diversion	3669	1202	673
Hamilton Boulevard (extended)	3896	1205	675
Pino Dam inflow	4120	1250	697
Pino Dam outflow	4120	269	192
Wyoming Boulevard	4448	541	281
Interstate 25	4516	623	321
At confluence Tributary nr. Jefferson	4525	626	323
Tributary near Jefferson Street	867	933	467
Total including Trib. nr. Jefferson	5392	1295	657
North Diversion Channel	5496	1405	771

TABLE 2 CONTINUED

NORTH ARROYO DEL PINO			
Tramway Boulevard	161	400	75
Diversion at Arroyo del Pino	350	740	135
Hamilton Boulevard	193	255	128
Ventura Street	561	642	322
Barstow Street	794	885	433
Interstate 25	1176	1117	559
North Diversion Channel	1327	1175	588
ARROYO DE DOMINGO BACA			
Tramway Diversion	2089	2550	735
Domingo Baca Tributary Diversion	657	1350	210
Total including Baca Trib. Diversion	2746	3900	940
Dam near Lowell inflow	2835	3845	830
Dam near Lowell outflow	2835	761	489
Hamilton Boulevard	3375	890	525
Ventura Street	3738	1142	630
Barstow Street	4191	1603	727
Interstate 25	4689	2146	987
At confluence of North Baca	4777	2173	1001
Total including North Baca	8002	3577	1692
North Diversion Channel	8147	3620	1714
NORTH ARROYO DE DOMINGO BACA			
Tramway Boulevard	637	1055	255
Total inc. div. from S. T. of La Cueva	746	1300	373
Hamilton Dam inflow	1993	1563	400
Hamilton Dam outflow	1993	360	280
Ventura Street	2403	624	320
Barstow Street	2779	1092	534
Interstate 25	3191	1393	685
Confluence at Domingo Baca	3225	1404	691
LA CUEVA ARROYO			
Tramway Boulevard	1730	3761	1540
Diversion at Camino's Hamilton Dam	2147	3603	850
Ventura Street	174	244	122
Barstow Street	387	517	259
Interstate 25	756	777	390
North Diversion Channel	1116	1049	525
South Tributary:			
Diversion to North Baca	109	281	110
CAMINO ARROYO			
Tramway Boulevard	1235	2641	950
Hamilton Boulevard	1385	2513	907
Total Hamilton Dam inflow	3532	5626	1168
Hamilton Dam outflow	3532	1158	514
Ventura Street	3788	1172	518
Barstow Street	4064	1187	523
Interstate 25	4332	1243	527
North Diversion Channel	4501	1289	529

unless the flows can safely be returned to the historic thalweg. If critical portions of the plan are implemented, private developers may proceed with development and individual street crossings with assurance the elements will be compatible with the overall system.

The drawings are not sufficiently accurate, however, to justify final design of individual structures without a detailed investigation of the surrounding utilities, street grades, building elevations and other factors which necessarily affect construction design. The normal degree of accuracy of aerial photographic mapping specifies that 90 percent of the contours must be within one half interval of the actual elevation. This means that the average contour may be off one foot, and some contours can be off two feet. In some of the mapping, discrepancies greater than these were observed. One possible use of the master plan drawings will be in the acquisition of right-of-way prior to construction. The drawings illustrate the approximate location of existing property ownership and state proposed right-of-way requirements.

Many existing local drainage problems exist along the arroyos. These problems were not examined in detail while preparing the master plan for the major arroyos. It was assumed that local grading and development would allow local drainage to flow into major drainage channels. These problems must be specifically considered in final design. Final construction plans will deal with structural design of facilities, detailed grading, treatment of individual utilities and many other problems that are considered at a planning level only in this study.

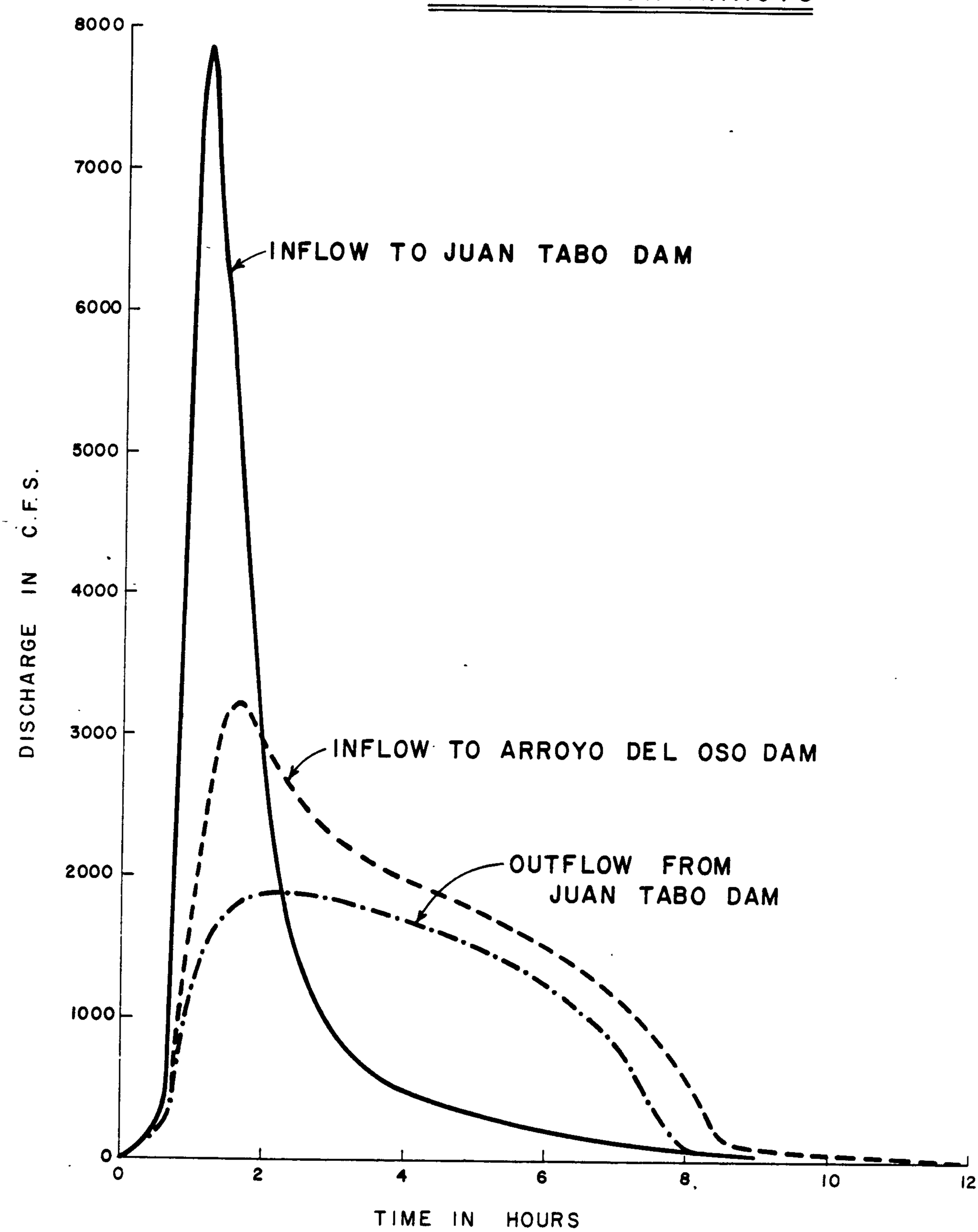
The master plan will be of great benefit to administrators, developers, and the community and provides the basis for design of channel improvements. It is not, however, a solution to all the problems of construction and final design.

Bear Canyon Arroyo

This watershed has the most development and channel improvements of any in the area. From the North Diversion Channel to Moon Street, except for the Arroyo del Oso Golf Course, the channel is well defined by existing right-of-way and/or development. Through this reach proposed improvements consist of preparing a uniform cross-section with drop structures, check dams and/or revetments to check erosion and maintain the cross-section. In the reach between San Mateo Boulevard and the Arroyo del Oso Golf Course the right-of-way is much narrower than from Interstate 25 to the North Diversion Channel, and is proposed to be concrete, utilizing the existing section as much as possible. Through the golf course and east of the Arroyo del Oso Dam to Wyoming Boulevard floodplain zoning is recommended. From Wyoming Boulevard to Juan Tabo Boulevard a uniform unlined channel is recommended.

Figure 2 shows the hydrograph entering and leaving the proposed Juan Tabo Dam. The 75 percent peak flow reduction makes this dam a very valuable part of the plan because it reduces right-of-way and bridge crossing requirements from Juan Tabo to the North Diversion Channel. It also allows the existing right-of-way and channel to safely carry the flow. Unfortunately, the spillway must come over the dam unless the spillway is

FIGURE 2


BEAR CANYON ARROYO
8000
7000
6000
5000
4000
3000
2000
1000
0
DISCHARGE IN C.F.S.
INFLOW TO JUAN TABO DAM
INFLOW TO ARROYO DEL OSO DAM
OUTFLOW FROM
JUAN TABO DAM
0
2
4
6
8
10
12
TIME IN HOURS

constructed through the north abutment and allowed to discharge into the arroyo that has not historically had that burden. Since the channel north of Bear Canyon Arroyo does not allow the rapid return of the emergency spillway flows to Bear Canyon Arroyo, this method was not proposed. A large purchase of land required for such a spillway may yield park and open space benefits that property owners and the community would desire.

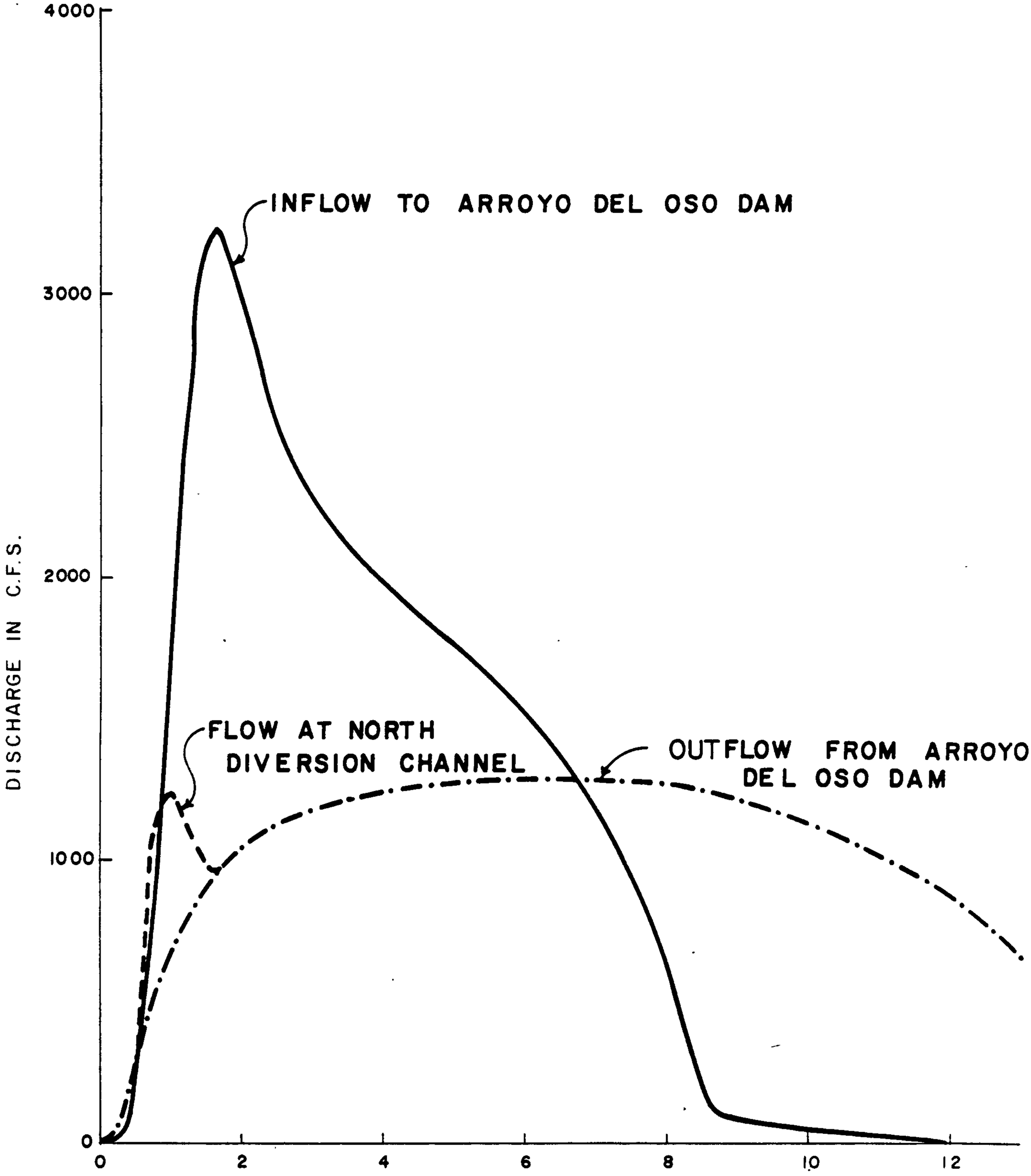
East of Juan Tabo Dam floodplain zoning is recommended because of the large flows and the well defined channel in the Bear Canyon Arroyo. A dike is needed east of Tramway Boulevard to ensure the flows proceed down Bear Canyon Arroyo instead of flowing into Bear Arroyo Tributary.

Bear Canyon Arroyo has two tributaries on the right or north bank. The first, Bear Arroyo, has been diverted into Bear Canyon east of Juan Tabo Dam. The second, Bear Arroyo Tributary, joins Bear Canyon Arroyo between the Arroyo del Oso Dam and Wyoming Boulevard. The maximum peak flow in this arroyo is 1520 cfs. An improved channel is included for Bear Arroyo Tributary to Tramway Boulevard, with floodplain zoning east of Tramway Boulevard.

Figure 3 shows the inflow and outflow hydrographs at the Arroyo del Oso Dam and the small peak caused by the urban area which enters the arroyo between the dam and Interstate 25. To maximize the use of the available storage an auxiliary outlet is required in the existing dam. The present spillway must be upgraded to handle the probable maximum flood and directed

FIGURE 3

BEAR CANYON ARROYO



to the channel below the dam and meet the requirements of the State Engineer. The final hydrologic investigation has shown peak flows exceeding those shown in Phase A report.

Arroyo del Pino

The improvements proposed for Arroyo del Pino begin with a concrete channel from the existing inlet at the North Diversion Channel to Louisiana Boulevard.

The historic channel between Interstate 25 and Louisiana Boulevard has been used for a sanitary land fill, and materials in the land fill create a very unstable condition for unlined or natural channels. A health and sanitation health problem will exist if the land fill were to wash out or be severely eroded. The land fill also creates a poor foundation for a lined channel, as any shift or settlement would severely weaken the structure. The channel will be located on the Public Service Company easement which parallels San Antonio Street. Tentative arrangements have been made by AMAFCA to use the southerly sixty feet of the Public Service Company easement. This allows a common service and maintenance road. A new culvert is required under Interstate 25 to allow use of the right-of-way and maintain a straight alignment. The final design of this crossing must consider utilities paralleling both sides of the Interstate and adequate, safe movement of traffic. The remaining portion of the Arroyo del Pino is to be floodplain zoned. Other improvements include a concrete diversion from North Arroyo del Pino, an auxilliary outlet to the existing Pino dam and the construction of a new dam near Tramway Boulevard.

FIGURE 4

ARROYO DEL PINO

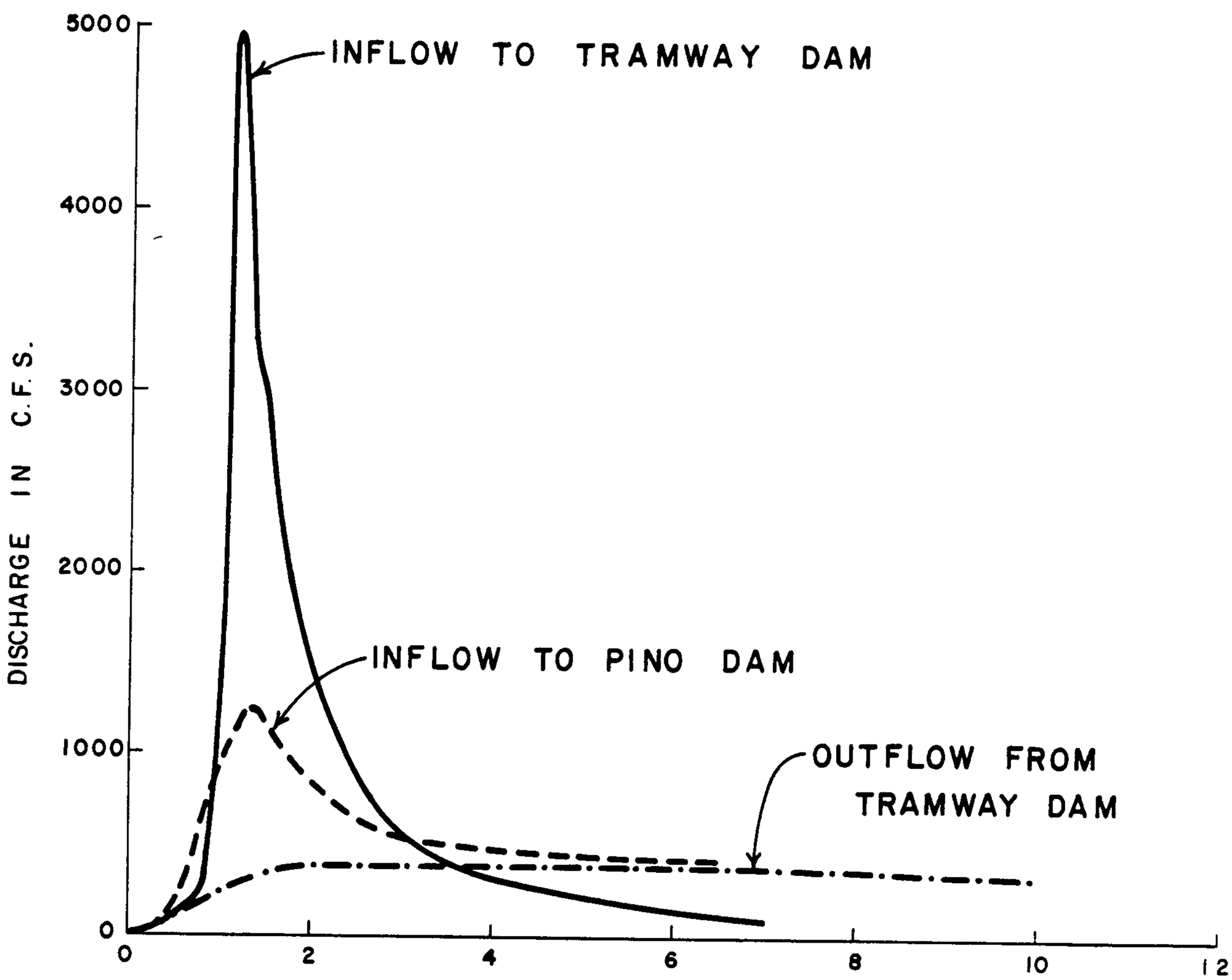
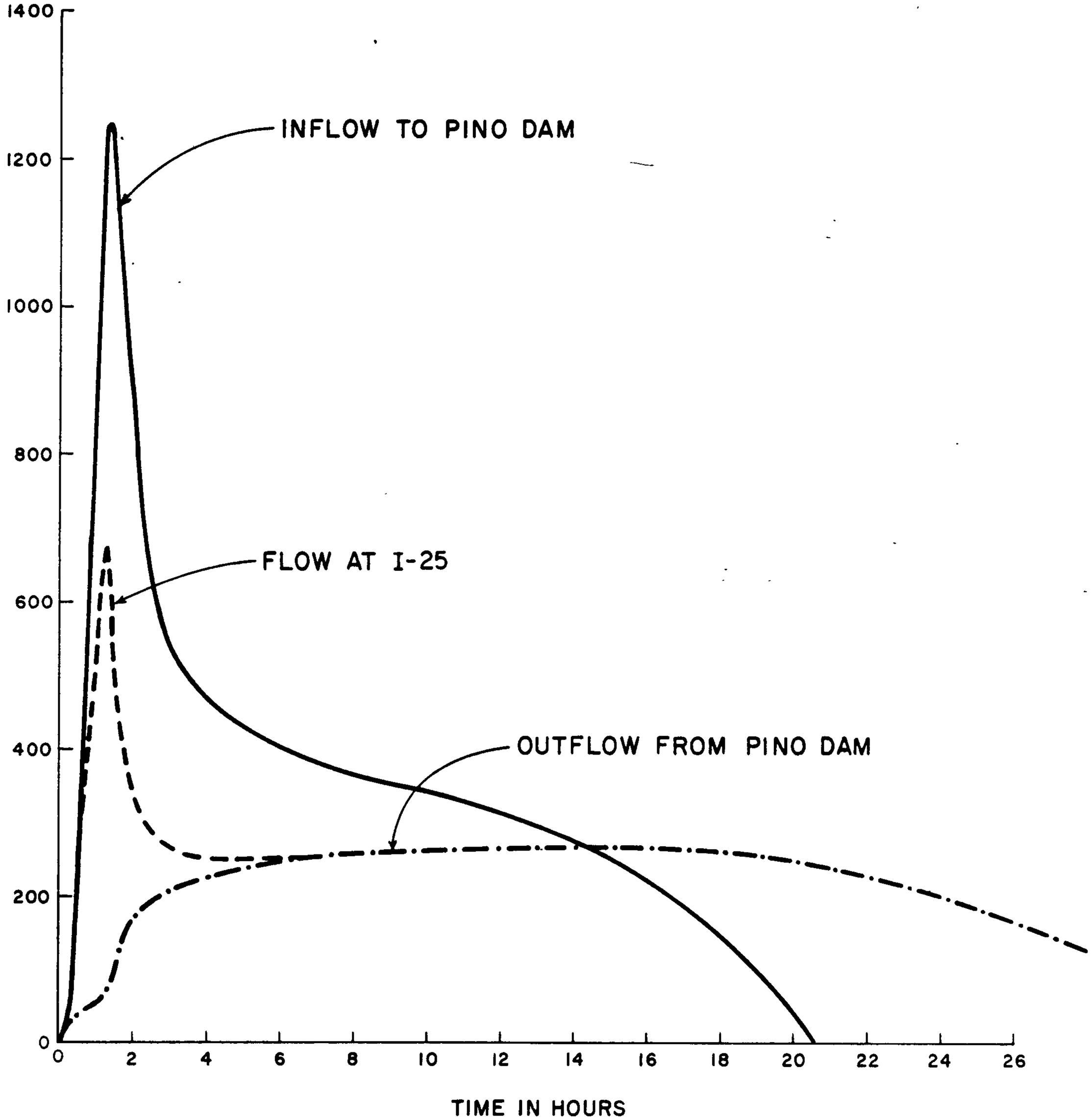


FIGURE 5

ARROYO DEL PINO



Hydrographs shown in Figures 4 and 5 illustrate the reduction in peak flows by the dams and the increase the diversion has on the peak flows in the watershed. Figure 4 shows the peak flow at the Tramway Dam is reduced from 4990 cfs to 384 cfs. Figure 5 shows the inflow to the existing Pino Dam has increased to 1250 cfs, which is largely the result of the North Arroyo del Pino diversion. An auxilliary outlet is required in the existing dam to allow the 100-year flood to be detained without using the spillway. In addition to the auxilliary outlet the spillway of the existing Pino Dam must be analyzed under a probable maximum precipitation flood and upgraded to meet the State Engineer's requirements.

Large new culverts at Tramway Boulevard are required to handle the 4990 cfs. If the dam were located east of Tramway Boulevard this culvert would be much smaller, an alternative the community may wish to consider.

North Arroyo del Pino

The improvements proposed for this watershed divert the flow into Arroyo del Pino just west of Lowell Street. This allows the existing Pino Dam to attenuate the peak flow. This diversion will be a concrete channel with a 20 foot bottom and 2:1 side slopes. The area east of the diversion shall be floodplain zoned to maintain the existing channel and flow capabilities. The area west of the diversion can then be designed for local drainage, with consideration given to the effect of flows greater than the 100-year event. The narrow easements left by existing development will adequately handle the local drainage without endangering life and property. The plan

and profile sheets west of the diversion are included in Volume 2, only to show the existing flood hazard areas.

Arroyo de Domingo Baca

This arroyo has a fairly well defined channel in a public right-of-way to the junction of North Arroyo de Domingo Baca. The channel is not centered in the existing right-of-way and channel widening and modifications are provided to ensure the channel capacity is adequate and within the right-of-way. This channel will have a 100 foot bottom with 3:1 side slopes.

At the junction of North Arroyo de Domingo Baca drop structures will be provided and the area riprapped or concreted to control erosion caused by the turbulence of the junction.

The existing culverts at Los Angeles Avenue and Interstate 25 are adequate although a stilling basin is to be installed downstream of the Interstate. Between the Interstate and Louisiana Boulevard a channel with a 100 foot bottom, 3:1 side slopes, in a 150 foot right-of-way is recommended. There are some easements reserved in this area but they need to be enlarged.

The existing platting between Louisiana Boulevard and Barstow Street, allows a channel having a 125 foot right-of-way, 75 foot bottom, 3:1 side slopes. The 100 foot bottom channel and 150 foot right-of-way is recommended between Barstow Street and Hamilton Street. At Hamilton Street the Arroyo de Domingo Baca Tributary joins the main channel and the

proposed improvements follow this alignment a short distance before following another natural arroyo into the Arroyo de Domingo Baca Dam near Lowell Street. Both Arroyo de Domingo Baca and its Tributary have short diversions immediately west of Tramway Boulevard to convey the runoff into the dam site.

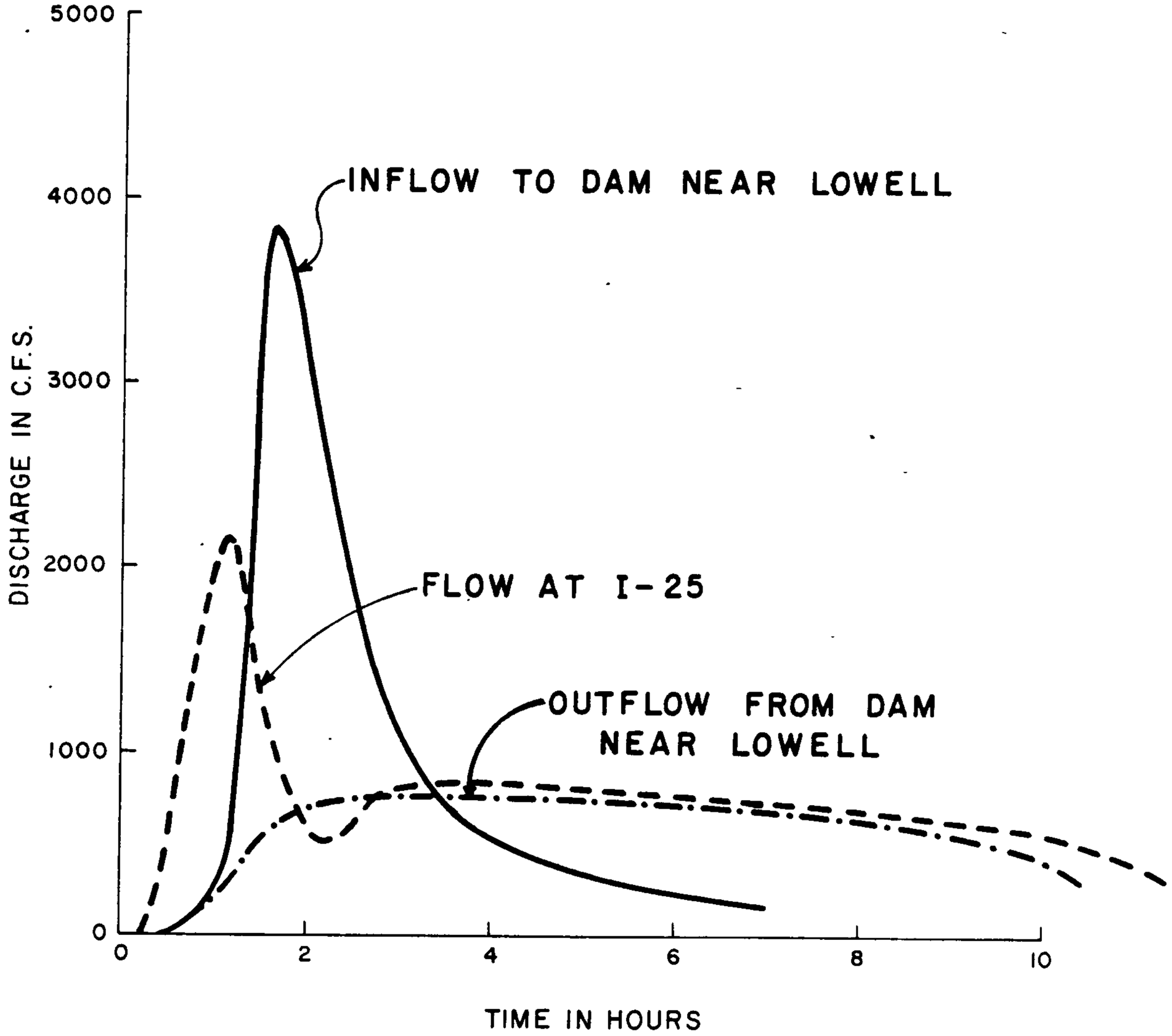
The steep natural arroyo, selected as the dam site, has very little potential for development. Since construction of the streets and buildings in the area of the dam would be almost impossible, its use as a dam site was considered desirable. Check dams are recommended in the arroyo above the dam so entrenchment will not continue during periods of flow.

The area along the abandoned arroyos between Hamilton and the diversions west of Tramway will be designed for local drainage, although consideration must be given to flows greater than the 100-year frequency. Floodplain zoning is proposed east of Tramway Boulevard.

Figure 6, showing the hydrographs for this arroyo, clearly shows the reduction provided by the dam and the peak generated by the urban area between the dam and Interstate 25.

FIGURE 6

ARROYO DE DOMINGO BACA



North Arroyo de Domingo Baca

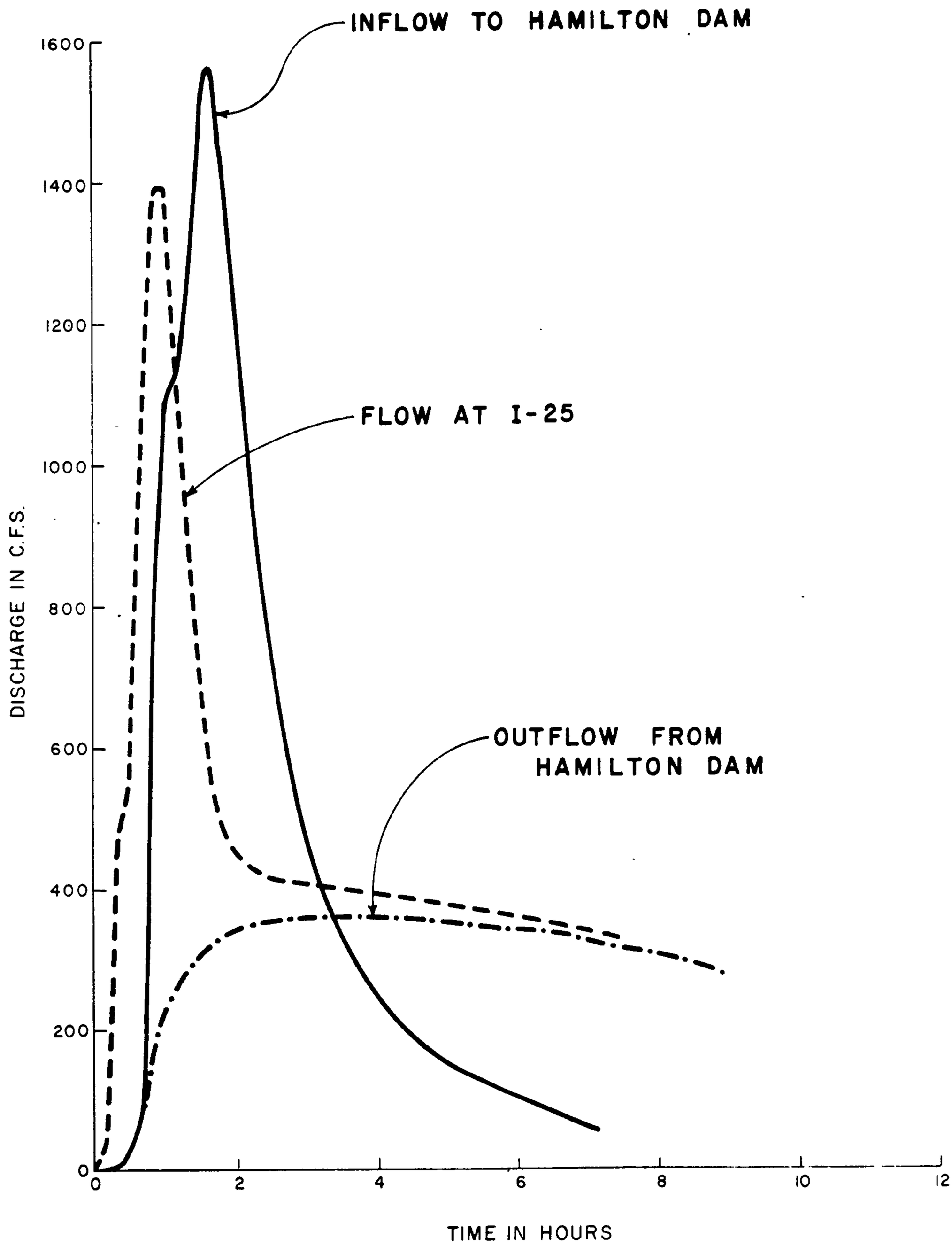
From the junction with Arroyo de Domingo Baca to Interstate 25 this channel is a narrow well-developed earth channel in a restricted right-of-way or on private property. Since this area is well developed and additional right-of-way will be expensive to acquire, the existing cross-section will be hard lined to avoid erosion and right-of-way problems. Figure 7 shows hydrographs at three locations and illustrates the dam at Hamilton Street dramatically reduces the peak flow but the urbanized area between the dam and Interstate 25 generates a peak that exceeds the hydrograph routed through the dam, and is nearly as large as the peak generated east of the dam.

The channel improvements west of Hamilton Dam have a 40 foot bottom and a 125 foot right-of-way between Interstate 25 and Barstow Street, and a 100 foot right-of-way between Barstow Street and Hamilton Street. The narrow right-of-way is possible because of the smaller flows and depths.

East of the dam a 100 foot bottom channel in a 150 foot right-of-way is required to carry the flows to dam. Just west of Tramway a diversion brigns the flows from the south tributary of the La Cueva Arroyo into this channel. The dam is designed to handle the flow from the Middle Tributary of La Cueva Arroyo although street pattern and local grading will be required to direct the flows into the dam. The area east of Tramway Boulevard is to be floodplain zoned.

FIGURE 7

NORTH ARROYO DE DOMINGO BACA



La Cueva Arroyo

Two diversions are made from the existing La Cueva Arroyo watershed. The South Tributary diverts to North Arroyo de Domingo Baca immediately west of Tramway Boulevard, and was described in the North Arroyo de Domingo Baca section. La Cueva Arroyo, itself, diverts into the Camino Arroyo Hamilton Dam. These diversions remove the major flows from the arroyo and allow the remaining area west of Hamilton Street to be designed for local drainage. A dike is required which will positively separate the La Cueva Arroyo from the North Arroyo de Domingo Baca at the existing piracy point near Ventura Street. The diversion channel will require a 250 foot right-of-way and a 200 foot wide bottom to convey flows into the Camino Hamilton Dam. Plan sheets are shown in Volume 2 to show existing flood hazard areas.

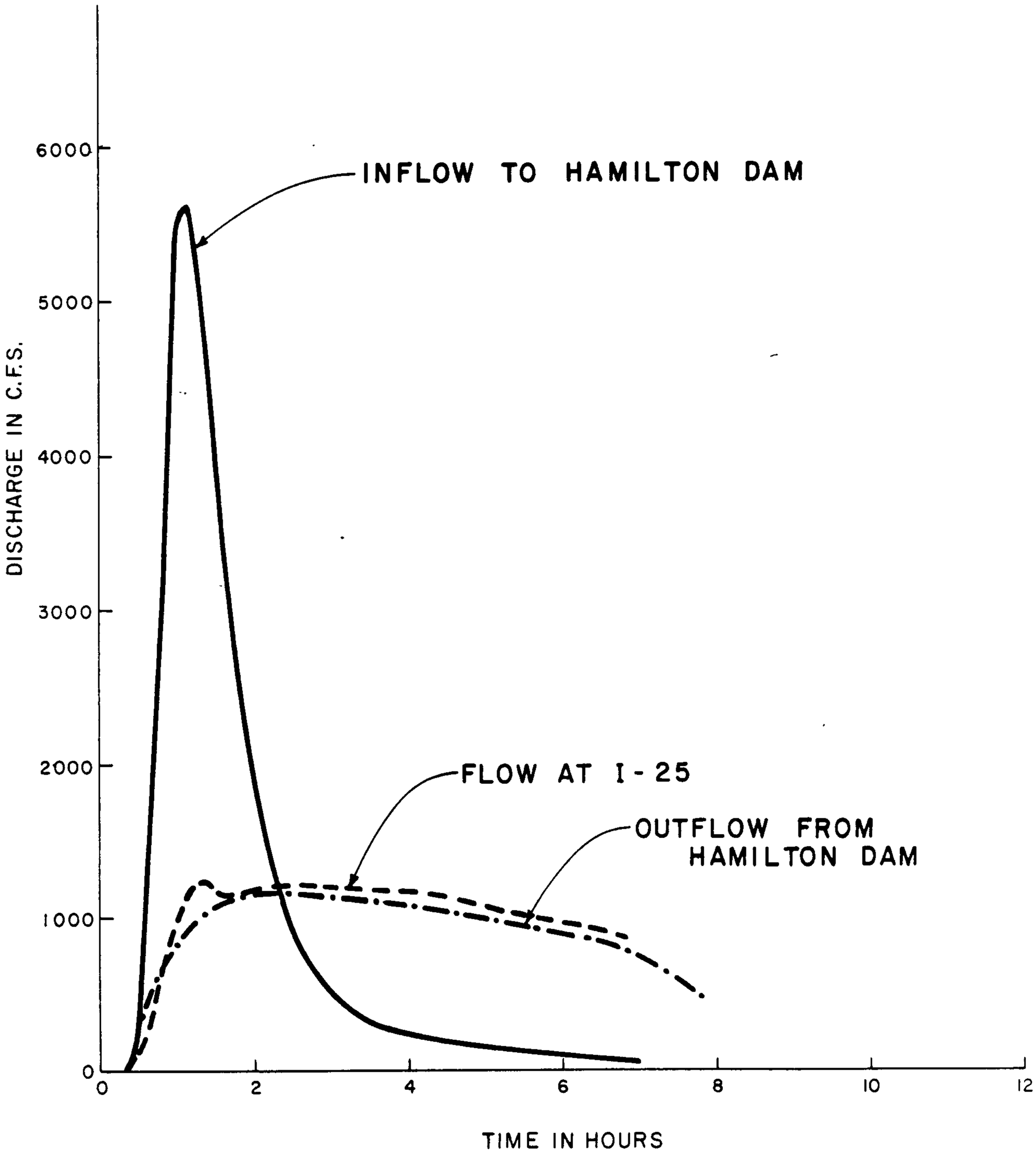
Camino Arroyo

The hydrographs in Figure 8 show the large peak flow entering the Camino Hamilton Dam which is comprised of the flows from the Camino and La Cueva Arroyo watersheds. The outflow hydrograph and the hydrograph at Interstate 25 illustrate why the improved channel is the same size from the dam to the North Diversion Channel. This channel will have a 75 foot bottom with 3:1 side slopes and be contained in a 125 foot right-of-way.

The emergency dam spillway must go over the dam embankment to insure the flows return to the historic arroyo. A less ex-

FIGURE 8

CAMINO ARROYO



pensive spillway can be constructed which would discharge into La Cueva Arroyo or North Camino Arroyo. Since more than half of the inflow is from La Cueva Arroyo diversion, it may be legally, economically and politically desirable to provide such a spillway.

A gravel mining operation will soon begin in the area between the North Diversion Channel and San Mateo Boulevard. This mining will probably change the grading and require a change in the master plan. Depending on the excavation and the method used to mine and restore the area, a number of designs will satisfy the requirement of conveying storm flows to the North Diversion Channel. Consideration must be given to where and how North Camino Arroyo joins the improved channel during and after the mining.

The existing culverts under Coronado Airport are not large enough to handle the 100-year design. Three additional 48 inch culverts are required to carry the 100-year flood without over flow at the runway. Since the future of the airport is not certain, additional culverts are not recommended. Flows across the runway will do little or no damage, other than possibly delaying landing aircraft during intense thunderstorms.

Effective Drainage Basin Management

The basic objective of the plan is to safely handle major drainage while making as much land as possible available for safe development with as little alteration as possible to the topography and other natural characteristics of the area.

Specific criteria used to accomplish these objectives, and the policies and regualtions which will provide effective implementation are:

- The plans were based on runoff from the 100-year storm.

- As far as possible, the arroyos are preserved in their natural state and in the primary storm drainage waterways.

- Ground water recharge potential and water quality standards will be preserved and possibly enhanced.

- Drainage problems are transferred from one location to another only when the relocation solves a problem without liability.

- The plans are as flexible as possible, avoiding fixed solutions and providing latitude for continuing adaptation to changing conditions. Any change which reduces present detention in channels (channel storage) will increase the downstream flood peaks and thus require more costly improvements. Since most of the major arroyos have extremely wide floodplain areas there is now considerable channel storage that would be lost in any channelization alternative designed to minimize the right-of-way. Thus, channelization to provide more land for development must include detention ponding so the downstream

peaks are not increased. This approach has been used extensively in the development of this master plan. Most of the proposed channel improvements use soft-lined channels. Hard linings are used only in areas of restricted right-of-way, or where a particular problem exists, such as a diversion or sanitary landfill.

Detention ponding reduces channel right-of-way requirements and makes more land available for development along major arroyo channels. At the same time, the open space benefits of wide channels may have more community appeal in specific areas. Floodplain zoning has been identified in areas where the land probably will remain open and topographic features are adequate to contain the flood waters.

Floodplain zoning is a viable alternative in areas where improved channels have been specified. For example, in a planned unit development a floodplain could be used as the open space portion of the development with higher density construction permitted in areas adjacent to the floodplain. East of the Tramway Boulevard, development is assumed to continue in the natural area, as it is in the Sandia Heights subdivision, which is compatable with floodplain zoning principle. The channels in this area above Tramway are more defined and narrower than in the lower portions of the basin, so greater land use is possible. Floodplain zoning has been specified in all arroyos east of Tramway Boulevard.

A floodplain regulation ordinance should be enacted to protect these existing drainageways from encroachment by development until the drainage management plan is implemented. Sediment and erosion control regulations should also be enacted.

The hydrographs, shown in Figures 2 through 8, illustrate the detention reservoirs effectively eliminate the drainage basin east of the detention dams. These hydrographs also show that the area between the dam and Interstate 25 generates flood peaks higher than those which are routed through the dams. Therefore, governmental agencies should construct the dams and necessary channel diversions and improvements to serve the dams. Channel improvement west of the dams shall be constructed at the expense of local developers. Possible exceptions may be Arroyo del Pino where a concrete channel is proposed west of Louisiana Boulevard and areas that are currently developed. The developing areas between Interstate 25 and the dams should be designed to minimize runoff so peak flows do not exceed those presented herein. Between Interstate 25 and the North Diversion Channel, runoff should be designed to reach the inlet or arroyo channel rapidly as possible since detention in this area could actually add to the peak flows.

Recommended Implementation Sequence

Budgetary restraints will undoubtedly require implementation in phases. Some phases of the plan have higher priorities than others due to the greater overall effect on the flood flows and potential damages. High priority items include:

- Construction of dikes at piracy points between Bear Canyon Arroyo and Bear Canyon Tributary above Tramway Boulevard and between La Cueva Arroyo and the North Arroyo de Domingo Baca near Ventura Street.

- The adoption of a floodplain zoning ordinance to protect future options and control encroachment into floodplains.

- Rehabilitation and construction of new outlets for the existing dams and upgrading of the spillways to meet State Engineer's requirements.

- Construction of the five detention dams to reduce flood peaks. This sequency could be Bear Canyon Arroyo, Juan Tabo Dam; Arroyo de Domingo Baca, Dam near Lowell Street with the diversions required for effective use of the dam; Arroyo del Pino, Tramway Dam; North Arroyo de Domingo Baca, Hamilton Dam; Camino Arroyo, Hamilton Dam with La Cueva diversion.

- Construction of sediment ponds at Tramway and regulations controlling erosion, especially during development.

- Construction of North Arroyo del Pino diversion to Arroyo del Pino.

- Construction of the South Tributary of La Cueva Arroyo diversion to North Arroyo de Domingo Baca.

- Construction of the concrete channel in Arroyo del Pino from Louisiana Boulevard to the North Diversion Channel, and the new culvert under the Interstate.

Implementation of the remaining plan should be on a watershed basis moving from south to north as development proceeds and moving from west to east in each watershed.

DESIGN CRITERIA

The overall objective is to obtain the most cost effective drainage management plan. It is desirable to use natural channels, improved "natural" channels and concrete-lined channels or closed conduits, in that order. Phase A determined that the use of detention storage was more economical than providing the greater channel capacities required to pass the unattenuated flood flow.

Specific design criteria adopted for the development of the master plan and recommended for use in final design are described in this section.

Improved Channels

In general, all open channels should be designed with the tops of the walls at or below the adjacent ground to allow interception of local surface flows. If this is unavoidable, it will be necessary to construct a means of draining these local pockets. In these plans, local drainage was not thoroughly investigated since final grading was unknown, and channel grades can be adjusted in the final design.

Natural Channels

Natural channels should be used wherever possible. The undefined nature of the arroyos and flood hazard areas and the intermingling of flows between major arroyo basins make the use of the natural channels meaningful only in the deeper well-

defined arroyos such as east of Tramway and the Arroyo del Pino and Bear Canyon Arroyo.

Improved Natural Channels

Improved natural channels essentially reduce the width of the flood hazard area by providing a flood channel which contains the flows within the improved channel. The improved channels closely follow the existing natural alignment; flow velocities do not exceed 8 feet per second; channels are adequate for the 100-year flow with a free-board of at least one foot. However, on curves the free-board should be at least one foot above the super elevated water surface. Channel side slopes should not be steeper than 3:1 and preferably 4:1 or flatter. Drop structures, check dams and revetments are used to limit flow velocity where necessary. The Froude number does not exceed 0.8 to assure there will be no excessive wave generation. The channel centerline curvature at least equals the channel top width, but is not less than 100 feet. Channel improvements include riprap or other slope protection at transitions and outer edges of curves to prevent erosion. Length of transition should be at least 2½ times the difference in channel water surface width.

This type of channel is flexible and lends itself to phased development. Originally, the arroyo channels can be left natural and as development proceeds, arroyos can be improved to meet the needs. Also, experimentation with different type drop structures, check dams and revetments can be made to determine which works best and serves the desires of the community.

Any deviation from the natural or improved natural channels presented in Volume 2 should be made only after a hydrologic and hydraulic analysis is made to determine the effect the change will have on the downstream peak flows and channel capacities.

Lined Open Channels

Lined open channels can be of concrete, riprap or gabions. Side slopes flatter than 2:1 may be riprapped but steeper side slopes, including vertical, may be obtained by using concrete walls or gabion baskets. Lined cross-sections are required where the velocity exceeds 8 feet per second or the Froude number exceeds 0.8. Freeboard shall be 2 feet and velocities shall be under 35 feet per second. In the final design, care must be taken to analyze conditions of expansive soil, freeze, thaw, and ground water. Access to hard lined channels should be limited for safety purposes. Children should not be allowed to play in or near hard lined channels.

Detention Dams

Detention dams shall be designed to meet the requirement of the New Mexico State Engineer. The dams will detain the 100-year flows with a maximum water surface below the spillway crest. Spillways must safely pass the probable maximum flood without overtopping the dam crest.

Culverts

Culverts are designed in accordance with the U.S. Department of

Commerce, Bureau of Public Roads Hydraulic Engineering Circulars Numbers 5 and 10. Energy dissipators are used at culvert outlets where exit flow velocities exceed allowable downstream channel velocities to minimize erosion. Culverts are located on Wyoming Boulevard and the proposed future extension of Wyoming Boulevard along Barstow Street in North Albuquerque Acres, along Hamilton Street and Tramway Boulevard. A new culvert at Interstate 25 on Arroyo del Pino is proposed to allow a continuous straight alignment and use of the Public Service Company easement.

Energy Dissipators

Energy dissipators will be necessary where excessive turbulance occur from high heads behind culverts. These usually will consist of rock impact blocks with suitable riprap or gabion protected bottom and side slopes. However, formed concrete dissipators may be necessary when extreme velocity differentials are encountered.

Drop Structures

Drop structures are designated on portions of the channel where new channel cross-sections are to be constructed. Drop structures may be constructed utilizing gabion baskets, timber and concrete with riprap or concrete protection above and below the drop The use of sufficient riprap or river mats above and below the drop structures is imperative to prevent erosion. Drop structures must be of sufficient height to ensure (1) a well-defined hydraulic jump will occur below the drop for

energy dissipation and (2) the drop will not be submerged due to backwater from the downstream channel.

Check Dams

Check dams may be constructed of timber, concrete or gabion baskets; sufficient riprap or river matting above and below the check dam is necessary to prevent erosion.

Utilities

Available information on existing sanitary sewers, water lines, gas lines, electric lines and telphone conduits is represented on the master plan sheets, however, the representation does not purport to be exact. Utilities other than sanitary sewers will be relocated as needed. Sanitary sewer conflicts will be resolved on an individual basis in final design.

Field surveys to verify utility locations and elevations must be completed prior to final design.

ESTIMATED COSTS

During Phase A, a benefit-cost analysis was completed, which, while broad in form, served to identify the alternative to be used as a basis for master planning. The costs in the following tables are based on present day (March, 1975) construction costs for public works projects. The ultimate cost will undoubtly increase if the project is constructed in phases over a long period of time.

Construction of the detention dams and diversion dams by AMAFCA will effectively reduce peak flood flows for most of the developable area west of the dams. When the dams are in place, peak flows will be generated by local areas tributary below the dams. For this reason, the cost of the channel improvements below the dams should be bourne by developers of those areas.

Land required for right-of-way and structures is located almost completely within the flood hazard area. The price of the property will be highly influenced by the Federal Insurance Program which restricts the use of land burdened with flood hazard. In many cases AMAFCA, local governments and developers will work out trades whereby easements and rights-of-way will be aquired without direct purchase. Also, the land required for implementation may have uses other than drainage, that would make it desirable for the community to aquire them. For these reasons, land costs are difficult to estimate. In order to arrive at a total project cost, the following assumptions were made:

- The right-of-way cost of channels in flood hazard areas would be zero.

- The right-of-way costs of diversion channels and dams would be based on $6000 per acre for land out of the 100-year flood hazard area.

- These unit prices are based on actual bid prices for similar type of construction and reflect prices prevailing in March, 1975.

Unit costs used for estimating purposes are presented in Table 3.

TABLE 3

Unit Costs

Item	Unit Cost
Excavation	0.85/c.y.
Embankment	0.65/c.y.
Structural concrete	150.00/c.y.
Slab concrete	80.00/c.y.
Plain riprap	30.00/c.y.
Gabion	40.00/c.y.
Corrugated steel pipe 48"	31.00/l.f.
Reinforced concrete pipe 48"	35.00/l.f.
Reinforced concrete pipe 66"	72.00/l.f.
Reinforced concrete pipe 78"	90.00/l.f.
Reinforced concrete pipe 84"	100.00/l.f.
Reinforced concrete pipe 96"	140.00/l.f.
Reinforced concrete pipe 36"x58"	40.00/l.f.
New culvert at Interstate 25	300.00/l.f.
Grass seeding	400.00/acre

The estimated costs are provided on an arroyo basis. Costs

for dams and street crossings are provided separately since these costs are most likely to be bourne by AMAFCA and local governments.

BEAR CANYON ARROYO

ITEM	QUANTITY	UNIT PRICE	COST
Excavation	55,900	0.85	47,500
Riprap	6,100	30.00	183,000
Gabion	4,000	40.00	160,000
Structural conc. (culverts)	1,410	150.00	211,500
Slab concrete (channels)	3,500	80.00	280,000
Seeding	59	400.00	23,600
Dams			
Arroyo del Oso			86,500
Juan Tabo			696,000
			1,688,100

BEAR ARROYO TRIBUTARY

Excavation	96,200	0.85	81,800
Riprap	6,500	30.00	195,000
Gabion	5,600	40.00	224,000
Structural concrete (culverts)	970	150.00	145,500
			646,300

ARROYO DEL PINO INCLUDING DIVERSION FROM NORTH ARROYO DEL PINO

Excavation	194,000	0.85	164,900
Riprap	400	30.00	12,000
Gabion	265	40.00	10,600
Structural concrete	1,558	150.00	233,700
Slab concrete	14,230	80.00	1,138,400
Culvert under Interstate 25	230	300.00	69,000
Seeding	8	400.00	3,200
Dams			
Pino			43,000
Tramway			383,000
Land	16	6,000.00	96,000
Land	4.8	6,000.00	28,800
			2,182,600

ARROYO DE DOMINGO BACA INCLUDING ARROYO
DE DOMINGO BACA TRIBUTARY

Excavation	851,200	0.85	723,500
Riprap	8,800	30.00	264,000
Gabion	9,600	40.00	384,000
Structural conc.	1,750	150.00	262,500
Slab conc.	6,410	80.00	512,800
Seeding	112	400.00	44,800
Dam			260,300
Land	35.0	6,000.00	210,000
Land	9.8	6,000.00	58,800
			2,720,700

NORTH ARROYO DE DOMINGO BACA INCLUDING DIVERSION
FROM THE SOUTH BRANCH OF LA CUEVA ARROYO

Excavation	474,400	0.85	403,200
Riprap	6,700	30.00	201,000
Gabion	7,100	40.00	284,000
Structural conc.	800	150.00	120,000
Slab conc.	2,460	80.00	196,800
Pipe culvert	300	40.00	12,000
Seeding	70	400.00	28,000
Dam			190,000
Land	25.3		151,800
Land	2.5	6,000.00	15,000
			1,601,800

CAMINO ARROYO INCLUDING LA CUEVA ARROYO DIVERSION

Excavation	380,600	0.85	323,500
Riprap	8,000	30.00	240,000
Gabion	11,500	40.00	460,000
Structural conc.	426	150.00	63,900
Seeding	93	400.00	37,200
Dam			498,000
Land	28.5	6,000.00	171,000
Land	8.5	6,000.00	51,000
			1,844,600

Total	10,684,100

Maintenance Costs

Information on maintenance costs for drainage facilities is not readily available. Most of the maintenance cost information pertains to improved grass areas or channels. Cities report drainageway maintenance costs varying from $2100 to $3000 per mile of channel. AMAFCA has an annual expenditure of approximately $10,000 per mile of channel for the North Diversion Channel.

Total maintenance costs for improved high quality grass lined channels have been estimated as $7000 to $9000 per mile per year. The more natural channels, or channels not depending upon irrigation for maintenance of the grassed areas, could cost $5000 to $6000 per mile per year to maintain. The lower figure would apply to rights-of-way up to 250 feet. The upper figure would be more realistic.

Concrete-lined channels do not require the same degree of maintenance as the grass-lined facilities. In the natural improved channels, a flow of 2000 cubic feet per second requires a right-of-way of about 150 feet. A concrete-lined channel with the same flow requires a right-of-way of 60 feet approximately. Of this width, 12 to 24 feet would be for access, the remaining 30 to 40 feet being the concrete channel requiring little maintenance except removing debris. On this basis, the costs for concrete-lined channels of the capacities required, were assumed to be 25 percent of that required for high-quality grassed channels, or about $1500 to $2500 per mile per year.

Table 4 gives the maintenance costs assumed.

TABLE 4

ANNUAL MAINTENANCE COSTS

Maintained recreation area combined with detention dams.	$70.00/acre
Sediment basin.	$150.00/acre
Grass-lined channels (maintained).	
Right-of-way less than 150 feet	$7500/mile
Right-of-way more than 150 feet	$9600/mile
Improved natural channels (minimum maintenance).	
Right-of-way less than 150 feet	$4800/mile
Right-of-way more than 150 feet	$7000/mile
Concrete-lined channels.	$2250/mile
Floodplain zone.	$2500/mile

APPENDIX A: Section 4

Resource Technology, Inc. (RTI) Letter
Explaining the Bulking Factor Equation for Sediment.

Resource Technology, Inc.

2129 OSUNA ROAD NE. SUITE 200
ALBUQUERQUE, NEW MEXICO 87113
(505) 345-3115
FAX (505) 345-4132

May 23, 1996

Dan Grochowski, P.E.
Bohannan-Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

RE: Revised Hydrology Model for North Camino, El Camino and La Cueva Arroyos
RTI File No. 95-190

Dear Dan:

The hydrology model on the enclosed disk incorporates the following changes:

1. Rock outcrop areas in the Sandia Mountains have been modeled as land treatment type "C" instead of type "D."

2. Bulking factors for sediment have been taken out.

3. Minor changes west of I-25 to reflect the City Corp site have been added.

Bulking factors are now added to analysis points external to the "clean water" model utilizing the following equation:

$$BF \text{ (in percent)} = 3.622 + .001875Q \text{ (in cfs)}$$

The equation was derived from statistical analysis of over forty reaches between Sandia Heights and I-25 with 10- and 100-year flow rates for the three arroyos of concern. Our flow rates in the revised Table 4.1 reflect bulking factors derived from this equation, rounded to the nearest whole percent. We feel it is valid for these three watersheds for natural channels with a D_{50} between 1.5 mm and 3.0 mm.

Sincerely,

RESOURCE TECHNOLOGY, INC.

Donald S. Dixon, P.E.
Vice President for Engineering

DSD/ljc

cc: Kurt Browning, P.E., AMAFCA

B:\95-190\GROBOWKI.LT1

APPENDIX A: Section 5

Spreadsheet Containing the AHYMO Model Flows, Calculated Bulking Factors, and the Final Flows for the Locations Reported in Explanation 3.4, Table 3.2.

Spreadsheet Calculating Bulking Factors and Bulked Flows
Flooding Source and Location Correspond to Information in Table 3.2

Bulking Factor Equation: BF(%)= 3.622 + 0.001875Q

Flooding Source and Location	AHYMO Q (cfs)	BF (%)	Rounded BF (%)	Q with BF (cfs)
North La Cueva Arroyo				
at Wyoming	2739	8.8	9.000	2986
at I-25	2747	8.8	9.000	2994
at North Diversion Channel	4870	12.8	13.000	5503
South La Cueva Arroyo				
at confluence with Wildflower Diversion, west of I-25	405	4.4	5.000	425
at San Mateo Blvd.	578	4.7	5.000	606
at confluence with N. La Cueva	750	5.0	5.000	788
South El Camino Arroyo				
at Wyoming Blvd.	2036	7.4	8.000	2199
at I-25	2054	7.5	8.000	2218

APPENDIX A: Section 6

Approved LOMRs for Nor Este Estates Subdivision

Federal Emergency Management Agency

Washington, D.C. 20472

JUN 3 1988

RECEIVED
JUN 07 1988
HYDROLOGY SECTION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IA-RA-RS

The Honorable Ken Schultz
Mayor of the City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Community: City of Albuquerque,
Bernalillo County,
New Mexico
Map Panel Number: 350002 0010 C
Effective Date of
this Revision: JUN 3 1988

Dear Mayor Schultz:

This is in reference to a March 22, 1988 letter, and technical data submitted by Mr. Carlos A. Montoya, P.E., Floodplain Administrator for the City of Albuquerque, Bernalillo County, New Mexico, regarding the Flood Insurance Study for your community. In his letter, Mr. Montoya requested that the Federal Emergency Management Agency (FEMA) issue a Letter of Map Revision (LOMR) to reflect floodplain changes resulting from the completed La Cueva Arroyo channel modification project in the vicinity of the Nor Este Estates subdivision between Wyoming Boulevard and Barstow Street. Mr. Montoya submitted the following data in support of his request: certified "as-built" construction plans of the channel modification project dated August 28, 1987; a HEC-2 hydraulic model of the "as-built" conditions dated February 25, 1988; and a letter dated January 18, 1988, from the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) stating their acceptance of the channel for maintenance.

Based on these data, we have revised the Flood Insurance Rate Map (FIRM) to reflect the effects of the completed channel modification project, which extends from Barstow Street to Wyoming Boulevard in the Nor Este Estates subdivision, a total channel distance of approximately 2,800 feet. The 100-year floodplain designation has been changed from Zone AO (Depth 1 foot) to Zone A and is now shown contained within the constructed channel on the enclosed annotated portion of the FIRM. This LOMR amends FIRM number 350002, panel 0010, dated October 14, 1983, for the City of Albuquerque, Bernalillo County, New Mexico. Because no regulatory floodways are delineated for La Cueva Arroyo, we are not enclosing an annotated FBFM.

During our review of the submitted La Cueva Arroyo channel modification project, it came to our attention that AMAFCA has constructed several flood protection and floodplain modification projects within the City of Albuquerque. In order for these projects to be recognized on the FIRM as providing protection from the 100-year flood in your community, the appropriate technical data and analyses must be provided to support revising the FIRM for Albuquerque; it is FEMA's goal to show the most up-to-date and accurate flood hazard information available on your community's FIRM. We call to your attention Part 65.3 of the National Flood Insurance Program (NFIP) regulation, which states that "A community's base flood elevations may increase or decrease resulting from physical changes affecting flooding conditions. As soon as practicable, but not later than six months after the date such information becomes available, a

community shall notify the Administrator of the changes by submitting technical or scientific data in accordance with this part. Such a submission is necessary so that upon confirmation of those physical changes affecting flooding conditions, risk premimum rates and floodplain management requirements will be based upon current data."

This revision is effective as of the date of this letter. However, a review of the determination made by this LOMR and any such requests to alter this determination should be made within 30 days. Any such requests must be based on scientific or technical data.

Due to present funding constraints, FEMA must limit the number of physical FIRM and FBFM revisions processed. Consequently, we will not republish the FIRM and FBFM for the City of Albuquerque to reflect the determination made by this LOMR. However, should your community's FIRM and FBFM warrant a physical revision and republication in the future, the determination in this LOMR will be incorporated at that time.

Since this LOMR will not be printed and distributed to users such as insurance agents and lenders, the community will serve as the repository for the new data. We encourage you to disseminate widely throughout the community the information reflected by this LOMR in order that interested persons may offer new information or comments.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. As required by this legislation, a community must adopt and enforce floodplain management regulations in order to ensure continued eligibility to participate in the NFIP. Therefore, the City of Albuquerque must enforce these regulations using, at a minimum, the elevations and zone designations in the Special Flood Hazard Areas as shown on your community's FIRM, including the modifications made by this LOMR.

The map as listed above and as amended by this letter will be used for all flood insurance policies and renewals issued for your community.

A Consultation Coordination Officer has been designated to assist you with any problems you may have concerning this LOMR. This officer will be the primary FEMA contact for your community, and can be reached at the following address:

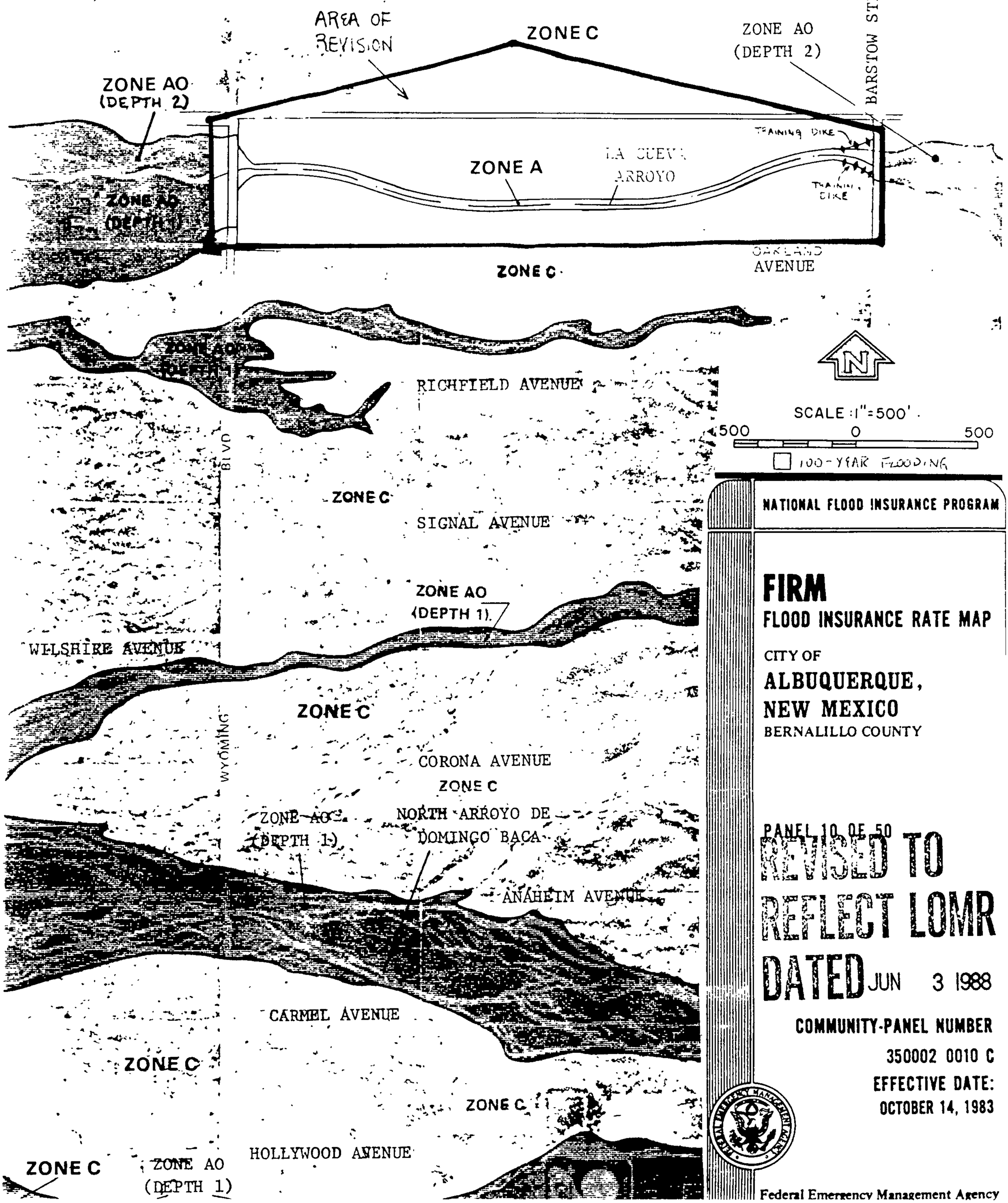
Mr. Alton S. Ray, Chief
FEMA, Natural & Technological
Hazards Division
Federal Regional Center
800 North Loop 288
Denton, Texas 76201-3698
(817) 898-9127

Any questions may be directed to your Consultation Coordination Officer.

Sincerely,

John L. Matticks
Chief, Risk Studies Division
Federal Insurance Administration

Enclosure
cc: Mr. Carlos A. Montoya, P.E.
Mr. Dennis Lorenz, P.E., Espey, Huston & Associates, Inc.



NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
ALBUQUERQUE, NEW MEXICO
BERNALILLO COUNTY

PANEL 10 OF 50

REVISED TO REFLECT LOMR DATED JUN 3 1988

COMMUNITY-PANEL NUMBER
350002 0010 C

EFFECTIVE DATE:
OCTOBER 14, 1983

Federal Emergency Management Agency

Federal Emergency Management Agency

Washington, D.C. 20472

JUN 29 1990

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

(102a)
Community: City of Albuquerque,
Bernalillo County,
New Mexico
Map Panel Number: 350002 0010 C
Effective Date of
this Revision: JUN 29 1990

The Honorable Louis Saavedra
Mayor of the City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Dear Mayor Saavedra:

The Flood Insurance Rate Map (FIRM) for the City of Albuquerque, New Mexico, has been revised by this Letter of Map Revision (LOMR) to reflect a change in the 100-year (Zone AO) floodplain for the Nor Este Estates Subdivision between Alameda Avenue and Oakland Avenue. This revision was requested by Mr. Gilbert Aldaz, P.E., L.S., Floodplain Administrator for the City of Albuquerque, in a January 29, 1990 letter to the Federal Emergency Management Agency (FEMA) Region VI office, which was subsequently forwarded to our Headquarters office in Washington, D.C. The review of this revision request was initiated in our March 8, 1990 letter to you, which also outlined criteria for the review of all revision requests within your community. We informed you in a May 11, 1990 letter that the submitted technical data were sufficient to complete our review of this revision request, and that a revision to the Albuquerque FIRM would be issued within 60 days.

Based on our review of the submitted information, this LOMR has been issued to remove the designated 100-year (Zone AO) floodplain along a minor tributary of La Cueva Arroyo between Alameda Avenue and Oakland Avenue in the Nor Este Estates subdivision, as shown on the enclosed annotated portion of the FIRM. This revises FIRM number 350002, panel 0010 C, dated October 14, 1983. Because this revision does not involve any regulatory floodway changes, we are not enclosing an annotated Flood Boundary and Floodway Map (FBFM); unless a subsequent physical map revision involves regulatory floodway changes for FBFM panel 0010, we will not revise it to show the changes made by this LOMR.

The enclosed annotated portion of the FIRM also reflects the changes made in a previous LOMR issued on June 3, 1988.

It should be noted that National Flood Insurance Program (NFIP) regulation Subparagraph 60.3(b)(7) requires communities to "assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained." This provision is incorporated into your community's existing floodplain management regulations; consequently, responsibility for maintaining the storm sewer and storm drainage facilities in an unobstructed manner rests with your community. The necessity for this maintenance is strengthened by the fact that sedimentation has been identified as having a severe impact on flood control projects within your community. Please be aware that FEMA may request that your community submit a description and schedule of the channel maintenance activities.

This revision is effective as of the date of this letter. However, a review of the determination made by this LOMR and any requests to alter this determination should be made within 30 days. Any such requests must be based on scientific or technical data.

Due to present funding constraints, FEMA must limit the number of physical FIS and FIRM revisions processed. Consequently, we will not republish the FIS and FIRM for the City of Albuquerque to reflect the determination made by this LOMR. However, should your community's FIS and FIRM warrant a physical revision and republication in the future, the determination in this LOMR will be incorporated at that time.

Since this LOMR will not be printed and distributed to primary map users such as local insurance agents and mortgage lenders, the community will serve as a repository for this new data. We encourage you to disseminate widely throughout the community the information reflected by this LOMR in order that interested persons such as property owners, insurance agents and mortgage lenders may benefit from this information. We also encourage you to give consideration to preparing an article for publication in the community's local newspaper. This article should describe the changes that have been made and the assistance the community will provide in serving as a clearinghouse for this data and interpreting NFIP maps.

The map as listed above and as revised by this letter should be used for all flood insurance policies and renewals issued for your community.

This determination has been made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and is in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. As required by this legislation, a community must adopt and enforce floodplain management regulations in order to ensure continued eligibility to participate in the NFIP. Therefore, the City of Albuquerque must enforce these regulations using, at a minimum, the elevations and zone designations in the 100-year floodplains as shown on your community's FIRM, including the modifications made by this LOMR.

A Consultation Coordination Officer has been designated to assist you with any problems you may have concerning this LOMR. This officer will be the primary FEMA contact for your community, and can be reached at the following address:

Mr. Alton S. Ray, Chief
FEMA, Natural & Technological
Hazards Division
Federal Regional Center
800 North Loop 288
Denton, Texas 76201-3698
(817) 898-9127

Should you have any questions regarding this matter, please do not hesitate to contact your Consultation Coordination Officer or members of our Headquarters staff in Washington, D.C., at (202) 646-2754.

Sincerely,

John L. Matticks
Chief, Risk Studies Division
Federal Insurance Administration

Enclosure

cc: Mr. Gilbert Aldaz

FIRM

FLOOD INSURANCE RATE MAP

CITY OF

ALBUQUERQUE, NEW MEXICO

BERNALILLO COUNTY

PANEL 10 OF 50

REVISED TO REFLECT LOMR DATED JUN 29 1990

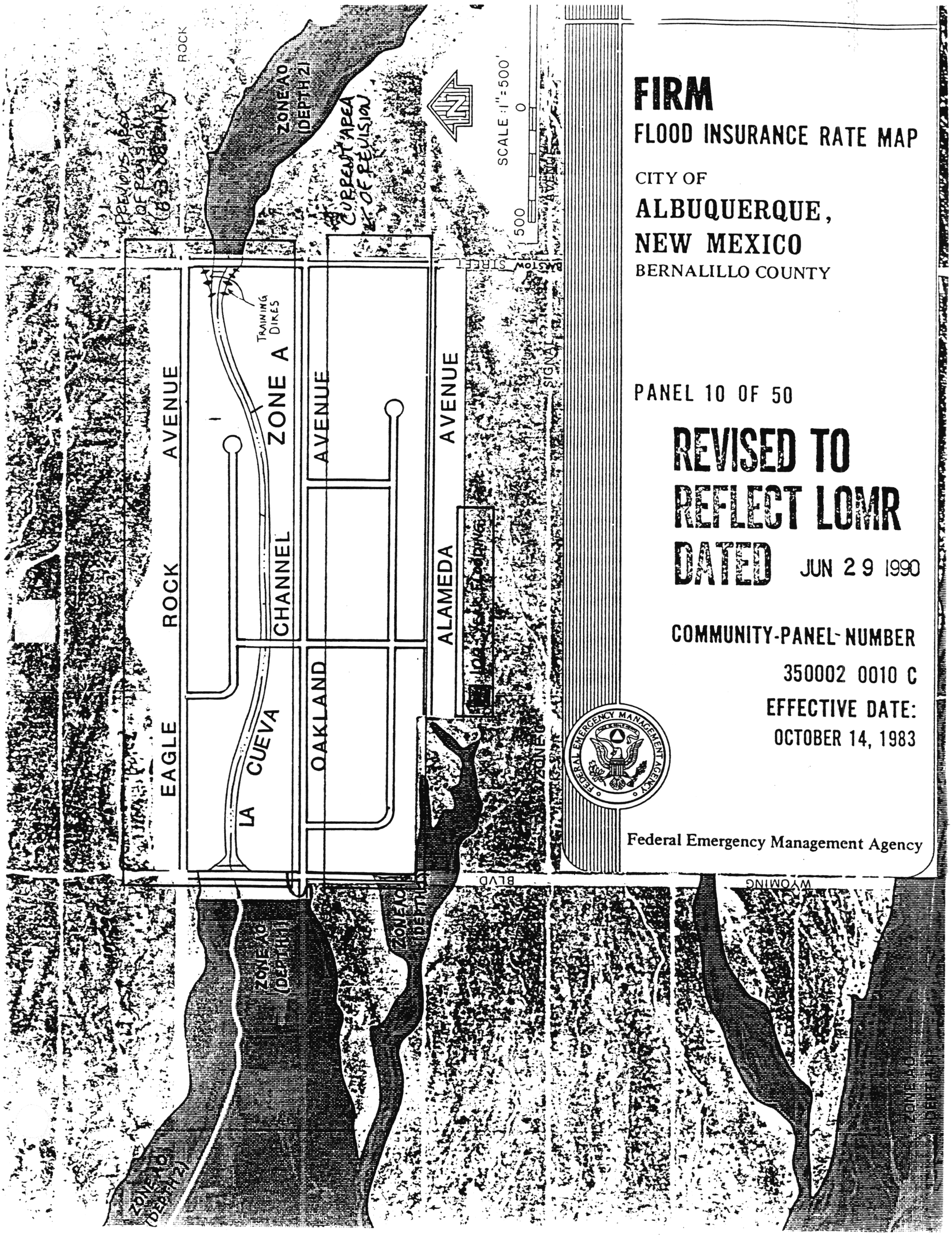
COMMUNITY-PANEL-NUMBER

350002 0010 C

EFFECTIVE DATE:

OCTOBER 14, 1983

Federal Emergency Management Agency



APPENDIX A: Section 7

AHYMO Summary Output for the North and South La Cueva Arroyos

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 = 1 NOTATION
START										TIME= .00
*S FILE NAME LC100C2.HYM										
*S BULKING FACTORS NOT INCLUDED IN ANY OF THE FLOWS										
RAINFALL TYPE= 2										RAIN24= 4.050
COMPUTE NM HYD	101.00	-	1	.60700	953.84	45.841	1.41600	1.650	2.455	PER IMP= .00
ROUTE MCUNGE	101.80	1	2	.60700	912.90	45.469	1.40451	1.850	2.350	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 4.200
COMPUTE NM HYD	100.00	-	1	1.21400	1201.70	87.881	1.35730	1.850	1.547	PER IMP= .00
ROUTE MCUNGE	100.80	1	3	1.21400	1177.21	87.700	1.35451	2.100	1.515	CCODE = .1
ADD HYD	101.88	3& 2	5	1.82100	1882.13	133.168	1.37117	1.950	1.615	
RAINFALL TYPE= 2										RAIN24= 3.650
COMPUTE NM HYD	102.00	-	1	.87500	1033.60	54.313	1.16386	1.700	1.846	PER IMP= .00
ADD HYD	102.90	1& 5	5	2.69600	2554.30	187.482	1.30389	1.900	1.480	
*S LA CUEVA TRIBUTARY ARROYO @ TRAMWAY BLVD. (102.9)										
ROUTE MCUNGE	102.80	5	2	2.69600	2515.07	187.100	1.30123	2.050	1.458	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.370
COMPUTE NM HYD	107.20	-	1	.17200	237.40	9.430	1.02797	1.550	2.157	PER IMP= 9.00
ADD HYD	107.29	1& 2	4	2.86800	2552.53	196.529	1.28484	2.050	1.391	
*S NORTH LA CUEVA AT GLENDALE AND BROWNING (107.29)										
RAINFALL TYPE= 2										RAIN24= 3.500
COMPUTE NM HYD	102.10	-	1	.09300	147.55	4.405	.88811	1.500	2.479	PER IMP= .00
*S LA CUEVA TRIBUTARY @ TRAMWAY BLVD.										
ROUTE MCUNGE	102.18	1	2	.09300	134.74	4.349	.87687	1.700	2.264	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.380
COMPUTE NM HYD	107.10	-	1	.18080	280.74	8.922	.92528	1.500	2.426	PER IMP= 5.00
ADD HYD	107.19	1& 2	5	.27380	303.70	13.271	.90883	1.600	1.733	
*S NORTH LA CUEVA (TRIB) AT FLORENCE AND BROWNING (107.19)										
ADD HYD	107.90	5& 4	3	3.14180	2611.52	209.801	1.25207	2.000	1.299	
RAINFALL TYPE= 2										RAIN24= 3.400
COMPUTE NM HYD	106.00	-	1	.04360	77.44	2.829	1.21672	1.500	2.775	PER IMP= 17.00
ROUTE MCUNGE	106.80	1	2	.04360	69.78	2.777	1.19435	1.700	2.501	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.340
COMPUTE NM HYD	106.10	-	1	.11160	187.37	6.465	1.08624	1.500	2.623	PER IMP= 10.00
ADD HYD	106.19	1& 2	6	.15520	196.76	9.243	1.11660	1.600	1.981	
*S LA CUEVA TRIBUTARY ARROYO @ BROWNING (106.19)										
ADD HYD	107.99	3& 6	5	3.29700	2658.92	219.043	1.24570	2.000	1.260	
ROUTE MCUNGE	107.80	5	2	3.29700	2647.18	218.906	1.24491	2.100	1.255	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.230
COMPUTE NM HYD	109.00	-	1	.10060	164.16	5.441	1.01402	1.500	2.550	PER IMP= 10.00
ADD HYD	109.90	1& 2	5	3.39760	2662.81	224.346	1.23808	2.100	1.225	
RAINFALL TYPE= 2										RAIN24= 3.250
COMPUTE NM HYD	108.00	-	7	.20550	311.04	11.246	1.02605	1.550	2.365	PER IMP= 10.00
ADD HYD	109.99	5& 7	5	3.60310	2698.71	235.592	1.22598	2.100	1.170	
*S LA CUEVA ARROYO @ EUBANK (MAIN) (109.99)										
ROUTE MCUNGE	109.88	5	2	3.60310	2673.21	235.416	1.22507	2.200	1.159	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.130
COMPUTE NM HYD	110.00	-	1	.16340	202.35	8.385	.96218	1.550	1.935	PER IMP= 10.00
ADD HYD	110.90	1& 2	5	3.76650	2695.65	243.801	1.21366	2.200	1.118	
*S LA CUEVA ARROYO @ VENTURA (MAIN) (110.90)										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE MCUNGE	110.80	5	2	3.76650	2692.04	243.873	1.21402	2.200	1.117	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.020
COMPUTE NM HYD	111.10	-	1	.10690	164.18	5.338	.93630	1.500	2.400	PER IMP= 10.00
ADD HYD	111.19	1& 2	5	3.87340	2702.74	249.211	1.20636	2.200	1.090	
RAINFALL TYPE= 2										RAIN24= 3.050
COMPUTE NM HYD	111.00	-	1	.06740	88.80	2.940	.81779	1.500	2.059	PER IMP= 5.00
ADD HYD	111.99	1& 5	5	3.94080	2709.09	252.151	1.19971	2.200	1.074	
*S LA CUEVA ARROYO @ BARSTOW (111.99)										
ROUTE MCUNGE	111.80	5	2	3.94080	2706.80	251.104	1.19473	2.229	1.073	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.960
COMPUTE NM HYD	112.00	-	1	.17650	436.35	17.654	1.87543	1.500	3.863	PER IMP= 50.00
ADD HYD	112.90	1& 2	5	4.11730	2739.06	268.055	1.22071	2.229	1.039	
*S LA CUEVA ARROYO @ WYOMING (112.90)										
ROUTE MCUNGE	112.80	5	2	4.11730	2734.41	267.959	1.22028	2.273	1.038	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.930
COMPUTE NM HYD	113.00	-	1	.11360	160.25	4.875	.80462	1.500	2.204	PER IMP= 5.00
ADD HYD	113.90	1& 2	5	4.23090	2742.42	272.834	1.20911	2.273	1.013	
*S LA CUEVA MAIN ARROYO @ LOUISIANA (113.90)										
ROUTE MCUNGE	113.80	5	4	4.23090	2738.20	272.791	1.20892	2.300	1.011	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.850
COMPUTE NM HYD	115.00	-	3	.13370	183.65	5.503	.77170	1.500	2.146	PER IMP= 5.00
ADD HYD	115.90	4& 3	5	4.36460	2746.52	278.294	1.19553	2.300	.983	
*S LA CUEVA NORTH (MAIN) ARROYO @ I-25 (115.90)										
*S**********										
*S HYDROGRAPH 205.90 TAKEN FROM THE FILE EC100CNC.HYM.										
*S RUNOFF AT AP 205.9 IS COMBINED WITH NORTH LA CUEVA FLOW JUST WEST OF										
*S I-25. (RECALL HYD DOES NOT INCLUDE BULKING FACTORS)										
*S**********										
RECALL HYD	205.90	-	2	3.22390	2053.58	237.639	1.38209	2.402	.995	
*S**********										
*S ADD EL CAMINO AND LA CUEVA FLOW AT WEST SIDE OF I-25										
*S ADD 115.9 AND 205.9 (BULKING FACTORS NOT INCLUDED)										
*S**********										
ADD HYD	115.99	5& 2	5	7.58850	4757.41	514.250	1.27063	2.348	.980	
*S LA CUEVA NORTH (MAIN) ARROYO @ CONFLUENCE WEST OF I-25 (115.99)										
ROUTE MCUNGE	115.80	5	2	7.58850	4753.47	514.232	1.27059	2.366	.979	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	118.00	-	1	.06490	172.75	7.273	2.10117	1.500	4.159	PER IMP= 70.00
ADD HYD	118.90	1& 2	5	7.65340	4761.21	520.930	1.27622	2.347	.972	
*S LA CUEVA NORTH (MAIN) ARROYO @ SAN MATEO										
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	118.10	-	1	.03060	42.12	1.370	.83948	1.500	2.150	PER IMP= 10.00
ADD HYD	118.99	1& 5	5	7.68400	4763.09	522.260	1.27439	2.347	.969	
ROUTE MCUNGE	118.80	5	2	7.68400	4760.84	521.238	1.27189	2.367	.968	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	126.00	-	1	.07370	195.81	8.059	2.05022	1.500	4.151	PER IMP= 70.00
ADD HYD	126.90	1& 2	5	7.75770	4769.40	528.604	1.27761	2.367	.961	
ROUTE MCUNGE	126.80	5	2	7.75770	4767.52	528.589	1.27758	2.375	.960	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.700
COMPUTE NM HYD	127.00	-	1	.06330	134.62	4.342	1.28604	1.500	3.323	PER IMP= 10.00
ADD HYD	127.90	1& 2	8	7.82100	4772.02	532.854	1.27746	2.375	.953	
*S NORTH LA CUEVA ARROYO AT APPROXIMATELY JEFFERSON ST.										
*S NOW BEGIN THE SOUTH LA CUEVA ARROYO EAST OF I-25										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
RAINFALL TYPE= 2										RAIN24= 2.850
COMPUTE NM HYD	116.00	-	5	.13090	193.62	6.460	.92539	1.500	2.311	PER IMP= 15.00
*S LA CUEVA SOUTH ARROYO @ I-25										
RAINFALL TYPE= 2										RAIN24= 2.890
COMPUTE NM HYD	117.40	-	1	.09930	107.91	4.622	.87277	1.550	1.698	PER IMP= 11.40
ROUTE MCUNGE	117.49	1	2	.09930	103.28	4.603	.86917	1.700	1.625	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.890
COMPUTE NM HYD	117.30	-	1	.10040	207.20	7.528	1.40585	1.500	3.225	PER IMP= 30.00
ADD HYD	117.39	2& 1	2	.19970	245.79	12.131	1.13898	1.550	1.923	
DIVIDE HYD	117.91	2	7	.09326	45.00	5.665	1.13898	1.350	.754	
	117.39	AND	9	.10644	200.79	6.466	1.13898	1.550	2.947	
RAINFALL TYPE= 2										RAIN24= 2.890
COMPUTE NM HYD	117.20	-	1	.16250	188.26	9.086	1.04839	1.600	1.810	PER IMP= 20.00
DIVIDE HYD	117.92	1	6	.07520	30.00	4.205	1.04838	1.400	.623	
	117.27	AND	10	.08730	158.26	4.881	1.04838	1.600	2.833	
ADD HYD	117.93	7& 6	1	.16846	75.00	9.870	1.09854	1.400	.696	
*S TOTAL RUNOFF TO SAN PEDRO STORM DRAIN-EXISTING CONDITIONS										
ROUTE	117.98	1	2	.16846	75.00	9.870	1.09854	1.750	.696	
ADD HYD	116.99	5& 2	5	.29936	268.13	16.330	1.02282	1.500	1.400	
*S SOUTH LA CUEVA ARROYO AT CONFLUENCE JUST WEST OF I-25 CROSSING										
ADD HYD	117.29	10& 5	5	.38666	404.71	21.211	1.02860	1.550	1.635	
ROUTE MCUNGE	117.28	5	2	.38666	400.37	20.568	.99740	1.551	1.618	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	119.00	-	1	.05490	146.12	6.152	2.10117	1.500	4.159	PER IMP= 70.00
ADD HYD	119.90	1& 2	5	.44156	528.56	26.467	1.12390	1.551	1.870	
RAINFALL TYPE= 2										RAIN24= 2.820
COMPUTE NM HYD	120.00	-	1	.02680	55.08	2.259	1.58045	1.500	3.211	PER IMP= 50.00
ADD HYD	120.90	1& 5	5	.46836	577.59	28.638	1.14649	1.551	1.927	
ROUTE MCUNGE	120.80	5	2	.46836	571.34	28.487	1.14045	1.582	1.906	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	125.00	-	1	.05080	134.25	5.548	2.04765	1.500	4.129	PER IMP= 70.00
ADD HYD	125.90	1& 2	6	.51916	682.40	33.794	1.22052	1.555	2.054	
*S LA CUEVA ARROYO SOUTH BEFORE WILDFLOWER FLOWS JUST UPSTREAM OF 96" RCP										
RAINFALL TYPE= 2										RAIN24= 2.810
COMPUTE NM HYD	121.00	-	1	.04890	63.24	1.947	.74674	1.500	2.021	PER IMP= 5.00
*S WILDFLOWER ARROYO AT SAN MATEO BLVD.										
DIVIDE HYD	121.83	1	11	.02445	31.62	.974	.74673	1.500	2.021	
	121.84	AND	12	.02445	31.62	.974	.74673	1.500	2.021	
ROUTE MCUNGE	121.81	11	2	.02445	29.40	.952	.73022	1.650	1.879	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.750
COMPUTE NM HYD	123.00	-	1	.01850	40.84	1.521	1.54168	1.500	3.449	PER IMP= 40.00
ADD HYD	123.90	1& 2	5	.04295	59.16	2.473	1.07972	1.550	2.152	
ROUTE MCUNGE	121.82	12	2	.02445	28.91	.957	.73427	1.650	1.847	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.750
COMPUTE NM HYD	122.00	-	1	.02250	53.55	2.068	1.72356	1.500	3.719	PER IMP= 50.00
ADD HYD	122.90	1& 2	3	.04695	62.44	3.026	1.20836	1.600	2.078	
RAINFALL TYPE= 2										RAIN24= 2.740
COMPUTE NM HYD	124.00	-	1	.02510	59.74	2.301	1.71856	1.500	3.719	PER IMP= 50.00
ADD HYD	124.91	3& 1	4	.07205	115.71	5.326	1.38609	1.500	2.509	
DIVIDE HYD	122.85	4	1	.06779	90.00	5.012	1.38609	1.450	2.074	
	124.92	AND	2	.00426	25.71	.315	1.38609	1.500	9.437	
*S TOTAL OUTFLOW TO ALAMEDA FROM JEFFERSON VIA 36" STORM DRAIN.										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE MCUNGE	124.83	2	3	.00426	23.96	.294	1.29335	1.600	8.795	CCODE = .1
ADD HYD	124.91	5& 3	4	.04721	82.22	2.767	1.09897	1.600	2.722	
*S SUBTRACT FLOW INTERCEPTED BY 36" PIPE TO WATERCRESS CHANNEL										
DIVIDE HYD	123.81	4	1	.04584	70.00	2.687	1.09897	1.550	2.386	
	123.99	AND	2	.00136	12.22	.080	1.09897	1.600	14.016	
ADD HYD	125.99	6& 1	3	.56500	752.40	36.421	1.20867	1.555	2.081	
*S TOTAL FLOW AT ENTRANCE TO 96" PIPE										
ROUTE	125.88	3	1	.56500	749.86	36.416	1.20850	1.582	2.074	
ADD HYD	127.91	1& 8	8	8.38600	4855.76	568.040	1.27006	2.375	.905	
ADD HYD	127.92	2& 8	5	8.38736	4855.76	568.118	1.27003	2.375	.905	
RAINFALL TYPE= 2										RAIN24= 2.690
COMPUTE NM HYD	128.00	-	1	.13730	254.82	9.454	1.29103	1.550	2.900	PER IMP= 10.00
ADD HYD	128.90	1& 5	5	8.52466	4869.66	577.408	1.27001	2.375	.893	
*S LA CUEVA ARROYO TOTAL @ THE NORTH DIVERSION CHANNEL										
FINISH										

APPENDIX A: Section 8

AHYMO Summary Output for the South El Camino Arroyo

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
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 3.990
COMPUTE NM HYD	300.00	-	1	.88400	1193.12	104.732	2.22142	1.800	2.109	PER IMP= 34.00
ROUTE MCUNGE	300.80	1	2	.88400	1162.70	104.229	2.21073	2.050	2.055	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.590
COMPUTE NM HYD	301.00	-	1	.85200	1018.92	77.706	1.71007	1.800	1.869	PER IMP= 27.00
ADD HYD	301.90	1& 2	11	1.73600	1902.36	181.934	1.96502	2.000	1.712	
*S NORTH EL CAMINO ARROYO AT TRAMWAY ROAD										
RAINFALL TYPE= 2										RAIN24= 3.370
COMPUTE NM HYD	201.00	-	1	.13390	207.70	6.497	.90979	1.500	2.424	PER IMP= 5.00
RAINFALL TYPE= 2										RAIN24= 3.500
COMPUTE NM HYD	200.00	-	3	.30300	487.60	15.384	.95201	1.550	2.514	PER IMP= .00
*S EL CAMINO ARROYO AT TRAMWAY BLVD (200.0)										
ADD HYD	200.70	11& 3	3	2.03900	1969.13	197.319	1.81448	1.950	1.509	
ROUTE MCUNGE	200.80	3	4	2.03900	1961.86	197.319	1.81448	2.050	1.503	CCODE = .2
ADD HYD	201.90	4& 1	5	2.17290	1984.38	203.816	1.75873	2.000	1.427	
*S EL CAMINO ARROYO (MAIN) AT BROWNING (201.9)										
ROUTE MCUNGE	201.80	5	2	2.17290	1979.70	203.496	1.75597	2.050	1.424	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.250
COMPUTE NM HYD	202.10	-	1	.10310	164.12	5.334	.97014	1.500	2.487	PER IMP= 8.00
ADD HYD	202.19	1& 2	5	2.27600	1997.41	208.831	1.72038	2.050	1.371	
*S EL CAMINO ARROYO (MAIN) AT EUBANK (202.19)										
ROUTE MCUNGE	202.18	5	2	2.27600	1987.58	208.732	1.71956	2.150	1.364	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.190
COMPUTE NM HYD	202.20	-	1	.10990	180.49	6.162	1.05124	1.500	2.566	PER IMP= 10.00
ADD HYD	202.29	1& 2	5	2.38590	2002.77	214.894	1.68878	2.150	1.312	
*S EL CAMINO ARROYO (MAIN) AT HOLBROOK (202.29)										
ROUTE MCUNGE	202.28	5	2	2.38590	1986.05	214.694	1.68721	2.250	1.301	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.070
COMPUTE NM HYD	202.30	-	1	.06840	118.36	4.064	1.11411	1.500	2.704	PER IMP= 15.00
ADD HYD	202.39	1& 2	6	2.45430	1992.98	218.758	1.67124	2.250	1.269	
*S EL CAMINO ARROYO (MAIN) AT VENTURA (202.39)										
RAINFALL TYPE= 2										RAIN24= 3.140
COMPUTE NM HYD	203.10	-	1	.12580	192.92	6.547	.97587	1.500	2.396	PER IMP= 10.00
*S EL CAMINO ARROYO (TRIBUTARY) AT HOLBROOK (203.1)										
ROUTE MCUNGE	203.18	1	2	.12580	176.32	6.466	.96366	1.700	2.190	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.070
COMPUTE NM HYD	203.20	-	1	.04850	74.17	2.466	.95343	1.500	2.389	PER IMP= 10.00
ADD HYD	203.29	1& 2	5	.17430	211.27	8.932	.96081	1.700	1.894	
ADD HYD	202.90	5& 6	5	2.62860	2020.67	227.690	1.62413	2.200	1.201	
ROUTE MCUNGE	202.80	5	2	2.62860	2016.23	223.471	1.59404	2.285	1.198	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.020
COMPUTE NM HYD	203.30	-	1	.05580	83.29	2.757	.92642	1.500	2.332	PER IMP= 10.00
ADD HYD	203.39	1& 2	5	2.68440	2020.68	226.176	1.57979	2.285	1.176	
*S EL CAMINO ARROYO (MAIN) AT BARSTOW (203.39)										
ROUTE MCUNGE	203.98	5	2	2.68440	2015.25	226.306	1.58070	2.350	1.173	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.960
COMPUTE NM HYD	204.00	-	1	.21190	235.18	10.122	.89562	1.600	1.734	PER IMP= 10.00
ADD HYD	204.90	1& 2	5	2.89630	2036.07	236.428	1.53058	2.300	1.098	
*S EL CAMINO ARROYO AT WYOMING (204.9)										

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
ROUTE MCUNGE	204.80	5	2	2.89630	2031.24	236.435	1.53063	2.400	1.096	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.890
COMPUTE NM HYD	204.20	-	1	.13330	185.49	6.169	.86774	1.500	2.174	PER IMP= 10.00
ADD HYD	204.29	1& 2	5	3.02960	2038.89	242.604	1.50146	2.400	1.052	
RAINFALL TYPE= 2										RAIN24= 2.910
COMPUTE NM HYD	204.10	-	1	.14840	181.03	7.086	.89528	1.550	1.906	PER IMP= 10.00
ROUTE MCUNGE	204.18	1	2	.14840	177.98	7.092	.89603	1.599	1.874	CCODE = .2
ADD HYD	204.19	2& 5	5	3.17800	2051.62	249.610	1.47268	2.399	1.009	
*S EL CAMINO ARROYO AT CORONADO AIRPORT (204.29)										
ROUTE MCUNGE	204.28	5	2	3.17800	2048.60	232.917	1.37420	2.402	1.007	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.850
COMPUTE NM HYD	205.00	-	1	.04590	123.43	5.191	2.12030	1.500	4.202	PER IMP= 70.00
ADD HYD	205.90	1& 2	5	3.22390	2053.58	237.637	1.38208	2.402	.995	
*S EL CAMINO ARROYO AT I-25 (205.90)										
RECALL HYD	205.9BF	-	2	3.22390	2197.33	251.563	1.46307	2.402	1.065	
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.10	-	1	.12210	154.08	5.425	.83315	1.550	1.972	PER IMP= 10.00
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.20	-	2	.05610	76.53	2.493	.83315	1.500	2.132	PER IMP= 10.00
ADD HYD	206.29	1& 2	5	.17820	228.80	7.918	.83315	1.500	2.006	
ROUTE	206.28	5	3	.17820	232.98	7.918	.83315	1.550	2.043	
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	206.40	-	1	.03270	59.24	2.164	1.24111	1.500	2.831	PER IMP= 30.00
ROUTE	206.48	1	2	.03270	58.63	2.165	1.24112	1.500	2.802	
ADD HYD	206.49	2& 3	5	.21090	289.80	10.083	.89640	1.550	2.147	
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	206.30	-	1	.04800	138.49	5.921	2.31273	1.500	4.508	PER IMP= 86.00
ADD HYD	206.39	1& 5	6	.25890	415.02	16.003	1.15899	1.500	2.505	
FINISH										

APPENDIX A: Section 9

Documentation of the AHYMO Computer Model

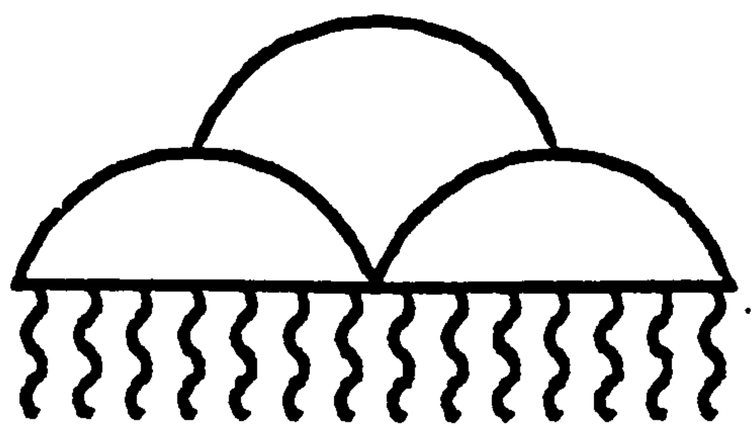
AHYMO Computer Program

Users Manual

(AMAFCA Hydrologic Model)

AMAFCA's Version of the A.R.S.
HYMO Computer Program

by the
Albuquerque Metropolitan Arroyo
Flood Control Authority (AMAFCA)
2600 Prospect NE
Albuquerque, NM 87107



January 1994 AHYM0194

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January 24, 1994
Program Version: January, 1994
AHYMO194

CERTIFICATION OF ACCEPTANCE
AHYMO - AMAFCA Version of the ARS HYMO Computer Program
JANUARY 1994 VERSION

The HYMO computer program was developed by Jimmy R. Williams and Roy W. Hann, Jr. for the USDA Agricultural Research Service, (ARS), United States Department of Agriculture in cooperation with the Texas Agricultural Experiment Station, Texas A&M University. The function of the program is described in detail in the "HYMO: Problem - Oriented Computer Language for Hydrologic Modeling, Users Manual" (ARS-S-9, May 1973).

The Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) is a local government agency, organized as a quasi-municipal corporation and a political subdivision of the State of New Mexico. AMAFCA was created in 1963 by the "Arroyo Flood Control Act" [72-16-1 to 72-16-103 NMSA 1978] to protect persons and property from floods. Its boundaries include the City of Albuquerque and neighboring areas in Bernalillo County.

The HYMO program was modified and enhanced by Clifford E. Anderson, PE for AMAFCA. These modifications and enhancements along with portions of the ARS version of the program have been named AHYMO, for AMAFCA Hydrologic Model. The Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) is the owner of all revisions and enhancements made to the USDA Agricultural Research Service (ARS) version of the HYMO program.

The AHYMO version of the HYMO program, including the COMPUTE NM HYD, RAINFALL, LAND FACTORS, DIVIDE HYD, SEDIMENT BULK, SEDIMENT TRANS and ROUTE MCUNGE functions, has been reviewed and tested by AMAFCA. AMAFCA accepts the program for purposes of design of flood control structures or for flood plain land use regulation, when the program is used by Registered Professional Engineers who possess the experience and thorough understanding of the engineering principles that apply to the application of the program.

Larry A. Blair, PE
Executive Engineer
AMAFCA

Clifford E. Anderson, PE
Drainage Engineer
AMAFCA

APPENDIX A: Section 10

Supporting Documentation of the AHYMO Models Used in this LOMR

HYDROLOGY REPORT

LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

Prepared For:

ALBUQUERQUE METROPOLITAN ARROYO
FLOOD CONTROL AUTHORITY

Prepared By:

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September, 1996

HYDROLOGY REPORT

LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

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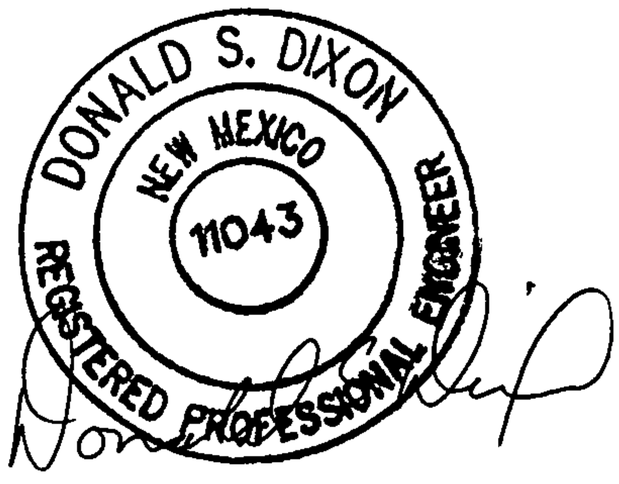
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September, 1996

LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

Hydrology Report

Table of Contents

1. INTRODUCTION 1

2. HYDROLOGY 7
   - A. Methodology 7
   - B. Land Treatments 7

3. SEDIMENT TRANSPORT ANALYSIS 15
   - A. General 15
   - B. Input Hydrographs 16
   - C. Bed Material 16
   - D. Wash Load 16
   - E. HEC-2 Modeling and Arroyo Rating Curves 17
   - F. Sediment Transport Capacity 18
   - G. Bulking Factors 19

4. EXISTING CONDITION HYDROLOGY MODEL 27
   - A. General 27
   - B. Current Development Model 27
   - C. Future Full Development Model 27

APPENDIX A — Computing Approximate Sediment Bulking Factors

APPENDIX B
   1. AHYMO Summary Files
   2. Hydrology Schematics

List of Tables

Table	Title	Page
2.1	Land Treatments	8
2.2	North Camino Arroyo Basin Characteristics	9
2.3	El Camino Arroyo Basin Characteristics	11
2.4	La Cueva Arroyo Basin Characteristics	13
2.5	La Cueva Diversion Channel Basin Characteristics	15
3.1	Estimated Fraction of 100-Year Hydrograph	20
3.2	Summary of Existing Conditions North Camino Arroyo	21
3.3	Summary of Existing Conditions North Camino Arroyo Tributary	22
3.4	Summary of Existing Conditions El Camino Arroyo	23
3.5	Summary of Existing Conditions La Cueva Arroyo	24
3.6	Summary of Existing Conditions La Cueva Diversion Channel	25
3.7	Bulking Factors for Sediment	26
4.1	Existing and Future Flow Rates	28

List of Figures

Figure	Title	Page
1.1	Existing Structure Location Map	4
1.2	Avulsion Location Map	5
1.3	Avulsion Location Map	6
2.1	Land Treatment and Drainage Basin Map	Back Flap
2.2	Land Treatment and Drainage Basin Map	Back Flap
2.3	Land Treatment and Drainage Basin Map	Back Flap
3.1	Sediment and Erosion Map	Back Flap
3.2	Sediment and Erosion Map	Back Flap
4.1	Analysis Point Location Map	Back Flap
4.2	Analysis Point Location Map	Back Flap

LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

1. INTRODUCTION

The La Cueva, El Camino and North Camino Arroyo systems in far northeast Albuquerque have a combined watershed area of approximately fourteen square miles at the point where they are intercepted by the North Diversion Channel (NDC). As such, they comprise 13% of the total contributing area to this major flood control facility. These watersheds, largely undeveloped to date, include not only unincorporated areas of Bernalillo County but also extensive U.S. Forest Service land in the Sandia Mountains and Sandia Indian Reservation land.

Most of the land not under control by the U.S. Forest Service or Sandia Pueblo was subdivided in the 1930's as part of the North Albuquerque Acres Subdivision. The original North Albuquerque Acres plat consisted of a uniform grid that ignored topographic and drainage features. During the mid-1960's the area east of Tramway Boulevard was re-platted and the new configuration was somewhat more sensitive to topographic features and made some attempts at providing for public drainage via dip section crossings and poorly defined drainage easements.

Prior to 1980 the only significant developments in these areas were:

- Sandia Heights Subdivision east of Tramway Boulevard, in the Sandia Mountain foothills.

- Interstate 25 and Tramway Boulevard, both of which traverse all three watersheds from north to south.

- Coronado Airport at I-25 and Tramway Road.

- A gravel pit immediately east of the North Diversion Channel.

- Some commercial development in the area adjacent to I-25, including a cemetery at Glendale Avenue and San Pedro Drive, immediately south of the airport, and an auto salvage yard.

Since 1980, the rate of development of this area has accelerated and now includes:

- Several major manufacturing plants west of I-25 as well as increased commercial development east of I-25.

- Approximately 240-acres of replatted land divided amongst several major subdivisions east of I-25 on the La Cueva Arroyo, between Ventura Street and Wyoming Boulevard.

- A privately owned sports complex and City of Albuquerque owned solid waste transfer station east of I-25.

- Approximately 20% of the original North Albuquerque Acres lots east of I-25 have been developed in the original or slightly modified configuration of one dwelling unit per acre.

- Two public schools which drain or partially drain to the La Cueva Arroyo system.

- A proposed Balloon Fiesta Park between I-25 and the North Diversion Channel.

- Extensive road work east of I-25, including major improvements to Tramway Boulevard, the paving of Wyoming Boulevard, Eubank Boulevard, Ventura Street and portions of Modesto Avenue and Browning Street.

With the increased level of development has come increased concern with drainage issues and efforts to control storm water runoff. Beginning in 1974, with the Leonard Rice "Northeast Heights Drainage Management Plan," a series of drainage management studies have been conducted that have resulted in the construction of flood control facilities to serve some of the needs in the area. These facilities, shown in Figure 1.1, are concentrated in the I-25 to the North Diversion Channel and the Tramway Boulevard areas. The four-and-one-half miles separating Tramway Boulevard and I-25 has seen only isolated drainage improvements, reflecting the relatively sparse development in this area. The last comprehensive drainage management study of the area was conducted by Bohannan-Huston, Inc., twelve years ago, in 1983. The Literature Review in the Appendix contains a summary of these as well as other significant drainage documents.

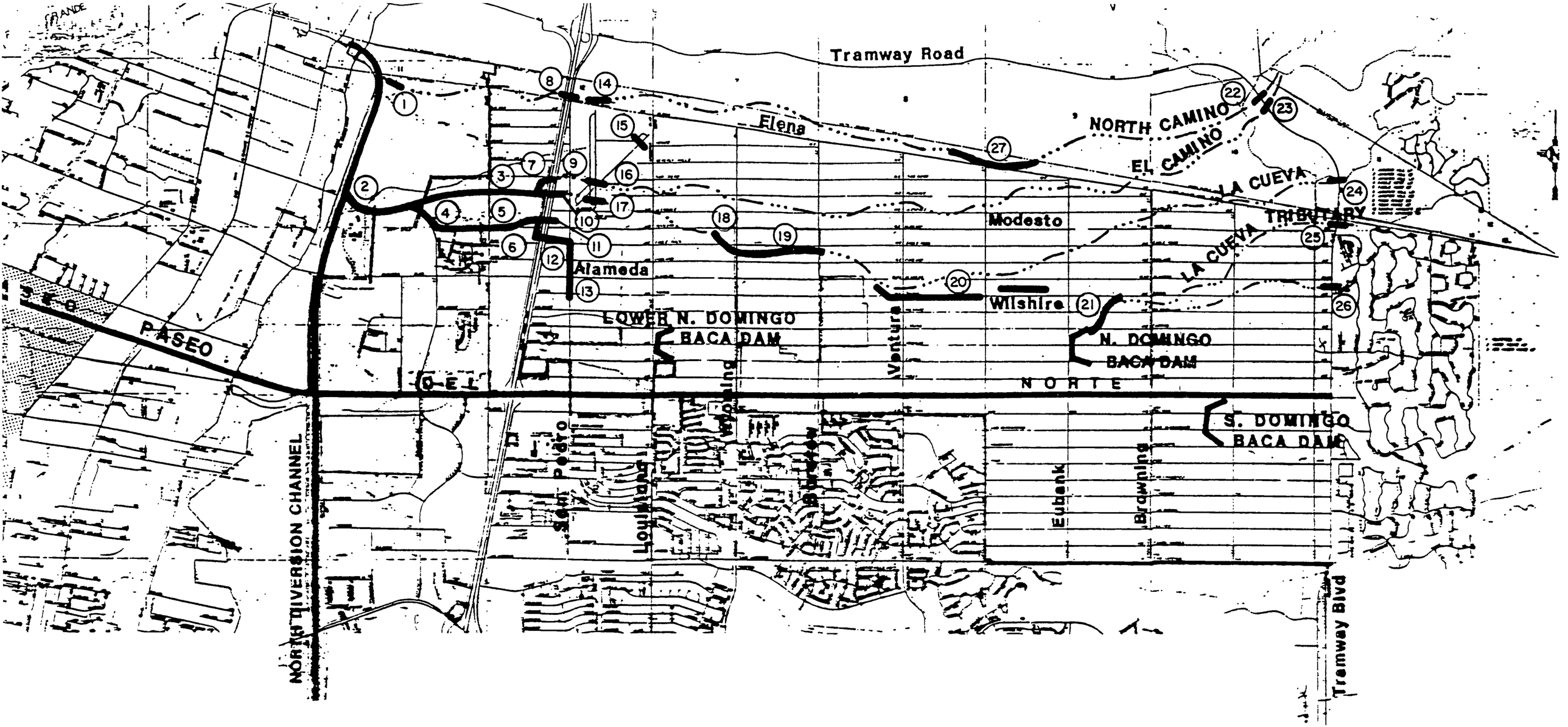
The study area, between Tramway Boulevard and I-25, as well as the area between I-25 and the North Diversion Channel that lies north of the concrete lined North La Cueva Arroyo, is characterized by the three major arroyo systems traversing it from east to west. The watershed produces significant amounts of sediment in response to major rainfall events. The natural arroyos, which are seldom deeply incised, have alternating reaches of sediment aggradation and degradation. The eastern half of this area is experiencing moderate levels of single family home construction on the original platted lots. The western portion is being developed either as commercial/industrial or replatted for higher density residential development.

There is extensive evidence that, over time, the main arroyo channels change flow paths on a regular, if unpredictable, basis. These changes in flow paths, or avulsions, as they have come to be called, are a matter of major concern in the area. Attempts to quantitatively evaluate these avulsions have been unsuccessful to date but several structures, such as the Signal Avenue and Nor Este training dikes, have been constructed to control areas where major arroyo flow changes were judged qualitatively to have a high probability of occurrence. However, there are still numerous potential avulsions that have been identified, but not yet controlled, that pose a hazard to downstream property owners as well as existing public flood control facilities.

Because of the continued concern with drainage issues resulting from increased levels of development, sediment/erosion problems and the need for a comprehensive drainage review of the area, the AMAFCA Board of Directors has authorized this current study.

This Hydrology Report is intended to summarize the methodology used in the sediment and erosion analysis as well as the findings from the hydrology modeling for existing drainage conditions for both current and full development scenarios prior to any further drainage improvements.

As part of the analysis, avulsion locations are being identified. However, for the purpose of the hydrology model, all avulsions that result in interbasin transfers of storm water are assumed to be controlled. The major avulsion areas which have a potential for interbasin transfers, as well as possible avulsion control measures, are shown on Figures 1.2 and 1.3. Avulsion control options will be dealt with in more detail in the Drainage Management Plan Flood Control Options Report in the future.



1 CAMINO INLET
2 LA CUEVA INLET
3 NORTH LA CUEVA CHANNEL
4 SOUTH LA CUEVA CONDUIT
5 SOUTH LA CUEVA CHANNEL
6 WILDFLOWER DIVERSION
7 CAMINO DIVERSION
8 NORTH CAMINO
9 CAMINO
10 NORTH LA CUEVA
11 SOUTH LA CUEVA
12 WILDFLOWER
13 SAN PEDRO S.D.
14 NORTH CAMINO
15 NORTH CAMINO TRIBUTARY
16 CAMINO
17 NORTH LA CUEVA
18 WYOMING DIVERSION DIKE
19 LA CUEVA CHANNEL AT NOR ESTE
20 SIGNAL DIKE
21 SOUTH LA CUEVA DIVERSION CHANNEL
22 NORTH CAMINO ARROYO
23 CAMINO ARROYO
24 NORTH BRANCH OF LA CUEVA ARROYO
25 MIDDLE BRANCH OF LA CUEVA ARROYO
26 SOUTH BRANCH OF LA CUEVA ARROYO
27 NORTH CAMINO CHANNEL AT SUNSET HILLS

FIGURE 1.1

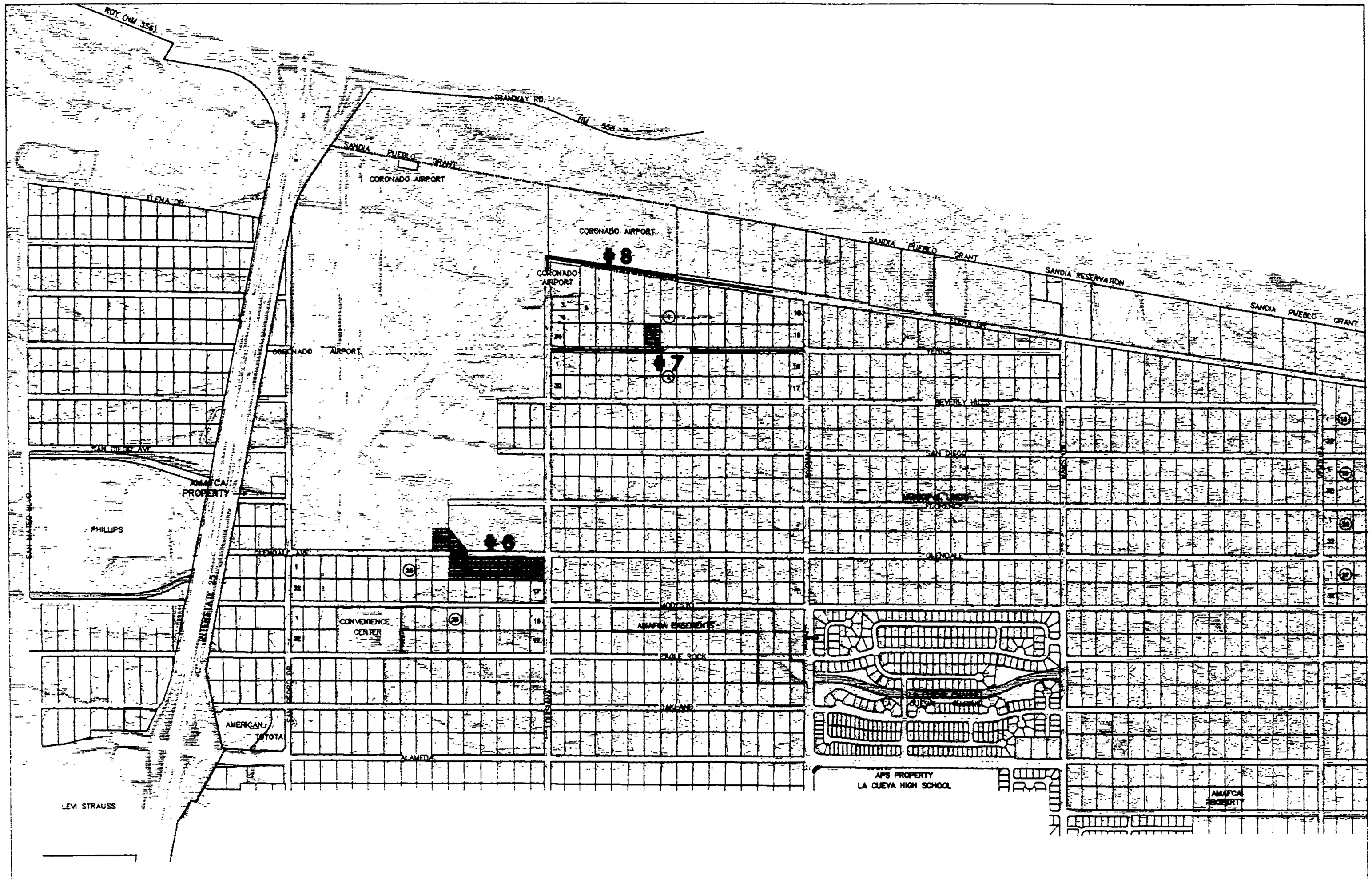
CAMINO, NORTH CAMINO AND LA CUEVA ARROYOS
DRAINAGE MANAGEMENT PLAN

EXISTING STRUCTURE LOCATION MAP

Resource Technology, Inc.
ENGINEERS & ENVIRONMENTAL SCIENTISTS

JOB NO. 95-190
SHEET NO.

DESIGNED BY: DSD | DRAWN BY: [illegible] | CHECKED BY: DSD | DATE: APRIL 1996



LEGEND

- PROPOSED TRAINING DIKE
- PROPOSED PAVED ROAD
- PROPOSED CUL-DE-SAC
- PROPOSED BRIDGE
- POTENTIAL R/W ACQUISITION
- 2 AVULSION NUMBER
- (18) BLOCK NUMBER
- 1 LOT NUMBER

N

500 250 0 500 1000

SCALE: 1" = 500'

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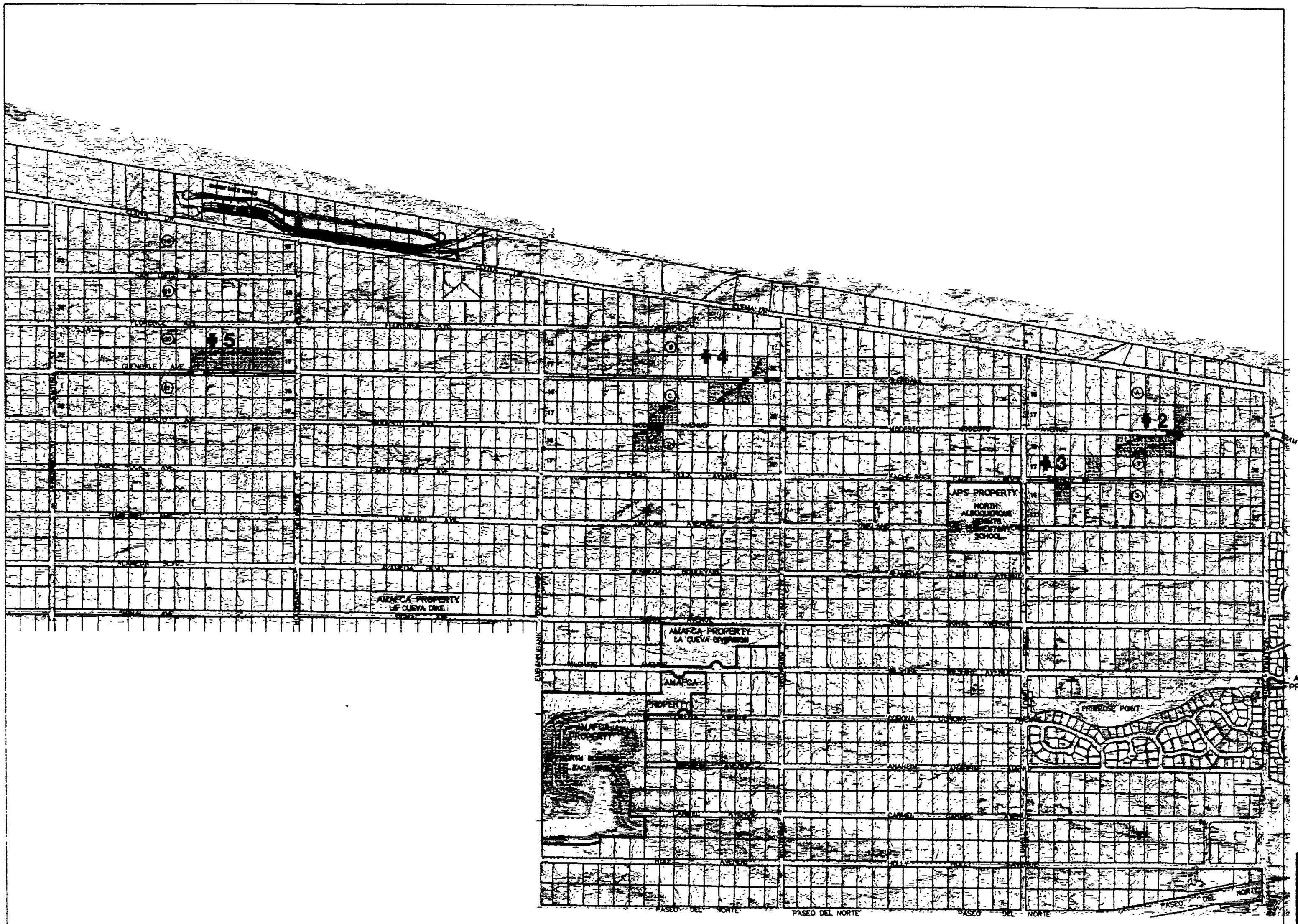
TITLE: LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

AVULSION LOCATION MAP

FIGURE 12

PROJECT NO.	95-190	MAP NO.	SHEET	OF
		B-C18,19,20		

C:\DATA\95-190\MAP\AMAP



LEGEND

- PROPOSED TRAINING DIKE
- PROPOSED PAVED ROAD
- PROPOSED CUL-DE-SAC
- PROPOSED BRIDGE
- POTENTIAL R/W ACQUISITION
- #2 AVULSION NUMBER
- (16) BLOCK NUMBER
- 1 LOT NUMBER

N

500 250 0 500 1000

SCALE: 1" = 500'

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TITLE: LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

AVULSION LOCATION MAP

FIGURE 13

PROJECT NO.	95-190	MAP NO.	B-C18,19,20	SHEET	OF

C:\DATA\95-190\PLAN\FIG12.DWG

2. HYDROLOGY

A. Methodology

The methodology utilized in this study is generally consistent with the City of Albuquerque Development Process Manual (DPM), Section 22.2, Hydrology (rev. Jan. 1993) and the companion computer hydrology program, AHYMO (rev. Jan. 1994). The one exception to the standard DPM procedure was to treat rock outcrops in the mountain areas as land treatment type C rather than as type D. It was felt that the initial abstraction and uniform loss rates associated with type C land treatments more closely approximated conditions found in these areas.

Preliminary drainage basin delineation relied on previous work performed by RTI for the Federal Emergency Management Agency in the project area. These preliminary basins were modified based on field verification and more recent aerial photography and topographic mapping performed for AMAFCA in 1994 by Thomas R. Mann, Inc. under a separate contract and in 1995 by Koogle and Pouls, Inc., as part of this contract. The Muskingcum-Cunge Method was used for all channel routings and the Variable Storage Coefficient Method was used for closed conduit flow. Bulking factors were not added to the basic hydrology models, see discussion in Section 3.

B. Land Treatments

Existing conditions land treatments were determined from aerial photography, other documented studies and field verification. Standard definitions of land treatments were taken from Chapter 22.2 of the COA DPM. Treatment types and slopes were adjusted for "steep slope" conditions for the mountainous basins.

Future Conditions land treatments had to be based on several assumptions concerning future development in specific areas. These were:

- Sandia Heights/Tramway Boulevard (SH/TB): This area would be built out in patterns reflecting existing development.

- North Albuquerque Acres (NAA): The area between Ventura Street and Tennyson Street as well as the area east of Coronado Airport and north of Florence Avenue would continue to develop along the lines of the existing one acre lot platting.

- Residential (R): The area west of Ventura Street, south of Modesto Avenue and east of Louisiana Boulevard would develop as relatively high density residential.

- Commercial/Industrial (C/I): The area west of Louisiana Boulevard, north of Modesto Avenue and east of I-25 would develop as high density commercial and industrial.

- Medium Density Industrial (MI): Areas west of I-25 and east of Jefferson Boulevard would continue to develop as large scale industrial facilities with somewhat less impervious area than the commercial/industrial area east of I-25.

- Balloon Fiesta Park (BF): The new Balloon Fiesta Park area, which includes some commercial/industrial areas, is still in the planning stages. However, due to the nature of the planned activity as well as the example of the current facility it seems likely that there will be extensive paved parking areas as well as graded and compacted launch areas. Therefore, 80% of the land treatment for the area north of San Diego Avenue and west of I-25 was considered to be Type C or D.

- Sandia Tribal Lands (ST): Sandia tribal lands south of Tramway Road and north of the Sandia Pueblo Grant Boundary were allocated land treatments consistent with moderate levels of development even though there are no current plans to develop this area.

Individual basin land treatment factors were assigned according to these assumptions as shown in Table 2.1 and the areas to which they apply and drainage basins are shown on Figures 2.1, 2.2 and 2.3 in the back flap. Where a basin fell into more than one of these areas, the land treatments were weighted. Future and existing land treatments, as well as other basin hydrologic characteristics, are shown in Tables 2.2 through 2.5.

TABLE 2.1

	Land Treatments (%)			
	A	**B**	**C**	**D**
Sandia Heights/Tramway (SH/TB)	25	40	5	35
North Albuquerque Acres (NAA)	22	23	34	17
Residential (R)	0	34	16	50
Commercial/Industrial (C/I)	0	20	10	70
Medium Density Industrial (MI)	0	20	30	50
Balloon Fiesta Park (BF)	0	20	30	50
Sandia Tribal Lands (ST)	20	20	40	20

TABLE 2.2

NORTH CAMINO ARROYO BASIN CHARACTERISTICS

Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
300	Existing Future	.8840 .8840	0 0	0 0	100 100	0 0	.432 .432
301	Existing Future	.8520 .8520	10 10	50 50	40 40	0 0	.402 .402
302	Existing Future	.1576 .1576	90 20	0 20	5 30	5 30	.133 .133
303	Existing Future	.1706 .1706	60 20	0 20	25 40	15 20	.16 .16
304	Existing Future	.0840 .0840	70 22	5 23	10 38	15 17	.14 .14
305.1	Existing Future	.1691 .1691	70 20	0 20	15 40	15 20	.19 .19
305.2	Existing Future	.1529 .1529	90 20	0 20	5 40	5 20	.23 .23
306	Existing Future	.1051 .1051	50 22	15 23	20 38	15 17	.133 .133
307	Existing Future	.0663 .0663	78 20	3 22	11 38	8 20	.133 .133
308	Existing Future	.0535 .0535	88 22	0 23	7 38	5 17	.133 .133
309	Existing Future	.0796 .0796	87 22	0 23	8 38	5 17	.16 .16
310	Existing Future	.1033 .1033	87 22	0 23	8 38	5 17	.21 .21
311	Existing Future	.1528 .1528	90 22	0 23	5 38	5 17	.21 .21
312	Existing Future	.0660 .0660	90 20	0 20	5 40	5 20	.18 .18
313	Existing Future	.2092 .2092	78 9	0 21	7 21	15 49	.18 .18
314	Existing Future	.0960 .0960	87 0	0 20	5 30	8 50	.133 .133

TABLE 2.2 (CONT.)

NORTH CAMINO ARROYO BASIN CHARACTERISTICS

Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
315	Existing	.0426	92	0	3	5	.133
	Future	.0426	0	20	30	50	.133
401	Existing	.0556	0	0	100	0	.133
	Future	.0556	0	20	30	50	.133
402	Existing	.2918	0	0	90	10	.17
	Future	.2918	0	20	30	50	.17

TABLE 2.3

EL CAMINO ARROYO BASIN CHARACTERISTICS

Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment %				TP (hrs)
			A	B	C	D	
201	Existing Future	.1339 .1339	95 95	0 0	0 0	5 5	.133 .133
200	Existing Future	.3030 .3030	65 65	20 20	15 15	0 0	.167 .167
202.1	Existing Future	.1031 .1031	84 22	0 23	8 38	8 17	.133 .133
202.2	Existing Future	.1099 .1099	70 22	5 23	15 38	10 17	.14 .14
202.3	Existing Future	.0684 .0684	60 11	10 26	15 33	15 30	.133 .133
203.1	Existing Future	.1258 .1258	80 22	0 23	10 38	10 17	.14 .14
203.2	Existing Future	.0485 .0485	80 11	0 26	10 33	10 30	.133 .133
203.3	Existing Future	.0558 .0558	80 0	0 34	10 16	10 50	.133 .133
204	Existing Future	.2119 .2119	80 6	0 31	10 21	10 42	.21 .21
204.2	Existing Future	.1333 .1333	80 8	0 22	10 25	10 45	.14 .14
204.1	Existing Future	.1484 .1484	80 17	0 22	10 31	10 30	.18 .18
205	Existing Future	.0459 .0459	10 0	0 10	20 20	70 70	.133 .133
206.1	Existing Future	.1221 .1221	75 0	5 20	10 30	10 50	.150 .150
206.2	Existing Future	.0561 .0561	75 0	5 20	10 30	10 50	.133 .133
206.3	Existing Future	.0480 .0480	0 0	7 7	7 7	86 86	.133 .133
206.4	Existing Future	.0327 .0327	40 0	25 20	5 30	30 50	.133 .133

TABLE 2.4

LA CUEVA ARROYO BASIN CHARACTERISTICS

Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
100	Existing Future	1.2140 1.2140	0 0	0 0	100 100	0 0	.475 .475
101	Existing Future	.6070 .6070	0 0	0 0	100 100	0 0	.267 .267
102	Existing Future	.8750 .8750	20 20	40 40	40 40	0 0	.320 .320
102.1	Existing Future	.0930 .0930	82 80	0 0	18 20	0 0	.133 .133
106	Existing Future	.0436 .0436	78 22	0 23	5 38	17 17	.133 .133
106.1	Existing Future	.1116 .1116	75 22	0 23	15 38	10 17	.14 .14
107.1	Existing Future	.1808 .1808	92 22	0 23	3 38	5 17	.14 .14
107.2	Existing Future	.1720 .1720	86 22	0 23	5 38	9 17	.18 .18
108	Existing Future	.2055 .2055	80 22	0 23	10 38	10 17	.16 .16
109	Existing Future	.1006 .1006	80 22	0 23	10 38	10 17	.133 .133
110	Existing Future	.1634 .1634	80 22	0 23	10 38	10 17	.19 .19
111	Existing Future	.0674 .0674	90 16	0 26	5 33	5 25	.14 .14
111.1	Existing Future	.1069 .1069	80 0	0 34	10 16	10 50	.133 .133
112	Existing Future	.1765 .1765	0 0	34 34	16 16	50 50	.14 .14
113	Existing Future	.1136 .1136	80 0	0 34	15 16	5 50	.133 .133
115	Existing Future	.1337 .1337	80 0	0 26	15 12	5 62	.133 .133

TABLE 2.4 (CONT.)

LA CUEVA ARROYO BASIN CHARACTERISTICS

Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
116	Existing Future	.1309 .1309	80 0	0 26	5 12	15 62	.133 .133
117.2	Existing Future	.1625 .1625	73 9	0 21	7 21	20 49	.22 .22
117.3	Existing Future	.1004 .1004	30 0	10 26	30 12	30 62	.133 .133
117.4	Existing Future	.0921 .0921	85 0	0 34	5 16	10 50	.133 .133
118	Existing Future	.0649 .0649	0 0	20 20	10 10	70 70	.133 .133
118.1	Existing Future	.0306 .0306	75 0	5 20	10 30	10 50	.133 .133
119	Existing Future	.0549 .0549	0 0	20 20	10 10	70 70	.133 .133
120	Existing Future	.0268 .0268	50 0	0 20	0 10	50 70	.133 .133
121	Existing Future	.0489 .0489	80 0	0 20	15 10	5 70	.133 .133
122	Existing Future	.0225 .0225	0 0	34 34	16 16	50 50	.133 .133
123	Existing Future	.0185 .0185	0 0	48 34	12 16	40 50	.133 .133
124	Existing Future	.0251 .0251	0 0	34 34	16 16	50 50	.133 .133
125	Existing Future	.0508 .0508	0 0	20 20	10 10	70 70	.133 .133
126	Existing Future	.0737 .0737	0 0	20 20	10 10	70 70	.133 .133
127	Existing Future	.0633 .0633	0 0	0 20	90 10	10 70	.133 .133
128	Existing Future	.1373 .1373	0 0	0 20	90 10	10 70	.17 .17

TABLE 2.5

LA CUEVA DIVERSION CHANNEL BASIN CHARACTERISTICS

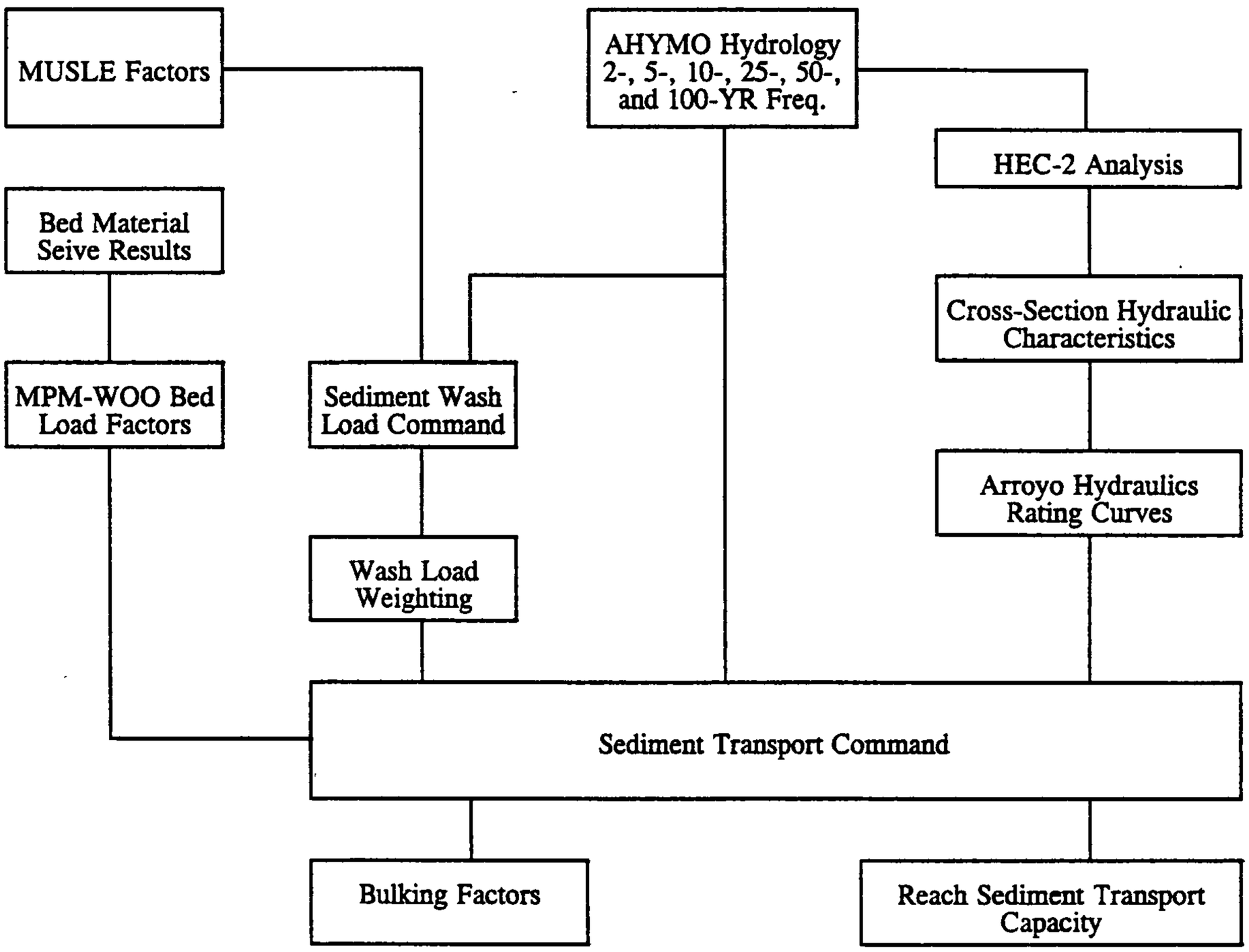
Basin ID	Hydrologic Condition	Basin Area (mi^2)	Land Treatment (%)				TP (hrs)
			A	B	C	D	
103	Existing Future	.212 .212	6 6	41 41	53 53	0 0	.198 .198
103.1	Existing Future	.2299 .2299	27 27	33 33	40 40	0 0	.234 .234
103.2	Existing Future	.0616 .0616	25 20	30 5	31 46	14 29	.139 .139
103.4	Existing Future	.0953 .0953	55 20	0 5	35 40	10 35	.136 .136
103.5	Existing Future	.0625 .0625	20 20	5 5	40 40	35 35	.133 .133
103.6	Existing Future	.0684 .0684	58 20	8 5	8 40	26 35	.137 .137
104.1	Existing Future	.1200 .1200	50 16	10 26	15 33	25 25	.133 .133
104.2	Existing Future	.0804 .0804	84 22	0 23	8 38	8 17	.16 .16
105.1	Existing Future	.1382 .1382	70 16	0 26	15 33	15 25	.133 .133
105.2	Existing Future	.1058 .1058	84 22	0 23	8 38	8 17	.133 .133

3. SEDIMENT TRANSPORT ANALYSIS

A. General

The purpose of this Sediment Transport Analysis is to determine bulking factors for the subject arroyos and to identify reaches as being aggradational or degradational. The methodology involves the use of the AHYMO Sediment Transport command. A flow chart of the various inputs for the Sediment Transport Command is shown below. A description of each of the inputs, including assumptions and other important information is also given. Input and Summary files are in the Appendix.

Flow-Chart of Sediment Transport Analysis



B. Input Hydrographs

Existing condition 100-year hydrographs were used as the basis for analysis for both bed load and wash load. Where other frequencies were required, they were estimated as a fraction of the 100-year frequency using data from an earlier analysis of portions of the North Camino Arroyo for the Sunset Hills CLOMR, approved by FEMA in February of 1996. The estimated fraction of the 100-year hydrograph is shown in Table 3.1.

C. Bed Material

Bed samples were taken at several locations in all three arroyos. A high degree of variability existed in the mean grain sizes (D-50). For this reason, all samples taken east of Browning Street were averaged together to obtain a single representative D-50 for the area. Similarly, results for samples taken west of Browning Street were averaged together. Locations of all sediment samples are shown in Figures 3.1 and 3.2.

The average D-50 was used to find factors **a** through **d** according to Figure 3.20 of Sediment and Erosion Design Guide. Factors **a-d** are used in the MPM-WOO Bed Load Formula, and are inputs to the Sediment Transport Command.

D. Wash Load

Wash load calculations were completed using the AHYMO Sed Wash Load command. This command uses the Modified Universal Soil Loss Equation (MUSLE) to compute wash load concentration. The results are multiplied by 3.0 as recommended in AMAFCA's "Sediment and Erosion Design Guide," Mussetter, 1994. Since several basins contribute runoff to a particular reach of an arroyo, the wash load results for each basin were weighted corresponding to basin area. Factors for each basin are contained in the Appendix. Inputs for the MUSLE equation are described as follows:

Soil Erodibility Factor, K

K-values were determined from the "Prudent Line Analysis, La Cueva Arroyo and Watershed Between Tennyson Street and Modesto Avenue," RCE (1992) and "Albuquerque Arroyos Sedimentation Study Numerical Model Investigation,"Corps of Engineers (1995) K-values of the Camino and La Cueva Basins. The Corps, using SCS soil surveys, determined a weighted K-value for each subbasin based on the percentage of a given soil type in that area. RCE (1992) used K=0.02 to K=0.05 for Sandia Mountain Basins. In this study, a K factor of 0.05 was selected for use in the mountain basins and a K-value of 0.20 was used for all basins west of Tramway Boulevard.

Cover and Management Factor, C

The C-values used were determined from Table B.2 of the AMAFCA "Sediment and Erosion Design Guide" (1994). A 25% canopy area of grasses and shrubs was assumed with no

appreciable mulch for the non-mountain basins. For this condition Table B.2 gives a C-value of 0.36 which compares well with the C-value of 0.40 used by the Corps of Engineers (1995).

The mountain basins contain trees, brush, and more ground cover. A 50% canopy cover with 6' height was assumed in the upland basins, with a ground cover of 20%. Table B.2 gives a C-value of 0.19 for this condition.

Erosion Control Practice Factor, P

A P-value of 1.0 was used, assuming that undeveloped land will not be graded or ploughed to control erosion.

Topographic Factor, LS

LS values were determined from Equation B.3 of the AMAFCA Sediment and Erosion Design Guide (1994):

$$LS=(\frac{\lambda}{72.6})^n*(0.065+0.0454*S+0.0065*S^2)$$

λ = overland slope length
S = slope in percent

n = 0.3 for slope $\leq$ 3%
n = 0.4 for slope = 4%
n = 0.5 for slope $\geq$ 5%

LS values corresponding to upland (mountain) basins, developed basins east of Tramway Boulevard, and developed basins west of Tramway Boulevard were used. LS values for mountain basins were computed individually, depending on topography. Other LS values are as follows:

	λ (ft)	S(%)	LS
East of Eubank Boulevard	240	5	0.83
West of Eubank Boulevard	240	4	0.57

The overland slope lengths were determined based on site visits and topographic maps. The overland flow length in North Albuquerque Acres was chosen as 240 feet since this is the approximate typical lot length. The slopes shown are average values for the specified areas.

E. HEC-2 Modeling and Arroyo Rating Curves

Cross-sections for the HEC-2 model, obtained from digitized topographic maps, were obtained using advanced CADD methods. Discharges corresponding to 10%, 20%, 40%, 60%, 80%, 100%, and 120% of the 100-yr discharge were input to the HEC-2 analyses to obtain rating curves for individual reaches. Arroyo cross-sections were taken at 100-feet intervals for the HEC-2 analysis. GR cards were created using a program that converts distance-elevation information for each cross-section.

Cross-section geometry was examined to determine channel vs. overbank areas. In cases where there was no clear division between channel and overbank, the overbank was assumed to be where the 100-yr flow depth was 6-inches or less. This criteria of a 6-inch flow depth was determined based on an overbank flow velocity of 3 fps or less, as recommended by the HEC-2 User's Manual for Floodway Determination. A normal depth of 6-inches corresponds to a velocity of 3 fps in wide channels with slope and roughness characteristics found in the study area. Cross-sections where more than one flow path was evident (braided streams) were considered as a whole channel, again as suggested in the HEC-2 User's Manual for Floodway Determination.

Mannings "n" values of 0.030 for channel and 0.045 for overbank were used in the models. The "NH Card" option was used for labeling n-values so that n-values could be fixed independently of the position chosen for the overbanks, and also so that multiple-channel conditions could be modeled.

Top width and mean velocity data for each cross-section were examined to select reaches with similar hydraulic characteristics. Once reaches were selected, the top width and velocity were averaged for each of the seven discharges to obtain a rating curve for that reach. A total of thirty-eight reaches on the three main arroyos and twenty reaches on two tributary arroyos were studied in detail.

F. Sediment Transport Capacity

The Rating Curves were used as input in the Sediment Transport Command to relate top width and velocity with discharge for each reach shown in Figures 3.1 and 3.2. To this the weighted results from the wash load computations and the MPM-Woo coefficients were added. In this manner, with the input hydrographs for the 100-yr, 50-yr, 25-yr, 10-yr, 5-yr and 2-yr storms as described in Section 3.B, the sediment transport capacity for each reach was determined as reported in Tables 3.2 through 3.6.

Utilizing the sediment transport capacity as determined above, the potential for aggradation or degradation in each reach was determined by applying the principal of continuity. If each natural arroyo reach was assumed to transport sediment up to its full capacity, and that if this capacity exceeded the supply from the upstream reach, then arroyo degradation (erosion) would occur. Conversely, if the supply of sediment exceeded the transport capacity then aggradation would take place. To further aid in this analysis Equation 1.1 of the "Erosion and Sediment Design Guide" was utilized to determine mean annual sediment loadings. In this manner both short term (average annual) sediment aggradation/degradation potential and long term (30 times the average annual plus the 100-year) aggradation/degradation potential could be examined. These are also reported in tables 3.2 through 3.6 for each arroyo.

A comparison of the average annual sediment loadings for the Camino and North Camino Arroyos reveals relative channel stability east of Coronado Airport. At the airport itself there seems to be a major depositional zone that may be related to the gradual decrease in the prevailing east to west arroyo bed slopes. However, a comparison of the long term trends for each arroyo reach reveals

a pattern for alternating degredational and aggradational zones that could have a major impact on long term arroyo channel stability.

The La Cueva arroyo demonstrates a somewhat different pattern. East of Eubank there is a pattern of major arroyo bed degradation followed by aggradation in the vicinity of one of the previously identified avulsion areas just east of Eubank even at the average annual level. This is followed by a series of reaches from Eubank west to Ventura where there is relative short term channel stability. West of Ventura the model indicates an area of channel degradation that coincides with an area observed in the field to be characterized by arroyo channel head cuts. These tendencies are even more pronounced when a comparison is made of the long term trends. Immediately downstream from the hard lined channel through Nor Este Subdivision there is a zone of channel degradation followed by an aggradational zone at Coronado Airport under both short term and long term conditions.

G. Bulking Factors

In addition to reporting the sediment transport capacity for each reach, both volumetrically and by weight, the AHYMO output also calculates the average bulking factor for each hydrograph. The average bulking factors for the 10- and 100-year flows for the thirty-eight main arroyo reaches from this study plus an additional three reaches from similar studies in the project area were statistically analyzed to determine a relationship between flow rate and bulking factor. The following equation was found to provide a reasonably good fit for the data:

$$BF \text{ (in \%)} = 3.622 + .001875Q \text{ (in cfs)}$$

Bulking factors (rounded to the nearest whole percent) were then calculated as a function of flow rate as shown in Table 3.7. A more complete discussion of the statistical analysis is contained in Appendix A.

Bulking factors, determined in this manner, could then be applied externally to the hydrology model results to determine peak flow rates at various points, prior to any reservoir routings or to approximate sediment storage requirements for ponds and dams. It was felt that applying bulking factors as a function of flow rate gave a reasonable representation of the effects of sediment in these limited situations but should not be used where a higher degree of accuracy is required, such as for prudent line analysis or for determining sediment aggradation/degradation zones.

TABLE 3.1

HYDROGRAPH FREQUENCY FACTORS

Frequency	Fraction of Q-100
2-Yr	.22
5-Yr	.35
10-Yr	.53
25-Yr	.71
50-Yr	.87

TABLE 3.2

SUMMARY OF EXISTING CONDITIONS
NORTH CAMINO ARROYO

Reach*	Sediment Transport Capacity in Tons by Frequency							Average Annual Aggradation (+) Degradation (-) Tons	100-Year Aggradation (+) Degradation (-) Tons	30-Year Cumulative Plus 100-Year Tons
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	Average Annual			
1A	5479	9777	16865	23718	29704	36898	7372	-	-	-
1B	4409	7827	13104	18556	23613	28861	5907	+1465	+8037	+51987
1C	4515	8702	15158	22601	29849	35684	6646	-739	-6823	-28993
2A	4456	7627	12439	17691	22648	26694	5751	+895	+8990	+35840
2B	4594	8310	15613	24122	32537	39837	6799	-1048	-13143	-44583
3A	4639	7530	12040	17242	22526	27132	5759	+1040	+12705	+43905
3B	5801	9407	14736	20721	26524	30948	7072	-1313	-3816	-43206
4A	6734	10404	15266	20469	25487	30059	7648	-576	+889	-16391
4B	4708	7660	12127	17739	23862	29141	5900	+1748	+918	+53358
4C	4432	7437	11945	16716	21224	25236	5581	+319	+3905	+13475
4D	7690	13662	23346	34784	46100	54061	10569	-4988	-28825	-178465

*Reach locations are shown on Figures 3.1 and 3.2

TABLE 3.3

SUMMARY OF EXISTING CONDITIONS
NORTH CAMINO ARROYO TRIBUTARY

Reach*	Sediment Transport Capacity in Tons by Frequency							Average Annual Aggradation (+) Degradation (-) Tons	100-Year Aggradation (+) Degradation (-) Tons	30-Year Cumulative Plus 100-Year Tons
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	Average Annual			
1A	119	199	326	467	601	714	152			
1B	154	267	470	693	884	1039	209	-57	-325	-2035
1C	199	337	514	714	926	1113	247	-38	-74	-1214
1D	110	180	283	390	488	570	134	+113	+543	+3933
1E	163	282	497	734	942	1113	222	-88	-543	-3183
1F	117	193	302	415	517	600	143	+79	+513	+2883
1G	216	368	610	875	1125	1138	278	-135	-538	-4588
1H	173	285	448	625	792	932	213	+65	+206	+2126
1I	170	278	430	583	718	829	205	+8	+103	+343
1J	640	1166	1955	2811	3735	4479	893	-688	-3650	-24290
1K	445	730	1145	1588	1999	2341	544	+349	+2138	+12608
1L	827	1386	2192	2964	3650	4242	1020	-476	-1901	-16181

*Reach locations are shown on Figures 3.1 and 3.2

TABLE 3.4

SUMMARY OF EXISTING CONDITIONS
EL CAMINO ARROYO

Reach*	Sediment Transport Capacity in Tons by Frequency							Average Annual Aggradation (+) Degradation (-) Tons	100-Year Aggradation (+) Degradation (-) Tons	30-Year Cumulative Plus 100-Year Tons
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	Average Annual			
1A	779	1515	2830	4525	6283	7851	1234	-	-	-
1B	762	1359	2273	3282	4264	5110	1030	+204	+2741	+8861
2A	1005	1865	3213	4770	6388	7847	1436	-406	-2737	-14917
2B	970	1690	2700	3766	4881	5881	1254	+182	+1966	+7426
2C	1011	1810	3220	5118	6990	8587	1462	-208	-2706	-8946
3A	1092	1953	3405	5115	6522	7656	1517	-55	+931	-719
3B	1130	2081	3677	5763	7499	8769	1610	-93	-1113	-3903
4A	1028	1872	2918	4045	5216	6401	1377	+233	+2368	+9358
4B	975	1762	3069	4515	5864	7071	1363	+14	-670	-250
5A	1488	2423	3800	5234	6586	7724	1808	-445	-653	-14003
5B	1775	2922	4449	6110	7568	8761	2140	-332	-1037	-10997
5C	1683	2813	4389	6065	7720	9224	2084	+56	-463	+1217
6A	3454	6287	11234	14439	17528	20279	4682	-2598	-11055	-88995
6B	1684	2961	4796	6692	8398	9794	2190	+2492	+10485	+85245
6C	2224	4123	6944	10249	13496	16350	3127	-937	-6556	-34666

*Reach locations are shown on Figures 3.1 and 3.2

TABLE 3.5

SUMMARY OF EXISTING CONDITIONS
LA CUEVA ARROYO

Reach*	Sediment Transport Capacity in Tons by Frequency							Average Annual Aggradation (+) Degradation (-) Tons	100-Year Aggradation (+) Degradation (-) Tons	30-Year Cumulative Plus 100-Year Ton
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	Average Annual			
1A	9679	19751	36471	57934	80862	101926	15599	-	-	-
1B	11171	22942	45824	74322	106044	139271	19375	-3776	-37345	-150625
1C	7699	14395	26721	42104	58562	74455	11473	+7902	+64816	+301876
2A	8402	15999	28533	42679	56436	69690	12442	-969	+4765	-24305
2B	8098	16098	30027	47267	66135	83010	12989	-547	-13320	-29730
3A	8850	15626	25786	37222	48940	60423	11857	+1132	+22587	+23719
3B	7617	13329	23150	34453	45437	54992	10449	+1408	+5431	+47671
4A	7730	14986	27889	43606	59745	73322	12061	-1612	-18330	-66690
4B	14578	29226	53690	84653	119144	151733	23421	-11360	-78411	-419211
4C	11233	21689	35445	49832	64502	75893	15766	+7655	+75840	+305490
5 (Nor Este Channel)										
6A	14481	25850	42897	61000	77897	93882	19411	-3645	-17989	-127329
6B	13801	21251	33843	48297	62099	73112	16438	+2973	+20770	+109960

*Reach locations are shown on Figures 3.1 and 3.2

TABLE 3.6

SUMMARY OF EXISTING CONDITIONS
LA CUEVA DIVERSION CHANNEL

Reach*	Sediment Transport Capacity in Tons by Frequency							Average Annual Aggradation (+) Degradation (-) Tons	100-Year Aggradation (+) Degradation (-) Tons	30-Year Cumulative Plus 100-Year Tons
	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	Average Annual			
1A	1431	2603	4706	6986	9305	11511	2061	-	-	-
1B	1146	2068	3277	4332	5372	6229	1481	+580	+5282	+22682
1C	1420	2437	3792	5210	6713	8248	1792	-311	-2019	-11349
1D	875	1644	3048	4391	5350	6157	1271	+521	+2091	+17721
1E	1199	2036	3546	5589	7508	9189	1644	-373	-3032	-14222
1F	997	1794	3121	4765	6564	8143	1418	+226	+1046	+7826
1G	986	1933	3856	6396	8783	10878	1640	-222	-2735	-9395
1H	1164	1899	2968	4139	5337	6363	1424	+216	+4515	+10995

*Reach locations are shown on Figures 3.1

TABLE 3.7

BULKING FACTORS FOR SEDIMENT AS A FUNCTION OF FLOW RATE

Clean Water Flow Rate, Q (cfs)	Bulking Factor (%)
0 - 500	4
501 - 1000	5
1001 - 1600	6
1601 - 2100	7
2101 - 2600	8
2601 - 3200	9
3201 - 3700	10
3701 - 4200	11

Valid for NAA and Sandia Heights natural channels west of USFS Boundary only, D_{50} 1.5mm - 3.0mm

4. EXISTING CONDITION HYDROLOGY MODEL

A. General

The term "existing condition," as used in this report, refers to drainage infrastructure rather than levels of development. Thus, there are existing conditions with current levels of development and existing conditions with future full development. The modeling of new drainage infrastructure will be referred to as "Proposed Conditions."

B. Current Development Model

The existing conditions, current development, model results are summarized in Table 4.1 as "existing" conditions. Flow rates have been adjusted to reflect sediment bulking by the factors shown in Table 3.7. All avulsions are assumed to be controlled so as to prevent interbasin transfers of storm water. Because of the overriding influence of the Sandia Mountain drainage basins on the La Cueva and North Camino Arroyos, there is little variation in flow from Tramway Boulevard to I-25. It appears that local inflows merely replace the reduction in peak flows due to routing. The El Camino Arroyo, which is less dependent on mountain flows, shows a gradual increase in flow as it progresses from east to west. Output summary files and hydrology schematic maps are located in Appendix B. Figures 4.1 and 4.2 (in the back flap) show the location of selected analysis points.

C. Future Full Development Model

The existing condition, future full development, model results are also shown in Table 4.1 as "Future Conditions." Again, due to the influence of the mountain basins, there is little apparent increase in peak runoff rates due to development in the North Camino and La Cueva Arroyo basins. The El Camino basin, which is less influenced by the mountain areas, shows a correspondingly greater impact due to development. Selected flow rates for both existing and future conditions are shown on Figures 2.1, 2.2 and 2.3.

The proposed improvements to the Balloon Fiesta Park have only been reflected in land treatments and not in terms of any impact proposed facilities may have on runoff routing. In general, this model only reflects changes in land treatments and does not model any other proposed improvements other than avulsion control.

TABLE 4.1

EXISTING AND FUTURE FLOW RATES

	North Camino Arroyo (cfs)	El Camino Arroyo (cfs)	La Cueva Arroyo (cfs)
Tramway	AP 301.90	AP 200.0	AP 102.90
Existing	1718	472	2758
Future	1718	472	2758
Browning		AP 201.90	AP 107.29
Existing	-	587	2756
Future	-	587	2782
Eubank		AP 202.19	AP 109.99
Existing	-	619	2942
Future	-	646	3040
Holbrook	AP 303.90	AP 202.29	
Existing	1717	638	-
Future	1767	685	-
Ventura	AP 305.19	AP 202.39	AP 110.9
Existing	1736	638	2939
Future	1798	710	3048
Barstow	AP 305.29	AP 203.39	AP 111.99
Existing	1739	726	2953
Future	1829	920	3066
Wyoming		AP 204.9	AP 112.90
Existing	-	790	2986
Future	-	1130	3094
Louisiana			AP 113.90
Existing	-	-	2989
Future	-	-	3106
I-25	AP 313.99	AP 205.90	AP 115.90
Existing	1846	908	2994
Future	1982	1335	3108
North Diversion Channel	AP 402.90		AP 128.90
Existing	1863	-	3898
Future	2422	-	4591

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APPENDIX A

COMPUTING APPROXIMATE SEDIMENT BULKING FACTORS FOR HYDROLOGIC USE IN NORTH ALBUQUERQUE ACRES CITY OF ALBUQUERQUE, NEW MEXICO

PREPARED FOR:

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

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RTI PROJECT NO. 95-190

AUGUST 1996

COMPUTING APPROXIMATE SEDIMENT BULKING FACTORS FOR HYDROLOGIC USE IN NORTH ALBUQUERQUE ACRES CITY OF ALBUQUERQUE, NEW MEXICO

1. INTRODUCTION

Resource Technology, Inc. (RTI) was contracted by Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) to prepare "Drainage Management Plan (DMP) for La Cueva, El Camino and North Camino Arroyos." These arroyos are located in North Albuquerque Acres, City of Albuquerque, New Mexico. As part of DMP, RTI computed sediment bulking factors at several locations (from Tramway Blvd. to I-25) using AHYMO194 model. The AHYMO194 is state of the art hydrology model for the City of Albuquerque. In this paper, an attempt is made to correlate the peak clear water discharge with sediment bulking factors in an equation form for limited use in adjusting peak flow rates to account for sediment load where a higher degree of accuracy does not justify the expense of more detailed analysis.

2. DEVELOPMENT OF HYDROLOGY MODEL

Hydrology was computed using the AHYMO194 model. The hydrology model extends from Sandia Mountains to past I-25 for all three arroyos. The initial abstraction and uniform loss rates were chosen as defined in Section 22.2, Hydrology of the Development Process Manual (DPM), Volume 2, Design Criteria for the City of Albuquerque, New Mexico. The land treatments used in the model were chosen based on man-made development and slope criteria given in the DPM. Rock outcrop areas of the Sandia Mountains were initially regarded as totally impervious areas, land treatment type "D." Finally the steep slope procedure was applied, as specified in the DPM, to sub-basins with greater than 4% slopes.

After the regression analysis in this paper, the hydrology model was modified to the extent that rock outcrops were considered the same as compacted natural soil, land treatment type "C," rather than as totally impervious. However this should not affect the regression analysis performed for this paper because the analysis relates the absolute peak discharge (in cfs) to the sediment bulking factor (in percent) in the study area.

3. SOIL SAMPLES

The soil samples were collected in plastic bags at twenty-three locations. These locations range from Tramway Blvd. to I-25. The samples were collected in all three arroyos. Some samples were collected in the arroyos and some were collected in the watershed area. The top two inches of soil cover was removed before collecting any samples. However, only those samples that were collected in the arroyos were used in the sediment analysis.

After collecting these soil samples, they were taken to the soil testing laboratory for sieve analysis to obtain the soil gradation information. Using this information, the D_{50} (median size) was determined for all the samples. These median sizes ranged from 1.5 to 3 mm. See Appendix B.

4. SEDIMENT TRANSPORT ANALYSIS

The sediment transport analysis is described in the "Sediment and Erosion Design Guide" for the Albuquerque area. This guide was compiled by Resource Consultants & Engineers, Inc. for AMAFCA. The sediment transport analysis involves using the hydrology model, to determine sediment wash loads and flow rates for various frequencies, hydraulic model to determine hydraulic characteristics at various flow rates, and then the hydrology model again with the wash load data and hydraulic rating curves to determine sediment transport capacity and bulking factors. The hydraulics model used was the U.S. Army Corps of Engineers' HEC-2. The AHYMO194 model was used to compute the sediment yield (wash load) as well as sediment bed-load using the commands SEDIMENT WASH LOAD and SEDIMENT TRANS respectively. The SEDIMENT WASH LOAD uses the MUSLE equation to compute the sediment yield. The SEDIMENT TRANS can use either MPM-WOO bed-load equation or Zeller and Fullerton relation. For this project, MPM-WOO equation was selected.

The sediment transport analysis procedure consists of following steps:

A. Develop the hydrology model using AHYMO194.
B. Using the best available topographic data, generate cross-sections and identify reaches based on similar cross-section characteristics. Develop hydraulic models (i.e., HEC-2 models) for each arroyo.
C. Run hydraulic model with a range of discharges. Obtain the velocity and top width for each discharge for each cross-section.
D. Average the velocity and top width parameters for a given discharge and the reach.
E. Compile the sediment wash load parameters. This information was compiled from four sources. They are: 1) Sediment and Erosion Design Guide (Resource Consultants & Engineers, 1994); 2) Prudent analysis, La Cueva Arroyo and Watershed Between Tennyson Street and Modesto Avenue (Resource Consultants & Engineers, 1992); 3) Albuquerque Arroyos Sedimentation Study Numerical Model Investigation (U.S. Army Corps of Engineers, 1995); and, 4) Soil Survey Maps.
F. Compile the sediment bed-load parameters using D_{50} from soil gradation samples and "Sediment and Erosion Design Guide."
G. Input the sediment wash load parameters, sediment bed-load parameters and average values of velocity and top width for a given peak discharge and reach into the AHYMO194 model below the hydrograph of interest.
H. Run AHYMO194 model to get the sediment bulking factors. There are two sediment bulking factors. One is for the peak discharge value (peak sediment bulking factor) and the other is for the entire hydrograph (average sediment bulking factor).

5. SELECTION OF SAMPLE DATA

The sediment bulking factors were computed for 2-, 5-, 10-, 25-, 50- and 100-year return periods in the DMP for all three arroyos. However, the data for 100-year and 10-year return periods were chosen as the sample data because of the large number of data points. The reason behind selecting the two return periods instead of one was to obtain the range of sediment bulking factors for the regression analysis. The average sediment bulking factors were used as the sample data.

6. REGRESSION ANALYSIS

6.1 CURVE Program

The CURVE program, written by U.S. Army Corps of Engineers for DOS applications, was used in performing this regression analysis. This program contains the algorithm for nine different equations. They are of following form:

Exponential:	$SB = A * e^{B*Q}$	(1)
Power:	$SB = A * Q^{B}$	(2)
Common LOG (LOG1):	$SB = A_1 + A_2 * LOG(Q) + A_3 * (LOG(Q))^2$	(3)
Common LOG (LOG2):	$SB = A_1 + A_2 * Q + A_3 * LOG(Q)$	(4)
Natural LOG (LOG1):	$SB = A + B * LN(Q)$	(5)
Polynomial (Degree 1):	$SB = A_1 + A_2 * Q$	(6)
Polynomial (Degree 2):	$SB = A_1 + A_2 * Q + A_3 * Q^2$	(7)
Polynomial (Degree 3):	$SB = A_1 + A_2 * Q + A_3 * Q^2 + A_4 * Q^3$	(8)
Hyperbola:	$SB = A + (B/Q)$	(9)

where

SB = Sediment bulking factor in percent
Q = Peak discharge in cfs
A, B, A_1, A_2, A_3, A_4 = Regression constants

RTI used one additional equation which is not part of the CURVE program:

$$SB = 10^{((Q + A)/B)} \quad (10)$$

The regression analysis for this equation was performed separately in the spreadsheet program Quattro Pro (Version 6.0 for Windows).

6.2 Slope Criteria

The data were divided into two different slope data sets, one with flatter slopes ($< 3.5\%$) and the other with steeper slopes ($\geq 3.5\%$). It was initially thought that slope as well as flow rate might be a significant variables. Regression analysis was performed on these two different data sets to obtain two different equations using the CURVE program as well as the Quattro Pro (Version 6.0 for Windows) spreadsheet.

6.3 Results

The sample correlation coefficient (r^2) in regression analysis gives a measure of the curves fit with the observed data. The closer this parameter is to 1, the better the degree of curve fit. The correlation coefficients along with the equations are given in Table 1 and Table 2.

Table 1. Regression Results for Flatter Slopes (< 3.5%) N = 60

Equation #	Correlation Coefficient	Equation
1	0.30	$SB = 4.34 * e^{0.00018 * Q}$
2	0.20	$SB = 1.06 * Q^{0.24}$
3	0.35	$SB = 61.27 - 40.23 * LOG(Q) + 7.17 * (LOG(Q))^2$
4	0.36	$SB = 11.99 + 0.002 * (Q) - 2.97 * LOG(Q)$
5	0.26	$SB = -5.70 + 1.67 * LN(Q)$
6	0.34	$SB = 4.13 + 0.0013 * Q$
7	0.37	$SB = 4.95 + 0.00006 * Q$
8	0.37	$SB = 5.07 - 0.00023 * Q$
9	0.16	$SB = 7.40 - 1236.58/Q$
10	0.37	$SB = 10^{(Q + 2139.95)/4751.74)}$

Table 2. Regression Results for Steeper Slopes (≥ 3.5%) N = 23

Equation #	Correlation Coefficient	Equation
1	0.64	$SB = 3.45 * e^{0.00038 * Q}$
2	0.57	$SB = 0.07 * Q^{0.63}$
3	0.62	$SB = 84.73 - 60.66 * LOGg(Q) + 11.40 * (LOG(Q))^2$
4	0.62	$SB = 2.37 + 0.003 * (Q) - 0.066 * LOG(Q)$
5	0.57	$SB = -25.8 + 4.62 * LN(Q)$
6	0.62	$SB = 2.55 + 0.00295 * Q$
7	0.62	$SB = 2.64 + 0.00284 * Q$
8	0.63	$SB = 0.09 + 0.0089 * Q$
9	0.41	$SB = 11.64 - 4284.92/Q$
10	0.59	$SB = 10^{(Q + 1206.6)/3612.59)}$

Table 3 and Table 4 list the original sediment bulking factor data used in the regression analysis along with that computed using the regression coefficients for each equation.

For slopes less than 3.5%, Equations 1, 2, 5 and 9 do not represent a good correlation between the peak discharge and sediment bulking factor based on the correlation coefficient. Equations 7 and 8 can also be eliminated because these equations are showing a linear correlation while

they themselves are non-linear. In Equations. 3 and 4, the predicted sediment bulking factor decreases with increase in peak discharge for a particular range as evident from Table 3. The Equation 10 has a slightly better correlation coefficient than that for Equation 6. However, to keep the equation simple, the linear equation (Equation 6) was selected as the sediment bulking factor equation for flatter slopes (i.e., slopes lower than 3.5%).

Table 3. Results of Regression Analysis for Flatter Slopes (< 3.5%)

Peak Discharge (cfs)	Original Average Sediment Bulking Factors	Calculated Average Sediment Bulking Factors									
		Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7	Equation 8	Equation 9	Equation 10
350	4.4	4.7	4.3	5.4	5.2	4.1	4.6	5.0	5.0	3.9	3.3
350	5.6	4.7	4.3	5.4	5.2	4.1	4.6	5.0	5.0	3.9	3.3
386	5.4	4.7	4.4	5.2	5.1	4.2	4.6	5.0	5.0	4.2	3.4
386	4.2	4.7	4.4	5.2	5.1	4.2	4.6	5.0	5.0	4.2	3.4
386	5.2	4.7	4.4	5.2	5.1	4.2	4.6	5.0	5.0	4.2	3.4
399	5.0	4.7	4.4	5.2	5.1	4.3	4.6	5.0	5.0	4.3	3.4
399	4.4	4.7	4.4	5.2	5.1	4.3	4.6	5.0	5.0	4.3	3.4
399	4.1	4.7	4.4	5.2	5.1	4.3	4.6	5.0	5.0	4.3	3.4
511	3.9	4.8	4.7	4.9	5.0	4.7	4.8	5.0	5.0	5.0	3.6
511	4.0	4.8	4.7	4.9	5.0	4.7	4.8	5.0	5.0	5.0	3.6
511	3.4	4.8	4.7	4.9	5.0	4.7	4.8	5.0	5.0	5.0	3.6
524	5.7	4.8	4.7	4.9	5.0	4.7	4.8	5.0	4.9	5.0	3.6
524	3.8	4.8	4.7	4.9	5.0	4.7	4.8	5.0	4.9	5.0	3.6
524	8.5	4.8	4.7	4.9	5.0	4.7	4.8	5.0	4.9	5.0	3.6
661	5.2	4.9	5.0	4.9	5.0	5.1	5.0	5.0	4.9	5.5	3.9
661	8.2	4.9	5.0	4.9	5.0	5.1	5.0	5.0	4.9	5.5	3.9
729	7.3	5.0	5.1	4.9	5.0	5.3	5.1	5.0	4.9	5.7	4.0
729	6.8	5.0	5.1	4.9	5.0	5.3	5.1	5.0	4.9	5.7	4.0
729	5.0	5.0	5.1	4.9	5.0	5.3	5.1	5.0	4.9	5.7	4.0
752	5.5	5.0	5.2	4.9	5.0	5.3	5.1	5.0	4.9	5.8	4.1
752	5.2	5.0	5.2	4.9	5.0	5.3	5.1	5.0	4.9	5.8	4.1
752	5.7	5.0	5.2	4.9	5.0	5.3	5.1	5.0	4.9	5.8	4.1
964	3.6	5.2	5.5	5.1	5.2	5.8	5.4	5.0	4.8	6.1	4.5
964	4.2	5.2	5.5	5.1	5.2	5.8	5.4	5.0	4.8	6.1	4.5
964	4.7	5.2	5.5	5.1	5.2	5.8	5.4	5.0	4.8	6.1	4.5
988	4.2	5.2	5.5	5.1	5.2	5.8	5.4	5.0	4.8	6.2	4.6
988	8.6	5.2	5.5	5.1	5.2	5.8	5.4	5.0	4.8	6.2	4.6
988	7.4	5.2	5.5	5.1	5.2	5.8	5.4	5.0	4.8	6.2	4.6
1039	5.5	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1039	4.6	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7

Table 3. Results of Regression Analysis for Flatter Slopes (< 3.5%)

Peak Discharge (cfs)	Original Average Sediment Bulking Factors	Calculated Average Sediment Bulking Factors									
		Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7	Equation 8	Equation 9	Equation 10
1047	5.6	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1047	4.2	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1050	4.0	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1050	4.1	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1050	3.9	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1050	4.9	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1050	4.9	5.3	5.6	5.2	5.2	5.9	5.5	5.0	4.8	6.2	4.7
1961	6.9	6.2	6.5	6.6	6.4	6.9	6.7	5.1	4.6	6.8	7.3
1961	5.7	6.2	6.5	6.6	6.4	6.9	6.7	5.1	4.6	6.8	7.3
1976	4.8	6.2	6.5	6.6	6.4	6.9	6.7	5.1	4.6	6.8	7.3
1976	7.4	6.2	6.5	6.6	6.4	6.9	6.7	5.1	4.6	6.8	7.3
1981	5.3	6.3	6.5	6.6	6.4	7.0	6.7	5.1	4.6	6.8	7.4
1981	4.9	6.3	6.5	6.6	6.4	7.0	6.7	5.1	4.6	6.8	7.4
1981	5.4	6.3	6.5	6.6	6.4	7.0	6.7	5.1	4.6	6.8	7.4
1981	4.6	6.3	6.5	6.6	6.4	7.0	6.7	5.1	4.6	6.8	7.4
1981	5.5	6.3	6.5	6.6	6.4	7.0	6.7	5.1	4.6	6.8	7.4
2008	5.8	6.3	6.5	6.7	6.4	7.0	6.7	5.1	4.6	6.8	7.5
2008	5.1	6.3	6.5	6.7	6.4	7.0	6.7	5.1	4.6	6.8	7.5
2057	6.2	6.3	6.6	6.7	6.5	7.0	6.8	5.1	4.6	6.8	7.6
2057	11.7	6.3	6.6	6.7	6.5	7.0	6.8	5.1	4.6	6.8	7.6
2057	7.0	6.3	6.6	6.7	6.5	7.0	6.8	5.1	4.6	6.8	7.6
2099	8.5	6.4	6.6	6.8	6.6	7.0	6.9	5.1	4.6	6.8	7.8
2099	6.9	6.4	6.6	6.8	6.6	7.0	6.9	5.1	4.6	6.8	7.8
3788	8.1	8.7	7.6	9.2	9.4	8.0	9.1	5.2	4.2	7.1	17.7
3788	6.6	8.7	7.6	9.2	9.4	8.0	9.1	5.2	4.2	7.1	17.7
3882	8.1	8.8	7.6	9.3	9.6	8.1	9.2	5.2	4.2	7.1	18.5
3882	7.8	8.8	7.6	9.3	9.6	8.1	9.2	5.2	4.2	7.1	18.5
3882	18.4	8.8	7.6	9.3	9.6	8.1	9.2	5.2	4.2	7.1	18.5
3961	7.8	8.9	7.7	9.4	9.7	8.1	9.3	5.2	4.2	7.1	19.2
3961	10.4	8.9	7.7	9.4	9.7	8.1	9.3	5.2	4.2	7.1	19.2

Table 4. Results of Regression Analysis for Steeper Slopes (> 3.5%)

Peak Discharge (cfs)	Original Average Sediment Bulking Factors	Calculated Average Sediment Bulking Factors									
		Equation 1	Equation 2	Equation 3	Equation 4	Equation 5	Equation 6	Equation 7	Equation 8	Equation 9	Equation 10
399	5.5	4.0	3.0	4.0	3.4	1.9	3.7	3.8	3.6	0.9	2.8
485	3.4	4.1	3.4	4.0	3.6	2.8	4.0	4.0	4.4	2.8	2.9
498	3.2	4.2	3.5	4.0	3.7	2.9	4.0	4.1	4.5	3.0	3.0
540	1.9	4.2	3.7	4.1	3.8	3.3	4.1	4.2	4.9	3.7	3.0
752	6.2	4.6	4.5	4.5	4.4	4.8	4.8	4.8	6.8	5.9	3.5
988	8.6	5.0	5.4	5.3	5.1	6.1	5.5	5.4	8.9	7.3	4.1
1039	5.9	5.1	5.5	5.4	5.2	6.3	5.6	5.6	9.4	7.5	4.2
1045	4.2	5.1	5.5	5.5	5.2	6.4	5.6	5.6	9.4	7.5	4.2
1046	3.9	5.1	5.5	5.5	5.2	6.4	5.6	5.6	9.4	7.5	4.2
1050	8.0	5.1	5.6	5.5	5.3	6.4	5.6	5.6	9.5	7.6	4.2
1213	2.8	5.4	6.1	6.0	5.7	7.1	6.1	6.1	10.9	8.1	4.7
1900	9.7	7.0	8.1	8.3	7.7	9.1	8.2	8.0	17.0	9.4	7.2
1900	7.1	7.0	8.1	8.3	7.7	9.1	8.2	8.0	17.0	9.4	7.2
1900	12.3	7.0	8.1	8.3	7.7	9.1	8.2	8.0	17.0	9.4	7.2
1961	7.6	7.2	8.2	8.5	7.9	9.3	8.3	8.2	17.6	9.5	7.5
1981	9.4	7.3	8.3	8.6	8.0	9.3	8.4	8.3	17.8	9.5	7.6
1997	6.6	7.3	8.3	8.7	8.0	9.4	8.4	8.3	17.9	9.5	7.7
1997	7.2	7.3	8.3	8.7	8.0	9.4	8.4	8.3	17.9	9.5	7.7
3584	15.0	13.3	12.0	13.1	12.6	12.1	13.1	12.8	32.1	10.4	21.2
3584	10.8	13.3	12.0	13.1	12.6	12.1	13.1	12.8	32.1	10.4	21.2
3767	10.8	14.2	12.4	13.5	13.2	12.3	13.7	13.3	33.7	10.5	23.8
3767	9.2	14.2	12.4	13.5	13.2	12.3	13.7	13.3	33.7	10.5	23.8
3884	21.1	14.9	12.6	13.8	13.5	12.4	14.0	13.7	34.7	10.5	25.7

For steeper slopes, Equations 7, 8 and 9 were eliminated for the same reasons as those identified for flatter slopes. Equations 3 and 4 were eliminated considering the behavior of these equations under flatter slopes criteria. Equations 2, 5 and 10 were eliminated considering the low correlation coefficients. Equations 1 and 6 gave reasonable results and have nearly identical correlation coefficients. For the purpose of simplicity and consistency with the equation for flatter slopes, the linear equation (Equation. 6) was selected as the sediment bulking factor equation for the slopes greater than or equal to 3.5%.

The two selected equations were:

$$SB = 4.13 + (0.0013 \times Q) \text{ for flatter slopes } (< 3.5\%)$$
$$SB = 2.55 + (0.00295 \times Q) \text{ for steeper slopes } (\geq 3.5\%)$$

However, the predicted sediment bulking factors for flatter slopes are greater than those for steeper slopes at low discharges. This did not seem to be reasonable.

For this reason, it was decided to combine all the data points into one data set and ignore the effects of slope. Also, instead of performing the regression analysis on all ten equations, it was decided to perform only linear regression analysis. The correlation coefficient for this new equation was 0.43. This equation is:

$$SB = 3.622 + (0.001875 \text{ X } Q)$$

where SB = Average sediment bulking factor (in percent)
Q = Discharge (in cfs)

Figure 1 shows the above equation (solid line) with original data points. Table 5 documents the original sediment bulking factors along with the computed sediment bulking factor using the above equation. For the purpose of simplicity, Table 6 is created to show the predicted sediment bulking factors (rounded off to nearest integer) for the corresponding range of peak discharge values.

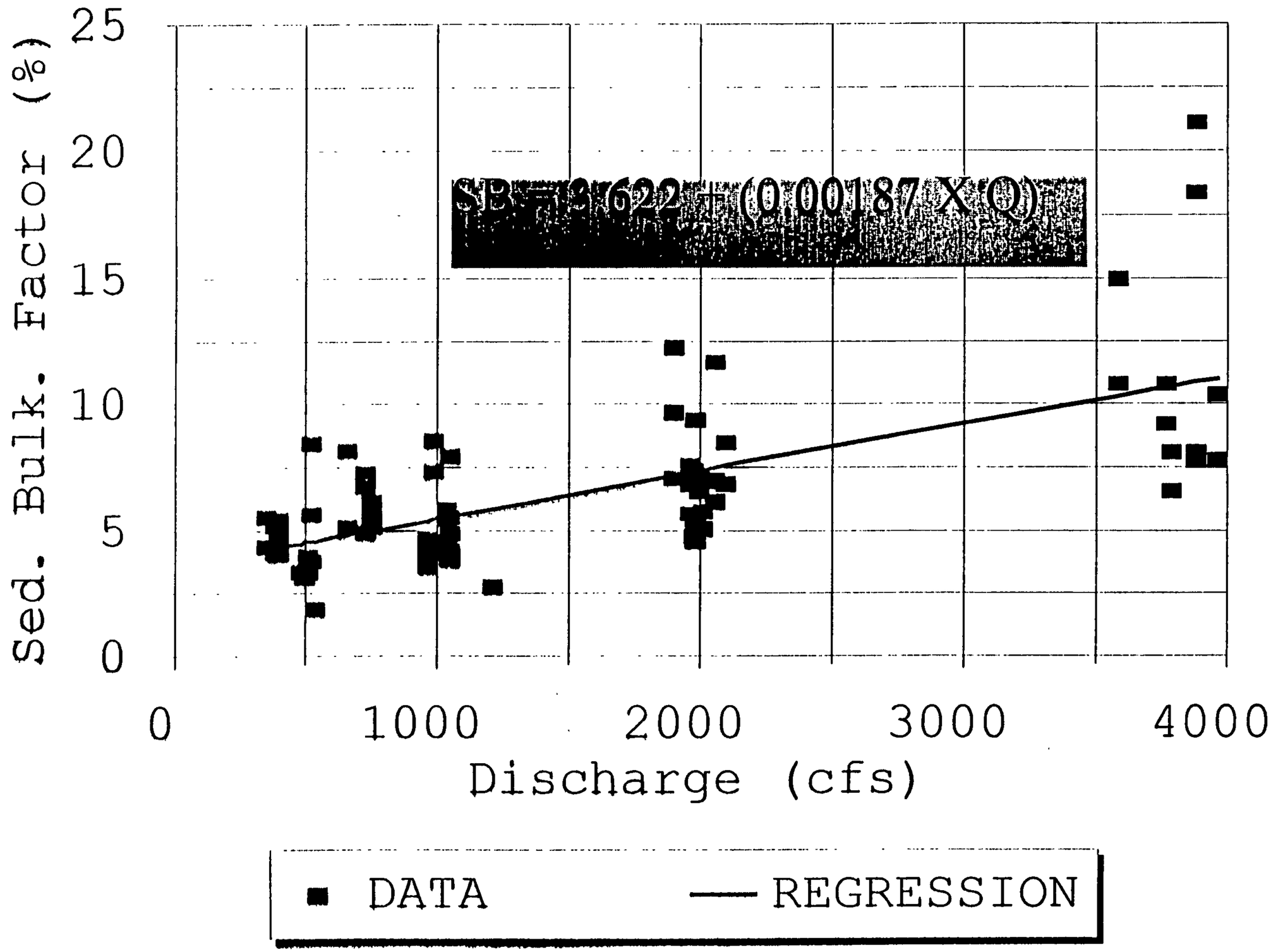


Figure 1. Discharge vs. Average Sediment Bulking Factors From Final Regression Equation

Table 5. Results of Final Prediction Equation for Sediment Bulking Factors		
Peak Discharge (cfs)	Original Average Sediment Bulking Factors	Calculated Average Sediment Bulking Factors*
350	5.6	4.3
350	4.4	4.3
386	5.2	4.3
386	4.2	4.3
386	5.4	4.3
399	4.1	4.4
399	5.5	4.4
399	5.0	4.4
399	4.4	4.4
485	3.4	4.5
498	3.2	4.6
511	3.9	4.6
511	4.0	4.6
511	3.4	4.6
524	5.7	4.6
524	3.8	4.6
524	8.5	4.6
540	1.9	4.6
661	5.2	4.9
661	8.2	4.9
729	5.0	5.0
729	7.3	5.0
729	6.8	5.0
752	6.2	5.0
752	5.2	5.0
752	5.7	5.0
752	5.5	5.0
964	3.6	5.4
964	4.2	5.4
964	4.7	5.4
988	8.6	5.5
988	4.2	5.5
988	8.6	5.5
988	7.4	5.5
1039	5.9	5.6
1039	5.5	5.6
1039	4.6	5.6
1045	4.2	5.6
1046	3.9	5.6
1047	4.2	5.6
1047	5.6	5.6
1050	3.9	5.6

Table 5. Results of Final Prediction Equation for Sediment Bulking Factors

Peak Discharge (cfs)	Original Average Sediment Bulking Factors	Calculated Average Sediment Bulking Factors*
1050	8.0	5.6
1050	4.9	5.6
1050	4.9	5.6
1050	4.1	5.6
1050	4.0	5.6
1213	2.8	5.9
1900	12.3	7.2
1900	7.1	7.2
1900	9.7	7.2
1961	5.7	7.3
1961	6.9	7.3
1961	7.6	7.3
1976	4.8	7.3
1976	7.4	7.3
1981	9.4	7.3
1981	5.4	7.3
1981	4.6	7.3
1981	5.5	7.3
1981	4.9	7.3
1981	5.3	7.3
1997	7.2	7.4
1997	6.6	7.4
2008	5.1	7.4
2008	5.8	7.4
2057	6.2	7.5
2057	11.7	7.5
2057	7.0	7.5
2099	6.9	7.6
2099	8.5	7.6
3584	10.8	10.3
3584	15.0	10.3
3767	10.8	10.7
3767	9.2	10.7
3788	8.1	10.7
3788	6.6	10.7
3882	18.4	10.9
3882	7.8	10.9
3882	8.1	10.9
3884	21.1	10.9
3961	7.8	11
3961	10.4	11

* Calculated using $SB = 3.622 + (0.001875 \times Q)$

Table 6. Predicted Average Sediment Bulking Factors For a Given Discharge in North Albuquerque Acres Area, East of I-25

Unbulked Peak Discharge (cfs)	Average Sediment Bulking Factor* (%)
0 - 500	4
501 - 1000	5
1001 - 1600	6
1601 - 2100	7
2101 - 2600	8
2601 - 3200	9
3201 - 3700	10
3701 - 4200	11

*Rounded off to nearest integer.

7. CONCLUSION

The average sediment bulking factors were calculated for La Cueva, El Camino and North Camino arroyos using the methods presented in AMAFCA's "Sediment and Erosion Design Guide." A regression analysis was performed on these sediment bulking factors to obtain a correlation between the sediment bulking factors and peak discharge values irrespective of the slopes in corresponding watersheds. This analysis resulted in a linear equation

This prediction equation can be used to estimate the sediment bulking factor to be applied to clean water discharge rates in other natural arroyos with a similar geomorphology, soil characteristics and slopes in far northeast Albuquerque where approximate methods can be utilized. It should not be used where a higher degree of accuracy is required for sediment and erosion studies, such as for aggradation/degradation determination, prudent line analysis, scour at major hydraulic structures, etc. The relatively low correlation coefficient ($r^2 = .43$) indicates that there are clearly other factors which need to be considered besides clear water flow rates where the highest degree of accuracy is desired.

APPENDIX B

EXISTING CONDITION
CURRENT DEVELOPMENT SUMMARY FILES
100-YR AND 10-YR

NO. CAMINO -100YR - CUR. DEV

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/05/1996

INPUT FILE = nc100b.ext USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	3.990
COMPUTE NM HYD	300.00	-	1	.88400	1001.07	68.141	1.44530	1.800	1.769	PER IMP=	.00
ROUTE MCUNGE	300.80	1	2	.88400	976.60	67.873	1.43962	2.050	1.726	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.590
COMPUTE NM HYD	301.00	-	1	.85200	862.46	54.493	1.19922	1.800	1.582	PER IMP=	.00
ADD HYD	301.90	1& 2	11	1.73600	1605.38	122.366	1.32164	1.950	1.445		
*S NORTH EL CAMINO ARROYO AT TRAMWAY ROAD (301.90)											
ROUTE MCUNGE	301.82	11	2	1.73600	1587.76	122.145	1.31925	2.100	1.429	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.340
COMPUTE NM HYD	302.00	-	1	.15760	250.67	7.701	.91624	1.500	2.485	PER IMP=	5.00
ADD HYD	302.90	1& 2	5	1.89360	1608.31	129.846	1.28570	2.100	1.327		
ROUTE MCUNGE	302.81	5	1	1.89360	1604.35	129.690	1.28417	2.107	1.324	CCODE =	.2
ROUTE MCUNGE	302.82	1	2	1.89360	1583.35	129.725	1.28451	2.250	1.307	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.220
COMPUTE NM HYD	303.00	-	1	.17060	288.51	10.990	1.20788	1.550	2.642	PER IMP=	15.00
ADD HYD	303.90	1& 2	5	2.06420	1604.95	140.715	1.27818	2.250	1.215		
*S NORTH EL CAMINO ARROYO AT HOLBROOK (303.90)											
ROUTE MCUNGE	303.80	5	2	2.06420	1604.39	140.662	1.27770	2.300	1.214	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	3.130
COMPUTE NM HYD	305.10	-	1	.16910	237.45	10.106	1.12056	1.550	2.194	PER IMP=	15.00
ADD HYD	305.19	1& 2	5	2.23330	1625.07	150.768	1.26580	2.300	1.137		
*S NORTH EL CAMINO ARROYO AT VENTURA (305.19)											
ROUTE MCUNGE	305.18	5	2	2.23330	1622.13	150.810	1.26615	2.350	1.135	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	3.070
COMPUTE NM HYD	305.20	-	1	.15290	146.57	6.756	.82850	1.600	1.498	PER IMP=	5.00
ADD HYD	305.29	1& 2	5	2.38620	1638.02	157.566	1.23810	2.300	1.073		
*S NORTH EL CAMINO ARROYO AT BARSTOW (305.29)											
ROUTE MCUNGE	305.28	5	2	2.38620	1624.82	157.418	1.23694	2.450	1.064	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.960
COMPUTE NM HYD	312.00	-	1	.06600	70.11	2.761	.78428	1.550	1.660	PER IMP=	5.00
ADD HYD	312.90	1& 2	5	2.45220	1629.17	160.179	1.22476	2.450	1.038		
*S NORTH EL CAMINO ARROYO AT WYOMING (312.90)											
ROUTE MCUNGE	312.80	5	2	2.45220	1617.14	159.972	1.22317	2.550	1.030	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.870
COMPUTE NM HYD	313.00	-	1	.20920	266.92	10.599	.94995	1.550	1.994	PER IMP=	15.00
ADD HYD	313.90	1& 2	7	2.66140	1629.15	170.571	1.20170	2.550	.956		
RAINFALL TYPE= 2										RAIN24=	3.160
COMPUTE NM HYD	304.00	-	1	.08400	138.67	4.992	1.11436	1.500	2.579	PER IMP=	15.00
ROUTE MCUNGE	304.80	1	2	.08400	127.81	4.955	1.10611	1.700	2.377	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.030
COMPUTE NM HYD	307.00	-	1	.06630	98.65	3.196	.90371	1.500	2.325	PER IMP=	8.00
ADD HYD	307.90	1& 2	5	.15030	174.12	8.151	1.01683	1.700	1.810		
*S NORTH CAMINO ARROYO (TRIB) AT BARSTOW (307.90)											
ROUTE MCUNGE	307.81	5	1	.15030	164.37	8.121	1.01304	1.850	1.709	CCODE =	.1
ROUTE MCUNGE	307.82	1	2	.15030	158.65	8.051	1.00441	1.950	1.649	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.950
COMPUTE NM HYD	310.00	-	1	.10330	100.32	4.361	.79158	1.600	1.517	PER IMP=	5.00
ADD HYD	310.90	1& 2	6	.25360	191.03	12.412	.91771	1.950	1.177		

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
RAINFALL TYPE= 2										RAIN24= 3.080
COMPUTE NM HYD	306.00	-	1	.10510	193.49	6.528	1.16463	1.500	2.877	PER IMP= 15.00
ROUTE MCUNGE	306.80	1	2	.10510	175.36	6.480	1.15606	1.700	2.607	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.980
COMPUTE NM HYD	308.00	-	1	.05350	72.95	2.296	.80462	1.500	2.131	PER IMP= 5.00
ADD HYD	308.90	1& 2	5	.15860	209.86	8.776	1.03751	1.700	2.067	
RAINFALL TYPE= 2										RAIN24= 2.990
COMPUTE NM HYD	309.00	-	1	.07960	96.16	3.439	.80999	1.550	1.888	PER IMP= 5.00
ADD HYD	309.90	1& 5	5	.23820	278.03	12.215	.96148	1.650	1.824	
ROUTE MCUNGE	309.80	5	2	.23820	261.19	12.109	.95318	1.850	1.713	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.950
COMPUTE NM HYD	311.00	-	1	.15280	147.74	6.278	.77037	1.600	1.511	PER IMP= 5.00
ADD HYD	311.90	1& 2	5	.39100	335.66	18.387	.88174	1.800	1.341	
ADD HYD	311.99	5& 6	5	.64460	501.68	30.799	.89589	1.850	1.216	
*S NORTH CAMINO ARROYO (TRIB) AT CORONADO RUNWAY (311.99)										
ROUTE MCUNGE	311.81	5	1	.64460	496.75	30.745	.89430	1.900	1.204	CCODE = .1
ROUTE MCUNGE	311.82	1	2	.64460	494.22	30.142	.87677	1.913	1.198	CCODE = .2
*S NORTH EL CAMINO ARROYO AT I-25 (AP 313.99)										
ADD HYD	313.99	2& 7	5	3.30600	1725.31	199.649	1.13231	2.520	.815	
ROUTE MCUNGE	313.88	5	2	3.30600	1710.28	199.463	1.13126	2.600	.808	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	314.00	-	1	.09600	125.48	3.960	.77351	1.500	2.042	PER IMP= 8.00
ADD HYD	314.99	1& 2	5	3.40200	1713.33	203.423	1.12116	2.600	.787	
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	315.00	-	1	.04260	50.88	1.578	.69449	1.500	1.866	PER IMP= 5.00
ADD HYD	315.99	1& 5	5	3.44460	1714.65	205.001	1.11588	2.600	.778	
RECALL HYD	206.39	-	19	.25890	415.02	16.003	1.15898	1.500	2.505	
ADD HYD	206.99	5&19	5	3.70350	1726.61	221.004	1.11890	2.600	.728	
ROUTE MCUNGE	206.88	5	2	3.70350	1725.43	221.017	1.11896	2.650	.728	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	401.00	-	1	.05560	114.46	3.498	1.17962	1.500	3.217	PER IMP= .00
ADD HYD	401.90	1& 2	5	3.75910	1726.99	224.515	1.11986	2.650	.718	
RAINFALL TYPE= 2										RAIN24= 2.730
COMPUTE NM HYD	402.00	-	1	.29180	557.26	20.367	1.30869	1.550	2.984	PER IMP= 10.00
ADD HYD	402.90	1& 5	6	4.05090	1741.11	244.882	1.13346	2.650	.672	
*S FLOW TO N. DIVERSION CHANNEL FROM NORTH EL CAMINO ARROYO										
FINISH										

No. Camino - 10-yr - Cur Dev.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =08/30/1996
INPUT FILE = nc10b.ext USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.660
COMPUTE NM HYD	300.00	-	1	.88400	509.61	34.987	.74209	1.800	.901	PER IMP=	.00
ROUTE MCUNGE	300.80	1	2	.88400	491.66	34.807	.73826	2.150	.869	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.390
COMPUTE NM HYD	301.00	-	1	.85200	374.23	24.387	.53669	1.800	.686	PER IMP=	.00
ADD HYD	301.90	1& 2	11	1.73600	719.02	59.194	.63933	2.050	.647		
*S NORTH EL CAMINO ARROYO AT TRAMWAY ROAD (301.90)											
ROUTE MCUNGE	301.82	11	2	1.73600	710.39	59.155	.63892	2.200	.639	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.230
COMPUTE NM HYD	302.00	-	1	.15760	98.52	3.014	.35859	1.500	.977	PER IMP=	5.00
ADD HYD	302.90	1& 2	5	1.89360	716.62	62.169	.61559	2.200	.591		
ROUTE MCUNGE	302.81	5	1	1.89360	715.07	62.083	.61473	2.207	.590	CCODE =	.2
ROUTE MCUNGE	302.82	1	2	1.89360	714.79	62.328	.61716	2.350	.590	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.150
COMPUTE NM HYD	303.00	-	1	.17060	138.60	5.250	.57705	1.550	1.269	PER IMP=	15.00
ADD HYD	303.90	1& 2	5	2.06420	725.37	67.579	.61385	2.250	.549		
*S NORTH EL CAMINO ARROYO AT HOLBROOK (303.90)											
ROUTE MCUNGE	303.80	5	2	2.06420	718.36	67.496	.61309	2.400	.544	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.090
COMPUTE NM HYD	305.10	-	1	.16910	106.64	4.665	.51729	1.550	.985	PER IMP=	15.00
ADD HYD	305.19	1& 2	5	2.23330	725.99	72.161	.60584	2.400	.508		
*S NORTH EL CAMINO ARROYO AT VENTURA (305.19)											
ROUTE MCUNGE	305.18	5	2	2.23330	719.49	72.114	.60544	2.500	.503	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.050
COMPUTE NM HYD	305.20	-	1	.15290	52.98	2.543	.31188	1.600	.541	PER IMP=	5.00
ADD HYD	305.29	1& 2	5	2.38620	723.74	74.657	.58663	2.500	.474		
*S NORTH EL CAMINO ARROYO AT BARSTOW (305.29)											
ROUTE MCUNGE	305.28	5	2	2.38620	715.20	74.558	.58585	2.650	.468	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.970
COMPUTE NM HYD	312.00	-	1	.06600	24.85	.995	.28279	1.550	.588	PER IMP=	5.00
ADD HYD	312.90	1& 2	5	2.45220	716.31	75.554	.57770	2.650	.456		
*S NORTH EL CAMINO ARROYO AT WYOMING (312.90)											
ROUTE MCUNGE	312.80	5	2	2.45220	715.53	75.502	.57731	2.750	.456	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	1.910
COMPUTE NM HYD	313.00	-	1	.20920	107.68	4.628	.41481	1.550	.804	PER IMP=	15.00
ADD HYD	313.90	1& 2	7	2.66140	719.04	80.130	.56453	2.750	.422		
RAINFALL TYPE= 2										RAIN24=	2.110
COMPUTE NM HYD	304.00	-	1	.08400	63.70	2.306	.51474	1.500	1.185	PER IMP=	15.00
ROUTE MCUNGE	304.80	1	2	.08400	56.24	2.224	.49647	1.800	1.046	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.020
COMPUTE NM HYD	307.00	-	1	.06630	40.21	1.296	.36660	1.500	.948	PER IMP=	8.00
ADD HYD	307.90	1& 2	5	.15030	67.19	3.520	.43918	1.800	.699		
*S NORTH CAMINO ARROYO (TRIB) AT BARSTOW (307.90)											
ROUTE MCUNGE	307.81	5	1	.15030	61.42	3.451	.43053	2.050	.638	CCODE =	.1
ROUTE MCUNGE	307.82	1	2	.15030	58.30	3.431	.42799	2.200	.606	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.970
COMPUTE NM HYD	310.00	-	1	.10330	35.86	1.609	.29205	1.600	.542	PER IMP=	5.00
ADD HYD	310.90	1& 2	6	.25360	63.51	5.040	.37261	2.200	.391		

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
RAINFALL TYPE= 2										RAIN24= 2.050
COMPUTE NM HYD	306.00	-	1	.10510	93.29	3.072	.54801	1.500	1.387	PER IMP= 15.00
ROUTE MCUNGE	306.80	1	2	.10510	79.75	2.971	.52998	1.800	1.186	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.990
COMPUTE NM HYD	308.00	-	1	.05350	27.40	.856	.29998	1.500	.800	PER IMP= 5.00
ADD HYD	308.90	1& 2	5	.15860	87.71	3.827	.45239	1.750	.864	
RAINFALL TYPE= 2										RAIN24= 1.990
COMPUTE NM HYD	309.00	-	1	.07960	35.55	1.276	.30060	1.550	.698	PER IMP= 5.00
ADD HYD	309.90	1& 5	5	.23820	104.30	5.103	.40166	1.750	.684	
ROUTE MCUNGE	309.80	5	2	.23820	92.92	5.033	.39618	2.050	.610	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.970
COMPUTE NM HYD	311.00	-	1	.15280	50.41	2.264	.27775	1.600	.515	PER IMP= 5.00
ADD HYD	311.90	1& 2	5	.39100	105.56	7.297	.34990	2.050	.422	
ADD HYD	311.99	5& 6	5	.64460	156.12	12.336	.35884	2.050	.378	
*S NORTH CAMINO ARROYO (TRIB) AT CORONADO RUNWAY (311.99)										
ROUTE MCUNGE	311.81	5	1	.64460	153.93	12.295	.35763	2.150	.373	CCODE = .1
ROUTE MCUNGE	311.82	1	2	.64460	153.74	12.137	.35305	2.176	.373	CCODE = .2
*S NORTH EL CAMINO ARROYO AT I-25 (AP 313.99)										
ADD HYD	313.99	2& 7	5	3.30600	767.73	91.988	.52171	2.712	.363	
ROUTE MCUNGE	313.88	5	2	3.30600	767.00	92.027	.52193	2.750	.363	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 1.890
COMPUTE NM HYD	314.00	-	1	.09600	44.42	1.482	.28950	1.500	.723	PER IMP= 8.00
ADD HYD	314.99	1& 2	5	3.40200	767.81	93.509	.51537	2.750	.353	
RAINFALL TYPE= 2										RAIN24= 1.890
COMPUTE NM HYD	315.00	-	1	.04260	16.59	.536	.23596	1.500	.609	PER IMP= 5.00
ADD HYD	315.99	1& 5	5	3.44460	768.14	94.045	.51192	2.750	.348	
RECALL HYD	206.39	-	19	.25890	196.30	7.942	.57519	1.500	1.185	
ADD HYD	206.99	5&19	5	3.70350	772.07	101.988	.51634	2.750	.326	
ROUTE MCUNGE	206.88	5	2	3.70350	765.39	101.972	.51626	2.900	.323	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.840
COMPUTE NM HYD	401.00	-	1	.05560	63.78	1.623	.54738	1.500	1.792	PER IMP= .00
ADD HYD	401.90	1& 2	5	3.75910	765.66	103.595	.51672	2.900	.318	
RAINFALL TYPE= 2										RAIN24= 1.820
COMPUTE NM HYD	402.00	-	1	.29180	288.97	10.105	.64929	1.550	1.547	PER IMP= 10.00
ADD HYD	402.90	1& 5	6	4.05090	770.06	113.700	.52627	2.900	.297	
*S FLOW TO N. DIVERSION CHANNEL FROM NORTH EL CAMINO ARROYO										
FINISH										

EL CAMINO - 100YR - CUR. DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/05/1996

INPUT FILE = EC100B.EXT USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	3.370
COMPUTE NM HYD	201.00	-	1	.13390	207.70	6.497	.90979	1.500	2.424	PER IMP=	5.00
RAINFALL TYPE= 2										RAIN24=	3.500
COMPUTE NM HYD	200.00	-	3	.30300	487.60	15.384	.95201	1.550	2.514	PER IMP=	.00
*S EL CAMINO ARROYO AT TRAMWAY BLVD (200.0)											
ROUTE MCUNGE	200.80	3	4	.30300	453.59	15.176	.93914	1.700	2.339	CCODE =	.1
ADD HYD	201.90	4& 1	5	.43690	559.37	21.674	.93014	1.650	2.000		
*S EL CAMINO ARROYO (MAIN) AT BROWNING (201.9)											
ROUTE MCUNGE	201.80	5	2	.43690	534.38	21.592	.92664	1.800	1.911	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.250
COMPUTE NM HYD	202.10	-	1	.10310	164.12	5.334	.97014	1.500	2.487	PER IMP=	8.00
ADD HYD	202.19	1& 2	5	.54000	589.48	26.926	.93495	1.750	1.706		
*S EL CAMINO ARROYO (MAIN) AT EUBANK (202.19)											
ROUTE MCUNGE	202.18	5	2	.54000	565.85	26.878	.93327	1.850	1.637	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.190
COMPUTE NM HYD	202.20	-	1	.10990	180.49	6.162	1.05124	1.500	2.566	PER IMP=	10.00
ADD HYD	202.29	1& 2	5	.64990	607.66	33.040	.95322	1.850	1.461		
*S EL CAMINO ARROYO (MAIN) AT HOLBROOK (202.29)											
ROUTE MCUNGE	202.28	5	2	.64990	588.10	33.013	.95244	1.950	1.414	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.070
COMPUTE NM HYD	202.30	-	1	.06840	118.36	4.064	1.11411	1.500	2.704	PER IMP=	15.00
ADD HYD	202.39	1& 2	6	.71830	607.11	37.077	.96783	1.950	1.321		
*S EL CAMINO ARROYO (MAIN) AT VENTURA (202.39)											
RAINFALL TYPE= 2										RAIN24=	3.140
COMPUTE NM HYD	203.10	-	1	.12580	192.92	6.547	.97587	1.500	2.396	PER IMP=	10.00
*S EL CAMINO ARROYO (TRIBUTARY) AT HOLBROOK (203.1)											
ROUTE MCUNGE	203.18	1	2	.12580	176.32	6.466	.96366	1.700	2.190	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.070
COMPUTE NM HYD	203.20	-	1	.04850	74.17	2.466	.95343	1.500	2.389	PER IMP=	10.00
ADD HYD	203.29	1& 2	5	.17430	211.27	8.932	.96081	1.700	1.894		
ADD HYD	202.90	5& 6	5	.89260	685.83	46.009	.96646	1.950	1.201		
ROUTE MCUNGE	202.80	5	2	.89260	680.66	45.950	.96522	1.990	1.192	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	3.020
COMPUTE NM HYD	203.30	-	1	.05580	83.29	2.757	.92642	1.500	2.332	PER IMP=	10.00
ADD HYD	203.39	1& 2	5	.94840	691.83	48.707	.96294	1.990	1.140		
*S EL CAMINO ARROYO (MAIN) AT BARSTOW (203.39)											
ROUTE MCUNGE	203.98	5	2	.94840	689.37	48.718	.96315	2.050	1.136	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.960
COMPUTE NM HYD	204.00	-	1	.21190	235.18	10.122	.89562	1.600	1.734	PER IMP=	10.00
ADD HYD	204.90	1& 2	5	1.16030	752.02	58.839	.95082	1.800	1.013		
*S EL CAMINO ARROYO AT WYOMING (204.9)											
ROUTE MCUNGE	204.80	5	2	1.16030	737.66	58.784	.94992	1.900	.993	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.890
COMPUTE NM HYD	204.20	-	1	.13330	185.49	6.169	.86774	1.500	2.174	PER IMP=	10.00
ADD HYD	204.29	1& 2	5	1.29360	770.82	64.953	.94145	1.900	.931		
RAINFALL TYPE= 2										RAIN24=	2.910
COMPUTE NM HYD	204.10	-	1	.14840	181.03	7.086	.89528	1.550	1.906	PER IMP=	10.00
ROUTE MCUNGE	204.18	1	2	.14840	177.98	7.092	.89603	1.599	1.874	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
ADD HYD	204.19	2& 5	5	1.44200	832.88	72.022	.93648	1.899	.902	
*S EL CAMINO ARROYO AT CORONADO AIRPORT (204.29)										
ROUTE MCUNGE	204.28	5	2	1.44200	831.34	70.867	.92147	1.901	.901	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.850
COMPUTE NM HYD	205.00	-	1	.04590	123.43	5.191	2.12030	1.500	4.202	PER IMP= 70.00
ADD HYD	205.90	1& 2	5	1.48790	864.92	75.765	.95476	1.901	.908	
*S EL CAMINO ARROYO AT I-25 (205.90)										
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.10	-	1	.12210	154.08	5.425	.83315	1.550	1.972	PER IMP= 10.00
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.20	-	2	.05610	76.53	2.493	.83315	1.500	2.132	PER IMP= 10.00
ADD HYD	206.29	1& 2	5	.17820	228.80	7.918	.83315	1.500	2.006	
ROUTE	206.28	5	3	.17820	232.98	7.918	.83315	1.550	2.043	
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	206.40	-	1	.03270	59.24	2.164	1.24111	1.500	2.831	PER IMP= 30.00
ROUTE	206.48	1	2	.03270	58.63	2.165	1.24112	1.500	2.802	
ADD HYD	206.49	2& 3	5	.21090	289.80	10.083	.89640	1.550	2.147	
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	206.30	-	1	.04800	138.49	5.921	2.31273	1.500	4.508	PER IMP= 86.00
ADD HYD	206.39	1& 5	6	.25890	415.02	16.003	1.15899	1.500	2.505	
FINISH										

El Camino -10 YR - Cur. Dev.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =08/30/1996
INPUT FILE = ec10b.ext USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.250
COMPUTE NM HYD	201.00	-	1	.13390	81.06	2.525	.35355	1.500	.946	PER IMP=	5.00
RAINFALL TYPE= 2										RAIN24=	2.330
COMPUTE NM HYD	200.00	-	3	.30300	197.06	5.927	.36680	1.550	1.016	PER IMP=	.00
*S EL CAMINO ARROYO AT TRAMWAY BLVD (200.0)											
ROUTE MCUNGE	200.80	3	4	.30300	174.00	5.666	.35063	1.750	.897	CCODE =	.1
ADD HYD	201.90	4& 1	5	.43690	201.09	8.191	.35152	1.750	.719		
*S EL CAMINO ARROYO (MAIN) AT BROWNING (201.9)											
ROUTE MCUNGE	201.80	5	2	.43690	186.22	8.142	.34941	1.950	.666	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.170
COMPUTE NM HYD	202.10	-	1	.10310	68.80	2.226	.40486	1.500	1.043	PER IMP=	8.00
ADD HYD	202.19	1& 2	5	.54000	196.34	10.368	.36000	1.950	.568		
*S EL CAMINO ARROYO (MAIN) AT EUBANK (202.19)											
ROUTE MCUNGE	202.18	5	2	.54000	194.42	10.406	.36132	2.000	.563	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.130
COMPUTE NM HYD	202.20	-	1	.10990	79.79	2.692	.45922	1.500	1.134	PER IMP=	10.00
ADD HYD	202.29	1& 2	5	.64990	205.88	13.098	.37788	2.000	.495		
*S EL CAMINO ARROYO (MAIN) AT HOLBROOK (202.29)											
ROUTE MCUNGE	202.28	5	2	.64990	193.86	13.046	.37639	2.200	.466	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.050
COMPUTE NM HYD	202.30	-	1	.06840	55.75	1.887	.51719	1.500	1.274	PER IMP=	15.00
ADD HYD	202.39	1& 2	6	.71830	197.66	14.933	.38980	2.200	.430		
*S EL CAMINO ARROYO (MAIN) AT VENTURA (202.39)											
RAINFALL TYPE= 2										RAIN24=	2.090
COMPUTE NM HYD	203.10	-	1	.12580	81.09	2.799	.41718	1.500	1.007	PER IMP=	10.00
*S EL CAMINO ARROYO (TRIBUTARY) AT HOLBROOK (203.1)											
ROUTE MCUNGE	203.18	1	2	.12580	71.96	2.717	.40496	1.750	.894	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.050
COMPUTE NM HYD	203.20	-	1	.04850	31.32	1.043	.40304	1.500	1.009	PER IMP=	10.00
ADD HYD	203.29	1& 2	5	.17430	82.94	3.759	.40442	1.750	.744		
ADD HYD	202.90	5& 6	5	.89260	216.21	18.692	.39265	2.200	.378		
ROUTE MCUNGE	202.80	5	2	.89260	213.98	18.682	.39243	2.250	.375	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.010
COMPUTE NM HYD	203.30	-	1	.05580	34.52	1.152	.38696	1.500	.967	PER IMP=	10.00
ADD HYD	203.39	1& 2	5	.94840	216.00	19.833	.39211	2.250	.356		
*S EL CAMINO ARROYO (MAIN) AT BARSTOW (203.39)											
ROUTE MCUNGE	203.98	5	2	.94840	206.24	19.779	.39104	2.450	.340	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.970
COMPUTE NM HYD	204.00	-	1	.21190	89.98	4.166	.36862	1.600	.664	PER IMP=	10.00
ADD HYD	204.90	1& 2	5	1.16030	230.99	23.945	.38694	2.000	.311		
*S EL CAMINO ARROYO AT WYOMING (204.9)											
ROUTE MCUNGE	204.80	5	2	1.16030	223.54	23.884	.38595	2.200	.301	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.930
COMPUTE NM HYD	204.20	-	1	.13330	71.82	2.508	.35273	1.500	.842	PER IMP=	10.00
ADD HYD	204.29	1& 2	5	1.29360	229.07	26.392	.38253	2.200	.277		
RAINFALL TYPE= 2										RAIN24=	1.940
COMPUTE NM HYD	204.10	-	1	.14840	71.63	2.914	.36813	1.550	.754	PER IMP=	10.00
ROUTE MCUNGE	204.18	1	2	.14840	69.91	2.905	.36706	1.600	.736	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	
ADD HYD	204.19	2& 5	5	1.44200	240.19	29.297	.38094	2.200	.260		
*S EL CAMINO ARROYO AT CORONADO AIRPORT (204.29)											
ROUTE MCUNGE	204.28	5	2	1.44200	239.03	29.197	.37965	2.209	.259	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	1.900
COMPUTE NM HYD	205.00	-	1	.04590	77.96	3.150	1.28671	1.500	2.654	PER IMP=	70.00
ADD HYD	205.90	1& 2	5	1.48790	244.86	32.330	.40742	2.209	.257		
*S EL CAMINO ARROYO AT I-25 (205.90)											
RAINFALL TYPE= 2										RAIN24=	1.890
COMPUTE NM HYD	206.10	-	1	.12210	57.36	2.154	.33078	1.550	.734	PER IMP=	10.00
RAINFALL TYPE= 2										RAIN24=	1.890
COMPUTE NM HYD	206.20	-	2	.05610	29.10	.990	.33078	1.500	.810	PER IMP=	10.00
ADD HYD	206.29	1& 2	5	.17820	85.76	3.144	.33078	1.500	.752		
ROUTE	206.28	5	3	.17820	87.56	3.144	.33078	1.550	.768		
RAINFALL TYPE= 2										RAIN24=	1.840
COMPUTE NM HYD	206.40	-	1	.03270	29.76	1.107	.63495	1.500	1.422	PER IMP=	30.00
ROUTE	206.48	1	2	.03270	29.08	1.107	.63496	1.500	1.389		
ADD HYD	206.49	2& 3	5	.21090	116.20	4.251	.37794	1.550	.861		
RAINFALL TYPE= 2										RAIN24=	1.840
COMPUTE NM HYD	206.30	-	1	.04800	89.62	3.691	1.44188	1.500	2.917	PER IMP=	86.00
ADD HYD	206.39	1& 5	6	.25890	196.30	7.942	.57519	1.500	1.185		
FINISH											

LA CUEVA - 100YR - CUR. DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/05/1996
INPUT FILE = lc100b.ext USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	4.050
COMPUTE NM HYD	101.00	-	1	.60700	953.84	45.841	1.41600	1.650	2.455	PER IMP=	.00
ROUTE MCUNGE	101.80	1	2	.60700	912.90	45.469	1.40451	1.850	2.350	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	4.200
COMPUTE NM HYD	100.00	-	1	1.21400	1201.70	87.881	1.35730	1.850	1.547	PER IMP=	.00
ROUTE MCUNGE	100.80	1	3	1.21400	1177.21	87.700	1.35451	2.100	1.515	CCODE =	.1
ADD HYD	101.88	3& 2	5	1.82100	1882.13	133.168	1.37117	1.950	1.615		
RAINFALL TYPE= 2										RAIN24=	3.650
COMPUTE NM HYD	102.00	-	1	.87500	1033.60	54.313	1.16386	1.700	1.846	PER IMP=	.00
ADD HYD	102.90	1& 5	5	2.69600	2554.30	187.482	1.30389	1.900	1.480		
*S LA CUEVA TRIBUTARY ARROYO @ TRAMWAY BLVD. (102.9)											
ROUTE MCUNGE	102.80	5	2	2.69600	2515.07	187.100	1.30123	2.050	1.458	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.370
COMPUTE NM HYD	107.20	-	1	.17200	237.40	9.430	1.02797	1.550	2.157	PER IMP=	9.00
ADD HYD	107.29	1& 2	4	2.86800	2552.53	196.529	1.28484	2.050	1.391		
*S NORTH LA CUEVA AT GLENDALE AND BROWNING (107.29)											
RAINFALL TYPE= 2										RAIN24=	3.500
COMPUTE NM HYD	102.10	-	1	.09300	147.55	4.405	.88811	1.500	2.479	PER IMP=	.00
*S LA CUEVA TRIBUTARY @ TRAMWAY BLVD.											
ROUTE MCUNGE	102.18	1	2	.09300	134.74	4.349	.87687	1.700	2.264	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.380
COMPUTE NM HYD	107.10	-	1	.18080	280.74	8.922	.92528	1.500	2.426	PER IMP=	5.00
ADD HYD	107.19	1& 2	5	.27380	303.70	13.271	.90883	1.600	1.733		
*S NORTH LA CUEVA (TRIB) AT FLORENCE AND BROWNING (107.19)											
ADD HYD	107.90	5& 4	3	3.14180	2611.52	209.801	1.25207	2.000	1.299		
RAINFALL TYPE= 2										RAIN24=	3.400
COMPUTE NM HYD	106.00	-	1	.04360	77.44	2.829	1.21672	1.500	2.775	PER IMP=	17.00
ROUTE MCUNGE	106.80	1	2	.04360	69.78	2.777	1.19435	1.700	2.501	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.340
COMPUTE NM HYD	106.10	-	1	.11160	187.37	6.465	1.08624	1.500	2.623	PER IMP=	10.00
ADD HYD	106.19	1& 2	6	.15520	196.76	9.243	1.11660	1.600	1.981		
*S LA CUEVA TRIBUTARY ARROYO @ BROWNING (106.19)											
ADD HYD	107.99	3& 6	5	3.29700	2658.92	219.043	1.24570	2.000	1.260		
ROUTE MCUNGE	107.80	5	2	3.29700	2647.18	218.906	1.24491	2.100	1.255	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.230
COMPUTE NM HYD	109.00	-	1	.10060	164.16	5.441	1.01402	1.500	2.550	PER IMP=	10.00
ADD HYD	109.90	1& 2	5	3.39760	2662.81	224.346	1.23808	2.100	1.225		
RAINFALL TYPE= 2										RAIN24=	3.250
COMPUTE NM HYD	108.00	-	7	.20550	311.04	11.246	1.02605	1.550	2.365	PER IMP=	10.00
ADD HYD	109.99	5& 7	5	3.60310	2698.71	235.592	1.22598	2.100	1.170		
*S LA CUEVA ARROYO @ EUBANK (MAIN) (109.99)											
ROUTE MCUNGE	109.88	5	2	3.60310	2673.21	235.416	1.22507	2.200	1.159	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.130
COMPUTE NM HYD	110.00	-	1	.16340	202.35	8.385	.96218	1.550	1.935	PER IMP=	10.00
ADD HYD	110.90	1& 2	5	3.76650	2695.65	243.801	1.21366	2.200	1.118		
*S LA CUEVA ARROYO @ VENTURA (MAIN) (110.90)											
ROUTE MCUNGE	110.80	5	2	3.76650	2692.04	243.873	1.21402	2.200	1.117	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	3.020

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	111.10	-	1	.10690	164.18	5.338	.93630	1.500	2.400	PER IMP=	10.00
ADD HYD	111.19	1& 2	5	3.87340	2702.74	249.211	1.20636	2.200	1.090		
RAINFALL TYPE= 2										RAIN24=	3.050
COMPUTE NM HYD	111.00	-	1	.06740	88.80	2.940	.81779	1.500	2.059	PER IMP=	5.00
ADD HYD	111.99	1& 5	5	3.94080	2709.09	252.151	1.19971	2.200	1.074		
*S LA CUEVA ARROYO @ BARSTOW (111.99)											
ROUTE MCUNGE	111.80	5	2	3.94080	2706.80	251.104	1.19473	2.229	1.073	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.960
COMPUTE NM HYD	112.00	-	1	.17650	436.35	17.654	1.87543	1.500	3.863	PER IMP=	50.00
ADD HYD	112.90	1& 2	5	4.11730	2739.06	268.055	1.22071	2.229	1.039		
*S LA CUEVA ARROYO @ WYOMING (112.90)											
ROUTE MCUNGE	112.80	5	2	4.11730	2734.41	267.959	1.22028	2.273	1.038	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.930
COMPUTE NM HYD	113.00	-	1	.11360	160.25	4.875	.80462	1.500	2.204	PER IMP=	5.00
ADD HYD	113.90	1& 2	5	4.23090	2742.42	272.834	1.20911	2.273	1.013		
*S LA CUEVA MAIN ARROYO @ LOUISIANA (113.90)											
ROUTE MCUNGE	113.80	5	4	4.23090	2738.20	272.791	1.20892	2.300	1.011	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.850
COMPUTE NM HYD	115.00	-	3	.13370	183.65	5.503	.77170	1.500	2.146	PER IMP=	5.00
ADD HYD	115.90	4& 3	5	4.36460	2746.52	278.294	1.19553	2.300	.983		
*S LA CUEVA NORTH (MAIN) ARROYO @ I-25 (115.90)											
RECALL HYD	205.90	-	9	1.48790	864.92	75.764	.95475	1.901	.908		
ADD HYD	115.99	5& 9	5	5.85250	3390.06	353.527	1.13262	2.266	.905		
ROUTE MCUNGE	115.80	5	2	5.85250	3385.61	352.572	1.12955	2.303	.904	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.830
COMPUTE NM HYD	118.00	-	1	.06490	172.75	7.273	2.10117	1.500	4.159	PER IMP=	70.00
ADD HYD	118.90	1& 2	5	5.91740	3394.95	359.336	1.13860	2.303	.896		
*S LA CUEVA NORTH (MAIN) ARROYO @ SAN MATEO											
RAINFALL TYPE= 2										RAIN24=	2.830
COMPUTE NM HYD	118.10	-	1	.03060	42.12	1.370	.83948	1.500	2.150	PER IMP=	10.00
ADD HYD	118.99	1& 5	5	5.94800	3397.03	360.671	1.13695	2.303	.892		
ROUTE MCUNGE	118.80	5	2	5.94800	3394.86	359.902	1.13453	2.316	.892	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.760
COMPUTE NM HYD	126.00	-	1	.07370	195.81	8.059	2.05022	1.500	4.151	PER IMP=	70.00
ADD HYD	126.90	1& 2	5	6.02170	3404.86	367.367	1.14389	2.316	.883		
ROUTE MCUNGE	126.80	5	2	6.02170	3402.62	367.365	1.14388	2.335	.883	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.700
COMPUTE NM HYD	127.00	-	1	.06330	134.62	4.342	1.28604	1.500	3.323	PER IMP=	10.00
ADD HYD	127.90	1& 2	8	6.08500	3407.71	371.638	1.14514	2.335	.875		
*S NORTH LA CUEVA ARROYO AT APPROXIMATELY JEFFERSON ST.											
*S NOW BEGIN THE SOUTH LA CUEVA ARROYO EAST OF I-25											
RAINFALL TYPE= 2										RAIN24=	2.850
COMPUTE NM HYD	116.00	-	5	.13090	193.62	6.460	.92539	1.500	2.311	PER IMP=	15.00
*S LA CUEVA SOUTH ARROYO @ I-25											
RAINFALL TYPE= 2										RAIN24=	2.890
COMPUTE NM HYD	117.40	-	1	.09210	126.18	4.096	.83378	1.500	2.141	PER IMP=	10.00
ROUTE MCUNGE	117.49	1	2	.09210	116.52	4.064	.82728	1.600	1.977	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.890
COMPUTE NM HYD	117.30	-	1	.10040	207.20	7.528	1.40585	1.500	3.225	PER IMP=	30.00
ADD HYD	117.39	2& 1	2	.19250	280.72	11.591	1.12903	1.550	2.279		
DIVIDE HYD	117.91	2	7	.11669	80.00	7.027	1.12903	1.400	1.071		
	117.39	AND	9	.07581	200.72	4.565	1.12903	1.550	4.137		

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
RAINFALL TYPE= 2										RAIN24= 2.890
COMPUTE NM HYD	117.20	-	1	.16250	188.26	9.086	1.04839	1.600	1.810	PER IMP= 20.00
DIVIDE HYD	117.92	1	6	.12129	80.00	6.782	1.04838	1.450	1.031	
	117.27	AND	10	.04121	108.26	2.304	1.04838	1.600	4.105	
ADD HYD	117.93	7& 6	1	.23799	160.00	13.809	1.08793	1.450	1.050	
*S TOTAL RUNOFF TO SAN PEDRO STORM DRAIN										
ROUTE	117.98	1	2	.23799	160.00	13.809	1.08793	1.850	1.050	
ADD HYD	116.99	5& 2	5	.36889	348.81	20.269	1.03025	1.500	1.477	
*S SOUTH LACUEVA ARROYO AT CONFLUENCE JUST WEST OF I-25 CROSSING										
ADD HYD	117.29	10& 5	5	.41009	438.50	22.573	1.03207	1.550	1.671	
ROUTE MCUNGE	117.28	5	2	.41009	436.59	21.947	1.00347	1.551	1.663	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	119.00	-	1	.05490	146.12	6.152	2.10117	1.500	4.159	PER IMP= 70.00
ADD HYD	119.90	1& 2	5	.46499	564.77	27.847	1.12287	1.551	1.898	
RAINFALL TYPE= 2										RAIN24= 2.820
COMPUTE NM HYD	120.00	-	1	.02680	55.08	2.259	1.58045	1.500	3.211	PER IMP= 50.00
ADD HYD	120.90	1& 5	5	.49179	613.80	30.018	1.14444	1.551	1.950	
ROUTE MCUNGE	120.80	5	2	.49179	612.12	29.609	1.12888	1.551	1.945	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	125.00	-	1	.05080	134.25	5.548	2.04765	1.500	4.129	PER IMP= 70.00
ADD HYD	125.90	1& 2	6	.54259	729.81	34.850	1.20428	1.551	2.102	
*S LA CUEVA ARROYO SOUTH BEFORE WILDFLOWER FLOWS JUST UPSTREAM OF 96" RCP										
RAINFALL TYPE= 2										RAIN24= 2.810
COMPUTE NM HYD	121.00	-	1	.04890	63.24	1.947	.74674	1.500	2.021	PER IMP= 5.00
*S WILDFLOWER ARROYO AT SAN MATEO BLVD.										
DIVIDE HYD	121.83	1	11	.02445	31.62	.974	.74673	1.500	2.021	
	121.84	AND	12	.02445	31.62	.974	.74673	1.500	2.021	
ROUTE MCUNGE	121.81	11	2	.02445	29.40	.952	.73022	1.650	1.879	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.750
COMPUTE NM HYD	123.00	-	1	.01850	40.84	1.521	1.54168	1.500	3.449	PER IMP= 40.00
ADD HYD	123.90	1& 2	5	.04295	59.16	2.473	1.07972	1.550	2.152	
ROUTE MCUNGE	121.82	12	2	.02445	28.91	.957	.73427	1.650	1.847	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.750
COMPUTE NM HYD	122.00	-	1	.02250	53.55	2.068	1.72356	1.500	3.719	PER IMP= 50.00
ADD HYD	122.90	1& 2	3	.04695	62.44	3.026	1.20836	1.600	2.078	
RAINFALL TYPE= 2										RAIN24= 2.740
COMPUTE NM HYD	124.00	-	1	.02510	59.74	2.301	1.71856	1.500	3.719	PER IMP= 50.00
ADD HYD	124.91	3& 1	4	.07205	115.71	5.326	1.38609	1.500	2.509	
DIVIDE HYD	122.85	4	1	.06779	90.00	5.012	1.38609	1.450	2.074	
	124.92	AND	2	.00426	25.71	.315	1.38609	1.500	9.437	
*S TOTAL OUTFLOW TO ALAMEDA FROM JEFFERSON VIA 36" STORM DRAIN.										
ROUTE MCUNGE	124.83	2	3	.00426	23.96	.294	1.29335	1.600	8.795	CCODE = .1
ADD HYD	124.91	5& 3	4	.04721	82.22	2.767	1.09897	1.600	2.722	
*S SUBTRACT FLOW INTERCEPTED BY 36" PIPE TO WATERCRESS CHANNEL										
DIVIDE HYD	123.81	4	1	.04584	70.00	2.687	1.09897	1.550	2.386	
	123.99	AND	2	.00136	12.22	.080	1.09897	1.600	14.016	
ADD HYD	125.99	6& 1	3	.58844	799.81	37.465	1.19380	1.551	2.124	
*S TOTAL FLOW AT ENTRANCE TO 96" PIPE										
ROUTE	125.88	3	1	.58844	796.23	37.500	1.19490	1.550	2.114	
ADD HYD	127.91	1& 8	8	6.67344	3495.83	408.537	1.14784	2.316	.819	
ADD HYD	127.92	2& 8	5	6.67480	3495.83	408.615	1.14783	2.316	.818	
RAINFALL TYPE= 2										RAIN24= 2.690

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	128.00	-	1	.13730	254.82	9.454	1.29103	1.550	2.900	PER IMP= 10.00
ADD HYD	128.90	1& 5	5	6.81210	3512.35	417.923	1.15032	2.316	.806	

*S LA CUEVA ARROYO TOTAL @ THE NORTH DIVERSION CHANNEL
FINISH

LA CUEVA - 10-YR CUM. DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =08/30/1996
INPUT FILE = lc10b.ext USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.700
COMPUTE NM HYD	101.00	-	1	.60700	509.80	23.753	.73371	1.650	1.312	PER IMP=	.00
ROUTE MCUNGE	101.80	1	2	.60700	476.53	23.555	.72760	1.950	1.227	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.800
COMPUTE NM HYD	100.00	-	1	1.21400	612.19	46.185	.71331	1.850	.788	PER IMP=	.00
ROUTE MCUNGE	100.80	1	3	1.21400	599.30	45.939	.70952	2.100	.771	CCODE =	.1
ADD HYD	101.88	3& 2	5	1.82100	1010.00	69.494	.71555	2.000	.867		
RAINFALL TYPE= 2										RAIN24=	2.430
COMPUTE NM HYD	102.00	-	1	.87500	448.31	23.830	.51065	1.700	.801	PER IMP=	.00
ADD HYD	102.90	1& 5	5	2.69600	1250.98	93.324	.64905	1.950	.725		
*S LA CUEVA TRIBUTARY ARROYO @ TRAMWAY BLVD. (102.9)											
ROUTE MCUNGE	102.80	5	2	2.69600	1233.20	93.101	.64749	2.100	.715	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.250
COMPUTE NM HYD	107.20	-	1	.17200	98.65	4.034	.43971	1.550	.896	PER IMP=	9.00
ADD HYD	107.29	1& 2	4	2.86800	1248.41	97.135	.63503	2.100	.680		
*S NORTH LA CUEVA AT GLENDALE AND BROWNING (107.29)											
RAINFALL TYPE= 2										RAIN24=	2.330
COMPUTE NM HYD	102.10	-	1	.09300	60.66	1.628	.32823	1.500	1.019	PER IMP=	.00
*S LA CUEVA TRIBUTARY @ TRAMWAY BLVD.											
ROUTE MCUNGE	102.18	1	2	.09300	51.64	1.513	.30511	1.800	.868	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.250
COMPUTE NM HYD	107.10	-	1	.18080	108.58	3.485	.36138	1.500	.938	PER IMP=	5.00
ADD HYD	107.19	1& 2	5	.27380	108.58	4.998	.34227	1.500	.620		
*S NORTH LA CUEVA (TRIB) AT FLORENCE AND BROWNING (107.19)											
ADD HYD	107.90	5& 4	3	3.14180	1273.88	102.133	.60952	2.100	.634		
RAINFALL TYPE= 2										RAIN24=	2.270
COMPUTE NM HYD	106.00	-	1	.04360	36.47	1.348	.57988	1.500	1.307	PER IMP=	17.00
ROUTE MCUNGE	106.80	1	2	.04360	31.87	1.312	.56407	1.750	1.142	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.230
COMPUTE NM HYD	106.10	-	1	.11160	83.44	2.853	.47939	1.500	1.168	PER IMP=	10.00
ADD HYD	106.19	1& 2	6	.15520	84.62	4.165	.50318	1.500	.852		
*S LA CUEVA TRIBUTARY ARROYO @ BROWNING (106.19)											
ADD HYD	107.99	3& 6	5	3.29700	1293.14	106.298	.60451	2.100	.613		
ROUTE MCUNGE	107.80	5	2	3.29700	1292.06	106.338	.60474	2.150	.612	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.150
COMPUTE NM HYD	109.00	-	1	.10060	71.10	2.352	.43835	1.500	1.104	PER IMP=	10.00
ADD HYD	109.90	1& 2	5	3.39760	1297.94	108.689	.59981	2.150	.597		
RAINFALL TYPE= 2										RAIN24=	2.170
COMPUTE NM HYD	108.00	-	7	.20550	131.23	4.880	.44524	1.550	.998	PER IMP=	10.00
ADD HYD	109.99	5& 7	5	3.60310	1312.35	113.569	.59100	2.150	.569		
*S LA CUEVA ARROYO @ EUBANK (MAIN) (109.99)											
ROUTE MCUNGE	109.88	5	2	3.60310	1290.73	113.348	.58985	2.250	.560	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.090
COMPUTE NM HYD	110.00	-	1	.16340	81.93	3.552	.40759	1.550	.783	PER IMP=	10.00
ADD HYD	110.90	1& 2	5	3.76650	1299.35	116.900	.58194	2.250	.539		
*S LA CUEVA ARROYO @ VENTURA (MAIN) (110.90)											
ROUTE MCUNGE	110.80	5	2	3.76650	1294.77	116.815	.58152	2.350	.537	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.010

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	111.10	-	1	.10690	67.80	2.233	.39174	1.500	.991	PER IMP= 10.00
ADD HYD	111.19	1& 2	5	3.87340	1297.78	119.048	.57628	2.350	.524	
RAINFALL TYPE= 2										RAIN24= 2.030
COMPUTE NM HYD	111.00	-	1	.06740	32.59	1.082	.30088	1.500	.756	PER IMP= 5.00
ADD HYD	111.99	1& 5	5	3.94080	1299.45	120.130	.57157	2.350	.515	
*S LA CUEVA ARROYO @ BARSTOW (111.99)										
ROUTE MCUNGE	111.80	5	2	3.94080	1295.12	119.798	.56999	2.379	.514	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 1.970
COMPUTE NM HYD	112.00	-	1	.17650	256.88	10.211	1.08469	1.500	2.274	PER IMP= 50.00
ADD HYD	112.90	1& 2	5	4.11730	1306.48	129.839	.59128	2.379	.496	
*S LA CUEVA ARROYO @ WYOMING (112.90)										
ROUTE MCUNGE	112.80	5	2	4.11730	1306.04	129.833	.59125	2.400	.496	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 1.950
COMPUTE NM HYD	113.00	-	1	.11360	60.44	1.835	.30284	1.500	.831	PER IMP= 5.00
ADD HYD	113.90	1& 2	5	4.23090	1308.36	131.667	.58351	2.400	.483	
*S LA CUEVA MAIN ARROYO @ LOUISIANA (113.90)										
ROUTE MCUNGE	113.80	5	4	4.23090	1293.78	131.531	.58290	2.500	.478	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.900
COMPUTE NM HYD	115.00	-	3	.13370	66.25	2.015	.28263	1.500	.774	PER IMP= 5.00
ADD HYD	115.90	4& 3	5	4.36460	1295.80	133.546	.57370	2.500	.464	
*S LA CUEVA NORTH (MAIN) ARROYO @ I-25 (115.90)										
RECALL HYD	205.90	-	9	1.48790	244.86	32.330	.40742	2.209	.257	
ADD HYD	115.99	5& 9	5	5.85250	1495.38	165.849	.53134	2.519	.399	
ROUTE MCUNGE	115.80	5	2	5.85250	1493.27	164.439	.52682	2.541	.399	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 1.890
COMPUTE NM HYD	118.00	-	1	.06490	109.38	4.423	1.27774	1.500	2.633	PER IMP= 70.00
ADD HYD	118.90	1& 2	5	5.91740	1495.82	168.644	.53437	2.541	.395	
RAINFALL TYPE= 2										RAIN24= 1.890
COMPUTE NM HYD	118.10	-	1	.03060	16.53	.555	.33990	1.500	.844	PER IMP= 10.00
ADD HYD	118.99	1& 5	5	5.94800	1496.29	169.184	.53332	2.541	.393	
*S LA CUEVA NORTH (MAIN) ARROYO @ SAN MATEO										
ROUTE MCUNGE	118.80	5	2	5.94800	1494.87	169.117	.53311	2.561	.393	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 1.840
COMPUTE NM HYD	126.00	-	1	.07370	123.66	4.880	1.24143	1.500	2.622	PER IMP= 70.00
ADD HYD	126.90	1& 2	5	6.02170	1497.47	173.775	.54109	2.561	.389	
ROUTE MCUNGE	126.80	5	2	6.02170	1496.69	173.359	.53979	2.567	.388	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 1.800
COMPUTE NM HYD	127.00	-	1	.06330	76.71	2.153	.63770	1.500	1.894	PER IMP= 10.00
ADD HYD	127.90	1& 2	8	6.08500	1497.72	175.480	.54071	2.567	.385	
*S NORTH LA CUEVA ARROYO AT APPROXIMATELY JEFFERSON ST.										
*S NOW BEGIN THE SOUTH LA CUEVA ARROYO EAST OF I-25										
RAINFALL TYPE= 2										RAIN24= 1.900
COMPUTE NM HYD	116.00	-	5	.13090	78.93	2.813	.40290	1.500	.942	PER IMP= 15.00
*S LA CUEVA SOUTH ARROYO @ I-25										
RAINFALL TYPE= 2										RAIN24= 1.930
COMPUTE NM HYD	117.40	-	1	.09210	47.69	1.635	.33288	1.500	.809	PER IMP= 10.00
ROUTE MCUNGE	117.49	1	2	.09210	42.90	1.611	.32789	1.650	.728	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.930
COMPUTE NM HYD	117.30	-	1	.10040	111.50	3.980	.74331	1.500	1.735	PER IMP= 30.00
ADD HYD	117.39	2& 1	2	.19250	120.89	5.591	.54455	1.550	.981	
DIVIDE HYD	117.91	2	7	.17028	80.00	4.945	.54455	1.450	.734	
	117.39	AND	9	.02222	40.89	.645	.54455	1.550	2.875	

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
RAINFALL TYPE= 2										RAIN24= 1.930
COMPUTE NM HYD	117.20	-	1	.16250	82.97	4.268	.49245	1.600	.798	PER IMP= 20.00
DIVIDE HYD	117.92	1	6	.16203	80.00	4.256	.49245	1.600	.771	
	117.27	AND	10	.00047	2.97	.012	.49245	1.600	9.931	
ADD HYD	117.93	7& 6	1	.33231	160.00	9.201	.51915	1.600	.752	
*S TOTAL RUNOFF TO SAN PEDRO STORM DRAIN										
ROUTE	117.98	1	2	.33231	158.17	9.201	.51915	1.650	.744	
ADD HYD	116.99	5& 2	5	.46321	219.90	12.014	.48630	1.550	.742	
*S SOUTH LACUEVA ARROYO AT CONFLUENCE JUST WEST OF I-25 CROSSING										
ADD HYD	117.29	10& 5	5	.46368	219.90	12.026	.48630	1.550	.741	
ROUTE MCUNGE	117.28	5	2	.46368	217.73	11.967	.48391	1.630	.734	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.890
COMPUTE NM HYD	119.00	-	1	.05490	92.57	3.741	1.27774	1.500	2.635	PER IMP= 70.00
ADD HYD	119.90	1& 2	5	.51858	281.31	15.700	.56766	1.590	.848	
RAINFALL TYPE= 2										RAIN24= 1.880
COMPUTE NM HYD	120.00	-	1	.02680	31.05	1.284	.89829	1.500	1.810	PER IMP= 50.00
ADD HYD	120.90	1& 5	5	.54538	303.84	16.981	.58381	1.590	.870	
ROUTE MCUNGE	120.80	5	2	.54538	301.95	16.513	.56772	1.615	.865	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.840
COMPUTE NM HYD	125.00	-	1	.05080	84.70	3.358	1.23947	1.500	2.605	PER IMP= 70.00
ADD HYD	125.90	1& 2	6	.59618	357.17	19.766	.62164	1.584	.936	
*S LA CUEVA ARROYO SOUTH BEFORE WILDFLOWER FLOWS JUST UPSTREAM OF 96" RCP										
RAINFALL TYPE= 2										RAIN24= 1.870
COMPUTE NM HYD	121.00	-	1	.04890	22.64	.701	.26862	1.500	.723	PER IMP= 5.00
*S WILDFLOWER ARROYO AT SAN MATEO BLVD.										
DIVIDE HYD	121.83	1	11	.02445	11.32	.350	.26862	1.500	.723	
	121.84	AND	12	.02445	11.32	.350	.26862	1.500	.723	
ROUTE MCUNGE	121.81	11	2	.02445	10.08	.350	.26864	1.750	.644	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.830
COMPUTE NM HYD	123.00	-	1	.01850	23.27	.837	.84832	1.500	1.966	PER IMP= 40.00
ADD HYD	123.90	1& 2	5	.04295	23.84	1.187	.51831	1.500	.867	
ROUTE MCUNGE	121.82	12	2	.02445	9.20	.343	.26309	1.800	.588	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.830
COMPUTE NM HYD	122.00	-	1	.02250	31.84	1.183	.98604	1.500	2.211	PER IMP= 50.00
ADD HYD	122.90	1& 2	3	.04695	32.09	1.526	.60954	1.500	1.068	
RAINFALL TYPE= 2										RAIN24= 1.830
COMPUTE NM HYD	124.00	-	1	.02510	35.79	1.323	.98821	1.500	2.228	PER IMP= 50.00
ADD HYD	124.91	3& 1	4	.07205	67.88	2.849	.74145	1.500	1.472	
DIVIDE HYD	122.85	4	1	.07205	67.88	2.849	.74145	1.500	1.472	
	124.92	AND	2	.00000	.00	.000	.00000	-.050	.000	
*S TOTAL OUTFLOW TO ALAMEDA FROM JEFFERSON VIA 36" STORM DRAIN.										
ROUTE MCUNGE	124.83	2	3	.04695	.00	.000	.00000	-.050	.000	CCODE = .1
ADD HYD	124.91	5& 3	4	.08990	23.84	1.187	.24762	1.500	.414	
*S SUBTRACT FLOW INTERCEPTED BY 36" PIPE TO WATERCRESS CHANNEL										
DIVIDE HYD	123.81	4	1	.08990	23.84	1.187	.24762	1.500	.414	
	123.99	AND	2	.00000	.00	.000	.00000	-.050	.000	
ADD HYD	125.99	6& 1	3	.68608	377.88	20.928	.57195	1.584	.861	
*S TOTAL FLOW AT ENTRANCE TO 96" PIPE										
ROUTE	125.88	3	1	.68608	378.67	20.925	.57186	1.600	.862	
ADD HYD	127.91	1& 8	8	6.77108	1523.37	195.946	.54260	2.567	.352	
ADD HYD	127.92	2& 8	5	6.77108	1523.37	195.946	.54260	2.567	.352	
RAINFALL TYPE= 2										RAIN24= 1.790

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	128.00	-	1	.13730	139.29	4.662	.63670	1.550	1.585	PER IMP= 10.00
ADD HYD	128.90	1& 5	5	6.90838	1527.35	200.543	.54429	2.567	.345	

*S LA CUEVA ARROYO TOTAL @ THE NORTH DIVERSION CHANNEL

FINISH

LA CUEVA DIV. -100 YR- CUR. DEV.

HYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/12/1996

NPUT FILE = lcdv100b.ext USER NO.= RSTECHNM.STE

MAND	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	
ART										TIME=	.00
AINFALL TYPE= 2										RAIN24=	3.550
OMPUTE NM HYD	103.20	-	1	.06160	127.12	4.677	1.42358	1.500	3.224	PER IMP=	14.00
OUTE MCUNGE	103.80	1	2	.06160	121.23	4.662	1.41909	1.600	3.075	CCODE =	.1
AINFALL TYPE= 2										RAIN24=	3.500
OMPUTE NM HYD	103.40	-	1	.09530	184.28	6.348	1.24889	1.500	3.021	PER IMP=	10.00
DD HYD	103.49	1& 2	11	.15690	289.35	11.010	1.31571	1.550	2.882		
S SOUTH LACUEVA TRIB @ TRAMWAY BLVD (103.49)											
AINFALL TYPE= 2										RAIN24=	3.500
OMPUTE NM HYD	103.50	-	1	.06250	157.65	6.408	1.92240	1.500	3.941	PER IMP=	35.00
DD HYD	103.59	1&11	5	.21940	432.28	17.418	1.48853	1.500	3.079		
OUTE MCUNGE	103.48	5	2	.21940	408.77	17.240	1.47338	1.650	2.911	CCODE =	.1
AINFALL TYPE= 2										RAIN24=	3.450
OMPUTE NM HYD	104.10	-	1	.12000	251.45	9.569	1.49513	1.500	3.274	PER IMP=	25.00
DD HYD	104.19	1& 2	5	.33940	553.42	26.809	1.48106	1.650	2.548		
S SOUTH LACUEVA TRIB @ LOWELL (104.19)											
OUTE MCUNGE	104.18	5	2	.33940	548.56	26.834	1.48244	1.650	2.525	CCODE =	.2
AINFALL TYPE= 2										RAIN24=	3.350
OMPUTE NM HYD	104.20	-	1	.08040	114.02	4.326	1.00893	1.550	2.216	PER IMP=	8.00
DD HYD	104.29	1& 2	6	.41980	634.68	31.160	1.39175	1.650	2.362		
S SOUTH LACUEVA TRIB @ BROWNING (104.29)											
AINFALL TYPE= 2										RAIN24=	3.750
OMPUTE NM HYD	103.00	-	1	.21200	365.76	14.423	1.27562	1.550	2.696	PER IMP=	.00
UTE RESERVOIR	103.11	1	2	.21200	341.18	14.423	1.27562	1.600	2.515	AC-FT=	1.951
TE MCUNGE	103.81	2	3	.21200	329.31	14.386	1.27236	1.750	2.427	CCODE =	.1
NFALL TYPE= 2										RAIN24=	3.600
OMPUTE NM HYD	103.60	-	1	.06840	137.46	5.606	1.53665	1.500	3.140	PER IMP=	26.00
DD HYD	103.19	1& 3	5	.28040	382.39	19.992	1.33683	1.750	2.131		
AINFALL TYPE= 2										RAIN24=	3.600
OMPUTE NM HYD	103.10	-	1	.22990	326.84	14.085	1.14876	1.600	2.221	PER IMP=	.00
OUTE MCUNGE	103.88	1	2	.22990	316.24	14.054	1.14622	1.700	2.149	CCODE =	.1
DD HYD	103.99	5& 2	5	.51030	694.78	34.046	1.25095	1.750	2.127		
S NORTH LACUEVA TRIB @ TRAMWAY BLVD (103.99)											
OUTE MCUNGE	103.18	5	2	.51030	672.61	33.939	1.24701	1.850	2.059	CCODE =	.1
AINFALL TYPE= 2										RAIN24=	3.400
OMPUTE NM HYD	105.10	-	1	.13820	260.36	9.014	1.22294	1.500	2.944	PER IMP=	15.00
DD HYD	105.19	1& 2	5	.64850	728.66	42.952	1.24188	1.850	1.756		
S NORTH LACUEVA TRIB @ LOWELL (105.19)											
OUTE MCUNGE	105.18	5	2	.64850	728.46	42.985	1.24281	1.850	1.755	CCODE =	.2
AINFALL TYPE= 2										RAIN24=	3.330
OMPUTE NM HYD	105.20	-	1	.10580	172.94	5.646	1.00054	1.500	2.554	PER IMP=	8.00
DD HYD	105.29	1& 2	5	.75430	763.62	48.630	1.20882	1.850	1.582		
S NORTH LACUEVA TRIB @ BROWNING (105.29)											
DD HYD	105.90	5& 6	17	1.17410	1245.48	79.791	1.27423	1.750	1.657		
S TOTAL RUNOFF TO LACUEVA DIVERSION CHANNEL (105.9)											
INISH											

LA CUEVA DIV. 10-YR CUR-DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =08/30/1996
INPUT FILE = lcdv10b.ext USER NO.= RSTECHNM.STE

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
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 2.370
COMPUTE NM HYD	103.20	-	1	.06160	68.41	2.326	.70815	1.500	1.735	PER IMP= 14.00
ROUTE MCUNGE	103.80	1	2	.06160	63.03	2.316	.70501	1.600	1.599	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.330
COMPUTE NM HYD	103.40	-	1	.09530	92.00	2.969	.58416	1.500	1.508	PER IMP= 10.00
ADD HYD	103.49	1& 2	11	.15690	137.74	5.285	.63160	1.550	1.372	
*S SOUTH LACUEVA TRIB @ TRAMWAY BLVD (103.49)										
RAINFALL TYPE= 2										RAIN24= 2.330
COMPUTE NM HYD	103.50	-	1	.06250	94.68	3.605	1.08145	1.500	2.367	PER IMP= 35.00
ADD HYD	103.59	1&11	5	.21940	222.82	8.890	.75975	1.550	1.587	
ROUTE MCUNGE	103.48	5	2	.21940	206.68	8.801	.75213	1.700	1.472	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.300
COMPUTE NM HYD	104.10	-	1	.12000	132.31	5.006	.78225	1.500	1.723	PER IMP= 25.00
ADD HYD	104.19	1& 2	5	.33940	263.37	13.807	.76277	1.700	1.212	
*S SOUTH LACUEVA TRIB @ LOWELL (104.19)										
ROUTE MCUNGE	104.18	5	2	.33940	255.73	13.789	.76176	1.800	1.177	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.230
COMPUTE NM HYD	104.20	-	1	.08040	48.56	1.825	.42552	1.550	.944	PER IMP= 8.00
ADD HYD	104.29	1& 2	6	.41980	273.75	15.613	.69736	1.800	1.019	
*S SOUTH LACUEVA TRIB @ BROWNING (104.29)										
RAINFALL TYPE= 2										RAIN24= 2.500
COMPUTE NM HYD	103.00	-	1	.21200	184.92	6.637	.58699	1.550	1.363	PER IMP= .00
ROUTE RESERVOIR	103.11	1	2	.21200	151.32	6.637	.58699	1.650	1.115	AC-FT= .752
ROUTE MCUNGE	103.81	2	3	.21200	150.12	6.566	.58073	1.800	1.106	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.400
COMPUTE NM HYD	103.60	-	1	.06840	72.88	2.959	.81112	1.500	1.665	PER IMP= 26.00
ADD HYD	103.19	1& 3	5	.28040	172.67	9.525	.63693	1.800	.962	
RAINFALL TYPE= 2										RAIN24= 2.400
COMPUTE NM HYD	103.10	-	1	.22990	149.93	6.117	.49885	1.600	1.019	PER IMP= .00
ROUTE MCUNGE	103.88	1	2	.22990	144.39	6.107	.49806	1.750	.981	CCODE = .1
ADD HYD	103.99	5& 2	5	.51030	316.60	15.632	.57436	1.750	.969	
*S NORTH LACUEVA TRIB @ TRAMWAY BLVD (103.99)										
ROUTE MCUNGE	103.18	5	2	.51030	315.19	15.675	.57596	1.800	.965	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.270
COMPUTE NM HYD	105.10	-	1	.13820	123.03	4.265	.57864	1.500	1.391	PER IMP= 15.00
ADD HYD	105.19	1& 2	5	.64850	348.40	19.940	.57653	1.800	.839	
*S NORTH LACUEVA TRIB @ LOWELL (105.19)										
ROUTE MCUNGE	105.18	5	2	.64850	343.94	19.906	.57554	1.900	.829	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.220
COMPUTE NM HYD	105.20	-	1	.10580	73.17	2.369	.41977	1.500	1.081	PER IMP= 8.00
ADD HYD	105.29	1& 2	5	.75430	356.37	22.275	.55369	1.900	.738	
*S NORTH LACUEVA TRIB @ BROWNING (105.29)										
ADD HYD	105.90	5& 6	17	1.17410	604.74	37.888	.60506	1.850	.805	
*S TOTAL RUNOFF TO LACUEVA DIVERSION CHANNEL (105.9)										
FINISH										

EXISTING CONDITION
FULL DEVELOPMENT SUMMARY FILES
100-YR AND 10-YR

No. CAMINO - 100 YR - FULL DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/11/1996
INPUT FILE = NC100B.FUT USER NO.= RSTECHNM.STE

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
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 3.990
COMPUTE NM HYD	300.00	-	1	.88400	1001.07	68.141	1.44530	1.800	1.769	PER IMP= .00
ROUTE MCUNGE	300.80	1	2	.88400	976.60	67.873	1.43962	2.050	1.726	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.590
COMPUTE NM HYD	301.00	-	1	.85200	862.46	54.493	1.19922	1.800	1.582	PER IMP= .00
ADD HYD	301.90	1& 2	11	1.73600	1605.38	122.366	1.32164	1.950	1.445	
*S NORTH EL CAMINO ARROYO AT TRAMWAY ROAD (301.90)										
ROUTE MCUNGE	301.82	11	2	1.73600	1587.76	122.145	1.31925	2.100	1.429	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.340
COMPUTE NM HYD	302.00	-	1	.15760	377.68	14.313	1.70288	1.500	3.744	PER IMP= 30.00
ADD HYD	302.90	1& 2	5	1.89360	1631.74	136.458	1.35117	2.100	1.346	
ROUTE MCUNGE	302.81	5	1	1.89360	1628.16	135.566	1.34235	2.107	1.343	CCODE = .2
ROUTE MCUNGE	302.82	1	2	1.89360	1623.95	135.667	1.34335	2.200	1.340	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.220
COMPUTE NM HYD	303.00	-	1	.17060	340.12	13.452	1.47844	1.550	3.115	PER IMP= 20.00
ADD HYD	303.90	1& 2	5	2.06420	1655.63	149.119	1.35451	2.150	1.253	
*S NORTH EL CAMINO ARROYO AT HOLBROOK (303.90)										
ROUTE MCUNGE	303.80	5	2	2.06420	1651.58	149.012	1.35354	2.250	1.250	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.130
COMPUTE NM HYD	305.10	-	1	.16910	302.07	13.014	1.44303	1.550	2.791	PER IMP= 20.00
ADD HYD	305.19	1& 2	5	2.23330	1682.34	162.026	1.36032	2.250	1.177	
*S NORTH EL CAMINO ARROYO AT VENTURA (305.19)										
ROUTE MCUNGE	305.18	5	2	2.23330	1680.41	162.092	1.36087	2.300	1.176	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.070
COMPUTE NM HYD	305.20	-	1	.15290	236.60	11.517	1.41235	1.600	2.418	PER IMP= 20.00
ADD HYD	305.29	1& 2	5	2.38620	1709.09	173.609	1.36417	2.300	1.119	
*S NORTH EL CAMINO ARROYO AT BARSTOW (305.29)										
ROUTE MCUNGE	305.28	5	2	2.38620	1695.57	173.479	1.36314	2.400	1.110	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.960
COMPUTE NM HYD	312.00	-	1	.06600	114.08	4.765	1.35364	1.550	2.701	PER IMP= 20.00
ADD HYD	312.90	1& 2	5	2.45220	1702.84	178.243	1.36288	2.400	1.085	
S NORTH EL CAMINO ARROYO AT WYOMING (312.90)										
ROUTE MCUNGE	312.80	5	2	2.45220	1689.97	178.115	1.36190	2.500	1.077	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.870
COMPUTE NM HYD	313.00	-	1	.20920	437.50	19.847	1.77880	1.550	3.268	PER IMP= 49.00
ADD HYD	313.90	1& 2	7	2.66140	1712.23	197.962	1.39467	2.500	1.005	
RAINFALL TYPE= 2										RAIN24= 3.160
COMPUTE NM HYD	304.00	-	1	.08400	171.88	6.183	1.38016	1.500	3.197	PER IMP= 17.00
ROUTE MCUNGE	304.80	1	2	.08400	157.05	6.140	1.37048	1.700	2.921	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.030
COMPUTE NM HYD	307.00	-	1	.06630	138.74	4.861	1.37458	1.500	3.270	PER IMP= 20.00
ADD HYD	307.90	1& 2	5	.15030	222.53	11.000	1.37228	1.650	2.313	
*S NORTH CAMINO ARROYO (TRIB) AT BARSTOW (307.90)										
ROUTE MCUNGE	307.81	5	1	.15030	212.89	10.943	1.36511	1.850	2.213	CCODE = .1
ROUTE MCUNGE	307.82	1	2	.15030	209.97	10.997	1.37191	1.850	2.183	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.950
COMPUTE NM HYD	310.00	-	1	.10330	154.99	7.037	1.27736	1.600	2.344	PER IMP= 17.00
ADD HYD	310.90	1& 2	6	.25360	285.42	18.035	1.33339	1.850	1.759	

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
RAINFALL TYPE= 2										RAIN24= 3.080
COMPUTE NM HYD	306.00	-	1	.10510	220.14	7.537	1.34456	1.500	3.273	PER IMP= 17.00
ROUTE MCUNGE	306.80	1	2	.10510	197.50	7.491	1.33639	1.700	2.936	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.980
COMPUTE NM HYD	308.00	-	1	.05350	108.45	3.706	1.29894	1.500	3.167	PER IMP= 17.00
ADD HYD	308.90	1& 2	5	.15860	248.41	11.197	1.32375	1.700	2.447	
RAINFALL TYPE= 2										RAIN24= 2.990
COMPUTE NM HYD	309.00	-	1	.07960	143.06	5.522	1.30064	1.550	2.808	PER IMP= 17.00
ADD HYD	309.90	1& 5	5	.23820	353.40	16.719	1.31603	1.650	2.318	
ROUTE MCUNGE	309.80	5	2	.23820	353.09	16.763	1.31953	1.750	2.316	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.950
COMPUTE NM HYD	311.00	-	1	.15280	230.86	10.352	1.27025	1.600	2.361	PER IMP= 17.00
ADD HYD	311.90	1& 2	5	.39100	530.42	27.115	1.30027	1.700	2.120	
ADD HYD	311.99	5& 6	5	.64460	781.47	45.149	1.31330	1.700	1.894	
*S NORTH CAMINO ARROYO (TRIB) AT CORONADO RUNWAY (311.99)										
ROUTE MCUNGE	311.81	5	1	.64460	772.71	45.076	1.31117	1.800	1.873	CCODE = .1

ROUTE MCUNGE	311.82	1	2	.64460	768.73	43.628	1.26903	1.814	1.863	CCODE = .2
*S NORTH EL CAMINO ARROYO AT I-25 (AP 313.99)										
DD HYD	313.99	2& 7	5	3.30600	1852.46	238.845	1.35461	2.453	.876	
OUTE MCUNGE	313.88	5	2	3.30600	1849.89	238.796	1.35433	2.500	.874	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	314.00	-	1	.09600	239.07	9.345	1.82515	1.500	3.891	PER IMP= 50.00
ADD HYD	314.99	1& 2	5	3.40200	1878.02	248.141	1.36762	1.900	.863	
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	315.00	-	1	.04260	104.88	4.130	1.81763	1.500	3.847	PER IMP= 50.00
ADD HYD	315.99	1& 5	5	3.44460	1904.79	252.270	1.37318	1.900	.864	
RECALL HYD	206.39	-	19	.25890	619.79	26.255	1.90144	1.500	3.741	
ADD HYD	206.99	5&19	5	3.70350	2086.40	278.526	1.41011	1.900	.880	
ROUTE MCUNGE	206.88	5	2	3.70350	2056.30	278.357	1.40926	2.000	.868	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	401.00	-	1	.05560	135.75	5.261	1.77417	1.500	3.815	PER IMP= 50.00
ADD HYD	401.90	1& 2	5	3.75910	2083.38	283.619	1.41466	2.000	.866	
RAINFALL TYPE= 2										RAIN24= 2.730
COMPUTE NM HYD	402.00	-	1	.29180	631.89	27.357	1.75788	1.550	3.384	PER IMP= 50.00
ADD HYD	402.90	1& 5	6	4.05090	2242.77	310.975	1.43938	2.000	.865	
*S FLOW TO N. DIVERSION CHANNEL FROM NORTH EL CAMINO ARROYO										
FINISH										

EL CAMINO - 100YR. - FULL DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/11/1996
INPUT FILE = EC100B.FUT USER NO.= RSTECHNM.STE

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
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 3.370
COMPUTE NM HYD	201.00	-	1	.13390	207.70	6.497	.90979	1.500	2.424	PER IMP= 5.00
RAINFALL TYPE= 2										RAIN24= 3.500
COMPUTE NM HYD	200.00	-	3	.30300	487.60	15.384	.95201	1.550	2.514	PER IMP= .00
*S EL CAMINO ARROYO AT TRAMWAY BLVD (200.0)										
ROUTE MCUNGE	200.80	3	4	.30300	453.59	15.176	.93914	1.700	2.339	CCODE = .1
ADD HYD	201.90	4& 1	5	.43690	559.37	21.674	.93014	1.650	2.000	
*S EL CAMINO ARROYO (MAIN) AT BROWNING (201.9)										
ROUTE MCUNGE	201.80	5	2	.43690	534.38	21.592	.92664	1.800	1.911	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.250
COMPUTE NM HYD	202.10	-	1	.10310	223.44	7.813	1.42091	1.500	3.386	PER IMP= 17.00
ADD HYD	202.19	1& 2	5	.54000	615.10	29.405	1.02101	1.750	1.780	
*S EL CAMINO ARROYO (MAIN) AT EUBANK (202.19)										
ROUTE MCUNGE	202.18	5	2	.54000	591.52	29.266	1.01619	1.850	1.712	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.190
COMPUTE NM HYD	202.20	-	1	.10990	229.39	8.219	1.40216	1.500	3.261	PER IMP= 17.00
ADD HYD	202.29	1& 2	5	.64990	652.42	37.485	1.08146	1.850	1.569	
*S EL CAMINO ARROYO (MAIN) AT HOLBROOK (202.29)										
ROUTE MCUNGE	202.28	5	2	.64990	647.14	37.484	1.08143	1.950	1.556	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.070
COMPUTE NM HYD	202.30	-	1	.06840	156.98	5.834	1.59917	1.500	3.586	PER IMP= 30.00
ADD HYD	202.39	1& 2	6	.71830	682.02	43.318	1.13074	1.900	1.484	
*S EL CAMINO ARROYO (MAIN) AT VENTURA (202.39)										
RAINFALL TYPE= 2										RAIN24= 3.140
COMPUTE NM HYD	203.10	-	1	.12580	257.46	9.143	1.36267	1.500	3.198	PER IMP= 17.00
*S EL CAMINO ARROYO (TRIBUTARY) AT HOLBROOK (203.1)										
ROUTE MCUNGE	203.18	1	2	.12580	237.85	9.047	1.34848	1.650	2.954	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.070
COMPUTE NM HYD	203.20	-	1	.04850	111.19	4.137	1.59917	1.500	3.582	PER IMP= 30.00
ADD HYD	203.29	1& 2	5	.17430	301.91	13.184	1.41823	1.650	2.706	
DD HYD	202.90	5& 6	5	.89260	818.98	56.502	1.18687	1.650	1.434	
OUTE MCUNGE	202.80	5	2	.89260	810.84	56.482	1.18647	1.940	1.419	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.020
COMPUTE NM HYD	203.30	-	1	.05580	141.22	5.693	1.91302	1.500	3.955	PER IMP= 50.00
ADD HYD	203.39	1& 2	5	.94840	875.42	62.175	1.22922	1.642	1.442	
*S EL CAMINO ARROYO (MAIN) AT BARSTOW (203.39)										
ROUTE MCUNGE	203.98	5	2	.94840	856.92	62.036	1.22646	1.850	1.412	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.960
COMPUTE NM HYD	204.00	-	1	.21190	390.65	19.426	1.71887	1.600	2.881	PER IMP= 42.00
ADD HYD	204.90	1& 2	5	1.16030	1065.97	81.461	1.31638	1.800	1.435	
*S EL CAMINO ARROYO AT WYOMING (204.9)										
ROUTE MCUNGE	204.80	5	2	1.16030	1047.60	81.345	1.31450	1.900	1.411	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.890
COMPUTE NM HYD	204.20	-	1	.13330	311.22	12.338	1.73550	1.500	3.648	PER IMP= 45.00
ADD HYD	204.29	1& 2	5	1.29360	1127.33	93.683	1.35789	1.900	1.362	
RAINFALL TYPE= 2										RAIN24= 2.910
COMPUTE NM HYD	204.10	-	1	.14840	276.54	11.781	1.48848	1.550	2.912	PER IMP= 30.00
ROUTE MCUNGE	204.18	1	2	.14840	272.77	11.791	1.48971	1.586	2.872	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
ADD HYD	204.19	2& 5	5	1.44200	1225.63	105.489	1.37165	1.886	1.328	
*S EL CAMINO ARROYO AT CORONADO AIRPORT (204.29)										
ROUTE MCUNGE	204.28	5	2	1.44200	1223.19	101.464	1.31932	1.885	1.325	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.850
COMPUTE NM HYD	205.00	-	1	.04590	125.85	5.278	2.15602	1.500	4.284	PER IMP= 70.00
ADD HYD	205.90	1& 2	5	1.48790	1259.10	106.382	1.34059	1.885	1.322	
*S EL CAMINO ARROYO AT I-25 (205.90)										
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.10	-	1	.12210	279.20	11.808	1.81320	1.500	3.573	PER IMP= 50.00
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.20	-	2	.05610	137.40	5.425	1.81320	1.500	3.827	PER IMP= 50.00
ADD HYD	206.29	1& 2	5	.17820	416.60	17.233	1.81319	1.500	3.653	
ROUTE	206.28	5	3	.17820	407.60	17.233	1.81320	1.550	3.574	
RAINFALL TYPE= 2										RAIN24= 2.760
OMPUTE NM HYD	206.40	-	1	.03270	80.27	3.102	1.77859	1.500	3.836	PER IMP= 50.00
OUTE	206.48	1	2	.03270	79.75	3.102	1.77860	1.500	3.811	

ADD HYD	206.49	2& 3	5	.21090	482.92	20.334	1.80783	1.550	3.578	
RAINFALL TYPE= 2										RAIN24= 2.760
OMPUTE NM HYD	206.30	-	1	.04800	138.49	5.921	2.31273	1.500	4.508	PER IMP= 86.00
DD HYD	206.39	1& 5	6	.25890	619.79	26.255	1.90144	1.500	3.741	

FINISH

LA CUEVA - 100YR - FULL DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/11/1996
INPUT FILE = LC100B.FUT USER NO.= RSTECHNM.STE

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
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 4.050
COMPUTE NM HYD	101.00	-	1	.60700	953.84	45.841	1.41600	1.650	2.455	PER IMP= .00
ROUTE MCUNGE	101.80	1	2	.60700	912.90	45.469	1.40451	1.850	2.350	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 4.200
COMPUTE NM HYD	100.00	-	1	1.21400	1201.70	87.881	1.35730	1.850	1.547	PER IMP= .00
ROUTE MCUNGE	100.80	1	3	1.21400	1177.21	87.700	1.35451	2.100	1.515	CCODE = .1
ADD HYD	101.88	3& 2	5	1.82100	1882.13	133.168	1.37117	1.950	1.615	
RAINFALL TYPE= 2										RAIN24= 3.650
COMPUTE NM HYD	102.00	-	1	.87500	1033.60	54.313	1.16386	1.700	1.846	PER IMP= .00
ADD HYD	102.90	1& 5	5	2.69600	2554.30	187.482	1.30389	1.900	1.480	
*S LA CUEVA TRIBUTARY ARROYO @ TRAMWAY BLVD. (102.9)										
ROUTE MCUNGE	102.80	5	2	2.69600	2515.07	187.100	1.30123	2.050	1.458	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.370
COMPUTE NM HYD	107.20	-	1	.17200	325.87	13.591	1.48157	1.550	2.960	PER IMP= 17.00
ADD HYD	107.29	1& 2	4	2.86800	2575.01	200.690	1.31205	2.050	1.403	
*S NORTH LA CUEVA AT GLENDALE AND BROWNING (107.29)										
RAINFALL TYPE= 2										RAIN24= 3.500
COMPUTE NM HYD	102.10	-	1	.09300	149.17	4.457	.89867	1.500	2.506	PER IMP= .00
*S LA CUEVA TRIBUTARY @ TRAMWAY BLVD.										
ROUTE MCUNGE	102.18	1	2	.09300	136.20	4.395	.88600	1.700	2.288	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.380
COMPUTE NM HYD	107.10	-	1	.18080	399.38	14.303	1.48327	1.500	3.452	PER IMP= 17.00
ADD HYD	107.19	1& 2	5	.27380	399.38	18.697	1.28040	1.500	2.279	
*S NORTH LA CUEVA (TRIB) AT FLORENCE AND BROWNING (107.19)										
ADD HYD	107.90	5& 4	3	3.14180	2666.73	219.388	1.30929	2.000	1.326	
RAINFALL TYPE= 2										RAIN24= 3.400
COMPUTE NM HYD	106.00	-	1	.04360	95.85	3.448	1.48281	1.500	3.435	PER IMP= 17.00
ROUTE MCUNGE	106.80	1	2	.04360	86.06	3.396	1.46043	1.700	3.084	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.340
COMPUTE NM HYD	106.10	-	1	.11160	238.47	8.685	1.45925	1.500	3.339	PER IMP= 17.00
ADD HYD	106.19	1& 2	6	.15520	257.25	12.081	1.45958	1.550	2.590	
'S LA CUEVA TRIBUTARY ARROYO @ BROWNING (106.19)										
ADD HYD	107.99	3& 6	5	3.29700	2733.21	231.469	1.31636	2.000	1.295	
ROUTE MCUNGE	107.80	5	2	3.29700	2713.95	231.319	1.31551	2.100	1.286	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.230
COMPUTE NM HYD	109.00	-	1	.10060	216.30	7.552	1.40751	1.500	3.359	PER IMP= 17.00
ADD HYD	109.90	1& 2	5	3.39760	2736.13	238.871	1.31823	2.100	1.258	
RAINFALL TYPE= 2										RAIN24= 3.250
COMPUTE NM HYD	108.00	-	7	.20550	404.63	15.573	1.42091	1.550	3.077	PER IMP= 17.00
ADD HYD	109.99	5& 7	5	3.60310	2789.17	254.444	1.32409	2.100	1.210	
*S LA CUEVA ARROYO @ EUBANK (MAIN) (109.99)										
ROUTE MCUNGE	109.88	5	2	3.60310	2763.62	254.113	1.32237	2.200	1.198	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.130
COMPUTE NM HYD	110.00	-	1	.16340	275.61	11.738	1.34689	1.550	2.636	PER IMP= 17.00
ADD HYD	110.90	1& 2	5	3.76650	2796.05	265.851	1.32343	2.200	1.160	
*S LA CUEVA ARROYO @ VENTURA (MAIN) (110.90)										
ROUTE MCUNGE	110.80	5	2	3.76650	2786.59	265.626	1.32231	2.250	1.156	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.020

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	111.10	-	1	.10690	274.26	10.950	1.92055	1.500	4.009	PER IMP= 50.00
ADD HYD	111.19	1& 2	5	3.87340	2803.75	276.576	1.33882	2.250	1.131	
RAINFALL TYPE= 2										RAIN24= 3.050
COMPUTE NM HYD	111.00	-	1	.06740	142.79	5.325	1.48141	1.500	3.310	PER IMP= 25.00
ADD HYD	111.99	1& 5	5	3.94080	2812.86	281.901	1.34126	2.250	1.115	
*S LA CUEVA ARROYO @ BARSTOW (111.99)										
ROUTE MCUNGE	111.80	5	2	3.94080	2810.03	279.600	1.33031	2.255	1.114	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.960
COMPUTE NM HYD	112.00	-	1	.17650	436.35	17.654	1.87543	1.500	3.863	PER IMP= 50.00
ADD HYD	112.90	1& 2	5	4.11730	2838.78	296.545	1.35045	2.255	1.077	
*S LA CUEVA ARROYO @ WYOMING (112.90)										
ROUTE MCUNGE	112.80	5	2	4.11730	2833.18	296.631	1.35085	2.273	1.075	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.930
COMPUTE NM HYD	113.00	-	1	.11360	282.19	11.193	1.84750	1.500	3.881	PER IMP= 50.00
ADD HYD	113.90	1& 2	5	4.23090	2849.38	307.823	1.36418	2.273	1.052	
*S LA CUEVA MAIN ARROYO @ LOUISIANA (113.90)										

ROUTE MCUNGE	113.80	5	4	4.23090	2835.18	307.830	1.36420	2.350	1.047	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.850
COMPUTE NM HYD	115.00	-	3	.13370	347.51	14.182	1.98890	1.500	4.061	PER IMP=	62.00
)D HYD	115.90	4& 3	5	4.36460	2851.08	322.012	1.38334	2.350	1.021		
*S LA CUEVA NORTH (MAIN) ARROYO @ I-25 (115.90)											
RECALL HYD	205.90	-	9	1.48790	1259.10	106.380	1.34056	1.885	1.322		
ADD HYD	115.99	5& 9	5	5.85250	3662.44	425.243	1.36238	2.266	.978		
ROUTE MCUNGE	115.80	5	2	5.85250	3662.18	425.140	1.36205	2.281	.978	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.830
COMPUTE NM HYD	118.00	-	1	.06490	172.75	7.273	2.10117	1.500	4.159	PER IMP=	70.00
ADD HYD	118.90	1& 2	5	5.91740	3672.25	431.904	1.36854	2.281	.970		
*S LA CUEVA NORTH (MAIN) ARROYO @ SAN MATEO											
RAINFALL TYPE= 2										RAIN24=	2.830
COMPUTE NM HYD	118.10	-	1	.03060	75.34	2.966	1.81763	1.500	3.847	PER IMP=	50.00
ADD HYD	118.99	1& 5	5	5.94800	3676.38	434.699	1.37031	2.281	.966		
ROUTE MCUNGE	118.80	5	2	5.94800	3674.40	433.019	1.36502	2.278	.965	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.760
COMPUTE NM HYD	126.00	-	1	.07370	195.81	8.059	2.05022	1.500	4.151	PER IMP=	70.00
ADD HYD	126.90	1& 2	5	6.02170	3685.79	440.484	1.37155	2.278	.956		
ROUTE MCUNGE	126.80	5	2	6.02170	3683.31	440.487	1.37156	2.316	.956	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.700
COMPUTE NM HYD	127.00	-	1	.06330	165.35	6.750	1.99932	1.500	4.081	PER IMP=	70.00
ADD HYD	127.90	1& 2	8	6.08500	3691.61	446.756	1.37661	2.316	.948		
*S NORTH LA CUEVA ARROYO AT APPROXIMATELY JEFFERSON ST.											
*S NOW BEGIN THE SOUTH LA CUEVA ARROYO EAST OF I-25											
RAINFALL TYPE= 2										RAIN24=	2.850
COMPUTE NM HYD	116.00	-	5	.13090	340.19	13.885	1.98890	1.500	4.061	PER IMP=	62.00
*S LA CUEVA SOUTH ARROYO @ I-25											
RAINFALL TYPE= 2										RAIN24=	2.890
COMPUTE NM HYD	117.40	-	1	.09210	224.53	8.908	1.81357	1.500	3.809	PER IMP=	50.00
ROUTE MCUNGE	117.49	1	2	.09210	208.29	8.914	1.81470	1.550	3.534	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.890
COMPUTE NM HYD	117.30	-	1	.10040	260.94	10.790	2.01499	1.500	4.061	PER IMP=	62.00
ADD HYD	117.39	2& 1	2	.19250	439.33	19.703	1.91916	1.550	3.566		
DIVIDE HYD	117.91	2	7	.09975	80.00	10.210	1.91916	1.350	1.253		
	117.39	AND	9	.09275	359.33	9.494	1.91916	1.550	6.053		

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	
RAINFALL TYPE= 2										RAIN24=	2.890
COMPUTE NM HYD	117.20	-	1	.16250	297.52	15.446	1.78226	1.600	2.861	PER IMP=	49.00
DIVIDE HYD	117.92	1	6	.10030	80.00	9.533	1.78226	1.400	1.246		
	117.27	AND	10	.06220	217.52	5.913	1.78226	1.600	5.464		
ADD HYD	117.93	7& 6	1	.20004	160.00	19.743	1.85052	1.400	1.250		
*S TOTAL RUNOFF TO SAN PEDRO STORM DRAIN											
ROUTE	117.98	1	2	.20004	160.00	19.743	1.85052	2.050	1.250		
ADD HYD	116.99	5& 2	5	.33094	498.86	33.628	1.90525	1.500	2.355		
*S SOUTH LACUEVA ARROYO AT CONFLUENCE JUST WEST OF I-25 CROSSING											
ADD HYD	117.29	10& 5	5	.39315	667.50	39.541	1.88579	1.550	2.653		
ROUTE MCUNGE	117.28	5	2	.39315	664.23	37.162	1.77231	1.531	2.640	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.830
COMPUTE NM HYD	119.00	-	1	.05490	146.12	6.152	2.10117	1.500	4.159	PER IMP=	70.00
ADD HYD	119.90	1& 2	5	.44805	799.59	42.988	1.79897	1.531	2.788		
RAINFALL TYPE= 2										RAIN24=	2.820
COMPUTE NM HYD	120.00	-	1	.02680	70.98	2.990	2.09159	1.500	4.139	PER IMP=	70.00
ADD HYD	120.90	1& 5	5	.47485	865.34	45.818	1.80920	1.531	2.847		
ROUTE MCUNGE	120.80	5	2	.47485	858.35	45.014	1.77745	1.539	2.824	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.760
COMPUTE NM HYD	125.00	-	1	.05080	134.25	5.548	2.04765	1.500	4.129	PER IMP=	70.00
ADD HYD	125.90	1& 2	6	.52565	980.11	50.198	1.79059	1.539	2.913		
*S LA CUEVA ARROYO SOUTH BEFORE WILDFLOWER FLOWS JUST UPSTREAM OF 96" RCP											
RAINFALL TYPE= 2										RAIN24=	2.810
COMPUTE NM HYD	121.00	-	1	.04890	130.08	5.442	2.08650	1.500	4.156	PER IMP=	70.00
*S WILDFLOWER ARROYO AT SAN MATEO BLVD.											
DIVIDE HYD	121.83	1	11	.02445	65.04	2.721	2.08649	1.500	4.156		
	121.84	AND	12	.02445	65.04	2.721	2.08649	1.500	4.156		
ROUTE MCUNGE	121.81	11	2	.02445	60.11	2.697	2.06844	1.600	3.841	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.750
COMPUTE NM HYD	123.00	-	1	.01850	44.03	1.701	1.72356	1.500	3.719	PER IMP=	50.00
ADD HYD	123.90	1& 2	5	.04295	93.48	4.398	1.91987	1.550	3.401		
ROUTE MCUNGE	121.82	12	2	.02445	60.16	2.690	2.06322	1.600	3.845	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.750
COMPUTE NM HYD	122.00	-	1	.02250	53.55	2.068	1.72356	1.500	3.719	PER IMP=	50.00
ADD HYD	122.90	1& 2	3	.04695	100.95	4.759	1.90043	1.550	3.360		
RAINFALL TYPE= 2										RAIN24=	2.740

COMPUTE NM HYD	124.00	-	1	.02510	59.74	2.301	1.71856	1.500	3.719	PER IMP= 50.00
ADD HYD	124.91	3& 1	4	.07205	154.29	7.059	1.83707	1.550	3.346	
IVIDE HYD	122.85	4	1	.06183	90.00	6.058	1.83707	1.450	2.274	
	124.92	AND	2	.01022	64.29	1.001	1.83707	1.550	9.833	
*S TOTAL OUTFLOW TO ALAMEDA FROM JEFFERSON VIA 36" STORM DRAIN.										
ROUTE MCUNGE	124.83	2	3	.01022	58.69	.966	1.77240	1.585	8.976	CCODE = .1
ADD HYD	124.91	5& 3	4	.05317	150.58	5.359	1.88982	1.585	4.425	
*S SUBTRACT FLOW INTERCEPTED BY 36" PIPE TO WATERCRESS CHANNEL										
DIVIDE HYD	123.81	4	1	.04179	70.00	4.212	1.88982	1.489	2.617	
	123.99	AND	2	.01138	80.58	1.147	1.88982	1.585	11.068	
ADD HYD	125.99	6& 1	3	.56744	1050.11	54.136	1.78882	1.539	2.892	
*S TOTAL FLOW AT ENTRANCE TO 96" PIPE										
ROUTE	125.88	3	1	.56744	1052.95	54.100	1.78762	1.550	2.899	
ADD HYD	127.91	1& 8	8	6.65244	4029.71	500.198	1.40982	1.907	.946	
ADD HYD	127.92	2& 8	5	6.66381	4029.71	501.317	1.41056	1.907	.945	
RAINFALL TYPE= 2										RAIN24= 2.690

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	128.00	-	1	.13730	318.30	14.604	1.99431	1.550	3.622	PER IMP= 70.00
ADD HYD	128.90	1& 5	5	6.80111	4136.37	514.902	1.41953	1.907	.950	
*S LA CUEVA ARROYO TOTAL @ THE NORTH DIVERSION CHANNEL										

FINISH

LA CUEVA DIV. - 100 YR - FULL DEV.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =06/11/1996
INPUT FILE = LCDV100B.FUT USER NO.= RSTECHNM.STE

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
START										TIME= .00
RAINFALL TYPE= 2										RAIN24= 3.550
COMPUTE NM HYD	103.20	-	1	.06160	147.27	5.997	1.82535	1.500	3.736	PER IMP= 29.00
ROUTE MCUNGE	103.80	1	2	.06160	147.22	6.011	1.82961	1.550	3.734	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.500
COMPUTE NM HYD	103.40	-	1	.09530	239.06	9.771	1.92240	1.500	3.919	PER IMP= 35.00
ADD HYD	103.49	1& 2	11	.15690	372.35	15.782	1.88597	1.500	3.708	
*S SOUTH LACUEVA TRIB @ TRAMWAY BLVD (103.49)										
RAINFALL TYPE= 2										RAIN24= 3.500
COMPUTE NM HYD	103.50	-	1	.06250	157.65	6.408	1.92240	1.500	3.941	PER IMP= 35.00
ADD HYD	103.59	1&11	5	.21940	530.01	22.190	1.89634	1.500	3.775	
ROUTE MCUNGE	103.48	5	2	.21940	527.26	22.226	1.89941	1.550	3.755	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.450
COMPUTE NM HYD	104.10	-	1	.12000	281.54	10.631	1.66102	1.500	3.666	PER IMP= 25.00
ADD HYD	104.19	1& 2	5	.33940	781.37	32.856	1.81512	1.550	3.597	
*S SOUTH LACUEVA TRIB @ LOWELL (104.19)										
ROUTE MCUNGE	104.18	5	2	.33940	743.87	32.801	1.81206	1.650	3.425	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.350
COMPUTE NM HYD	104.20	-	1	.08040	156.14	6.295	1.46801	1.550	3.034	PER IMP= 17.00
ADD HYD	104.29	1& 2	6	.41980	864.75	39.095	1.74616	1.600	3.219	
*S SOUTH LACUEVA TRIB @ BROWNING (104.29)										
RAINFALL TYPE= 2										RAIN24= 3.750
COMPUTE NM HYD	103.00	-	1	.21200	365.76	14.423	1.27562	1.550	2.696	PER IMP= .00
ROUTE RESERVOIR	103.11	1	2	.21200	341.18	14.423	1.27562	1.600	2.515	AC-FT= 1.951
ROUTE MCUNGE	103.81	2	3	.21200	329.31	14.386	1.27236	1.750	2.427	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.600
COMPUTE NM HYD	103.60	-	1	.06840	169.48	7.142	1.95774	1.500	3.872	PER IMP= 35.00
ADD HYD	103.19	1& 3	5	.28040	396.12	21.528	1.43955	1.750	2.207	
RAINFALL TYPE= 2										RAIN24= 3.600
COMPUTE NM HYD	103.10	-	1	.22990	326.84	14.085	1.14876	1.600	2.221	PER IMP= .00
ROUTE MCUNGE	103.88	1	2	.22990	316.24	14.054	1.14622	1.700	2.149	CCODE = .1
DD HYD	103.99	5& 2	5	.51030	708.51	35.582	1.30739	1.750	2.169	
S NORTH LACUEVA TRIB @ TRAMWAY BLVD (103.99)										
ROUTE MCUNGE	103.18	5	2	.51030	686.03	35.448	1.30247	1.850	2.101	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.400
COMPUTE NM HYD	105.10	-	1	.13820	327.32	12.180	1.65254	1.500	3.701	PER IMP= 25.00
ADD HYD	105.19	1& 2	5	.64850	771.14	47.628	1.37707	1.800	1.858	
*S NORTH LACUEVA TRIB @ LOWELL (105.19)										
ROUTE MCUNGE	105.18	5	2	.64850	769.56	47.604	1.37638	1.850	1.854	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.330
COMPUTE NM HYD	105.20	-	1	.10580	233.25	8.224	1.45755	1.500	3.445	PER IMP= 17.00
ADD HYD	105.29	1& 2	5	.75430	827.62	55.829	1.38776	1.850	1.714	
*S NORTH LACUEVA TRIB @ BROWNING (105.29)										
ADD HYD	105.90	5& 6	17	1.17410	1507.68	94.924	1.51591	1.650	2.006	
*S TOTAL RUNOFF TO LACUEVA DIVERSION CHANNEL (105.9)										
FINISH										

North Camino Arroyo 10-yr
Future Condition Summary File

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =09/06/1996
INPUT FILE = nc10b.fut USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.660
COMPUTE NM HYD	300.00	-	1	.88400	509.61	34.987	.74209	1.800	.901	PER IMP=	.00
ROUTE MCUNGE	300.80	1	2	.88400	491.66	34.807	.73826	2.150	.869	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.390
COMPUTE NM HYD	301.00	-	1	.85200	374.23	24.387	.53669	1.800	.686	PER IMP=	.00
ADD HYD	301.90	1& 2	11	1.73600	719.02	59.194	.63933	2.050	.647		
*S NORTH EL CAMINO ARROYO AT TRAMWAY ROAD (301.90)											
ROUTE MCUNGE	301.82	11	2	1.73600	710.39	59.155	.63892	2.200	.639	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.230
COMPUTE NM HYD	302.00	-	1	.15760	213.57	7.816	.92984	1.500	2.117	PER IMP=	30.00
ADD HYD	302.90	1& 2	5	1.89360	725.20	66.971	.66313	2.200	.598		
ROUTE MCUNGE	302.81	5	1	1.89360	724.01	66.514	.65861	2.207	.597	CCODE =	.1
ROUTE MCUNGE	302.82	1	2	1.89360	722.36	66.661	.66006	2.350	.596	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.150
COMPUTE NM HYD	303.00	-	1	.17060	184.83	6.966	.76565	1.550	1.693	PER IMP=	20.00
ADD HYD	303.90	1& 2	5	2.06420	732.53	73.627	.66878	2.350	.554		
*S NORTH EL CAMINO ARROYO AT HOLBROOK (303.90)											
ROUTE MCUNGE	303.80	5	2	2.06420	728.11	73.609	.66863	2.400	.551	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.090
COMPUTE NM HYD	305.10	-	1	.16910	159.69	6.681	.74082	1.550	1.476	PER IMP=	20.00
ADD HYD	305.19	1& 2	5	2.23330	738.56	80.291	.67409	2.400	.517		
*S NORTH EL CAMINO ARROYO AT VENTURA (305.19)											
ROUTE MCUNGE	305.18	5	2	2.23330	731.91	80.183	.67319	2.500	.512	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.050
COMPUTE NM HYD	305.20	-	1	.15290	125.07	5.912	.72493	1.600	1.278	PER IMP=	20.00
ADD HYD	305.29	1& 2	5	2.38620	740.94	86.095	.67651	2.500	.485		
*S NORTH EL CAMINO ARROYO AT BARSTOW (305.29)											
ROUTE MCUNGE	305.28	5	2	2.38620	732.79	86.015	.67588	2.650	.480	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.970
COMPUTE NM HYD	312.00	-	1	.06600	61.07	2.401	.68219	1.550	1.446	PER IMP=	20.00
ADD HYD	312.90	1& 2	5	2.45220	734.79	88.416	.67605	2.650	.468		
*S NORTH EL CAMINO ARROYO AT WYOMING (312.90)											
ROUTE MCUNGE	312.80	5	2	2.45220	726.56	88.352	.67556	2.800	.463	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.910
COMPUTE NM HYD	313.00	-	1	.20920	250.33	11.376	1.01961	1.550	1.870	PER IMP=	49.00
ADD HYD	313.90	1& 2	7	2.66140	732.87	99.728	.70260	2.800	.430		
RAINFALL TYPE= 2										RAIN24=	2.110
COMPUTE NM HYD	304.00	-	1	.08400	92.34	3.106	.69341	1.500	1.718	PER IMP=	17.00
ROUTE MCUNGE	304.80	1	2	.08400	78.37	3.012	.67222	1.800	1.458	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.020
COMPUTE NM HYD	307.00	-	1	.06630	75.36	2.466	.69744	1.500	1.776	PER IMP=	20.00
ADD HYD	307.90	1& 2	5	.15030	102.15	5.478	.68334	1.750	1.062		
*S NORTH CAMINO ARROYO (TRIB) AT BARSTOW (307.90)											
ROUTE MCUNGE	307.81	5	1	.15030	91.96	5.379	.67105	2.000	.956	CCODE =	.1
ROUTE MCUNGE	307.82	1	2	.15030	88.23	5.343	.66653	2.150	.917	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.970
COMPUTE NM HYD	310.00	-	1	.10330	80.12	3.483	.63215	1.600	1.212	PER IMP=	17.00
ADD HYD	310.90	1& 2	6	.25360	101.31	8.826	.65252	2.150	.624		

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
RAINFALL TYPE= 2										RAIN24= 2.050
COMPUTE NM HYD	306.00	-	1	.10510	117.15	3.751	.66916	1.500	1.742	PER IMP= 17.00
ROUTE MCUNGE	306.80	1	2	.10510	98.22	3.614	.64474	1.750	1.460	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.990
COMPUTE NM HYD	308.00	-	1	.05350	58.24	1.845	.64646	1.500	1.701	PER IMP= 17.00
ADD HYD	308.90	1& 2	5	.15860	116.73	5.459	.64532	1.750	1.150	
RAINFALL TYPE= 2										RAIN24= 1.990
COMPUTE NM HYD	309.00	-	1	.07960	75.82	2.731	.64323	1.550	1.488	PER IMP= 17.00
ADD HYD	309.90	1& 5	5	.23820	149.47	8.189	.64462	1.750	.980	
ROUTE MCUNGE	309.80	5	2	.23820	139.37	8.158	.64219	1.950	.914	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.970
COMPUTE NM HYD	311.00	-	1	.15280	116.78	5.107	.62669	1.600	1.194	PER IMP= 17.00
ADD HYD	311.90	1& 2	5	.39100	198.87	13.265	.63613	1.750	.795	
ADD HYD	311.99	5& 6	5	.64460	267.56	22.091	.64258	1.950	.649	
*S NORTH CAMINO ARROYO (TRIB) AT CORONADO RUNWAY (311.99)										
ROUTE MCUNGE	311.81	5	1	.64460	263.14	22.043	.64118	2.050	.638	CCODE = .1
ROUTE MCUNGE	311.82	1	2	.64460	262.25	21.708	.63143	2.076	.636	CCODE = .1
*S NORTH EL CAMINO ARROYO AT I-25 (AP 313.99)										
ADD HYD	313.99	2& 7	5	3.30600	784.71	120.844	.68537	2.779	.371	
ROUTE MCUNGE	313.88	5	2	3.30600	779.26	120.777	.68499	2.900	.368	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.890
COMPUTE NM HYD	314.00	-	1	.09600	144.47	5.411	1.05679	1.500	2.351	PER IMP= 50.00
ADD HYD	314.99	1& 2	5	3.40200	780.42	126.188	.69548	2.900	.358	
RAINFALL TYPE= 2										RAIN24= 1.890
COMPUTE NM HYD	315.00	-	1	.04260	64.05	2.396	1.05449	1.500	2.349	PER IMP= 50.00
ADD HYD	315.99	1& 5	5	3.44460	780.94	128.584	.69992	2.900	.354	
RECALL HYD	206.39	-	19	.25890	376.50	15.625	1.13156	1.500	2.272	
ADD HYD	206.99	5&19	5	3.70350	795.00	144.208	.73010	2.100	.335	
ROUTE MCUNGE	206.88	5	2	3.70350	786.28	144.132	.72971	2.200	.332	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 1.840
COMPUTE NM HYD	401.00	-	1	.05560	82.44	3.035	1.02340	1.500	2.317	PER IMP= 50.00
ADD HYD	401.90	1& 2	5	3.75910	792.02	147.166	.73405	2.200	.329	
RAINFALL TYPE= 2										RAIN24= 1.820
COMPUTE NM HYD	402.00	-	1	.29180	360.39	15.753	1.01221	1.550	1.930	PER IMP= 50.00
ADD HYD	402.90	1& 5	6	4.05090	980.19	162.919	.75409	1.650	.378	
*S FLOW TO N. DIVERSION CHANNEL FROM NORTH EL CAMINO ARROYO										
FINISH										

El Camino Arroys Future Condition Summary File
10-YR

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =09/06/1996
NPUT FILE = ec10b.fut USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.250
COMPUTE NM HYD	201.00	-	1	.13390	81.06	2.525	.35355	1.500	.946	PER IMP=	5.00
RAINFALL TYPE= 2										RAIN24=	2.330
COMPUTE NM HYD	200.00	-	3	.30300	197.06	5.927	.36680	1.550	1.016	PER IMP=	.00
*S EL CAMINO ARROYO AT TRAMWAY BLVD (200.0)											
ROUTE MCUNGE	200.80	3	4	.30300	174.00	5.666	.35063	1.750	.897	CCODE =	.1
ADD HYD	201.90	4& 1	5	.43690	201.09	8.191	.35152	1.750	.719		
*S EL CAMINO ARROYO (MAIN) AT BROWNING (201.9)											
ROUTE MCUNGE	201.80	5	2	.43690	186.22	8.142	.34941	1.950	.666	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.170
COMPUTE NM HYD	202.10	-	1	.10310	121.81	3.961	.72027	1.500	1.846	PER IMP=	17.00
ADD HYD	202.19	1& 2	5	.54000	204.64	12.102	.42022	1.950	.592		
*S EL CAMINO ARROYO (MAIN) AT EUBANK (202.19)											
ROUTE MCUNGE	202.18	5	2	.54000	202.93	12.151	.42189	2.050	.587	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.130
COMPUTE NM HYD	202.20	-	1	.10990	122.75	4.133	.70507	1.500	1.745	PER IMP=	17.00
ADD HYD	202.29	1& 2	5	.64990	232.22	16.283	.46978	1.600	.558		
*S EL CAMINO ARROYO (MAIN) AT HOLBROOK (202.29)											
ROUTE MCUNGE	202.28	5	2	.64990	230.99	16.359	.47196	1.700	.555	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.050
COMPUTE NM HYD	202.30	-	1	.06840	90.55	3.165	.86748	1.500	2.069	PER IMP=	30.00
ADD HYD	202.39	1& 2	6	.71830	269.52	19.523	.50963	1.700	.586		
*S EL CAMINO ARROYO (MAIN) AT VENTURA (202.39)											
RAINFALL TYPE= 2										RAIN24=	2.090
COMPUTE NM HYD	203.10	-	1	.12580	136.73	4.591	.68422	1.500	1.698	PER IMP=	17.00
*S EL CAMINO ARROYO (TRIBUTARY) AT HOLBROOK (203.1)											
ROUTE MCUNGE	203.18	1	2	.12580	123.10	4.553	.67854	1.700	1.529	CCODE =	.1
AINFALL TYPE= 2										RAIN24=	2.050
OMPUTE NM HYD	203.20	-	1	.04850	64.24	2.244	.86749	1.500	2.070	PER IMP=	30.00
D HYD	203.29	1& 2	5	.17430	150.41	6.796	.73111	1.700	1.348		
D HYD	202.90	5& 6	5	.89260	419.93	26.320	.55288	1.700	.735		
ROUTE MCUNGE	202.80	5	2	.89260	403.62	26.270	.55182	1.750	.707	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.010
COMPUTE NM HYD	203.30	-	1	.05580	86.47	3.308	1.11170	1.500	2.421	PER IMP=	50.00
ADD HYD	203.39	1& 2	5	.94840	434.70	29.578	.58476	1.750	.716		
*S EL CAMINO ARROYO (MAIN) AT BARSTOW (203.39)											
ROUTE MCUNGE	203.98	5	2	.94840	399.69	29.497	.58315	1.950	.658	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	1.970
COMPUTE NM HYD	204.00	-	1	.21190	219.98	10.936	.96770	1.600	1.622	PER IMP=	42.00
ADD HYD	204.90	1& 2	5	1.16030	488.12	40.433	.65338	1.900	.657		
*S EL CAMINO ARROYO AT WYOMING (204.9)											
ROUTE MCUNGE	204.80	5	2	1.16030	484.26	40.494	.65437	1.950	.652	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	1.930
COMPUTE NM HYD	204.20	-	1	.13330	180.66	7.016	.98686	1.500	2.118	PER IMP=	45.00
ADD HYD	204.29	1& 2	5	1.29360	524.89	47.510	.68863	1.950	.634		
RAINFALL TYPE= 2										RAIN24=	1.940
COMPUTE NM HYD	204.10	-	1	.14840	151.13	6.285	.79413	1.550	1.591	PER IMP=	30.00
ROUTE MCUNGE	204.18	1	2	.14840	149.27	6.300	.79598	1.599	1.572	CCODE =	.2

La Cueva Arroyo Future Condition Summary File

11-yr

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =09/06/1996
INPUT FILE = lc10b.fut USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.700
COMPUTE NM HYD	101.00	-	1	.60700	509.80	23.753	.73371	1.650	1.312	PER IMP=	.00
ROUTE MCUNGE	101.80	1	2	.60700	476.53	23.555	.72760	1.950	1.227	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.800
COMPUTE NM HYD	100.00	-	1	1.21400	612.19	46.185	.71331	1.850	.788	PER IMP=	.00
ROUTE MCUNGE	100.80	1	3	1.21400	599.30	45.939	.70952	2.100	.771	CCODE =	.1
ADD HYD	101.88	3& 2	5	1.82100	1010.00	69.494	.71555	2.000	.867		
RAINFALL TYPE= 2										RAIN24=	2.430
COMPUTE NM HYD	102.00	-	1	.87500	448.31	23.830	.51065	1.700	.801	PER IMP=	.00
ADD HYD	102.90	1& 5	5	2.69600	1250.98	93.324	.64905	1.950	.725		
*S LA CUEVA TRIBUTARY ARROYO @ TRAMWAY BLVD. (102.9)											
ROUTE MCUNGE	102.80	5	2	2.69600	1233.20	93.101	.64749	2.100	.715	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.250
COMPUTE NM HYD	107.20	-	1	.17200	173.80	6.940	.75654	1.550	1.579	PER IMP=	17.00
ADD HYD	107.29	1& 2	4	2.86800	1259.20	100.041	.65403	2.100	.686		
*S NORTH LA CUEVA AT GLENDALE AND BROWNING (107.29)											
RAINFALL TYPE= 2										RAIN24=	2.330
COMPUTE NM HYD	102.10	-	1	.09300	62.01	1.663	.33524	1.500	1.042	PER IMP=	.00
*S LA CUEVA TRIBUTARY @ TRAMWAY BLVD.											
ROUTE MCUNGE	102.18	1	2	.09300	52.57	1.543	.31104	1.800	.883	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.250
COMPUTE NM HYD	107.10	-	1	.18080	213.04	7.266	.75349	1.500	1.841	PER IMP=	17.00
ADD HYD	107.19	1& 2	5	.27380	213.04	8.808	.60320	1.500	1.216		
*S NORTH LA CUEVA (TRIB) AT FLORENCE AND BROWNING (107.19)											
ADD HYD	107.90	5& 4	3	3.14180	1296.96	108.850	.64961	2.100	.645		
RAINFALL TYPE= 2										RAIN24=	2.270
COMPUTE NM HYD	106.00	-	1	.04360	53.01	1.753	.75385	1.500	1.900	PER IMP=	17.00
ROUTE MCUNGE	106.80	1	2	.04360	46.25	1.702	.73188	1.750	1.658	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.230
COMPUTE NM HYD	106.10	-	1	.11160	129.28	4.414	.74155	1.500	1.810	PER IMP=	17.00
ADD HYD	106.19	1& 2	6	.15520	130.47	6.116	.73883	1.500	1.314		
*S LA CUEVA TRIBUTARY ARROYO @ BROWNING (106.19)											
ADD HYD	107.99	3& 6	5	3.29700	1322.89	114.965	.65381	2.100	.627		
ROUTE MCUNGE	107.80	5	2	3.29700	1318.53	115.099	.65457	2.150	.625	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.150
COMPUTE NM HYD	109.00	-	1	.10060	117.54	3.815	.71104	1.500	1.826	PER IMP=	17.00
ADD HYD	109.90	1& 2	5	3.39760	1329.78	118.914	.65624	2.100	.612		
RAINFALL TYPE= 2										RAIN24=	2.170
COMPUTE NM HYD	108.00	-	7	.20550	214.13	7.894	.72027	1.550	1.628	PER IMP=	17.00
ADD HYD	109.99	5& 7	5	3.60310	1357.52	126.808	.65989	2.100	.589		
*S LA CUEVA ARROYO @ EUBANK (MAIN) (109.99)											
ROUTE MCUNGE	109.88	5	2	3.60310	1336.08	126.466	.65811	2.250	.579	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.090
COMPUTE NM HYD	110.00	-	1	.16340	141.22	5.863	.67278	1.550	1.350	PER IMP=	17.00
ADD HYD	110.90	1& 2	5	3.76650	1349.92	132.329	.65875	2.250	.560		
*S LA CUEVA ARROYO @ VENTURA (MAIN) (110.90)											
ROUTE MCUNGE	110.80	5	2	3.76650	1340.06	132.253	.65837	2.350	.556	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.010

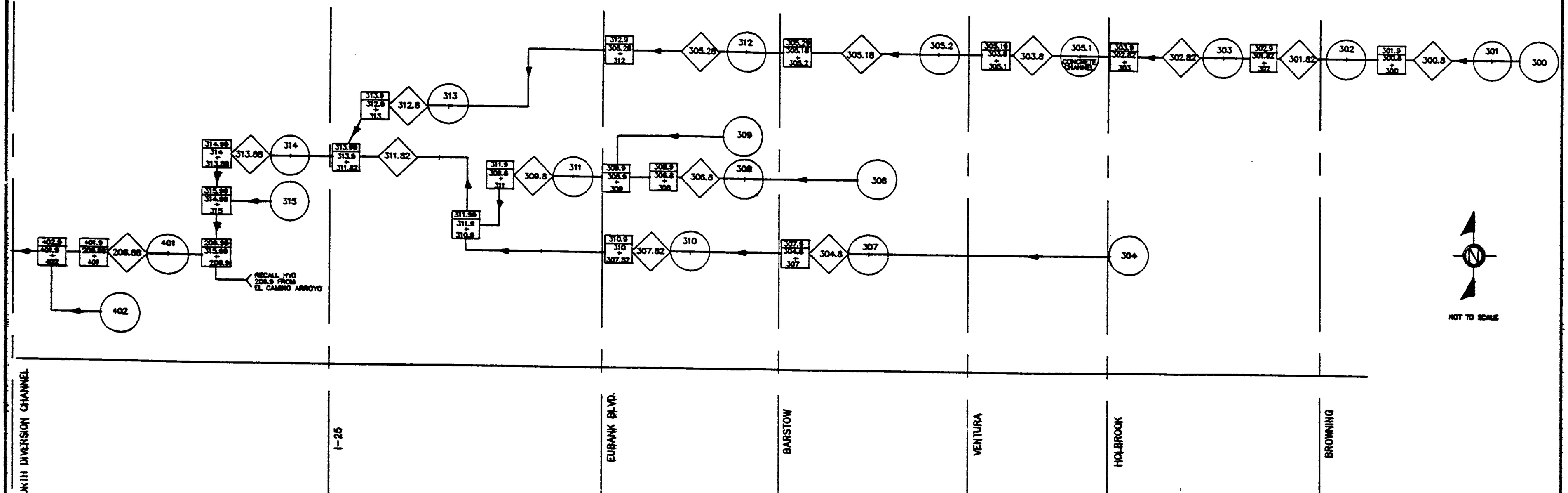
LA Cuenca Diversion Channel 10-YR
Future Condition Summary File.

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =09/06/1996
INPUT FILE = lcdv10b.fut USER NO.= RSTECHNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	2.370
COMPUTE NM HYD	103.20	-	1	.06160	87.21	3.311	1.00774	1.500	2.212	PER IMP=	29.00
ROUTE MCUNGE	103.80	1	2	.06160	86.26	3.315	1.00904	1.550	2.188	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.330
COMPUTE NM HYD	103.40	-	1	.09530	142.27	5.497	1.08145	1.500	2.333	PER IMP=	35.00
ADD HYD	103.49	1& 2	11	.15690	217.05	8.812	1.05302	1.500	2.162		
*S SOUTH LACUEVA TRIB @ TRAMWAY BLVD (103.49)											
RAINFALL TYPE= 2										RAIN24=	2.330
COMPUTE NM HYD	103.50	-	1	.06250	94.68	3.605	1.08145	1.500	2.367	PER IMP=	35.00
ADD HYD	103.59	1&11	5	.21940	311.73	12.416	1.06112	1.500	2.220		
ROUTE MCUNGE	103.48	5	2	.21940	286.01	12.329	1.05366	1.650	2.037	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.300
COMPUTE NM HYD	104.10	-	1	.12000	159.53	5.699	.89053	1.500	2.077	PER IMP=	25.00
ADD HYD	104.19	1& 2	5	.33940	373.20	18.029	.99598	1.650	1.718		
*S SOUTH LACUEVA TRIB @ LOWELL (104.19)											
ROUTE MCUNGE	104.18	5	2	.33940	367.75	18.102	1.00001	1.700	1.693	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.230
COMPUTE NM HYD	104.20	-	1	.08040	86.15	3.205	.74734	1.550	1.674	PER IMP=	17.00
ADD HYD	104.29	1& 2	6	.41980	415.66	21.306	.95162	1.700	1.547		
*S SOUTH LACUEVA TRIB @ BROWNING (104.29)											
RAINFALL TYPE= 2										RAIN24=	2.500
COMPUTE NM HYD	103.00	-	1	.21200	184.92	6.637	.58699	1.550	1.363	PER IMP=	.00
ROUTE RESERVOIR	103.11	1	2	.21200	151.32	6.637	.58699	1.650	1.115	AC-FT=	.752
ROUTE MCUNGE	103.81	2	3	.21200	150.12	6.566	.58073	1.800	1.106	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	2.400
COMPUTE NM HYD	103.60	-	1	.06840	101.97	4.042	1.10801	1.500	2.329	PER IMP=	35.00
ADD HYD	103.19	1& 3	5	.28040	181.24	10.608	.70935	1.750	1.010		
RAINFALL TYPE= 2										RAIN24=	2.400
COMPUTE NM HYD	103.10	-	1	.22990	149.93	6.117	.49885	1.600	1.019	PER IMP=	.00
ROUTE MCUNGE	103.88	1	2	.22990	144.39	6.107	.49806	1.750	.981	CCODE =	.1
ADD HYD	103.99	5& 2	5	.51030	325.62	16.715	.61416	1.750	.997		
*S NORTH LACUEVA TRIB @ TRAMWAY BLVD (103.99)											
ROUTE MCUNGE	103.18	5	2	.51030	323.28	16.780	.61656	1.850	.990	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.270
COMPUTE NM HYD	105.10	-	1	.13820	184.01	6.513	.88358	1.500	2.080	PER IMP=	25.00
ADD HYD	105.19	1& 2	5	.64850	380.72	23.293	.67346	1.750	.917		
*S NORTH LACUEVA TRIB @ LOWELL (105.19)											
ROUTE MCUNGE	105.18	5	2	.64850	380.04	23.351	.67514	1.800	.916	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.220
COMPUTE NM HYD	105.20	-	1	.10580	127.52	4.175	.73985	1.500	1.883	PER IMP=	17.00
ADD HYD	105.29	1& 2	5	.75430	411.37	27.526	.68421	1.800	.852		
*S NORTH LACUEVA TRIB @ BROWNING (105.29)											
ADD HYD	105.90	5& 6	17	1.17410	766.40	48.832	.77983	1.750	1.020		
*S TOTAL RUNOFF TO LACUEVA DIVERSION CHANNEL (105.9)											
FINISH											

LEGEND

- 300 — BASIN 100 HYD. COMP.
- 300.8 — ROUTING POINT 100.8
- 300.8 — ANALYSIS POINT (COMBINATION POINT)
- DIVIDE HYDROGRAPH
- DIRECTION OF FLOW
- 301 — ROUTING THROUGH BASIN 301 (ROUTING IS THROUGH NATURAL CHANNEL UNLESS OTHERWISE NOTED.)



NOT TO SCALE

Resource Technology, Inc.

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA/CAMINO AND NORTH CAMINO DRAINAGE MANAGEMENT PLAN

HYDROLOGY SCHEMATIC
NORTH CAMINO ARROYO

PROJECT NO.	95-180	MAP NO. B-C8&9&10	SHEET 1 OF 4

LEGEND

200 — BASIN 100 HYD. COMP.

200.8 — ROUTING POINT 100.8

200.8 — ANALYSIS POINT (COMBINATION POINT)

DIRECTION OF FLOW

201 — ROUTING THROUGH BASIN 201 (ROUTING IS THROUGH NATURAL CHANNEL UNLESS OTHERWISE NOTED.)

200.8

201.9 + 201.8 + 200

DIVIDE HYDROGRAPH

200 201 201.8 200.8 201.9 + 201.8 + 201 202.1 202.18 202.2 202.28 202.3 203.1 203.18 203.2 203.3 202.8 203.98 204 204.8 204.2 204.18 204.1 204.28 205 204.8 + 204.2 204.28 + 205 204.18 + 204.28 + 205 204.9 + 204 203.98 + 204 202.8 + 203.3 202.9 + 202.28 + 203.3 202.28 + 203.3 202.18 + 202.2 202.28 + 202.2 202.18 + 202.1 203.9 + 203.18 + 203.2 206.28 206.3 PIPE FLOW 206.48 206.1 206.2 206.4 206.28 + 206.48 206.28 + 206.1 + 206.2 206.48 + 206.4 206.38 + 206.48 + 206.3

HYDROGRAPH 206.38 IS DIVERTED TO THE NORTH CAMINO ARROYO

HYDROGRAPH 205.9 IS DIVERTED TO THE NORTH LA CUEVA CHANNEL

NORTH DIVERSION CHANNEL

I-25

WYOMING

BARSTOW

VENTURA

HOLBROOK

EUBANK

BROWNING

NOT TO SCALE

Resource Technology, Inc.

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA/CAMINO AND NORTH CAMINO DRAINAGE MANAGEMENT PLAN

HYDROLOGY SCHEMATIC EL CAMINO ARROYO

PROJECT NO. 95-180 | MAP NO. B-C2E28 | SHEET 2 OF 4

Date: 08-12-96 C:\WORK\95-180\DWG\95180-11.DWG

LEGEND

- 100 — BASIN 100 HYD. COMP.
- 106.8 — ROUTING POINT 106.8
- 100.8 — ANALYSIS POINT (COMBINATION POINT)
- DIV HYD — DIVIDE HYDROGRAPH
- DIRECTION OF FLOW
- 106 — ROUTING THROUGH BASIN 106 (ROUTING IS THROUGH NATURAL CHANNEL UNLESS OTHERWISE NOTED.)

NORTH DIVERSION CHANNEL
PATTERSON
SAN MATEO
I-25
LOUISIANA
WYOMING
BARSTOW
VENTURA
HOLBROOK
EUBANK
BROWNING
TRAMWAY

NOT TO SCALE

Resource Technology, Inc.

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA CANYON AND NORTH CANYON DRAINAGE MANAGEMENT PLAN

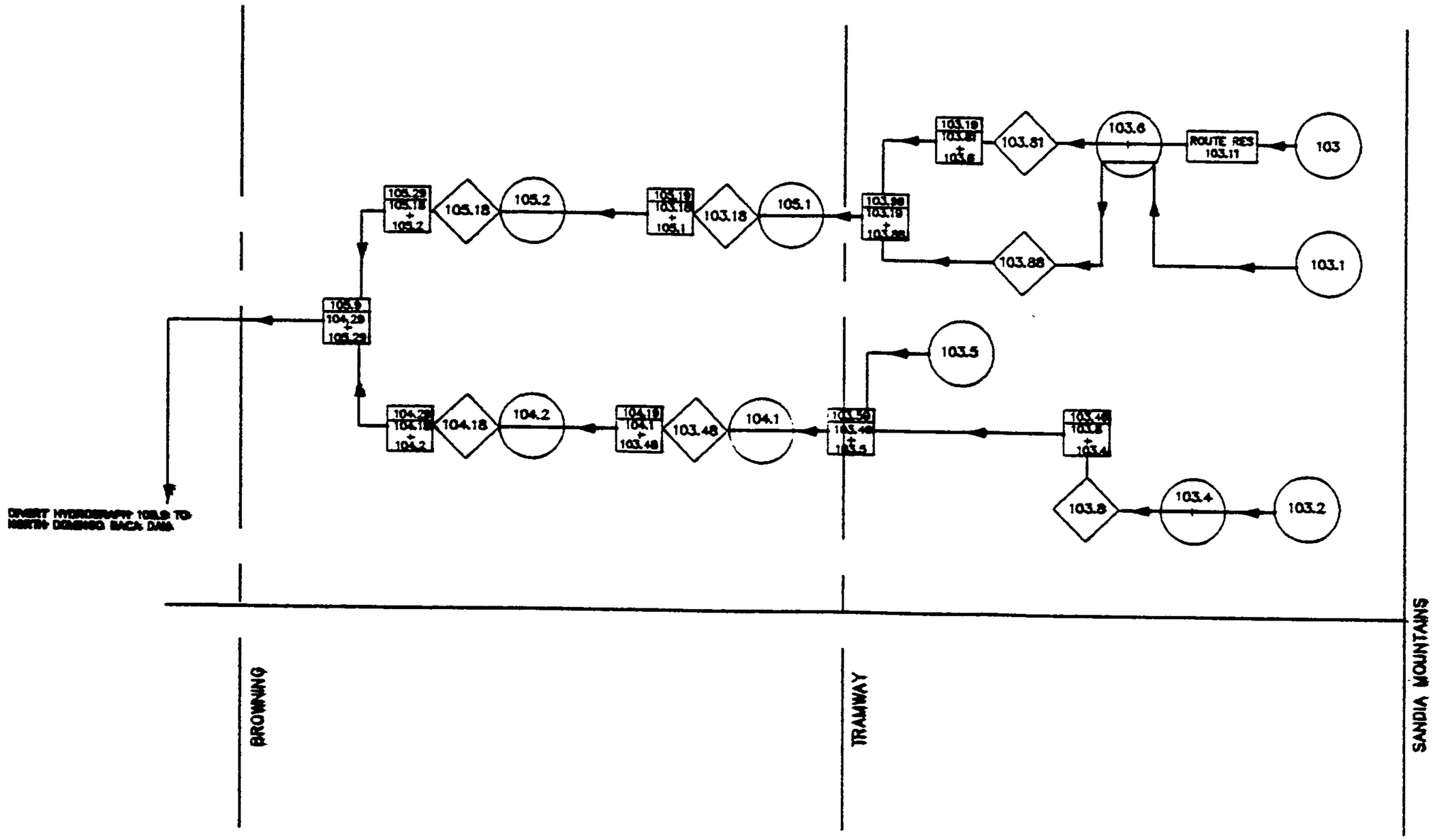
HYDROLOGY SCHEMATIC
LA CUEVA ARROYO

PROJECT NO.	95-180	MAP NO. B-C28,29,30	SHEET 3 OF 4

DWG: C:\LA95\B-28 - 1W
TIME: 08-10-98 10:

LEGEND

- 103 — BASIN 103 HYD. COMP.
- 103.6 — ROUTING POINT 103.6
- 103.19 — ANALYSIS POINT (COMBINATION POINT)
- DIRECTION OF FLOW
- 103.6 — ROUTING THROUGH BASIN 103.6 (ROUTING IS THROUGH NATURAL CHANNEL UNLESS OTHERWISE NOTED.)
- 103.51 — 103.19 + 103.51 + 103.6
- DIV HYD — DIVIDE HYDROGRAPH
- ROUTE RES 103.11 — ROUTE RESERVOIR 103.11



NOT TO SCALE

Resource Technology, Inc.

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA CANYO AND NORTH CANYO DRAINAGE MANAGEMENT PLANS

HYDROLOGY SCHEMATIC
LA CUEVA DIVERSION CHANNEL

PROJECT NO.	MAP NO.	SHEET
95-180	B-C23.20	4 OF 4

DWG: CA\MAN\96-1-104\MAN\DWG\95180
TIME: 02-16-96 15:

APPENDIX A: Section 11

San Pedro Storm Drain Diversion
Notes And Calculations

SAN PEDRO STORM DRAIN NOTES AND CALCULATIONS

BASIN 117.3

-RTI AHYMO has 80 cFs from this Dasin entering San Pedro Storm Drain.

-Sonora Subdivision:

-Wilshire paved From Louisiana to West edge of Sonora Subdivision,

-4 inlets on Wilshire, at west edge of Sonora Subdivision.

- 2 inlets in subdivision, at end of Cul-du-Sacs.

-Approximate Flow to Storm drain = 25 cfs,

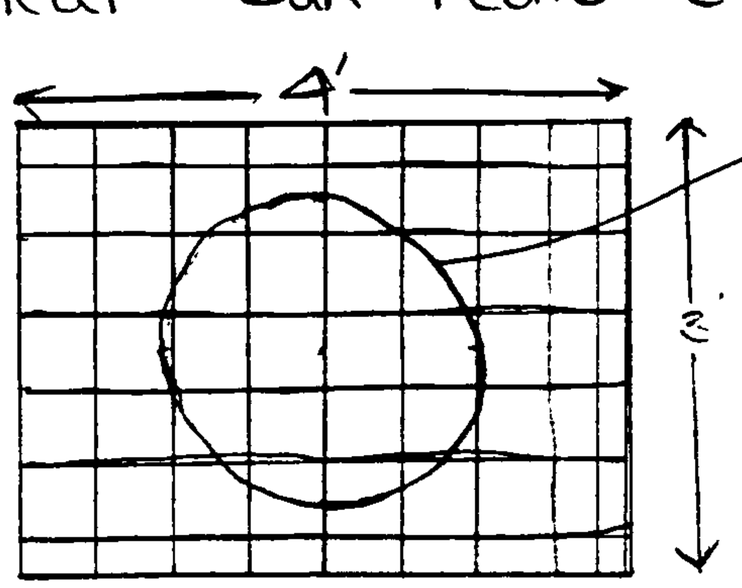
-Flow approximation made from percent of area of basin that is in Storm drain area.

- Alameda Ave. Inlets:

-2 inlets

-Typical San Pedro Storm Drain Inlet

-inlet is horizontal with bar grate covering pipe inlet.



-estimate of possible head ≅ 0.5F+
(From site visit)

BOHANNAN-HUSTON INC.

PROJECT NAME La Cueva + S. El Camino Lomes SHEET 1 OF 3

PROJECT NO. 96155C1.210 BY SJG DATE 5/10/96

SUBJECT San Pedro Storm Drain CH'D [illegible] DATE 5/10/96

BASIN 117.3 CONTINUED

-used Orifice Program to estimate flow into inlets

-incremental elev. = 0.1'
-top of dam elev. = 1.0'
-pipe elev. = 0
-pipe diameter = 24"

*program output is attached

0.5 Ft head → Q ≃ 10 cfs

-Assuming each inlet on San Pedro allows ≃ 10 cfs.

-Therefore, Alameda Ave. Inlets ≅ 20 cfs

TOTAL

-From site visits, total Flow For Basin 117.3 entering Storm drain =

25cfs + 20cfs = 45 cfs

BASIN 117.2

-3 inlets to storm drain
-3×10cfs ≃ 30 cfs

BASIN 116

-all Flow from this basin reaches Structure 12, at I-25, including any Flow from this basin that enters the Storm drain
-do not need to estimate what flow from this basin enters the Storm drain.

ORIFICE PROGRAM

SAN PEDRO STORM DRAIN TYPICAL INLET

TPE DIAMETER = 24"
ESTIMATED TYPICAL HEAD ABOVE INLET = 0.5 FT

ELEVATION (FT)	DISCHARGE (CFS)
0.10000	4.78155
0.20000	6.76213
0.30000	8.28188
0.40000	9.56309
0.50000	10.69186
0.60000	11.71235
0.70000	12.65078
0.80000	13.52425
0.90000	14.34464
DISCHARGE AT TOP	15.12058

APPENDIX B

Form 4 : Riverine Hydraulic Analysis Form #1
North La Cueva Arroyo, East of I-25

Backup Data

1. Disk #2: diskette containing the HEC-2 computer model input and output files for the 100-year recurrence intervals.

2. HEC-2 output for the revised conditions model for the North La Cueva Arroyo located east of I-25.

3. Summary of the source of input parameters used in the revised conditions model.

4. Calculations for section number 2205, where the water surface elevation is higher than end points of cross section.

5. HEC-2 model from the accepted LOMR for Nor Este Estates Subdivision.

APPENDIX B: Section 1

Hec-2 Computer Model Input And Output Files For The 100-Year Recurrence Intervals

APPENDIX B: Section 2

HEC-2 Output for the Revised Conditions Model for the North La Cueva Arroyo Located East of I-25

HEC2 S 1363001424 HMVersion: 6.52 Data File: E:\HEC :\NLCREV.HC2

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE     6JUN96    TIME   14:50:39  *
*******************************************
```


```
************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
```


```
 X     X  XXXXXXX   XXXXX              XXXXX
 X     X  X        X     X            X     X
 X     X  X        X                        X
 XXXXXXX  XXXX     X          XXXXX    XXXXX
 X     X  X        X                   X
 X     X  X        X     X             X
 X     X  XXXXXXX   XXXXX              XXXXXXX


:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
:::                                       :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                       :::
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
```


```
============================
H A E S T A D   M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 6JUN96 14:50:39

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

```
T1      RESOURCE TECHNOLOGY INC., ALBUQUERQUE NM (rev. by BOHANNAN-HUSTON INC.)
T1      FEMA RE-STUDY (ALBUQUERQUE, NM) (rev. for LOMR)
T1      DATE: 11/23/93,11/24 (rev. 4/3/96)
T2      FILENAME: NLCREV.HC2  SUPER-CRITICAL
T2      NORTH LA CUEVA ARROYO I-25 TO BARSTOW
T2      CROSS SECTIONS REVISED 4/15/96 BY SJG USING 1"=200' ORTHOPHOTO/TOPO MAPS
T2      FLOWS REVISED 5/28/96 TO MATCH RTI'S REVISED AHYMO MODEL (FILE: LC100C.H
T2      FLOWS INCLUDE SEDIMENT BULKING FACTORS CALC. BY RTI'S EQUATION
T2      STARTING WATER SURFACE ELEV. WAS TAKEN AS NORMAL DEPTH (FILE: NORESTE.IN
T3      100 YEAR FLOW

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ
        0         2         0         1         0         0         0         0    5398.7

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE
        1         0        -1       0.0       0.0       0.0        -1       0.0       0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

       38        39        42        51        43         1         2         3         5         4
        8        26        25
       38         1         2         8         3        23        24        39        26        43

NC    0.013     0.013     0.013       0.1       0.3
QT        1      2986
          THE FIRST 6 SECTIONS ARE TAKEN FROM THE ESPY-HUSTON HEC-2 RUN
          FOR THE NOR ESTE ESTATES SUBDIVISION LOMR RECEIVED
          JUNE 3, 1988 (NUMBERED 20 THRU 25 BY E-H)
X1     7062         4         0      52.2     211.0     211.0     211.0         0         0         0
GR   5402.7         0    5394.50      17.5    5394.2      27.5    5406.6      52.2

X1     6851         4         0      51.0      77.0      77.0      77.0         0         0         0
GR   5398.4       0.0    5390.20      17.5    5389.90     27.50    5401.70     51.00

NC    0.045     0.045     0.045       0.1       0.3
```

```
          DUMPED RIP RAP ON THE CHANNEL SIDES AND BOTTOM
X1      6774          7          0       77.5       50.0       50.0       50.0        0          0          0
GR    5398.8          0    5397.80       5.00    5395.80      17.00    5387.70    34.50    5387.70    44.50
GR    5397.4      65.50    5398.40      77.50

X1      6724          5          0      102.0       50.0       50.0       50.0        0          0          0
GR    5397.6          0    5386.90      35.00    5386.90      75.00    5397.60    90.00    5397.90     102.00

X1      6674          7          0     500.00       24.0       24.0       24.0        0          0          0
GR    5393.5       0.00    5387.50     175.00    5386.50     220.00    5386.50     285.00    5387.50     320.00
GR    5389.5     390.00    5395.50     500.00

NC     0.017      0.017      0.017        0.1        0.3
QT         1       2989
          CROSS SECTION ON WYOMING, SECTION P-P
X1      6650          7       0.00     490.00     135.00     135.00     135.00        0          0          0
GR    5393.4       0.00    5386.20     220.00    5386.20     245.00    5386.20     285.00    5387.65     320.00
GR    5389.4     380.00    5395.35     490.00

NC     0.050      0.050      0.038        0.1        0.3
          TRAINING DIKE, SOUTH OF EAGLE ROCK, SECTION O-O
X1      6515         15     500.00     738.00      425.0      425.0      425.0        0          0          0
X3        10
GR    5394.0     500.00    5394.00     515.00    5392.00     520.00    5390.00     527.00    5388.00     532.00
GR    5386.0     538.00    5385.00     545.00    5384.75     558.00    5384.75     600.00    5385.00     618.00
GR    5386.0     630.00    5388.00     654.00    5390.00     670.00    5392.00     695.00    5394.00     738.00

          TRAINING DIKE, NORTH OF EAGLE ROCK, SECTION N-N
X1      6090         13     510.00     682.00      280.0      280.0      280.0        0          0          0
X3        10
GR    5384.0     500.00    5384.00     510.00    5382.00     518.00    5380.00     521.00    5378.00     552.00
GR    5376.0     570.00    5375.00     572.00    5375.00     578.00    5376.00     580.00    5378.00     588.00
GR    5380.0     630.00    5382.00     647.00    5384.00     682.00

          NEW CROSS SECTION, SECTION N1-N1
X1      5810         16     500.00     778.00      235.0      235.0      235.0        0          0          0
X3        10
GR    5374.8     500.00    5374.00     530.00    5372.00     580.00    5370.00     585.00    5369.00     590.00
GR    5368.3     594.00    5369.00     598.00    5370.00     610.00    5370.00     620.00    5369.75     623.00
GR    5370.0     630.00    5372.00     660.00    5374.00     690.00    5376.00     710.00    5378.00     728.00
GR    5380.0     778.00

          NEW CROSS SECTION, SECTION N2-N2
X1      5575         32     712.00     930.00      255.0      255.0      255.0        0          0          0
X3        10
GR    5370.0     500.00    5369.00     530.00    5368.50     545.00    5368.50     578.00    5368.00     610.00
GR    5366.0     645.00    5365.50     655.00    5366.00     680.00    5368.00     700.00    5369.00     712.00
GR    5368.0     730.00    5367.00     740.00    5366.20     755.00    5367.00     775.00    5367.00     790.00
GR    5366.0     800.00    5365.00     815.00    5364.00     845.00    5362.00     850.00    5362.00     870.00
GR    5364.0     873.00    5366.00     900.00    5367.00     920.00    5367.50     930.00    5367.00     950.00
GR    5366.8     960.00    5367.00     970.00    5368.00     995.00    5368.50    1025.00    5369.00    1050.00
GR    5369.0    1110.00    5368.00    1130.00
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SECTION M-M

X1	5320	41	616.00	810.00	260.0	260.0	260.0	0	0	0
X3	10									
GR	5362.0	500.00	5360.00	540.00	5359.00	555.00	5358.50	562.00	5359.00	575.00
GR	5360.0	590.00	5362.00	606.00	5362.50	612.00	5362.75	616.00	5362.50	620.00
GR	5362.0	635.00	5360.00	660.00	5358.00	685.00	5356.00	690.00	5355.00	696.00
GR	5354.8	703.00	5355.00	710.00	5356.00	718.00	5358.00	740.00	5360.00	765.00
GR	5362.0	785.00	5363.00	810.00	5362.00	840.00	5361.00	855.00	5360.50	870.00
GR	5361.0	885.00	5362.00	915.00	5361.00	940.00	5360.20	955.00	5361.00	970.00
GR	5362.0	1000.00	5362.25	1035.00	5362.00	1085.00	5360.00	1110.00	5358.00	1130.00
GR	5357.0	1140.00	5356.30	1150.00	5357.00	1160.00	5358.00	1168.00	5360.00	1188.00
GR	5360.4	1199.00								

NEW CROSS SECTION, SECTION M1-M1

X1	5060	28	700.00	910.00	290.0	290.0	290.0	0	0	0
X3	10									
GR	5352.0	500.00	5351.00	530.00	5350.00	600.00	5349.00	620.00	5350.00	630.00
GR	5352.0	652.00	5353.00	670.00	5353.60	700.00	5353.00	720.00	5352.00	760.00
GR	5350.0	780.00	5348.00	810.00	5346.00	820.00	5346.00	825.00	5348.00	840.00
GR	5350.0	865.00	5352.00	910.00	5351.80	920.00	5350.00	965.00	5349.00	980.00
GR	5348.2	990.00	5349.00	1000.00	5350.00	1020.00	5351.00	1030.00	5351.20	1043.00
GR	5351.0	1055.00	5352.00	1105.00	5352.0	1145.00				

SECTION L-L

X1	4770	49	890.00	1055.00	290.0	290.0	290.0	0	0	0
X3	10									
GR	5350.0	500.00	5348.00	530.00	5348.00	535.00	5348.20	545.00	5348.00	552.00
GR	5348.0	560.00	5348.20	605.00	5348.00	640.00	5347.00	695.00	5346.00	730.00
GR	5344.0	790.00	5342.00	840.00	5341.80	846.00	5342.00	852.00	5344.00	870.00
GR	5346.0	890.00	5344.00	910.00	5342.00	930.00	5340.00	950.00	5338.00	970.00
GR	5337.0	980.00	5337.00	1005.00	5338.00	1015.00	5340.00	1020.00	5342.00	1022.00
GR	5343.0	1055.00	5342.00	1070.00	5342.30	1080.00	5342.00	1090.00	5341.00	1100.00
GR	5340.0	1110.00	5349.80	1120.00	5340.00	1125.00	5340.00	1140.00	5338.00	1165.00
GR	5337.0	1170.00	5336.80	1180.00	5337.00	1190.00	5338.00	1200.00	5340.00	1230.00
GR	5340.8	1250.00	5340.00	1265.00	5338.00	1285.00	5336.00	1300.00	5334.10	1325.00
GR	5336.0	1365.00	5336.00	1395.00	5338.00	1420.00	5338.80	1430.00		

NEW CROSS SECTION, SECTION L1-L1

X1	4480	45	645.00	830.00	350.0	350.0	350.0	0	0	0
X3	10									
GR	5334.0	500.00	5334.50	510.00	5334.75	515.00	5334.50	530.00	5334.00	540.00
GR	5332.0	552.00	5331.00	568.00	5331.00	572.00	5332.00	585.00	5333.00	595.00
GR	5333.2	605.00	5333.00	630.00	5333.20	645.00	5333.00	665.00	5332.00	690.00
GR	5330.0	720.00	5328.00	770.00	5327.00	775.00	5326.80	782.00	5327.00	790.00
GR	5328.0	795.00	5330.00	800.00	5331.00	810.00	5331.50	830.00	5331.00	840.00
GR	5330.0	850.00	5331.00	895.00	5331.80	920.00	5331.00	930.00	5330.00	940.00
GR	5328.0	960.00	5328.00	965.00	5330.00	990.00	5332.00	1015.00	5333.00	1030.00
GR	5333.4	1080.00	5333.00	1120.00	5332.00	1155.00	5333.00	1195.00	5328.00	1220.00
GR	5327.0	1230.00	5328.00	1238.00	5330.00	1260.00	5332.00	1285.00	5332.80	1300.00

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          SECTION K-K
X1      4130          45     1005.00     1215.00      400.0       400.0       400.0        0           0           0
X3        10
GR    5323.5      500.00     5323.00      525.00     5322.80      540.00     5323.00      560.00     5323.50      595.00
GR    5323.0      620.00     5322.20      670.00     5322.10      705.00     5322.40      730.00     5322.00      750.00
GR    5321.0      760.00     5320.80      765.00     5321.00      770.00     5322.00      790.00     5322.40      820.00
GR    5322.0      850.00     5321.00      855.00     5320.60      860.00     5321.00      865.00     5322.00      890.00
GR    5321.0      920.00     5320.80      930.00     5321.00      945.00     5322.00     1005.00     5320.00     1055.00
GR    5319.0     1075.00     5318.80     1087.00     5319.00     1100.00     5318.00     1140.00     5317.00     1150.00
GR    5317.0     1160.00     5318.00     1165.00     5320.00     1168.00     5322.00     1215.00     5321.80     1240.00
GR    5322.0     1260.00     5320.00     1300.00     5319.20     1315.00     5320.00     1330.00     5322.00     1370.00
GR    5324.0     1410.00     5325.20     1455.00     5324.00     1480.00     5322.00     1500.00     5320.00     1512.00

          SECTION J-J
X1      3730          46      957.00     1300.00      330.0       330.0       330.0        0           0           0
X3        10
GR    5316.0      500.00     5315.00      530.00     5314.70      560.00     5315.00      590.00     5315.20      610.00
GR    5315.0      630.00     5314.00      650.00     5313.00      660.00     5312.80      668.00     5313.00      675.00
GR    5313.8      690.00     5313.00      725.00     5312.80      740.00     5312.80      760.00     5312.00      795.00
GR    5310.0      870.00     5309.80      882.00     5310.00      890.00     5310.20      905.00     5310.00      920.00
GR    5310.0      940.00     5310.10      957.00     5310.00      975.00     5309.00     1050.00     5308.80     1060.00
GR    5308.0     1090.00     5306.00     1120.00     5305.00     1190.00     5304.00     1208.00     5304.00     1225.00
GR    5306.0     1232.00     5308.00     1240.00     5310.00     1260.00     5311.00     1280.00     5311.50     1300.00
GR    5311.0     1310.00     5310.00     1330.00     5308.00     1390.00     5307.50     1405.00     5307.50     1415.00
GR    5308.0     1430.00     5308.40     1450.00     5308.40     1475.00     5309.00     1490.00     5310.00     1500.00
GR    5312.0     1512.00

QT        1       2994
          CROSS SECTION ON LOUISIANA, SECTION I-I
X1      3400          15      575.00     1040.00      195.0       195.0       195.0        0           0           0
X3        10
GR    5302.0      500.00     5300.00      575.00     5298.00      700.00     5296.00      745.00     5295.00      790.00
GR    5294.8      798.00     5295.00      805.00     5295.00      840.00     5294.80      850.00     5295.00      860.00
GR    5296.0      870.00     5298.00      960.00     5299.00     1040.00     5298.00     1110.00     5296.00     1170.00

          SECTION H-H
X1      3205          38      710.00      955.00      350.0       350.0       350.0        0           0           0
X3        10
GR    5292.3      500.00     5292.00      530.00     5290.00      570.00     5289.80      585.00     5290.00      600.00
GR    5290.2      615.00     5290.00      620.00     5289.30      655.00     5290.00      680.00     5291.00      695.00
GR    5291.8      710.00     5291.00      725.00     5290.00      735.00     5288.00      755.00     5287.00      762.00
GR    5287.0      770.00     5288.00      795.00     5288.50      808.00     5288.00      818.00     5288.00      820.00
GR    5290.0      830.00     5291.00      862.00     5292.00      895.00     5293.00      920.00     5293.80      955.00
GR    5294.0     1005.00     5294.20     1017.00     5294.00     1030.00     5294.00     1040.00     5295.00     1050.00
GR    5295.2     1060.00     5295.00     1065.00     5294.80     1075.00     5295.00     1085.00     5295.50     1100.00
GR    5295.0     1110.00     5294.00     1120.00     5292.00     1140.00

          SECTION G-G
X1      2855          36      782.00      940.00      250.0       250.0       250.0        0           0           0
X3        10
GR    5285.5      500.00     5285.00      530.00     5284.00      595.00     5282.00      615.00     5280.00      635.00
GR    5278.0      655.00     5277.00      670.00     5276.60      685.00     5277.00      700.00     5278.00      715.00
GR    5280.0      740.00     5282.00      770.00     5283.00      782.00     5282.00      805.00     5280.00      810.00
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GR   5278.0     820.00    5277.00     825.00    5276.80     845.00    5276.00     860.00    5277.00     870.00
GR   5276.0     880.00    5277.00     905.00    5278.00     920.00    5279.00     928.00    5280.00     940.00
GR   5278.0     995.00    5277.90    1000.00    5278.00    1010.00    5278.80    1025.00    5278.00    1035.00
GR   5276.0    1055.00    5274.00    1080.00    5273.80    1085.00    5274.00    1090.00    5276.00    1130.00
GR   5276.2    1155.00

         SECTION G1-G1
X1     2605          24     750.00     970.00      400.0      400.0      400.0          0          0          0
X3       10
GR   5274.0     685.00    5272.00     750.00    5271.00     765.00    5270.50     780.00    5271.00     800.00
GR   5270.0     810.00    5268.00     845.00    5268.00     855.00    5269.00     860.00    5269.50     868.00
GR   5269.0     880.00    5268.80     885.00    5269.00     890.00    5270.00     900.00    5272.00     940.00
GR   5272.5     970.00    5272.00     990.00    5270.00    1020.00    5268.00    1070.00    5267.80    1075.00
GR   5268.0    1080.00    5270.00    1115.00    5272.00    1135.00    5274.00    1180.00

         SECTION F-F
X1     2205          31     680.00     950.00      470.0      470.0      470.0          0          0          0
X3       10                                                                                  5258.00
GR   5264.0     500.00    5262.00     530.00    5264.00     560.00    5264.20     570.00    5264.00     580.00
GR   5262.0     620.00    5261.00     625.00    5260.50     635.00    5261.00     645.00    5260.20     665.00
GR   5261.0     675.00    5261.20     680.00    5261.00     685.00    5260.00     690.00    5258.00     730.00
GR   5256.0     780.00    5255.40     795.00    5256.00     810.00    5256.20     820.00    5256.00     830.00
GR   5256.2     860.00    5256.00     870.00    5255.70     910.00    5256.00     920.00    5257.00     935.00
GR   5257.5     950.00    5257.00    1000.00    5256.00    1030.00    5255.50    1045.00    5256.00    1060.00
GR   5258.0    1090.00

      SECTION E-E, SECTION JUST EAST OF THE CORONADO AIRPORT
      LAST SECTION REVISED BY BHI-AFTER THIS TIE INTO EXISTING FLOODPLAIN
X1     1735          34     650.00     935.00        0.00        0.00        0.00          0          0          0
X3       10
GR   5250.0     500.00    5249.00     510.00    5248.00     545.00    5249.00     555.00    5250.00     560.00
GR   5250.4     565.00    5250.00     570.00    5248.00     600.00    5246.00     650.00    5244.00     690.00
GR   5243.9     700.00    5244.00     730.00    5244.00     745.00    5243.00     755.00    5242.70     770.00
GR   5242.8     790.00    5242.80     812.00    5243.00     830.00    5243.50     840.00    5243.00     850.00
GR   5242.7     870.00    5243.00     885.00    5244.00     895.00    5246.00     925.00    5246.10     935.00
GR   5246.0     945.00    5245.50     960.00    5245.00     990.00    5244.00    1020.00    5243.50    1035.00
GR   5244.0    1045.00    5244.00    1070.00    5246.00    1105.00    5247.00    1130.00
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 7062.000
THE FIRST 6 SECTIONS ARE TAKEN FROM THE ESPY-HUSTON HEC-2 RUN
FOR THE NOR ESTE ESTATES SUBDIVISION LOMR RECEIVED
JUNE 3, 1988 (NUMBERED 20 THRU 25 BY E-H)

7062.000	4.50	5398.70	5402.74	5398.70	5419.04	20.34	0.00	0.00	5402.70
2986.0	0.0	2986.0	0.0	0.0	82.5	0.0	0.0	0.0	5406.60
0.00	0.00	36.20	0.00	0.000	0.013	0.000	0.000	5394.20	8.54
0.025950	0.	0.	0.	0	16	0	0.00	27.93	36.46

*SECNO 6851.000

3301 HV CHANGED MORE THAN HVINS

6851.000	4.61	5394.51	5398.44	0.00	5413.41	18.90	5.20	0.43	5398.40
2986.0	0.0	2986.0	0.0	0.0	85.6	0.0	0.4	0.1	5401.70
0.00	0.00	34.89	0.00	0.000	0.013	0.000	0.000	5389.90	8.30
0.023467	211.	211.	211.	8	17	0	0.00	28.38	36.68

CCHV= 0.100 CEHV= 0.300
*SECNO 6774.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.13

DUMPED RIP RAP ON THE CHANNEL SIDES AND BOTTOM

6774.000	4.63	5392.33	5396.07	0.00	5408.41	16.07	4.15	0.85	5398.80
2986.0	0.0	2986.0	0.0	0.0	92.8	0.0	0.6	0.2	5398.40
0.00	0.00	32.17	0.00	0.000	0.045	0.000	0.000	5387.70	24.49
0.230345	77.	77.	77.	8	14	0	0.00	30.05	54.53

*SECNO 6724.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

6724.000	2.91	5389.81	5391.91	0.00	5397.28	7.48	8.54	2.58	5397.60
2986.0	0.0	2986.0	0.0	0.0	136.1	0.0	0.7	0.2	5397.90
0.00	0.00	21.94	0.00	0.000	0.045	0.000	0.000	5386.90	25.49
0.131768	50.	50.	50.	7	8	0	0.00	53.59	79.08

*SECNO 6674.000

3301 HV CHANGED MORE THAN HVINS

6674.000	1.91	5388.41	5389.05	0.00	5390.43	2.02	5.22	1.64	5393.50
2986.0	0.0	2986.0	0.0	0.0	262.0	0.0	0.9	0.4	5395.50
0.00	0.00	11.40	0.00	0.000	0.045	0.000	0.000	5386.50	148.68
0.084779	50.	50.	50.	6	11	0	0.00	202.90	351.58

CCHV= 0.100 CEHV= 0.300
*SECNO 6650.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.21

CROSS SECTION ON WYOMING, SECTION P-P

6650.000	2.75	5388.95	5388.98	0.00	5389.85	0.89	0.24	0.34	5393.40
2989.0	0.0	2989.0	0.0	0.0	393.7	0.0	1.1	0.5	5395.35
0.01	0.00	7.59	0.00	0.000	0.017	0.000	0.000	5386.20	136.03
0.003653	24.	24.	24.	0	11	0	0.00	228.49	364.51

CCHV= 0.100 CEHV= 0.300
*SECNO 6515.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5394.00 ELREA= 5394.00

TRAINING DIKE, SOUTH OF EAGLE ROCK, SECTION O-O

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
6515.000	3.35	5388.10	5388.10	0.00	5389.43	1.33	0.90	0.38	5394.00
2989.0	0.0	2989.0	0.0	0.0	322.8	0.0	2.2	1.0	5394.00
0.01	0.00	9.26	0.00	0.000	0.038	0.000	0.000	5384.75	531.76
0.015587	135.	135.	135.	20	11	0	0.00	123.02	654.78

*SECNO 6090.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5384.00 ELREA= 5384.00

TRAINING DIKE, NORTH OF EAGLE ROCK, SECTION N-N

6090.000	5.96	5380.96	5381.02	0.00	5382.42	1.46	7.00	0.01	5384.00
2989.0	0.0	2989.0	0.0	0.0	308.4	0.0	5.3	2.2	5384.00
0.02	0.00	9.69	0.00	0.000	0.038	0.000	0.000	5375.00	519.56
0.017426	425.	425.	425.	0	17	0	0.00	118.61	638.17

*SECNO 5810.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.49

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5374.80 ELREA= 5380.00

NEW CROSS SECTION, SECTION N1-N1

5810.000	4.67	5372.97	5373.71	0.00	5375.33	2.36	6.99	0.09	5374.80
2989.0	0.0	2989.0	0.0	0.0	242.5	0.0	7.1	3.0	5380.00
0.03	0.00	12.32	0.00	0.000	0.038	0.000	0.000	5368.30	555.63
0.038773	280.	280.	280.	5	15	0	0.00	118.98	674.62

*SECNO 5575.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5369.00 ELREA= 5367.50

NEW CROSS SECTION, SECTION N2-N2

5575.000	5.18	5367.18	5367.46	0.00	5368.34	1.16	6.63	0.36	5369.00
2989.0	0.0	2989.0	0.0	0.0	346.0	0.0	8.7	3.8	5367.50
0.04	0.00	8.64	0.00	0.000	0.038	0.000	0.000	5362.00	738.17
0.021451	235.	235.	235.	4	8	0	0.00	185.49	923.66

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 5320.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5362.75 ELREA= 5363.00

SECTION M-M

5320.000	5.08	5359.88	5360.45	0.00	5362.06	2.18	6.18	0.10	5362.75
2989.0	0.0	2989.0	0.0	0.0	252.4	0.0	10.4	4.7	5363.00
0.04	0.00	11.84	0.00	0.000	0.038	0.000	0.000	5354.80	661.57
0.027633	255.	255.	255.	4	8	0	0.00	101.85	763.43

*SECNO 5060.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5353.60 ELREA= 5352.00

NEW CROSS SECTION, SECTION M1-M1

5060.000	4.85	5350.85	5351.55	0.00	5353.39	2.54	8.63	0.04	5353.60
2989.0	0.0	2989.0	0.0	0.0	233.7	0.0	11.9	5.3	5352.00
0.05	0.00	12.79	0.00	0.000	0.038	0.000	0.000	5346.00	771.53
0.040645	260.	260.	260.	5	11	0	0.00	112.53	884.06

*SECNO 4770.000
3280 CROSS SECTION 4770.00 EXTENDED 2.26 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5346.00 ELREA= 5343.00

SECTION L-L

4770.000	4.06	5341.06	5341.76	0.00	5343.67	2.61	9.71	0.01	5346.00
2989.0	0.0	2989.0	0.0	0.0	230.5	0.0	13.4	5.9	5343.00
0.05	0.00	12.97	0.00	0.000	0.038	0.000	0.000	5337.00	939.38
0.028055	290.	290.	290.	5	17	0	0.00	81.68	1021.06

*SECNO 4480.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5333.20 ELREA= 5331.50

NEW CROSS SECTION, SECTION L1-L1

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
4480.000	4.29	5331.09	5331.61	0.00	5333.75	2.66	9.92	0.01	5333.20
2989.0	0.0	2989.0	0.0	0.0	228.3	0.0	14.9	6.6	5331.50
0.06	0.00	13.09	0.00	0.000	0.038	0.000	0.000	5326.80	703.70
0.042590	290.	290.	290.	8	11	0	0.00	109.75	813.46

*SECNO 4130.000
3280 CROSS SECTION 4130.00 EXTENDED 1.09 FEET

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5322.00 ELREA= 5322.00

SECTION K-K									
4130.000	4.10	5321.10	5321.37	0.00	5322.45	1.35	10.91	0.39	5322.00
2989.0	0.0	2989.0	0.0	0.0	320.6	0.0	17.1	7.7	5322.00
0.07	0.00	9.32	0.00	0.000	0.038	0.000	0.000	5317.00	1027.66
0.023799	350.	350.	350.	4	5	0	0.00	166.05	1193.70

*SECNO 3730.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5310.10 ELREA= 5311.50

SECTION J-J									
3730.000	3.12	5307.12	5307.83	0.00	5309.50	2.38	12.84	0.10	5310.10
2989.0	0.0	2989.0	0.0	0.0	241.5	0.0	19.7	9.1	5311.50
0.08	0.00	12.38	0.00	0.000	0.038	0.000	0.000	5304.00	1103.07
0.045653	400.	400.	400.	5	11	0	0.00	133.44	1236.51

*SECNO 3400.000
3280 CROSS SECTION 3400.00 EXTENDED 1.49 FEET

3301 HV CHANGED MORE THAN HVINS

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5300.00 ELREA= 5299.00

CROSS SECTION ON LOUISIANA, SECTION I-I

3400.000	2.70	5297.50	5297.67	0.00	5298.56	1.06	10.54	0.40	5300.00
2994.0	0.0	2994.0	0.0	0.0	363.1	0.0	22.0	10.4	5299.00
0.09	0.00	8.25	0.00	0.000	0.038	0.000	0.000	5294.80	711.38
0.023620	330.	330.	330.	3	12	0	0.00	225.85	937.24

*SECNO 3205.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5291.80 ELREA= 5293.80

SECTION H-H

3205.000	3.68	5290.68	5291.34	0.00	5292.86	2.18	5.59	0.11	5291.80
2994.0	0.0	2994.0	0.0	0.0	252.9	0.0	23.4	11.2	5293.80
0.09	0.00	11.84	0.00	0.000	0.038	0.000	0.000	5287.00	728.17
0.035489	195.	195.	195.	5	17	0	0.00	123.67	851.84

*SECNO 2855.000
3280 CROSS SECTION 2855.00 EXTENDED 3.05 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5283.00 ELREA= 5280.00

SECTION G-G

2855.000	3.24	5279.24	5280.02	0.00	5281.32	2.08	11.51	0.03	5283.00
2994.0	0.0	2994.0	0.0	0.0	259.0	0.0	25.4	12.2	5280.00
0.10	0.00	11.56	0.00	0.000	0.038	0.000	0.000	5276.00	813.74
0.030562	350.	350.	350.	5	26	0	0.00	117.27	931.02

*SECNO 2605.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5272.00 ELREA= 5272.50

SECTION G1-G1

2605.000	3.53	5271.53	5271.96	0.00	5273.15	1.62	8.03	0.14	5272.00
2994.0	0.0	2994.0	0.0	0.0	293.5	0.0	27.0	13.0	5272.50
0.11	0.00	10.20	0.00	0.000	0.038	0.000	0.000	5268.00	757.12
0.033817	250.	250.	250.	4	11	0	0.00	173.39	930.51

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2205.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5261.20 ELREA= 5258.00

SECTION F-F

2205.000	2.32	5257.72	5258.02	0.00	5259.15	1.42	13.94	0.06	5261.20
2994.0	0.0	2994.0	0.0	0.0	312.6	0.0	29.8	14.8	5257.50
0.12	0.00	9.58	0.00	0.000	0.038	0.000	0.000	5255.40	737.12
0.035955	400.	400.	400.	4	26	0	0.00	212.88	950.00

*SECNO 1735.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5246.00 ELREA= 5246.10

SECTION E-E, SECTION JUST EAST OF THE CORONADO AIRPORT
LAST SECTION REVISED BY BHI-AFTER THIS TIE INTO EXISTING FLOODPLAIN

1735.000	2.31	5245.01	5245.11	0.00	5245.97	0.96	13.03	0.14	5246.00
2994.0	0.0	2994.0	0.0	0.0	380.1	0.0	33.5	17.2	5246.10
0.14	0.00	7.88	0.00	0.000	0.038	0.000	0.000	5242.70	669.84
0.022038	470.	470.	470.	3	8	0	0.00	240.27	910.12

THIS RUN EXECUTED 6JUN96 14:50:41

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR FLOW

SUMMARY PRINTOUT

	SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
	7062.000	0.00	5394.20	0.00	2986.00	5398.70	5402.74	5419.04	259.50	27.93	4.50	36.20	82.4
	6851.000	211.00	5389.90	-4.19	2986.00	5394.51	5398.44	5413.41	234.67	28.38	4.61	34.89	85.5
*	6774.000	77.00	5387.70	-2.18	2986.00	5392.33	5396.07	5408.41	2303.45	30.05	4.63	32.17	92.8
	6724.000	50.00	5386.90	-2.52	2986.00	5389.81	5391.91	5397.28	1317.68	53.59	2.91	21.94	136.0
	6674.000	50.00	5386.50	-1.40	2986.00	5388.41	5389.05	5390.43	847.79	202.90	1.91	11.40	261.9
*	6650.000	24.00	5386.20	0.55	2989.00	5388.95	5388.98	5389.85	36.53	228.49	2.75	7.59	393.7
*	6515.000	135.00	5384.75	-0.86	2989.00	5388.10	5388.10	5389.43	155.87	123.02	3.35	9.26	322.7
	6090.000	425.00	5375.00	-7.14	2989.00	5380.96	5381.02	5382.42	174.26	118.61	5.96	9.69	308.4
*	5810.000	280.00	5368.30	-7.99	2989.00	5372.97	5373.71	5375.33	387.73	118.98	4.67	12.32	242.5
	5575.000	235.00	5362.00	-5.79	2989.00	5367.18	5367.46	5368.34	214.51	185.49	5.18	8.64	345.9
	5320.000	255.00	5354.80	-7.30	2989.00	5359.88	5360.45	5362.06	276.33	101.85	5.08	11.84	252.3
	5060.000	260.00	5346.00	-9.03	2989.00	5350.85	5351.55	5353.39	406.45	112.53	4.85	12.79	233.6
	4770.000	290.00	5337.00	-9.79	2989.00	5341.06	5341.76	5343.67	280.55	81.68	4.06	12.97	230.5
	4480.000	290.00	5326.80	-9.97	2989.00	5331.09	5331.61	5333.75	425.90	109.75	4.29	13.09	228.2
	4130.000	350.00	5317.00	-9.99	2989.00	5321.10	5321.37	5322.45	237.99	166.05	4.10	9.32	320.6
	3730.000	400.00	5304.00	-13.97	2989.00	5307.12	5307.83	5309.50	456.53	133.44	3.12	12.38	241.4
	3400.000	330.00	5294.80	-9.62	2994.00	5297.50	5297.67	5298.56	236.20	225.85	2.70	8.25	363.1

SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
3205.000	195.00	5287.00	-6.82	2994.00	5290.68	5291.34	5292.86	354.89	123.67	3.68	11.84	252.8
2855.000	350.00	5276.00	-11.44	2994.00	5279.24	5280.02	5281.32	305.62	117.27	3.24	11.56	258.9
2605.000	250.00	5268.00	-7.71	2994.00	5271.53	5271.96	5273.15	338.17	173.39	3.53	10.20	293.5
2205.000	400.00	5255.40	-13.81	2994.00	5257.72	5258.02	5259.15	359.55	212.88	2.32	9.58	312.6
1735.000	470.00	5242.70	-12.71	2994.00	5245.01	5245.11	5245.97	220.38	240.27	2.31	7.88	380.0

100 YEAR FLOW

SUMMARY PRINTOUT

	SECNO	CWSEL	CRIWS	DEPTH	EG	XLBEL	RBEL	XLCH	VCH	Q
	7062.000	5398.70	5402.74	4.50	5419.04	5402.70	5406.60	0.00	36.20	2986.00
	6851.000	5394.51	5398.44	4.61	5413.41	5398.40	5401.70	211.00	34.89	2986.00
*	6774.000	5392.33	5396.07	4.63	5408.41	5398.80	5398.40	77.00	32.17	2986.00
	6724.000	5389.81	5391.91	2.91	5397.28	5397.60	5397.90	50.00	21.94	2986.00
	6674.000	5388.41	5389.05	1.91	5390.43	5393.50	5395.50	50.00	11.40	2986.00
*	6650.000	5388.95	5388.98	2.75	5389.85	5393.40	5395.35	24.00	7.59	2989.00
*	6515.000	5388.10	5388.10	3.35	5389.43	5394.00	5394.00	135.00	9.26	2989.00
	6090.000	5380.96	5381.02	5.96	5382.42	5384.00	5384.00	425.00	9.69	2989.00
*	5810.000	5372.97	5373.71	4.67	5375.33	5374.80	5380.00	280.00	12.32	2989.00
	5575.000	5367.18	5367.46	5.18	5368.34	5369.00	5367.50	235.00	8.64	2989.00
	5320.000	5359.88	5360.45	5.08	5362.06	5362.75	5363.00	255.00	11.84	2989.00
	5060.000	5350.85	5351.55	4.85	5353.39	5353.60	5352.00	260.00	12.79	2989.00
	4770.000	5341.06	5341.76	4.06	5343.67	5346.00	5343.00	290.00	12.97	2989.00
	4480.000	5331.09	5331.61	4.29	5333.75	5333.20	5331.50	290.00	13.09	2989.00
	4130.000	5321.10	5321.37	4.10	5322.45	5322.00	5322.00	350.00	9.32	2989.00
	3730.000	5307.12	5307.83	3.12	5309.50	5310.10	5311.50	400.00	12.38	2989.00
	3400.000	5297.50	5297.67	2.70	5298.56	5300.00	5299.00	330.00	8.25	2994.00
	3205.000	5290.68	5291.34	3.68	5292.86	5291.80	5293.80	195.00	11.84	2994.00
	2855.000	5279.24	5280.02	3.24	5281.32	5283.00	5280.00	350.00	11.56	2994.00
	2605.000	5271.53	5271.96	3.53	5273.15	5272.00	5272.50	250.00	10.20	2994.00
	2205.000	5257.72	5258.02	2.32	5259.15	5261.20	5257.50	400.00	9.58	2994.00
	1735.000	5245.01	5245.11	2.31	5245.97	5246.00	5246.10	470.00	7.88	2994.00

SUMMARY OF ERRORS AND SPECIAL NOTES

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WARNING SECNO=    6774.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    6650.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=    6515.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    6515.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    6515.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=    5810.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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APPENDIX B: Section 3

Summary of the Source of Input Parameters Used in the Revised Conditions Model

The source of input parameters used in the revised conditions model are listed below:

1. Orthophoto/topographic maps with 1"=200' scale from December 1995, were used to develop cross sections for the North La Cueva Arroyo on the east side of I-25. The maps were developed by Koogle & Pouls Engineering, Inc., Albuquerque, NM.

2. The HEC-2 model from the accepted LOMR for the Nor Este Estates Subdivision was used to assure a transition between the revised floodplain boundaries and the floodplain boundaries established by the accepted LOMR.

3. The HEC-2 model from the accepted LOMR for the Nor Este Estates Subdivision was also used to define a channel section, from which a starting water surface elevation could be generated and used for the new HEC-2 model on the east side of I-25.

4. The 100-year flows from AMAFCA's approved hydrology were used in the HEC-2 model. The hydrology was developed by Resource Technology, Inc. Documentation and results for the approved hydrology are included in Appendix A.

APPENDIX B: Section 4

Calculations for Section Number 2205
Water Surface Elevation Higher than End Points of Cross Section.

Section F-F (SECNO 2205)

- HEC-2 Cross Section Information:

	STATION	ELEV
Left Bank	680	5261.2 Ft
Right Bank	950	5257.7 Ft

*For right bank, set elevation (artifical levée) at elev. 5258 Ft

- Results of HEC-2 Run

CRIWS = 5258.02 Ft

- Depth of Water over Weir (over ridge):

5258.02 - 5257.7 = 0.52 feet

- used WEIR program to determine amount of flow over approximated weir.

Assumptions for weir:
(1) 100 Ft in length,
(2) sides are approximated as 3:1 side slopes
(3) weir coefficient estimated as 2.61

•output from program is included (file name SECTF.OUT)

For D = 0.52 Ft → [illegible]

BOHANNAN-HUSTON INC.

PROJECT NAME N. LA CUEVA LOMAS SHEET 1 OF 2

PROJECT NO. _____ BY S.G DATE 5/28/96

SUBJECT SEC. NO 2205. NLCREV HC2 CHKD DTD DATE 6/19/01

- The adjacent channel section was determined using 1"=200' orthophoto/topographic maps, December 1995.

Manning's N = 0.038
Slope = 0.04

elev	x
2.0	0
1.5	50
0.5	80
.0	95
0.5	110
2.5	140

- used STREAM program to determine depth for 100 cfs in adjacent channel (File name: FDEPTH.OUT)

Q = 100 cfs → Depth in channel = 0.86 ft

≅ 0.9 ft

@ SECNO 2205

- The 100 cfs continues downstream to Section E-E (1"=2'). No additional flow from the main channel enters the adjacent channel.

- Use STREAM program to estimate depth of water in adjacent channel.

N = 0.038
Slope = 0.029

elev	x
2.5	0
2.0	15
1.5	45
0.5	75
0.0	90
0.5	100
2.5	125
2.5	160

For Q = 100 cfs →
Depth = 0.96 ft
@ SECNO 1725

BOHANNAN-HUSTON INC.

PROJECT NAME N. LA JUEVA LOOP SHEET 2 OF 2
PROJECT NO _____ BY SJO DATE 5/28/96
SUBJECT SECNO 2205 NUMERICAL CHK'D [illegible] DATE 5/30/96

RP WEIR
SECTF.OUT

WEIR OVER RB AT SECTION F-F

WEIR COEFFICENT = 2.6400
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

NT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	3.00	3	109.00	0.00			
2	9.00	0.00	4	118.00	3.00			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
0.01	0.01	0.00	0.26	880.17	100.06
0.02	0.02	2.00	0.75	0.37	100.12
0.03	0.03	3.00	1.37	0.46	100.18
0.04	0.04	4.00	2.11	0.53	100.24
0.05	0.05	5.01	2.96	0.59	100.30
0.06	0.06	6.01	3.89	0.65	100.36
0.07	0.07	7.01	4.90	0.70	100.42
0.08	0.08	8.02	5.98	0.75	100.48
0.09	0.09	9.02	7.14	0.79	100.54
0.10	0.10	10.03	8.37	0.83	100.60
0.11	0.11	11.04	9.66	0.87	100.66
0.12	0.12	12.04	11.01	0.91	100.72
0.13	0.13	13.05	12.41	0.95	100.78
0.14	0.14	14.06	13.88	0.99	100.84
0.15	0.15	15.07	15.39	1.02	100.90
0.16	0.16	16.08	16.96	1.05	100.96
0.17	0.17	17.09	18.58	1.09	101.02
0.18	0.18	18.10	20.25	1.12	101.08
0.19	0.19	19.11	21.96	1.15	101.14
0.20	0.20	20.12	23.73	1.18	101.20
0.21	0.21	21.13	25.53	1.21	101.26
0.22	0.22	22.15	27.39	1.24	101.32
0.23	0.23	23.16	29.28	1.26	101.38
0.24	0.24	24.17	31.22	1.29	101.44
0.25	0.25	25.19	33.20	1.32	101.50
0.26	0.26	26.20	35.22	1.34	101.56
0.27	0.27	27.22	37.28	1.37	101.62
0.28	0.28	28.24	39.38	1.39	101.68
0.29	0.29	29.25	41.52	1.42	101.74
0.30	0.30	30.27	43.69	1.44	101.80
0.31	0.31	31.29	45.91	1.47	101.86
0.32	0.32	32.31	48.16	1.49	101.92
0.33	0.33	33.33	50.44	1.51	101.98
0.34	0.34	34.35	52.77	1.54	102.04
0.35	0.35	35.37	55.12	1.56	102.10
0.36	0.36	36.39	57.52	1.58	102.16
0.37	0.37	37.41	59.94	1.60	102.22
0.38	0.38	38.43	62.40	1.62	102.28
0.39	0.39	39.46	64.90	1.64	102.34
0.40	0.40	40.48	67.43	1.67	102.40
0.41	0.41	41.50	69.99	1.69	102.46
0.42	0.42	42.53	72.58	1.71	102.52
0.43	0.43	43.55	75.21	1.73	102.58
0.44	0.44	44.58	77.86	1.75	102.64
0.45	0.45	45.61	80.55	1.77	102.70
0.46	0.46	46.63	83.27	1.79	102.76
0.47	0.47	47.66	86.02	1.80	102.82
0.48	0.48	48.69	88.80	1.82	102.88
0.49	0.49	49.72	91.62	1.84	102.94
0.50	0.50	50.75	94.46	1.86	103.00
0.51	0.51	51.78	97.33	1.88	103.06
0.52	0.52	52.81	100.23	1.90	103.12
0.53	0.53	53.84	103.16	1.92	103.18

* 5/28/96

0.54	0.54	54.87	106.12	1.93	103.24
0.55	0.55	55.91	109.10	1.95	103.30
0.56	0.56	56.94	112.12	1.97	103.36
0.57	0.57	57.97	115.16	1.99	103.42
0.58	0.58	59.01	118.23	2.00	103.48
0.59	0.59	60.04	121.33	2.02	103.54
0.60	0.60	61.08	124.46	2.04	103.60
0.61	0.61	62.12	127.61	2.05	103.66
0.62	0.62	63.15	130.80	2.07	103.72
0.63	0.63	64.19	134.01	2.09	103.78
0.64	0.64	65.23	137.24	2.10	103.84
0.65	0.65	66.27	140.51	2.12	103.90
0.66	0.66	67.31	143.79	2.14	103.96
0.67	0.67	68.35	147.11	2.15	104.02
0.68	0.68	69.39	150.45	2.17	104.08
0.69	0.69	70.43	153.82	2.18	104.14
0.70	0.70	71.47	157.21	2.20	104.20
0.71	0.71	72.51	160.63	2.22	104.26
0.72	0.72	73.56	164.07	2.23	104.32
0.73	0.73	74.60	167.54	2.25	104.38
0.74	0.74	75.64	171.04	2.26	104.44
0.75	0.75	76.69	174.56	2.28	104.50
0.76	0.76	77.73	178.10	2.29	104.56
0.77	0.77	78.78	181.67	2.31	104.62
0.78	0.78	79.83	185.27	2.32	104.68
0.79	0.79	80.87	188.88	2.34	104.74
0.80	0.80	81.92	192.53	2.35	104.80
0.81	0.81	82.97	196.20	2.36	104.86
0.82	0.82	84.02	199.89	2.38	104.92
0.83	0.83	85.07	203.60	2.39	104.98
0.84	0.84	86.12	207.34	2.41	105.04
0.85	0.85	87.17	211.10	2.42	105.10
0.86	0.86	88.22	214.89	2.44	105.16
0.87	0.87	89.27	218.71	2.45	105.22
0.88	0.88	90.32	222.54	2.46	105.28
0.89	0.89	91.38	226.40	2.48	105.34
0.90	0.90	92.43	230.27	2.49	105.40
0.91	0.91	93.48	234.18	2.51	105.46
0.92	0.92	94.54	238.10	2.52	105.52
0.93	0.93	95.59	242.06	2.53	105.58
0.94	0.94	96.65	246.03	2.55	105.64
0.95	0.95	97.71	250.02	2.56	105.70
0.96	0.96	98.76	254.04	2.57	105.76
0.97	0.97	99.82	258.08	2.59	105.82
0.98	0.98	100.88	262.14	2.60	105.88
0.99	0.99	101.94	266.23	2.61	105.94
1.00	1.00	103.00	270.33	2.62	106.00
1.01	1.01	104.06	274.46	2.64	106.06
1.02	1.02	105.12	278.62	2.65	106.12
1.03	1.03	106.18	282.79	2.66	106.18
1.04	1.04	107.24	286.99	2.68	106.24
1.05	1.05	108.31	291.20	2.69	106.30
1.06	1.06	109.37	295.44	2.70	106.36
1.07	1.07	110.43	299.70	2.71	106.42
1.08	1.08	111.50	303.98	2.73	106.48
1.09	1.09	112.56	308.29	2.74	106.54
1.10	1.10	113.63	312.61	2.75	106.60
1.11	1.11	114.70	316.96	2.76	106.66
1.12	1.12	115.76	321.33	2.78	106.72
1.13	1.13	116.83	325.71	2.79	106.78
1.14	1.14	117.90	330.13	2.80	106.84
1.15	1.15	118.97	334.56	2.81	106.90
1.16	1.16	120.04	339.01	2.82	106.96
1.17	1.17	121.11	343.49	2.84	107.02
1.18	1.18	122.18	347.98	2.85	107.08

1.20	1.20	124.32	357.03	2.87	107.20
1.21	1.21	125.39	361.59	2.88	107.26
1.22	1.22	126.47	366.16	2.90	107.32
1.23	1.23	127.54	370.76	2.91	107.38
1.24	1.24	128.61	375.38	2.92	107.44
1.25	1.25	129.69	380.02	2.93	107.50
1.26	1.26	130.76	384.68	2.94	107.56
1.27	1.27	131.84	389.36	2.95	107.62
1.28	1.28	132.92	394.05	2.96	107.68
1.29	1.29	133.99	398.78	2.98	107.74
1.30	1.30	135.07	403.51	2.99	107.80
1.31	1.31	136.15	408.27	3.00	107.86
1.32	1.32	137.23	413.05	3.01	107.92
1.33	1.33	138.31	417.86	3.02	107.98
1.34	1.34	139.39	422.68	3.03	108.04
1.35	1.35	140.47	427.51	3.04	108.10
1.36	1.36	141.55	432.37	3.05	108.16
1.37	1.37	142.63	437.26	3.07	108.22
1.38	1.38	143.71	442.16	3.08	108.28
1.39	1.39	144.80	447.08	3.09	108.34
1.40	1.40	145.88	452.01	3.10	108.40
1.41	1.41	146.96	456.97	3.11	108.46
1.42	1.42	148.05	461.95	3.12	108.52
1.43	1.43	149.13	466.94	3.13	108.58
1.44	1.44	150.22	471.95	3.14	108.64
1.45	1.45	151.31	476.99	3.15	108.70
1.46	1.46	152.39	482.05	3.16	108.76
1.47	1.47	153.48	487.12	3.17	108.82
1.48	1.48	154.57	492.21	3.18	108.88
1.49	1.49	155.66	497.33	3.19	108.94
1.50	1.50	156.75	502.45	3.21	109.00
1.51	1.51	157.84	507.60	3.22	109.06
1.52	1.52	158.93	512.78	3.23	109.12
1.53	1.53	160.02	517.96	3.24	109.18
1.54	1.54	161.11	523.17	3.25	109.24
1.55	1.55	162.21	528.40	3.26	109.30
1.56	1.56	163.30	533.64	3.27	109.36
1.57	1.57	164.39	538.92	3.28	109.42
1.58	1.58	165.49	544.19	3.29	109.48
1.59	1.59	166.58	549.50	3.30	109.54
1.60	1.60	167.68	554.82	3.31	109.60
1.61	1.61	168.78	560.15	3.32	109.66
1.62	1.62	169.87	565.51	3.33	109.72
1.63	1.63	170.97	570.88	3.34	109.78
1.64	1.64	172.07	576.28	3.35	109.84
1.65	1.65	173.17	581.70	3.36	109.90
1.66	1.66	174.27	587.13	3.37	109.96
1.67	1.67	175.37	592.58	3.38	110.02
1.68	1.68	176.47	598.04	3.39	110.08
1.69	1.69	177.57	603.53	3.40	110.14
1.70	1.70	178.67	609.03	3.41	110.20
1.71	1.71	179.77	614.57	3.42	110.26
1.72	1.72	180.88	620.11	3.43	110.32
1.73	1.73	181.98	625.66	3.44	110.38
1.74	1.74	183.08	631.24	3.45	110.44
1.75	1.75	184.19	636.83	3.46	110.50
1.76	1.76	185.29	642.44	3.47	110.56
1.77	1.77	186.40	648.08	3.48	110.62
1.78	1.78	187.51	653.74	3.49	110.68
1.79	1.79	188.61	659.40	3.50	110.74
1.80	1.80	189.72	665.08	3.51	110.80
1.81	1.81	190.83	670.80	3.52	110.86
1.82	1.82	191.94	676.51	3.52	110.92
1.83	1.83	193.05	682.26	3.53	110.98
1.84	1.84	194.16	688.02	3.54	111.04

1.86	1.86	196.38	699.58	3.56	111.16
1.87	1.87	197.49	705.40	3.57	111.22
1.88	1.88	198.60	711.22	3.58	111.28
1.89	1.89	199.72	717.08	3.59	111.34
1.90	1.90	200.83	722.94	3.60	111.40
1.91	1.91	201.94	728.81	3.61	111.46
1.92	1.92	203.06	734.71	3.62	111.52
1.93	1.93	204.17	740.63	3.63	111.58
1.94	1.94	205.29	746.56	3.64	111.64
1.95	1.95	206.41	752.52	3.65	111.70
1.96	1.96	207.52	758.49	3.65	111.76
1.97	1.97	208.64	764.48	3.66	111.82
1.98	1.98	209.76	770.49	3.67	111.88
1.99	1.99	210.88	776.50	3.68	111.94
2.00	2.00	212.00	782.55	3.69	112.00
2.01	2.01	213.12	788.60	3.70	112.06
2.02	2.02	214.24	794.68	3.71	112.12
2.03	2.03	215.36	800.76	3.72	112.18
2.04	2.04	216.48	806.88	3.73	112.24
2.05	2.05	217.61	812.99	3.74	112.30
2.06	2.06	218.73	819.14	3.74	112.36
2.07	2.07	219.85	825.31	3.75	112.42
2.08	2.08	220.98	831.48	3.76	112.48
2.09	2.09	222.10	837.69	3.77	112.54
2.10	2.10	223.23	843.89	3.78	112.60
2.11	2.11	224.36	850.13	3.79	112.66
2.12	2.12	225.48	856.36	3.80	112.72
2.13	2.13	226.61	862.64	3.81	112.78
2.14	2.14	227.74	868.92	3.82	112.84
2.15	2.15	228.87	875.21	3.82	112.90
2.16	2.16	230.00	881.53	3.83	112.96
2.17	2.17	231.13	887.85	3.84	113.02
2.18	2.18	232.26	894.20	3.85	113.08
2.19	2.19	233.39	900.57	3.86	113.14
2.20	2.20	234.52	906.95	3.87	113.20
2.21	2.21	235.65	913.34	3.88	113.26
2.22	2.22	236.79	919.77	3.88	113.32
2.23	2.23	237.92	926.20	3.89	113.38
2.24	2.24	239.05	932.65	3.90	113.44
2.25	2.25	240.19	939.12	3.91	113.50
2.26	2.26	241.32	945.59	3.92	113.56
2.27	2.27	242.46	952.10	3.93	113.62
2.28	2.28	243.60	958.62	3.94	113.68
2.29	2.29	244.73	965.15	3.94	113.74
2.30	2.30	245.87	971.68	3.95	113.80
2.31	2.31	247.01	978.27	3.96	113.86
2.32	2.32	248.15	984.83	3.97	113.92
2.33	2.33	249.29	991.44	3.98	113.98
2.34	2.34	250.43	998.04	3.99	114.04
2.35	2.35	251.57	1004.70	3.99	114.10
2.36	2.36	252.71	1011.33	4.00	114.16
2.37	2.37	253.85	1018.00	4.01	114.22
2.38	2.38	254.99	1024.68	4.02	114.28
2.39	2.39	256.14	1031.38	4.03	114.34
2.40	2.40	257.28	1038.11	4.03	114.40
2.41	2.41	258.42	1044.83	4.04	114.46
2.42	2.42	259.57	1051.57	4.05	114.52
2.43	2.43	260.71	1058.34	4.06	114.58
2.44	2.44	261.86	1065.12	4.07	114.64
2.45	2.45	263.01	1071.93	4.08	114.70
2.46	2.46	264.15	1078.75	4.08	114.76
2.47	2.47	265.30	1085.56	4.09	114.82
2.48	2.48	266.45	1092.43	4.10	114.88
2.49	2.49	267.60	1099.29	4.11	114.94
2.50	2.50	268.75	1106.16	4.12	115.00

2.52	2.52	271.05	1119.97	4.13	115.12
2.53	2.53	272.20	1126.90	4.14	115.18
2.54	2.54	273.35	1133.83	4.15	115.24
2.55	2.55	274.51	1140.80	4.16	115.30
2.56	2.56	275.66	1147.76	4.16	115.36
2.57	2.57	276.81	1154.76	4.17	115.42
2.58	2.58	277.97	1161.76	4.18	115.48
2.59	2.59	279.12	1168.81	4.19	115.54
2.60	2.60	280.28	1175.85	4.20	115.60
2.61	2.61	281.44	1182.90	4.20	115.66
2.62	2.62	282.59	1189.97	4.21	115.72
2.63	2.63	283.75	1197.07	4.22	115.78
2.64	2.64	284.91	1204.17	4.23	115.84
2.65	2.65	286.07	1211.29	4.23	115.90
2.66	2.66	287.23	1218.44	4.24	115.96
2.67	2.67	288.39	1225.59	4.25	116.02
2.68	2.68	289.55	1232.76	4.26	116.08
2.69	2.69	290.71	1239.94	4.27	116.14
2.70	2.70	291.87	1247.14	4.27	116.20
2.71	2.71	293.03	1254.35	4.28	116.26
2.72	2.72	294.19	1261.60	4.29	116.32
2.73	2.73	295.36	1268.84	4.30	116.38
2.74	2.74	296.52	1276.10	4.30	116.44
2.75	2.75	297.69	1283.38	4.31	116.50
2.76	2.76	298.85	1290.69	4.32	116.56
2.77	2.77	300.02	1298.01	4.33	116.62
2.78	2.78	301.18	1305.33	4.33	116.68
2.79	2.79	302.35	1312.67	4.34	116.74
2.80	2.80	303.52	1320.04	4.35	116.80
2.81	2.81	304.69	1327.41	4.36	116.86
2.82	2.82	305.86	1334.80	4.36	116.92
2.83	2.83	307.03	1342.22	4.37	116.98
2.84	2.84	308.20	1349.64	4.38	117.04
2.85	2.85	309.37	1357.08	4.39	117.10
2.86	2.86	310.54	1364.52	4.39	117.16
2.87	2.87	311.71	1372.00	4.40	117.22
2.88	2.88	312.88	1379.49	4.41	117.28
2.89	2.89	314.06	1386.98	4.42	117.34
2.90	2.90	315.23	1394.51	4.42	117.40
2.91	2.91	316.40	1402.05	4.43	117.46
2.92	2.92	317.58	1409.59	4.44	117.52
2.93	2.93	318.75	1417.14	4.45	117.58
2.94	2.94	319.93	1424.73	4.45	117.64
2.95	2.95	321.11	1432.33	4.46	117.70
2.96	2.96	322.28	1439.93	4.47	117.76
2.97	2.97	323.46	1447.57	4.48	117.82
2.98	2.98	324.64	1455.22	4.48	117.88
2.99	2.99	325.82	1462.87	4.49	117.94
3.00	3.00	327.00	1470.53	4.50	118.00

FDEPTH.OUT

RIGHT ADJ. STREAM AT SECTION F-F

MANNING'S N = .0380 SLOPE = .0400

JT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
-	0.00	2.00	3	80.00	0.50	5	110.00	0.50
2	50.00	1.50	4	95.00	0.00	6	140.00	2.50

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.10	0.10	0.3	0.3	6.0	1.1	6.00
0.20	0.20	1.2	2.0	12.0	1.7	12.00
0.30	0.30	2.7	6.0	18.0	2.2	18.00
0.40	0.40	4.8	12.8	24.0	2.7	24.00
0.50	0.50	7.5	23.3	30.0	3.1	30.00
0.60	0.60	10.7	38.5	34.5	3.6	34.50
0.70	0.70	14.4	57.9	39.0	4.0	39.00
0.80	0.80	18.5	82.0	43.5	4.4	43.50
0.90	0.90	23.1	110.9	48.0	4.8	48.00
1.00	1.00	28.1	145.0	52.5	5.2	52.50
1.10	1.10	33.6	184.6	57.0	5.5	57.00
1.20	1.20	39.5	230.1	61.6	5.8	61.50
1.30	1.30	45.9	281.6	66.1	6.1	66.00
1.40	1.40	52.7	339.6	70.6	6.4	70.50
1.50	1.50	60.0	404.2	75.1	6.7	75.00
1.60	1.60	68.1	453.6	86.6	6.7	86.50
1.70	1.70	77.3	515.9	98.1	6.7	98.00
1.80	1.80	87.7	591.0	109.6	6.7	109.50
1.90	1.90	99.2	679.3	121.1	6.8	121.00
2.00	2.00	111.9	781.3	132.6	7.0	132.50

$$\frac{110.9-82.0}{0.1} = \frac{110.9-100}{x}$$

$$x = 0.04$$

$$0.9' - 0.04 = \boxed{0.86\ Ft}$$

RT. ADJ. STREAM AT E-E, FLOW FROM F-F

MANNING'S N = .0380 SLOPE = .0290

] IT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
	0.00	2.50	4	75.00	0.50	7	125.00	0.50
2	15.00	2.00	5	90.00	0.00	8	160.00	2.50
3	45.00	1.50	6	100.00	0.50			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.10	0.10	0.3	0.2	5.0	0.9	5.00
0.20	0.20	1.0	1.4	10.0	1.4	10.00
0.30	0.30	2.3	4.2	15.0	1.9	15.00
0.40	0.40	4.0	9.1	20.0	2.3	20.00
0.50	0.50	6.3	16.5	25.0	2.6	50.00
0.60	0.60	11.5	27.0	54.8	2.4	54.75
0.70	0.70	17.2	50.1	59.5	2.9	59.50
0.80	0.80	23.4	79.4	64.3	3.4	64.25
0.90	0.90	30.1	114.9	69.0	3.8	69.00
1.00	1.00	37.2	156.8	73.8	4.2	73.75
1.10	1.10	44.8	205.2	78.5	4.6	78.50
1.20	1.20	52.9	260.2	83.3	4.9	83.25
1.30	1.30	61.5	322.0	88.1	5.2	88.00
1.40	1.40	70.5	390.7	92.8	5.5	92.75
1.50	1.50	80.0	466.7	97.6	5.8	97.50
1.60	1.60	90.1	541.1	105.3	6.0	105.25
1.70	1.70	101.1	624.3	113.1	6.2	113.00
1.80	1.80	112.7	716.9	120.8	6.4	120.75
1.90	1.90	125.2	819.1	128.6	6.5	128.50
2.00	2.00	138.4	931.4	136.3	6.7	136.25
2.10	2.10	152.3	1067.3	141.1	7.0	141.00
2.20	2.20	166.6	1212.8	145.8	7.3	145.75
2.30	2.30	181.5	1368.2	150.6	7.5	150.50
2.40	2.40	196.7	1533.6	155.4	7.8	155.25
2.50	2.50	212.5	1709.1	160.1	8.0	160.00

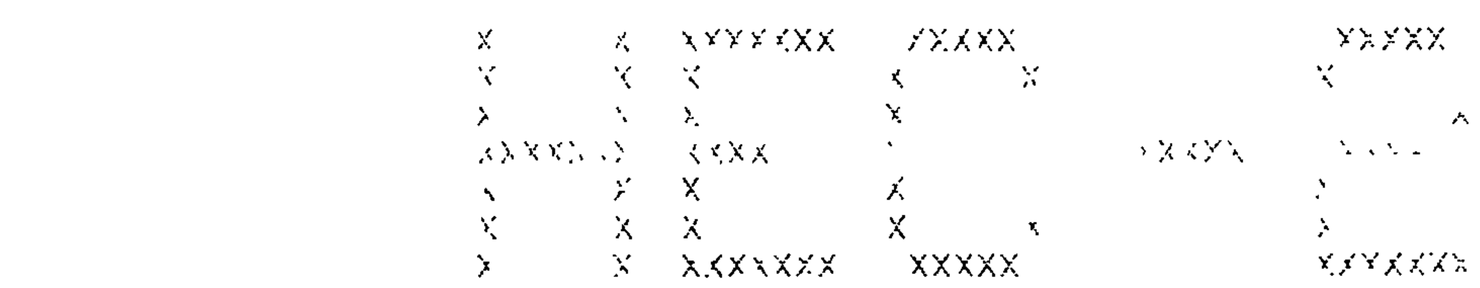
$$\frac{114.9-79.4}{0.1} = \frac{111.9-100}{X} \qquad X = 0.04$$

$$D = 0.9 - 0.04 = \underline{\underline{0.86+}}$$

APPENDIX B: Section 5

HEC-2 Model from the Accepted LOMR for Nor Este Estates Subdivision

U.S. ARMY CORPS OF ENGINEERS
THE HYDROLOGIC ENGINEERING CENTER
609 SECOND STREET - SUITE I
DAVIS, CALIFORNIA 95616
(916) 551-1748 FTS 448-1748



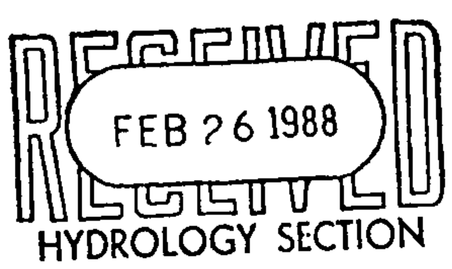
THIS RUN EXECUTED 02/25/88 09:37:09

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**********************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR  1982
  ERROR CORR -  01,02,03,04,05
  MODIFICATION -  50,51,52,53,54,55
**********************************************************
```

```
I1        LA CUEVA CHANNEL
I2        IMPROVED CHANNEL  -  100 YEAR EXISTING CONDITION
I3        SUPERCRITICAL FLOW
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	2.	0.	1.	0.000000	0.00	0.0	0.	480.50	0.000
J2	NPROF	IPLOT	PRFVS	XSECV	XSPCH	FN	ALLOC	ISN	CHNCH	ITRACE
	1.000	0.000	1.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000

J3 VARIABLE CODES FOR SUMMARY PRINTOUT



	150.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.030	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OI	1.000	4650.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	1.500	7.000	55.000	220.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	486.000	0.000	482.000	45.000	490.000	50.000	478.000	145.000	478.000	220.000
GR	480.000	230.000	491.000	205.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	2.000	14.000	65.000	190.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	486.000	0.000	485.000	10.000	484.000	15.000	483.000	20.000	482.000	50.000
GR	481.000	40.000	480.000	45.000	479.000	50.000	478.000	65.000	478.000	115.000
GR	476.500	140.000	478.000	190.000	478.000	235.000	480.000	300.000	0.000	0.000
X1	3.000	7.000	95.000	225.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	484.500	0.000	481.000	45.000	478.000	95.000	476.000	150.000	475.000	190.000
GR	476.000	225.000	479.000	340.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.025	0.025	0.030	0.100	0.000	0.000	0.000	0.000	0.000	0.000
X1	4.000	7.000	80.000	240.000	50.000	50.000	50.000	0.000	0.000	0.000
GR	480.000	0.000	478.000	40.000	476.000	80.000	474.500	150.000	476.000	240.000
GR	480.000	255.000	484.000	275.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	5.000	8.000	90.000	220.000	70.000	70.000	70.000	0.000	0.000	0.000
GR	476.500	0.000	476.000	25.000	476.000	80.000	475.500	90.000	475.500	170.000
GR	475.500	220.000	480.000	240.000	100.000	260.000	0.000	0.000	0.000	0.000

02/25/00 09:57:09 PAGE 2

X1	6.000	7.000	55.000	90.000	52.000	52.000	52.000	0.000	0.000	0.000
GR	478.000	0.000	478.000	15.000	466.300	55.000	465.700	70.000	466.300	90.000
GR	475.000	120.000	475.000	130.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	7.000	7.000	90.000	60.000	45.000	45.000	45.000	0.000	0.000	0.000
GR	472.000	0.000	472.000	10.000	462.000	40.000	461.000	50.000	462.000	60.000
GR	477.000	90.000	475.000	100.000	0.000	0.000	0.000	0.000	0.000	0.000
NC	0.013	0.013	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	8.500	7.000	0.000	70.400	170.000	187.000	185.000	0.000	0.000	0.000
GR	467.000	0.000	465.400	10.000	457.300	27.500	457.000	52.500	460.200	60.000
GR	464.500	70.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
X1	9.000	4.000	0.000	50.800	187.000	196.000	191.000	0.000	0.000	0.000
GR	460.300	0.000	452.000	17.500	451.000	27.500	463.700	52.000	0.000	0.000

XI	10.000	4.000	0.000	52.[illegible]	214.000	107.000	200.[illegible]	0.[illegible]	0.000	0.000
GR	452.600	0.000	446.100	23.000	445.800	33.000	455.[illegible]	53.[illegible]	0.000	0.000
XI	11.000	4.000	[illegible].300	[illegible].000	201.000	[illegible].000	196.300	[illegible].000	0.[illegible]	0.000
GR	452.100	0.000	432.700	24.000	439.500	34.900	448.500	51.800	0.000	0.000
XI	12.000	4.000	0.000	51.100	71.000	62.000	69.000	0.000	0.000	0.000
GR	442.600	0.000	433.600	25.100	433.300	33.100	442.300	51.100	0.000	0.000
XI	13.000	4.000	0.000	47.700	200.000	200.000	200.000	0.000	0.000	0.000
GR	441.200	0.000	431.100	19.900	430.800	29.900	439.300	47.900	0.000	0.000
XI	14.000	4.000	0.000	45.500	200.000	200.000	200.000	0.000	0.000	0.000
GR	434.200	0.000	425.500	17.500	425.200	27.500	434.200	45.500	0.000	0.000
XI	15.000	4.000	0.000	45.500	100.000	100.000	100.000	0.000	0.000	0.000
GR	428.000	0.000	418.300	17.500	419.000	27.500	428.000	45.500	0.000	0.000
XI	16.000	4.000	0.000	48.500	203.000	203.000	203.000	0.000	0.000	0.000
GR	425.400	0.000	416.100	18.500	415.900	28.500	424.900	46.500	0.000	0.000
XI	17.000	4.000	0.000	52.200	209.000	209.000	209.500	0.000	0.000	0.000
GR	42[illegible].100	0.000	413.100	21.200	409.800	31.200	418.000	52.[illegible]	0.000	0.000
XI	18.000	4.000	0.000	51.500	124.000	124.000	124.000	0.000	0.000	0.000
GR	414.600	0.000	403.800	21.700	403.600	31.700	413.500	51.500	0.000	0.000
XI	19.000	4.000	0.000	51.500	196.000	195.000	190.000	0.000	0.000	0.000
GR	407.500	0.000	400.200	18.900	392.900	28.900	411.200	51.500	0.000	0.000
XI	20.000	4.000	0.000	52.200	202.000	211.000	206.700	0.000	0.000	0.000
GR	402.700	0.000	394.500	17.500	394.200	27.500	406.600	52.200	0.000	0.000

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02/25/00 09:57:09 Page 3

XI	21.000	4.000	0.000	51.000	77.000	77.000	77.000	0.000	0.000	0.000
GR	396.600	0.000	388.400	17.500	388.100	27.500	399.900	51.000	0.000	0.000
NC	0.045	0.015	0.045	0.000	0.600	0.000	0.000	0.000	0.000	.000
XI	22.000	4.000	0.000	77.500	50.000	50.000	50.000	0.000	0.000	0.000
GR	397.000	0.000	392.000	5.000	394.000	17.000	385.900	34.500	385.900	44.500
GR	395.600	65.500	394.500	77.500	0.000	0.000	0.000	0.000	0.000	0.000

XI	35.000	5.000	[illegible]	102.000	50.000	50.000	50.000	[illegible]	[illegible]	[illegible]
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
NC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
NC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
NC	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
XI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
GA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

02/25/08 09:37:00 [illegible]

SECNO	PLOTP	CHOPL	CRTWS	WSPIN	BG	KV	HB	OLOSS	BANK FLEV
I	I GR	OCH	VPOB	SELCR	ACH	APOB	VOL	THR	LEFT/RIGHT
TIME	VLOR	VCH	VBOR	ANL	TNPV	CHP	WTH	ELOSS	[illegible]
SLOPE	FLOAL	KLCH	VIGHP	DIRIAL	JPC	CLOSS	CORAR	COMPUTED	ENDS!

*PROF 1

*SECNO 1.000

[illegible]	2.75	880.25	401.2C	402.75	407.50	2.14	0.00	1.00	01.00
4630.	5.	4391.	234.	1.	367.	33.	0.	0.	[illegible]
0.00	3.63	11.5[illegible]	2.10	[illegible].030	0.030	0.040	0.000	[illegible]	45.25
0.020324	0.	(.	0.	0	[illegible]	^	0.00	[illegible]	271.25

```
0
 *SECNO 2.000
      2.00      3.19     473.69     480.32      0.00     481.21      2.12      1.09      0.00     478.00
     4630.      155.      2340.      1126.       17.       307.      122.        0.        .      478.00
      0.00      8.16      13.52      9.20     0.050      0.030     0.030     0.000     470.00      46.50
  0.023270       50.       50.       50.         3         11         0      0.00     243.34     205.94
0
 *SECNO 3.000
      3.00      3.47     472.47     479.14      0.00     480.66      2.19      1.15      0.00     478.00
     4630.        2.       3653.      993.        1.       297.      117.        1.        1.      478.00
      0.00      2.79      17.04      7.55     0.030      0.030     0.030     0.000     175.30      91.54
  0.022619       50.       50.       50.         3         11         0      0.00     237.32     319.36
0
 CCHV=    0.100 CEHV=    0.000
 *SECNO 4.000
      4.00      3.12     472.62     478.10      0.00     479.07      2.05      1.99      0.00     476.50
     4630.      179.      4411.      833.       26.       379.        5.        1.        1.      476.00
      6.00      6.84      11.67      6.69     0.025      0.030     0.025     0.000     474.50      47.67
  0.017598       50.       50.       50.         6          8         0      0.00     198.40     240.06
0
 *SECNO 5.000

 3301 HV CHANGED MORE THAN HVINS
      5.00      2.65     475.95     476.83      0.00     478.65      2.70      0.95      0.00     477.50
     4630.      116.      4426.      833.       12.       332.        9.        2.        1.      477.50
      0.00      9.62      15.33      9.49     0.025      0.030     0.025     0.000     475.30      80.18
  0.020737       50.       50.       50.         5          8         0      0.00     147.37     227.05
0
 *SECNO 6.000
1
 02/25/88     09:37:09                                                                          PAGE     5

    SECNO      DEPTH      CWSEL      CRIWS      WSELK       EG         HV         HL        QLOSS    BANK ELEV
    0          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA     LEFT  RIGHT
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN       ELMIN       STA
    SLOPE      XLOBL      XLCH       XLOBR      TTRIAL     UBC        ICONT      COMAR     IOPWID      ENDST


 3301 HV CHANGED MORE THAN HVINS
      6.00      5.19     470.99     472.77      0.00     476.85      5.96      1.47      0.33     466.30
     4630.      529.      3566.      534.       54.       171.       36.        2.        1.      466.30
      0.01     14.70      20.83      14.70     0.025      0.030     0.025     0.000     465.70      39.30
  0.021323       70.       70.       70.         5         20         0      0.00      60.52     105.83
0
 *SECNO 7.000
```

3301 HV CHANGED MORE THAN HVINS

7.00	6.65	467.05	470.16	0.00	475.53	7.87	1.19	0.19	462.00
4630.	826.	3859.	745.	46.	173.	44.	3.	1.	462.00
0.01	17.18	24.83	17.07	0.025	0.030	0.025	0.000	-61.00	5.02
0.022400	52.	53.	50.	5	14	0	0.00	52.41	75.44

0

*SECNO 8.000

3301 HV CHANGED MORE THAN HVINS

8.00	7.27	464.27	467.57	0.00	471.71	10.44	0.55	0.26	447.6
4630.	0.	4630.	0.	0.	171.	0.	3.	1.	448.50
0.01	0.00	25.96	0.00	0.013	0.013	0.013	0.000	457.00	12.44
0.007793	45.	45.	45.	7	14	0	0.00	40.14	62.58

0

*SECNO 9.000

3301 HV CHANGED MORE THAN HVINS

9.00	6.56	458.36	462.13	0.00	472.60	14.25	1.73	0.38	460.30
4630.	0.	4630.	0.	0.	153.	0.	3.	1.	463.70
0.01	0.00	30.29	0.00	0.013	0.013	0.013	0.000	451.80	4.10
0.011847	178.	183.	187.	8	14	0	0.30	57.34	81.44

0

*SECNO 10.000

3301 HV CHANGED MORE THAN HVINS

1

02/25/00 09:37:09

PAGE 6

SECNO	DEPTH	CWSEL	CRIWS	WSELS	EG	HV	HL	OLOSS	TARP ELEV
Q	CHOB	OCH	CROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XRCH	XNR	WIN	ELMIN	SSTA
SLOPE	NLOBL	NLCH	NLOBR	TIRIAL	IDT	ICONT	CORAP	TOPWID	CROST
10.00	6.13	451.93	456.13	0.00	469.64	17.71	2.22	0.35	454.40
4630.	0.	4630.	0.	0.	137.	0.	4.	2.	459.30
0.01	0.00	33.77	0.00	0.013	0.013	0.013	0.000	445.00	10.22
0.016020	187.	191.	196.	8	14	0	0.00	35.81	46.03

0

*SECNO 11.000

3301 HV CHANGED MORE THAN HVINS

11.00	5.90	445.48	449.90	0.00	465.79	20.31	3.59	0.26	452.10
4630.	0.	4630.	0.	0.	128.	0.	5.	2.	448.50
0.01	0.00	36.17	0.00	0.013	0.013	0.013	0.000	439.50	13.24

0.010650	214.	200.	200.	8	14	0	0.00	33.53	40.7%

0
*SECNO 12.000

3301 HV CHANGED MORE THAN HVINC

12.00	5.50	430.40	443.35	0.00	461.51	22.63	4.04	0.23	437.00
4630.	0.	4630.	0.	0.	121.	0.	5.	2.	439.30
0.01	0.00	38.10	0.00	0.013	0.013	0.013	0.000	433.30	0.04
0.022938	201.	196.	192.	8	14	0	0.00	34.77	44.0%

0
*SECNO 13.000

3301 HV CHANGED MORE THAN HVINS

13.00	5.77	436.57	441.26	0.00	459.88	23.31	1.37	0.07	441.00
4630.	0.	4630.	0.	0.	119.	0.	0.	2.	439.80
0.01	0.00	38.75	0.00	0.013	0.013	0.013	0.000	42[illegible]	0.71
0.022493	71.	69.	69.	8	17	0	0.00	32.53	41.4

0
*SECNO 14.000

3301 HV CHANGED MORE THAN HVINS

14.00	5.69	430.89	435.64	0.00	455.16	24.27	4.62	0.19	434.20
4630.	0.	4630.	0.	0.	117.	0.	4.	2.	439.20
0.01	0.00	39.53	0.00	0.013	0.013	0.013	0.000	429.20	0.85
0.023760	200.	200.	200.	8	14	0	0.00	32.24	38.8%

0
1
02/25/08 09:37:09 PAGE 7

SECNO	DEPTH	CWSEL	CRITWS	WSELK	FC	HV	HI	QTOT	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLTIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	TRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 15.000

3301 HV CHANGED MORE THAN HVINS

15.00	5.61	424.61	429.45	0.00	450.12	25.51	4.91	0.12	426.00
4630.	0.	4630.	0.	0.	114.	0.	7.	2.	439.00
0.01	0.00	40.53	0.00	0.013	0.013	0.013	0.000	419.00	0.83
0.025424	200.	199.	200.	8	14	0	0.00	31.89	38.7%

0
*SECNO 16.000

3301 HV CHANGED MORE THAN HVINS

```
     16.06       5.53     421.43     426.35       0.00     447.49       26.06       2.52       0.05     425.40
     4630.         0.       4630.         0.         3.        113.         0.         2.         2.      12.50
      0.02       0.00      41.97       0.00      0.013      0.013      0.013      0.000     415.90       7.90
  0.026108      100.       100.       100.          7         14          0       0.00      31.05      39.58
0
 *SECNO 17.000

 3301 HV CHANGED MORE THAN HVINS
     17.00       5.52     419.32     420.29       0.00     442.03       26.71       2.48       0.06     422.19
     4630.         0.       4630.         0.         0.        112.         0.         2.         2.      12.00
      0.02       0.00      41.47       0.00      0.013      0.013      0.013      0.000     422.80      13.37
  0.027071      203.       203.       203.          7         17          0       0.00      31.57      45.24
0
 *SECNO 18.000

 3301 HV CHANGED MORE THAN HVINS
     18.00       5.43     409.93     414.11       0.00     436.36       27.33       2.61       0.06     414.69
     4630.         0.       4630.         0.         3.        110.         0.         2.         3.      11.50
      0.02       0.00      41.95       0.00      0.013      0.013      0.013      0.000     403.60      11.18
  0.027906      209.       204.       209.          7         17          0       0.00      31.38      42.57
0
 *SECNO 19.000
     19.00       5.46     405.36     410.41       0.00     432.06       27.50       2.46       0.02     409.90
     4630.         0.       4630.         0.         1.        111.         0.         2.         3.      11.20
      0.02       0.00      42.08       0.00      0.013      0.013      0.013      0.000     399.90       8.41
  0.028216      124.       124.       124.          7         17          0       0.00      31.41      39.82
0
1
 02/25/88     09:37:09                                                                                  PAGE     8

     SECNO      DEPTH      CHSEL      CRIWS      WSELL      EG         HV         HL         QLOSS    BANK ELEV
     Q          QLOB       RCH        QROB       ALOB       ACH        AROB       VOL        TWA    LEFT/RIGHT
     TIME       VLOB       VCH        VROB       XNL        XNCH       ZHP        WTN        ELMIN       SSTA
     SLOPE      KLOSL      XI CH      XI ORR     ITRIAL     IDC        ICONT      COPAR      TOPWID      CHSSI

 *SECNO 20.000
     20.00       5.40     399.60     404.60       0.00     427.41       27.00       5.43       0.02     402.70
     4630.         0.       4630.         0.         0.        109.         0.         2.         3.      10.60
      0.02       0.00      42.31       0.00      0.013      0.013      0.013      0.000     394.20       6.41
  0.028994      196.       196.       193.          7         17          0       0.00      31.66      38.26
0
 *SECNO 21.000
     21.00       5.40     393.50     398.50       0.00     421.42       27.92       5.98       0.01     396.10
     4630.         0.       4630.         0.         0.        108.         0.         2.         3.      10.20
      0.02       0.00      42.40       0.00      0.013      0.013      0.013      0.000     388.10       6.12
```

0.329092	202.	206.	211.	7	17	0	0.00	31.03	32.25

0
CCHV= 0.100 CEHV= 0.300
*SECNO 22.000

3301 HV CHANGED MORE THAN HVINC

22.00	5.45	391.35	396.50	0.00	414.95	23.64	5.14	1.20	397.00
4633.	0.	4630.	0.	0.	119.	0.	9.	3.	396.50
0.02	0.00	39.02	0.00	0.045	0.045	0.045	0.000	385.90	22.73
0.284228	77.	77.	77.	4	17	0	0.00	33.5%	46.7%

0
*SECNO 23.000

3301 HV CHANGED MORE THAN HVINC

23.00	3.48	388.78	391.80	0.00	400.65	11.87	10.81	2.33	397.00
4630.	0.	4630.	0.	4.	167.	4.	10.	3.	396.33
0.02	0.00	27.64	0.00	0.045	0.045	0.045	0.000	385.90	23.47
0.169979	50.	50.	50.	4	11	0	0.00	54.2%	72.8%

0
CCHV= 0.100 CEHV= 0.300
*SECNO 24.000

3301 HV CHANGED MORE THAN HVINC

24.00	1.54	386.54	388.10	0.00	391.71	8.18	4.83	1.11	392.00
4630.	0.	4630.	0.	0.	202.	0.	10.	3.	394.00
0.02	0.00	22.95	0.00	0.017	0.017	0.017	0.000	385.00	159.34
0.062183	50.	50.	50.	5	11	0	0.00	104.78	346.11

0
1
02/25/80 09:37:09 PAGE 5

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	QLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	IWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	YNCH	XNR	WIN	LOSIN	SQIN
SLOPE	ALOBL	ICH	XLOBP	FINTGL	EIC	ICONT	CURAP	IOPTIO	CMOST

CCHV= 0.100 CEHV= 0.300
*SECNO 25.000

3301 HV CHANGED MORE THAN HVINC

25.00	2.29	388.39	391.07	0.00	398.96	4.77	2.70	1.05	397.00
4630.	0.	4630.	0.	0.	267.	0.	10.	3.	394.00
0.03	0.00	17.35	0.00	0.025	0.025	0.025	0.000	384.00	157.11
0.047295	90.	50.	15.	7	17	0	0.00	171.50	328.61

0

*SECNO 26.000

3301 HV CHANGED MORE THAN HVTOL
26.00 4.13 307.03 307.55 0.00 389.21 2.19 1.00 0.75 391.96
4630. 0. 4630. 0. 0. 391. 0. 10. 4. 394.00
0.03 0.00 11.85 0.00 0.025 0.025 0.025 0.000 402.99 22.37
0.011005 60. 50. 5. 6 17 0 0.00 148.7. 171.10
)
*SECNO 27.000

3301 HV CHANGED MORE THAN HVTOL
3605 20 TRIALS ATTEMPTED WSEL/CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
27.00 4.63 387.16 387.16 0.00 388.67 1.51 0.41 0.17 393.0.
4630. 0. 4630. 0. 0. 470. 0. 11. 3. 3[illegible]
0.03 0.00 9.85 0.00 0.025 0.025 0.025 0.000 382.5. 22.2.
0.006420 60. 50. 5. 0 8 0 0.00 157.3. 1[illegible]
0
*SECNO 28.000
3605 20 TRIALS ATTEMPTED WSEL/CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
28.00 3.94 386.94 386.94 0.00 388.43 1.54 0.61 0.48 390.0.
4630. 0. 4630. 0. 0. 464. 0. 12. 4. 394.0.
0.03 0.00 9.97 0.00 0.025 0.025 0.025 0.000 381.99 20.21
0.00[illegible]453 125. 100. 5. 20 8 0 0.00 153.2[illegible] 170.47
)
[illegible]

02/13/08 09:37:09 PAGE 10

SECNO	DEPTH	CHSEL	CRTWS	WSELV	EG	HV	HL	ULOSS	BANK ELEV	
Q	ALOB	ACH	AROB	ALOB	ACH	AROB	VOL	TWA	LEFT	RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	FLMIN		SSTA
CLOFF	XLOBL	XLCH	XLOBR	DTFIN	IBC	ICONT	CUMSF	TOPWID		ENRGY

*SECNO 29.000
29.00 4.63 385.03 385.10 0.00 387.72 1.90 0.72 0.04 [illegible]
4630. 0. 4630. 0. 0. 419. 0. 13. 5. 39[illegible]
0.03 0.00 11.35 0.00 0.025 0.025 0.025 0.000 381.70 22.72
0.000109 115. 100. 70. . 8 0 0.00 140.[illegible] 163.40
)
]

02/13/08 09:37:09 PAGE 11

[illegible] PUN [illegible] 02/25/[illegible]

```
**********************************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAR  1982
  ERROR CODE =  01,02,03,04,05
  MODIFICATION =  50,51,52,53,54,55
**********************************************************
```

NOTE- ASTERISK (*) AT LEFT OF CROSS SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUPERCRITICAL FLOW
SUMMARY PRINTOUT TABLE 150

SECNO	XLOB	LLOB	CHL	ELMIN	D	CWSEL	CRIWS	TW	[illegible]	VCH	AREA	[illegible]
1.000	0.00	[illegible].00	0.00	478.00	4630.00	480.75	481.7[illegible]	[illegible]	203.79	11.5[illegible]	[illegible]	324.37
2.000	50.00	[illegible].00	0.00	[illegible]	4630.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3.000	50.00	0.00	0.00	[illegible]5.00	4630.00	478.47	479.14	480.66	225.1[illegible]	12.54	[illegible]	307.85
4.000	50.00	[illegible].00	0.00	474.50	[illegible]30.00	477.62	[illegible]78.10	[illegible]	175.9[illegible]	[illegible]	139.71	349.37
5.000	50.00	[illegible].00	0.00	471.30	4630.00	475.95	[illegible]76.87	[illegible]78.65	207.32	13.33	316.39	321.52
6.000	70.00	0.00	0.00	465.70	4630.00	470.89	[illegible]72.72	[illegible]76.[illegible]	213.23	20.83	243.55	31[illegible].07
7.000	52.00	[illegible].00	0.00	461.00	4630.00	467.65	470.16	[illegible]75.53	[illegible]14.03	[illegible]4.83	214.92	[illegible].
8.000	45.00	0.00	0.00	457.00	4630.00	464.27	[illegible]67.57	474.71	[illegible]2.93	25.03	[illegible]	524.40
9.000	182.00	0.00	0.00	451.80	4630.00	458.36	462.13	[illegible]72.60	116.47	36.29	157.30	424.38
10.000	191.00	0.00	0.00	445.00	4630.00	451.93	[illegible]56.[illegible]	[illegible]65.[illegible]	[illegible]66.20	33.77	137.10	361.71
11.000	200.00	0.00	0.00	439.50	4630.00	445.48	[illegible]49.[illegible]	[illegible]65.79	[illegible]80.50	37.17	124.02	339.04
12.000	196.00	0.00	0.00	433.30	[illegible]630.00	439.89	443.38	461.91	225.38	38.18	121.27	305.79
13.000	69.00	0.00	0.00	[illegible]37.89	4630.00	436.57	[illegible]41.26	[illegible]59.80	224.2[illegible]	[illegible]0.75	[illegible]19.56	[illegible]03.60
14.000	[illegible]00.00	0.00	0.00	[illegible]25.20	[illegible]630.30	[illegible]30.69	435.[illegible]4	[illegible]55.[illegible]	[illegible]27.[illegible]	[illegible]9.53	[illegible]17.13	[illegible]03.[illegible]
15.000	200.00	0.00	0.00	419.00	4630.00	424.61	429.45	450.17	254.24	40.53	114.23	296.37

16.000	100.00	0.00	0.00	415.90	4630.00	421.43	420.35	447.45	261.93	4[illegible]	113.62	286.54
17.000	203.00	0.00	0.00	409.00	4630.00	413.32	420.39	442.03	270.71	41.47	111.64	281.40

02/25/88 09:37:09 PAGE 18

	SECNO	XLOC	ELINV	ELLC	ELMIN	Q	CWSEL	CRITWS	ES	AREA	WTOP	DEPTH	VEL
	18.000	204.00	0.00	0.00	403.60	4630.00	409.03	414.71	436.50	279.06	41.95	110.3	277.16
	19.000	124.00	0.00	0.00	399.90	4630.00	405.36	410.41	432.84	282.12	42.00	110.62	275.64
	20.000	190.00	0.00	0.00	394.20	4630.00	399.60	404.60	427.41	289.24	42.31	109.42	272.24
	21.000	206.00	0.00	0.00	388.10	4630.00	393.50	398.50	421.42	298.92	42.40	108.19	271.14
	22.000	77.33	0.00	0.00	385.90	4630.00	391.35	396.50	414.99	2842.28	39.32	110.65	86.85
	23.000	50.00	0.00	0.00	385.30	4630.00	388.75	391.80	406.45	1695.77	27.64	107.49	112.30
	24.000	50.00	0.00	0.00	385.00	4630.00	386.54	388.19	393.71	671.83	22.95	201.78	185.67
	25.000	50.00	0.00	0.00	384.00	4630.00	386.25	387.62	389.46	47.25	17.3[illegible]	10.85	211.90
	26.000	50.00	0.00	0.00	382.50	4630.00	387.03	387.55	389.21	110.05	11.85	390.78	441.34
*	27.000	50.00	0.00	0.00	382.50	4630.00	387.16	387.16	388.67	64.70	9.85	410.27	477.81
*	28.000	100.00	0.00	0.00	381.90	4630.00	386.94	386.94	388.48	84.53	9.27	411.36	476.36
	29.000	100.00	0.00	0.00	381.20	4630.00	385.83	386.10	387.72	81.09	11.05	410.90	514.14

02/25/88 09:37:09 PAGE 19

SUPERCRITICAL FLOW
SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSC	DIFKWS	TOPWID	FCH
1.000	4630.00	400.[illegible]	0.00	[illegible].00	0.00	221.00	0.0[illegible]
2.000	4630.00	409.69	0.00	-1.00	0.00	213.34	90.00

3.000	4630.00	470.17	0.00	1.23	0.00	227.83	50.00
4.000	4630.00	477.62	0.00	-0.85	0.00	198.40	50.00
5.000	4630.00	477.95	0.00	1.07	0.00	147.37	50.00
6.000	4630.00	470.85	0.00	-5.06	0.00	60.51	73.20
7.000	4630.00	467.05	0.00	-3.24	0.00	52.41	52.60
8.000	4630.00	464.27	0.00	-1.38	0.00	46.14	35.00
9.000	4630.00	458.36	0.00	5.92	0.00	37.34	100.00
10.000	4630.00	451.73	0.00	-6.43	0.00	35.81	151.00
11.000	4630.00	444.43	0.00	6.45	0.00	33.53	200.00
12.000	4630.00	438.88	0.00	-5.60	0.00	32.72	150.00
13.000	4630.00	436.57	0.00	-2.31	0.00	32.53	69.00
14.000	4630.00	430.80	0.00	-5.67	0.00	32.24	200.00
15.000	4630.00	424.61	0.00	-6.20	0.00	31.88	200.00
16.000	4630.00	421.43	0.00	-3.18	0.00	31.65	100.00
17.000	4630.00	415.32	0.00	-6.11	0.00	31.57	203.00
18.000	4630.00	409.03	0.00	-6.29	0.00	31.38	204.00
19.000	4630.00	405.36	0.00	-3.67	0.00	31.41	124.00
20.000	4630.00	399.60	0.00	-5.76	0.00	31.66	170.00
21.000	4630.00	393.50	0.00	-6.11	0.00	31.62	206.00
22.000	4630.00	391.35	0.00	-2.15	0.00	33.56	77.00
23.000	4630.00	388.78	0.00	-2.57	0.00	56.26	50.00
24.000	4630.00	386.54	0.00	-2.25	0.00	105.78	50.00

1

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLOSS
25.000	4630.00	384.24	0.00	-0.25	0.00	171.50	50.00
26.000	4630.00	387.03	0.00	0.74	0.00	148.73	50.30
* 27.000	4630.00	327.16	0.00	0.13	0.00	157.37	50.00
* 28.000	4630.00	386.94	0.00	0.22	0.00	150.76	100.00
29.000	4670.00	385.83	0.00	-1.11	0.00	140.76	100.00

1
02/25/98 09:37:09 PAGE 15

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 27.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 27.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 27.000 PROFILE= 1 ** TRIALS ATTEMPTED TO BALANCE WSEL

1
02/25/98 09:37:15 PAGE 1

****
NCC2 RELEASE DATED NOV 96 UPDATED MAR 1997
ERROR CORR - 01,02,03,04,05
MODIFICATION - 50,51,52,53,54,55
****

AppendixC

APPENDIX C

Form 4 : Riverine Hydraulic Analysis Form #2
North La Cueva Arroyo, West of I-25

Backup Data

1. Disk #3: diskette containing the HEC-2 computer model input and output files for the 100-year recurrence interval.

2. Summary of the file names and contents for the HEC-2 revised conditions models for the North La Cueva Arroyo, west of I-25.

3. HEC-2 output for the revised conditions model for the North La Cueva Arroyo located west of I-25.

4. HEC-2 output for the revised conditions model for the South El Camino Diversion concrete box culvert located west of I-25.

5. El Camino/North La Cueva Confluence Report. Dr. Richard J. Heggen, University of New Mexico, Department of Civil Engineering. November 20, 1994.

6. Momentum balance analysis calculations for the North La Cueva Channel and the South El Camino Diversion confluence.

7. Engineering Analysis for North and South La Cueva Channel Project. Bohannan-Huston, Inc., May 1988.

8. Momentum balance analysis calculations for the North La Cueva Channel and the South La Cueva Channel confluence.

9. Summary of the source of input parameters used in the revised conditions models.

APPENDIX C: Section 1

HEC-2 Computer Model Input And Output Files For The 100-Year Recurrence Interval

APPENDIX C: Section 2

Summary of the File Names and Contents for the HEC-2 Revised Conditions Models for the North La Cueva Arroyo, West of I-25

The HEC-2 revised conditions models for the North La Cueva Arroyo are provided on Disk #3. All of the HEC-2 runs use the 100-year, existing conditions flows. The files for the South La Cueva Diversion model are included because of the hydraulic connection with the North La Cueva Channel. Table C1. below summarizes the model file names and contents.

Table C1: Summary of HEC-2 Models for the North La Cueva Arroyo

Input File Name	Output File Name	Contents
NLCWI25.SUP	NLCWI25.OUT	This file contains the HEC-2 run for the North La Cueva Arroyo on the west side of I-25. The upstream limit of the reach is at I-25 and the downstream limit is at the North Diversion Channel. This model is for supercritical flow.
NEWBOX.SUP	NEWBOX.OUT	This file contains the HEC-2 run for the South El Camino Diversion concrete box culvert on the west side of I-25. This model is for supercritical flow.

APPENDIX C: Section 3

HEC-2 Output
for the Revised Conditions Model for the
North La Cueva Arroyo Located West of I-25

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    12AUG96    TIME   16:16:07  *
*******************************************
```


```
************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
```


```
 X     X  XXXXXXX   XXXXX              XXXXX
 X     X  X         X     X           X     X
 X     X  X         X                       X
 XXXXXXX  XXXX      X          XXXXX    XXXXX
 X     X  X         X                  X
 X     X  X         X     X            X
 X     X  XXXXXXX   XXXXX              XXXXXXX
```

```
::::::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::::::
:::                                          :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION    :::
:::                                          :::
::::::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::::::
```

```
==============================
H A E S T A D   M E T H O D S
==============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 12AUG96 16:16:08

```
**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**********************************


T1   NORTH LA CUEVA ARROYO
T1   WEST OF I-25 TO THE NORTH DIVERSION CHANNEL
T1   FLOWS FROM NEW RTI AHYMO FILE 5/29/96(LC100C.HYM)
T1   FLOWS USED INCLUDE SEDIMENT BULKING FACTORS
T1   GR CARDS FROM AS-BUILT PLANS FOR THE CHANNEL
T2   HEC-2 RUN FOR  LA CUEVA AND SOUTH EL CAMINO LOMR
T3          SUPERCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

            2.                      1        -1

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   -1.          0       -1.                                     -1.

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.       42.        4.        26.        1.        2.        3.        8.        14.

QT      1.0     3200.5
NC     .015       .015       .015         .1         .3
          NORTH LA CUEVA AT I-25
          FLOW THAT PASSES THROUGH STRUCTURE 11
X1   7901.6        4.0     500.00      531.5      26.63      26.6      26.6
GR   5191.8      500.0    5181.76      500.0    5181.76      531.5   5191.76      531.5

X1   7875.0        4.0     500.00      566.4       7.00        7.0       7.0
GR   5191.0      500.0    5180.99      520.0    5180.99      546.4   5190.99      566.4

X1   7868.0        4.0     500.00      564.8      15.19       15.2      15.2
GR   5190.8      500.0    5180.79      520.0    5180.79      544.8   5190.79      564.8

X1   7852.8        4.0     500.00      561.6       2.81        2.8       2.8
GR   5190.4      500.0    5180.36      520.0    5180.36      541.6   5190.36      561.6

X1   7850.0        4.0     500.00      561.0      13.19       13.2      13.2
GR   5190.3      500.0    5180.28      520.0    5180.28      541.0   5190.28      561.0

X1   7836.8        4.0     500.00      558.0      11.81       11.8      11.8
GR   5189.9      500.0    5179.91      520.0    5179.91      538.0   5189.91      558.0
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X1   7825.0        4.0     500.00      555.5        2.59         2.6         2.6
GR   5189.6      500.0    5179.57      520.0     5179.57       535.5     5189.57       555.5

X1   7822.4        4.0     500.00      555.0       20.00        20.0        20.0
GR   5189.5      500.0    5179.50      520.0     5179.50       535.0     5189.50       555.0

X1   7802.4        5.0     500.00      543.0        27.4        27.4        27.4
GR   5188.0      500.0    5178.80      520.0     5178.80       535.0     5182.80       543.0     5188.80       543.0

X1   7775.0        5.0     500.00      537.8        35.00        35.0        35.0
GR   5188.0      500.0    5178.00      520.0     5178.00       535.8     5179.00       537.8     5190.00       537.8

X1   7740.0        5.0     500.00      537.9        21.90        21.9        21.9
GR   5186.9      500.0    5176.90      520.0     5176.90       536.9     5177.40       537.9     5186.90       537.9

QT      1.0       5376
          CONFLUENCE OF NORTH LA CUEVA AND SOUTH EL CAMINO DIVERSION
          FLOW INCLUDES PREVIOUS FLOW + FLOW THROUGH
          STRUCTURES 8, 9, AND 10 (SOUTH EL CAMINO DIVERSION)
X1   7718.1        4.0     500.00      572.5       20.10         20.1        20.1
GR   5186.3      500.0    5176.25      520.0     5176.25       552.5     5186.25       572.5

          WATER SURFACE ELEVATION FROM MOMENTUM BALANCE ANALYSIS
          OF NORTH LA CUEVA AND SOUTH EL CAMINO DIVERSION
X1   7698.0        4.0     500.00      560.8       48.00        48.00        48.00
X5      1.0    5182.10
GR   5186.8      500.0    5175.80      519.0     5175.80       541.8     5186.80       560.8

          FLOW INCLUDES PREVIOUS + BASIN 118
X1   7650.0        4.0     500.00      559.5       50.00         50.0        50.0
GR   5183.9      500.0    5174.37      519.0     5174.37       540.5     5183.87       559.5

QT      1.0       5380
X1   7600.0        4.0     500.00      558.0       50.00         50.0        50.0
GR   5182.4      500.0    5172.88      519.0     5172.88       539.0     5182.38       558.0

X1   7550.0        4.0     500.00      556.1       50.00         50.0        50.0
GR   5180.9      500.0    5171.39      519.0     5171.39       537.1     5180.89       556.1

X1   7500.0        4.0     500.00      554.2       25.00         25.0        25.0
GR   5179.4      500.0    5169.90      519.0     5169.90       535.2     5179.40       554.2

X1   7475.0        4.0     500.00      553.2        5.00          5.0         5.0
GR   5178.6      500.0    5169.15      519.0     5169.15       534.2     5178.65       553.2

X1   7470.0        4.0     500.00      553.0       45.00         45.0        45.0
GR   5178.5      500.0    5169.00      519.0     5169.00       534.0     5178.50       553.0
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X1	7425.0	4.0	500.00	553.0	50.00	50.0	50.0	
GR	5177.6	500.0	5168.09	519.0	5168.09	534.0	5177.59	553.0
X1	7375.0	4.0	500.00	553.0	50.00	50.0	50.0	
GR	5176.6	500.0	5167.07	519.0	5167.07	534.0	5176.57	553.0
X1	7325.0	4.0	500.00	553.0	50.00	50.0	50.0	
GR	5175.6	500.0	5166.05	519.0	5166.05	534.0	5175.55	553.0
X1	7275.0	4.0	500.00	553.0	50.00	50.0	50.0	
GR	5174.5	500.0	5165.04	519.0	5165.04	534.0	5174.54	553.0
X1	7225.0	4.0	500.00	553.0	50.00	50.0	50.0	
GR	5173.5	500.0	5164.02	519.0	5164.02	534.0	5173.52	553.0
X1	7175.0	4.0	500.00	553.0	50.00	50.0	50.0	
GR	5172.5	500.0	5163.01	519.0	5163.01	534.0	5172.51	553.0
X1	7125.0	4.0	500.00	553.0	50.00	50.0	50.0	
GR	5171.5	500.0	5161.99	519.0	5161.99	534.0	5171.49	553.0
X1	7075.0	4.0	500.00	553.5	50.00	50.0	50.0	
GR	5170.6	500.0	5160.98	519.3	5160.98	534.3	5170.60	553.5
X1	7025.0	4.0	500.00	554.5	25.00	25.0	25.0	
GR	5169.8	500.0	5159.96	519.8	5159.96	534.8	5169.84	554.5
X1	7000.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5169.5	500.0	5159.45	520.0	5159.45	535.0	5169.45	555.0
X1	6950.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5168.4	500.0	5158.44	520.0	5158.44	535.0	5168.44	555.0
X1	6900.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5167.4	500.0	5157.42	520.0	5157.42	535.0	5167.42	555.0
X1	6850.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5166.4	500.0	5156.41	520.0	5156.41	535.0	5166.41	555.0
X1	6800.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5165.4	500.0	5155.39	520.0	5155.39	535.0	5165.39	555.0
X1	6750.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5164.4	500.0	5154.38	520.0	5154.38	535.0	5164.38	555.0
X1	6700.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5163.4	500.0	5153.36	520.0	5153.36	535.0	5163.36	555.0

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X1   6650.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5162.3    500.0    5152.34   520.0    5152.34   535.0   5162.34    555.0

X1   6600.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5161.3    500.0    5151.33   520.0    5151.33   535.0   5161.33    555.0

X1   6550.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5160.3    500.0    5150.31   520.0    5150.31   535.0   5160.31    555.0

X1   6500.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5159.3    500.0    5149.30   520.0    5149.30   535.0   5159.30    555.0

X1   6450.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5158.3    500.0    5148.28   520.0    5148.28   535.0   5158.28    555.0

X1   6400.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5157.3    500.0    5147.27   520.0    5147.27   535.0   5157.27    555.0

X1   6350.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5156.3    500.0    5146.25   520.0    5146.25   535.0   5156.25    555.0

X1   6300.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5155.2    500.0    5145.24   520.0    5145.24   535.0   5155.24    555.0

X1   6250.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5154.2    500.0    5144.22   520.0    5144.22   535.0   5154.22    555.0

X1   6200.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5153.2    500.0    5143.20   520.0    5143.20   535.0   5153.20    555.0

X1   6150.0      4.0    500.00    555.0     50.00     50.0     50.0
GR   5152.2    500.0    5142.19   520.0    5142.19   535.0   5152.19    555.0

X1   6100.0      4.0    500.00    555.0     25.00     25.0     25.0
GR   5151.2    500.0    5141.17   520.0    5141.17   535.0   5151.17    555.0

X1   6075.0      4.0    500.00    551.8     25.00     25.0     25.0
GR   5151.2    500.0    5140.67   518.4    5140.67   533.4   5151.17    551.8

          UPSTREAM SIDE OF SAN MATEO BLVD. BRIDGE
X1   6050.0      4.0    500.00    548.0     25.00     25.0     25.0
GR   5151.2    500.0    5140.16   516.5    5140.16   531.5   5151.16    548.0

X1   6025.0      6.0    500.00    536.0     25.00     25.0     25.0
GR   5150.6    500.0    5146.65   500.0    5139.65   510.5   5139.65    525.5   5146.65   536.0
GR   5150.6    536.0

X1   6000.0      6.0    500.00    536.0     25.00     25.0     25.0
GR   5150.1    500.0    5146.14   500.0    5139.14   510.5   5139.14    525.5   5146.14   536.0
GR   5150.1    536.0
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X1   5975.0        6.0     500.00      536.0       25.00       25.0       25.0
GR   5149.6      500.0    5145.63      500.0    5138.63       510.5    5138.63       525.5    5145.63       536.0
GR   5149.6      536.0

          DOWNSTREAM SIDE OF SAN MATEO BLVD. BRIDGE
          FLOW INCLUDES PREVIOUS FLOW + BASIN 126 RUNOFF
X1   5950.0        4.0     500.00      548.0       25.00       25.0       25.0
GR   5149.1      500.0    5138.13      516.5    5138.13       531.5    5149.13       548.0

QT      1.0       5389
X1   5925.0        4.0     500.00      551.8       25.00       25.0       25.0
GR   5148.1      500.0    5137.62      518.4    5137.62       533.4    5148.12       551.8

X1   5900.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5147.1      500.0    5137.11      520.0    5137.11       535.0    5147.11       555.0

X1   5850.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5146.1      500.0    5136.10      520.0    5136.10       535.0    5146.10       555.0

X1   5800.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5145.1      500.0    5135.08      520.0    5135.08       535.0    5145.08       555.0

X1   5750.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5144.0      500.0    5133.96      520.0    5133.96       535.0    5143.96       555.0

X1   5700.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5142.8      500.0    5132.85      520.0    5132.85       535.0    5142.85       555.0

X1   5650.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5141.7      500.0    5131.73      520.0    5131.73       535.0    5141.73       555.0

X1   5600.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5140.6      500.0    5130.61      520.0    5130.61       535.0    5140.61       555.0

X1   5550.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5139.5      500.0    5129.49      520.0    5129.49       535.0    5139.49       555.0

X1   5500.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5138.4      500.0    5128.38      520.0    5128.38       535.0    5138.38       555.0

X1   5450.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5137.3      500.0    5127.26      520.0    5127.26       535.0    5137.26       555.0

X1   5400.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5136.1      500.0    5126.14      520.0    5126.14       535.0    5136.14       555.0

X1   5350.0        4.0     500.00      555.0       50.00       50.0       50.0
GR   5135.0      500.0    5125.02      520.0    5125.02       535.0    5135.02       555.0
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X1   5300.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5133.9     500.0    5123.90      520.0    5123.90      535.0    5133.90      555.0

X1   5250.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5132.8     500.0    5122.79      520.0    5122.79      535.0    5132.79      555.0

X1   5200.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5131.7     500.0    5121.67      520.0    5121.67      535.0    5131.67      555.0

X1   5150.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5130.6     500.0    5120.55      520.0    5120.55      535.0    5130.55      555.0

X1   5100.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5129.4     500.0    5119.44      520.0    5119.44      535.0    5129.44      555.0

X1   5050.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5128.3     500.0    5118.32      520.0    5118.32      535.0    5128.32      555.0

X1   5000.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5127.2     500.0    5117.20      520.0    5117.20      535.0    5127.20      555.0

X1   4950.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5126.1     500.0    5116.08      520.0    5116.08      535.0    5126.08      555.0

X1   4900.0       4.0     500.00      555.0      50.00       50.0       50.0
GR   5125.0     500.0    5114.96      520.0    5114.96      535.0    5124.96      555.0

X1   4850.0       4.0     500.00      555.0      25.00       25.0       25.0
GR   5123.8     500.0    5113.85      520.0    5113.85      535.0    5123.85      555.0

X1   4825.0       4.0     500.00      554.0      25.00       25.0       25.0
GR   5123.0     500.0    5113.29      519.5    5113.29      534.5    5123.04      554.0

X1   4800.0       4.0     500.00      553.0      50.00       50.0       50.0
GR   5122.2     500.0    5112.73      519.0    5112.73      534.0    5122.23      553.0

X1   4750.0       4.0     500.00      553.0      50.00       50.0       50.0
GR,  5121.1     500.0    5111.61      519.0    5111.61      534.0    5121.11      553.0

X1   4700.0       4.0     500.00      553.0      50.00       50.0       50.0
GR   5120.0     500.0    5110.49      519.0    5110.49      534.0    5119.99      553.0

X1   4650.0       4.0     500.00      553.0      50.00       50.0       50.0
GR   5118.9     500.0    5109.38      519.0    5109.38      534.0    5118.88      553.0

X1   4600.0       4.0     500.00      553.0      50.00       50.0       50.0
GR   5117.8     500.0    5108.26      519.0    5108.26      534.0    5117.76      553.0
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X1   4550.0       4.0     500.00      553.0       50.00       50.0       50.0
GR   5116.0     500.0     5106.51     519.0     5106.51       534.0     5116.01      553.0

X1   4500.0       4.0     500.00      553.0       50.00       50.0       50.0
GR   5114.3     500.0     5104.76     519.0     5104.76       534.0     5114.26      553.0

X1   4450.0       4.0     500.00      553.0       50.00       50.0       50.0
GR   5112.5     500.0     5103.01     519.0     5103.01       534.0     5112.51      553.0

X1   4400.0       4.0     500.00      553.0       50.00       50.0       50.0
GR   5110.8     500.0     5101.26     519.0     5101.26       534.0     5110.76      553.0

X1   4350.0       4.0     500.00      553.0       50.00       50.0       50.0
GR   5109.0     500.0     5099.51     519.0     5099.51       534.0     5109.01      553.0

X1   4300.0       4.0     500.00      553.0       19.98       20.0       20.0
GR   5107.3     500.0     5097.76     519.0     5097.76       534.0     5107.26      553.0

X1   4280.0       4.0     500.00      553.0        5.02        5.0        5.0
GR   5106.9     500.0     5097.36     519.0     5097.36       534.0     5106.86      553.0

X1   4275.0       4.0     500.00      552.6       25.00       25.0       25.0
GR   5106.9     500.0     5097.26     518.8     5097.26       533.8     5106.91      552.6

X1   4250.0       4.0     500.00      550.4       19.98       20.0       20.0
GR   5107.2     500.0     5096.76     517.7     5096.76       532.7     5107.16      550.4

          CHANNEL SIDE SLOPE CHANGES TO 1.5 : 1
          JUST UPSTREAM OF OLD JEFFERSON ST. BRIDGE
X1   4230.0       4.0     500.00      548.0        5.02        5.0        5.0
GR   5107.4     500.0     5096.36     516.5     5096.36       531.5     5107.36      548.0

X1   4225.0       4.0     500.00      548.0       25.00       25.0       25.0
GR   5107.3     500.0     5096.26     516.5     5096.26       531.5     5107.26      548.0

          APPROXIMATE UPSTREAM FACE OF OLD JEFFERSON ST. BRIDGE
X1   4200.0       5.0     500.00      542.0       25.00       25.0       25.0
GR   5106.8     500.0     5095.76     516.5     5095.76       531.5     5102.76      542.0     5106.76      542.0

X1   4175.0       6.0     500.00      536.0       25.00       25.0       25.0
GR   5106.3     500.0     5102.26     500.0     5095.26       510.5     5095.26      525.5     5102.26      536.0
GR   5106.3     536.0

X1   4150.0       6.0     500.00      536.0       25.00       25.0       25.0
GR   5105.8     500.0     5101.76     500.0     5094.76       510.5     5094.76      525.5     5101.76      536.0
GR   5105.8     536.0

X1   4125.0       6.0     500.00      536.0       25.00       25.0       25.0
GR   5105.3     500.0     5101.23     500.0     5094.26       510.5     5094.26      525.5     5101.26      536.0
GR   5105.3     536.0
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APPROXIMATE DOWNSTREAM FACE OF OLD JEFFERSON ST. BRIDGE

X1	4100.0	5.0	500.00	540.3	25.00	25.0	25.0			
GR	5104.8	500.0	5100.76	500.0	5093.76	510.5	5093.76	525.5	5103.56	540.3
X1	4075.0	4.0	500.00	548.0	15.00	15.0	15.0			
GR	5104.3	500.0	5093.26	516.5	5093.26	531.5	5104.26	548.0		

CHANNEL SIDE SLOPE CHANGES TO 2 : 1
JUST DOWNSTREAM OF OLD JEFFERSON ST. BRIDGE

X1	4060.0	4.0	500.00	548.0	10.00	10.0	10.0			
GR	5104.0	500.0	5092.96	516.5	5092.96	531.5	5103.96	548.0		
X1	4050.0	4.0	500.00	549.6	25.00	25.0	25.0			
GR	5103.6	500.0	5092.76	517.3	5092.76	532.3	5103.56	549.6		
X1	4025.0	4.0	500.00	553.1	15.00	15.0	15.0			
GR	5102.6	500.0	5092.26	519.1	5092.26	534.1	5102.56	553.1		
X1	4010.0	4.0	500.00	555.0	15.00	15.0	15.0			
GR	5102.0	500.0	5091.96	520.0	5091.96	535.0	5101.96	555.0		
X1	4025.0	4.0	500.00	555.0	9.40	9.4	9.4			
GR	5102.3	500.0	5092.26	520.0	5092.26	535.0	5102.26	555.0		
X1	4015.6	4.0	500.00	555.0	15.60	15.6	15.6			
GR	5102.1	500.0	5092.07	520.0	5092.07	535.0	5102.07	555.0		
X1	4000.0	4.0	500.00	553.4	4.40	4.4	4.4			
GR	5101.4	500.0	5091.76	519.2	5091.76	534.2	5101.37	553.4		
X1	3995.6	4.0	500.00	553.0	20.60	20.6	20.6			
GR	5101.0	500.0	5091.54	519.0	5091.54	534.0	5101.04	553.0		
X1	3975.0	4.0	500.00	553.0	25.00	25.0	25.0			
GR	5100.2	500.0	5090.71	519.0	5090.71	534.0	5100.21	553.0		
X1	3950.0	4.0	500.00	553.0	50.00	50.0	50.0			
GR	5099.2	500.0	5089.72	519.0	5089.72	534.0	5099.22	553.0		
X1	3900.0	4.0	500.00	553.0	50.00	50.0	50.0			
GR	5097.2	500.0	5087.74	519.0	5087.74	534.0	5097.24	553.0		
X1	3850.0	4.0	500.00	553.0	50.00	50.0	50.0			
GR	5095.3	500.0	5085.77	519.0	5085.77	534.0	5095.27	553.0		
X1	3800.0	4.0	500.00	553.0	50.00	50.0	50.0			
GR	5093.3	500.0	5083.79	519.0	5083.79	534.0	5093.29	553.0		

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X1   3750.0      4.0    500.00    553.0     50.00     50.0     50.0
GR   5092.1    500.0    5082.64   519.0     5082.64   534.0    5092.14    553.0

X1   3700.0      4.0    500.00    553.0     50.00     50.0     50.0
GR   5091.3    500.0    5081.77   519.0     5081.77   534.0    5091.27    553.0

X1   3650.0      4.0    500.00    553.0     50.00     50.0     50.0
GR   5090.4    500.0    5080.90   519.0     5080.90   534.0    5090.40    553.0

X1   3600.0      4.0    500.00    553.0     50.00     50.0     50.0
GR   5089.5    500.0    5080.04   519.0     5080.04   534.0    5089.54    553.0

X1   3550.0      4.0    500.00    553.0     50.00     50.0     50.0
GR   5088.7    500.0    5079.17   519.0     5079.17   534.0    5088.67    553.0

X1   3500.0      4.0    500.00    553.0     34.40     34.4     34.4
GR   5087.8    500.0    5078.30   519.0     5078.30   534.0    5087.80    553.0

X1   3465.6      4.0    500.00    553.0     15.60     15.6     15.6
GR   5087.2    500.0    5077.71   519.0     5077.71   534.0    5087.21    553.0

X1   3450.0      4.0    500.00    551.8     25.00     25.0     25.0
GR   5087.4    500.0    5077.44   518.4     5077.44   533.4    5087.40    551.8

X1   3425.0      4.0    500.00    549.2      9.40      9.4      9.4
GR   5087.7    500.0    5077.00   517.1     5077.00   532.1    5087.72    549.2

          UPSTREAM FACE OF JEFFERSON STREET CROSSING
X1   3415.6      4.0    500.00    548.0     15.60     15.6     15.6
GR   5087.8    500.0    5076.84   516.5     5076.84   531.5    5087.84    548.0

X1   3400.0      6.0    500.00    536.0     25.00     25.0     25.0
GR   5087.6    500.0    5083.57   500.0     5076.57   510.5    5076.57    525.5    5083.57    536.0
GR   5087.6    536.0

X1   3375.0      6.0    500.00    536.0     25.00     25.0     25.0
GR   5087.1    500.0    5083.14   500.0     5076.14   510.5    5076.14    525.5    5083.14    536.0
GR   5087.1    536.0

X1   3350.0      6.0    500.00    548.0     24.40     24.4     24.4
GR   5086.7    500.0    5082.70   500.0     5075.70   510.5    5075.70    525.5    5082.70    536.0
GR   5086.7    536.0

          DOWNSTREAM FACE OF JEFFERSON STREET CROSSING
X1   3325.6      4.0    500.00    548.0     25.60     25.6     25.6
GR   5086.3    500.0    5075.28   516.5     5075.28   531.5    5086.28    548.0

X1   3300.0      4.0    500.00    555.0      25.0      25.0     25.0
GR   5085.1    500.0    5073.74   520.0     5073.74   535.0    5085.12    555.0
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X1   3275.0       4.0     500.00      562.9       25.00       25.0       25.0
GR   5083.0     500.0     5071.29     523.5     5071.29      539.4     5083.04      562.9

X1   3250.0       5.0     500.00      563.6       25.00       25.0       25.0
GR   5082.6     500.0     5081.07     500.0     5070.82      520.5     5070.82      536.7     5082.57      560.2

X1   3225.0       5.0     500.00      564.2       25.00       25.0       25.0
GR   5082.1     500.0     5077.35     500.0     5070.34      514.0     5070.34      531.0     5082.09      554.5

X1   3200.0       5.0     500.00      564.9       25.00       25.0       25.0
GR   5081.6     500.0     5073.85     500.0     5069.87      508.0     5069.87      525.5     5081.62      549.0

X1   3175.0       5.0     500.00      565.5       25.00       25.0       25.0
GR   5081.1     500.0     5071.35     500.0     5069.40      504.0     5069.40      522.5     5081.15      546.0

X1   3150.0       4.0     500.00      566.1       25.00       25.0       25.0
GR   5080.7     500.0     5068.92     500.0     5068.92      519.0     5080.67      542.5

QT      1.0      5392
X1   3125.0       4.0     500.00      566.8        7.71        7.7        7.7
GR   5080.2     500.0     5068.45     500.0     5068.45      519.8     5080.20      543.8

QT      1.0      5487
         CONFLUENCE OF NORTH LA CUEVA AND SOUTH LA CUEVA
         FLOW INCLUDES PREVIOUS FLOW + SOUTH LA CUEVA
X1   3117.3       4.0     500.00      573.0       17.29       17.3       17.3
GR   5080.0     500.0     5068.30     523.5     5068.30      549.5     5080.05      573.0
         WATER SURFACE ELEVATION FROM MOMENTUM BALANCE ANALYSIS
         OF NORTH LA CUEVA AND SOUTH LA CUEVA
X1   3100.0       4.0     500.00      571.8       25.00       25.0       25.0
X5      1.0   5072.30
GR   5079.6     500.0     5067.90     523.4     5067.90      548.4     5079.58      571.8

X1   3075.0       4.0     500.00      570.0       25.00       25.0       25.0
GR   5078.9     500.0     5067.33     523.2     5067.33      546.8     5078.91      570.0

X1   3050.0       4.0     500.00      568.2       25.00       25.0       25.0
GR   5078.2     500.0     5066.75     523.0     5066.75      545.3     5078.24      568.2

X1   3025.0       4.0     500.00      566.5       25.00       25.0       25.0
GR   5077.6     500.0     5066.18     522.8     5066.18      543.7     5077.56      566.5

X1   3000.0       4.0     500.00      564.7       25.00       25.0       25.0
GR   5076.6     500.0     5065.36     522.6     5065.36      542.1     5076.65      564.7

X1   2975.0       4.0     500.00      562.9       25.00       25.0       25.0
GR   5075.7     500.0     5064.50     522.4     5064.50      540.5     5075.69      562.9
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X1   2950.0       4.0     500.00     561.1      23.00      23.0      23.0
GR   5074.7     500.0    5063.65     522.2    5063.65     539.0   5074.74     561.1

X1   2927.0       4.0     500.00     559.5       2.00       2.0       2.0
GR   5073.9     500.0    5062.86     522.0    5062.86     537.5   5073.86     559.5

X1   2925.0       4.0     500.00     559.5      25.00      25.0      25.0
GR   5073.8     500.0    5062.79     522.0    5062.79     537.5   5073.79     559.5

X1   2900.0       4.0     500.00     559.4      25.00      25.0      25.0
GR   5072.9     500.0    5061.94     522.0    5061.94     537.4   5072.94     559.4

X1   2875.0       4.0     500.00     559.3      25.00      25.0      25.0
GR   5072.1     500.0    5061.08     522.0    5061.08     537.3   5072.08     559.3

X1   2850.0       4.0     500.00     559.2      25.00      25.0      25.0
GR   5071.2     500.0    5060.22     522.0    5060.22     537.2   5071.22     559.2

X1   2825.0       4.0     500.00     559.1      25.00      25.0      25.0
GR   5070.4     500.0    5059.37     522.0    5059.37     537.1   5070.37     559.1

X1   2800.0       4.0     500.00     559.0      12.72      12.7      12.7
GR   5069.5     500.0    5058.51     522.0    5058.51     537.0   5069.51     559.0

X1   2787.3       4.0     500.00     559.0       0.68       0.7       0.7
GR   5069.1     500.0    5058.07     522.0    5058.07     537.0   5069.07     559.0

X1   2786.6       4.0     500.00     559.0      11.60      11.6      11.6
GR   5069.1     500.0    5058.05     522.0    5058.05     537.0   5069.05     559.0

X1   2775.0       4.0     500.00     556.7       8.40       8.4       8.4
GR   5068.2     500.0    5057.83     520.8    5057.83     535.8   5068.25     556.7

X1   2766.6       4.0     500.00     555.0      16.60      16.6      16.6
GR   5067.8     500.0    5057.76     520.0    5057.76     535.0   5067.76     555.0

X1   2750.0       4.0     500.00     555.0      50.00      50.0      50.0
GR   5067.6     500.0    5057.63     520.0    5057.63     535.0   5067.63     555.0

X1   2700.0       4.0     500.00     555.0      25.00      25.0      25.0
GR   5067.2     500.0    5057.23     520.0    5057.23     535.0   5067.23     555.0

QT      1.0      5503
X1   2675.0       4.0     500.00     555.0      25.00      25.0      25.0
GR   5067.0     500.0    5057.03     520.0    5057.03     535.0   5067.03     555.0

X1   2650.0       4.0     500.00     555.0      50.00      50.0      50.0
GR   5066.8     500.0    5056.84     520.0    5056.84     535.0   5066.84     555.0
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X1	2600.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5066.4	500.0	5056.44	520.0	5056.44	535.0	5066.44	555.0
X1	2550.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5066.0	500.0	5056.04	520.0	5056.04	535.0	5066.04	555.0
X1	2500.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5065.6	500.0	5055.65	520.0	5055.65	535.0	5065.65	555.0
X1	2450.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5065.2	500.0	5055.25	520.0	5055.25	535.0	5065.25	555.0
X1	2400.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5064.9	500.0	5054.85	520.0	5054.85	535.0	5064.85	555.0
X1	2350.0	4.0	500.00	555.0	50.00	50.0	50.0	
GR	5064.5	500.0	5054.46	520.0	5054.46	535.0	5064.46	555.0
X1	2300.0	4.0	500.00	555.5	13.40	13.4	13.4	
GR	5064.2	500.0	5054.06	520.3	5054.06	535.3	5064.19	555.5
X1	2286.6	4.0	500.00	556.2	11.60	11.6	11.6	
GR	5064.3	500.0	5053.95	520.6	5053.95	535.6	5064.25	556.2
X1	2275.0	4.0	500.00	556.2	25.00	25.0	25.0	
GR	5064.2	500.0	5053.86	520.6	5053.86	535.6	5064.16	556.2
X1	2250.0	4.0	500.00	556.2	50.00	50.0	50.0	
GR	5064.0	500.0	5053.66	520.6	5053.66	535.6	5063.96	556.2
X1	2200.0	4.0	500.00	556.2	50.00	50.0	50.0	
GR	5063.6	500.0	5053.26	520.6	5053.26	535.6	5063.56	556.2
X1	2150.0	4.0	500.00	556.2	50.00	50.0	50.0	
GR	5063.2	500.0	5052.87	520.6	5052.87	535.6	5063.17	556.2
X1	2100.0	4.0	500.00	556.2	50.00	50.0	50.0	
GR	5062.8	500.0	5052.47	520.6	5052.47	535.6	5062.77	556.2
X1	2050.0	4.0	500.00	556.2	50.00	50.0	50.0	
GR	5062.4	500.0	5052.07	520.6	5052.07	535.6	5062.37	556.2
X1	2000.0	4.0	500.00	556.2	50.00	50.0	50.0	
GR	5062.0	500.0	5051.68	520.6	5051.68	535.6	5061.98	556.2
X1	1950.0	4.0	500.00	556.2	50.00	50.0	50.0	
GR	5061.6	500.0	5051.28	520.6	5051.28	535.6	5061.58	556.2

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X1   1900.0       4.0     500.00      556.2       50.00       50.0       50.0
GR   5061.2     500.0     5050.88     520.6     5050.88      535.6    5061.18      556.2

X1   1850.0       4.0     500.00      556.2       50.00       50.0       50.0
GR   5060.8     500.0     5050.49     520.6     5050.49      535.6    5060.79      556.2

X1   1800.0       4.0     500.00      556.2       50.00       50.0       50.0
GR   5060.4     500.0     5050.09     520.6     5050.09      535.6    5060.39      556.2

X1   1750.0       4.0     500.00      556.2       50.00       50.0       50.0
GR   5060.0     500.0     5049.69     520.6     5049.69      535.6    5059.99      556.2

X1   1700.0       4.0     500.00      556.2       50.00       50.0       50.0
GR   5059.6     500.0     5049.30     520.6     5049.30      535.6    5059.60      556.2

X1   1650.0       4.0     500.00      556.2       50.00       50.0       50.0
GR   5059.2     500.0     5048.90     520.6     5048.90      535.6    5059.20      556.2

X1   1600.0       4.0     500.00      556.2       25.00       25.0       25.0
GR   5058.8     500.0     5048.50     520.6     5048.50      535.6    5058.80      556.2

X1   1575.0       4.0     500.00      556.2       18.40       18.4       18.4
GR.  5058.6     500.0     5048.30     520.6     5048.30      535.6    5058.60      556.2

X1   1556.6       4.0     500.00      556.2        6.60        6.6        6.6
GR   5058.5     500.0     5048.16     520.6     5048.16      535.6    5058.46      556.2

X1   1550.0       4.0     500.00      560.2       13.40       13.4       13.4
GR   5059.4     500.0     5048.11     522.6     5048.11      537.6    5059.40      560.2

X1   1536.6       4.0     500.00      568.2        0.00        0.0        0.0
GR   5061.3     500.0     5048.00     526.6     5048.00      541.6    5061.30      568.2
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 7901.600
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED
NORTH LA CUEVA AT I-25
FLOW THAT PASSES THROUGH STRUCTURE 11

7901.600	6.82	5188.58	5188.58	0.00	5192.03	3.45	0.00	0.00	5191.80
3200.5	0.0	3200.5	0.0	0.0	214.8	0.0	0.0	0.0	5191.76
0.00	0.00	14.90	0.00	0.000	0.015	0.000	0.000	5181.76	500.00
0.002825	0.	0.	0.	0	10	0	0.00	31.50	531.50

*SECNO 7875.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.65

7875.000	4.55	5185.54	5187.48	0.00	5191.64	6.11	0.12	0.27	5191.00
3200.5	0.0	3200.5	0.0	0.0	161.4	0.0	0.1	0.0	5190.99
0.00	0.00	19.83	0.00	0.000	0.015	0.000	0.000	5180.99	510.91
0.007675	27.	27.	27.	14	8	0	0.00	44.58	555.49

*SECNO 7868.000

7868.000	4.72	5185.51	5187.45	0.00	5191.58	6.07	0.05	0.01	5190.80
3200.5	0.0	3200.5	0.0	0.0	161.9	0.0	0.1	0.0	5190.79
0.00	0.00	19.77	0.00	0.000	0.015	0.000	0.000	5180.79	510.55
0.007420	7.	7.	7.	2	11	0	0.00	43.70	554.26

*SECNO 7852.800

7852.800	5.15	5185.51	5187.40	0.00	5191.43	5.92	0.11	0.04	5190.40
3200.5	0.0	3200.5	0.0	0.0	163.9	0.0	0.2	0.0	5190.36
0.00	0.00	19.53	0.00	0.000	0.015	0.000	0.000	5180.36	509.75
0.006843	15.	15.	15.	3	11	0	0.00	42.13	551.89

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 7850.000									
7850.000	5.22	5185.50	5187.37	0.00	5191.40	5.90	0.02	0.01	5190.30
3200.5	0.0	3200.5	0.0	0.0	164.2	0.0	0.2	0.0	5190.28
0.00	0.00	19.49	0.00	0.000	0.015	0.000	0.000	5180.28	509.57
0.006757	3.	3.	3.	2	11	0	0.00	41.87	551.45
*SECNO 7836.800									
7836.800	5.73	5185.64	5187.42	0.00	5191.22	5.59	0.08	0.09	5189.90
3200.5	0.0	3200.5	0.0	0.0	168.7	0.0	0.3	0.1	5189.91
0.00	0.00	18.97	0.00	0.000	0.015	0.000	0.000	5179.91	508.53
0.006039	13.	13.	13.	2	11	0	0.00	40.92	549.45
*SECNO 7825.000									
7825.000	6.21	5185.78	5187.43	0.00	5191.06	5.28	0.07	0.09	5189.60
3200.5	0.0	3200.5	0.0	0.0	173.6	0.0	0.3	0.1	5189.57
0.00	0.00	18.44	0.00	0.000	0.015	0.000	0.000	5179.57	507.60
0.005436	12.	12.	12.	2	11	0	0.00	40.33	547.93
*SECNO 7822.400									
7822.400	6.31	5185.81	5187.43	0.00	5191.03	5.22	0.01	0.02	5189.50
3200.5	0.0	3200.5	0.0	0.0	174.5	0.0	0.3	0.1	5189.50
0.00	0.00	18.34	0.00	0.000	0.015	0.000	0.000	5179.50	507.37
0.005335	3.	3.	3.	2	11	0	0.00	40.26	547.63
*SECNO 7802.400									
3301 HV CHANGED MORE THAN HVINS									
7802.400	6.05	5184.85	5186.67	0.00	5190.84	5.99	0.11	0.08	5188.00
3200.5	0.0	3200.5	0.0	0.0	162.9	0.0	0.4	0.1	5188.80
0.00	0.00	19.65	0.00	0.000	0.015	0.000	0.000	5178.80	506.85
0.006142	20.	20.	20.	16	11	0	0.00	36.15	543.00
*SECNO 7775.000									
7775.000	6.70	5184.70	5186.49	0.00	5190.67	5.97	0.16	0.01	5188.00
3200.5	0.0	3200.5	0.0	0.0	163.2	0.0	0.5	0.1	5190.00
0.00	0.00	19.61	0.00	0.000	0.015	0.000	0.000	5178.00	506.59
0.005753	27.	27.	27.	5	11	0	0.00	31.21	537.80

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 7740.000

3301 HV CHANGED MORE THAN HVINS

7740.000	6.15	5183.05	5185.33	0.00	5190.31	7.26	0.23	0.13	5186.90
3200.5	0.0	3200.5	0.0	0.0	148.1	0.0	0.6	0.1	5186.90
0.00	0.00	21.62	0.00	0.000	0.015	0.000	0.000	5176.90	507.67
0.007620	35.	35.	35.	14	11	0	0.00	30.23	537.90

*SECNO 7718.100

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.63

CONFLUENCE OF NORTH LA CUEVA AND SOUTH EL CAMINO DIVERSION
FLOW INCLUDES PREVIOUS FLOW + FLOW THROUGH
STRUCTURES 8, 9, AND 10 (SOUTH EL CAMINO DIVERSION)

7718.100	5.35	5181.60	5184.20	0.00	5190.02	8.42	0.18	0.12	5186.30
5376.0	0.0	5376.0	0.0	0.0	230.9	0.0	0.7	0.2	5186.25
0.00	0.00	23.28	0.00	0.000	0.015	0.000	0.000	5176.25	509.36
0.008430	22.	22.	22.	15	11	0	0.00	53.84	563.20

*SECNO 7698.000
WATER EL=X5 CARD= 5182.100

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
WATER SURFACE ELEVATION FROM MOMENTUM BALANCE ANALYSIS
OF NORTH LA CUEVA AND SOUTH EL CAMINO DIVERSION

7698.000	6.30	5182.10	5185.18	0.00	5192.07	9.97	0.18	0.15	5186.80
5376.0	0.0	5376.0	0.0	0.0	212.2	0.0	0.8	0.2	5186.80
0.00	0.00	25.33	0.00	0.000	0.015	0.000	0.000	5175.80	508.12
0.008999	20.	20.	20.	0	14	0	0.00	44.56	552.68

*SECNO 7650.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

FLOW INCLUDES PREVIOUS + BASIN 118

7650.000	6.01	5180.38	5183.71	0.00	5191.48	11.10	0.47	0.11	5183.90
5376.0	0.0	5376.0	0.0	0.0	201.1	0.0	1.0	0.2	5183.87
0.00	0.00	26.74	0.00	0.000	0.015	0.000	0.000	5174.37	507.03
0.010882	48.	48.	48.	15	11	0	0.00	45.48	552.51

*SECNO 7600.000

3301 HV CHANGED MORE THAN HVINS

7600.000	6.06	5178.94	5182.39	0.00	5190.83	11.90	0.57	0.08	5182.40
5380.0	0.0	5380.0	0.0	0.0	194.4	0.0	1.3	0.3	5182.38
0.00	0.00	27.68	0.00	0.000	0.015	0.000	0.000	5172.88	506.91
0.011777	50.	50.	50.	9	14	0	0.00	44.20	551.11

*SECNO 7550.000

3301 HV CHANGED MORE THAN HVINS

7550.000	6.21	5177.60	5181.14	0.00	5190.16	12.56	0.61	0.07	5180.90
5380.0	0.0	5380.0	0.0	0.0	189.1	0.0	1.5	0.3	5180.89
0.00	0.00	28.45	0.00	0.000	0.015	0.000	0.000	5171.39	506.61
0.012452	50.	50.	50.	9	14	0	0.00	42.89	549.50

*SECNO 7500.000

3301 HV CHANGED MORE THAN HVINS

7500.000	6.38	5176.28	5179.92	0.00	5189.46	13.18	0.64	0.06	5179.40
5380.0	0.0	5380.0	0.0	0.0	184.7	0.0	1.7	0.4	5179.40
0.00	0.00	29.13	0.00	0.000	0.015	0.000	0.000	5169.90	506.24
0.013051	50.	50.	50.	9	14	0	0.00	41.71	547.96

*SECNO 7475.000

7475.000	6.48	5175.63	5179.30	0.00	5189.10	13.47	0.33	0.03	5178.60
5380.0	0.0	5380.0	0.0	0.0	182.7	0.0	1.8	0.4	5178.65
0.00	0.00	29.45	0.00	0.000	0.015	0.000	0.000	5169.15	505.97
0.013343	25.	25.	25.	9	14	0	0.00	41.18	547.16

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 7470.000									
7470.000	6.51	5175.51	5179.19	0.00	5189.03	13.52	0.07	0.00	5178.50
5380.0	0.0	5380.0	0.0	0.0	182.3	0.0	1.8	0.4	5178.50
0.00	0.00	29.51	0.00	0.000	0.015	0.000	0.000	5169.00	505.98
0.013372	5.	5.	5.	6	14	0	0.00	41.03	547.02
*SECNO 7425.000									
7425.000	6.46	5174.55	5178.28	0.00	5188.39	13.84	0.61	0.03	5177.60
5380.0	0.0	5380.0	0.0	0.0	180.2	0.0	2.0	0.5	5177.59
0.01	0.00	29.85	0.00	0.000	0.015	0.000	0.000	5168.09	506.10
0.013799	45.	45.	45.	9	14	0	0.00	40.82	546.92
*SECNO 7375.000									
7375.000	6.41	5173.48	5177.26	0.00	5187.65	14.18	0.70	0.03	5176.60
5380.0	0.0	5380.0	0.0	0.0	178.1	0.0	2.2	0.5	5176.57
0.01	0.00	30.21	0.00	0.000	0.015	0.000	0.000	5167.07	506.23
0.014254	50.	50.	50.	10	14	0	0.00	40.59	546.81
*SECNO 7325.000									
7325.000	6.36	5172.41	5176.25	0.00	5186.90	14.49	0.72	0.03	5175.60
5380.0	0.0	5380.0	0.0	0.0	176.1	0.0	2.4	0.5	5175.55
0.01	0.00	30.54	0.00	0.000	0.015	0.000	0.000	5166.05	506.34
0.014677	50.	50.	50.	10	14	0	0.00	40.38	546.72
*SECNO 7275.000									
7275.000	6.31	5171.35	5175.22	0.00	5186.13	14.77	0.74	0.03	5174.50
5380.0	0.0	5380.0	0.0	0.0	174.4	0.0	2.6	0.6	5174.54
0.01	0.00	30.85	0.00	0.000	0.015	0.000	0.000	5165.04	506.33
0.015108	50.	50.	50.	10	14	0	0.00	40.29	546.62
*SECNO 7225.000									
7225.000	6.28	5170.30	5174.21	0.00	5185.33	15.04	0.76	0.03	5173.50
5380.0	0.0	5380.0	0.0	0.0	172.9	0.0	2.8	0.6	5173.52
0.01	0.00	31.12	0.00	0.000	0.015	0.000	0.000	5164.02	506.43
0.015472	50.	50.	50.	10	14	0	0.00	40.12	546.55

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 7175.000									
7175.000	6.24	5169.25	5173.20	0.00	5184.53	15.28	0.78	0.02	5172.50
5380.0	0.0	5380.0	0.0	0.0	171.5	0.0	3.0	0.7	5172.51
0.01	0.00	31.37	0.00	0.000	0.015	0.000	0.000	5163.01	506.51
0.015804	50.	50.	50.	10	14	0	0.00	39.97	546.48
*SECNO 7125.000									
7125.000	6.21	5168.20	5172.18	0.00	5183.71	15.50	0.80	0.02	5171.50
5380.0	0.0	5380.0	0.0	0.0	170.3	0.0	3.2	0.7	5171.49
0.01	0.00	31.60	0.00	0.000	0.015	0.000	0.000	5161.99	506.59
0.016122	50.	50.	50.	10	14	0	0.00	39.83	546.42
*SECNO 7075.000									
7075.000	6.18	5167.16	5171.18	0.00	5182.87	15.71	0.81	0.02	5170.60
5380.0	0.0	5380.0	0.0	0.0	169.1	0.0	3.4	0.8	5170.60
0.01	0.00	31.81	0.00	0.000	0.015	0.000	0.000	5160.98	506.90
0.016424	50.	50.	50.	10	14	0	0.00	39.73	546.63
*SECNO 7025.000									
7025.000	6.15	5166.11	5170.19	0.00	5182.02	15.91	0.83	0.02	5169.80
5380.0	0.0	5380.0	0.0	0.0	168.1	0.0	3.6	0.8	5169.84
0.01	0.00	32.01	0.00	0.000	0.015	0.000	0.000	5159.96	507.42
0.016718	50.	50.	50.	10	14	0	0.00	39.64	547.07
*SECNO 7000.000									
7000.000	6.15	5165.60	5169.72	0.00	5181.60	16.00	0.42	0.01	5169.50
5380.0	0.0	5380.0	0.0	0.0	167.6	0.0	3.7	0.8	5169.45
0.01	0.00	32.10	0.00	0.000	0.015	0.000	0.000	5159.45	507.77
0.016815	25.	25.	25.	10	14	0	0.00	39.53	547.29
*SECNO 6950.000									
6950.000	6.12	5164.56	5168.69	0.00	5180.73	16.18	0.85	0.02	5168.40
5380.0	0.0	5380.0	0.0	0.0	166.7	0.0	3.9	0.9	5168.44
0.01	0.00	32.28	0.00	0.000	0.015	0.000	0.000	5158.44	507.72
0.017102	50.	50.	50.	10	14	0	0.00	39.51	547.23

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 6900.000									
6900.000	6.10	5163.52	5167.67	0.00	5179.85	16.34	0.86	0.02	5167.40
5380.0	0.0	5380.0	0.0	0.0	165.9	0.0	4.1	0.9	5167.42
0.01	0.00	32.44	0.00	0.000	0.015	0.000	0.000	5157.42	507.78
0.017329	50.	50.	50.	10	14	0	0.00	39.41	547.19
*SECNO 6850.000									
6850.000	6.08	5162.49	5166.67	0.00	5178.97	16.48	0.87	0.01	5166.40
5380.0	0.0	5380.0	0.0	0.0	165.2	0.0	4.3	1.0	5166.41
0.01	0.00	32.58	0.00	0.000	0.015	0.000	0.000	5156.41	507.83
0.017530	50.	50.	50.	10	14	0	0.00	39.33	547.16
*SECNO 6800.000									
6800.000	6.07	5161.46	5165.65	0.00	5178.07	16.62	0.88	0.01	5165.40
5380.0	0.0	5380.0	0.0	0.0	164.5	0.0	4.5	1.0	5165.39
0.01	0.00	32.71	0.00	0.000	0.015	0.000	0.000	5155.39	507.88
0.017724	50.	50.	50.	10	14	0	0.00	39.24	547.13
*SECNO 6750.000									
6750.000	6.06	5160.44	5164.63	0.00	5177.17	16.73	0.89	0.01	5164.40
5380.0	0.0	5380.0	0.0	0.0	163.9	0.0	4.7	1.1	5164.38
0.01	0.00	32.83	0.00	0.000	0.015	0.000	0.000	5154.38	507.92
0.017891	50.	50.	50.	10	14	0	0.00	39.18	547.10
*SECNO 6700.000									
6700.000	6.04	5159.40	5163.63	0.00	5176.26	16.86	0.90	0.01	5163.40
5380.0	0.0	5380.0	0.0	0.0	163.3	0.0	4.8	1.1	5163.36
0.01	0.00	32.95	0.00	0.000	0.015	0.000	0.000	5153.36	507.97
0.018066	50.	50.	50.	10	14	0	0.00	39.10	547.07
*SECNO 6650.000									
6650.000	6.02	5158.36	5162.59	0.00	5175.34	16.98	0.91	0.01	5162.30
5380.0	0.0	5380.0	0.0	0.0	162.7	0.0	5.0	1.2	5162.34
0.01	0.00	33.07	0.00	0.000	0.015	0.000	0.000	5152.34	507.92
0.018276	50.	50.	50.	10	14	0	0.00	39.10	547.03

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 6600.000									
6600.000	6.00	5157.33	5161.58	0.00	5174.41	17.08	0.92	0.01	5161.30
5380.0	0.0	5380.0	0.0	0.0	162.2	0.0	5.2	1.2	5161.33
0.01	0.00	33.17	0.00	0.000	0.015	0.000	0.000	5151.33	507.96
0.018425	50.	50.	50.	11	14	0	0.00	39.05	547.00
*SECNO 6550.000									
6550.000	5.99	5156.30	5160.56	0.00	5173.48	17.18	0.92	0.01	5160.30
5380.0	0.0	5380.0	0.0	0.0	161.8	0.0	5.4	1.2	5160.31
0.01	0.00	33.26	0.00	0.000	0.015	0.000	0.000	5150.31	508.00
0.018559	50.	50.	50.	11	14	0	0.00	38.98	546.99
*SECNO 6500.000									
6500.000	5.98	5155.28	5159.56	0.00	5172.54	17.26	0.93	0.01	5159.30
5380.0	0.0	5380.0	0.0	0.0	161.4	0.0	5.6	1.3	5159.30
0.01	0.00	33.34	0.00	0.000	0.015	0.000	0.000	5149.30	508.03
0.018675	50.	50.	50.	11	14	0	0.00	38.94	546.97
*SECNO 6450.000									
6450.000	5.97	5154.25	5158.54	0.00	5171.59	17.34	0.94	0.01	5158.30
5380.0	0.0	5380.0	0.0	0.0	161.0	0.0	5.8	1.3	5158.28
0.01	0.00	33.42	0.00	0.000	0.015	0.000	0.000	5148.28	508.07
0.018793	50.	50.	50.	11	14	0	0.00	38.88	546.95
*SECNO 6400.000									
6400.000	5.97	5153.24	5157.53	0.00	5170.65	17.40	0.94	0.01	5157.30
5380.0	0.0	5380.0	0.0	0.0	160.7	0.0	6.0	1.4	5157.27
0.01	0.00	33.48	0.00	0.000	0.015	0.000	0.000	5147.27	508.10
0.018880	50.	50.	50.	12	14	0	0.00	38.84	546.94
*SECNO 6350.000									
6350.000	5.95	5152.20	5156.52	0.00	5169.69	17.49	0.95	0.01	5156.30
5380.0	0.0	5380.0	0.0	0.0	160.3	0.0	6.1	1.4	5156.25
0.01	0.00	33.56	0.00	0.000	0.015	0.000	0.000	5146.25	508.14
0.018993	50.	50.	50.	11	14	0	0.00	38.79	546.92

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 6300.000									
6300.000	5.95	5151.19	5155.49	0.00	5168.73	17.54	0.95	0.01	5155.20
5380.0	0.0	5380.0	0.0	0.0	160.1	0.0	6.3	1.5	5155.24
0.02	0.00	33.61	0.00	0.000	0.015	0.000	0.000	5145.24	508.06
0.019116	50.	50.	50.	12	14	0	0.00	38.83	546.89
*SECNO 6250.000									
6250.000	5.94	5150.16	5154.48	0.00	5167.77	17.61	0.96	0.01	5154.20
5380.0	0.0	5380.0	0.0	0.0	159.8	0.0	6.5	1.5	5154.22
0.02	0.00	33.67	0.00	0.000	0.015	0.000	0.000	5144.22	508.09
0.019200	50.	50.	50.	12	14	0	0.00	38.79	546.88
*SECNO 6200.000									
6200.000	5.94	5149.14	5153.46	0.00	5166.80	17.66	0.96	0.01	5153.20
5380.0	0.0	5380.0	0.0	0.0	159.5	0.0	6.7	1.6	5153.20
0.02	0.00	33.73	0.00	0.000	0.015	0.000	0.000	5143.20	508.13
0.019278	50.	50.	50.	12	14	0	0.00	38.74	546.87
*SECNO 6150.000									
6150.000	5.93	5148.12	5152.45	0.00	5165.83	17.71	0.97	0.00	5152.20
5380.0	0.0	5380.0	0.0	0.0	159.3	0.0	6.9	1.6	5152.19
0.02	0.00	33.77	0.00	0.000	0.015	0.000	0.000	5142.19	508.15
0.019342	50.	50.	50.	12	14	0	0.00	38.71	546.86
*SECNO 6100.000									
6100.000	5.93	5147.10	5151.43	0.00	5164.86	17.76	0.97	0.00	5151.20
5380.0	0.0	5380.0	0.0	0.0	159.1	0.0	7.1	1.6	5151.17
0.02	0.00	33.82	0.00	0.000	0.015	0.000	0.000	5141.17	508.18
0.019408	50.	50.	50.	12	14	0	0.00	38.68	546.86
*SECNO 6075.000									
6075.000	6.21	5146.88	5151.32	0.00	5164.28	17.40	0.47	0.11	5151.20
5380.0	0.0	5380.0	0.0	0.0	160.7	0.0	7.2	1.7	5151.17
0.02	0.00	33.48	0.00	0.000	0.015	0.000	0.000	5140.67	507.55
0.017903	25.	25.	25.	8	14	0	0.00	36.74	544.29

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 6050.000									
UPSTREAM SIDE OF SAN MATEO BLVD. BRIDGE									
6050.000	6.55	5146.71	5151.21	0.00	5163.74	17.04	0.43	0.11	5151.20
5380.0	0.0	5380.0	0.0	0.0	162.4	0.0	7.2	1.7	5151.16
0.02	0.00	33.12	0.00	0.000	0.015	0.000	0.000	5140.16	506.71
0.016442	25.	25.	25.	7	14	0	0.00	34.61	541.32
*SECNO 6025.000									
6025.000	6.53	5146.18	5150.50	0.00	5163.32	17.14	0.41	0.01	5150.60
5380.0	0.0	5380.0	0.0	0.0	161.9	0.0	7.3	1.7	5150.60
0.02	0.00	33.22	0.00	0.000	0.015	0.000	0.000	5139.65	500.70
0.016589	25.	25.	25.	10	14	0	0.00	34.59	535.30
*SECNO 6000.000									
6000.000	6.52	5145.66	5149.98	0.00	5162.90	17.24	0.42	0.01	5150.10
5380.0	0.0	5380.0	0.0	0.0	161.5	0.0	7.4	1.7	5150.10
0.02	0.00	33.32	0.00	0.000	0.015	0.000	0.000	5139.14	500.72
0.016718	25.	25.	25.	10	14	0	0.00	34.55	535.28
*SECNO 5975.000									
5975.000	6.51	5145.14	5149.48	0.00	5162.47	17.33	0.42	0.01	5149.60
5380.0	0.0	5380.0	0.0	0.0	161.0	0.0	7.5	1.8	5149.60
0.02	0.00	33.41	0.00	0.000	0.015	0.000	0.000	5138.63	500.74
0.016844	25.	25.	25.	10	14	0	0.00	34.51	535.26
*SECNO 5950.000									
DOWNSTREAM SIDE OF SAN MATEO BLVD. BRIDGE									
FLOW INCLUDES PREVIOUS FLOW + BASIN 126 RUNOFF									
5950.000	6.49	5144.62	5149.16	0.00	5162.04	17.41	0.42	0.01	5149.10
5380.0	0.0	5380.0	0.0	0.0	160.7	0.0	7.6	1.8	5149.13
0.02	0.00	33.49	0.00	0.000	0.015	0.000	0.000	5138.13	506.74
0.016963	25.	25.	25.	10	14	0	0.00	34.50	541.24
*SECNO 5925.000									
5925.000	6.17	5143.79	5148.24	0.00	5161.56	17.77	0.44	0.04	5148.10
5389.0	0.0	5389.0	0.0	0.0	159.3	0.0	7.7	1.8	5148.12
0.02	0.00	33.83	0.00	0.000	0.015	0.000	0.000	5137.62	507.57
0.018416	25.	25.	25.	10	14	0	0.00	36.64	544.21

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 5900.000									
5900.000	5.90	5143.01	5147.37	0.00	5161.05	18.04	0.48	0.03	5147.10
5389.0	0.0	5389.0	0.0	0.0	158.1	0.0	7.8	1.8	5147.11
0.02	0.00	34.09	0.00	0.000	0.015	0.000	0.000	5137.11	508.19
0.019827	25.	25.	25.	10	14	0	0.00	38.61	546.80
*SECNO 5850.000									
5850.000	5.90	5142.00	5146.37	0.00	5160.06	18.06	0.99	0.00	5146.10
5389.0	0.0	5389.0	0.0	0.0	158.0	0.0	8.0	1.9	5146.10
0.02	0.00	34.10	0.00	0.000	0.015	0.000	0.000	5136.10	508.21
0.019847	50.	50.	50.	12	14	0	0.00	38.59	546.79
*SECNO 5800.000									
5800.000	5.90	5140.98	5145.35	0.00	5159.06	18.08	0.99	0.00	5145.10
5389.0	0.0	5389.0	0.0	0.0	157.9	0.0	8.2	1.9	5145.08
0.02	0.00	34.13	0.00	0.000	0.015	0.000	0.000	5135.08	508.23
0.019876	50.	50.	50.	12	14	0	0.00	38.56	546.79
*SECNO 5750.000									
5750.000	5.88	5139.84	5144.24	0.00	5158.05	18.21	1.00	0.01	5144.00
5389.0	0.0	5389.0	0.0	0.0	157.4	0.0	8.3	1.9	5143.96
0.02	0.00	34.25	0.00	0.000	0.015	0.000	0.000	5133.96	508.28
0.020062	50.	50.	50.	11	14	0	0.00	38.49	546.77
*SECNO 5700.000									
5700.000	5.86	5138.71	5143.11	0.00	5157.03	18.32	1.01	0.01	5142.80
5389.0	0.0	5389.0	0.0	0.0	156.9	0.0	8.5	2.0	5142.85
0.02	0.00	34.35	0.00	0.000	0.015	0.000	0.000	5132.85	508.21
0.020268	50.	50.	50.	11	14	0	0.00	38.51	546.73
*SECNO 5650.000									
5650.000	5.85	5137.58	5142.00	0.00	5156.00	18.43	1.02	0.01	5141.70
5389.0	0.0	5389.0	0.0	0.0	156.4	0.0	8.7	2.0	5141.73
0.02	0.00	34.45	0.00	0.000	0.015	0.000	0.000	5131.73	508.26
0.020418	50.	50.	50.	11	14	0	0.00	38.45	546.71

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 5600.000									
5600.000	5.84	5136.45	5140.88	0.00	5154.97	18.52	1.02	0.01	5140.60
5389.0	0.0	5389.0	0.0	0.0	156.0	0.0	8.9	2.1	5140.61
0.02	0.00	34.54	0.00	0.000	0.015	0.000	0.000	5130.61	508.30
0.020556	50.	50.	50.	11	14	0	0.00	38.39	546.69
*SECNO 5550.000									
5550.000	5.84	5135.33	5139.76	0.00	5153.93	18.60	1.03	0.01	5139.50
5389.0	0.0	5389.0	0.0	0.0	155.7	0.0	9.1	2.1	5139.49
0.02	0.00	34.61	0.00	0.000	0.015	0.000	0.000	5129.49	508.34
0.020667	50.	50.	50.	12	14	0	0.00	38.34	546.68
*SECNO 5500.000									
5500.000	5.82	5134.20	5138.66	0.00	5152.89	18.69	1.04	0.01	5138.40
5389.0	0.0	5389.0	0.0	0.0	155.3	0.0	9.2	2.2	5138.38
0.02	0.00	34.69	0.00	0.000	0.015	0.000	0.000	5128.38	508.36
0.020792	50.	50.	50.	11	14	0	0.00	38.30	546.66
*SECNO 5450.000									
5450.000	5.83	5133.09	5137.54	0.00	5151.84	18.75	1.04	0.01	5137.30
5389.0	0.0	5389.0	0.0	0.0	155.1	0.0	9.4	2.2	5137.26
0.02	0.00	34.75	0.00	0.000	0.015	0.000	0.000	5127.26	508.40
0.020884	50.	50.	50.	12	14	0	0.00	38.25	546.65
*SECNO 5400.000									
5400.000	5.80	5131.94	5136.41	0.00	5150.78	18.84	1.05	0.01	5136.10
5389.0	0.0	5389.0	0.0	0.0	154.7	0.0	9.6	2.3	5136.14
0.02	0.00	34.83	0.00	0.000	0.015	0.000	0.000	5126.14	508.34
0.021054	50.	50.	50.	11	14	0	0.00	38.28	546.62
*SECNO 5350.000									
5350.000	5.80	5130.82	5135.29	0.00	5149.72	18.90	1.05	0.01	5135.00
5389.0	0.0	5389.0	0.0	0.0	154.5	0.0	9.8	2.3	5135.02
0.02	0.00	34.89	0.00	0.000	0.015	0.000	0.000	5125.02	508.37
0.021134	50.	50.	50.	12	14	0	0.00	38.24	546.61

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 5300.000									
5300.000	5.80	5129.70	5134.17	0.00	5148.66	18.96	1.06	0.01	5133.90
5389.0	0.0	5389.0	0.0	0.0	154.2	0.0	10.0	2.3	5133.90
0.02	0.00	34.94	0.00	0.000	0.015	0.000	0.000	5123.90	508.40
0.021213	50.	50.	50.	12	14	0	0.00	38.20	546.60
*SECNO 5250.000									
5250.000	5.79	5128.58	5133.07	0.00	5147.59	19.01	1.06	0.00	5132.80
5389.0	0.0	5389.0	0.0	0.0	154.0	0.0	10.1	2.4	5132.79
0.02	0.00	34.99	0.00	0.000	0.015	0.000	0.000	5122.79	508.42
0.021285	50.	50.	50.	12	14	0	0.00	38.17	546.59
*SECNO 5200.000									
5200.000	5.79	5127.46	5131.95	0.00	5146.52	19.06	1.07	0.01	5131.70
5389.0	0.0	5389.0	0.0	0.0	153.8	0.0	10.3	2.4	5131.67
0.02	0.00	35.04	0.00	0.000	0.015	0.000	0.000	5121.67	508.45
0.021359	50.	50.	50.	12	14	0	0.00	38.13	546.58
*SECNO 5150.000									
5150.000	5.78	5126.33	5130.83	0.00	5145.44	19.11	1.07	0.00	5130.60
5389.0	0.0	5389.0	0.0	0.0	153.6	0.0	10.5	2.5	5130.55
0.02	0.00	35.08	0.00	0.000	0.015	0.000	0.000	5120.55	508.48
0.021425	50.	50.	50.	12	14	0	0.00	38.09	546.57
*SECNO 5100.000									
5100.000	5.78	5125.22	5129.71	0.00	5144.37	19.15	1.07	0.00	5129.40
5389.0	0.0	5389.0	0.0	0.0	153.5	0.0	10.7	2.5	5129.44
0.02	0.00	35.12	0.00	0.000	0.015	0.000	0.000	5119.44	508.40
0.021528	50.	50.	50.	12	14	0	0.00	38.15	546.55
*SECNO 5050.000									
5050.000	5.77	5124.09	5128.59	0.00	5143.28	19.19	1.08	0.00	5128.30
5389.0	0.0	5389.0	0.0	0.0	153.3	0.0	10.8	2.6	5128.32
0.03	0.00	35.15	0.00	0.000	0.015	0.000	0.000	5118.32	508.43
0.021581	50.	50.	50.	12	14	0	0.00	38.11	546.54

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 5000.000									
5000.000	5.77	5122.97	5127.48	0.00	5142.20	19.23	1.08	0.00	5127.20
5389.0	0.0	5389.0	0.0	0.0	153.1	0.0	11.0	2.6	5127.20
0.03	0.00	35.19	0.00	0.000	0.015	0.000	0.000	5117.20	508.46
0.021634	50.	50.	50.	12	14	0	0.00	38.08	546.54
*SECNO 4950.000									
4950.000	5.77	5121.85	5126.36	0.00	5141.11	19.27	1.08	0.00	5126.10
5389.0	0.0	5389.0	0.0	0.0	153.0	0.0	11.2	2.6	5126.08
0.03	0.00	35.22	0.00	0.000	0.015	0.000	0.000	5116.08	508.49
0.021680	50.	50.	50.	12	14	0	0.00	38.05	546.54
*SECNO 4900.000									
4900.000	5.77	5120.73	5125.25	0.00	5140.02	19.30	1.08	0.00	5125.00
5389.0	0.0	5389.0	0.0	0.0	152.9	0.0	11.4	2.7	5124.96
0.03	0.00	35.25	0.00	0.000	0.015	0.000	0.000	5114.96	508.51
0.021718	50.	50.	50.	12	14	0	0.00	38.02	546.53
*SECNO 4850.000									
4850.000	5.76	5119.61	5124.12	0.00	5138.93	19.33	1.09	0.00	5123.80
5389.0	0.0	5389.0	0.0	0.0	152.7	0.0	11.5	2.7	5123.85
0.03	0.00	35.28	0.00	0.000	0.015	0.000	0.000	5113.85	508.43
0.021809	50.	50.	50.	12	14	0	0.00	38.08	546.51
*SECNO 4825.000									
4825.000	5.76	5119.05	5123.53	0.00	5138.39	19.34	0.55	0.00	5123.00
5389.0	0.0	5389.0	0.0	0.0	152.7	0.0	11.6	2.8	5123.04
0.03	0.00	35.29	0.00	0.000	0.015	0.000	0.000	5113.29	507.94
0.021817	25.	25.	25.	10	14	0	0.00	38.07	546.01
*SECNO 4800.000									
4800.000	5.76	5118.49	5122.94	0.00	5137.84	19.35	0.55	0.00	5122.20
5389.0	0.0	5389.0	0.0	0.0	152.7	0.0	11.7	2.8	5122.23
0.03	0.00	35.30	0.00	0.000	0.015	0.000	0.000	5112.73	507.45
0.021832	25.	25.	25.	10	14	0	0.00	38.06	545.51

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 4750.000									
4750.000	5.75	5117.36	5121.83	0.00	5136.75	19.38	1.09	0.00	5121.10
5389.0	0.0	5389.0	0.0	0.0	152.5	0.0	11.9	2.8	5121.11
0.03	0.00	35.33	0.00	0.000	0.015	0.000	0.000	5111.61	507.48
0.021872	50.	50.	50.	12	14	0	0.00	38.03	545.51
*SECNO 4700.000									
4700.000	5.76	5116.25	5120.71	0.00	5135.65	19.40	1.09	0.00	5120.00
5389.0	0.0	5389.0	0.0	0.0	152.5	0.0	12.1	2.9	5119.99
0.03	0.00	35.35	0.00	0.000	0.015	0.000	0.000	5110.49	507.51
0.021897	50.	50.	50.	12	14	0	0.00	38.00	545.51
*SECNO 4650.000									
4650.000	5.76	5115.14	5119.61	0.00	5134.55	19.42	1.10	0.00	5118.90
5389.0	0.0	5389.0	0.0	0.0	152.4	0.0	12.2	2.9	5118.88
0.03	0.00	35.36	0.00	0.000	0.015	0.000	0.000	5109.38	507.52
0.021913	50.	50.	50.	12	14	0	0.00	37.99	545.50
*SECNO 4600.000									
4600.000	5.75	5114.01	5118.49	0.00	5133.45	19.44	1.10	0.00	5117.80
5389.0	0.0	5389.0	0.0	0.0	152.3	0.0	12.4	3.0	5117.76
0.03	0.00	35.38	0.00	0.000	0.015	0.000	0.000	5108.26	507.54
0.021938	50.	50.	50.	12	14	0	0.00	37.96	545.50

*SECNO 4550.000

3301 HV CHANGED MORE THAN HVINS

4550.000	5.69	5112.20	5116.73	0.00	5132.27	20.07	1.12	0.06	5116.00
5389.0	0.0	5389.0	0.0	0.0	149.9	0.0	12.6	3.0	5116.01
0.03	0.00	35.95	0.00	0.000	0.015	0.000	0.000	5106.51	507.62
0.022949	50.	50.	50.	10	14	0	0.00	37.75	545.37

*SECNO 4500.000

3301 HV CHANGED MORE THAN HVINS

4500.000	5.63	5110.39	5114.99	0.00	5131.04	20.65	1.17	0.06	5114.30
5389.0	0.0	5389.0	0.0	0.0	147.8	0.0	12.8	3.0	5114.26
0.03	0.00	36.47	0.00	0.000	0.015	0.000	0.000	5104.76	507.78
0.023836	50.	50.	50.	10	14	0	0.00	37.48	545.26

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4450.000

3301 HV CHANGED MORE THAN HVINS

4450.000	5.58	5108.59	5113.23	0.00	5129.77	21.19	1.21	0.05	5112.50
5389.0	0.0	5389.0	0.0	0.0	145.9	0.0	12.9	3.1	5112.51
0.03	0.00	36.94	0.00	0.000	0.015	0.000	0.000	5103.01	507.83
0.024718	50.	50.	50.	10	14	0	0.00	37.32	545.15

*SECNO 4400.000

4400.000	5.54	5106.80	5111.50	0.00	5128.47	21.67	1.25	0.05	5110.80
5389.0	0.0	5389.0	0.0	0.0	144.2	0.0	13.1	3.1	5110.76
0.03	0.00	37.36	0.00	0.000	0.015	0.000	0.000	5101.26	507.97
0.025476	50.	50.	50.	10	14	0	0.00	37.10	545.07

*SECNO 4350.000

4350.000	5.49	5105.00	5109.74	0.00	5127.13	22.13	1.29	0.05	5109.00
5389.0	0.0	5389.0	0.0	0.0	142.7	0.0	13.3	3.2	5109.01
0.03	0.00	37.75	0.00	0.000	0.015	0.000	0.000	5099.51	508.00
0.026250	50.	50.	50.	10	14	0	0.00	36.98	544.98

*SECNO 4300.000

4300.000	5.47	5103.23	5108.00	0.00	5125.76	22.53	1.33	0.04	5107.30
5389.0	0.0	5389.0	0.0	0.0	141.5	0.0	13.4	3.2	5107.26
0.03	0.00	38.09	0.00	0.000	0.015	0.000	0.000	5097.76	508.12
0.026876	50.	50.	50.	9	14	0	0.00	36.80	544.92

*SECNO 4280.000

4280.000	5.48	5102.84	5107.60	0.00	5125.17	22.33	0.53	0.06	5106.90
5389.0	0.0	5389.0	0.0	0.0	142.1	0.0	13.5	3.2	5106.86
0.03	0.00	37.92	0.00	0.000	0.015	0.000	0.000	5097.36	508.09
0.026541	20.	20.	20.	9	14	0	0.00	36.87	544.96

*SECNO 4275.000

4275.000	5.52	5102.78	5107.57	0.00	5125.00	22.22	0.13	0.03	5106.90
5389.0	0.0	5389.0	0.0	0.0	142.5	0.0	13.5	3.2	5106.91
0.03	0.00	37.83	0.00	0.000	0.015	0.000	0.000	5097.26	508.02
0.026109	5.	5.	5.	5	14	0	0.00	36.55	544.57

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4250.000

3301 HV CHANGED MORE THAN HVINS

4250.000	5.80	5102.56	5107.50	0.00	5124.21	21.65	0.62	0.17	5107.20
5389.0	0.0	5389.0	0.0	0.0	144.3	0.0	13.6	3.3	5107.16
0.03	0.00	37.34	0.00	0.000	0.015	0.000	0.000	5096.76	507.86
0.023877	25.	25.	25.	8	14	0	0.00	34.72	542.58

*SECNO 4230.000
CHANNEL SIDE SLOPE CHANGES TO 1.5 : 1
JUST UPSTREAM OF OLD JEFFERSON ST. BRIDGE

4230.000	6.06	5102.42	5107.46	0.00	5123.61	21.19	0.46	0.14	5107.40
5389.0	0.0	5389.0	0.0	0.0	145.9	0.0	13.6	3.3	5107.36
0.03	0.00	36.94	0.00	0.000	0.015	0.000	0.000	5096.36	507.44
0.022183	20.	20.	20.	8	14	0	0.00	33.15	540.59

*SECNO 4225.000

4225.000	6.06	5102.32	5107.34	0.00	5123.50	21.18	0.11	0.00	5107.30
5389.0	0.0	5389.0	0.0	0.0	145.9	0.0	13.7	3.3	5107.26
0.03	0.00	36.93	0.00	0.000	0.015	0.000	0.000	5096.26	507.44
0.022162	5.	5.	5.	5	14	0	0.00	33.15	540.59

*SECNO 4200.000
APPROXIMATE UPSTREAM FACE OF OLD JEFFERSON ST. BRIDGE

4200.000	6.07	5101.83	5106.78	0.00	5122.92	21.09	0.55	0.03	5106.80
5389.0	0.0	5389.0	0.0	0.0	146.2	0.0	13.7	3.3	5106.76
0.03	0.00	36.85	0.00	0.000	0.015	0.000	0.000	5095.76	507.43
0.022027	25.	25.	25.	9	14	0	0.00	33.18	540.61

*SECNO 4175.000

4175.000	6.08	5101.34	5106.14	0.00	5122.34	21.00	0.55	0.02	5106.30
5389.0	0.0	5389.0	0.0	0.0	146.5	0.0	13.8	3.3	5106.30
0.03	0.00	36.78	0.00	0.000	0.015	0.000	0.000	5095.26	501.39
0.021925	25.	25.	25.	9	14	0	0.00	33.23	534.61

*SECNO 4150.000

4150.000	6.07	5100.83	5105.64	0.00	5121.78	20.94	0.55	0.02	5105.80
5389.0	0.0	5389.0	0.0	0.0	146.7	0.0	13.9	3.3	5105.80
0.03	0.00	36.73	0.00	0.000	0.015	0.000	0.000	5094.76	501.38
0.021838	25.	25.	25.	8	14	0	0.00	33.25	534.62

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 4125.000									
4125.000	6.08	5100.34	5105.14	0.00	5121.21	20.87	0.54	0.02	5105.30
5389.0	0.0	5389.0	0.0	0.0	147.0	0.0	14.0	3.3	5105.30
0.03	0.00	36.66	0.00	0.000	0.015	0.000	0.000	5094.26	501.33
0.021752	25.	25.	25.	8	14	0	0.00	33.30	534.63
*SECNO 4100.000									
APPROXIMATE DOWNSTREAM FACE OF OLD JEFFERSON ST. BRIDGE									
4100.000	6.08	5099.84	5104.67	0.00	5120.65	20.80	0.54	0.02	5104.80
5389.0	0.0	5389.0	0.0	0.0	147.2	0.0	14.1	3.4	5103.56
0.03	0.00	36.60	0.00	0.000	0.015	0.000	0.000	5093.76	501.36
0.021659	25.	25.	25.	8	14	0	0.00	33.34	534.70
*SECNO 4075.000									
4075.000	6.10	5099.36	5104.33	0.00	5120.08	20.72	0.54	0.02	5104.30
5389.0	0.0	5389.0	0.0	0.0	147.5	0.0	14.2	3.4	5104.26
0.03	0.00	36.53	0.00	0.000	0.015	0.000	0.000	5093.26	507.37
0.021503	25.	25.	25.	8	14	0	0.00	33.29	540.66
*SECNO 4060.000									
CHANNEL SIDE SLOPE CHANGES TO 2 : 1									
JUST DOWNSTREAM OF OLD JEFFERSON ST. BRIDGE									
4060.000	6.11	5099.07	5104.03	0.00	5119.75	20.67	0.32	0.01	5104.00
5389.0	0.0	5389.0	0.0	0.0	147.7	0.0	14.2	3.4	5103.96
0.03	0.00	36.49	0.00	0.000	0.015	0.000	0.000	5092.96	507.36
0.021438	15.	15.	15.	8	14	0	0.00	33.31	540.67
*SECNO 4050.000									
4050.000	5.99	5098.75	5103.66	0.00	5119.52	20.77	0.22	0.01	5103.60
5389.0	0.0	5389.0	0.0	0.0	147.4	0.0	14.3	3.4	5103.56
0.03	0.00	36.57	0.00	0.000	0.015	0.000	0.000	5092.76	507.73
0.022058	10.	10.	10.	9	14	0	0.00	34.17	541.90
*SECNO 4025.000									
4025.000	5.74	5098.00	5102.75	0.00	5118.93	20.94	0.57	0.02	5102.60
5389.0	0.0	5389.0	0.0	0.0	146.8	0.0	14.3	3.4	5102.56
0.03	0.00	36.72	0.00	0.000	0.015	0.000	0.000	5092.26	508.51
0.023533	25.	25.	25.	10	14	0	0.00	36.18	544.68

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 4010.000									
4010.000	5.60	5097.56	5102.25	0.00	5118.57	21.01	0.36	0.01	5102.00
5389.0	0.0	5389.0	0.0	0.0	146.5	0.0	14.4	3.4	5101.96
0.03	0.00	36.78	0.00	0.000	0.015	0.000	0.000	5091.96	508.85
0.024411	15.	15.	15.	10	14	0	0.00	37.35	546.20
*SECNO 4025.000									
3301 HV CHANGED MORE THAN HVINS									
4025.000	5.70	5097.96	5102.56	0.00	5117.89	19.93	0.35	0.32	5102.30
5389.0	0.0	5389.0	0.0	0.0	150.4	0.0	14.4	3.5	5102.26
0.03	0.00	35.82	0.00	0.000	0.015	0.000	0.000	5092.26	508.64
0.022700	15.	15.	15.	4	14	0	0.00	37.76	546.40
*SECNO 4015.600									
4015.600	5.71	5097.78	5102.36	0.00	5117.67	19.89	0.21	0.01	5102.10
5389.0	0.0	5389.0	0.0	0.0	150.6	0.0	14.5	3.5	5102.07
0.03	0.00	35.79	0.00	0.000	0.015	0.000	0.000	5092.07	508.62
0.022646	9.	9.	9.	8	14	0	0.00	37.79	546.41
*SECNO 4000.000									
4000.000	5.71	5097.47	5102.00	0.00	5117.29	19.82	0.35	0.02	5101.40
5389.0	0.0	5389.0	0.0	0.0	150.9	0.0	14.5	3.5	5101.37
0.03	0.00	35.72	0.00	0.000	0.015	0.000	0.000	5091.76	507.82
0.022521	16.	16.	16.	9	14	0	0.00	37.80	545.62
*SECNO 3995.600									
3995.600	5.69	5097.23	5101.76	0.00	5117.18	19.94	0.10	0.01	5101.00
5389.0	0.0	5389.0	0.0	0.0	150.4	0.0	14.5	3.5	5101.04
0.03	0.00	35.84	0.00	0.000	0.015	0.000	0.000	5091.54	507.57
0.022766	4.	4.	4.	7	14	0	0.00	37.82	545.39
*SECNO 3975.000									
3975.000	5.67	5096.38	5100.94	0.00	5116.67	20.29	0.47	0.03	5100.20
5389.0	0.0	5389.0	0.0	0.0	149.1	0.0	14.6	3.5	5100.21
0.03	0.00	36.15	0.00	0.000	0.015	0.000	0.000	5090.71	507.67
0.023301	21.	21.	21.	10	14	0	0.00	37.66	545.32

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 3950.000									
3950.000	5.62	5095.34	5099.94	0.00	5116.04	20.70	0.59	0.04	5099.20
5389.0	0.0	5389.0	0.0	0.0	147.6	0.0	14.7	3.5	5099.22
0.03	0.00	36.51	0.00	0.000	0.015	0.000	0.000	5089.72	507.73
0.023942	25.	25.	25.	10	14	0	0.00	37.51	545.24
*SECNO 3900.000									
3301 HV CHANGED MORE THAN HVINS									
3900.000	5.55	5093.29	5097.96	0.00	5114.74	21.44	1.23	0.07	5097.20
5389.0	0.0	5389.0	0.0	0.0	145.0	0.0	14.9	3.6	5097.24
0.03	0.00	37.16	0.00	0.000	0.015	0.000	0.000	5087.74	507.85
0.025151	50.	50.	50.	10	14	0	0.00	37.25	545.10
*SECNO 3850.000									
3301 HV CHANGED MORE THAN HVINS									
3850.000	5.50	5091.27	5096.01	0.00	5113.39	22.12	1.28	0.07	5095.30
5389.0	0.0	5389.0	0.0	0.0	142.8	0.0	15.0	3.6	5095.27
0.03	0.00	37.74	0.00	0.000	0.015	0.000	0.000	5085.77	508.04
0.026200	50.	50.	50.	9	14	0	0.00	36.95	544.99
*SECNO 3800.000									
3301 HV CHANGED MORE THAN HVINS									
3800.000	5.44	5089.23	5094.02	0.00	5111.99	22.76	1.34	0.06	5093.30
5389.0	0.0	5389.0	0.0	0.0	140.8	0.0	15.2	3.6	5093.29
0.03	0.00	38.28	0.00	0.000	0.015	0.000	0.000	5083.79	508.13
0.027262	50.	50.	50.	9	14	0	0.00	36.75	544.88
*SECNO 3750.000									
3750.000	5.46	5088.10	5092.87	0.00	5110.54	22.44	1.35	0.10	5092.10
5389.0	0.0	5389.0	0.0	0.0	141.8	0.0	15.4	3.7	5092.14
0.04	0.00	38.01	0.00	0.000	0.015	0.000	0.000	5082.64	508.03
0.026764	50.	50.	50.	9	14	0	0.00	36.90	544.93

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3700.000

3301 HV CHANGED MORE THAN HVINS

3700.000	5.53	5087.30	5092.01	0.00	5109.02	21.71	1.31	0.22	5091.30
5389.0	0.0	5389.0	0.0	0.0	144.1	0.0	15.5	3.7	5091.27
0.04	0.00	37.39	0.00	0.000	0.015	0.000	0.000	5081.77	507.97
0.025545	50.	50.	50.	9	14	0	0.00	37.10	545.07

*SECNO 3650.000

3301 HV CHANGED MORE THAN HVINS

3650.000	5.59	5086.49	5091.13	0.00	5107.57	21.08	1.25	0.19	5090.40
5389.0	0.0	5389.0	0.0	0.0	146.2	0.0	15.7	3.8	5090.40
0.04	0.00	36.85	0.00	0.000	0.015	0.000	0.000	5080.90	507.83
0.024550	50.	50.	50.	9	14	0	0.00	37.35	545.17

*SECNO 3600.000

3301 HV CHANGED MORE THAN HVINS

3600.000	5.64	5085.68	5090.26	0.00	5106.20	20.52	1.21	0.17	5089.50
5389.0	0.0	5389.0	0.0	0.0	148.2	0.0	15.9	3.8	5089.54
0.04	0.00	36.35	0.00	0.000	0.015	0.000	0.000	5080.04	507.68
0.023671	50.	50.	50.	9	14	0	0.00	37.60	545.27

*SECNO 3550.000

3301 HV CHANGED MORE THAN HVINS

3550.000	5.70	5084.87	5089.40	0.00	5104.89	20.01	1.16	0.15	5088.70
5389.0	0.0	5389.0	0.0	0.0	150.1	0.0	16.0	3.9	5088.67
0.04	0.00	35.90	0.00	0.000	0.015	0.000	0.000	5079.17	507.65
0.022839	50.	50.	50.	9	14	0	0.00	37.74	545.39

*SECNO 3500.000

3500.000	5.74	5084.04	5088.53	0.00	5103:63	19.59	1.13	0.13	5087.80
5389.0	0.0	5389.0	0.0	0.0	151.7	0.0	16.2	3.9	5087.80
0.04	0.00	35.52	0.00	0.000	0.015	0.000	0.000	5078.30	507.54
0.022198	50.	50.	50.	9	14	0	0.00	37.93	545.46

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 3465.600									
3465.600	5.77	5083.48	5087.93	0.00	5102.80	19.32	0.76	0.08	5087.20
5389.0	0.0	5389.0	0.0	0.0	152.8	0.0	16.3	3.9	5087.21
0.04	0.00	35.27	0.00	0.000	0.015	0.000	0.000	5077.71	507.47
0.021777	34.	34.	34.	9	14	0	0.00	38.05	545.52
*SECNO 3450.000									
3450.000	5.94	5083.38	5087.90	0.00	5102.37	18.99	0.33	0.10	5087.40
5389.0	0.0	5389.0	0.0	0.0	154.1	0.0	16.4	3.9	5087.40
0.04	0.00	34.97	0.00	0.000	0.015	0.000	0.000	5077.44	507.43
0.020580	16.	16.	16.	6	14	0	0.00	36.93	544.37
*SECNO 3425.000									
3301 HV CHANGED MORE THAN HVINS									
3425.000	6.26	5083.26	5087.89	0.00	5101.72	18.46	0.49	0.16	5087.70
5389.0	0.0	5389.0	0.0	0.0	156.3	0.0	16.5	4.0	5087.72
0.04	0.00	34.48	0.00	0.000	0.015	0.000	0.000	5077.00	507.10
0.018750	25.	25.	25.	8	14	0	0.00	34.97	542.08
*SECNO 3415.600									
UPSTREAM FACE OF JEFFERSON STREET CROSSING									
3415.600	6.39	5083.23	5087.88	0.00	5101.48	18.25	0.17	0.06	5087.80
5389.0	0.0	5389.0	0.0	0.0	157.2	0.0	16.5	4.0	5087.84
0.04	0.00	34.29	0.00	0.000	0.015	0.000	0.000	5076.84	506.88
0.018078	9.	9.	9.	5	14	0	0.00	34.20	541.08
*SECNO 3400.000									
3400.000	6.39	5082.96	5087.43	0.00	5101.19	18.23	0.28	0.01	5087.60
5389.0	0.0	5389.0	0.0	0.0	157.3	0.0	16.6	4.0	5087.60
0.04	0.00	34.26	0.00	0.000	0.015	0.000	0.000	5076.57	500.91
0.018034	16.	16.	16.	8	14	0	0.00	34.19	535.09
*SECNO 3375.000									
3375.000	6.40	5082.54	5087.00	0.00	5100.73	18.19	0.45	0.01	5087.10
5389.0	0.0	5389.0	0.0	0.0	157.5	0.0	16.6	4.0	5087.10
0.04	0.00	34.22	0.00	0.000	0.015	0.000	0.000	5076.14	500.90
0.017976	25.	25.	25.	10	14	0	0.00	34.20	535.10

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 3350.000									
3350.000	6.41	5082.11	5086.57	0.00	5100.27	18.17	0.45	0.01	5086.70
5389.0	0.0	5389.0	0.0	0.0	157.6	0.0	16.7	4.0	5086.70
0.04	0.00	34.20	0.00	0.000	0.015	0.000	0.000	5075.70	500.90
0.017950	25.	25.	25.	10	14	0	0.00	34.21	535.10
*SECNO 3325.600									
DOWNSTREAM FACE OF JEFFERSON STREET CROSSING									
3325.600	6.41	5081.69	5086.33	0.00	5099.83	18.14	0.44	0.01	5086.30
5389.0	0.0	5389.0	0.0	0.0	157.7	0.0	16.8	4.0	5086.28
0.04	0.00	34.18	0.00	0.000	0.015	0.000	0.000	5075.28	506.90
0.017905	24.	24.	24.	10	14	0	0.00	34.21	541.11
*SECNO 3300.000									
3301 HV CHANGED MORE THAN HVINS									
3300.000	5.97	5079.71	5084.41	0.00	5099.20	19.49	0.49	0.13	5085.10
5389.0	0.0	5389.0	0.0	0.0	152.1	0.0	16.9	4.1	5085.12
0.04	0.00	35.42	0.00	0.000	0.015	0.000	0.000	5073.74	509.49
0.020926	26.	26.	26.	10	14	0	0.00	35.99	545.49
*SECNO 3275.000									
3301 HV CHANGED MORE THAN HVINS									
3275.000	5.40	5076.69	5081.46	0.00	5098.40	21.71	0.58	0.22	5083.00
5389.0	0.0	5389.0	0.0	0.0	144.1	0.0	17.0	4.1	5083.04
0.04	0.00	37.39	0.00	0.000	0.015	0.000	0.000	5071.29	512.67
0.025840	25.	25.	25.	17	14	0	0.00	37.52	550.19
*SECNO 3250.000									
3250.000	5.38	5076.20	5080.99	0.00	5097.69	21.49	0.64	0.07	5082.60
5389.0	0.0	5389.0	0.0	0.0	144.9	0.0	17.1	4.1	5082.57
0.04	0.00	37.20	0.00	0.000	0.015	0.000	0.000	5070.82	509.75
0.025557	25.	25.	25.	9	14	0	0.00	37.70	547.45

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 3225.000									
3225.000	5.27	5075.61	5080.28	0.00	5097.03	21.42	0.64	0.02	5082.10
5389.0	0.0	5389.0	0.0	0.0	145.1	0.0	17.2	4.1	5082.09
0.04	0.00	37.14	0.00	0.000	0.015	0.000	0.000	5070.34	503.48
0.025684	25.	25.	25.	11	14	0	0.00	38.06	541.54
*SECNO 3200.000									
3200.000	5.26	5075.13	5080.02	0.00	5096.34	21.21	0.63	0.06	5081.60
5389.0	0.0	5389.0	0.0	0.0	145.8	0.0	17.3	4.1	5081.62
0.04	0.00	36.96	0.00	0.000	0.015	0.000	0.000	5069.87	500.00
0.024368	25.	25.	25.	9	14	0	0.00	36.02	536.02
*SECNO 3175.000									
3175.000	5.41	5074.81	5079.83	0.00	5095.64	20.83	0.59	0.11	5081.10
5389.0	0.0	5389.0	0.0	0.0	147.1	0.0	17.3	4.2	5081.15
0.04	0.00	36.63	0.00	0.000	0.015	0.000	0.000	5069.40	500.00
0.022885	25.	25.	25.	8	14	0	0.00	33.32	533.32
*SECNO 3150.000									

3301 HV CHANGED MORE THAN HVINS

3150.000	6.02	5074.94	5079.98	0.00	5094.79	19.85	0.55	0.29	5080.70
5389.0	0.0	5389.0	0.0	0.0	150.7	0.0	17.4	4.2	5080.67
0.04	0.00	35.75	0.00	0.000	0.015	0.000	0.000	5068.92	500.00
0.021102	25.	25.	25.	6	17	0	0.00	31.05	531.05
*SECNO 3125.000									
3125.000	5.84	5074.29	5079.29	0.00	5094.25	19.96	0.53	0.01	5080.20
5392.0	0.0	5392.0	0.0	0.0	150.4	0.0	17.5	4.2	5080.20
0.04	0.00	35.85	0.00	0.000	0.015	0.000	0.000	5068.45	500.00
0.021592	25.	25.	25.	10	14	0	0.00	31.72	531.72

*SECNO 3117.300

3301 HV CHANGED MORE THAN HVINS

CONFLUENCE OF NORTH LA CUEVA AND SOUTH LA CUEVA

FLOW INCLUDES PREVIOUS FLOW + SOUTH LA CUEVA

3117.300	4.28	5072.58	5077.09	0.00	5093.92	21.34	0.19	0.14	5080.00
5487.0	0.0	5487.0	0.0	0.0	148.0	0.0	17.5	4.2	5080.05
0.04	0.00	37.07	0.00	0.000	0.015	0.000	0.000	5068.30	514.90
0.028776	8.	8.	8.	6	14	0	0.00	43.16	558.06

*SECNO 3100.000
WATER EL=X5 CARD= 5072.300
WATER SURFACE ELEVATION FROM MOMENTUM BALANCE ANALYSIS
OF NORTH LA CUEVA AND SOUTH LA CUEVA

3100.000	4.40	5072.30	5076.82	0.00	5093.43	21.13	0.49	0.06	5079.60
5487.0	0.0	5487.0	0.0	0.0	148.7	0.0	17.6	4.2	5079.58
0.04	0.00	36.89	0.00	0.000	0.015	0.000	0.000	5067.90	514.60
0.027897	17.	17.	17.	0	17	0	0.00	42.61	557.21

*SECNO 3075.000

3075.000	4.58	5071.91	5076.43	0.00	5092.62	20.71	0.68	0.13	5078.90
5487.0	0.0	5487.0	0.0	0.0	150.2	0.0	17.7	4.3	5078.91
0.04	0.00	36.52	0.00	0.000	0.015	0.000	0.000	5067.33	514.01
0.026535	25.	25.	25.	9	17	0	0.00	41.97	555.98

*SECNO 3050.000

3050.000	4.77	5071.52	5076.03	0.00	5091.87	20.35	0.65	0.11	5078.20
5487.0	0.0	5487.0	0.0	0.0	151.6	0.0	17.8	4.3	5078.24
0.04	0.00	36.20	0.00	0.000	0.015	0.000	0.000	5066.75	513.43
0.025356	25.	25.	25.	9	17	0	0.00	41.36	554.79

*SECNO 3025.000

3025.000	4.96	5071.15	5075.67	0.00	5091.14	20.00	0.62	0.11	5077.60
5487.0	0.0	5487.0	0.0	0.0	152.9	0.0	17.9	4.3	5077.56
0.04	0.00	35.88	0.00	0.000	0.015	0.000	0.000	5066.18	512.90
0.024237	25.	25.	25.	9	17	0	0.00	40.74	553.64

*SECNO 3000.000

3000.000	5.13	5070.49	5075.05	0.00	5090.53	20.05	0.60	0.01	5076.60
5487.0	0.0	5487.0	0.0	0.0	152.7	0.0	17.9	4.3	5076.65
0.04	0.00	35.93	0.00	0.000	0.015	0.000	0.000	5065.36	512.29
0.023889	25.	25.	25.	12	17	0	0.00	40.07	552.36

*SECNO 2975.000

2975.000	5.30	5069.80	5074.46	0.00	5089.93	20.13	0.59	0.01	5075.70
5487.0	0.0	5487.0	0.0	0.0	152.4	0.0	18.0	4.3	5075.69
0.04	0.00	36.00	0.00	0.000	0.015	0.000	0.000	5064.50	511.79
0.023568	25.	25.	25.	11	14	0	0.00	39.34	551.12

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2950.000									
2950.000	5.47	5069.12	5073.81	0.00	5089.34	20.21	0.59	0.01	5074.70
5487.0	0.0	5487.0	0.0	0.0	152.1	0.0	18.1	4.4	5074.74
0.04	0.00	36.08	0.00	0.000	0.015	0.000	0.000	5063.65	511.19
0.023332	25.	25.	25.	11	14	0	0.00	38.72	549.92
*SECNO 2927.000									
2927.000	5.67	5068.53	5073.24	0.00	5088.80	20.27	0.53	0.01	5073.90
5487.0	0.0	5487.0	0.0	0.0	151.9	0.0	18.2	4.4	5073.86
0.04	0.00	36.13	0.00	0.000	0.015	0.000	0.000	5062.86	510.71
0.023049	23.	23.	23.	10	14	0	0.00	38.12	548.83
*SECNO 2925.000									
2925.000	5.67	5068.46	5073.16	0.00	5088.75	20.29	0.05	0.00	5073.80
5487.0	0.0	5487.0	0.0	0.0	151.8	0.0	18.2	4.4	5073.79
0.04	0.00	36.15	0.00	0.000	0.015	0.000	0.000	5062.79	510.69
0.023103	2.	2.	2.	6	14	0	0.00	38.13	548.82
*SECNO 2900.000									
2900.000	5.65	5067.59	5072.33	0.00	5088.14	20.55	0.58	0.03	5072.90
5487.0	0.0	5487.0	0.0	0.0	150.8	0.0	18.3	4.4	5072.94
0.04	0.00	36.38	0.00	0.000	0.015	0.000	0.000	5061.94	510.67
0.023506	25.	25.	25.	10	14	0	0.00	38.03	548.69
*SECNO 2875.000									
2875.000	5.64	5066.72	5071.49	0.00	5087.52	20.80	0.59	0.02	5072.10
5487.0	0.0	5487.0	0.0	0.0	149.9	0.0	18.4	4.4	5072.08
0.04	0.00	36.60	0.00	0.000	0.015	0.000	0.000	5061.08	510.74
0.023846	25.	25.	25.	10	14	0	0.00	37.85	548.58
*SECNO 2850.000									
2850.000	5.63	5065.85	5070.64	0.00	5086.90	21.05	0.60	0.02	5071.20
5487.0	0.0	5487.0	0.0	0.0	149.0	0.0	18.5	4.5	5071.22
0.04	0.00	36.82	0.00	0.000	0.015	0.000	0.000	5060.22	510.72
0.024223	25.	25.	25.	10	14	0	0.00	37.74	548.46

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2825.000									
2825.000	5.63	5065.00	5069.82	0.00	5086.27	21.27	0.61	0.02	5070.40
5487.0	0.0	5487.0	0.0	0.0	148.3	0.0	18.5	4.5	5070.37
0.04	0.00	37.01	0.00	0.000	0.015	0.000	0.000	5059.37	510.77
0.024525	25.	25.	25.	10	14	0	0.00	37.58	548.36
*SECNO 2800.000									
2800.000	5.62	5064.13	5068.97	0.00	5085.63	21.50	0.62	0.02	5069.50
5487.0	0.0	5487.0	0.0	0.0	147.5	0.0	18.6	4.5	5069.51
0.04	0.00	37.21	0.00	0.000	0.015	0.000	0.000	5058.51	510.75
0.024883	25.	25.	25.	10	14	0	0.00	37.49	548.24
*SECNO 2787.300									
2787.300	5.61	5063.68	5068.53	0.00	5085.30	21.62	0.32	0.01	5069.10
5487.0	0.0	5487.0	0.0	0.0	147.1	0.0	18.7	4.5	5069.07
0.04	0.00	37.31	0.00	0.000	0.015	0.000	0.000	5058.07	510.81
0.025054	13.	13.	13.	10	14	0	0.00	37.41	548.22
*SECNO 2786.600									
2786.600	5.62	5063.67	5068.52	0.00	5085.28	21.61	0.02	0.00	5069.10
5487.0	0.0	5487.0	0.0	0.0	147.1	0.0	18.7	4.5	5069.05
0.04	0.00	37.31	0.00	0.000	0.015	0.000	0.000	5058.05	510.82
0.025037	1.	1.	1.	4	14	0	0.00	37.40	548.23
*SECNO 2775.000									
2775.000	5.61	5063.44	5068.26	0.00	5084.96	21.52	0.29	0.03	5068.20
5487.0	0.0	5487.0	0.0	0.0	147.4	0.0	18.7	4.5	5068.25
0.04	0.00	37.23	0.00	0.000	0.015	0.000	0.000	5057.83	509.54
0.024939	12.	12.	12.	8	14	0	0.00	37.52	547.06
*SECNO 2766.600									
2766.600	5.64	5063.40	5068.14	0.00	5084.68	21.29	0.21	0.07	5067.80
5487.0	0.0	5487.0	0.0	0.0	148.2	0.0	18.7	4.5	5067.76
0.04	0.00	37.03	0.00	0.000	0.015	0.000	0.000	5057.76	508.76
0.024525	8.	8.	8.	5	14	0	0.00	37.53	546.29

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2750.000									
2750.000	5.69	5063.32	5068.00	0.00	5084.14	20.83	0.40	0.14	5067.60
5487.0	0.0	5487.0	0.0	0.0	149.8	0.0	18.8	4.5	5067.63
0.04	0.00	36.62	0.00	0.000	0.015	0.000	0.000	5057.63	508.61
0.023829	17.	17.	17.	7	14	0	0.00	37.75	546.36
*SECNO 2700.000									
3301 HV CHANGED MORE THAN HVINS									
2700.000	5.81	5063.04	5067.59	0.00	5082.63	19.59	1.14	0.37	5067.20
5487.0	0.0	5487.0	0.0	0.0	154.5	0.0	19.0	4.6	5067.23
0.04	0.00	35.52	0.00	0.000	0.015	0.000	0.000	5057.23	508.36
0.021915	50.	50.	50.	9	14	0	0.00	38.24	546.60
*SECNO 2675.000									
3301 HV CHANGED MORE THAN HVINS									
2675.000	5.88	5062.91	5067.39	0.00	5081.92	19.02	0.54	0.17	5067.00
5503.0	0.0	5503.0	0.0	0.0	157.2	0.0	19.1	4.6	5067.03
0.04	0.00	35.00	0.00	0.000	0.015	0.000	0.000	5057.03	508.22
0.020993	25.	25.	25.	9	14	0	0.00	38.53	546.75
*SECNO 2650.000									
3301 HV CHANGED MORE THAN HVINS									
2650.000	5.93	5062.77	5067.20	0.00	5081.25	18.48	0.51	0.16	5066.80
5503.0	0.0	5503.0	0.0	0.0	159.5	0.0	19.2	4.6	5066.84
0.04	0.00	34.50	0.00	0.000	0.015	0.000	0.000	5056.84	508.09
0.020183	25.	25.	25.	8	14	0	0.00	38.78	546.87
*SECNO 2600.000									
3301 HV CHANGED MORE THAN HVINS									
2600.000	6.04	5062.48	5066.80	0.00	5079.98	17.50	0.97	0.29	5066.40
5503.0	0.0	5503.0	0.0	0.0	163.9	0.0	19.3	4.7	5066.44
0.04	0.00	33.57	0.00	0.000	0.015	0.000	0.000	5056.44	507.86
0.018727	50.	50.	50.	9	14	0	0.00	39.23	547.09

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2550.000

3301 HV CHANGED MORE THAN HVINS

2550.000	6.15	5062.19	5066.39	0.00	5078.82	16.63	0.90	0.26	5066.00
5503.0	0.0	5503.0	0.0	0.0	168.2	0.0	19.5	4.7	5066.04
0.04	0.00	32.72	0.00	0.000	0.015	0.000	0.000	5056.04	507.64
0.017468	50.	50.	50.	8	14	0	0.00	39.66	547.31

*SECNO 2500.000

3301 HV CHANGED MORE THAN HVINS

2500.000	6.27	5061.92	5066.00	0.00	5077.73	15.81	0.84	0.25	5065.60
5503.0	0.0	5503.0	0.0	0.0	172.5	0.0	19.7	4.8	5065.65
0.05	0.00	31.91	0.00	0.000	0.015	0.000	0.000	5055.65	507.42
0.016304	50.	50.	50.	7	14	0	0.00	40.10	547.52

*SECNO 2450.000

3301 HV CHANGED MORE THAN HVINS

2450.000	6.36	5061.61	5065.59	0.00	5076.73	15.13	0.79	0.21	5065.20
5503.0	0.0	5503.0	0.0	0.0	176.3	0.0	19.9	4.8	5065.25
0.05	0.00	31.21	0.00	0.000	0.015	0.000	0.000	5055.25	507.23
0.015347	50.	50.	50.	7	14	0	0.00	40.49	547.71

*SECNO 2400.000

3301 HV CHANGED MORE THAN HVINS

2400.000	6.46	5061.31	5065.21	0.00	5075.80	14.49	0.74	0.19	5064.90
5503.0	0.0	5503.0	0.0	0.0	180.2	0.0	20.1	4.9	5064.85
0.05	0.00	30.54	0.00	0.000	0.015	0.000	0.000	5054.85	507.14
0.014435	50.	50.	50.	7	14	0	0.00	40.78	547.92

*SECNO 2350.000

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3301 HV CHANGED MORE THAN HVINS

2350.000	6.55	5061.01	5064.82	0.00	5074.92	13.92	0.70	0.17	5064.50
5503.0	0.0	5503.0	0.0	0.0	183.8	0.0	20.3	4.9	5064.46
0.05	0.00	29.94	0.00	0.000	0.015	0.000	0.000	5054.46	506.96
0.013670	50.	50.	50.	8	14	0	0.00	41.14	548.10

*SECNO 2300.000

3301 HV CHANGED MORE THAN HVINS

2300.000	6.63	5060.69	5064.43	0.00	5074.11	13.42	0.67	0.15	5064.20
5503.0	0.0	5503.0	0.0	0.0	187.2	0.0	20.6	5.0	5064.19
0.05	0.00	29.39	0.00	0.000	0.015	0.000	0.000	5054.06	507.03
0.013009	50.	50.	50.	9	14	0	0.00	41.49	548.52

*SECNO 2286.600

2286.600	6.65	5060.60	5064.35	0.00	5073.90	13.29	0.17	0.04	5064.30
5503.0	0.0	5503.0	0.0	0.0	188.1	0.0	20.6	5.0	5064.25
0.05	0.00	29.26	0.00	0.000	0.015	0.000	0.000	5053.95	507.36
0.012837	13.	13.	13.	5	14	0	0.00	41.55	548.90

*SECNO 2275.000

2275.000	6.67	5060.53	5064.26	0.00	5073.72	13.19	0.15	0.03	5064.20
5503.0	0.0	5503.0	0.0	0.0	188.8	0.0	20.7	5.0	5064.16
0.05	0.00	29.14	0.00	0.000	0.015	0.000	0.000	5053.86	507.31
0.012701	12.	12.	12.	5	14	0	0.00	41.63	548.94

*SECNO 2250.000

2250.000	6.71	5060.37	5064.06	0.00	5073.34	12.97	0.31	0.07	5064.00
5503.0	0.0	5503.0	0.0	0.0	190.4	0.0	20.8	5.0	5063.96
0.05	0.00	28.90	0.00	0.000	0.015	0.000	0.000	5053.66	507.24
0.012414	25.	25.	25.	6	14	0	0.00	41.78	549.02

*SECNO 2200.000

2200.000	6.78	5060.04	5063.66	0.00	5072.61	12.57	0.61	0.12	5063.60
5503.0	0.0	5503.0	0.0	0.0	193.4	0.0	21.0	5.1	5063.56
0.05	0.00	28.45	0.00	0.000	0.015	0.000	0.000	5053.26	507.09
0.011894	50.	50.	50.	9	14	0	0.00	42.06	549.16

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2150.000									
2150.000	6.85	5059.72	5063.27	0.00	5071.91	12.20	0.58	0.11	5063.20
5503.0	0.0	5503.0	0.0	0.0	196.4	0.0	21.2	5.1	5063.17
0.05	0.00	28.03	0.00	0.000	0.015	0.000	0.000	5052.87	506.94
0.011418	50.	50.	50.	9	14	0	0.00	42.35	549.30
*SECNO 2100.000									
2100.000	6.91	5059.38	5062.87	0.00	5071.26	11.88	0.56	0.09	5062.80
5503.0	0.0	5503.0	0.0	0.0	199.0	0.0	21.4	5.1	5062.77
0.05	0.00	27.66	0.00	0.000	0.015	0.000	0.000	5052.47	506.82
0.011017	50.	50.	50.	9	14	0	0.00	42.60	549.42
*SECNO 2050.000									
2050.000	6.95	5059.02	5062.47	0.00	5070.64	11.61	0.54	0.08	5062.40
5503.0	0.0	5503.0	0.0	0.0	201.2	0.0	21.7	5.2	5062.37
0.05	0.00	27.35	0.00	0.000	0.015	0.000	0.000	5052.07	506.72
0.010681	50.	50.	50.	8	14	0	0.00	42.81	549.52
*SECNO 2000.000									
2000.000	7.02	5058.70	5062.08	0.00	5070.03	11.33	0.53	0.09	5062.00
5503.0	0.0	5503.0	0.0	0.0	203.7	0.0	21.9	5.2	5061.98
0.05	0.00	27.01	0.00	0.000	0.015	0.000	0.000	5051.68	506.59
0.010330	50.	50.	50.	8	14	0	0.00	43.05	549.64
*SECNO 1950.000									
1950.000	7.06	5058.34	5061.68	0.00	5069.45	11.11	0.51	0.07	5061.60
5503.0	0.0	5503.0	0.0	0.0	205.8	0.0	22.1	5.3	5061.58
0.05	0.00	26.74	0.00	0.000	0.015	0.000	0.000	5051.28	506.49
0.010053	50.	50.	50.	8	14	0	0.00	43.24	549.73
*SECNO 1900.000									
1900.000	7.10	5057.98	5061.34	0.00	5068.89	10.91	0.50	0.06	5061.20
5503.0	0.0	5503.0	0.0	0.0	207.6	0.0	22.4	5.3	5061.18
0.05	0.00	26.50	0.00	0.000	0.015	0.000	0.000	5050.88	506.41
0.009809	50.	50.	50.	8	11	0	0.00	43.41	549.82

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 1850.000									
1850.000	7.15	5057.64	5060.95	0.00	5068.35	10.71	0.48	0.06	5060.80
5503.0	0.0	5503.0	0.0	0.0	209.6	0.0	22.6	5.4	5060.79
0.05	0.00	26.26	0.00	0.000	0.015	0.000	0.000	5050.49	506.31
0.009568	50.	50.	50.	8	11	0	0.00	43.60	549.90
*SECNO 1800.000									
1800.000	7.19	5057.28	5060.54	0.00	5067.83	10.55	0.47	0.05	5060.40
5503.0	0.0	5503.0	0.0	0.0	211.1	0.0	22.9	5.4	5060.39
0.05	0.00	26.07	0.00	0.000	0.015	0.000	0.000	5050.09	506.24
0.009378	50.	50.	50.	8	11	0	0.00	43.74	549.98
*SECNO 1750.000									
1750.000	7.22	5056.91	5060.14	0.00	5067.32	10.42	0.46	0.04	5060.00
5503.0	0.0	5503.0	0.0	0.0	212.5	0.0	23.1	5.5	5059.99
0.05	0.00	25.90	0.00	0.000	0.015	0.000	0.000	5049.69	506.18
0.009214	50.	50.	50.	8	11	0	0.00	43.86	550.04
*SECNO 1700.000									
1700.000	7.25	5056.55	5059.75	0.00	5066.82	10.27	0.46	0.04	5059.60
5503.0	0.0	5503.0	0.0	0.0	214.0	0.0	23.3	5.5	5059.60
0.05	0.00	25.72	0.00	0.000	0.015	0.000	0.000	5049.30	506.10
0.009042	50.	50.	50.	8	11	0	0.00	44.01	550.10
*SECNO 1650.000									
1650.000	7.28	5056.18	5059.35	0.00	5066.34	10.17	0.45	0.03	5059.20
5503.0	0.0	5503.0	0.0	0.0	215.1	0.0	23.6	5.6	5059.20
0.05	0.00	25.59	0.00	0.000	0.015	0.000	0.000	5048.90	506.05
0.008917	50.	50.	50.	8	11	0	0.00	44.11	550.15
*SECNO 1600.000									
1600.000	7.30	5055.80	5058.94	0.00	5065.87	10.07	0.44	0.03	5058.80
5503.0	0.0	5503.0	0.0	0.0	216.1	0.0	23.8	5.6	5058.80
0.05	0.00	25.47	0.00	0.000	0.015	0.000	0.000	5048.50	506.00
0.008806	50.	50.	50.	8	11	0	0.00	44.20	550.20

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 1575.000									
1575.000	7.30	5055.60	5058.74	0.00	5065.64	10.04	0.22	0.01	5058.60
5503.0	0.0	5503.0	0.0	0.0	216.4	0.0	24.0	5.7	5058.60
0.05	0.00	25.43	0.00	0.000	0.015	0.000	0.000	5048.30	505.99
0.008766	25.	25.	25.	5	11	0	0.00	44.23	550.21
*SECNO 1556.600									
1556.600	7.33	5055.49	5058.61	0.00	5065.46	9.97	0.16	0.02	5058.50
5503.0	0.0	5503.0	0.0	0.0	217.1	0.0	24.1	5.7	5058.46
0.05	0.00	25.34	0.00	0.000	0.015	0.000	0.000	5048.16	506.00
0.008679	18.	18.	18.	5	11	0	0.00	44.26	550.26
*SECNO 1550.000									
1550.000	7.33	5055.44	5058.58	0.00	5065.40	9.96	0.06	0.00	5059.40
5503.0	0.0	5503.0	0.0	0.0	217.3	0.0	24.1	5.7	5059.40
0.05	0.00	25.33	0.00	0.000	0.015	0.000	0.000	5048.11	507.94
0.008673	7.	7.	7.	4	11	0	0.00	44.33	552.26
*SECNO 1536.600									
1536.600	7.33	5055.33	5058.47	0.00	5065.28	9.95	0.12	0.00	5061.30
5503.0	0.0	5503.0	0.0	0.0	217.4	0.0	24.2	5.7	5061.30
0.05	0.00	25.32	0.00	0.000	0.015	0.000	0.000	5048.00	511.94
0.008662	13.	13.	13.	5	11	0	0.00	44.32	556.26

THIS RUN EXECUTED 12AUG96 16:16:27

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUPERCRITICAL RUN

SUMMARY PRINTOUT

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
*	7901.600	5181.76	31.50	14.90	5188.58	5188.58	5192.03	6.82	3200.50
*	7875.000	5180.99	44.58	19.83	5185.54	5187.48	5191.64	4.55	3200.50
	7868.000	5180.79	43.70	19.77	5185.51	5187.45	5191.58	4.72	3200.50
	7852.800	5180.36	42.13	19.53	5185.51	5187.40	5191.43	5.15	3200.50
	7850.000	5180.28	41.87	19.49	5185.50	5187.37	5191.40	5.22	3200.50
	7836.800	5179.91	40.92	18.97	5185.64	5187.42	5191.22	5.73	3200.50
	7825.000	5179.57	40.33	18.44	5185.78	5187.43	5191.06	6.21	3200.50
	7822.400	5179.50	40.26	18.34	5185.81	5187.43	5191.03	6.31	3200.50
	7802.400	5178.80	36.15	19.65	5184.85	5186.67	5190.84	6.05	3200.50
	7775.000	5178.00	31.21	19.61	5184.70	5186.49	5190.67	6.70	3200.50
	7740.000	5176.90	30.23	21.62	5183.05	5185.33	5190.31	6.15	3200.50
*	7718.100	5176.25	53.84	23.28	5181.60	5184.20	5190.02	5.35	5376.00
*	7698.000	5175.80	44.56	25.33	5182.10	5185.18	5192.07	6.30	5376.00
	7650.000	5174.37	45.48	26.74	5180.38	5183.71	5191.48	6.01	5376.00
	7600.000	5172.88	44.20	27.68	5178.94	5182.39	5190.83	6.06	5380.00
	7550.000	5171.39	42.89	28.45	5177.60	5181.14	5190.16	6.21	5380.00
	7500.000	5169.90	41.71	29.13	5176.28	5179.92	5189.46	6.38	5380.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
7475.000	5169.15	41.18	29.45	5175.63	5179.30	5189.10	6.48	5380.00
7470.000	5169.00	41.03	29.51	5175.51	5179.19	5189.03	6.51	5380.00
7425.000	5168.09	40.82	29.85	5174.55	5178.28	5188.39	6.46	5380.00
7375.000	5167.07	40.59	30.21	5173.48	5177.26	5187.65	6.41	5380.00
7325.000	5166.05	40.38	30.54	5172.41	5176.25	5186.90	6.36	5380.00
7275.000	5165.04	40.29	30.85	5171.35	5175.22	5186.13	6.31	5380.00
7225.000	5164.02	40.12	31.12	5170.30	5174.21	5185.33	6.28	5380.00
7175.000	5163.01	39.97	31.37	5169.25	5173.20	5184.53	6.24	5380.00
7125.000	5161.99	39.83	31.60	5168.20	5172.18	5183.71	6.21	5380.00
7075.000	5160.98	39.73	31.81	5167.16	5171.18	5182.87	6.18	5380.00
7025.000	5159.96	39.64	32.01	5166.11	5170.19	5182.02	6.15	5380.00
7000.000	5159.45	39.53	32.10	5165.60	5169.72	5181.60	6.15	5380.00
6950.000	5158.44	39.51	32.28	5164.56	5168.69	5180.73	6.12	5380.00
6900.000	5157.42	39.41	32.44	5163.52	5167.67	5179.85	6.10	5380.00
6850.000	5156.41	39.33	32.58	5162.49	5166.67	5178.97	6.08	5380.00
6800.000	5155.39	39.24	32.71	5161.46	5165.65	5178.07	6.07	5380.00
6750.000	5154.38	39.18	32.83	5160.44	5164.63	5177.17	6.06	5380.00
6700.000	5153.36	39.10	32.95	5159.40	5163.63	5176.26	6.04	5380.00
6650.000	5152.34	39.10	33.07	5158.36	5162.59	5175.34	6.02	5380.00
6600.000	5151.33	39.05	33.17	5157.33	5161.58	5174.41	6.00	5380.00
6550.000	5150.31	38.98	33.26	5156.30	5160.56	5173.48	5.99	5380.00
6500.000	5149.30	38.94	33.34	5155.28	5159.56	5172.54	5.98	5380.00
6450.000	5148.28	38.88	33.42	5154.25	5158.54	5171.59	5.97	5380.00
6400.000	5147.27	38.84	33.48	5153.24	5157.53	5170.65	5.97	5380.00
6350.000	5146.25	38.79	33.56	5152.20	5156.52	5169.69	5.95	5380.00
6300.000	5145.24	38.83	33.61	5151.19	5155.49	5168.73	5.95	5380.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
6250.000	5144.22	38.79	33.67	5150.16	5154.48	5167.77	5.94	5380.00
6200.000	5143.20	38.74	33.73	5149.14	5153.46	5166.80	5.94	5380.00
6150.000	5142.19	38.71	33.77	5148.12	5152.45	5165.83	5.93	5380.00
6100.000	5141.17	38.68	33.82	5147.10	5151.43	5164.86	5.93	5380.00
6075.000	5140.67	36.74	33.48	5146.88	5151.32	5164.28	6.21	5380.00
6050.000	5140.16	34.61	33.12	5146.71	5151.21	5163.74	6.55	5380.00
6025.000	5139.65	34.59	33.22	5146.18	5150.50	5163.32	6.53	5380.00
6000.000	5139.14	34.55	33.32	5145.66	5149.98	5162.90	6.52	5380.00
5975.000	5138.63	34.51	33.41	5145.14	5149.48	5162.47	6.51	5380.00
5950.000	5138.13	34.50	33.49	5144.62	5149.16	5162.04	6.49	5380.00
5925.000	5137.62	36.64	33.83	5143.79	5148.24	5161.56	6.17	5389.00
5900.000	5137.11	38.61	34.09	5143.01	5147.37	5161.05	5.90	5389.00
5850.000	5136.10	38.59	34.10	5142.00	5146.37	5160.06	5.90	5389.00
5800.000	5135.08	38.56	34.13	5140.98	5145.35	5159.06	5.90	5389.00
5750.000	5133.96	38.49	34.25	5139.84	5144.24	5158.05	5.88	5389.00
5700.000	5132.85	38.51	34.35	5138.71	5143.11	5157.03	5.86	5389.00
5650.000	5131.73	38.45	34.45	5137.58	5142.00	5156.00	5.85	5389.00
5600.000	5130.61	38.39	34.54	5136.45	5140.88	5154.97	5.84	5389.00
5550.000	5129.49	38.34	34.61	5135.33	5139.76	5153.93	5.84	5389.00
5500.000	5128.38	38.30	34.69	5134.20	5138.66	5152.89	5.82	5389.00
5450.000	5127.26	38.25	34.75	5133.09	5137.54	5151.84	5.83	5389.00
5400.000	5126.14	38.28	34.83	5131.94	5136.41	5150.78	5.80	5389.00
5350.000	5125.02	38.24	34.89	5130.82	5135.29	5149.72	5.80	5389.00
5300.000	5123.90	38.20	34.94	5129.70	5134.17	5148.66	5.80	5389.00
5250.000	5122.79	38.17	34.99	5128.58	5133.07	5147.59	5.79	5389.00
5200.000	5121.67	38.13	35.04	5127.46	5131.95	5146.52	5.79	5389.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
5150.000	5120.55	38.09	35.08	5126.33	5130.83	5145.44	5.78	5389.00
5100.000	5119.44	38.15	35.12	5125.22	5129.71	5144.37	5.78	5389.00
5050.000	5118.32	38.11	35.15	5124.09	5128.59	5143.28	5.77	5389.00
5000.000	5117.20	38.08	35.19	5122.97	5127.48	5142.20	5.77	5389.00
4950.000	5116.08	38.05	35.22	5121.85	5126.36	5141.11	5.77	5389.00
4900.000	5114.96	38.02	35.25	5120.73	5125.25	5140.02	5.77	5389.00
4850.000	5113.85	38.08	35.28	5119.61	5124.12	5138.93	5.76	5389.00
4825.000	5113.29	38.07	35.29	5119.05	5123.53	5138.39	5.76	5389.00
4800.000	5112.73	38.06	35.30	5118.49	5122.94	5137.84	5.76	5389.00
4750.000	5111.61	38.03	35.33	5117.36	5121.83	5136.75	5.75	5389.00
4700.000	5110.49	38.00	35.35	5116.25	5120.71	5135.65	5.76	5389.00
4650.000	5109.38	37.99	35.36	5115.14	5119.61	5134.55	5.76	5389.00
4600.000	5108.26	37.96	35.38	5114.01	5118.49	5133.45	5.75	5389.00
4550.000	5106.51	37.75	35.95	5112.20	5116.73	5132.27	5.69	5389.00
4500.000	5104.76	37.48	36.47	5110.39	5114.99	5131.04	5.63	5389.00
4450.000	5103.01	37.32	36.94	5108.59	5113.23	5129.77	5.58	5389.00
4400.000	5101.26	37.10	37.36	5106.80	5111.50	5128.47	5.54	5389.00
4350.000	5099.51	36.98	37.75	5105.00	5109.74	5127.13	5.49	5389.00
4300.000	5097.76	36.80	38.09	5103.23	5108.00	5125.76	5.47	5389.00
4280.000	5097.36	36.87	37.92	5102.84	5107.60	5125.17	5.48	5389.00
4275.000	5097.26	36.55	37.83	5102.78	5107.57	5125.00	5.52	5389.00
4250.000	5096.76	34.72	37.34	5102.56	5107.50	5124.21	5.80	5389.00
4230.000	5096.36	33.15	36.94	5102.42	5107.46	5123.61	6.06	5389.00
4225.000	5096.26	33.15	36.93	5102.32	5107.34	5123.50	6.06	5389.00
4200.000	5095.76	33.18	36.85	5101.83	5106.78	5122.92	6.07	5389.00
4175.000	5095.26	33.23	36.78	5101.34	5106.14	5122.34	6.08	5389.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
4150.000	5094.76	33.25	36.73	5100.83	5105.64	5121.78	6.07	5389.00
4125.000	5094.26	33.30	36.66	5100.34	5105.14	5121.21	6.08	5389.00
4100.000	5093.76	33.34	36.60	5099.84	5104.67	5120.65	6.08	5389.00
4075.000	5093.26	33.29	36.53	5099.36	5104.33	5120.08	6.10	5389.00
4060.000	5092.96	33.31	36.49	5099.07	5104.03	5119.75	6.11	5389.00
4050.000	5092.76	34.17	36.57	5098.75	5103.66	5119.52	5.99	5389.00
4025.000	5092.26	36.18	36.72	5098.00	5102.75	5118.93	5.74	5389.00
4010.000	5091.96	37.35	36.78	5097.56	5102.25	5118.57	5.60	5389.00
4025.000	5092.26	37.76	35.82	5097.96	5102.56	5117.89	5.70	5389.00
4015.600	5092.07	37.79	35.79	5097.78	5102.36	5117.67	5.71	5389.00
4000.000	5091.76	37.80	35.72	5097.47	5102.00	5117.29	5.71	5389.00
3995.600	5091.54	37.82	35.84	5097.23	5101.76	5117.18	5.69	5389.00
3975.000	5090.71	37.66	36.15	5096.38	5100.94	5116.67	5.67	5389.00
3950.000	5089.72	37.51	36.51	5095.34	5099.94	5116.04	5.62	5389.00
3900.000	5087.74	37.25	37.16	5093.29	5097.96	5114.74	5.55	5389.00
3850.000	5085.77	36.95	37.74	5091.27	5096.01	5113.39	5.50	5389.00
3800.000	5083.79	36.75	38.28	5089.23	5094.02	5111.99	5.44	5389.00
3750.000	5082.64	36.90	38.01	5088.10	5092.87	5110.54	5.46	5389.00
3700.000	5081.77	37.10	37.39	5087.30	5092.01	5109.02	5.53	5389.00
3650.000	5080.90	37.35	36.85	5086.49	5091.13	5107.57	5.59	5389.00
3600.000	5080.04	37.60	36.35	5085.68	5090.26	5106.20	5.64	5389.00
3550.000	5079.17	37.74	35.90	5084.87	5089.40	5104.89	5.70	5389.00
3500.000	5078.30	37.93	35.52	5084.04	5088.53	5103.63	5.74	5389.00
3465.600	5077.71	38.05	35.27	5083.48	5087.93	5102.80	5.77	5389.00
3450.000	5077.44	36.93	34.97	5083.38	5087.90	5102.37	5.94	5389.00
3425.000	5077.00	34.97	34.48	5083.26	5087.89	5101.72	6.26	5389.00

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
	3415.600	5076.84	34.20	34.29	5083.23	5087.88	5101.48	6.39	5389.00
	3400.000	5076.57	34.19	34.26	5082.96	5087.43	5101.19	6.39	5389.00
	3375.000	5076.14	34.20	34.22	5082.54	5087.00	5100.73	6.40	5389.00
	3350.000	5075.70	34.21	34.20	5082.11	5086.57	5100.27	6.41	5389.00
	3325.600	5075.28	34.21	34.18	5081.69	5086.33	5099.83	6.41	5389.00
	3300.000	5073.74	35.99	35.42	5079.71	5084.41	5099.20	5.97	5389.00
	3275.000	5071.29	37.52	37.39	5076.69	5081.46	5098.40	5.40	5389.00
	3250.000	5070.82	37.70	37.20	5076.20	5080.99	5097.69	5.38	5389.00
	3225.000	5070.34	38.06	37.14	5075.61	5080.28	5097.03	5.27	5389.00
	3200.000	5069.87	36.02	36.96	5075.13	5080.02	5096.34	5.26	5389.00
	3175.000	5069.40	33.32	36.63	5074.81	5079.83	5095.64	5.41	5389.00
	3150.000	5068.92	31.05	35.75	5074.94	5079.98	5094.79	6.02	5389.00
	3125.000	5068.45	31.72	35.85	5074.29	5079.29	5094.25	5.84	5392.00
	3117.300	5068.30	43.16	37.07	5072.58	5077.09	5093.92	4.28	5487.00
*	3100.000	5067.90	42.61	36.89	5072.30	5076.82	5093.43	4.40	5487.00
	3075.000	5067.33	41.97	36.52	5071.91	5076.43	5092.62	4.58	5487.00
	3050.000	5066.75	41.36	36.20	5071.52	5076.03	5091.87	4.77	5487.00
	3025.000	5066.18	40.74	35.88	5071.15	5075.67	5091.14	4.96	5487.00
	3000.000	5065.36	40.07	35.93	5070.49	5075.05	5090.53	5.13	5487.00
	2975.000	5064.50	39.34	36.00	5069.80	5074.46	5089.93	5.30	5487.00
	2950.000	5063.65	38.72	36.08	5069.12	5073.81	5089.34	5.47	5487.00
	2927.000	5062.86	38.12	36.13	5068.53	5073.24	5088.80	5.67	5487.00
	2925.000	5062.79	38.13	36.15	5068.46	5073.16	5088.75	5.67	5487.00
	2900.000	5061.94	38.03	36.38	5067.59	5072.33	5088.14	5.65	5487.00
	2875.000	5061.08	37.85	36.60	5066.72	5071.49	5087.52	5.64	5487.00
	2850.000	5060.22	37.74	36.82	5065.85	5070.64	5086.90	5.63	5487.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
2825.000	5059.37	37.58	37.01	5065.00	5069.82	5086.27	5.63	5487.00
2800.000	5058.51	37.49	37.21	5064.13	5068.97	5085.63	5.62	5487.00
2787.300	5058.07	37.41	37.31	5063.68	5068.53	5085.30	5.61	5487.00
2786.600	5058.05	37.40	37.31	5063.67	5068.52	5085.28	5.62	5487.00
2775.000	5057.83	37.52	37.23	5063.44	5068.26	5084.96	5.61	5487.00
2766.600	5057.76	37.53	37.03	5063.40	5068.14	5084.68	5.64	5487.00
2750.000	5057.63	37.75	36.62	5063.32	5068.00	5084.14	5.69	5487.00
2700.000	5057.23	38.24	35.52	5063.04	5067.59	5082.63	5.81	5487.00
2675.000	5057.03	38.53	35.00	5062.91	5067.39	5081.92	5.88	5503.00
2650.000	5056.84	38.78	34.50	5062.77	5067.20	5081.25	5.93	5503.00
2600.000	5056.44	39.23	33.57	5062.48	5066.80	5079.98	6.04	5503.00
2550.000	5056.04	39.66	32.72	5062.19	5066.39	5078.82	6.15	5503.00
2500.000	5055.65	40.10	31.91	5061.92	5066.00	5077.73	6.27	5503.00
2450.000	5055.25	40.49	31.21	5061.61	5065.59	5076.73	6.36	5503.00
2400.000	5054.85	40.78	30.54	5061.31	5065.21	5075.80	6.46	5503.00
2350.000	5054.46	41.14	29.94	5061.01	5064.82	5074.92	6.55	5503.00
2300.000	5054.06	41.49	29.39	5060.69	5064.43	5074.11	6.63	5503.00
2286.600	5053.95	41.55	29.26	5060.60	5064.35	5073.90	6.65	5503.00
2275.000	5053.86	41.63	29.14	5060.53	5064.26	5073.72	6.67	5503.00
2250.000	5053.66	41.78	28.90	5060.37	5064.06	5073.34	6.71	5503.00
2200.000	5053.26	42.06	28.45	5060.04	5063.66	5072.61	6.78	5503.00
2150.000	5052.87	42.35	28.03	5059.72	5063.27	5071.91	6.85	5503.00
2100.000	5052.47	42.60	27.66	5059.38	5062.87	5071.26	6.91	5503.00
2050.000	5052.07	42.81	27.35	5059.02	5062.47	5070.64	6.95	5503.00
2000.000	5051.68	43.05	27.01	5058.70	5062.08	5070.03	7.02	5503.00
1950.000	5051.28	43.24	26.74	5058.34	5061.68	5069.45	7.06	5503.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
1900.000	5050.88	43.41	26.50	5057.98	5061.34	5068.89	7.10	5503.00
1850.000	5050.49	43.60	26.26	5057.64	5060.95	5068.35	7.15	5503.00
1800.000	5050.09	43.74	26.07	5057.28	5060.54	5067.83	7.19	5503.00
1750.000	5049.69	43.86	25.90	5056.91	5060.14	5067.32	7.22	5503.00
1700.000	5049.30	44.01	25.72	5056.55	5059.75	5066.82	7.25	5503.00
1650.000	5048.90	44.11	25.59	5056.18	5059.35	5066.34	7.28	5503.00
1600.000	5048.50	44.20	25.47	5055.80	5058.94	5065.87	7.30	5503.00
1575.000	5048.30	44.23	25.43	5055.60	5058.74	5065.64	7.30	5503.00
1556.600	5048.16	44.26	25.34	5055.49	5058.61	5065.46	7.33	5503.00
1550.000	5048.11	44.33	25.33	5055.44	5058.58	5065.40	7.33	5503.00
1536.600	5048.00	44.32	25.32	5055.33	5058.47	5065.28	7.33	5503.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION	SECNO=	7901.600	PROFILE=	1	CRITICAL DEPTH ASSUMED
WARNING	SECNO=	7875.000	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING	SECNO=	7718.100	PROFILE=	1	CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
NOTE	SECNO=	7698.000	PROFILE=	1	WSEL BASED ON X5 CARD
CAUTION	SECNO=	7698.000	PROFILE=	1	MINIMUM SPECIFIC ENERGY
NOTE	SECNO=	3100.000	PROFILE=	1	WSEL BASED ON X5 CARD

APPENDIX C: Section 4

HEC-2 Output for the Revised Conditions Model for the South El Camino Diversion Concrete Box Culvert Located West of I-25

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE     7AUG96    TIME    9:21:33  *
*******************************************
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************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX
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::::::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::::::
:::                                          :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION     :::
:::                                          :::
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::::::::::::::::::::::::::::::::::::::::::::::::
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============================
H A E S T A D  M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 7AUG96 9:21:33

```
**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**********************************


T1   S EL CAMINO DIVERSION BOX
T1   FLOWS FROM RTI'S AHYMO MODEL  5/29/96
T1   FLOWS INLCUDE SEDIMENT BULKING FACTORS
T1   STATIONING AND ELEVATIONS FROM AS BUILT PLANS
T1   STARTING WSEL IS AT CRITICAL DEPTH
T1   CULVERT ENTRANCE IS INLET CONTROLLED
T2   HEC-2 RUN FOR LA CUEVA AND SOUTH EL CAMINO LOMR (MAY 1996)
T3          SUPERCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

            2.                      1        -1

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   -1.          0       -1.                                     -1.

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.       42.        4.        26.        1.        2.        3.        8.        14.       33.

QT      1.0     1981.3
NC     .015       .015       .015        .1         .3
          FLOW FROM STRUCTURES 8 AND 9
          BEGIN 2 12' X 10' CBCs, BEGIN TRANSITION TO ONE 14' BY 10' CBCs
X1   1436.3        4.0     500.00      524.0       34.78       34.8       34.8
GR   5192.4      500.0    5182.39      500.0    5182.39       524.0    5192.39       524.0

          BEGIN 1 14' X 10' CBC
X1   1401.6        4.0     500.00      514.0        1.56        1.6        1.6
GR   5189.8      500.0    5179.77      500.0    5179.77       514.0    5189.77       514.0

X1   1400.0        4.0     500.00      514.0       50.00       50.0       50.0
GR   5189.8      500.0    5179.75      500.0    5179.75       514.0    5189.75       514.0

X1   1350.0        4.0     500.00      514.0       50.00       50.0       50.0
GR   5189.2      500.0    5179.23      500.0    5179.23       514.0    5189.23       514.0

QT      1.0     2011.5
          FLOW FROM STRUCTURE 10 (24" RCP) ENTERS CBC
X1   1300.0        4.0     500.00      514.0       50.00       50.0       50.0
GR   5188.7      500.0    5178.71      500.0    5178.71       514.0    5188.71       514.0
```

```
X1   1250.0        4.0     500.00      514.0      50.00       50.0       50.0
GR   5188.2      500.0     5178.19     500.0      5178.19     514.0      5188.19      514.0

X1   1200.0        4.0     500.00      514.0      50.00       50.0       50.0
GR   5187.7      500.0     5177.67     500.0      5177.67     514.0      5187.67      514.0

X1   1150.0        4.0     500.00      514.0      30.00       30.0       30.0
GR   5187.2      500.0     5177.15     500.0      5177.15     514.0      5187.15      514.0

          END 14' X 10' CBC
X1   1120.0        4.0     500.00      514.0      0.00        0.0        0.0
GR   5186.8      500.0     5176.84     500.0      5176.84     514.0      5186.84      514.0
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 1436.300
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED
FLOW FROM STRUCTURES 8 AND 9
BEGIN 2 12' X 10' CBCs, BEGIN TRANSITION TO ONE 14' BY 10' CBCs

1436.300	5.94	5188.33	5188.33	0.00	5191.33	3.00	0.00	0.00	5192.40
1981.3	0.0	1981.3	0.0	0.0	142.5	0.0	0.0	0.0	5192.39
0.00	0.00	13.91	0.00	0.000	0.015	0.000	0.000	5182.39	500.00
0.003133	0.	0.	0.	0	10	0	0.00	24.00	524.00

*SECNO 1401.600

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
BEGIN 1 14' X 10' CBC

1401.600	8.52	5188.29	5188.29	0.00	5192.57	4.28	0.13	0.41	5189.80
1981.3	0.0	1981.3	0.0	0.0	119.3	0.0	0.1	0.0	5189.77
0.00	0.00	16.61	0.00	0.000	0.015	0.000	0.000	5179.77	500.00
0.004669	35.	35.	35.	20	11	0	0.00	14.00	514.00

*SECNO 1400.000

1400.000	8.43	5188.18	5188.26	0.00	5192.56	4.38	0.01	0.01	5189.80
1981.3	0.0	1981.3	0.0	0.0	118.0	0.0	0.1	0.0	5189.75
0.00	0.00	16.80	0.00	0.000	0.015	0.000	0.000	5179.75	500.00
0.004807	2.	2.	2.	0	5	0	0.00	14.00	514.00

*SECNO 1350.000

3301 HV CHANGED MORE THAN HVINS

1350.000	7.68	5186.91	5187.76	0.00	5192.20	5.29	0.27	0.09	5189.20
1981.3	0.0	1981.3	0.0	0.0	107.4	0.0	0.2	0.0	5189.23
0.00	0.00	18.46	0.00	0.000	0.015	0.000	0.000	5179.23	500.00
0.006154	50.	50.	50.	6	5	0	0.00	14.00	514.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1300.000

3301 HV CHANGED MORE THAN HVINS

FLOW FROM STRUCTURE 10 (24" RCP) ENTERS CBC

1300.000	8.59	5187.30	5187.32	0.00	5191.65	4.35	0.27	0.28	5188.70
2011.5	0.0	2011.5	0.0	0.0	120.2	0.0	0.4	0.0	5188.71
0.00	0.00	16.74	0.00	0.000	0.015	0.000	0.000	5178.71	500.00
0.004719	50.	50.	50.	2	8	0	0.00	14.00	514.00

*SECNO 1250.000

3301 HV CHANGED MORE THAN HVINS

1250.000	7.73	5185.92	5186.79	0.00	5191.28	5.35	0.27	0.10	5188.20
2011.5	0.0	2011.5	0.0	0.0	108.4	0.0	0.5	0.1	5188.19
0.00	0.00	18.56	0.00	0.000	0.015	0.000	0.000	5178.19	500.00
0.006190	50.	50.	50.	5	5	0	0.00	14.00	514.00

*SECNO 1200.000

1200.000	7.43	5185.10	5186.28	0.00	5190.90	5.81	0.33	0.05	5187.70
2011.5	0.0	2011.5	0.0	0.0	104.0	0.0	0.6	0.1	5187.67
0.00	0.00	19.34	0.00	0.000	0.015	0.000	0.000	5177.67	500.00
0.006894	50.	50.	50.	18	8	0	0.00	14.00	514.00

*SECNO 1150.000

1150.000	7.23	5184.38	5185.77	0.00	5190.51	6.14	0.36	0.03	5187.20
2011.5	0.0	2011.5	0.0	0.0	101.2	0.0	0.7	0.1	5187.15
0.00	0.00	19.88	0.00	0.000	0.015	0.000	0.000	5177.15	500.00
0.007418	50.	50.	50.	18	8	0	0.00	14.00	514.00

*SECNO 1120.000

END 14' X 10' CBC

1120.000	7.13	5183.97	5185.44	0.00	5190.27	6.30	0.23	0.02	5186.80
2011.5	0.0	2011.5	0.0	0.0	99.9	0.0	0.8	0.1	5186.84
0.00	0.00	20.14	0.00	0.000	0.015	0.000	0.000	5176.84	500.00
0.007677	30.	30.	30.	19	11	0	0.00	14.00	514.00

THIS RUN EXECUTED 7AUG96 9:21:34

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUPERCRITICAL RUN

SUMMARY PRINTOUT

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH	K*CHSL
*	1436.300	5182.39	24.00	13.91	5188.33	5188.33	5191.33	5.94	1981.30	0.00
*	1401.600	5179.77	14.00	16.61	5188.29	5188.29	5192.57	8.52	1981.30	-75.29
	1400.000	5179.75	14.00	16.80	5188.18	5188.26	5192.56	8.43	1981.30	-12.51
	1350.000	5179.23	14.00	18.46	5186.91	5187.76	5192.20	7.68	1981.30	-10.40
	1300.000	5178.71	14.00	16.74	5187.30	5187.32	5191.65	8.59	2011.50	-10.40
	1250.000	5178.19	14.00	18.56	5185.92	5186.79	5191.28	7.73	2011.50	-10.40
	1200.000	5177.67	14.00	19.34	5185.10	5186.28	5190.90	7.43	2011.50	-10.40
	1150.000	5177.15	14.00	19.88	5184.38	5185.77	5190.51	7.23	2011.50	-10.40
	1120.000	5176.84	14.00	20.14	5183.97	5185.44	5190.27	7.13	2011.50	-10.34

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=    1436.300  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=    1401.600  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    1401.600  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=    1401.600  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

APPENDIX C: Section 5

El Camino/North La Cueva Confluence Report.
Dr. Richard J. Heggen, University of New Mexico, Department of Civil Engineering. November 20, 1994

Flows Used in El Camino/North La Cueva Confluence Report by Richard Heggen

Please note that the flows used in the El Camino/North La Cueva Confluence Report by Richard Heggen were preliminary flows used for the area prior to the completion of the Master Drainage Plan. This LOMR uses the approved flows from the completed Master Drainage Plan.

Richard Heggen's model and report are still applicable since the flows he used are higher than the Master Drainage Plan flows. The model results still hold for the conditions presented in this LOMR.

The table below summarized the flows used in Richard Heggen's model and the Master Drainage Plan flows, as used in this LOMR:

	South El Camino Diversion Flow (cfs)	North La Cueva Arroyo Flow (cfs)	Total Combined Flow (cfs)
Richard Heggen's Report	2300	5000	7300
Master Drainage Plan	2012	3200	5212

RECE[illegible] NOV [illegible]

FILE: 9328%.20

Lyn,

Pr I,

Then file in Project File

(+C)

THE UNIVERSITY OF NEW MEXICO
CIVIL ENGINEERING

Monday, November 21, 1994

Larry Blair, PE
AMAFCA
2600 Prospect NE
Albuquerque, NM 87107

Dear Larry:

Enclosed are three copies of my report *El Camino/ North La Cueva Confluence.* The model of the initial design revealed an oblique wave that would have spilled over the left side of the North La Cueva channel. With BHI's concurrence, we developed two modifications:

(1) We shortened the El Camino CBC 48 feet, pulling the vertical sidewall substantially out of the North La Cueva trapezoidal flow path. This reduced what had been a large reflecting wave.

(2) We altered the confluence reach. It was 100 feet of 29-foot bed width and then a 100-foot transition to 15 feet. It is now one single straight line transition from 29 feet to 15 feet over the entire length. This halved the deflection angle and reduced the rise of water surface at the 15-foot constriction.

The changes should not significantly change the project design or cost. There may be a little less concrete and rebar required, as we've replaced 48 feet of CBC with a 2:1 sideslope. BHI is incorporating the changes into the plans. The contractor saw the model and did not note additional difficulty from the buildability aspect.

The North La Cueva was originally sized for 5000 cfs. The El Camino diversion raises this to 7300 cfs, essentially consuming the existing freeboard. As upstream development approaches its projected value, North La Cueva sidewall extension below the confluence may be in order.

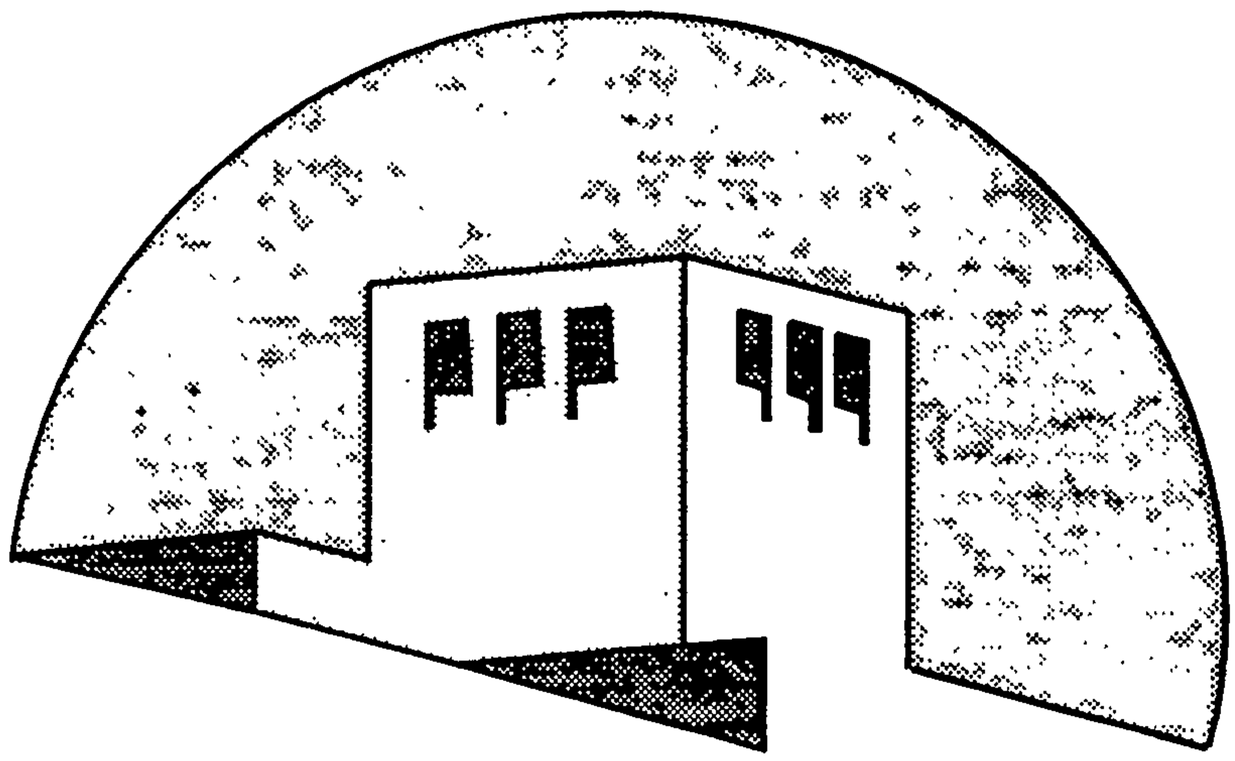
We're now working on the Sunport Interchange confluence with Molzen-Corbin.

Yours truly,

Richard J. Heggen

cc BHI

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University of New Mexico

Department of Civil Engineering

El Camino/ North La Cueva Confluence

Richard J. Heggen

November 20, 1994

A Report Prepared for the
Albuquerque Metropolitan Arroyo Flood Control Authority

El Camino/North La Cueva Confluence

Richard J. Heggen

Department of Civil Engineering
University of New Mexico

November 20, 1994

Introduction

Bohannan-Huston Inc. (BHI) has designed a 10x14 CBC diversion from the proposed El Camino (EC) detention basin west of I-40 to the North La Cueva (NLC) trapezoidal channel. NLC 100-year discharge above the confluence is 5038 cfs. Velocity is 27.8 fps. Depth is 6.5 feet. Flow is supercritical. EC discharge is 2300 cfs. Velocity is 22.2 fps. Depth is 7.4 fps. Flow is again supercritical.

The merger of the two supercritical discharges may generate standing waves. It is necessary to assure that no detrimental wave pattern initiates at the confluence.

Problem Statement

The Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) authorized UNM to model the EC/NLC confluence to:

1) Analyze hydraulic conditions, and

2) Recommend confluence modifications as needed.

The Model

The study employed the UNM Civil Engineering/AMAFCA Open Channel Test Facility. The 50 foot articulated table served as a platform for a three-dimensional model constructed of wood and sheet metal.

NLC model discharge was measured by a pressure differential Annubar Flow Sensor, model GCR25 in the primary pump piping. EC model discharge was measured by a McChrometer propeller meter in the auxiliary pump piping.

Geometric similitude was 1:30. The inertial-gravity force ratio was the same for both model and prototype, making Froude numbers equal.

Experiments

Table 1 summarizes the original design (Configuration 1) and the final recommendation (Configuration 2).

Table 1. Configurations

Configuration	EC CBC Outlet	NLC bed Transition
1	CBC extends to NLC bed tangent. CBC left wall cuts off all of NLC right sideslope.	100 ft of 29 ft bed width followed by 100 feet linear transition to 15 ft bed width. Approx 8 degree deflection on right side.
2	CBC terminates 48 ft upstream of original location. End of CBC approx 5 ft to right of NLC bed. Less encroachment on NLC right sideslope.	248 ft linear transition from 34 to 15 ft trap bed width. Approx 4 degree deflection on right side.

Unless noted, all dimensions given in this report refer to the prototype, not the model. Designations "left" and "right" refer to the perspective facing downstream. Figs. 1, 3 and 5 show plan views of Configuration 1. Figs. 7, 9 and 11 show plan views of Configuration 2.

The following are the same in both configurations:

CBC alignment

CBC outlet wall configuration, *i.e.,* orthogonal 2:1 slopes on the right and a triangular vertical splitter wall on the left

NLC right sideslope against the CBC left wall above Sta. 76+92

NLC left sideslope as built

Table 2 summarizes the experiments.

Table 2. Experimental Discharges

Configuration	Q (cfs) NLC	EC
1	5038	0
1	0	2300
1	5038	2300
2	5038	0
2	5038	1150
2	5038	2300

NLC zero-discharge cases were not evaluated for Configuration 2, as the Configuration 1 tests indicated that without NLC contribution, depths are minor in relation to channel capacity.

Results

Figs. 1-12 show the experimental results. Odd-numbered figures show the water surface in plan view. The sideslope boundary indicates a 10-foot height. Even-numbered figures plot the profile along each sideslope, along a continuation of the NLC 15-foot channel centerline and along an extension of the CBC centerline into the confluence. **Note that the profiles plotted at discrete stations may not indicate localized sideslope overtopping shown in plan view.**

Table 3 indicates maximum measured flow depth and the maximum measured flow depth along a sideslope.

Table 3. Result Summary

Configuration	Q (cfs) NLC	Q (cfs) EC	Maximum depth (feet) in channel	Maximum depth (feet) on sideslope
1	5038	0	8.88	8.88*
1	0	2300	5.88	5.00
1	5038	2300	9.63	9.63*
2	5038	0	7.50	7.50
2	5038	1150	7.63	7.33
2	5038	2300	9.13	9.13

* indicates localized sideslope overtopping shown in plan view

Model depths were recorded at the steady state. With changes in discharge, the wave sites move and magnitudes alter.

Discussion

<u>CBC Outlet</u>

An oblique wave initiates where the CBC impinges into the NLC right sideslope in Configuration 1. Reflected standing waves overtop the NLC sideslopes in several locations. Reducing EC inflow does not substantially alter this behavior.

Moving the CBC outlet back 48 feet pulls the left CBC wall up the NLC sideslope. This modification reduces the magnitude of the reflected wave such that it does not overtop the NLC sideslopes.

The triangular splitter wall between the two channels does not appear to be hydraulically necessary, but it neither appears to cause a problem.

Confluence

An oblique wave overtops the NLC left sideslope where the combined flows merge at the resumption of the 15-foot NLC bed width in Configuration 1. Moving the CBC outlet upstream does not eliminate this constriction effect.

Realigning the confluence right sideslope from an 8-degree deflection to a longer linear 4-degree deflection causes a smaller oblique wave at the 15-foot resumption and eliminates the overtopping.

Neither configuration is symmetrical. Waves might center and be reduced on the sideslopes if the Configuration 2 deflection were altered from 0 degrees on the left and 4 degrees on the right to 2 degrees on each side. Such alignment would require rebuilding the existing NLC left sideslope and is not a current option.

Downstream Conveyance

The existing NLC channel has capacity for approximately 5000 cfs. Depth is in the 7-foot range and freeboard is in the 3-foot range. A flow of 7300 cfs and wave action consume most of the freeboard below the confluence.

Given the uncertainty of the timing of future development and/or upstream conveyance limits, Configuration 2 appears to be the preferred alternative for now. As possible discharge approaches 7300 cfs, downstream NLC capacity may need to be increased, possibly by vertical walls. Improvements should be uniform down the channel, not limited to only the several reflected wave sites identified by the model.

Conclusions

1) Use Configuration 2.

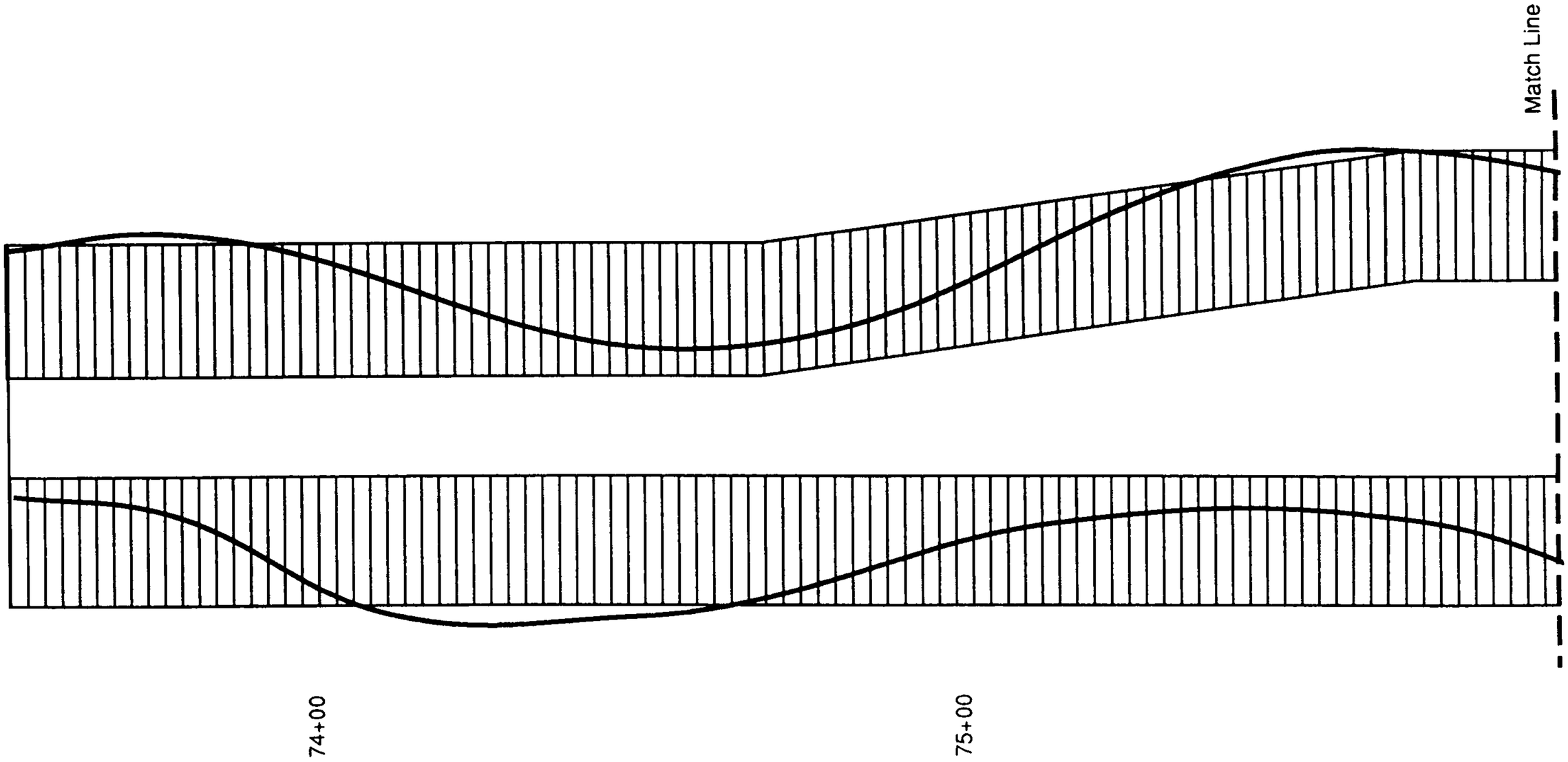
2) Maintain a future option to increase NLC capacity to 7300 cfs.

Notes:

1. Multiply model distances by 30 to get prototype distances.

2. Multiply model velocities by 5.48 to get prototype velocities.

3. Multiply model discharges by 10.98 in gpm to get prototype discharges in cfs.

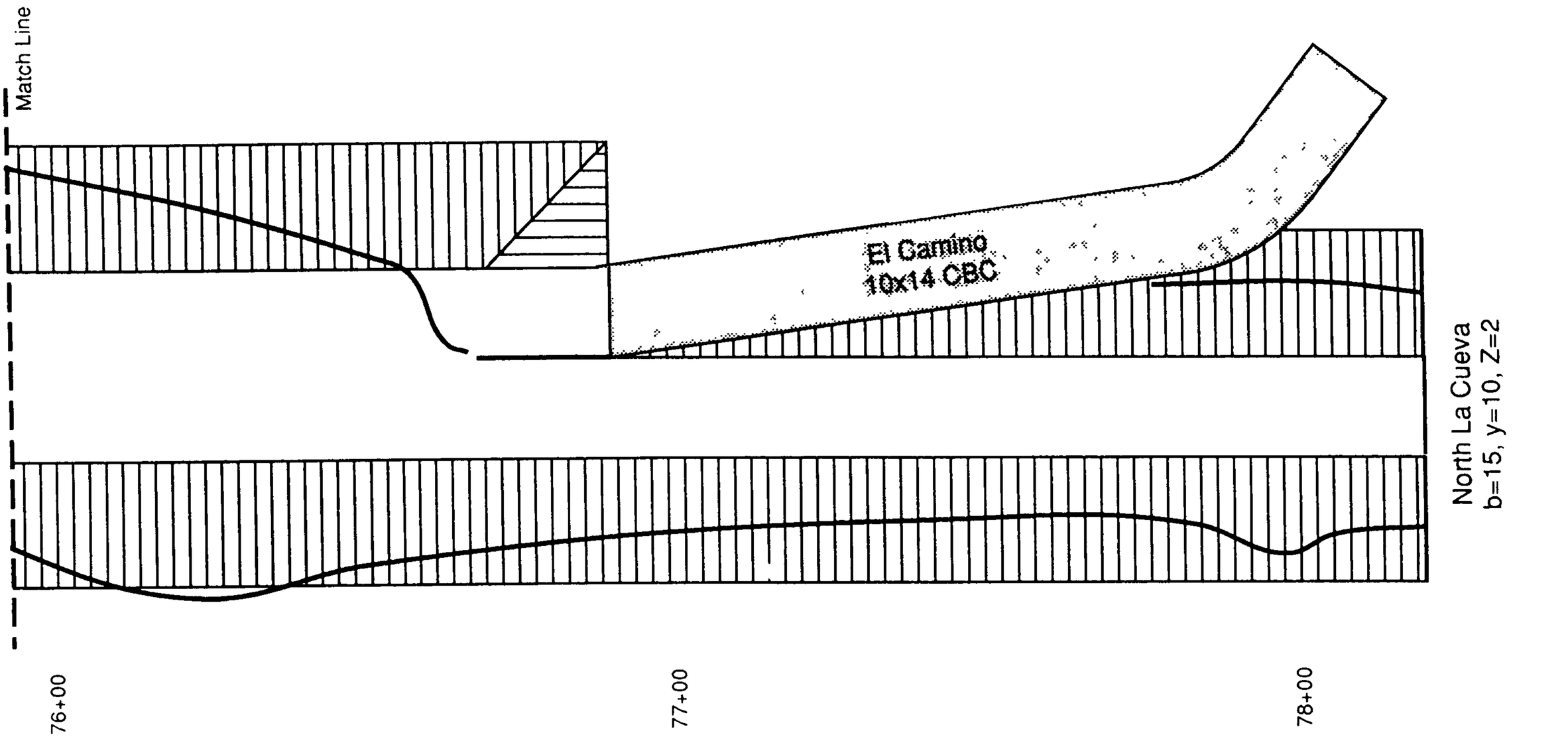


El Camino - North La Cueva Confluence

Scale 1" = 25 "

Configuration 1
NLC 5038 cfs
EC 0 cfs

Figure 1 (Part 1) **Configuration 1**
NLC 5038 cfs EC 0 cfs



El Camino - North La Cueva Confluence

Scale 1" = 25 "

Figure 1 (Part 2) **Configuration 1**
NLC 5038 cfs EC 0 cfs

Configuration	Q NLC	Q EC
1	5038	0

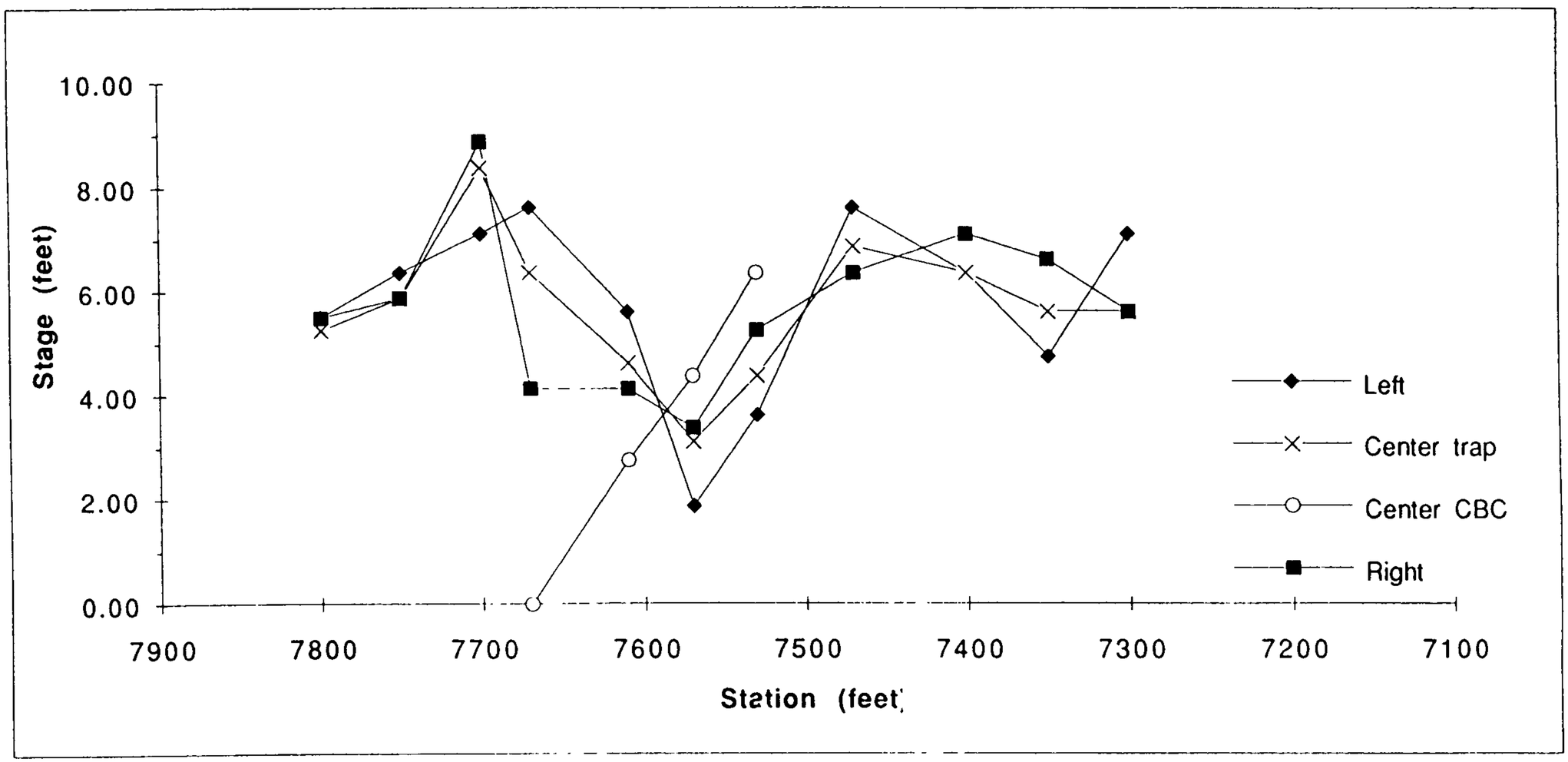
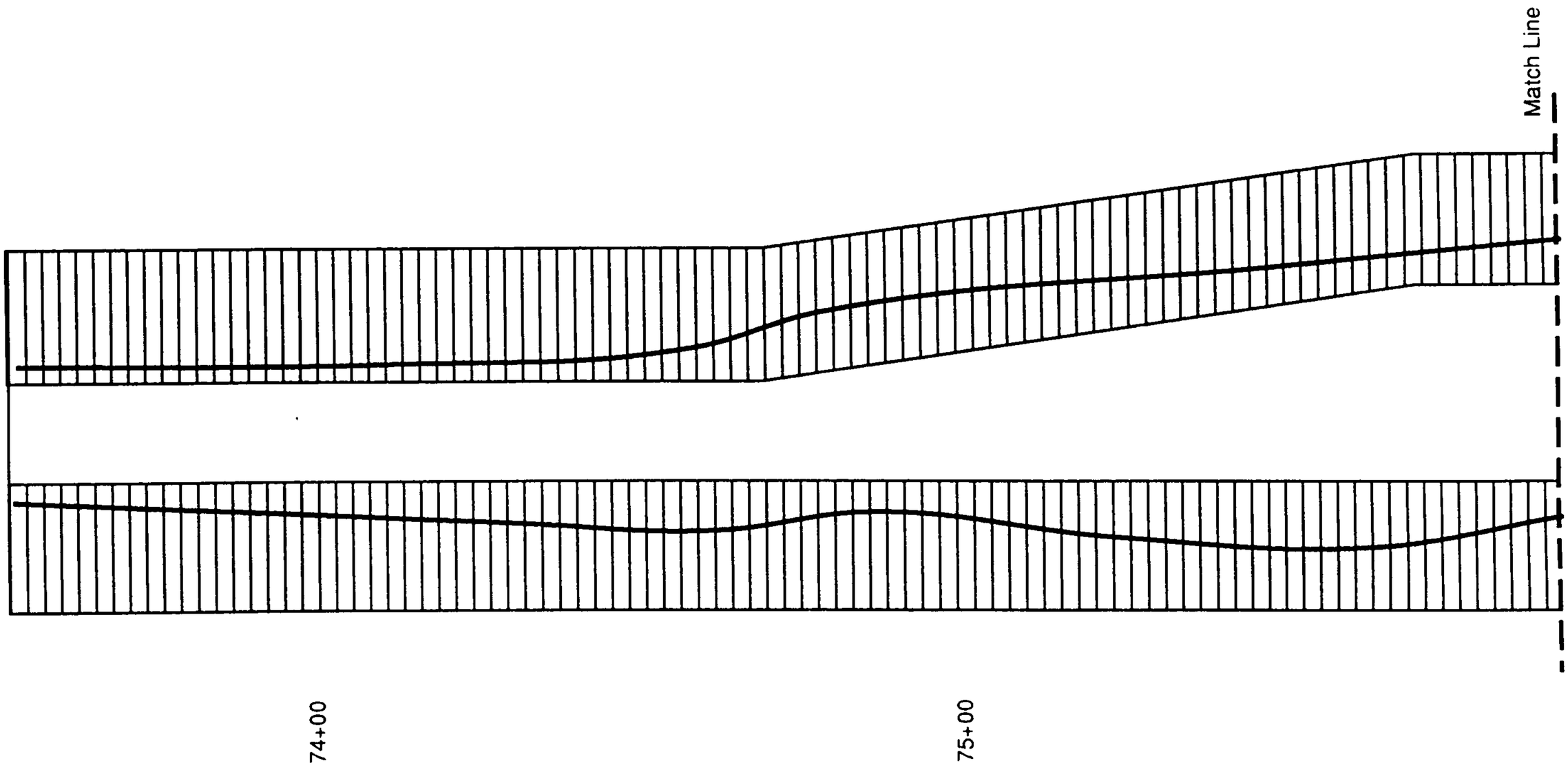


Figure 2 **Configuration 1**
NLC 5038 cfs EC 0 cfs

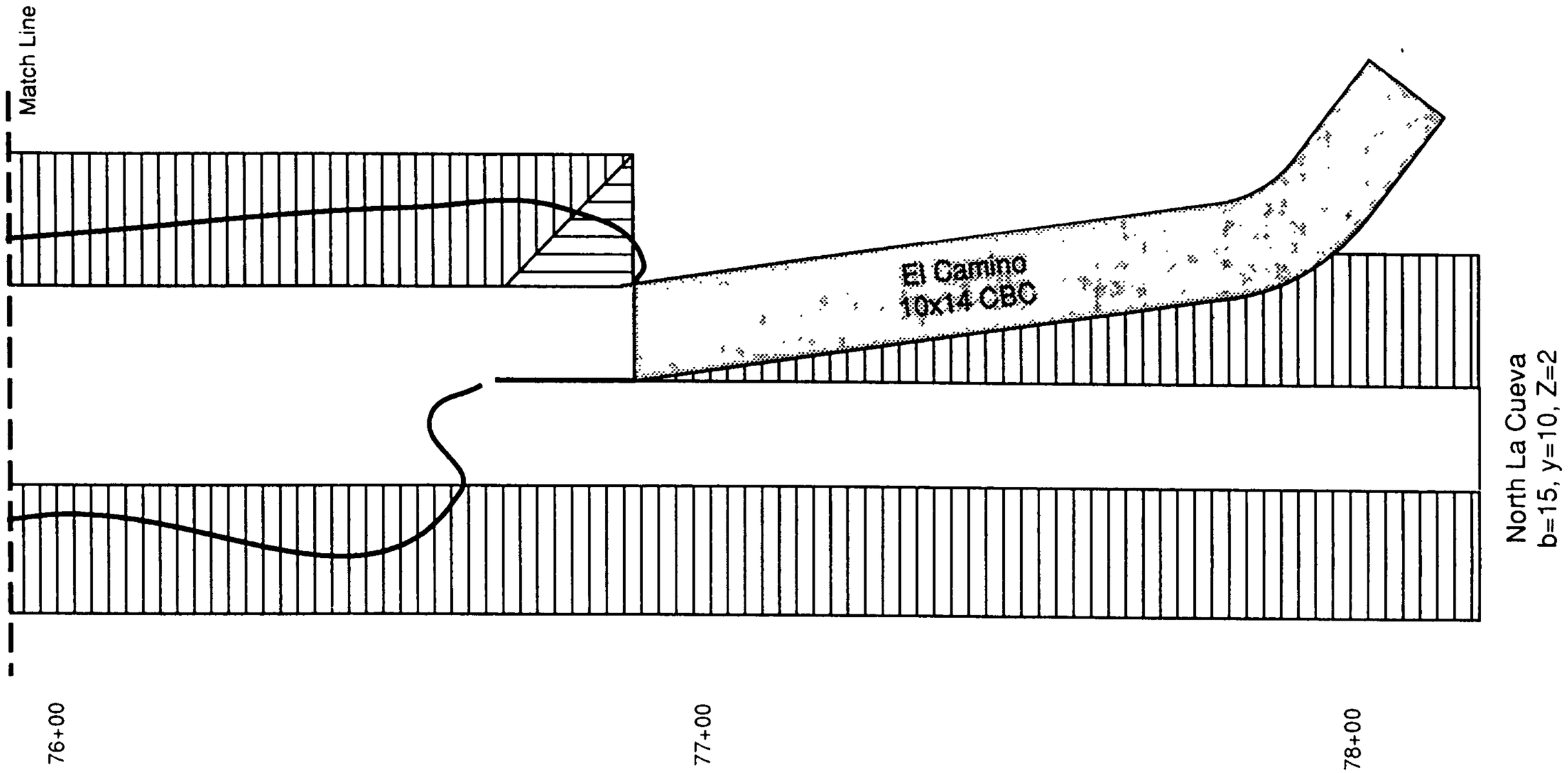


El Camino - North La Cueva Confluence

Scale 1" = 25 "

Configuration 1
NLC 0 cfs
EC 2300 cfs

Figure 3 (Part 1) **Configuration 1**
NLC 0 cfs **EC 2300 cfs**



El Camino - North La Cueva Confluence

Scale 1" = 25 "

Figure 3 (Part 2) **Configuration 1**
NLC 0 cfs **EC 2300 cfs**

Configuration	Q NLC	Q EC
1	**0**	**2300**

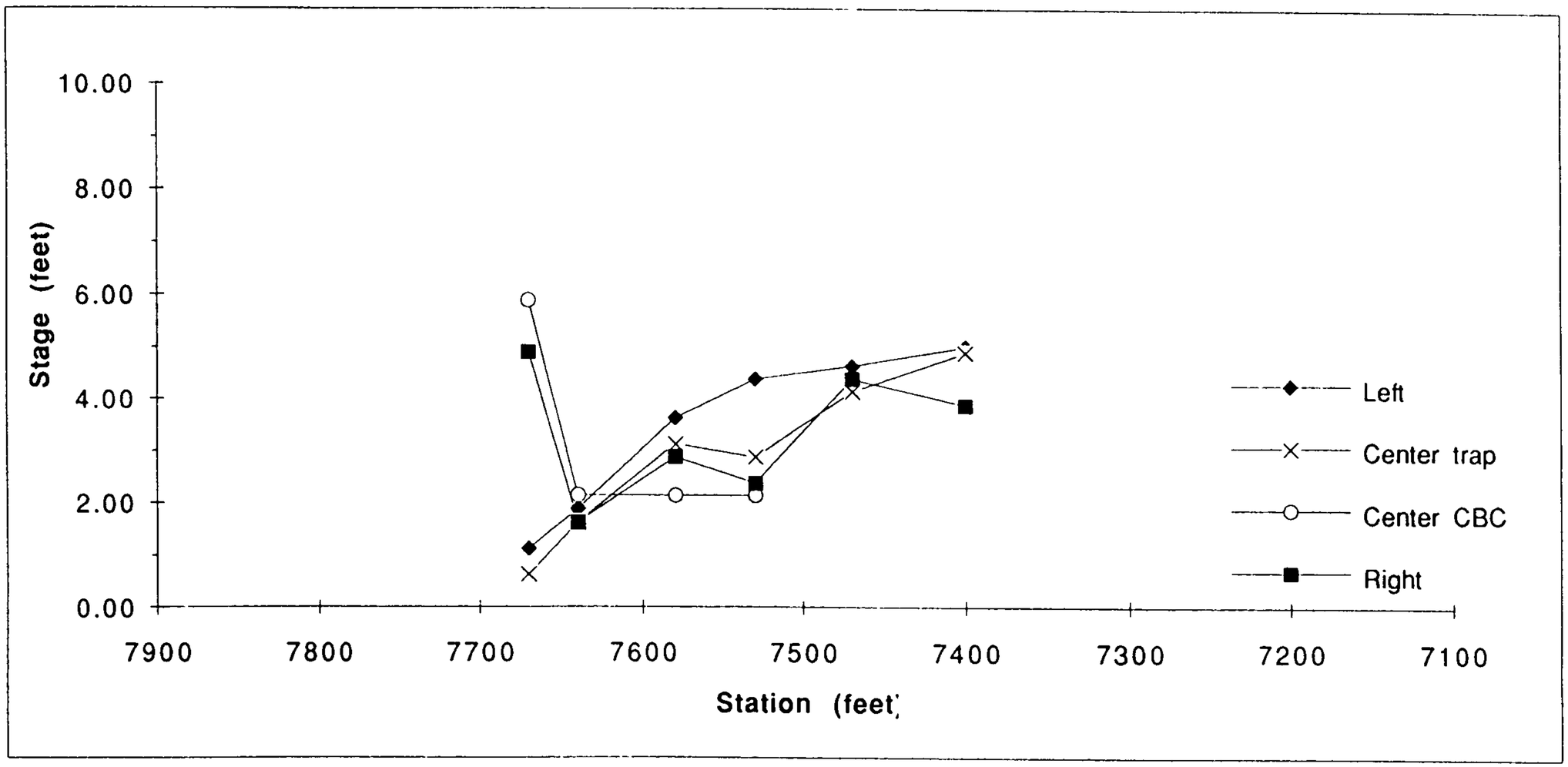
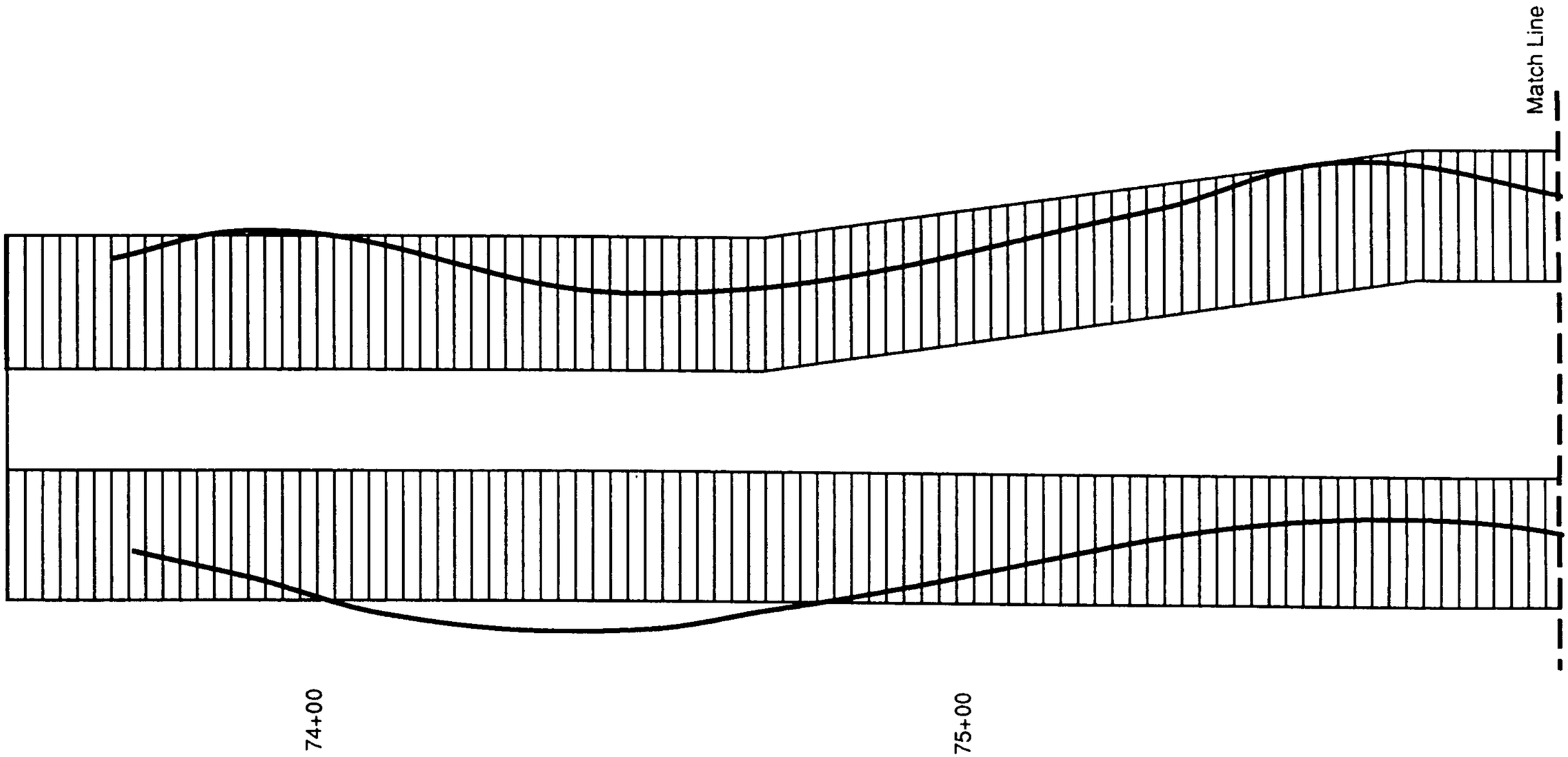


Figure 4

Configuration 1
NLC 0 cfs EC 2300 cfs

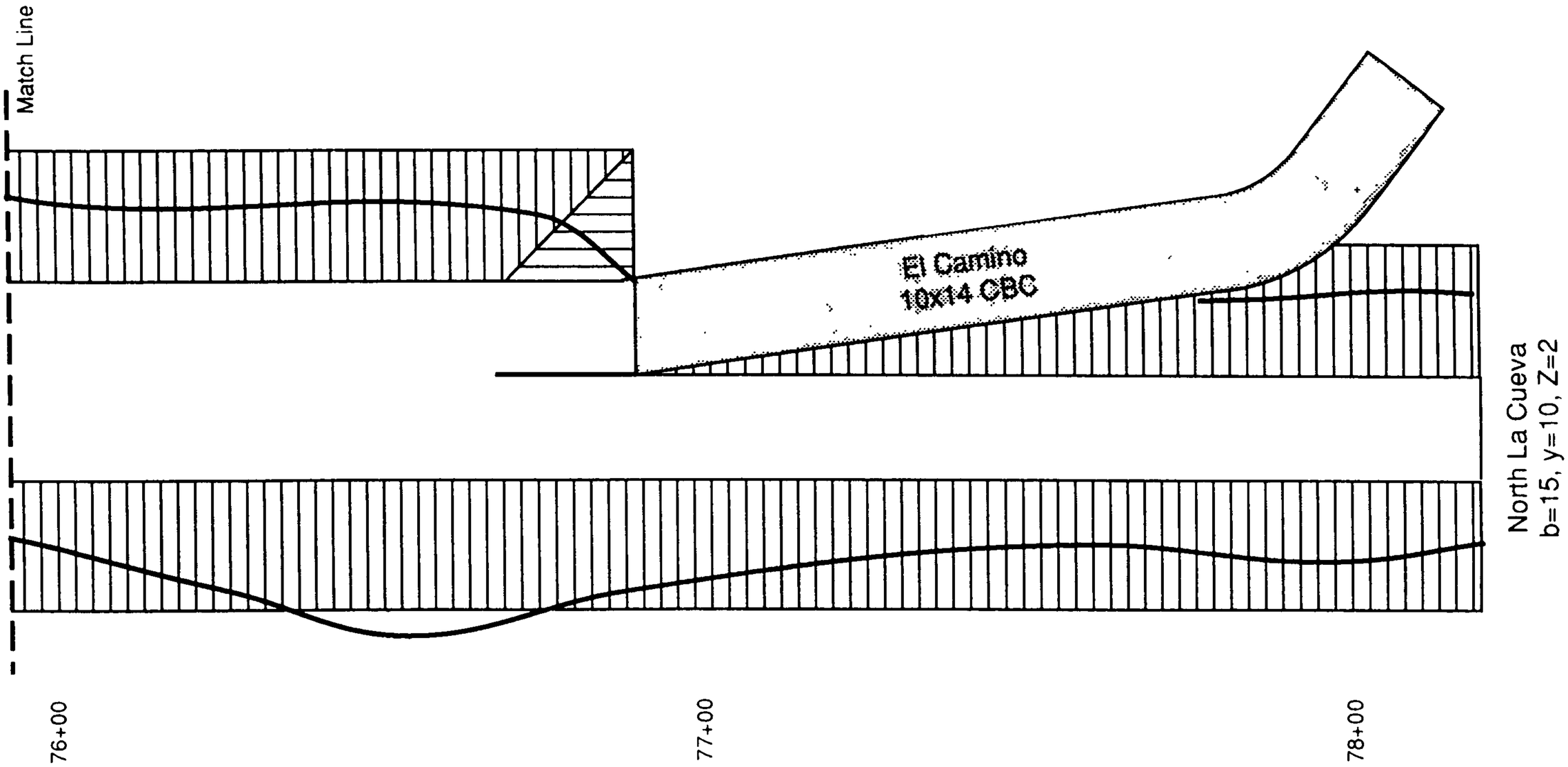


El Camino - North La Cueva Confluence

Scale 1" = 25 "

Configuration 1
NLC 5038 cfs
EC 2300 cfs

Figure 5 (Part 1) **Configuration 1**
NLC 5038 cfs EC 2300 cfs



El Camino - North La Cueva Confluence

Scale 1" = 25 "

Figure 5 (Part 2) **Configuration 1**
NLC 5038 cfs EC 2300 cfs

Configuration	Q NLC	Q EC
1	**5038**	**2300**

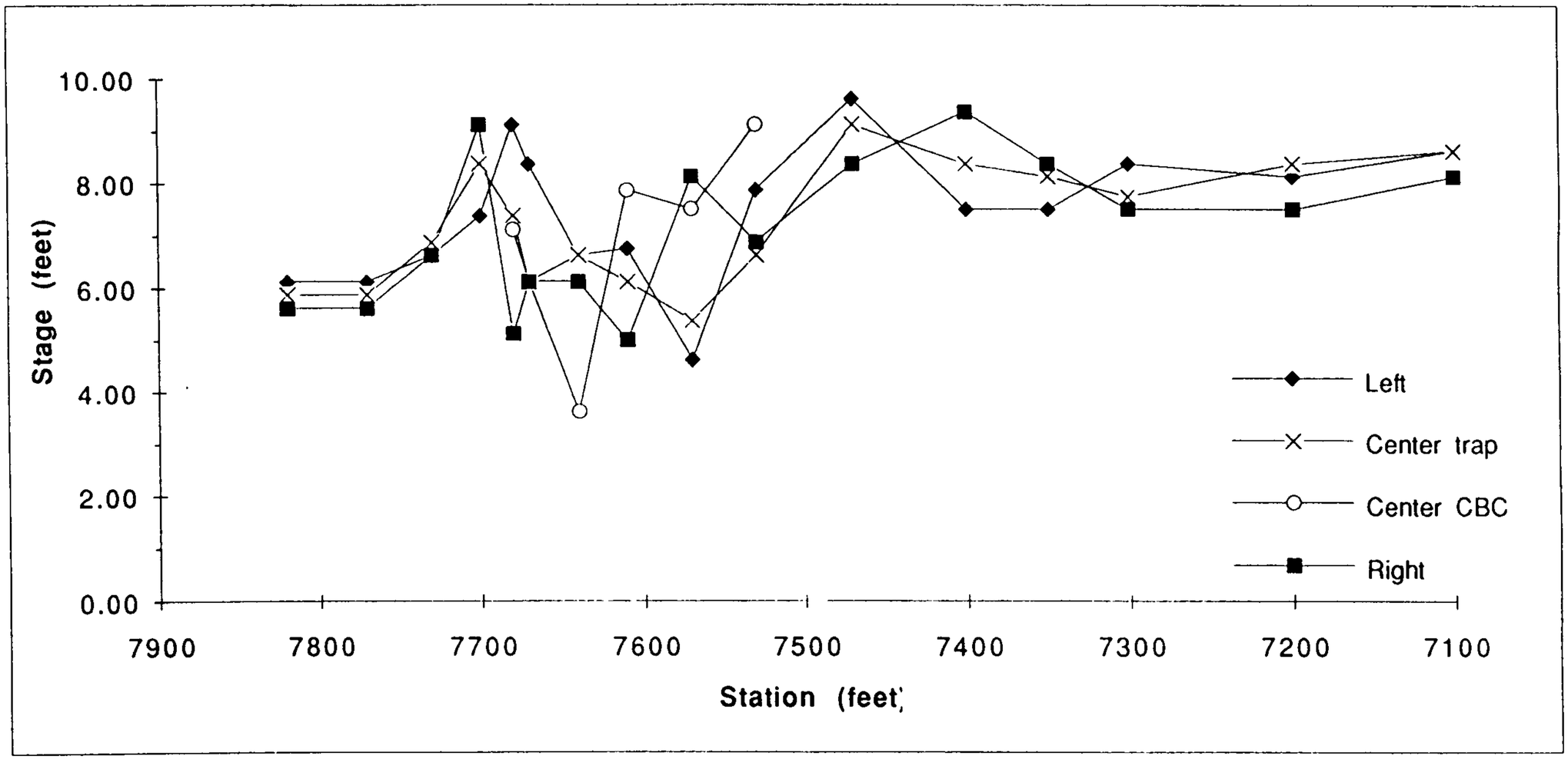
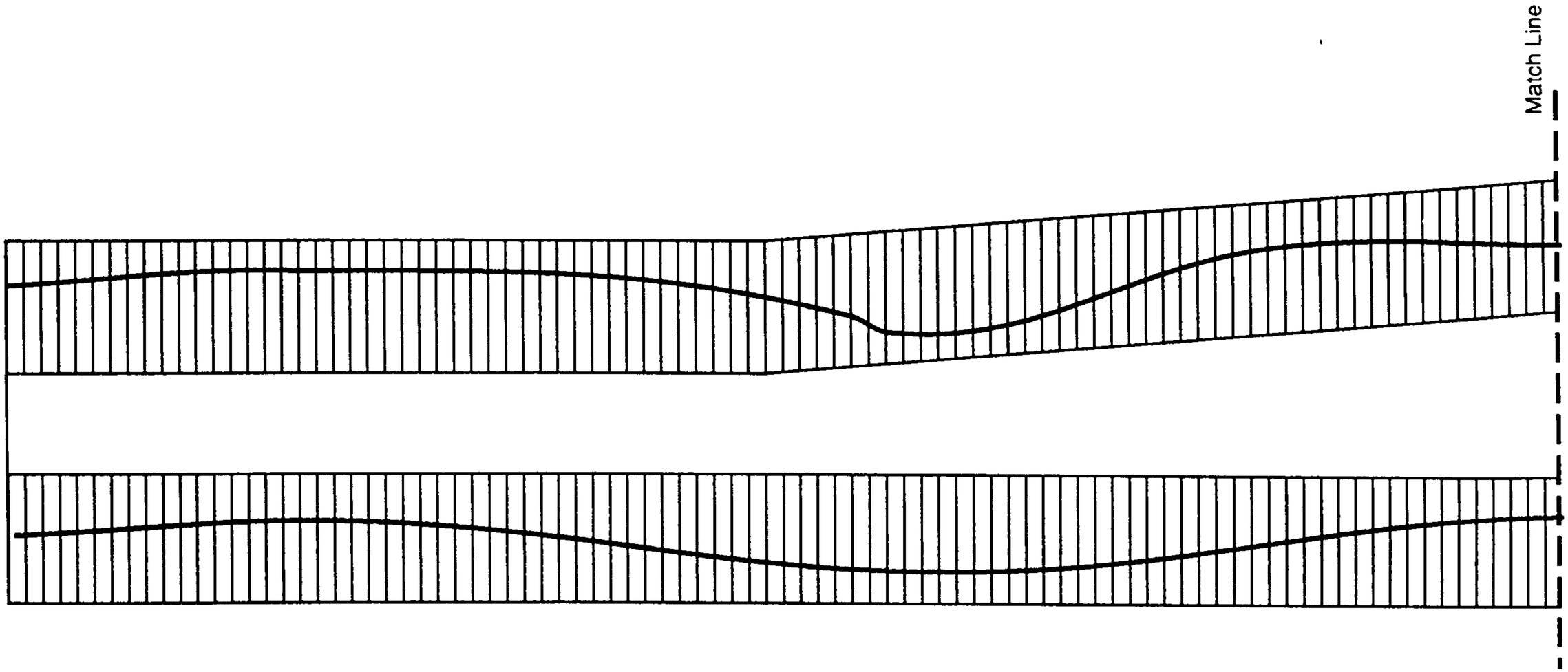


Figure 6

Configuration 1
NLC 5038 cfs EC 2300 cfs

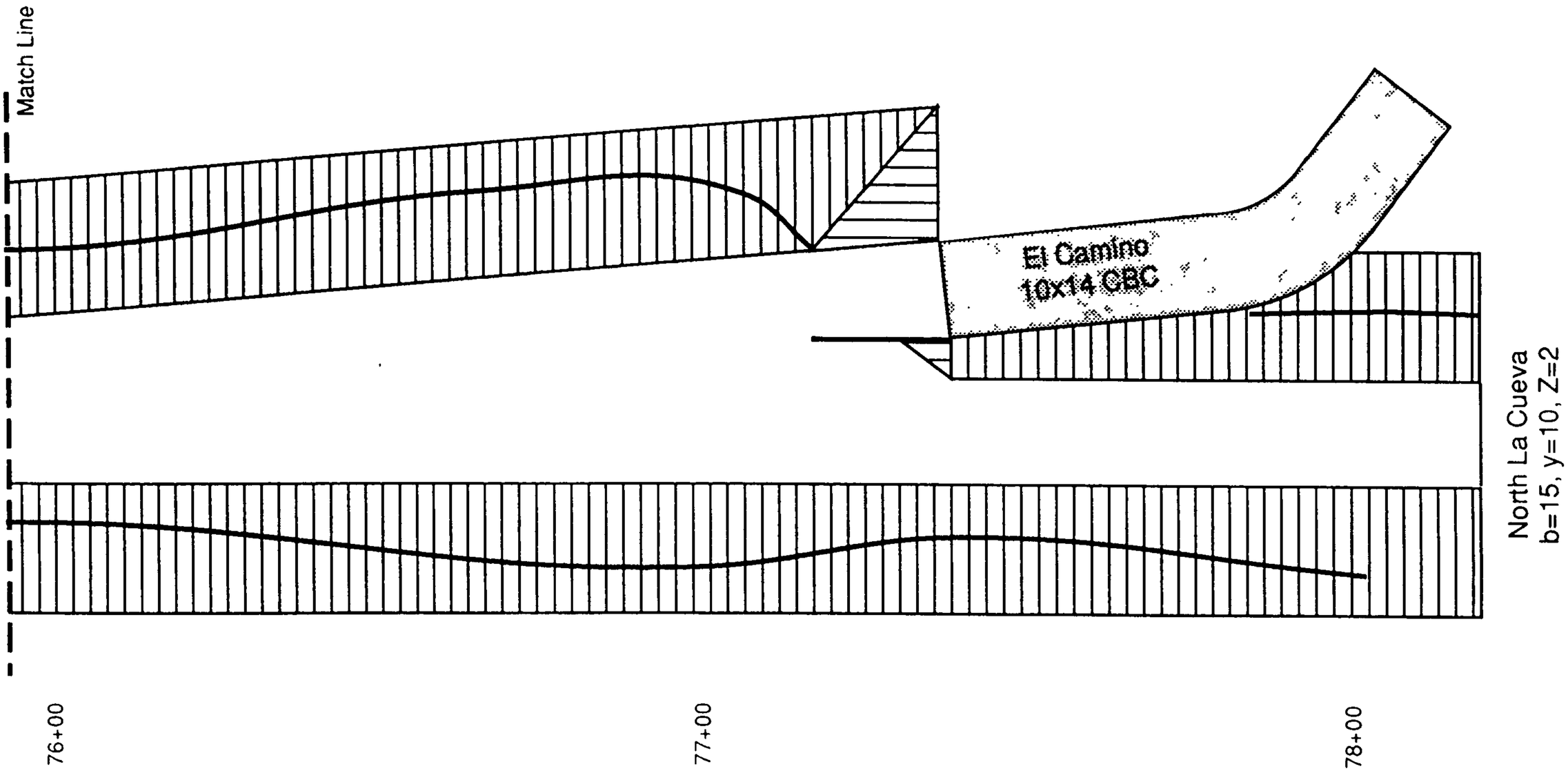


El Camino - North La Cueva Confluence

Scale 1" = 25 "

Configuration 2
NLC 5038 cfs
EC 0 cfs

Figure 7 (Part 1) **Configuration 2**
NLC 5038 cfs EC 0 cfs



El Camino - North La Cueva Confluence

Scale 1" = 25 "

Figure 7 (Part 2) **Configuration 2**
NLC 5038 cfs EC 0 cfs

Configuration	Q NLC	Q EC
2	5038	0

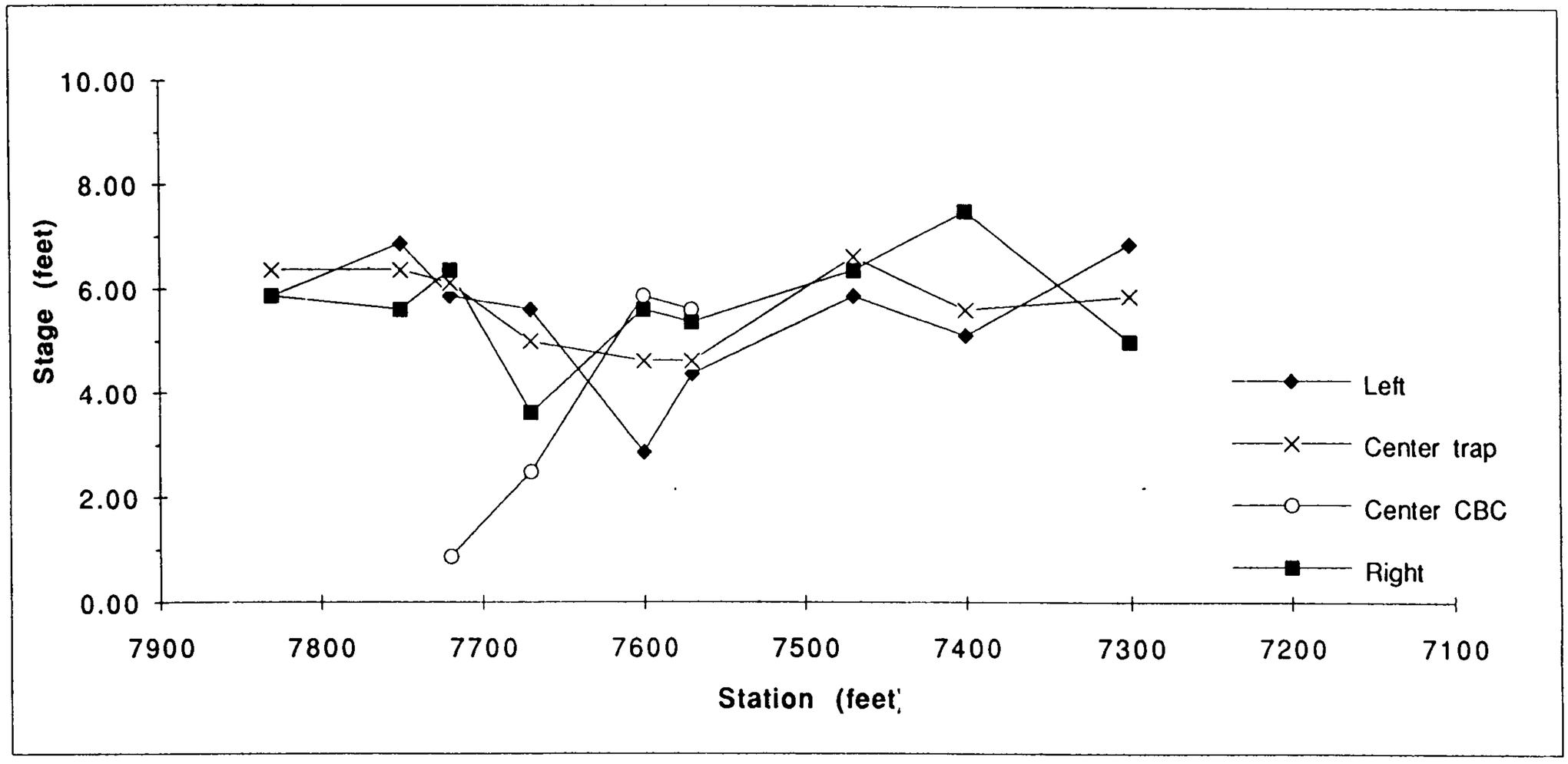
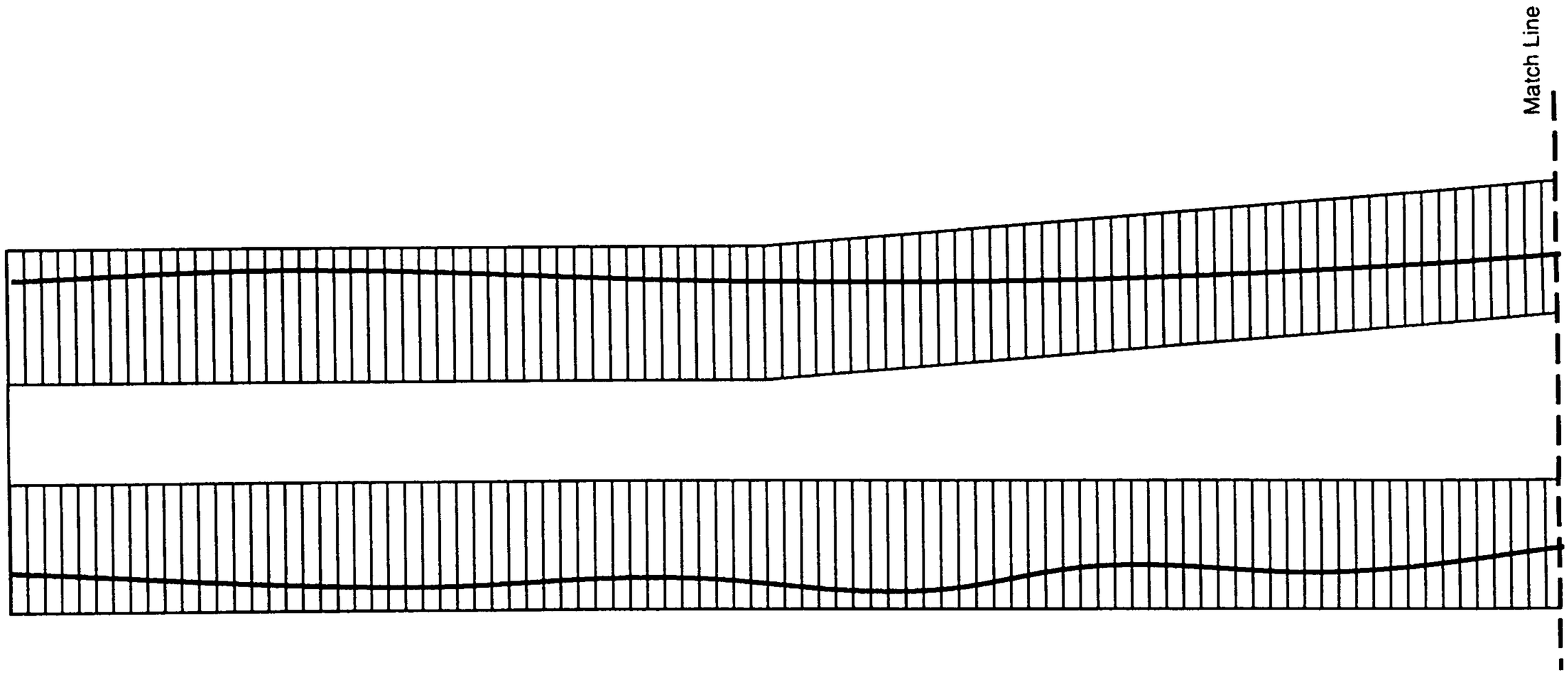


Figure 8

Configuration 2
NLC 5038 cfs EC 0 cfs

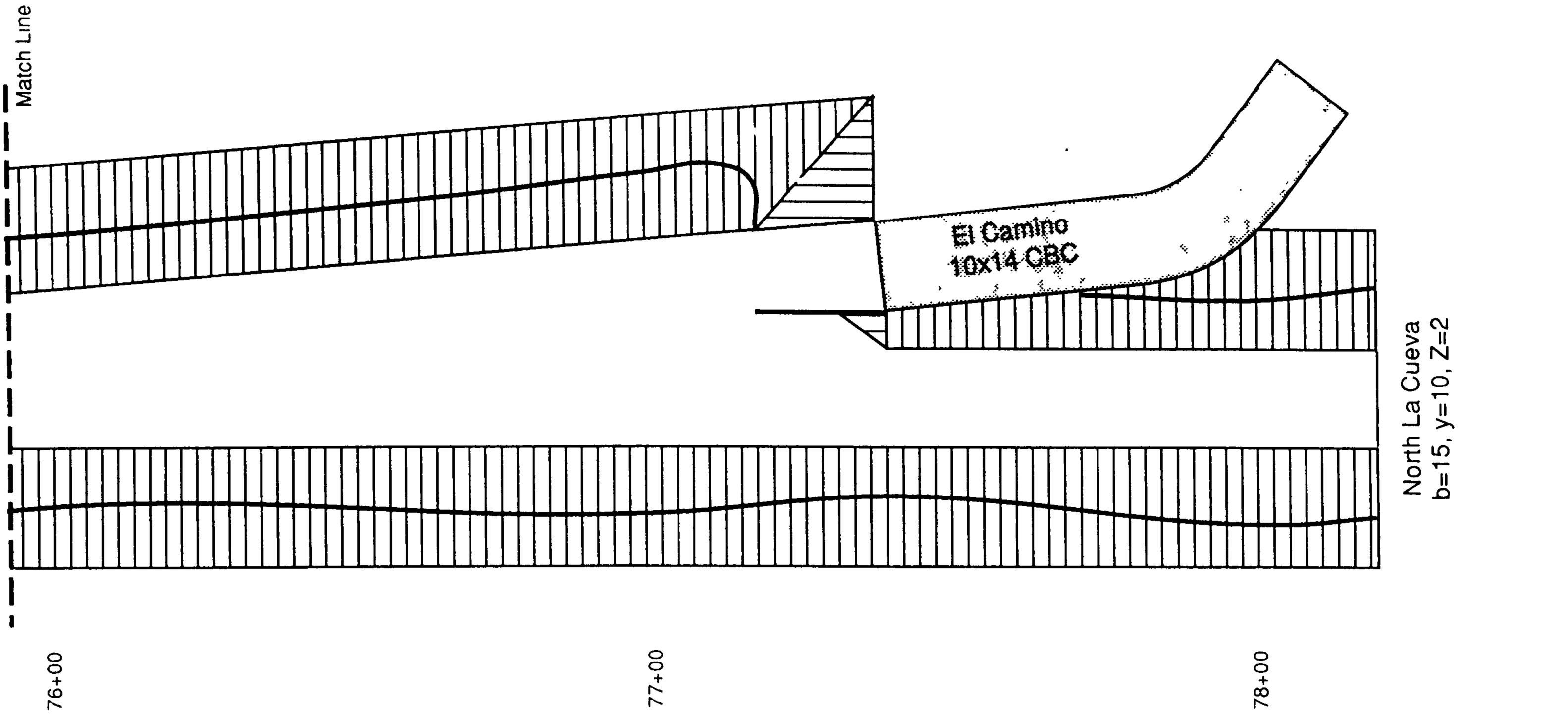


El Camino - North La Cueva Confluence

Scale 1" = 25 "

Configuration 2
NLC 5038 cfs
EC 1150 cfs

Figure 9 (Part 1) **Configuration 2**
NLC 5038 cfs EC 1150 cfs



El Camino - North La Cueva Confluence

Scale 1" = 25 "

Figure 9 (Part 2) **Configuration 2**
NLC 5038 cfs EC 1150 cfs

Configuration	Q NLC	Q EC
2	5038	1150

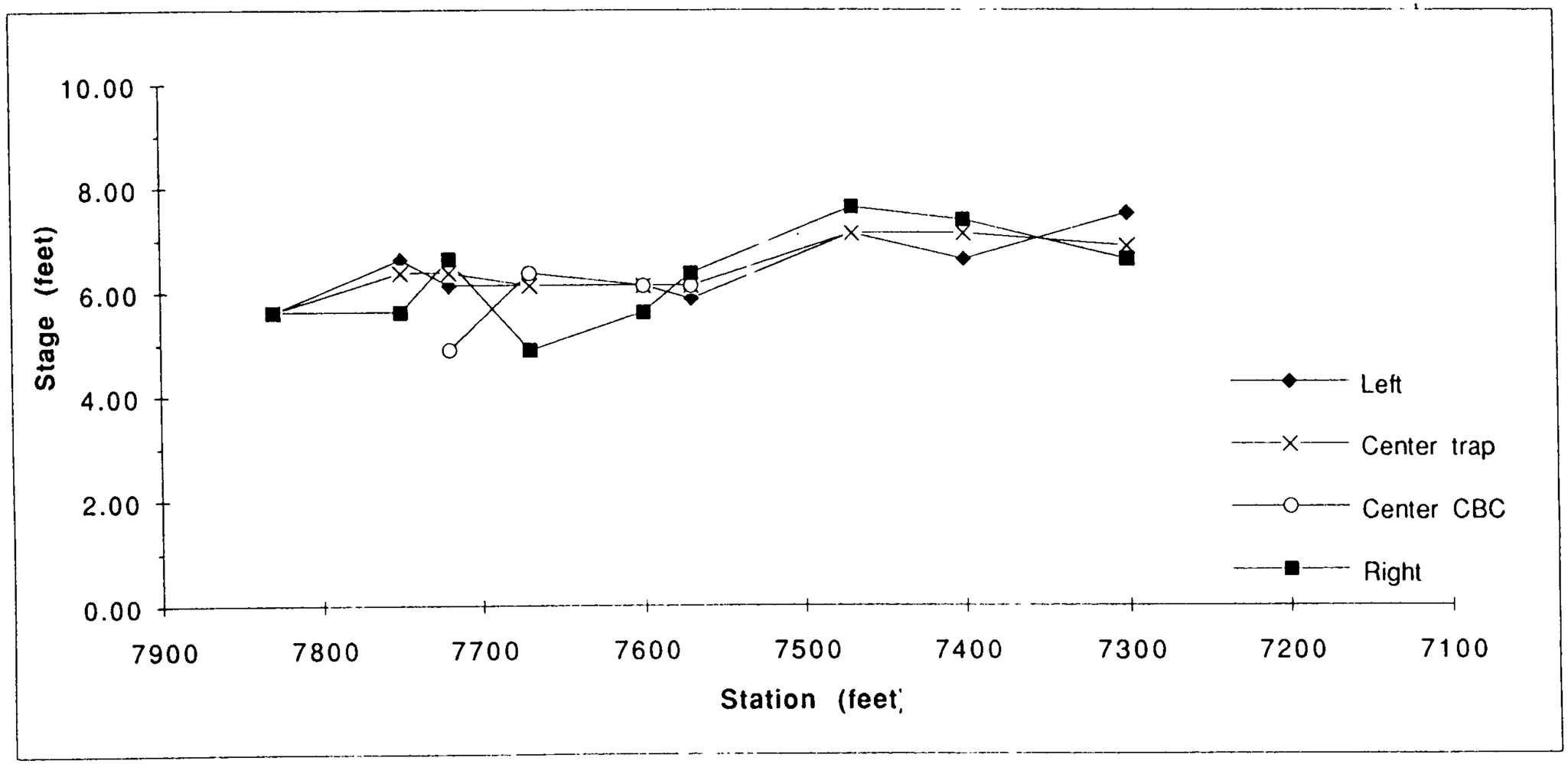
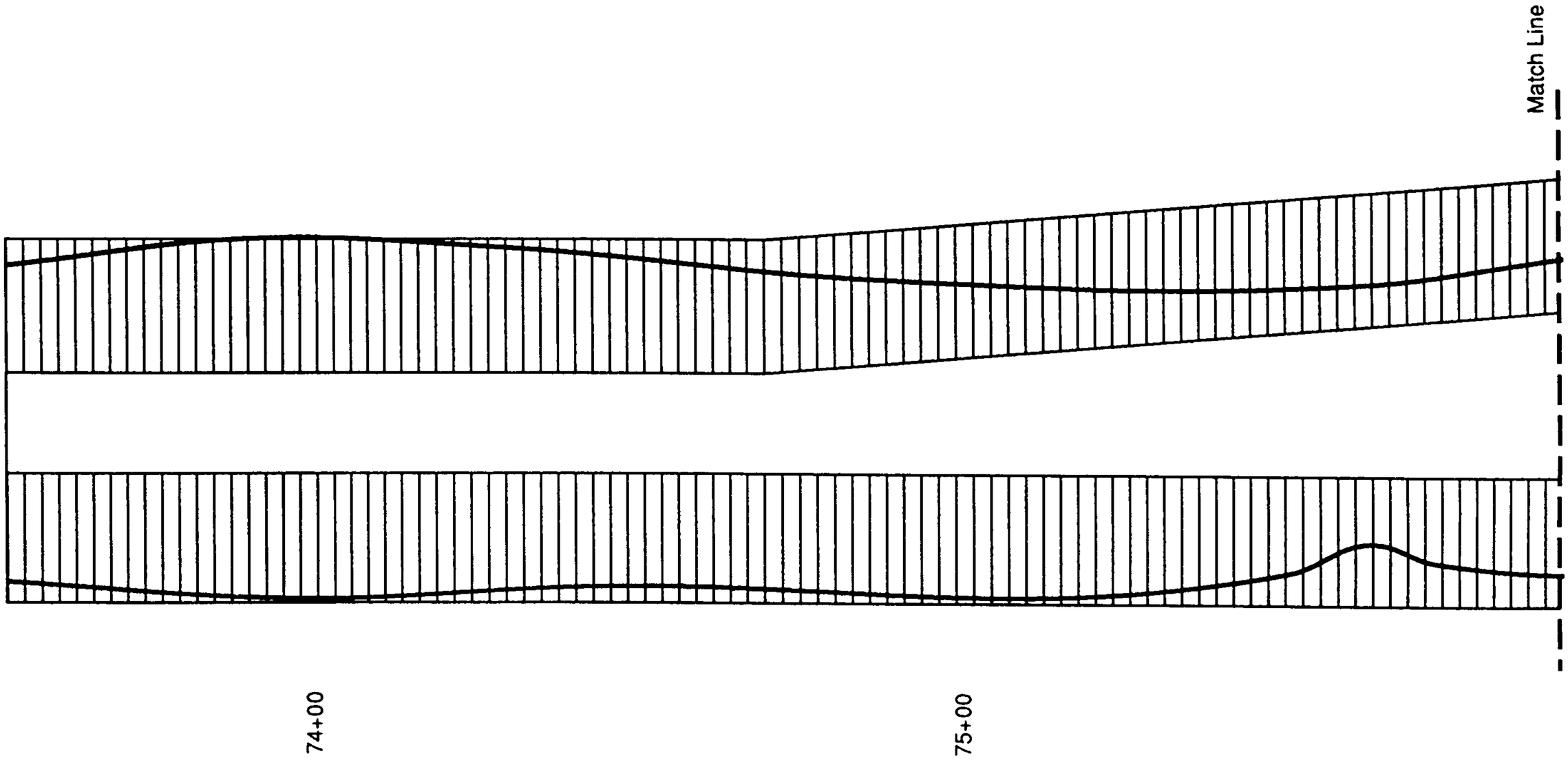


Figure 10 **Configuration 2**
NLC 5038 cfs EC 1150 cfs

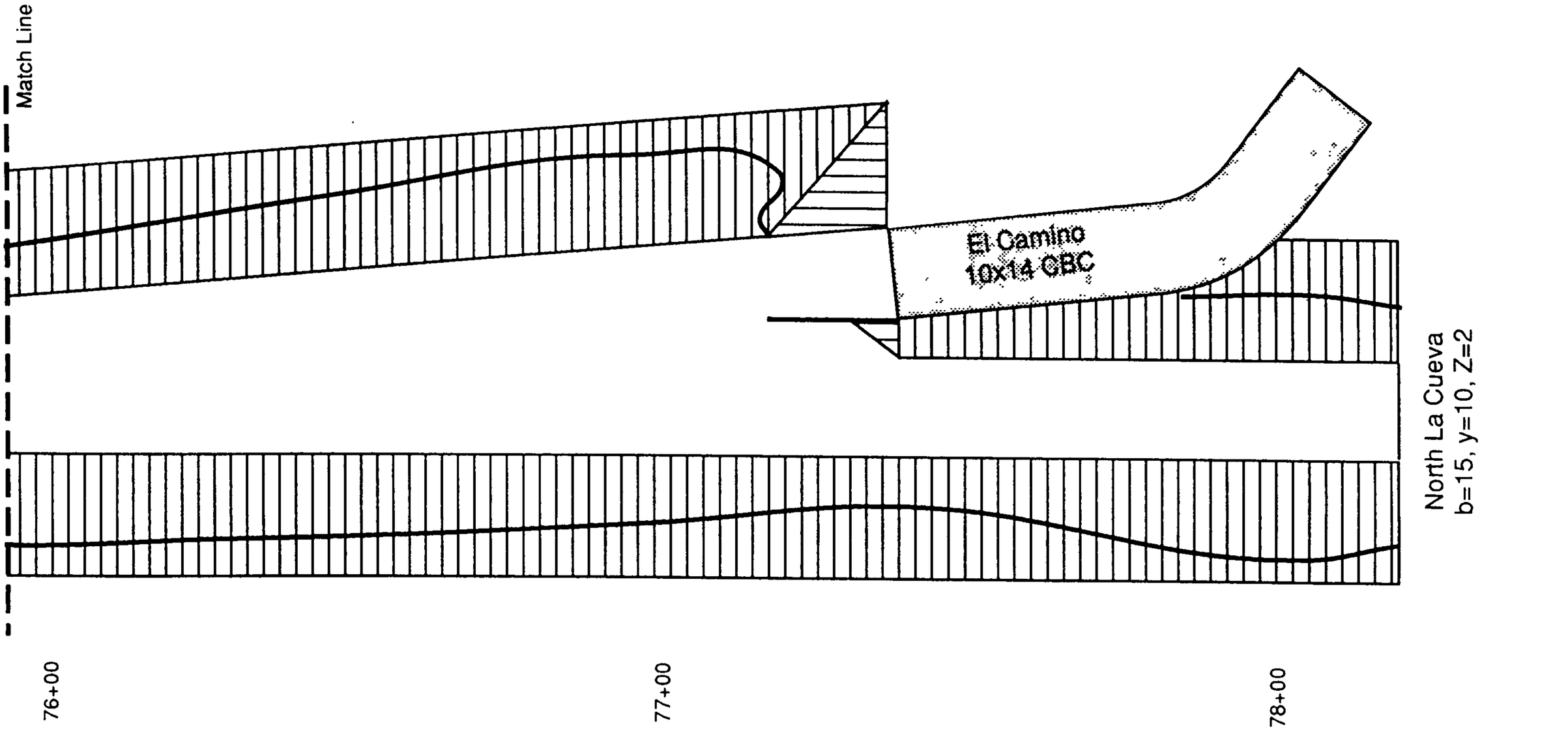


El Camino - North La Cueva Confluence

Scale 1" = 25 "

Configuration 2
NLC 5038 cfs
EC 2300 cfs

Figure 11 (Part 1) Configuration 2
NLC 5038 cfs EC 2300 cfs



El Camino - North La Cueva Confluence

Scale 1" = 25 "

Figure 11 (Part 2) Configuration 2
NLC 5038 cfs EC 2300 cfs

Configuration	Q NLC	Q EC
2	5038	2300

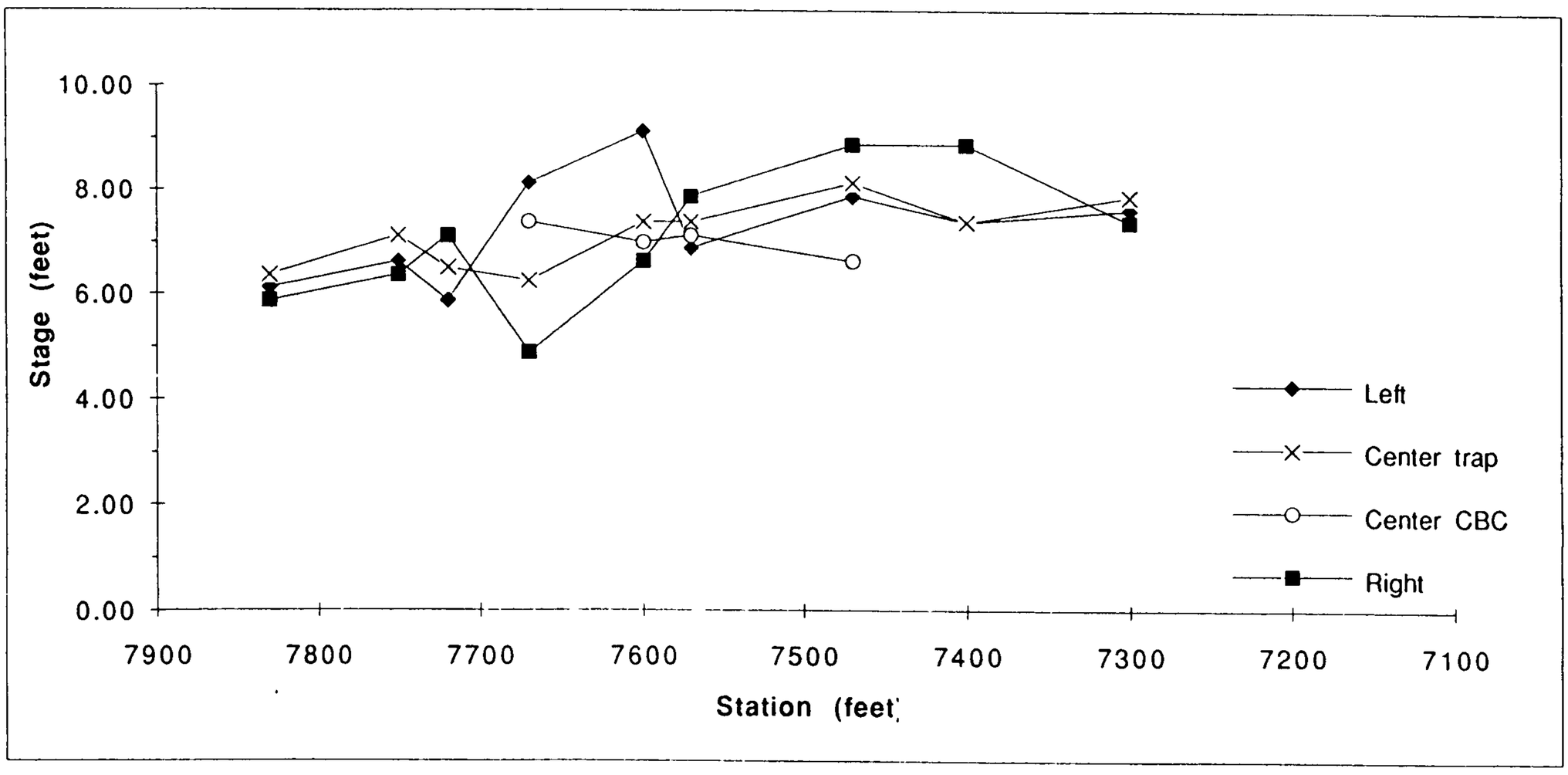


Figure 12

Configuration 2
NLC 5038 cfs EC 2300 cfs

APPENDIX C: Section 6

Momentum Balance Analysis Calculations for the North La Cueva Channel and the South El Camino Diversion Confluence

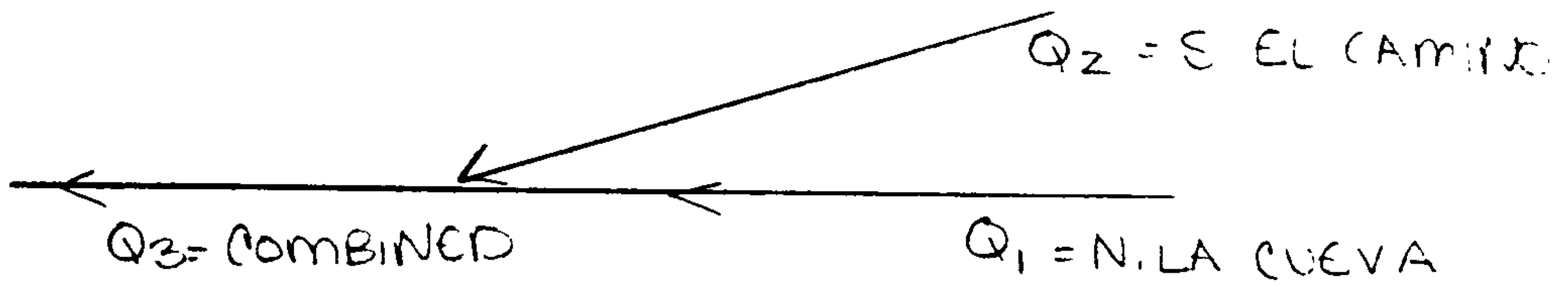
Momentum Balance Analysis

Confluence of North La Cueva Channel and South El Camino Diversion

NOTES

1. Source of Eqn.: Los Angeles County Flood Control District, Equilibrium equation for open trapezoidal channels.
2. Forces P_w, P_i, & P_f are negligible and assumed to be zero. The confluence has prismatic channels, small reach, and small channel slopes.

SUMMARY OF EQUATIONS USED



- $F_3 = F_1 + M_2 \cos\theta$

where $F_3 = M_3 + P_3$ (momentum + pressure) = specific force

$F_1 = M_1 + P_1$

- $M_2 = \dfrac{(Q_2)^2}{A_2 g}$ where A_2 = water area at Section 2

- F_1 and F_3 determined from Momentum Program

*Tp for converging channels are approximately equal.

In the following compilations:

"w", the unit weight of water, has been omitted since it appears in all terms.

(2) The assumptions are made that the cosines of the invert slopes equal unity and that the tangents and sines of the friction slopes are equal.

The general equilibrium equation for all cases is:

$$P_2 + M_2 = P_1 + M_1 + M_3 \cos\theta + P_i + P_w - P_f$$

Where P_1 = hydrostatic pressure on section 1

P_2 = hydrostatic pressure on section 2

P_i = horizontal component of hydrostatic pressure on inver

P_w = axial component of hydrostatic pressure on walls

P_f = retardation force of friction
(*S_1 and S_2 are friction slopes - see Kings Hdbk.*)

M_1 = momentum of moving mass of water entering junction at section 1

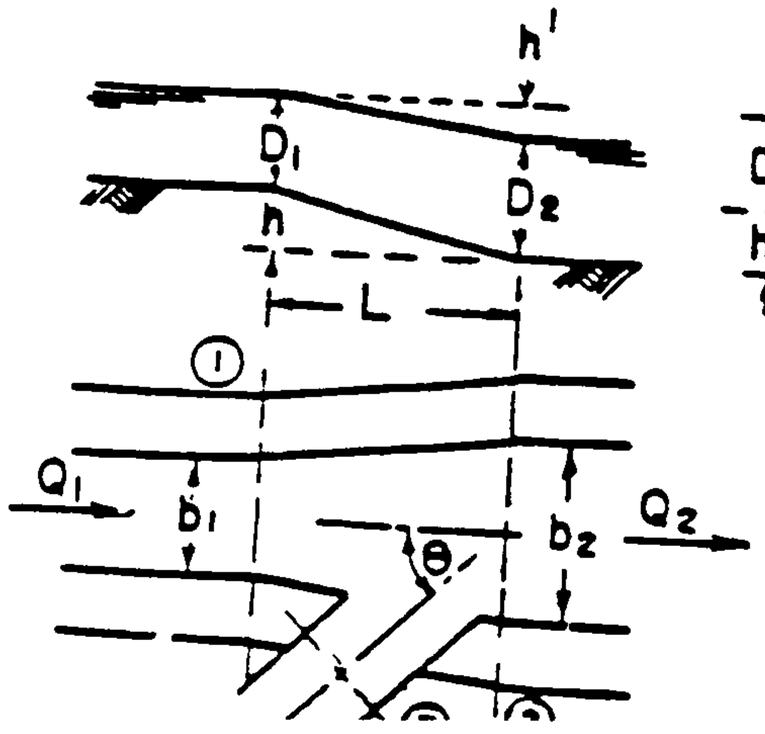
M_2 = momentum of moving mass of water leaving junction at section 2

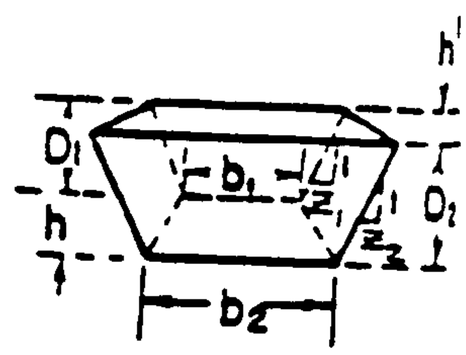
$M_3 \cos\theta$ = axial component of momentum of the moving mass of water entering the junction at section 3

CASE 1. OPEN TRAPEZOIDAL CHANNEL

$$M_1 = \frac{Q_1^2}{(b_1 + z_1 D_1 \cdot gD_1}$$

$$M_2 = \frac{Q_2^2}{(b_2 + z_2 D_2 \cdot gD_2}$$





Hyd. Man.

P. 2/13

$$M_3 \cos\theta = \frac{(Q_2 - Q_1)^2}{A_3 g} (\cos\theta) \qquad \text{where } A_3 = \text{water area at section 3}$$

$$P_1 = \frac{D_1^2}{6} \cdot (3b_1 + 2z_1 D_1)$$

$$P_2 = \frac{D_2^2}{6} \cdot (3b_2 + 2z_2 D_2)$$

$$P_1 = \left(\frac{b_1 + b_2}{2}\right) n \left[D_1 + \frac{(D_2 - D_1)(b_1 + 2b_2)}{3(b_1 + b_2)}\right]$$

$$P_w = \frac{D_1 + D_2}{4}\left[\frac{b_1 + b_2}{2}(D_1 - D_2) + h'(z_1 D_1 + z_2 D_2) + (b_2 + z_2 D_2)D_2 - (b_1 + z_1 D_1) D_1\right]$$

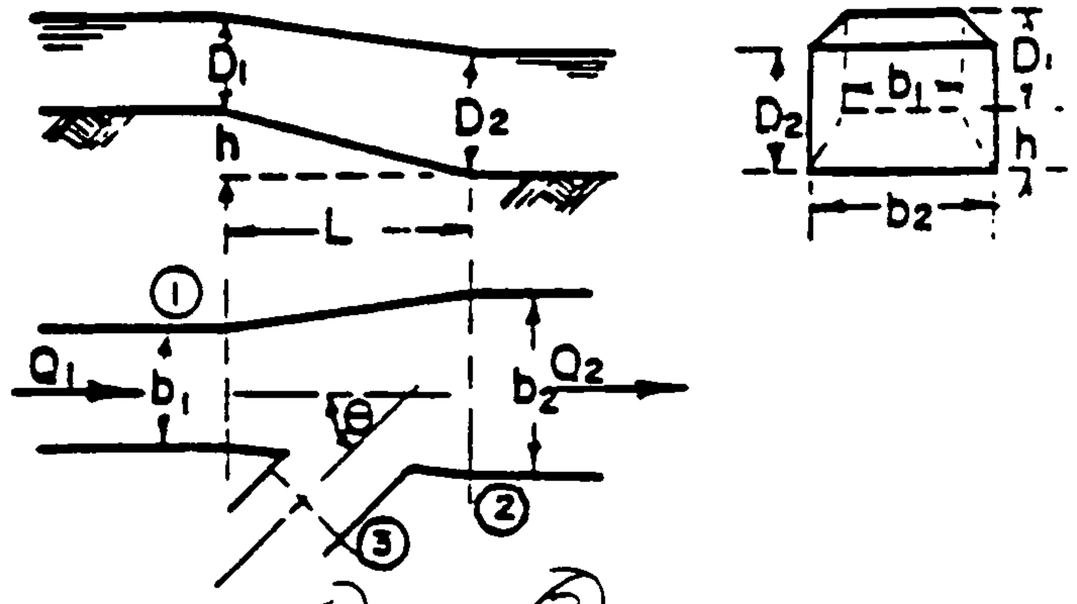
$$P_f = \frac{L(s_1 + s_2)}{4}\left[(b_1 + z_1 D_1) D_1 + (b_2 + z_2 D_2) D_2\right]$$

CASE 2. OPEN RECTANGULAR CHANNEL

$$M_1 = \frac{Q_1^2}{b_1 D_1 g}$$

$$M_2 = \frac{Q_2^2}{b_2 D_2 g}$$

$$M_3 \cos\theta = \frac{(Q_2 - Q_1)^2}{A_3 g} (\cos\theta)$$



Where A_3 = water area at section 3

$$P_1 = \frac{b_1 D_1^2}{2}$$

$$P_2 = \frac{b_2 D_2^2}{2}$$

$$P_i = \left(\frac{b_1 + b_2}{2}\right) n \left[D_1 + \frac{(D_2 - D_1)(b_1 + 2b_2)}{3(b_1 + b_2)}\right]$$

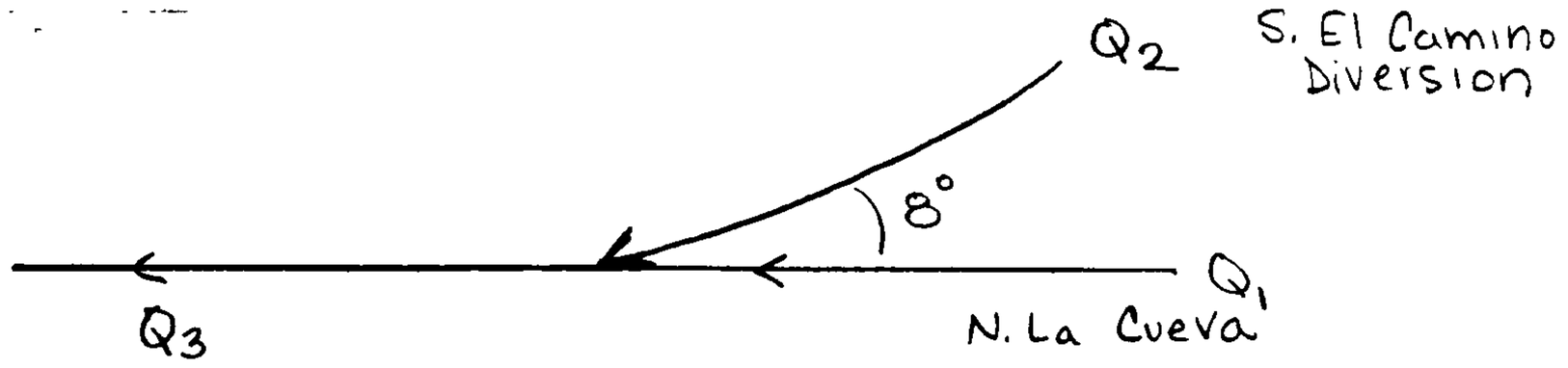
$$P_w = \frac{D_1 + D_2}{4}(b_2 - b_1)\left[D_1 + \frac{(D_2 - D_1)(D_1 + 2D_2)}{3(D_1 + D_2)}\right]$$

$$P_f = \frac{L(s_1 + s_2)}{4} \cdot (b_1 D_1 + b_2 D_2)$$

N. LA CUEVA LOMR

Momentum Balance Analysis

Confluence of N. La Cueva & S. El Camino Diversion



NEW RTI FLOWS

FILE: LC100C.HYM + ECIDOSIIC.EXT
DATE: 5/23/96

N. La Cueva (Struct. 11) Q_1 = 3200.5 cfs

S. El Camino diversion (Struct. 8, 9, and 10) Q_2 = 2011.5 cfs

Combined Flows Q_3 = 5212 cfs

*Flows From I-25 hydrologic analysis. See Form 7.1.1 and Appendix F

DATA	Q	STATION#/ HEC-2 FILE	d FLOW DEPTH	A FLOW AREA	VELOCITY	TOP WID.
1	3200.5 cfs	77+40 NLCWI25.SUP	6.15 ft *	148.1 ft²	21.62 fps	30.23 ft
2	2011.5 cfs	11+20 NEWBOX.SUP	7.13 ft **	99.9 ft²	20.14 fps	19 ft
3	5212 cfs	76+98 NLCWI25.SUP *USE momentum LOF	6.3' (2.10')			

*From HEC-2 - NLCWI25.SUP (App. C, Section 3)

**From HEC-2 - NEWBOX.SUP (App C, Section 4)

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva LOMR SHEET 4 OF 13
PROJECT NO 96155C1.2107 BY SJG DATE
SUBJECT Momentum Balance CHKD PTL DATE 5/30/96

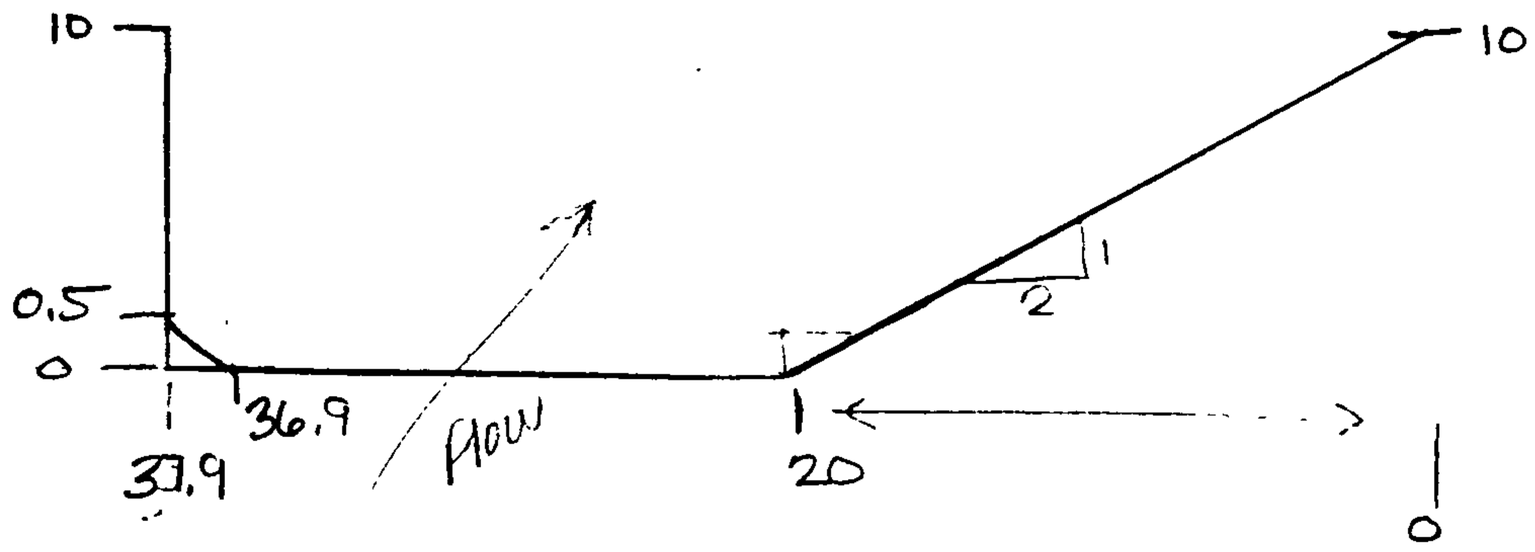
X-sections

(Taken from App. E. of S. El Camino Diversion Report)
And Edited per as-builts)

SECTION 1 – Upstream Section of N. La Cueva Channel (STATION 77+40)

Points = 5

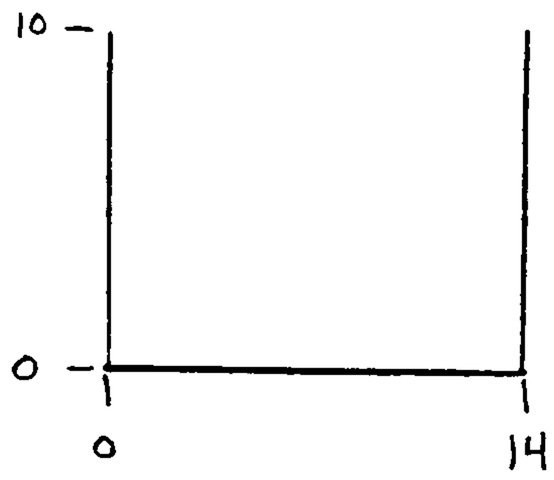
DIST	ELEV
0	10
20	0
36.9	0
37.9	0.5
37.9	10



SECTION 2 – Upstream Section in El Camino Box (STATION 11+20)

POINTS

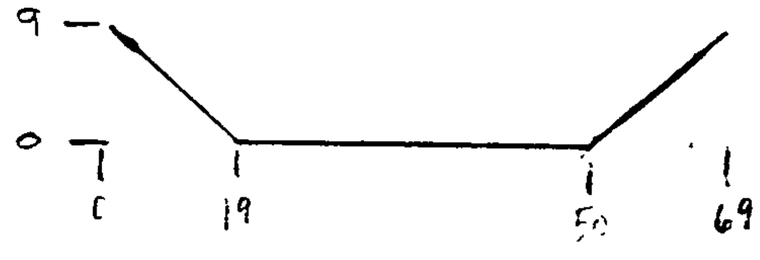
DIST	ELEV
0	10
0	0
14	0
14	10



SECTION 3 – Downstream of Confluence in N. La Cueva Channel (STATION 76+98)

(From As-builts + Field Visit)

DIST	ELEV
0	9
19	0
50	0
69	9



BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva LOMR SHEET 5 OF 13
PROJECT NO 96155C1.2107 BY SJG DATE
SUBJECT Momentum Balance

BASIC MOMENTUM EQN $$F_3 = F_1 + M_2 \cos\theta$$

where $F_3 = M_3 + P_3$

$F_1 = M_1 + P_1$

NOTE - ignoring minor forces (P_w, P_i, P_F) - able to do this due to small reach, small channel slope and prismatic channels.

---

① • Calculate M_2 - For S. El Camino Diversion

$Q_2 = 2011.5$ cfs

$d_2 = 7.13$ Ft (depth for Q_2 from HEC-2 analysis)

$A_2 = 99.9$ Ft^2

$M_2 = Q_2^2 / (g A_2) = (2011.5 \text{ cfs})^2 / (32.2 \times 99.9 \text{ ft}^3)$

$M_2 = 1257.8$ cu. Ft.

• NOTES ON MOMENTUM EQN

(1) P_1 and P_3 are factors accounting for the force from the weight of the water - hydrostatic pressure

$P_1 = \bar{z}_1 A_1$ where $\bar{z}_1$ = depth from water surface to centroid (Ft)

A_1 = Flow area (Ft^2)

(2) For the S. El Camino (entering channel) - only the momentum force is used (M_2). P_2 is assumed to be absorbed by the impact wall.

(3) F_1 and F_3 represent the specific force

---

② • Use the momentum program to calculate F_1 (M in program is F in eqn. being used)

output file name: NLCREV2.MOM
x-section title
incremental depth: 0.1'
discharge: 3200.5 cfs
pts: 5
elev, dist (section 1)

6.15
$F_1 = 2568.9$

*include momentum program printout - see pages 7-10

MOMENTUM PROGRAM PC VERSION SEPTEMBER 1993

NLC JUST UPSTREAM OF CONFLUENCE WITH S EL CAMINO DIVERSION - SECTION 1

Discharge= 3200.5

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	10.00	3	36.90	0.00	5	37.90	10.00
2	20.00	0.00	4	37.90	0.50	6	0.00	0.00

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
0.20	0.2	3.5	925.00	368.7	13286.3	91940.2
0.25	0.3	4.4	735.75	263.0	8405.9	73129.7
0.30	0.3	5.3	609.62	199.5	5771.0	60593.5
0.35	0.4	6.2	519.56	157.8	4192.0	51642.6
0.40	0.4	7.1	452.05	128.8	3173.5	44932.4
0.45	0.5	8.0	399.56	107.6	2479.5	39716.1
0.50	0.5	9.0	357.60	91.6	1986.2	35545.4
0.55	0.6	9.9	323.36	79.0	1624.2	32143.3
0.60	0.6	10.9	294.98	69.0	1351.7	29322.2
0.65	0.7	11.8	271.06	60.9	1141.5	26945.3
0.70	0.7	12.8	250.63	54.3	976.1	24915.2
0.75	0.8	13.7	232.98	48.8	843.6	23161.5
0.80	0.8	14.7	217.57	44.1	735.9	21631.3
0.85	0.9	15.7	204.02	40.2	647.2	20284.5
0.90	0.9	16.7	191.99	36.8	573.3	19090.2
0.95	1.0	17.7	181.25	33.8	511.1	18023.8
1.00	1.0	18.7	171.61	31.2	458.3	17066.0
05	1.1	19.6	162.90	29.0	413.1	16201.0
10	1.1	20.7	154.99	26.9	374.1	15416.0
.15	1.1	21.7	147.78	25.2	340.3	14700.4
1.20	1.2	22.7	141.18	23.5	310.7	14045.5
1.25	1.2	23.7	135.11	22.1	284.7	13443.9
1.30	1.3	24.7	129.52	20.8	261.8	12889.4
1.35	1.3	25.7	124.35	19.6	241.5	12376.7
1.40	1.4	26.8	119.56	18.5	223.3	11901.3
1.45	1.4	27.8	115.09	17.5	207.1	11459.3
1.50	1.5	28.8	110.94	16.6	192.6	11047.3
1.55	1.5	29.9	107.05	15.8	179.5	10662.5
1.60	1.6	30.9	103.41	15.0	167.6	10302.2
1.65	1.6	32.0	99.99	14.3	156.9	9964.2
1.70	1.7	33.1	96.78	13.7	147.1	9646.5
1.75	1.7	34.1	93.75	13.1	138.2	9347.3
1.80	1.8	35.2	90.90	12.5	130.1	9065.2
1.85	1.8	36.3	88.20	12.0	122.6	8798.8
1.90	1.9	37.4	85.64	11.5	115.8	8546.7
1.95	1.9	38.5	83.22	11.0	109.5	8307.8
2.00	2.0	39.5	80.92	10.6	103.7	8081.3
2.05	2.0	40.6	78.74	10.2	98.3	7866.1
2.10	2.1	41.7	76.66	9.8	93.4	7661.5

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
2.15	2.1	42.9	74.68	9.5	88.7	7466.7
2.20	2.2	44.0	72.79	9.1	84.5	7281.1
25	2.2	45.1	70.98	8.8	80.5	7104.0
.30	2.3	46.2	69.26	8.5	76.8	6934.9
2.35	2.3	47.3	67.61	8.2	73.3	6773.3
2.40	2.4	48.5	66.03	8.0	70.1	6618.7
2.45	2.4	49.6	64.52	7.7	67.1	6470.6
2.50	2.5	50.7	63.06	7.5	64.3	6328.8
2.55	2.5	51.9	61.67	7.2	61.6	6192.7
2.60	2.6	53.0	60.33	7.0	59.1	6062.2

07/13

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
2.65	2.6	54.2	59.04	6.8	56.8	5936.8
2.70	2.7	55.4	57.80	6.6	54.6	5816.4
2.75	2.7	56.5	56.61	6.4	52.5	5700.5
`.80	2.8	57.7	55.46	6.2	50.6	5589.1
.85	2.8	58.9	54.35	6.1	48.7	5481.8
..90	2.9	60.1	53.28	5.9	47.0	5378.4
2.95	2.9	61.3	52.25	5.7	45.3	5278.8
3.00	3.0	62.4	51.25	5.6	43.8	5182.7
3.05	3.0	63.6	50.28	5.4	42.3	5090.0
3.10	3.1	64.8	49.35	5.3	40.9	5000.6
3.15	3.1	66.1	48.45	5.2	39.6	4914.2
3.20	3.2	67.3	47.58	5.0	38.3	4830.7
3.25	3.2	68.5	46.73	4.9	37.2	4750.0
3.30	3.3	69.7	45.91	4.8	36.0	4672.0
3.35	3.3	70.9	45.12	4.7	35.0	4596.6
3.40	3.4	72.2	44.35	4.6	33.9	4523.6
3.45	3.4	73.4	43.60	4.5	33.0	4452.9
3.50	3.5	74.6	42.87	4.4	32.0	4384.5
3.55	3.5	75.9	42.17	4.3	31.2	4318.2
3.60	3.6	77.1	41.48	4.2	30.3	4254.0
3.65	3.6	78.4	40.82	4.1	29.5	4191.7
3.70	3.7	79.7	40.17	4.0	28.8	4131.4
3.75	3.7	80.9	39.54	3.9	28.0	4072.9
3.80	3.8	82.2	38.93	3.8	27.3	4016.1
3.85	3.8	83.5	38.34	3.7	26.7	3961.1
3.90	3.9	84.8	37.76	3.7	26.0	3907.6
3.95	3.9	86.1	37.19	3.6	25.4	3855.7
4.00	4.0	87.3	36.64	3.5	24.8	3805.4
4.05	4.0	88.6	36.10	3.4	24.3	3756.5
4.10	4.1	89.9	35.58	3.4	23.8	3709.0
15	4.1	91.3	35.07	3.3	23.2	3662.8
.20	4.2	92.6	34.57	3.2	22.8	3618.0
4.25	4.2	93.9	34.09	3.2	22.3	3574.5
4.30	4.3	95.2	33.62	3.1	21.8	3532.1
4.35	4.3	96.5	33.15	3.1	21.4	3491.0
4.40	4.4	97.9	32.70	3.0	21.0	3451.0
4.45	4.4	99.2	32.26	3.0	20.6	3412.1
4.50	4.5	100.5	31.83	2.9	20.2	3374.2
4.55	4.5	101.9	31.41	2.8	19.9	3337.5
4.60	4.6	103.2	31.00	2.8	19.5	3301.7
4.65	4.6	104.6	30.60	2.7	19.2	3266.9
4.70	4.7	106.0	30.20	2.7	18.9	3233.1
4.75	4.8	107.3	29.82	2.7	18.6	3200.2
4.80	4.8	108.7	29.44	2.6	18.3	3168.2
4.85	4.9	110.1	29.07	2.6	18.0	3137.0
4.90	4.9	111.5	28.71	2.5	17.7	3106.7
4.95	5.0	112.9	28.36	2.5	17.4	3077.2
5.00	5.0	114.3	28.01	2.4	17.2	3048.6
5.05	5.1	115.6	27.67	2.4	16.9	3020.7
5.10	5.1	117.1	27.34	2.4	16.7	2993.5
5.15	5.2	118.5	27.02	2.3	16.5	2967.1
5.20	5.2	119.9	26.70	2.3	16.3	2941.4
5.25	5.3	121.3	26.39	2.3	16.1	2916.4
30	5.3	122.7	26.08	2.2	15.9	2892.1
.35	5.4	124.1	25.78	2.2	15.7	2868.5
5.40	5.4	125.6	25.49	2.1	15.5	2845.5
5.45	5.5	127.0	25.20	2.1	15.3	2823.1
5.50	5.5	128.5	24.92	2.1	15.1	2801.4
5.55	5.6	129.9	24.64	2.1	15.0	2780.3
5.60	5.6	131.4	24.37	2.0	14.8	2759.7
5.65	5.7	132.8	24.10	2.0	14.7	2739.7

wSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.	
5.75	5.8	135.7	23.58	1.9	14.4	2701.5	
5.80	5.8	137.2	23.33	1.9	14.2	2683.1	
5.85	5.9	138.7	23.08	1.9	14.1	2665.3	
5.90	5.9	140.2	22.83	1.9	14.0	2648.0	
.95	6.0	141.7	22.59	1.8	13.9	2631.3	
.00	6.0	143.2	22.36	1.8	13.8	2615.0	
6.05	6.1	144.6	22.13	1.8	13.7	2599.2	
6.10	6.1	146.2	21.90	1.8	13.5	2583.8	
6.15	6.2	147.7	21.68	1.7	13.4	2568.9	←
6.20	6.2	149.2	21.46	1.7	13.3	2554.5	
6.25	6.3	150.7	21.24	1.7	13.3	2540.5	
6.30	6.3	152.2	21.03	1.7	13.2	2527.0	
6.35	6.4	153.7	20.82	1.6	13.1	2513.9	
6.40	6.4	155.3	20.61	1.6	13.0	2501.2	
6.45	6.5	156.8	20.41	1.6	12.9	2488.9	
6.50	6.5	158.4	20.21	1.6	12.8	2477.0	
6.55	6.6	159.9	20.02	1.6	12.8	2465.5	
6.60	6.6	161.5	19.82	1.5	12.7	2454.4	
6.65	6.7	163.0	19.63	1.5	12.6	2443.7	
6.70	6.7	164.6	19.45	1.5	12.6	2433.4	
6.75	6.8	166.1	19.26	1.5	12.5	2423.4	
6.80	6.8	167.7	19.08	1.5	12.5	2413.8	
6.85	6.9	169.3	18.91	1.4	12.4	2404.5	
6.90	6.9	170.9	18.73	1.4	12.3	2395.6	
6.95	7.0	172.5	18.56	1.4	12.3	2387.1	
7.00	7.0	174.1	18.39	1.4	12.3	2378.9	
7.05	7.1	175.6	18.22	1.4	12.2	2371.0	
7.10	7.1	177.3	18.06	1.4	12.2	2363.4	
7.15	7.2	178.9	17.89	1.3	12.1	2356.2	
7.20	7.2	180.5	17.73	1.3	12.1	2349.3	
25	7.3	182.1	17.58	1.3	12.0	2342.7	
30	7.3	183.7	17.42	1.3	12.0	2336.4	
7.35	7.4	185.3	17.27	1.3	12.0	2330.5	
7.40	7.4	187.0	17.12	1.3	11.9	2324.8	
7.45	7.5	188.6	16.97	1.2	11.9	2319.4	
7.50	7.5	190.3	16.82	1.2	11.9	2314.3	
7.55	7.6	191.9	16.68	1.2	11.9	2309.5	
7.60	7.6	193.6	16.54	1.2	11.8	2305.0	
7.65	7.7	195.2	16.40	1.2	11.8	2300.7	
7.70	7.7	196.9	16.26	1.2	11.8	2296.8	
7.75	7.8	198.5	16.12	1.2	11.8	2293.1	
7.80	7.8	200.2	15.99	1.2	11.8	2289.7	
7.85	7.9	201.9	15.85	1.1	11.8	2286.5	
7.90	7.9	203.6	15.72	1.1	11.7	2283.6	
7.95	8.0	205.3	15.59	1.1	11.7	2281.0	
8.00	8.0	207.0	15.47	1.1	11.7	2278.7	
8.05	8.1	208.6	15.34	1.1	11.7	2276.5	
8.10	8.1	210.4	15.22	1.1	11.7	2274.7	
8.15	8.2	212.1	15.09	1.1	11.7	2273.1	
8.20	8.2	213.8	14.97	1.1	11.7	2271.7	
8.25	8.3	215.5	14.85	1.0	11.7	2270.6	
8.30	8.3	217.2	14.73	1.0	11.7	2269.7	
8.35	8.4	218.9	14.62	1.0	11.7	2269.0	
8.40	8.4	220.7	14.50	1.0	11.7	2268.6	
45	8.5	222.4	14.39	1.0	11.7	2268.4	
.50	8.5	224.2	14.28	1.0	11.7	2268.5	
8.55	8.6	225.9	14.17	1.0	11.7	2268.7	
8.60	8.6	227.7	14.06	1.0	11.7	2269.2	
8.65	8.7	229.4	13.95	1.0	11.7	2269.9	
8.70	8.7	231.2	13.84	1.0	11.7	2270.9	
8.75	8.8	232.9	13.74	0.9	11.7	2272.0	
8.80	8.8	234.7	13.64	0.9	11.7	2273.4	

D.9/13

8.85	8.9	236.5	13.53	0.9	11.7	2275.0
8.90	8.9	238.3	13.43	0.9	11.7	2276.8
8.95	9.0	240.1	13.33	0.9	11.7	2278.8
00	9.0	241.9	13.23	0.9	11.7	2281.1
05	9.1	243.6	13.14	0.9	11.7	2283.5
.10	9.1	245.5	13.04	0.9	11.7	2286.1
9.15	9.2	247.3	12.94	0.9	11.8	2289.0
9.20	9.2	249.1	12.85	0.9	11.8	2292.0
9.25	9.3	250.9	12.76	0.9	11.8	2295.3
9.30	9.3	252.7	12.66	0.8	11.8	2298.7
9.35	9.4	254.5	12.57	0.8	11.8	2302.4
9.40	9.4	256.4	12.48	0.8	11.8	2306.2
9.45	9.5	258.2	12.40	0.8	11.8	2310.2
9.50	9.5	260.1	12.31	0.8	11.9	2314.5
9.55	9.6	261.9	12.22	0.8	11.9	2318.9
9.60	9.6	263.8	12.13	0.8	11.9	2323.5
9.65	9.7	265.6	12.05	0.8	11.9	2328.3
9.70	9.7	267.5	11.97	0.8	11.9	2333.3
9.75	9.8	269.3	11.88	0.8	11.9	2338.5
9.80	9.8	271.2	11.80	0.8	12.0	2343.8
9.85	9.9	273.1	11.72	0.8	12.0	2349.4
9.90	9.9	275.0	11.64	0.8	12.0	2355.1

③• Down stream OF Confluence – Section 3

$$F_3 = F_1 + M_2 \cos\Theta$$

$$F_3 = 2568.9 + (1257.8)\cos(8°)$$

$$F_3 = 3814.5 \text{ cu. ft.}$$

---

④• Run momentum program

output File name : LCEC.MOM
(printout on pages 12-13)

For F_3 = 3814.5 cu. ft → Depth ≅ 6.3 Ft

Q = 5212 cfs

• FOR SECTION 76+98 in NLCWI25.SUP

BOTTOM ELEV = 5175.8'

WSEL = 5175.8' + 6.3' = 5182.10 Ft

*Input on X5 card ←

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva LOMR SHEET 11 OF 13

PROJECT NO 96155C1.2107 BY SJG DATE -

SUBJECT Momentum Balance CHKD DRM DATE 6/20/96

CTION 3 - DOWNSTREAM OF CONFLUENCE

Discharge= 5212

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	9.00	3	50.00	0.00			
2	19.00	0.00	4	69.00	9.00			

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
0.30	0.3	9.5	549.21	178.5	4684.0	88898.3
0.40	0.4	12.7	409.18	115.5	2600.2	66233.2
0.50	0.5	16.0	325.19	82.4	1642.5	52639.6
0.60	0.6	19.4	269.21	62.4	1126.0	43581.8
0.70	0.7	22.7	229.26	49.4	816.8	37115.9
0.80	0.8	26.2	199.30	40.3	617.6	32270.2
0.90	0.9	29.6	176.02	33.6	482.0	28504.5
1.00	1.0	33.1	157.41	28.6	385.7	25495.0
1.10	1.1	36.7	142.19	24.7	315.1	23035.5
1.20	1.2	40.2	129.52	21.6	261.7	20988.5
1.30	1.3	43.9	118.81	19.1	220.5	19259.0
1.40	1.4	47.5	109.64	17.0	188.1	17778.9
1.50	1.5	51.3	101.70	15.3	162.1	16498.4
1.60	1.6	55.0	94.76	13.8	141.0	15380.1
1.70	1.7	58.8	88.64	12.6	123.7	14395.5
80	1.8	62.6	83.21	11.5	109.3	13522.3
90	1.9	66.5	78.35	10.6	97.2	12742.9
2.00	2.0	70.4	73.99	9.8	87.0	12043.5
2.10	2.1	74.4	70.04	9.0	78.3	11412.5
2.20	2.2	78.4	66.46	8.4	70.8	10840.7
2.30	2.3	82.5	63.20	7.8	64.3	10320.4
2.40	2.4	86.6	60.21	7.3	58.7	9845.2
2.50	2.5	90.7	57.47	6.9	53.8	9409.8
2.60	2.6	94.9	54.94	6.4	49.5	9009.5
2.70	2.7	99.1	52.60	6.1	45.7	8640.6
2.80	2.8	103.4	50.43	5.7	42.3	8299.7
2.90	2.9	107.7	48.41	5.4	39.3	7984.0
3.00	3.0	112.0	46.54	5.1	36.6	7690.9
3.10	3.1	116.4	44.78	4.9	34.2	7418.4
3.20	3.2	120.8	43.14	4.6	32.1	7164.5
3.30	3.3	125.3	41.60	4.4	30.2	6927.5
3.40	3.4	129.8	40.15	4.2	28.4	6706.1
3.50	3.5	134.4	38.79	4.0	26.9	6498.9
3.60	3.6	139.0	37.51	3.8	25.4	6304.8
3.70	3.7	143.6	36.30	3.6	24.2	6122.7
3.80	3.8	148.3	35.15	3.5	23.0	5951.7
3.90	3.9	153.0	34.06	3.3	21.9	5791.1
4.00	4.0	157.8	33.03	3.2	20.9	5640.0
4.10	4.1	162.6	32.06	3.1	20.1	5497.8
4.20	4.2	167.4	31.13	3.0	19.2	5364.0

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
4.30	4.3	172.3	30.24	2.8	18.5	5237.9
4.40	4.4	177.3	29.40	2.7	17.8	5119.0
4.50	4.5	182.2	28.60	2.6	17.2	5007.0
4.60	4.6	187.3	27.83	2.5	16.6	4901.3
4.70	4.7	192.3	27.10	2.5	16.1	4801.7
4.80	4.8	197.4	26.40	2.4	15.6	4707.8

5.00	5.0	207.8	25.08	2.2	14.8	4535.7
5.10	5.1	213.0	24.47	2.1	14.4	4457.0
5.20	5.2	218.3	23.88	2.1	14.1	4382.9
5.30	5.3	223.6	23.31	2.0	13.7	4313.1
.40	5.4	229.0	22.76	1.9	13.4	4247.4
.50	5.5	234.4	22.24	1.9	13.2	4185.7
5.60	5.6	239.8	21.73	1.8	12.9	4127.7
5.70	5.7	245.3	21.25	1.8	12.7	4073.2
5.80	5.8	250.8	20.78	1.7	12.5	4022.2
5.90	5.9	256.4	20.33	1.7	12.3	3974.5
6.00	6.0	262.0	19.89	1.6	12.1	3930.0
6.10	6.1	267.7	19.47	1.6	12.0	3888.4
6.20	6.2	273.4	19.07	1.5	11.8	3849.8
6.30 ≈6.3'	6.3	279.1	18.67	1.5	11.7	3813.9 3814.5 cu.ft
6.40	6.4	284.9	18.30	1.5	11.6	3780.8
6.50	6.5	290.7	17.93	1.4	11.5	3750.3
6.60	6.6	296.6	17.57	1.4	11.4	3722.2
6.70	6.7	302.5	17.23	1.3	11.3	3696.6
6.80	6.8	308.4	16.90	1.3	11.2	3673.3
6.90	6.9	314.4	16.58	1.3	11.2	3652.4
7.00	7.0	320.4	16.26	1.2	11.1	3633.6
7.10	7.1	326.5	15.96	1.2	11.1	3616.9
7.20	7.2	332.6	15.67	1.2	11.0	3602.3
7.30	7.3	338.8	15.38	1.2	11.0	3589.8
7.40	7.4	345.0	15.11	1.1	10.9	3579.2
7.50	7.5	351.2	14.84	1.1	10.9	3570.5
7.60	7.6	357.5	14.58	1.1	10.9	3563.7
7.70	7.7	363.9	14.32	1.1	10.9	3558.8
7.80	7.8	370.2	14.08	1.0	10.9	3555.6
7.90	7.9	376.7	13.84	1.0	10.9	3554.1
.00	8.0	383.1	13.60	1.0	10.9	3554.4
.10	8.1	389.6	13.38	1.0	10.9	3556.3
8.20	8.2	396.2	13.16	0.9	10.9	3559.8
8.30	8.3	402.7	12.94	0.9	10.9	3564.9
8.40	8.4	409.4	12.73	0.9	10.9	3571.6
8.50	8.5	416.0	12.53	0.9	10.9	3579.9
8.60	8.6	422.7	12.33	0.9	11.0	3589.6
8.70	8.7	429.5	12.14	0.8	11.0	3600.8
8.80	8.8	436.3	11.95	0.8	11.0	3613.5
8.90	8.9	443.1	11.76	0.8	11.0	3627.7
9.00	9.0	450.0	11.58	0.8	11.1	3643.2

APPENDIX C: Section 7

Engineering Analysis for North and South La Cueva Channel Project.
Bohannan-Huston, Inc., May 1988

FINAL

ENGINEERING ANALYSIS
FOR
NORTH AND SOUTH LA CUEVA
CHANNEL PROJECT

FINAL

ENGINEERING ANALYSIS
FOR
NORTH AND SOUTH LA CUEVA
CHANNEL PROJECT

MAY, 1988

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TABLE OF CONTENTS

	Page
Introduction	1
Purpose	1
Drainage	1
Hydrology	2
North La Cueva Inlet to North Diversion Channel	6
San Mateo Improvements	7
Jefferson Street Storm Drain	7
Hydraulics	8
South La Cueva Alternates	8
Channel Hydraulics	11
Underground Conduit Inlet	13
North and South La Cueva Confluence	14
North Diversion Confluence	14
Roadway	15
Jefferson Street	16
San Diego Avenue	16
Jefferson Street/North La Cueva Crossing	17
Administrative Items	17
References	19

APPENDICES

Appendix A:

Minutes of Design Team Meeting - Dated January 16, 1985

Appendix B:

Minutes of Design Team Meeting - Dated February 8, 1985

Appendix C:

Plate 1	Vicinity Map
Plate 2	Drainage Basin Map
Plate 3	Typical Channel Sections
Plate 4	Typical Road Sections
Plate 5	South La Cueva Channel Alternates
Plate 6	Jefferson Street
Plate 7	San Mateo Improvements

INTRODUCTION

This report replaces the Preliminary Drainage Report prepared in February, 1985. Plate 1 shows the location of the channel, roadway, and pipe sections. This report incorporates the hydrology and hydraulics associated with the construction of the final leg of the North La Cueva Channel from Jefferson Street to the North Diversion (which was not constructed with the rest of the project).

As shown in Plate 1, approximately 3600' of trapezoidal channel, 1250' of storm drain pipe, and 5200' of roadway were constructed in 1986. The final 1400' of trapezoidal channel will be constructed in the fall of 1988.

It should be noted that Sperry no longer owns the building west of Signetics. The building is now owned by Honeywell.

PURPOSE

The hydrology for the local drainage basins west of I-25 and the major drainage basins located east of I-25 is presented in this report. Also, the conceptual parameters for the channel hydraulics, roadway, and bridge criteria are addressed.

DRAINAGE

The majority of the contribution to the peak discharges in the North and South La Cueva Channels results from the drainage basins east of I-25. The North La Cueva Channel is designed to

drain the North La Cueva Arroyo and has additional capacity to allow the future diversion of storm runoff from the South El Camino Arroyo. The South La Cueva Channel will carry the runoff from four smaller basins east of I-25 and connect to the North La Cueva Channel west of Honeywell. From the North and South La Cueva confluence the combined flows drain to the North Diversion Channel.

Hydrology:

Presented in this report are the results of the hydrologic analyses for the 100-year storm, assuming developed conditions, and the Standard Project Flows (SPF), assuming existing conditions. Since the North Diversion Channel is designed for the SPF, the North La Cueva Channel from I-25 to the North Diversion must be capable of passing the SPF storm event.

The 100-year storm runoff for developed conditions east of I-25 has been well established; however, the developed drainage basins west of I-25 have up to now received a cursory analysis. Because AMAFCA was not able to supply the routed peak information necessary to analyze the north and south La Cueva Confluence, it was necessary to set up a computer model.

The rainfall-runoff computer model HYMO (Hydrologic Modeling), developed at Texas A & M, was used to determine the peak discharges for the 100-year storm event [1]. HYMO uses the Soil Conservation Service (SCS) curve number approach to determine rainfall-runoff characteristics and the variable storage coefficient (VSC) flood routing method to route flows downstream. In addition, the rainfall-runoff computer model HEC-1, developed

by the Hydrologic Engineering Center at Davis, California, was used to determine the 100-year storm runoff from the North La Cueva and South El Camino Arroyos [2]. HEC-1 was used for this arroyo because the VSC flood routing method is not as applicable over long reach lengths. A summary of the hydrologic parameters for each basin is presented in Table 1.

The SPF storm event was calculated for the watershed in order to determine the existing SPF inflow at the North La Cueva Inlet to the North Diversion Channel. The storm event for this analysis was the transposed Las Cruces Design Storm of 1935 used by the Corps of Engineers for the design of the North Diversion Channel.

The program HEC-1 was used to determine the flowrates for the South El Camino and North La Cueva Drainage basins. These hydrographs were then input into an SPF HYMO Model for the remainder of the basins.

TABLE 1

BASIN HYDROLOGY

Drainage Basin No. (See Plate 2)	Area (Sq. Mi.)	Computed TP (Hrs.)	SCS Curve Number	100-Year Peak Discharge (cfs)
West of I-25				
1	.050	.14	87	96
2	.040	.18	87	66
3	.036	.10	87	89
3b	.028	.11	87	65
4	.030	.14	87	59
6a	.031	.10	87	78
6b	.030	.11	90	90
7	.049	.19	87	75
8	.020	.15	78	15

TABLE 1

BASIN HYDROLOGY
(Continued)

Drainage Basin No. (See Plate 2)	Area (Sq. Mi.)	Computed TP (Hrs.)	SCS Curve Number	100-Year Peak Discharge (cfs)
East of I-25				
11	.119	.25	87	210
12	.005	.06	87	28
13	.248	.26	87	426
14	.353	.32	87	516
15	.0216	.06	87	100
16	.023	.12	87	75
17	5.416	1.57	89	4662
18	3.1	1.77	89	2204

The following is a listing of the major studies that have been conducted east of I-25 that impact the project area:

1. The Interstate 25 Frontage Roads Drainage Structure Analysis, April, 1982, [3].

2. Northeast Heights Drainage Management Plan, April, 1975, [4].

3. Drainage Management Study La Cueva and El Camino Arroyos, September, 1983, [5].

4. Review and Refinement of the Northeast Heights Drainage Management Plan, May, 1980 [6].

5. Flood Insurance Study - City of Albuquerque, March, 1983, [7].

All drainage basins were modeled using developed conditions. The peak discharges correlate well with the 100-year peak discharges from the Review and Refinement of the Northeast Heights Drainage Management Plan Report.

Table 2 presents the 100-year flows upstream of the I-25 structures and the maximum capacity of each structure. (See Plate 2 for the location of the I-25 crossing structures).

TABLE 2

I-25 Structure Capacity

Structure No.	Structure Description	Existing Max. Capacity cfs	Improved Max. Capacity cfs	Developed 100-Yr. Upstream Discharge
1				
2	3 10x10' Boxes	4400	7500	6620*
3	1 24" Dia. Pipe	28	-	75
4	8 36" Dia. Pipes	600	-	555
5	5 36" Dia. Pipes	335	-	516

*Includes proposed El Camino Diversion

I-25 Structure numbers 3 and 5 cannot pass the 100-year flow and in general the flow will overtop I-25 as sheet flow, eventually flowing back into the South La Cueva Channel. These flows will not increase the peak discharge in the channel because the runoff overtopping the road will be attenuated.

Structure No. 2 presently has a capacity of 4400 cfs; however, if the structure inlet conditions are improved to keep the flow supercritical, the total capacity can be increased to 7500 cfs. Table 3 summarizes the SPF and 100-year flows and the time to peak at key points. (See Plate 2 for location of analysis points).

The drainage basins west of I-25 are all relatively small with high runoff characteristics due to present and planned development. The peak discharges from these basins will have passed through the South and North La Cueva Channels prior to the peak flows from the basins east of I-25.

TABLE 3

Summary of Discharges

Analysis Point	100-Year Storm Discharge	100-Year Storm Time to Peak	SPF Storm Discharge	SPF Storm Time to Peak
AP10	2204	1.53	2901	1.84
AP20	4662	1.76	4970	1.67
AP30	555	0.30	377	1.75
AP40	128	0.33	135	0.50
AP50	335	0.36	335	0.67
AP55	6620	1.58	7796*	1.75
AP57	6620	1.58	6383	1.50
AP60	6628	1.63	6434	1.50
AP70	1065	0.33	985	1.84
AP80	6760	1.62	7245	1.84
AP90	6760	1.63	7236	1.94

*Divided flow due to overtopping of I-25

North La Cueva Inlet to North Diversion Channel

The North La Cueva Inlet was originally designed for a flow of 5500 cfs [8]. The discharge was computed based on the design storm using conditions existing in 1956.

In 1984, Resource Technology, Inc. did a study for AMAFCA analyzing the impact of diverting the South El Camino Arroyo into the North La Cueva Channel [9]. This study, which has been accepted by the U.S. Army Corps of Engineers, (COE), determined that the North Diversion Channel will not be overtaxed by increasing the flow at the North La Cueva Inlet.

Table 3 lists the SPF storm flowrates at key points in the watershed. The calculated SPF flowrate at the North La Cueva inlet to the North Diversion is 7388 cfs. For design purposes, and with agreement from AMAFCA and the Corps of Engineers (in a letter dated May 3, 1985), the design flowrate of 7500 cfs was selected.

San Mateo Improvements

On February 8, 1985, Bohannan-Huston, Inc. was awarded a contract with the City of Albuquerque to analyze the flows from I-25 structure No. 5 (335 cfs) and basin No. 3b (65 cfs). Storm runoff flowed down an existing arroyo, crossed over San Mateo Boulevard, and from there continued down to the La Cueva Inlet at the North Diversion. As shown in Plate 7, two alternates were considered to control the flooding from the I-25 crossing structure: a training dike and a channel [13]. The recommended alternate was the Wildflower Training Dike which was constructed in 1986 as part of the North and South La Cueva Project.

Jefferson Street Storm Drain:

Assuming developed conditions in Basin 3, the discharge on the proposed extension of Watercress Drive at Jefferson Street will be approximately 90 cfs for the 100-year storm. This flow cannot be contained in the street (maximum 16 cfs) and will necessitate a storm pipe and channel to divert the flow into the South La Cueva Channel.

The proposed solution will collect the flow from Watercress Drive in a series of drop inlets so no more than 16 cfs will flow onto Jefferson Street. A storm sewer pipe will then carry the flow into a channel park section, see Plate 3. The channel park section will then drain into the South La Cueva Channel.

Two options were considered to carry the flow from Watercress Drive to the South La Cueva: a storm sewer running down Jefferson and outletting into the South La Cueva channel or a storm sewer running down Jefferson and outletting into Wildflower Park. The constructed solution was the storm sewer outletting into the park and flowing through a channel park section to the South La Cueva Channel.

HYDRAULICS

This section discusses the flow characteristics in the channels, the pipe inlet structure, the pipe culvert and the confluences.

South La Cueva Alternates:

Four alternates were considered to carry flows from the existing South La Cueva Channel to the proposed confluence with the North La Cueva Channel. The alignment alternates are shown on Plate 5 and listed below:

1. West Channel: A concrete channel which flows west to Jefferson Street, crossing under Jefferson, and then paralleling Jefferson on the west side until turning west to the confluence with the North La Cueva Channel.
2. East Channel: A concrete channel which flows west to Jefferson, then parallel to Jefferson on the east side, and west under Jefferson to the confluence with the North La Cueva Channel.

3. East Underground Conduit: Alignment similar to the east channel alternate, except a conduit will parallel Jefferson instead of a concrete channel.

4. West Underground Conduit: Alignment Similar to the west channel alternate, except a conduit will parallel Jefferson instead of a concrete channel.

Alternate 3, the east underground conduit was chosen as the most advantageous of the four alternates for the following reasons:

1. An underground conduit will be buried, thus allowing easy access to adjacent properties (no bridge required) and will require significantly less right-of-way.
2. The underground conduit costs will be approximately equal to the costs of the trapezoidal channel. However, the overall project cost for the trapezoidal channel option would be more expensive because the existing sanitary sewer line along Jefferson would have to be relocated and a bridge would have to be built to provide access to Honeywell's parking lot.
3. An underground conduit allows greater freedom of grades thus allowing Jefferson to be low enough to generate excess earth.
4. The construction of the east underground conduit can proceed before or during the construction of Jefferson Street. This would allow the local drainage and South La Cueva Channel runoff to be carried through the underground conduit.

The Construction of Jefferson Street would then be protected from summer storm damage, helping to meet the September deadline for access to Honeywell's parking lot.

5. An underground conduit east of Jefferson allows for the direct interception of drainage from Honeywell's property.
6. A channel section east of Jefferson must pass over the existing sanitary sewer, make an extremely sharp curve and then dive beneath Jefferson in a skewed box culvert. All of the above create significant hydraulic problems and substantially increase the construction costs.
7. A channel located west of Jefferson would require shifting the proposed alignment of Jefferson to the east in order to allow a minimum of 3.67 acres in the triangular section cut out of Honeywell's land. Shifting Jefferson east would reduce the size of Honeywell's parking ot.

The underground conduit options, however, have some disadvantages over the trapezoidal channel options:

1. Less freeboard than a trapezoidal channel.
2. Design of a special inlet transition from trapezoidal channel to round pipe.
3. The inlet creates a perceived safety hazard. In addition, because the underground conduit has less freeboard capacity, it has a higher property damage potential.

The freeboard disadvantage will be eased by increasing the slope of the pipe to allow a 20 percent increase in capacity above the design flows.

Channel Hydraulics:

Concrete trapezoidal channels in the Albuquerque area are designed with freeboard to protect the integrity of the channel and life and property from potential overtopping. The "freeboard" is comprised of a standard 2 feet plus additional freeboard to account for superelevation and velocity effects. The following equations are used to calculate freeboard:

Superelevation Freeboard

$$s = 1.3 \frac{v^2 b}{gr}$$

S = Superelevation, ft
v = Velocity, fps
b = Channel width, ft
g = Acceleration due to gravity, ft/sec^2
r = Radius of curve

Velocity Freeboard

$$F = 0.7 \ (2 + 0.025 \ vd^{1/3}) \text{ - but not less than } 2.0'$$

V = Velocity, fps
d = Water depth, ff
f = Freeboard, ft

The hydraulic parameters for the channel sections are summarized in Table 4. Except where noted, the design storm for the channel was the 100-year storm event.

TABLE 4

Hydraulic Parameters

Channel Reach	Water Depth (ft.)	Superelevation (ft.)	Velocity (fps)	Freeboard (ft.)
N. La Cueva - East of Jefferson	5.5-6.5	1.6-2.3	32-39	2-2.9
N. La Cueva - West* of Jefferson	7.5-8.0	1.5	33.0	2.4
S. La Cueva - Park Section	3.0	1.0	23.	2.0
S. La Cueva Underground Conduit	5.7	NA	28.	2.3

*Based on the Standard Project Flood Event

Flows in the North La Cueva Channel will be carried in a concrete lined trapezoidal channel (see Plate 3 for typical channel sections). Between the proposed Jefferson Street and the existing North La Cueva Channel, the flows will be supercritical with a proposed grade of approximately 3%.

West of the Jefferson Street the North La Cueva Channel grade will decrease to .8%. This grade will be maintained from the confluence with the South La Cueva Channel to the existing inlet at the North Diversion.

The proposed South La Cueva Channel begins at the trapezoidal box culvert at San Mateo. From this box the channel runs west through a proposed city park. A typical park section is shown on Plate 3. The park section with a 2% slope will be concrete lined up to the 100-year water surface and the freeboard will be composed of grass laid on a 7:1 slope for ease of mowing. As the channel approaches Jefferson, the grass lined slope will increase to 5:1 due to right-of-way constraints.

Paralleling Jefferson, the channel will be a fully concrete lined section 5' deep prior to entering the underground conduit inlet.

Design of the inlet will be such that flow into, through, and out of the underground conduit will remain supercritical. The underground conduit will pass under Jefferson and then transition to a trapezoidal channel section before the confluence with the North La Cueva Channel. The South La Cueva Channel near the confluence will have a 2.3% grade which accelerates the flow to match the flow velocity in the North La Cueva Channel.

Underground Conduit Inlet:

The recommended pipe alternate on the portion of the South La Cueva Channel paralleling Jefferson Street required an inlet structure to direct the flow from the channel park section into the 96" dia. underground conduit. This structure is intended to maintain supercritical flow and not allow the possibility of a hydraulic jump for the 100-year storm.

The inlet structure was analyzed by the step-backwater model HEC-2 to determine the energy losses in the transition [10]. In addition, a wave analysis was performed to determine the expected wave height in the transition. Contraction and oblique wave energy losses were compensated for by increasing the slope in the approach to the transition.

Several options to restrict access through the underground conduit inlet were investigated. However, due to the potential for plugging and additional head loss through an access restriction, no access restriction device was installed.

North and South La Cueva Confluence:

The confluence of the North and South La Cueva will be designed for the 100-year storm event. The confluence is designed to maintain supercritical flow. The confluence was analyzed using the momentum equation as presented in SCS's report entitled "Design of Open Channels" [11]. In addition, the oblique shock wave analysis was used for full flow in one channel and no flow in the other. The upstream conditions were determined using HEC-2. Several combinations of flows were analyzed to determine the worst condition.

Case 1 The 100-year peak in the North La Cueva and the routed peak in the South La Cueva.

Case 2 The 100-year peak in the South La Cueva and the routed peak in the North La Cueva.

Case 3 The 100-year peak in the North La Cueva and zero flow in the South La Cueva.

Case 4 The 100-year peak in the South La Cueva and zero flow in the North La Cueva.

North Diversion Confluence:

The confluence of the North Diversion and the North La Cueva Channel is designed for the SPF storm. The accepted maximum flowrate at the North La Cueva Inlet is 7500 cfs.

In March, 1985, Bohannan-Huston, Inc. performed a momentum and wave analysis on the confluence. Table 5 summarizes the flow combinations that were analyzed:

TABLE 5

Case	North Diversion Flow (Upstream) CFS	North La Cueva Flow CFS
1^1_1	31,000	5,000
2^1_2	40,000	2,000
3^2_2	31,000	7,500
4^2	42,000	1,300

[1]Original Design Flow for North Diversion

[2]New SPF Flowrates

The mathematical analysis indicated a wave runup on the west side of the North Diversion opposite the North La Cueva Inlet. However, the mathematical model could not accurately predict the height of the spill nor if the next wave reflection also would spill.

The Corps of Engineers was then contracted by AMAFCA to set up a physical hydraulic model of this confluence at their Waterways Experiment Station at Vicksburg, Mississippi. Their physical model determined that a 3' high, 150' long splash wall on the west side of the North Diversion, opposite the North La Cueva inlet, would be sufficient to contain the flows. The results of their study are summarized in their memorandum dated January 26, 1988 [14].

ROADWAY

The Jefferson Street and San Diego Avenue construction is shown on the vicinity map. A bridge is required to pass the storm runoff from the North La Cueva under Jefferson Street.

Jefferson Street:

The Jefferson Street alignment ties to the existing Jefferson Alignment along the west edge of Wildflower Subdivision. Jefferson shall be a four lane divided street and shall be considered as a minor arterial. The street shall be 66' wide face to face with a 16' wide median. The proposed Jefferson alignment shall curve to the west and proceed in a northwesterly direction with its terminus just past the proposed entrance to Honeywell's parking lot. Jefferson Street will generally be 3 to 4 feet below existing centerline ground (approximately 2% to the north).

San Diego Avenue:

The San Diego Avenue Alignment ties to the existing intersection of San Diego and San Mateo and heads in a westerly direction paralleling the existing North La Cueva Channel. The south curb flowline is generally level or higher than the top of channel to facilitate drainage from the street into rundowns along the North La Cueva Channel. San Diego is 48' wide face to face and shall be considered as a collector. The San Diego right-of-way is 68 feet wide. The south curb line is approximately 25 feet north of the La Cueva Channel. This offset does not warrant guardrail to be placed along the channel based on criteria as stated in Guidelines for Selecting and Locating and Designing Traffic Barriers published by AASHTO.

The 25 foot wide area between the existing North La Cueva Channel and the south curb line could be used as a bicycle path. It shall be City Parks and Recreations responsibility to coordinate the bicycle path locations if one is needed in this area.

Jefferson Street and San Diego Avenue paving sections shall consist of the following in accordance with City Standard Drawing P-7.

1-1/2"	Surface course, 1800 lbs. stability
2-1/2"	Base Course, 1500 lbs. stability
4"	Asphalt treated base
8"	Compacted subbase
	or
1-1/2"	Surface course, 1800 lbs. stability
2-1/2"	Base course, 1500 lbs. stability
6"	Concrete treated base
6"	Compacted subbase.

These paving sections will be used assuming that a minimum R value can be achieved after the soils analysis has been performed.

Jefferson Street/North La Cueva Crossing:

The proposed crossing will be a simple span concrete slab bridge supported on piles. Approximately 2 feet of fill at centerline will be placed on top of the bridge deck with upstream and downstream parapets to contain the fill.

ADMINISTRATIVE ITEMS

Borrow material is not required from the Wildflower Park as was previously thought. If Honeywell elects to excavate the South La Cueva Channel to the limits of the channel grading plan, they may use that fill in the construction of their parking lot.

If Honeywell elects not to excavate the channel, they may negotiate with City Parks and Recreation for borrow from the proposed Wildflower Park.

Existing topographic base maps were delivered to Parks and Recreation and Sperry (now owned by Honeywell) on February 15, 1985 in order to facilitate design of the park and Sperry's parking lot. The finished grading plans from Parks and Recreation and Sperry were submitted to Bohannan-Huston, Inc. by March 1, 1985 for inclusion into the North and South La Cueva Channel Project.

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9. Resource Technology, Inc., June, 1984. Analysis of the Impact on the North Diversion Channel of Diverting a Portion of El Camino Arroyo to La Cueva Arroyo. Albuquerque, New Mexico.

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11. Soil Conservation Service. Hydraulics-Engineering Handbook. U.S. Department of Agriculture.

12. Department of the Army, Corps of Engineers, July, 1979. Hydraulic Design of Flood Control Channels. Washington, D.C.

13. Bohannan-Huston, Inc., March, 1985. Report on the Drainage Facilities in the Vicinity of Alameda, San Mateo and I-25. Albuquerque, New Mexico.

14. Department of the Army, Corps of Engineers, January 26, 1988, Memorandum - La Cueva Arroyo Inlet Model Study, Vicksburg, Mississippi.

MINUTES FOR THE FIRST COORDINATION MEETING FOR THE DESIGN AND CONSTRUCTION EFFORT FOR NORTH AND SOUTH LA CUEVA CHANNEL, JEFFERSON STREET, AND SAN DIEGO STREET

Introduction. Mike Emery, President of Bohannan-Huston Inc., called the meeting to order at 1:30 pm, January 16, 1985. The meeting was held at the Clarion Four Seasons Hotel.

Attendance. Those present at the meeting were:

Rich Leonard, Executive Engineer, AMAFCA
Carl Rodolph, Director, Municipal Development Department, City of Albuquerque
Mike Keleher, Keleher & McLeod, representing the Sisters of Saint Dominic
Art Kelly, City of Albuquerque, Transportation Department
Dan Hogan, Civil Engineer--Hydrology, City Engineer's Office
Jim Fink, Planning and Programming Hydrologist, City of Albuquerque
Larry Andren, Flatow, Moore, Bryan & Associates, Representing Sperry
Matthew Spangler, Rodey Dickason Sloan Akin & Robb, PA, Representing Sperry
Dick Buvens, Senior Facilities Development Engineer, Sperry
Jack Leaman, City Planner, City of Albuquerque
Pat Westbrook, Parks & Recreation Department, City of Albuquerque
Jerry R. Bohannan, Chairman of the Board, Bohannan-Huston Inc.
Michial M. Emery, President, Bohannan-Huston Inc.

A project description was given along with time frames for design and construction (See Appendix A for project description and Project Schedule).

The history of the project was discussed.

- In 1980 Sperry and Signetics began planning the move to the present sites.
- The memorandum of understanding between Sperry, Signetics, City of Albuquerque and AMAFCA for infrastructure development was negotiated, Summer 1980.
- Sperry and Signetics constructed plants, 1980 to Present.
- Sperry planned Phase III to open in 1985.
- Sisters of St. Dominic agreed to participate in the completion of North La Cueva Channel to the North Diversion Channel, December, 1983.
- Easterly portion of North La Cueva constructed, 1984.
- Jack Clifford formulated and assembled Richfield North Planning Group and formulate plans for the area and Wildflower Community Park.

- o Sperry defined the requirement for completion of Jefferson by September, 1985 to access their Phase III expansion.
- o Sisters of St. Dominic recommended realignment of Jefferson for future access to their land, Fall of 1984.
- o AMAFCA and the City formulate project to meet time schedules of Sperry, take advantage of Sisters planning efforts and commitments and to implement the improvements invisioned by Mr. Clifford's Richfield North Planning Group, Fall, 1984.
- o AMAFCA selected Bohannan-Huston Inc. as consultant to design the project, January 3, 1985.

Items covered.

I.) Wildflower Diversion, San Mateo Street and associated Drainage Improve-ments.

A) These items are being designed under a separate City contract. They may be constructed with this project.

B) The City needs to rapidly proceed with issuing the design contract so that Bohannan-Huston Inc. can commence its work!

II.) South La Cueva Channel and Wildflower Park

A) Location--The location of the South La Cueva Channel will be generally along the property line between Sperry and the Park. The centerline of the channel will start at San Mateo run in a westerly direction and swing north onto Sperry's property encroaching not more than 90 feet at its centerline thence south onto the park property encroaching not more than 90 feet at its centerline, describing an S curve between San Mateo and Jefferson, with the land covered by easement being approximately equal on the park and Sperry properties.

B) Cross-Section--The cross section of the proposed channel will be a trapezoidal channel having the same general dimensions as the channel up stream but containing the 100-year flow within the concrete portion of the channel with the required freeboard contained by sod within the park and Sperry properties. The City will sod their portion of the channel in the by fall, 1985, Sperry will sod their portion by Summer, 1986. In 1980, in a hearing with the Environmental Planning Commission and the Wildflower neighborhood a discussion was held to the effect that the South La Cueva would remain as a semi-natural channel. The proposed park section will accomplish this goal. To further improve the appearance, concrete tint will be added as a deductive alternate in the construction contract.

C) The City Planning Department (Jack Leaman) will insure that any hearing required with the Environmental Planning

Commission will be scheduled. Bohannan-Huston Inc. will aid in the presentation to the Environmental Planning Commission, if requested by Mr. Leaman.

D) Expansion Joints--Step joint or Z joint will be used throughout the project. The City and AMAFCA will agree on a detail and provide the same to Bohannan-Huston Inc.

E) Financial responsibility--The City will be responsible for paying for the concrete in this project. The sod will be installed by others in a contract not administered by AMAFCA. (Sperry and the Parks and Recreation department are candidates for this responsibility.)

F) Drainage from Jefferson and San Mateo Streets--The drainage will be handled by surface flow through the park. Swales lined with cobbles or concrete ribbons to take care of trickle flows will be used. These drainages will be located immediately west of San Mateo and east of Jefferson. The exact vertical and horizontal layout will be coordinated with Parks and Recreation.

G) The park site will be a source of borrow for the entire project. The whole park site will be raised or lowered to generate or dispose of any required or excess materials.

H) Topo maps at a scale of 1"=50' with a 2 foot contour interval were given to Pat Westbrook to be used by her consultant for grading the park. Originals of these maps are now available when they are needed.

I) The South La Cueva Channel parrelling Jefferson from the park to the North La Cueva Channel.

1. This reach of the arroyo is being evaluated to be replaced by an underground conduit approximately 96" in diameter.

2. The storm sewer would be constructed in an easement approximately 20 feet in width on the east side of the Jefferson right-of-way through Sperry's property. Having the storm sewer away from the street right-of-way is critical to the construction schedule for the project.

3. The storm sewer would be approximately the same cost as the previously proposed channel section but would eliminate the cost of the previously envisioned crossing structures. It would also eliminate access problems to adjoining parcels.

4. Placing a grate over the inlet to this pipe was discussed. A grate would offer an extreme hydraulic problem to design and the pipe would function much

better without it. If the grate is omitted then potential liability problems could exist. Since the pipe will be owned and maintained by the City, they will investigate the legal ramification and direct Bohannan-Huston Inc. with respect to the design of this facility.

J) Sperry needs to locate their entrances to their parking lot off of Jefferson as soon as possible so that they can be designed and constructed with this project.

III.) Jefferson Street

A) Jefferson Street will have 86 feet of right-of-way, be four lane divided, and have no sidewalks. The surface drainage criteria was discussed. Art Kelly and possibly Carl Rodolph will talk to Joe Martin concerning this restrictive criteria and attempt to get it relaxed for this and future projects. This could reduce the cost of the anticipated storm sewer in Jefferson.

B) The triangular piece of land on the west side of the newly proposed Jefferson Street alignment will be severed from the Sperry site and will be deeded to the City. This piece will contain an area equal to the area lying west of Jefferson's existing west right-of-way line. This area was estimated to be 3.67 acres net. A larger acreage would be better if it could be achieved.

IV.) San Diego

A) San Diego Street will have a 68 foot right-of-way and be 44 feet face to face with no sidewalks. The Sisters will have to dedicate 34 feet of right-of-way for the streets construction.

B) Sperry indicated that they were prepared to build their half of San Diego with this project.

C) Sperry will pay for their one-half (1/2), and the Sisters of St. Dominic will pay for their one-half (1/2).

V.) Public Hearings Required

A) There may be a public hearing required before the Environmental Planning Commission. See item II.C above.

B) As per the Memorandum of Understanding between Sperry, Signetics, AMAFCA, the City of Albuquerque, et. al., a public hearing before the AMAFCA Board will be required

for any diversion of flows into the North and South La Cueva Arroyos on or above the Sperry and Signetics sites.

C) Mr. Leonard suggested in separate telecom, that when the above public hearing is held before the AMAFCA Board that the diversion contemplated from the South Camino Arroyo to the North La Cueva Arroyo on the Coronado Airport Site be included and that the North East Heights Drainage Management Plan be ammended at the same time.

VI.) The Design Team will consist of the following people. The people on this committee will have authority to make design decisions for their respective department heads, and agencies.

Larry Blair	Field Engineer, AMAFCA
Jim Fink	City Engineer--Hydrology, City of Albuquerque
Andre Houle	City of Albuquerque, Design
Art Kelly	City of Albuquerque, Transportation Department
Pat Westbrook	City of Albuquerque, Parks and Recreation
Walt Nickerson	City of Albuquerque, Water Resources
Dick Buvens	Senior Facilities Development Engineer, Sperry
Larry Andren	Flatow, Moore, Bryan & Assoc. representing Sperry
Jerry R. Bohannan	Chairman of the Board, Bohannan-Huston Inc., Project Manager
Michial M. Emery	President, Bohannan-Huston Inc., Project Coordinator

MINUTES FOR THE SECOND COORDINATION MEETING FOR THE DESIGN AND CONSTRUCTION EFFORT FOR NORTH AND SOUTH LA CUEVA CHANNEL JEFFERSON STREET, AND SAN DIEGO STREET

Introduction. The meeting was called to order at 1:30 pm, February 8, 1985. The meeting was held in the Director's Room, Clarion 4-Seasons Hotel.

Attendance. Those present at the meeting were:

Mr. Rich Leonard, Executive Engineer, AMAFCA
Mr. Larry Blair, Field Supervisor, AMAFCA
Mr. Carl Rodolph, City of Albuquerque, Municipal Development
Mr. Mike Keleher, Keleher & McLeod, representing the Sisters of Saint Dominic
Mr. Art Kelly, City of Albuquerque, Transportation Department
Mr. Jim Fink, City of Albuquerque, Civil Engineer
Mr. Dick Buvens, Sperry Flight Systems
Mr. Larry Andren, Flatow, Moore, Bryan & Associates, Representing Sperry
Mr. Jack Leaman, City of Albuquerque, Planning
Ms. Pat Westbrook, City of Albuquerque, Parks and Recreation
Mr. Melvin Dahlberg, Bohannan-Huston Inc.
Mr. Jerry R. Bohannan, Bohannan-Huston Inc.
Mr. Michial M. Emery, Bohannan-Huston Inc.

New Attendees:

Mr. Bob Kastning, Jack M. Clifford and Company
Mr. Steve Hooper, Springer Corporation
Mr. Bob Fosnaugh, Traffic Engineer and DRB Member
Mr. Andre Houle, replacing Mr. Dan Hogan of the City DRC
Mr. Bob Sheppard, Civil Engineer, representing Flatow, Moore, Bryan and Associates for Sperry

Discussion commenced with new developments from the private sector. The Sisters of St. Dominic have agreed to participate in the project. This is subject to the negotiation and execution of an agreement between the Sisters and AMAFCA. Rich Leonard gave Mike Keleher a copy of this proposed agreement to review. Rich Leonard requested that Bohannan-Huston Inc. review and comment on this proposed draft agreement.

The preliminary project cost estimates and proposed assessments to the City, AMAFCA, Sperry and the Sisters were distributed (included in Appendix A) and discussed. These are still approximate cost estimates and will be refined and resubmitted at the next Design Team meeting to be held between March 1 and March 15, 1985. Notification of the meeting will be published well in advance.

The contract between the City and Bohannan-Huston Inc. for the study and design of the Wildflower diversion was executed and delivered to Bohannan-Huston Inc. immediately before this meeting. Report with recommendations will be made by Bohannan-Huston Inc. as soon as possible.

Sperry's expansion plans will be submitted to an EPC study session before the final EPC submittal. Jack Leaman and Sperry will discuss this before the study session and determine if the AMAFCA project should be presented at the same time.

The concrete channel joint detail is being drafted by the City. This has been agreed upon by AMAFCA and the City and will be given to Bohannan-Huston as soon as possible.

The project will be submitted for public hearing to the AMAFCA board tenatively on March 28, 1985. AMAFCA will inform BHI concerning the required exhibits that are needed. The public hearing will satisfy requirements of the "Memorandum of Understanding" and include the concept of the combination of the South Camino and North La Cueva on the Coronado Airport site. The end result will be the modification of the Northeast Heights Drainage Management Plan.

Mel Dahlberg, Bohannan-Huston Inc., gave a project description the following points were discussed:

- Wildflower diversion project
- The south leg of South La Cueva
- The northwest leg of South La Cueva
- Jefferson Street
- Watercress/Jefferson Storm Sewer
- San Diego Street
- North La Cueva Channel/Jefferson Street crossing
- Corps of Engineers interface with North La Cueva and the North Diversion Channel.

The interface between the Springer Corporation mining operation and the project was described. The haul road will be maintained until the Jefferson Street bridge is completed at which time the haul trucks will be diverted to the new structure clearing the way for construction of the North La Cueva Channel. The Springer Corporation agreed with this procedure.

Borrow from the park will probably not be needed for the construction of Jefferson, the North and South La Cueva Channels or San Diego. The Parks and Recreation Department, Sperry and the South La Cueva channel design effort will have to be closely coordinated to reduce earthwork cost and benefit all three parties through reduced construction costs. Some borrow from the Park may be required for the Sperry construction effort.

Sperry presented the preliminary plans for their parking lot (See Appendix B). This plan has reduced access to Jefferson to one drive. The vertical elevations will be designed to interface with Jefferson Street grades and the proposed northwest leg (underground conduit) of the South La Cueva Channel. The local flows from the parking lot will be designed to enter the proposed South La Cueva Channel or underground conduit. Sperry may need an easement across the corner of the Sisters Property to drain their northwest parking lot. They will define their requirements by March 1, 1985.

The proposed bidding and construction schedule was submitted (See Appendix C).

The following are things to do and discussions which have been held:

1. Sperry will talk to their legal department concerning the inlet for the storm sewer proposed to be located on their property.

2. BHI will propose solutions to people proofing of the storm sewer inlet and submit to AMAFCA and the City for evaluation and negotiation of the final solution.

3. BHI will investigate the safety of the proximity of the proposed channels to Jefferson and San Diego and evaluate the requirement for guard rail which has not been budgeted for in the projects. San Diego south curb line will be 25' from channel therefore no guard rail appears to be required per "Guidelines for Selecting, Locating and Designing Traffic Boundaries" published by AASHTO.

4. BHI will meet with Parks and Sperry and give proposed lines and grades for the South La Cueva Channel by the end of next week.

5. A meeting will be scheduled between Clifford, Sperry, the Sister's representative, the City and BHI to discuss when the proposed Jefferson and San Diego connection will be made and the possibility of placing temporary pavement on the old Jefferson Street right-of-way as an interim solution to traffic circulation. Bob Fosnaugh expressed a need for turnarounds if this connection is not made. The turnarounds would be constructed to existing City cul-de-sac geometric standards and temporary paving.

6. Sperry, Parks and Recreation, and BHI will work closely together to coordinate the construction of the South La Cueva Channel and the adjoining grading.

7. Parks and Sperry will meet with the Wildflower neighborhood to discuss the proposed project ahead of any EPC hearings.

8. Parks will have a grading plan by March 1 for BHI to use in their efforts.

9. Parks has no objection to draining the San Mateo storm sewer and the Watercress/Jefferson storm sewer through the park with grassed swales with concrete ribbons for low flows. Parks and Recreation has no objection to borrowing from the park site for fill if needed by the project or by Sperry. However, costs must be negotiated.

10. Sperry suggested moving the storm sewer entrance as far north as possible (immediately south of their Jefferson Street entrance). The existing sanitary sewer may be the limiting factor to the northerly extension.

11. BHI will submit the preliminary engineering analysis to AMAFCA by February 15, 1985. The Engineering Analysis will be reviewed and approved by March 1, 1985.

12. BHI proposed letting a materials only bid for the underground conduit portion of the project by March 15, 1985 with first pay estimate due no earlier than April 15, 1985.

13. The City T & T Department will not relax drainage criteria for Jefferson Street. Bob Fosnaugh will submit to BHI a sketch with methods of improving storm water carrying capacity in arterial streets.

14. AMACFA went on record as being receptive to an underground conduit adjacent to Jefferson. However, a grate in the channel is probably not acceptable. BHI will research.

15. Bike trails along San Diego and the La Cueva were discussed. Parks will investigate.

16. San Diego will be 48' face to face and will be at an elevation to drain into the channel.

17. The cost of Jefferson Street abuting private property through the Wildflower Subdivision will be assessed to the owners. The City will make the determination of ownership and negotiate for the private sector contribution.

APPENDIX A

ESTIMATED CONSTRUCTION COSTS
FEBRUARY 8, 1985

Item	Construction Cost	Responsible Parties and amount			
		AMAFCA	City	Sisters	Sperry
North La Cueva	740,000	370,000		370,000	
North La Cueva Inlet	200,000	200,000			
North La Cueva/ Jefferson Bridge	160,000			160,000	
North-South Channel-Confluence	100,000	50,000		50,000	
South La Cueva-South Leg	423,000		423,000		
South La Cueva Northwest Leg	293,000		136,500	136,500	20,000***
San Diego St. Construction	197,400			98,700	98,700
Jefferson Street Construction****	297,400		229,000		68,400
Jefferson Street Storm Drain	86,000		86,000		
Subtotal	**2,496,800**	**620,000**	**874,500**	**815,200**	**187,100**
Design Costs	148,000	74,000	74,000	0	0
Construction Management 10 percent	249,680	62,000	87,450	81,520	18,710
Contingencies 10 percent	249,680	62,000	87,450	81,520	18,710
Total Estimate Project Cost	**$3,144,160**	**$818,000**	**$1,123,400***	**$978,240**	**$224,520****

*Does not include park construction cost or the cost of Wildflower Diversion or any improvements on San Mateo.

**This Does not include the value of Sperry's land deeded to the City.

***Inlets to main system from site.

****Minor frontage on Wildflower lots east of Jefferson and Clifford property west of Jefferson could be assessed if property owners agree.

ADDENDUM NO. 1
FEB 18.

TOTAL STAFF PARKING = 2.666 CARS

OPTIONAL 15% CARS OVERFLOW

SAN DIEGO AVE. N.E.

NORTH LA CUEVA CHANNEL

SHIFT WEST OUTER LOOP ROAD TO PROP. LINE ADD ± 28 CARS

ADD 7 STALLS - SHIFT CONTROL POINT

SAN MATEO ST. N.E.

OPTIONAL 152 CARS OVERFLOW * PARKING

JEFFERSON ST. N.E.

SOUTH LA CUEVA ARROYO

CITY PARK

AD-1

APPENDIX B

Feb. 15 Submit Preliminary Engineering Analysis

Set Q's; Set Grades Begin Working Drawings

Approval of Preliminary Engineering Analysis — March 1

Bid Underground Conduit March 15 (if concept is approved)

Complete Preliminary Plans

Submit Preliminary Plans — April 1

April 15 Recieve Review Comments

Prepare Final Working Drawings & Specs.

Advertise For Bids — MAY 1

Submit Plans For Final Signature

OPEN BIDS MAY 21

Notice To Proceed — June 1

EORGE
RSWORTHY

AXEY

ADD.

STATE

ROAD

(EL CAMINO REAL)

R.S. CHAVEZ

SISTERS OF ST. DOMINIC

Tr. B

N

CAMINO

ARROYO

SISTERS OF ST. DOMINIC

END 1986
CONSTRUCTION PROJECT

SAN DIEGO AVE.
(1986

N. LA CUEVA
CHANNEL (1986)

N. LA CUEVA
CHANNEL (1985)

SPERRY SITE

S. LA CUEVA STORM SEWER
(1986 CONSTR.)

JEFFERSON ST.
(1986 CONSTR.)

S. LA CUEVA
CHANNEL
(1986 CONSTR.)

VISTA SANDIA
HOSPITAL

A-10

LOOP

NAZARETH

NEW MEXICO

ALAMEDA BLVD.

RICHFIELD
PARK

TR A-1

PHASE II

DR.

WATERCRESS

BELL FLOWER

LN.

BANEBERRY DR.

PHASE I

BLUE SAGE

DR

PL.

BLUEGRASS

CT.

COLUMBINE

PEONY

CT.

DESERT

WILLOW CT.

DR

LARKSPUR LN.

WILDFLOWER

GOLDENTHREAD

VERBENA

HAWTHORNE

CT.

CT.

CORAL BELL LN.

ST.

BLVD.

SAN MATEO

EAGLE

OAKLA

ALAMEI

PASADINA AVE.

VENICE

TR. A-1 AVE.

BEVERLY HILLS

SAN DIEGO

AVE.

AVE.

PAN-AMERICAN FREEWAY

7-B18

6-B18

AVE.

SIGNETICS ALBUQUERQUE FACILITY

25-11

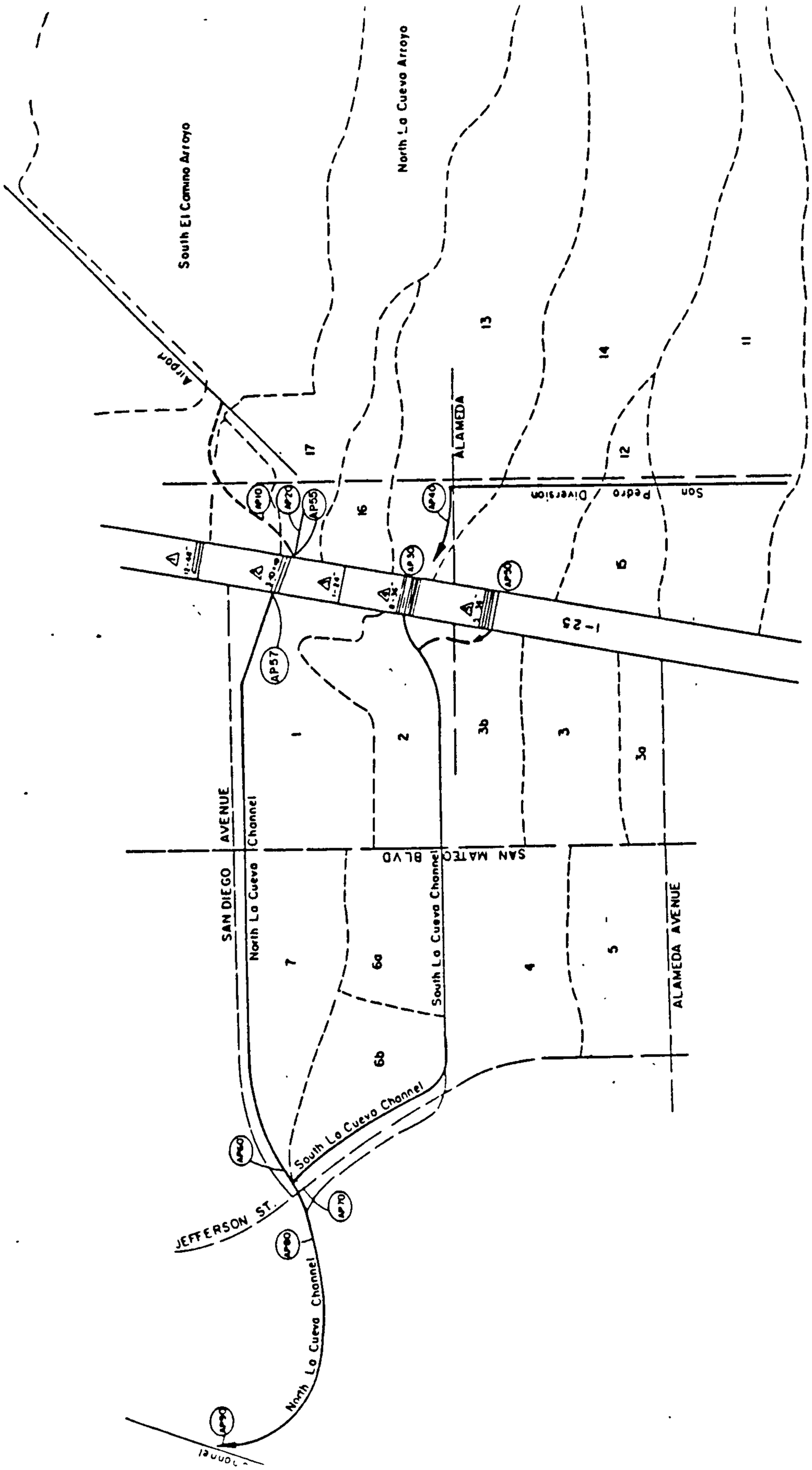
LEGEND

- ROAD CONSTRUCTION (1986)
- CHANNEL & STORM SEWER CONSTRUCTION (1986)
- CHANNEL CONSTRUCTION (1985)
- PROPOSED CHANNEL CONSTRUCTION (1988)

VICINITY MAP

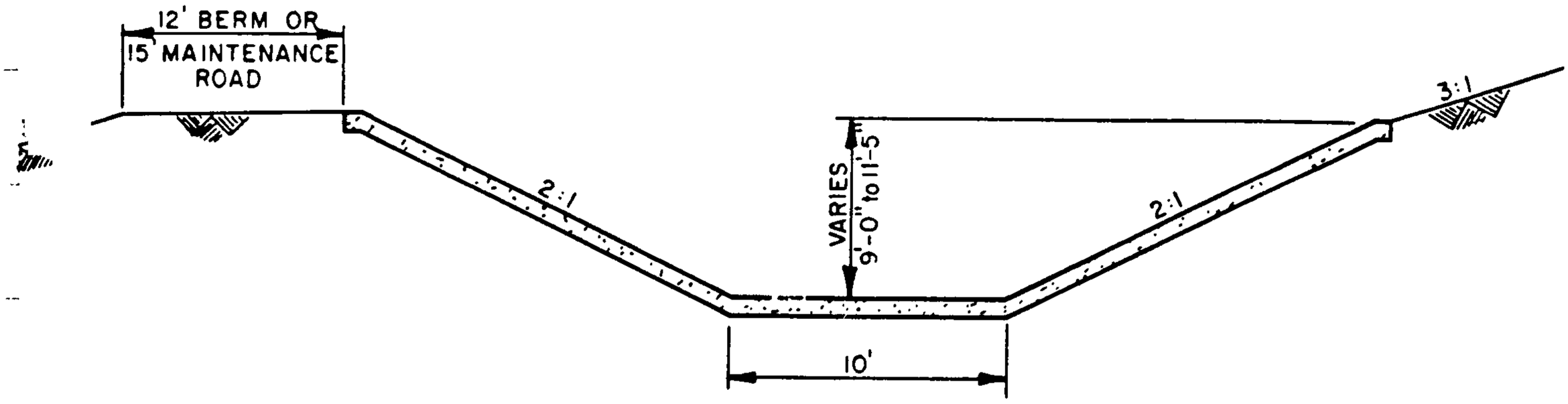
JOB # 88150.01

PLATE I

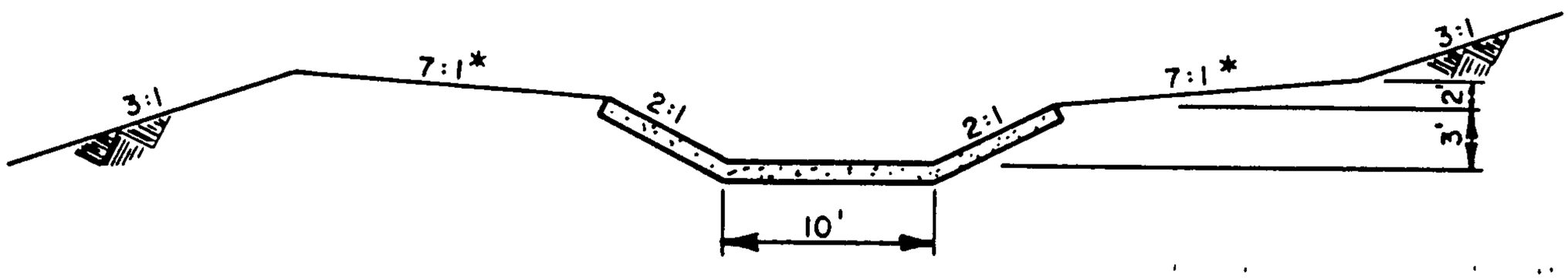


BASIN HYDROLOGY MAP

PLATE 2

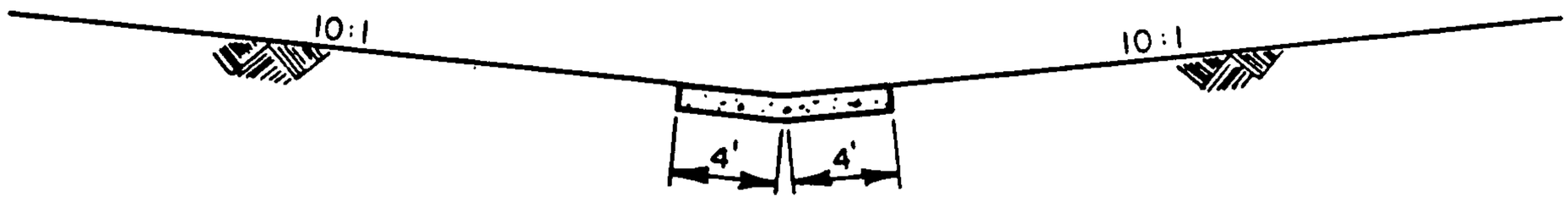


NORTH LA CUEVA



SOUTH LA CUEVA

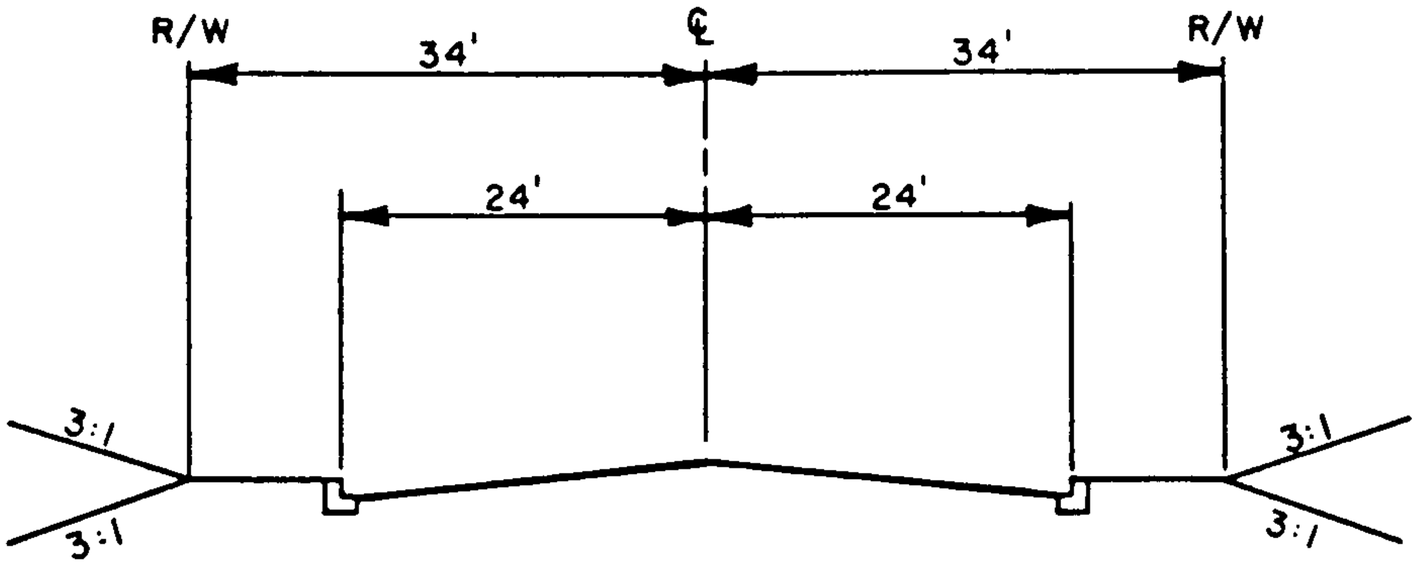
*5:1 in some cases



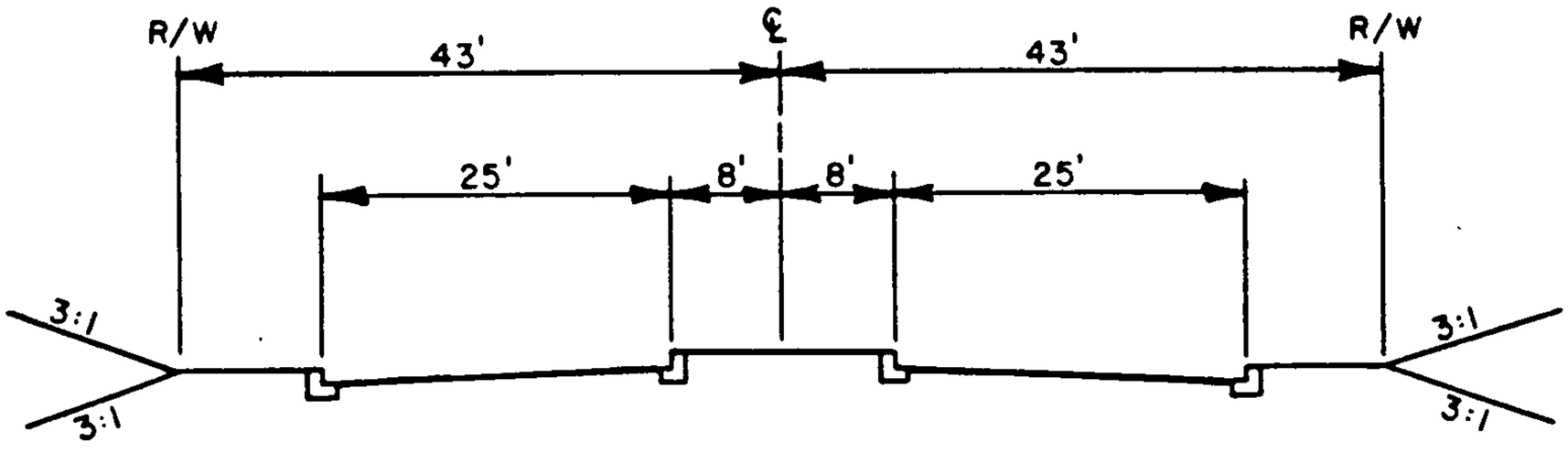
PARK SECTION

TYPICAL CHANNEL SECTIONS

PLATE 3



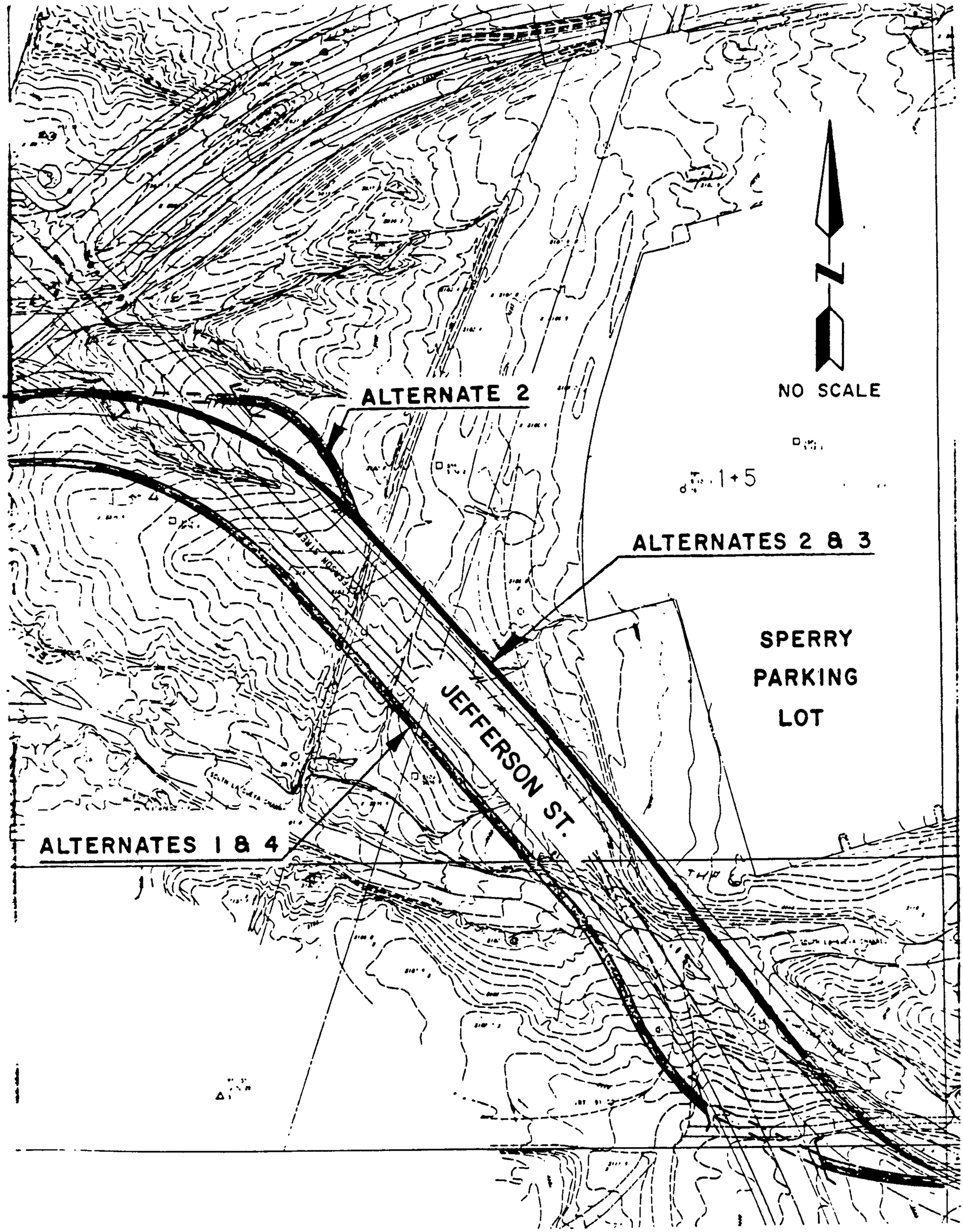
SAN DIEGO AVE.



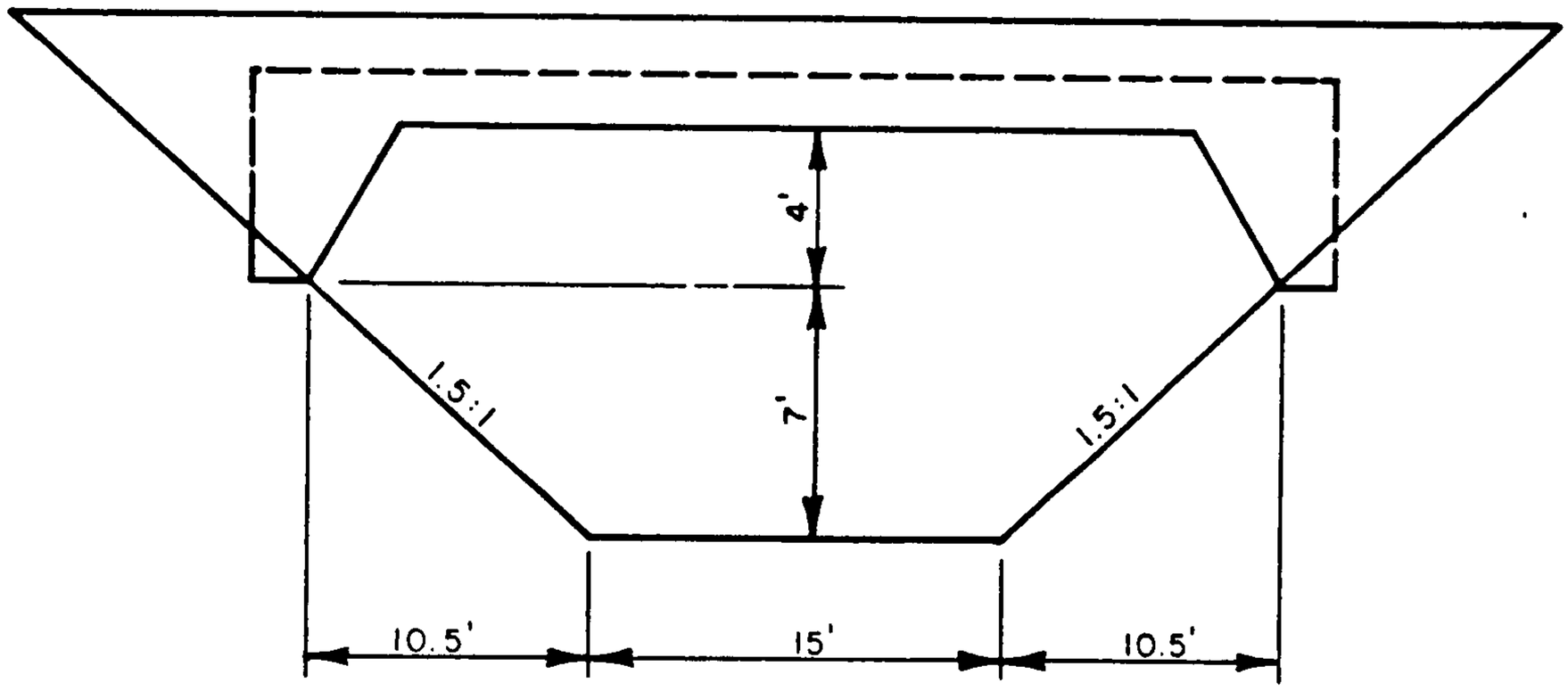
JEFFERSON ST.

TYPICAL ROADWAY SECTIONS

PLATE 4



SOUTH LA CUEVA CHANNEL ALTERNATES
PLATE 5



JEFFERSON ST. BRIDGE

PLATE 6

SAN DIEGO AVENUE

North La Cueva Channel

SIGNETICS

7

SPERRY

6b

6a

2

SAN MATEO BLVD.

Existing Dip Section

South La Cueva Channel

8

Wildflower Training Dike

3b

Wildflower Channel

EAGLE ROCK AVE

3

3a

4

Wildflower Subdivision

5

NEW ALAMEDA AVENUE

SAN MATEO IMPROVEMENTS

PLATE 7

8

2 3-10'x10'

3 1-24"

4 8-36"

5 5-36"

335cfs

AP10

AP20

AP30

AP40

AP50

Airport

17

16

OLD ALAMEDA

13

I-25

San Pedro Diversion

15

12

14

11

APPENDIX C: Section 8

Momentum Balance Analysis Calculations for the North La Cueva Channel and the South La Cueva Channel Confluence.

Momentum Balance Analysis

Confluence of the North La Cueva Channel and the South La Cueva Channel.

Notes

1. Source of Equation: Los Angeles County Flood Control District, Equilibrium equation for open trapezoidal channels.

2. Minor Forces P_w, P_i, and P_F are negligible and assumed to be zero. The confluence has prismatic channels, small reach, and small channel slopes.

3. Refer to momentum balance analysis for the North La Cueva and South El Camino Diversion for a summary of equations used. (Appendix B, Section 6)

4. The time to peak values for the two converging channels differ by approximately 48 minutes. As a result, two momentum balance analysis calculations must be done to determine worst case.
   - ① Peak of North La Cueva Channel reaches the confluence. (T_p = 2.375 hr)
   - ② Peak of the South La Cueva Channel reaches the confluence (T_p = 1.582 hr).

BOHANNAN-HUSTON INC.

PROJECT NAME La Cueva/El Camino LOMR SHEET 1 OF 31
PROJECT NO 96155C1.2107 BY SJG DATE 5/31/96
SUBJECT N+S. La Cueva Mom. Bal. Anal. CH'D [illegible] DATE 8/25/96

In the following compilations:

"w", the unit weight of water, has been omitted since it appears in all terms.

(2) The assumptions are made that the cosines of the invert slopes equal unity and that the tangents and sines of the friction slopes are equal.

The general equilibrium equation for all cases is:

$$P_2 + M_2 = P_1 + M_1 + M_3 \cos\theta + P_i + P_w - P_f$$

Where P_1= hydrostatic pressure on section 1

P_2 = hydrostatic pressure on section 2

P_i = horizontal component of hydrostatic pressure on inver

P_w = axial component of hydrostatic pressure on walls

P_f = retardation force of friction
(*S_1 and S_2 are friction slopes - see Kings Hdbk.*)

M_1 = momentum of moving mass of water entering junction at section 1

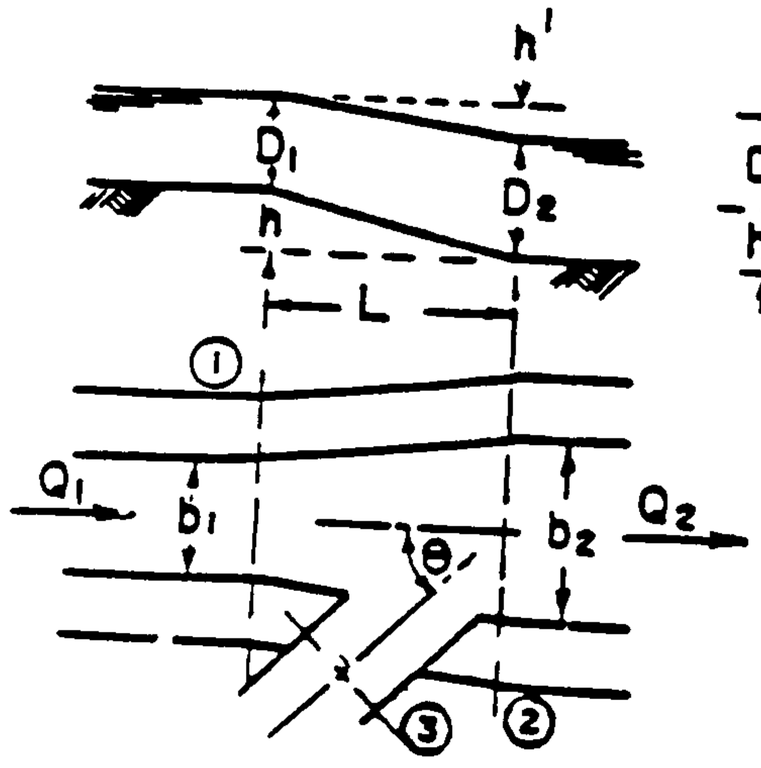
M_2 = momentum of moving mass of water leaving junction at section 2

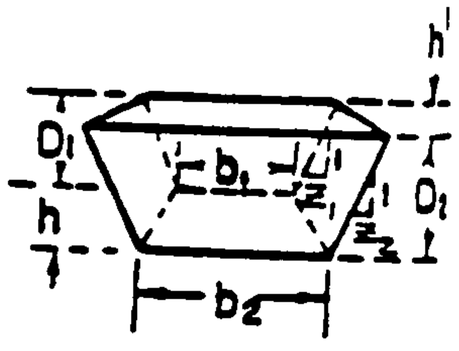
$M_3 \cos\theta$ = axial component of momentum of the moving mass of water entering the junction at section 3

CASE 1, OPEN TRAPEZOIDAL CHANNEL

$$M_1 = \frac{Q_1^2}{(b_1 + z_1 D_1)\, gD_1}$$

$$M_2 = \frac{Q_2^2}{(b_2 + z_2 D_2)\, gD_2}$$





Hyd. Man.

P.2/31

$$M_3 \cos\theta = \frac{(Q_2 - Q_1)^2}{A_3 g} (\cos\theta) \qquad \text{where } A_3 = \text{water area at section 3}$$

$$P_1 = \frac{D_1^2}{6} \cdot (3b_1 + 2z_1 D_1)$$

$$P_2 = \frac{D_2^2}{6} \cdot (3b_2 + 2z_2 D_2)$$

$$P_1 = \left(\frac{b_1 + b_2}{2}\right) n \left[D_1 + \frac{(D_2 - D_1)(b_1 + 2b_2)}{3(b_1 + b_2)}\right]$$

$$P_w = \frac{D_1 + D_2}{4} \left[\frac{b_1 + b_2}{2} (D_1 - D_2) + n' (z_1 D_1 + z_2 D_2) + (b_2 + z_2 D_2) D_2 - (b_1 + z_1 D_1) D_1\right]$$

$$P_f = \frac{L(s_1 + s_2)}{4} \left[(b_1 + z_1 D_1) D_1 + (b_2 + z_2 D_2) D_2\right]$$

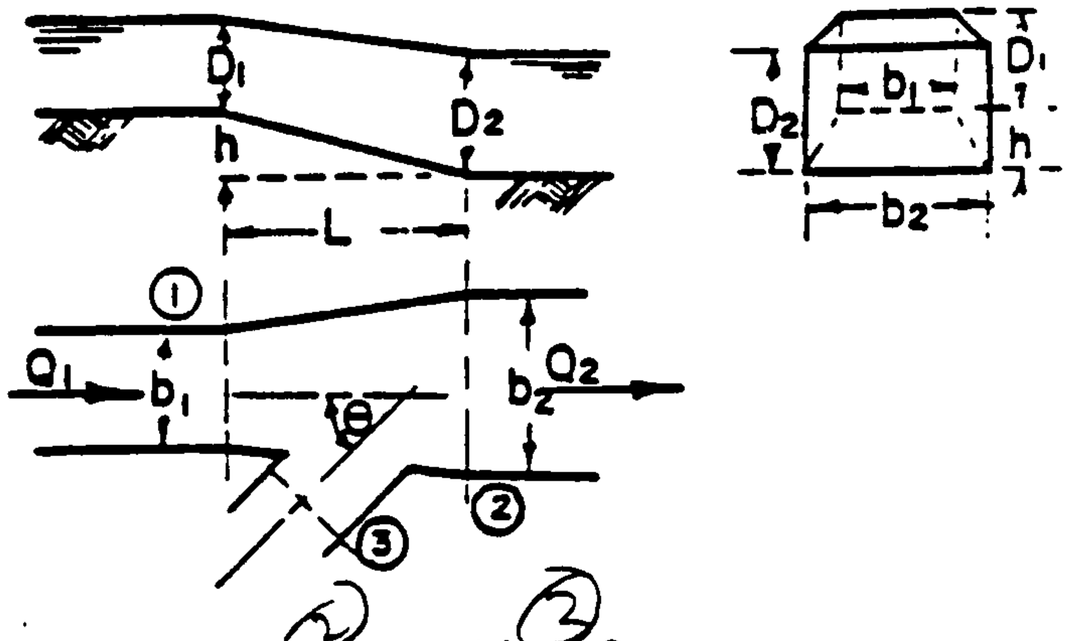
CASE 2, OPEN RECTANGULAR CHANNEL

Invert

$$M_1 = \frac{Q_1^2}{b_1 D_1 g}$$

$$M_2 = \frac{Q_2^2}{b_2 D_2 g}$$

$$M_3 \cos\theta = \frac{(Q_2 - Q_1)^2}{A_3 g} (\cos\theta)$$



Where A_3 = water area at section 3

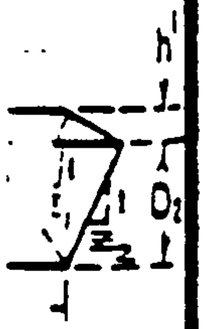
ion 3

$$P_1 = \frac{b_1 D_1^2}{2}$$

$$P_2 = \frac{b_2 D_2^2}{2}$$

$$P_1 = \left(\frac{b_1 + b_2}{2}\right) n \left[D_1 + \frac{(D_2 - D_1)(b_1 + 2b_2)}{3(b_1 + b_2)}\right]$$

$$P_w = \frac{D_1 + D_2}{4} (b_2 - b_1) \left[D_1 + \frac{(D_2 - D_1)(D_1 + 2D_2)}{3(D_1 + D_2)}\right]$$



$$P_f = \frac{L(s_1 + s_2)}{4} \cdot (b_1 D_1 + b_2 D_2)$$

→ First step for both momentum balance analysis calculations: Determine the flow rates in the channels at the times used for the analysis.

- Used the hydrographs of the the North La Cueva and South La Cueva flow - from the ATHYMO model (LC100C2.HYM)

- Sediment bulking factors were applied to the hydrograph flow rates.

BOHANNAN-HUSTON INC.

PROJECT NAME La Cueva+S. El Camino Loop SHEET p.4 OF 31

PROJECT NO 96155C1.2107 BY SJG DATE 5/31/96

SUBJECT N. and S. La Cueva Mom. Bal. Anal. CH'D [illegible] DATE 8/20/96

Flows For momentum balance analysis →

(1)

Qp in N. La Cueva Channel (Tp = 2.375 hr)

Q_1 (NLC) = 4772 cFs unbulked
+ 13% BF
5392 cFs bulked

Q_2 (SLC) = 83.7 cfs unbulked
+ 4% BF
= 87 cFs bulked

Q_3 (NLC + SLC) ⇒ $\Sigma Q_1 + Q_2$ (above) = 5479 cfs
bulked

(2) Qp in S. La Cueva (Tp = 1.582hr)

Q_2 (SLC) = 750cfs unbulked
+ 5% BF
788cfs bulked

Q_1 (NLC) = 1542 cFs unbulked
+ 7% BF
1650 cfs bulked

Q_3 (NLC + SLC) ⇒ $\Sigma Q_1 + Q_2$ above = 2438 cfs

BOHANNAN-HUSTON INC.

PROJECT NAME La Cueva + S. El Camino LOMR SHEET 5 OF 31
PROJECT NO 96155C1.2107 BY SLG DATE 5/31/96
SUBJECT N. and S. La Cueva Man Bal Analysis CH'D [illegible] DATE 6/20/96

Q1

DETAILED PRINTOUT OF NORTH LA CUEVA FLOW BEFORE CONFLUENCE WITH SOUTH LAC CUEVA CHANNEL
FLOWS LISTED IN HYDROGRAPH BELOW DO NOT INCLUDE BULKING FACTORS

PEAK = 4772 CFS + 13%BF = 5392 CFS AT Tp = 2.375 HR

```
*C    COMBINE HYD.'S   127    AND 126.8
*
ADD HYD              ID=8    HYD=127.9       ID I=1      ID II=2
*****************************************************************************
*S  NORTH LA CUEVA ARROYO AT CONFLUENCE WITH SOUTH LA CUEVA
*****************************************************************************
PRINT HYD            ID=8    CODE=0
```

PARTIAL HYDROGRAPH 127.90

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	2.127	3798.0	4.253	324.7	6.380	77.7	8.507	38.6
.018	.0	2.144	3880.4	4.271	319.7	6.398	77.1	8.524	38.4
.035	.0	2.162	3967.2	4.289	314.8	6.415	76.5	8.542	38.3
.053	.0	2.180	4057.5	4.306	310.2	6.433	75.9	8.560	38.2
.071	.0	2.198	4150.3	4.324	305.7	6.451	75.3	8.578	38.1
.089	.0	2.215	4243.0	4.342	301.2	6.469	74.6	8.595	37.9
.106	.0	2.233	4336.0	4.360	296.6	6.486	74.0	8.613	37.8
.124	.0	2.251	4426.6	4.377	292.0	6.504	73.4	8.631	37.7
.142	.0	2.268	4510.3	4.395	287.6	6.522	72.8	8.648	37.6
.160	.0	2.286	4579.9	4.413	283.5	6.539	72.3	8.666	37.5
.177	.0	2.304	4644.0	4.431	280.8	6.557	71.8	8.684	37.4
.195	.0	2.322	4694.3	4.448	278.4	6.575	71.3	8.702	37.3
.213	.0	2.339	4734.1	4.466	275.5	6.593	70.7	8.719	37.2
.230	.0	2.357	4759.6	4.484	272.1	6.610	70.0	8.737	37.1
.248	.0	① 2.375	4772.0	4.501	268.4	6.628	69.4	8.755	37.0
.266	.0	2.393	4771.4	4.519	264.5	6.646	68.8	8.772	36.9
.284	.0	2.410	4758.8	4.537	260.5	6.664	68.2	8.790	36.8
.301	.0	2.428	4733.5	4.555	256.5	6.681	67.6	8.808	36.7
.319	.0	2.446	4697.9	4.572	252.5	6.699	67.0	8.826	36.6
.337	.0	2.463	4653.6	4.590	248.5	6.717	66.5	8.843	36.5
.354	.0	2.481	4599.5	4.608	244.5	6.734	65.9	8.861	36.4
.372	.0	2.499	4536.9	4.625	240.3	6.752	65.4	8.879	36.3
.390	.0	2.517	4468.1	4.643	236.5	6.770	64.9	8.897	36.2
.408	.0	2.534	4392.6	4.661	233.4	6.788	64.4	8.914	36.1
.425	.0	2.552	4314.4	4.679	229.9	6.805	63.9	8.932	36.0
.443	.0	2.570	4229.0	4.696	226.5	6.823	63.5	8.950	35.9
.461	.0	2.587	4138.9	4.714	223.2	6.841	63.0	8.967	35.8
.479	.0	2.605	4045.8	4.732	219.9	6.858	62.6	8.985	35.7
.496	.0	2.623	3949.2	4.750	216.7	6.876	62.1	9.003	35.6
.514	.0	2.641	3851.5	4.767	213.4	6.894	61.6	9.021	35.5
.532	.0	2.658	3751.7	4.785	210.0	6.912	61.2	9.038	35.5
.549	.0	2.676	3651.4	4.803	206.6	6.929	60.7	9.056	35.4
.567	.0	2.694	3550.8	4.820	203.1	6.947	60.2	9.074	35.3
.585	.0	2.711	3452.2	4.838	199.8	6.965	59.7	9.091	35.2
.603	.0	2.729	3356.6	4.856	196.6	6.983	59.2	9.109	35.1
.620	.0	2.747	3253.8	4.874	193.7	7.000	58.8	9.127	35.0
.638	.0	2.765	3154.3	4.891	190.8	7.018	58.3	9.145	34.9
.656	.0	2.782	3052.8	4.909	188.0	7.036	57.8	9.162	34.8
.673	.0	2.800	2955.6	4.927	185.3	7.053	57.4	9.180	34.7
.691	.0	2.818	2860.9	4.944	182.6	7.071	56.9	9.198	34.7
.709	.0	2.836	2769.7	4.962	180.2	7.089	56.5	9.216	34.6
.727	.0	2.853	2681.5	4.980	177.9	7.107	56.1	9.233	34.5
.744	.0	2.871	2599.1	4.998	175.9	7.124	55.7	9.251	34.4
.762	.0	2.889	2510.8	5.015	174.0	7.142	55.2	9.269	34.3
.780	.0	2.906	2428.1	5.033	172.1	7.160	54.8	9.286	34.3
.798	.0	2.924	2344.7	5.051	170.2	7.177	54.4	9.304	34.2

5392 CFS w/ BF applied

13/9 P.6/21

.815	.0	2.942	2266.4	5.(	168.4	7.195	54.0	9.322	
.833	.0	2.960	2190.4	5.086	166.7	7.213	53.7	9.340	3[illegible].0
.851	.0	2.977	2116.7	5.104	164.8	7.231	53.3	9.357	33.9
.868	.0	2.995	2044.8	5.122	162.7	7.248	52.9	9.375	33.9
.886	.0	3.013	1981.5	5.139	160.4	7.266	52.5	9.393	33.8
.904	.0	3.030	1916.6	5.157	158.2	7.284	52.2	9.410	33.7
.922	.0	3.048	1850.6	5.175	156.0	7.302	51.8	9.428	33.7
.939	.0	3.066	1787.2	5.193	153.9	7.319	51.5	9.446	33.6
.957	.0	3.084	1725.3	5.210	151.8	7.337	51.1	9.464	33.5
.975	.0	3.101	1667.2	5.228	150.0	7.355	50.8	9.481	33.4
.992	.0	3.119	1610.7	5.246	148.2	7.372	50.4	9.499	33.4
1.010	.0	3.137	1555.1	5.263	146.5	7.390	50.1	9.517	33.3
1.028	.0	3.155	1501.3	5.281	144.8	7.408	49.8	9.535	33.2
1.046	.0	3.172	1450.0	5.299	143.1	7.426	49.5	9.552	33.1
1.063	.0	3.190	1405.6	5.317	141.4	7.443	49.1	9.570	33.1
1.081	.0	3.208	1360.4	5.334	139.7	7.461	48.8	9.588	33.0
1.099	.0	3.225	1313.7	5.352	138.0	7.479	48.5	9.605	32.9
1.117	.0	3.243	1269.6	5.370	136.3	7.496	48.2	9.623	32.9
1.134	.0	3.261	1226.7	5.388	134.6	7.514	47.9	9.641	32.8
1.152	.1	3.279	1186.2	5.405	132.7	7.532	47.6	9.659	32.8
1.170	.3	3.296	1147.2	5.423	130.8	7.550	47.4	9.676	32.7
1.187	.8	3.314	1109.1	5.441	128.9	7.567	47.1	9.694	32.6
1.205	2.0	3.332	1073.1	5.458	127.2	7.585	46.9	9.712	32.6
1.223	4.0	3.349	1039.3	5.476	125.4	7.603	46.6	9.729	32.5
1.241	7.5	3.367	1006.8	5.494	123.7	7.621	46.4	9.747	32.4
1.258	13.6	3.385	974.9	5.512	122.0	7.638	46.2	9.765	32.4
1.276	22.4	3.403	947.4	5.529	120.4	7.656	45.9	9.783	32.3
1.294	33.8	3.420	919.9	5.547	118.9	7.674	45.7	9.800	32.3
1.311	51.0	3.438	892.0	5.565	117.4	7.691	45.5	9.818	32.2
1.329	72.4	3.456	866.0	5.582	115.9	7.709	45.3	9.836	32.2
1.347	97.5	3.474	840.6	5.600	114.3	7.727	45.1	9.854	32.1
1.365	156.2	3.491	817.3	5.618	112.8	7.745	45.0	9.871	32.1
1.382	197.5	3.509	794.3	5.636	111.4	7.762	44.8	9.889	32.0
1.400	259.7	3.527	772.0	5.653	110.0	7.780	44.6	9.907	31.9
1.418	318.8	3.544	748.7	5.671	108.6	7.798	44.5	9.924	31.9
1.436	411.4	3.562	725.8	5.689	107.3	7.815	44.3	9.942	31.8
1.453	527.1	3.580	704.0	5.707	106.0	7.833	44.1	9.960	31.8
1.471	642.2	3.598	683.8	5.724	104.9	7.851	43.9	9.978	31.7
1.489	774.7	3.615	664.7	5.742	103.7	7.869	43.8	9.995	31.7
1.506	930.8	3.633	645.8	5.760	102.7	7.886	43.6	10.013	31.6
1.524	1071.5	3.651	627.8	5.777	101.7	7.904	43.4	10.031	31.6
1.542	1232.6	3.668	611.3	5.795	100.7	7.922	43.3	10.048	31.5
1.560	1378.9	3.686	596.0	5.813	99.8	7.940	43.1	10.066	31.4
1.577	1501.0	3.704	582.1	5.831	98.9	7.957	42.9	10.084	31.4
1.595	1646.9	3.722	571.4	5.848	97.9	7.975	42.8	10.102	31.3
1.613	1749.2	3.739	561.0	5.866	97.0	7.993	42.6	10.119	31.3
1.630	1825.4	3.757	549.8	5.884	96.2	8.010	42.4	10.137	31.2
1.648	1897.8	3.775	538.9	5.901	95.4	8.028	42.3	10.155	31.2
1.666	1947.2	3.793	527.0	5.919	94.8	8.046	42.1	10.173	31.1
1.684	1993.0	3.810	514.9	5.937	94.1	8.064	42.0	10.190	31.1
1.701	2034.0	3.828	502.8	5.955	93.4	8.081	41.8	10.208	31.0
1.719	2073.5	3.846	490.9	5.972	92.6	8.099	41.7	10.226	31.0
1.737	2119.1	3.863	479.7	5.990	91.8	8.117	41.5	10.243	30.9
1.755	2172.5	3.881	469.3	6.008	91.0	8.134	41.4	10.261	30.9
1.772	2241.1	3.899	459.2	6.026	90.3	8.152	41.2	10.279	30.8
1.790	2322.1	3.917	449.3	6.043	89.5	8.170	41.1	10.297	30.8
1.808	2403.9	3.934	440.3	6.061	88.7	8.188	40.9	10.314	30.7
1.825	2489.4	3.952	431.8	6.079	88.0	8.205	40.8	10.332	30.7
1.843	2575.1	3.970	423.8	6.096	87.2	8.223	40.7	10.350	30.7
1.861	2649.8	3.987	416.2	6.114	86.6	8.241	40.5	10.367	30.6
1.879	2712.0	4.005	409.2	6.132	86.1	8.259	40.4	10.385	30.6
1.896	2771.1	4.023	402.5	6.150	85.6	8.276	40.3	10.403	30.5
1.914	2824.5	4.041	395.7	6.167	85.4	8.294	40.1	10.421	30.5
1.932	2875.5	4.058	388.7	6.185	84.8	8.312	40.0	10.438	30.4
1.949	2929.9	4.076	381.5	6.203	84.2	8.329	39.9	10.456	30.4

(2) → 1.582 → 1.595 → 1542

1650 cfs w/BF applied

P.7 of 21

1.967	2992.9	4.094	373.9	6..	83.5	8.347	39.7	10.474	
1.985	3067.5	4.112	366.4	6.2.	82.7	8.365	39.6	10.492	3
2.003	3150.3	4.129	359.4	6.256	82.1	8.383	39.4	10.509	30.3
2.020	3242.8	4.147	353.1	6.274	81.4	8.400	39.3	10.527	21.7
2.038	3341.2	4.165	347.4	6.291	80.7	8.418	39.2	10.545	7.2
2.056	3438.6	4.182	342.3	6.309	80.1	8.436	39.1	10.562	2.0
2.074	3533.8	4.200	337.9	6.327	79.4	8.453	38.9	10.580	.6
2.091	3627.3	4.218	333.8	6.345	78.8	8.471	38.8	10.598	.2
2.109	3711.3	4.236	329.5	6.362	78.2	8.489	38.7	10.616	.1

RUNOFF VOLUME = 1.27746 INCHES = 532.8505 ACRE-FEET
PEAK DISCHARGE RATE = 4772.02 CFS AT 2.375 HOURS BASIN AREA = 7.8210 SQ. MI.

P.8/11

Q2

DETAILED PRINTOUT OF SOUTH LA CUEVA CHANNEL HYDROGRAPH AT RE CONFLUENCE WITH NLC
FLOWS LISTED IN HYDROGRAPH DO NOT INCLUDE BULKING FACTORS

PEAK = 749 CFS + 5%BF = 786 CFS AT Tp = 1.582 HR

ROUTE ID=1 HYD=125.88 INFLOW HYD ID=3 DT=0
PRINT HYD ID=1 CODE=0

PARTIAL HYDROGRAPH 125.88

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	3.218	17.0	6.436	4.2	9.654	3.3	12.872	2.8
.027	.0	3.245	16.4	6.463	4.2	9.681	3.3	12.899	2.8
.054	.0	3.272	15.8	6.490	4.2	9.708	3.3	12.926	2.8
.080	.0	3.298	15.2	6.516	4.2	9.734	3.3	12.952	2.8
.107	.0	3.325	14.6	6.543	4.1	9.761	3.3	12.979	2.8
.134	.0	3.352	14.1	6.570	4.1	9.788	3.3	13.006	2.8
.161	.0	3.379	13.6	6.597	4.1	9.815	3.3	13.033	2.8
.188	.0	3.406	13.1	6.624	4.1	9.842	3.3	13.060	2.8
.215	.0	3.433	12.6	6.651	4.1	9.869	3.3	13.087	2.8
.241	.0	3.459	12.1	6.677	4.1	9.895	3.3	13.113	2.7
.268	.0	3.486	11.7	6.704	4.1	9.922	3.2	13.140	2.7
.295	.0	3.513	11.3	6.731	4.1	9.949	3.2	13.167	2.7
.322	.0	3.540	11.0	6.758	4.0	9.976	3.2	13.194	2.7
.349	.0	3.567	10.6	6.785	4.0	10.003	3.2	13.221	2.7
.375	.0	3.593	10.3	6.811	4.0	10.029	3.2	13.247	2.7
.402	.0	3.620	10.0	6.838	4.0	10.056	3.2	13.274	2.7
.429	.0	3.647	9.7	6.865	4.0	10.083	3.2	13.301	2.7
.456	.0	3.674	9.4	6.892	4.0	10.110	3.2	13.328	2.7
.483	.0	3.701	9.1	6.919	4.0	10.137	3.2	13.355	2.7
.510	.0	3.728	8.9	6.946	4.0	10.164	3.2	13.382	2.7
.536	.0	3.754	8.7	6.972	4.0	10.190	3.2	13.408	2.7
.563	.0	3.781	8.4	6.999	3.9	10.217	3.2	13.435	2.7
.590	.0	3.808	8.2	7.026	3.9	10.244	3.2	13.462	2.7
.617	.0	3.835	8.0	7.053	3.9	10.271	3.2	13.489	2.7
.644	.0	3.862	7.8	7.080	3.9	10.298	3.2	13.516	2.7
.670	.0	3.888	7.6	7.106	3.9	10.324	3.2	13.542	2.7
.697	.0	3.915	7.4	7.133	3.9	10.351	3.2	13.569	2.7
.724	.0	3.942	7.3	7.160	3.9	10.378	3.2	13.596	2.7
.751	.0	3.969	7.1	7.187	3.9	10.405	3.1	13.623	2.7
.778	.0	3.996	6.9	7.214	3.9	10.432	3.1	13.650	2.7
.805	.0	4.023	6.8	7.241	3.9	10.459	3.1	13.676	2.7
.831	.0	4.049	6.6	7.267	3.9	10.485	3.1	13.703	2.7
.858	.0	4.076	6.5	7.294	3.9	10.512	3.1	13.730	2.7
.885	.0	4.103	6.3	7.321	3.8	10.539	3.1	13.757	2.7
.912	.0	4.130	6.2	7.348	3.8	10.566	3.1	13.784	2.7
.939	.0	4.157	6.0	7.375	3.8	10.593	3.1	13.811	2.7
.965	.0	4.183	5.9	7.401	3.8	10.619	3.1	13.837	2.6
.992	.0	4.210	5.8	7.428	3.8	10.646	3.1	13.864	2.6
1.019	.0	4.237	5.7	7.455	3.8	10.673	3.1	13.891	2.6
1.046	.0	4.264	5.6	7.482	3.8	10.700	3.1	13.918	2.6
1.073	.0	4.291	5.5	7.509	3.8	10.727	3.1	13.945	2.6
1.099	.0	4.318	5.4	7.536	3.8	10.754	3.1	13.971	2.6
1.126	.0	4.344	5.3	7.562	3.8	10.780	3.1	13.998	2.6
1.153	.1	4.371	5.2	7.589	3.8	10.807	3.1	14.025	2.6
1.180	.7	4.398	5.1	7.616	3.8	10.834	3.1	14.052	2.6
1.207	2.1	4.425	5.1	7.643	3.7	10.861	3.1	14.079	2.6
1.234	5.4	4.452	5.0	7.670	3.7	10.888	3.1	14.106	2.6
1.260	12.3	4.478	5.0	7.696	3.7	10.914	3.1	14.132	2.6
1.287	25.3	4.505	4.9	7.723	3.7	10.941	3.1	14.159	2.6
1.314	49.2	4.532	4.8	7.750	3.7	10.968	3.1	14.186	2.6

	1.341	83.7		4.559	4.8	7.	3.7	10.995	3.1	14.213	
	1.368	130.8		4.586	4.7	7.8	3.7	11.022	3.1	14.240	2.6
	1.394	196.4		4.612	4.7	7.831	3.7	11.048	3.0	14.266	2.6
	1.421	281.7		4.639	4.7	7.857	3.7	11.075	3.0	14.293	2.6
	1.448	391.6		4.666	4.6	7.884	3.7	11.102	3.0	14.320	2.6
	1.475	509.9		4.693	4.6	7.911	3.7	11.129	3.0	14.347	2.6
	1.502	616.9		4.720	4.5	7.938	3.7	11.156	3.0	14.374	2.6
	1.529	698.7		4.747	4.5	7.965	3.7	11.183	3.0	14.401	2.6
	1.555	744.0		4.773	4.5	7.991	3.7	11.209	3.0	14.427	2.6
(2) →	1.582	749.9 →		4.800	4.4	8.018	3.6	11.236	3.0	14.454	2.6
	1.609	725.6	788cfs	4.827	4.4	8.045	3.6	11.263	3.0	14.481	2.6
	1.636	689.3		4.854	4.4	8.072	3.6	11.290	3.0	14.508	2.6
	1.663	643.7	w/tF	4.881	4.3	8.099	3.6	11.317	3.0	14.535	2.6
	1.689	592.1	applied	4.907	4.3	8.125	3.6	11.343	3.0	14.561	2.6
	1.716	541.1		4.934	4.3	8.152	3.6	11.370	3.0	14.588	2.6
	1.743	493.9		4.961	4.3	8.179	3.6	11.397	3.0	14.615	2.6
	1.770	452.0		4.988	4.3	8.206	3.6	11.424	3.0	14.642	2.6
	1.797	414.5		5.015	4.2	8.233	3.6	11.451	3.0	14.669	2.6
	1.824	381.1		5.042	4.2	8.260	3.6	11.478	3.0	14.696	2.6
	1.850	352.1		5.068	4.2	8.286	3.6	11.504	3.0	14.722	2.5
	1.877	326.2		5.095	4.2	8.313	3.6	11.531	3.0	14.749	2.5
	1.904	303.9		5.122	4.2	8.340	3.6	11.558	3.0	14.776	2.5
	1.931	284.2		5.149	4.2	8.367	3.6	11.585	3.0	14.803	2.5
	1.958	266.3		5.176	4.2	8.394	3.6	11.612	3.0	14.830	2.5
	1.984	250.0		5.202	4.2	8.420	3.6	11.638	3.0	14.856	2.5
	2.011	235.9		5.229	4.1	8.447	3.6	11.665	3.0	14.883	2.5
	2.038	223.5		5.256	4.1	8.474	3.5	11.692	2.9	14.910	2.5
	2.065	211.4		5.283	4.1	8.501	3.5	11.719	2.9	14.937	2.5
	2.092	198.7		5.310	4.1	8.528	3.5	11.746	2.9	14.964	2.5
	2.119	185.0		5.337	4.1	8.555	3.5	11.773	2.9	14.990	2.5
	2.145	170.5		5.363	4.1	8.581	3.5	11.799	2.9	15.017	2.5
	2.172	156.6		5.390	4.1	8.608	3.5	11.826	2.9	15.044	2.5
	2.199	143.8		5.417	4.1	8.635	3.5	11.853	2.9	15.071	2.5
	2.226	132.0		5.444	4.1	8.662	3.5	11.880	2.9	15.098	2.5
	2.253	121.0		5.471	4.1	8.689	3.5	11.907	2.9	15.125	2.5
	2.279	110.4		5.497	4.1	8.715	3.5	11.933	2.9	15.151	2.5
	2.306	101.4		5.524	4.1	8.742	3.5	11.960	2.9	15.178	2.5
	2.333	94.0		5.551	4.1	8.769	3.5	11.987	2.9	15.205	2.5
(1) 2.315→	2.360	87.2 B3.7		5.578	4.1	8.796	3.5	12.014	2.9	15.232	2.5
	2.387	80.9		5.605	4.2	8.823	3.5	12.041	2.9	15.259	2.5
	2.414	75.5	↓	5.632	4.2	8.850	3.5	12.068	2.9	15.285	2.5
	2.440	70.8	B7cfs	5.658	4.2	8.876	3.5	12.094	2.9	15.312	2.5
	2.467	66.7	w/BF	5.685	4.2	8.903	3.4	12.121	2.9	15.339	2.5
	2.494	62.3	applied	5.712	4.2	8.930	3.4	12.148	2.9	15.366	2.5
	2.521	58.2		5.739	4.2	8.957	3.4	12.175	2.9	15.393	2.5
	2.548	54.6		5.766	4.2	8.984	3.4	12.202	2.9	15.420	2.5
	2.574	51.4		5.792	4.2	9.010	3.4	12.228	2.9	15.446	2.5
	2.601	48.5		5.819	4.2	9.037	3.4	12.255	2.9	15.473	2.5
	2.628	45.8		5.846	4.2	9.064	3.4	12.282	2.9	15.500	2.5
	2.655	43.3		5.873	4.3	9.091	3.4	12.309	2.9	15.527	2.5
	2.682	41.1		5.900	4.3	9.118	3.4	12.336	2.9	15.554	2.5
	2.708	38.9		5.927	4.3	9.145	3.4	12.362	2.9	15.580	2.5
	2.735	36.9		5.953	4.3	9.171	3.4	12.389	2.9	15.607	2.5
	2.762	35.0		5.980	4.3	9.198	3.4	12.416	2.8	15.634	2.5
	2.789	33.3		6.007	4.3	9.225	3.4	12.443	2.8	15.661	2.5
	2.816	31.7		6.034	4.3	9.252	3.4	12.470	2.8	15.688	2.5
	2.843	30.2		6.061	4.4	9.279	3.4	12.497	2.8	15.715	2.4
	2.869	28.7		6.087	4.4	9.305	3.4	12.523	2.8	15.741	2.4
	2.896	27.1		6.114	4.4	9.332	3.4	12.550	2.8	15.768	2.4
	2.923	25.6		6.141	4.4	9.359	3.4	12.577	2.8	15.795	2.4
	2.950	24.4		6.168	4.4	9.386	3.3	12.604	2.8	15.822	2.4
	2.977	23.3		6.195	4.3	9.413	3.3	12.631	2.8	15.849	2.4
	3.003	22.5		6.222	4.3	9.440	3.3	12.657	2.8	15.875	2.4
	3.030	21.8		6.248	4.3	9.466	3.3	12.684	2.8	15.902	2.4
	3.057	21.1		6.275	4.3	9.493	3.3	12.711	2.8	15.929	2.4

13/0.1d

3.084	20.3	6.302	4.3	9.	3.3	12.738	2.8	15.956	
3.111	19.7	6.329	4.3	9.5	3.3	12.765	2.8	15.983	.4
3.138	19.1	6.356	4.2	9.574	3.3	12.792	2.8	16.010	2.4
3.164	18.4	6.382	4.2	9.600	3.3	12.818	2.8	16.036	2.4
3.191	17.7	6.409	4.2	9.627	3.3	12.845	2.8	16.063	1.9

RUNOFF VOLUME = 1.20850 INCHES = 36.4158 ACRE-FEET
PEAK DISCHARGE RATE = 749.86 CFS AT 1.582 HOURS BASIN AREA = .5650 SQ. MI.

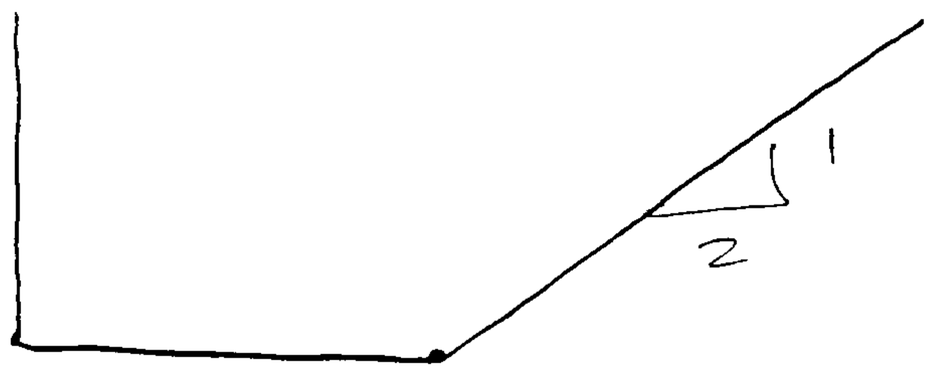
P.11/31

X-Sections -used in both calculations
(STATION 31+25)

SECTION 1 -upstream Section of N. La Cueva Channel

Points = 4

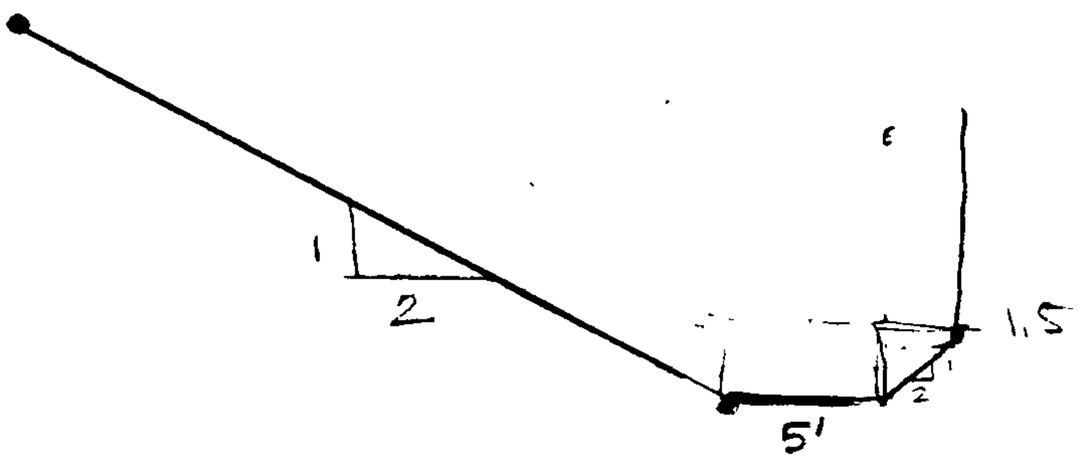
DIST	ELEV
0	11.75
0	0
19.8	0
43.3	11.75



Section 2 -upstream section of S. La Cueva Channel
(STATION 1+00. for S. La Cueva Stationing)

2:1 side slope - S. bank
5' bottom
11.9' depth - S bank

DIST	ELEV
0	11.95
23.5	0
28.5	0
31.5	1.5
31.5	3.2



OK Section 3 -Downstream of Confluence (STATION 31+00)

Points = 4

DIST	ELEV
0	11.7
23.4	0
48.4	0
71.8	11.7



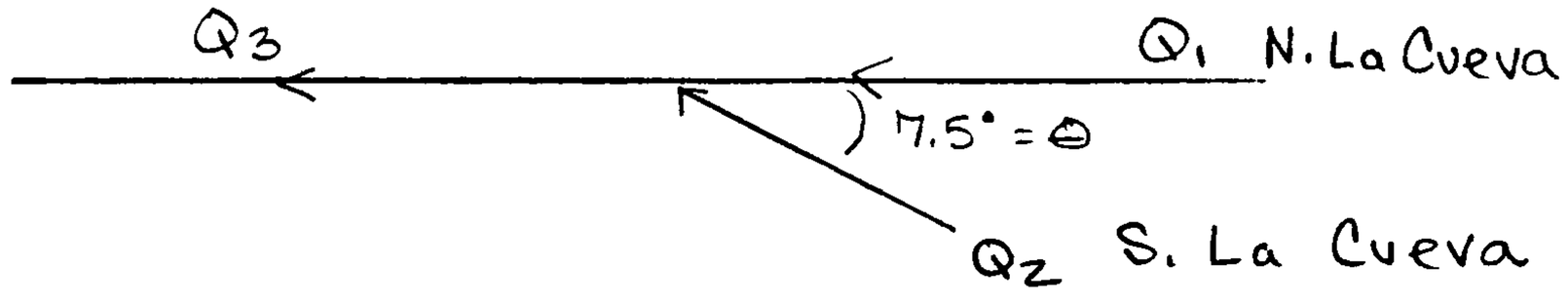
BOHANNAN-HUSTON INC.

PROJECT NAME La Cueva + S. El Camino LOMR SHEET 12 OF 34
PROJECT NO 96155C1.2107 BY SJG DATE [illegible]
SUBJECT Momentum Balance CH'D [illegible] DATE 6/20/96

Momentum Balance Analysis

Confluence of N. La Cueva + S. La Cueva

① Peak of North La Cueva Channel (T_p=2.375hr)



NEW RTI FLOWS

FILE: LC100.HYM
DATE: 5/30/96

① At time corresponding to Qpeak of N. La Cueva (2.375 hr

Q 100 yr times - LCA from 5-11

N. LA CUEVA Q_1= 5392 cfs

S. LA CUEVA Q_2= 87 cfs

COMBINED Q_3= 5479 cfs

At time corresponding to Qpeak of N. La Cueva

DATA	Q	STATION #/ HEC-2 FILE	d FLOW DEPTH	A FLOW AREA	VELOCITY	TOP WIDTH
1	5392 cfs	31+25 NLCWI25.SUP	5.54 Ft*	150.4 Ft^2	35.85 Ft/s	31.72 Ft
2	87 cfs	1+00 SLCWI25.SUP *calc. from normal depth	1.06 Ft	7.5 Ft^2	13.2 Ft/s	9 Ft
3.	5479 cfs	31+00 NLCWI25.SUP	4.4 Ft XS CARD 50 FC 2.3 Ft			

*From HEC-2 - NLCWI25.SUP

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva LOMR SHEET 13 OF 31
PROJECT NO 96155C1.2107 BY SJG DATE 5/31/96
SUBJECT Momentum Balance CH'D BJH DATE 5/20/96

BASIC MOMENTUM EQN

$F_3 = F_1 + M_z \cos\theta$

- Calculate M_z - For S. La Cueva Channel

$Q_z = 87$ CFS

$d_z = 1.06$ Ft

$A_z = 7.5$ Ft^2

REPORT FILE: SLCNLC.LST
P.

$$M_z = Q_z^2 / (g A_z) = (87)^2 / (32.2 \times 7.5 Ft^2)$$

$M_z = 31.3$ cu. Ft.

- Use the momentum program to calculate F_1
(M in program is F in ean. being used)

Printout page 17-19

output File name: NLC.MOM
x-section title
incremental depth = 0.1'
discharge = 87
#pts = 4
elev, dist (Sect. 1)

For $d_z = 5.84$ Ft
$F_1 = 6434.6$ cu. Ft.

- Down stream of confluence - Section 3

$F_3 = F_1 + M_2 \cos\theta$

$F_3 = 6434.6 + (31.3) \cos(7.5°)$

Printout page 20-22

$F_3 = 6465.6$ cu. Ft.

- Run momentum program
output File name: SLCNLC.MOM

For $F_3 = 6465.6$ cu. ft. → Depth = 4.4 Ft

- For Section 31+00 in NLCWI25.SUP
WSEL = 5067.9' + 4.4' = 5072.3'

Input on XS card →

BOHANNAN-HUSTON INC.

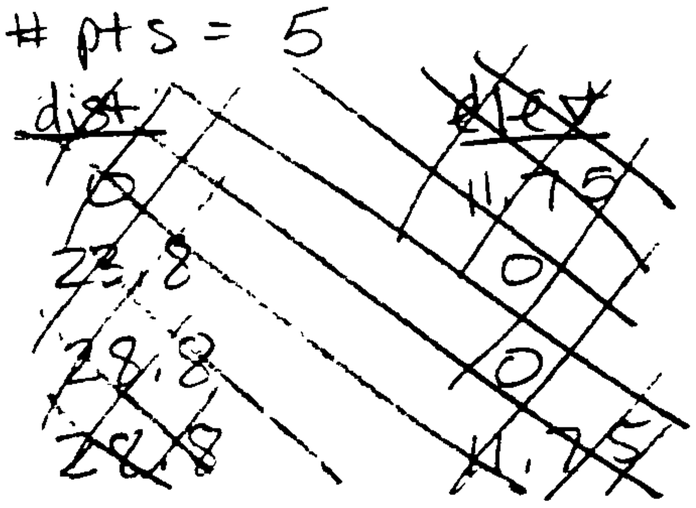
PROJECT NAME N. La Cueva Loma SHEET 14 OF 31
PROJECT NO 96155C1.2107 BY SJG DATE 5/3/96
SUBJECT Momentum Balance CH'D [illegible] DATE 8/20/96

-use Stream to find flow depth, flow area, velocity, and top width for the S. La Cueva channel section

- Q_2 = 90.2 cfs
- STREAM
  - OUTPUT FILE NAME = SLCNLC... OUT
  - x-Section title = S La Cueva, just before confluence with N. La Cueva.
  - Mannings N + SLP

    N = 0.013

    SLP = 2% = 0.02
  - depth increment = 0.1'
  - # pts = 5
  - dist



See sheet 2 for x-section

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva LOMR SHEET 15 OF 31

PROJECT NO 96155C1.2107 BY SJG DATE 5/31/96

SUBJECT Momentum Balance CH'D [illegible] DATE 6/20/96

SOUTH LA CUEVA JUST UPSTREAM OF CONFLUENCE WITH NORTH LA CUE

MANNING'S N = .0150 SLOPE = .0200

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	11.75	3	28.50	0.00	5	31.50	4.00
2	23.50	0.00	4	31.50	1.50			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.10	0.10	0.5	1.5	5.4	2.9	5.40
0.20	0.20	1.1	4.9	5.9	4.5	5.80
0.30	0.30	1.7	9.7	6.3	5.8	6.20
0.40	0.40	2.3	15.9	6.8	6.8	6.60
0.50	0.50	3.0	23.4	7.2	7.8	7.00
0.60	0.60	3.7	32.1	7.7	8.6	7.40
0.70	0.70	4.5	42.2	8.1	9.4	7.80
0.80	0.80	5.3	53.5	8.6	10.1	8.20
0.90	0.90	6.1	66.2	9.0	10.8	8.60
① → 1.00 1.06'	1.00	7.0	80.2 87.7	9.5	11.5	9.00
1.10	1.10	7.9	95.5	9.9	12.1	9.40
1.20	1.20	8.9	112.2	10.4	12.6	9.80
1.30	1.30	9.9	130.3	10.8	13.2	10.20
1.40	1.40	10.9	149.9	11.3	13.7	10.60
1.50	1.50	12.0	170.9	11.7	14.2	11.00
1.60	1.60	13.1	194.5	12.0	14.8	11.20
1.70	1.70	14.2	219.3	12.4	15.4	11.40
1.80	1.80	15.4	245.3	12.7	15.9	11.60
1.90	1.90	16.6	272.6	13.0	16.5	11.80
2.00	2.00	17.8	301.0	13.3	17.0	12.00
2.10	2.10	19.0	330.7	13.6	17.4	12.20
2.20	2.20	20.2	361.5	14.0	17.9	12.40
2.30	2.30	21.4	393.5	14.3	18.4	12.60
2.40	2.40	22.7	426.7	14.6	18.8	12.80
2.50	2.50	24.0	461.1	14.9	19.2	13.00
2.60	2.60	25.3	496.7	15.3	19.6	13.20
2.70	2.70	26.6	533.4	15.6	20.0	13.40
2.80	2.80	28.0	571.4	15.9	20.4	13.60
2.90	2.90	29.4	610.5	16.2	20.8	13.80
3.00	3.00	30.7	650.8	16.6	21.2	14.00
3.10	3.10	32.2	692.3	16.9	21.5	14.20
3.20	3.20	33.6	735.0	17.2	21.9	14.40
② 3.30 3.32'	3.30	35.0	778.9 788	17.5	22.2	14.60
3.40	3.40	36.5	824.0	17.9	22.6	14.80
3.50	3.50	38.0	870.3	18.2	22.9	15.00
3.60	3.60	39.5	917.9	18.5	23.2	15.20
3.70	3.70	41.0	966.6	18.8	23.6	15.40
3.80	3.80	42.6	1016.6	19.2	23.9	15.60
3.90	3.90	44.2	1067.8	19.5	24.2	15.80
4.00	4.00	45.7	1120.3	19.8	24.5	16.00

① Used at time of Qpeak for North La Cueva

② Used at time of Qpeak for South La Cueva

P.16, 31

MOMENTUM PROGRAM PC VERSION SEPTEMBER 1993

SECTION 1: NLC UPSTREAM OF CONFLUENCE WITH SLC

Discharge= 5392

INT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
	0.00	11.75	3	19.80	0.00			
	0.00	0.00	4	43.30	11.75			

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
0.50	0.5	10.1	531.23	134.0	4382.6	88959.1
0.60	0.6	12.2	440.52	101.7	3014.0	73770.7
0.70	0.7	14.4	375.75	80.5	2193.1	62925.4
0.80	0.8	16.5	327.18	65.7	1663.1	54794.7
0.90	0.9	18.6	289.43	54.9	1301.6	48473.6
1.00	1.0	20.8	259.23	46.8	1044.5	43419.3
1.10	1.1	23.0	234.54	40.4	855.3	39286.4
1.20	1.2	25.2	213.97	35.4	712.1	35844.5
1.30	1.3	27.4	196.57	31.3	601.3	32934.3
1.40	1.4	29.7	181.67	27.9	513.9	30441.8
1.50	1.5	32.0	168.76	25.1	443.8	28283.5
1.60	1.6	34.2	157.48	22.7	386.7	26396.7
1.70	1.7	36.6	147.52	20.7	339.6	24733.6
1.80	1.8	38.9	138.68	19.0	300.4	23257.0
1.90	1.9	41.2	130.78	17.4	267.5	21937.3
2.00	2.0	43.6	123.67	16.1	239.5	20751.2
2.10	2.1	46.0	117.24	14.9	215.5	19679.5
2.20	2.2	48.4	111.40	13.9	194.9	18706.6
2.30	2.3	50.8	106.08	13.0	177.0	17819.7
2.40	2.4	53.3	101.20	12.1	161.4	17008.1
2.50	2.5	55.7	96.72	11.4	147.8	16262.8
2.60	2.6	58.2	92.58	10.7	135.7	15576.0
2.70	2.7	60.7	88.76	10.1	125.0	14941.4
2.80	2.8	63.3	85.21	9.5	115.5	14353.4
2.90	2.9	65.8	81.91	9.0	107.1	13807.2
3.00	3.0	68.4	78.83	8.5	99.5	13298.5
3.10	3.1	71.0	75.95	8.1	92.7	12823.9
3.20	3.2	73.6	73.26	7.7	86.5	12380.1
3.30	3.3	76.2	70.73	7.3	81.0	11964.3
3.40	3.4	78.9	68.36	7.0	76.0	11574.2
3.50	3.5	81.5	66.12	6.7	71.4	11207.4
3.60	3.6	84.2	64.01	6.4	67.2	10862.2
3.70	3.7	86.9	62.01	6.1	63.4	10536.7
3.80	3.8	89.7	60.12	5.9	59.9	10229.4
3.90	3.9	92.4	58.34	5.6	56.7	9938.9
4.00	4.0	95.2	56.64	5.4	53.8	9664.1
4.10	4.1	98.0	55.03	5.2	51.1	9403.7
4.20	4.2	100.8	53.49	5.0	48.6	9156.8

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
4.30	4.3	103.6	52.03	4.8	46.3	8922.4
4.40	4.4	106.5	50.64	4.6	44.2	8699.7
4.50	4.5	109.3	49.31	4.5	42.3	8487.9
4.60	4.6	112.2	48.04	4.3	40.4	8286.4
4.70	4.7	115.1	46.83	4.2	38.7	8094.5
4.80	4.8	118.1	45.66	4.0	37.2	7911.5
4.90	4.9	121.0	44.55	3.9	35.7	7737.1
5.00	5.0	124.0	43.48	3.8	34.4	7570.7
5.10	5.1	127.0	42.46	3.6	33.1	7411.8
5.20	5.2	130.0	41.48	3.5	31.9	7260.0
5.30	5.3	133.0	40.53	3.4	30.8	7115.0
5.40	5.4	136.1	39.62	3.3	29.8	6976.3
5.50	5.5	139.1	38.75	3.2	28.8	6843.7
5.60	5.6	142.2	37.91	3.1	27.9	6716.8
5.70	5.7	145.3	37.10	3.0	27.1	6595.3
5.80	5.8	148.5	36.31	2.9	26.3	6479.1
5.84 5.90	5.9	151.6	35.56	2.9	25.5	6367.8 6434.6
6.00	6.0	154.8	34.83	2.8	24.8	6261.1
6.10	6.1	158.0	34.13	2.7	24.2	6159.0
6.20	6.2	161.2	33.45	2.6	23.6	6061.2
6.30	6.3	164.4	32.79	2.6	23.0	5967.4
6.40	6.4	167.7	32.16	2.5	22.5	5877.6
6.50	6.5	170.9	31.54	2.4	21.9	5791.5
6.60	6.6	174.2	30.95	2.4	21.5	5709.1
6.70	6.7	177.5	30.37	2.3	21.0	5630.0
6.80	6.8	180.9	29.81	2.3	20.6	5554.3
6.90	6.9	184.2	29.27	2.2	20.2	5481.8
7.00	7.0	187.6	28.74	2.1	19.8	5412.4
7.10	7.1	191.0	28.23	2.1	19.5	5345.9
7.20	7.2	194.4	27.74	2.1	19.1	5282.2
7.30	7.3	197.8	27.26	2.0	18.8	5221.3
7.40	7.4	201.3	26.79	2.0	18.5	5163.0
7.50	7.5	204.7	26.33	1.9	18.3	5107.3
7.60	7.6	208.2	25.89	1.9	18.0	5054.1
7.70	7.7	211.7	25.46	1.8	17.8	5003.2
7.80	7.8	215.3	25.05	1.8	17.5	4954.6
7.90	7.9	218.8	24.64	1.8	17.3	4908.3
8.00	8.0	222.4	24.24	1.7	17.1	4864.1
8.10	8.1	226.0	23.86	1.7	16.9	4822.0
8.20	8.2	229.6	23.48	1.6	16.8	4782.0
8.30	8.3	233.2	23.12	1.6	16.6	4743.9
8.40	8.4	236.9	22.76	1.6	16.4	4707.8
8.50	8.5	240.5	22.42	1.5	16.3	4673.5
8.60	8.6	244.2	22.08	1.5	16.2	4641.0
8.70	8.7	247.9	21.75	1.5	16.0	4610.3
8.80	8.8	251.7	21.42	1.5	15.9	4581.3
8.90	8.9	255.4	21.11	1.4	15.8	4554.0
9.00	9.0	259.2	20.80	1.4	15.7	4528.3
9.10	9.1	263.0	20.50	1.4	15.6	4504.3
9.20	9.2	266.8	20.21	1.3	15.5	4481.7
9.30	9.3	270.6	19.92	1.3	15.5	4460.7
9.40	9.4	274.5	19.64	1.3	15.4	4441.2

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
9.50	9.5	278.3	19.37	1.3	15.3	4423.1
9.60	9.6	282.2	19.10	1.3	15.3	4406.4
9.70	9.7	286.2	18.84	1.2	15.2	4391.1
9.80	9.8	290.1	18.59	1.2	15.2	4377.1
9.90	9.9	294.0	18.34	1.2	15.1	4364.5
10.00	10.0	298.0	18.09	1.2	15.1	4353.2
10.10	10.1	302.0	17.85	1.1	15.1	4343.2
10.20	10.2	306.0	17.62	1.1	15.0	4334.4
10.30	10.3	310.0	17.39	1.1	15.0	4326.9
10.40	10.4	314.1	17.17	1.1	15.0	4320.5
10.50	10.5	318.2	16.95	1.1	15.0	4315.3
10.60	10.6	322.2	16.73	1.1	14.9	4311.3
10.70	10.7	326.4	16.52	1.0	14.9	4308.5
10.80	10.8	330.5	16.32	1.0	14.9	4306.8
10.90	10.9	334.6	16.11	1.0	14.9	4306.1
11.00	11.0	338.8	15.91	1.0	14.9	4306.6
11.10	11.1	343.0	15.72	1.0	14.9	4308.1
11.20	11.2	347.2	15.53	1.0	14.9	4310.7
11.30	11.3	351.4	15.34	0.9	15.0	4314.3
11.40	11.4	355.7	15.16	0.9	15.0	4319.0
11.50	11.5	360.0	14.98	0.9	15.0	4324.7
11.60	11.6	364.2	14.80	0.9	15.0	4331.3
11.70	11.7	368.6	14.63	0.9	15.0	4339.0
11.75	11.8	370.7	14.54	0.9	15.0	4343.2

MOMENTUM PROGRAM PC VERSION SEPTEMBER 1993

SECTION DOWNSTREAM OF S AND N LA CUEVA CONFLUENCE - SECTION 3

Discharge= 5479

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	11.70	3	48.40	0.00			
2	23.40	0.00	4	71.80	11.70			

WSEL	DEPTH INC.	FLOW AREA	FLOW VEL	FROUDE NO.	E	M
FT	FT	SQ. FT.	FPS			CU. FT.
0.40	0.4	10.3	530.91	150.2	4377.2	90339.3
0.50	0.5	13.0	421.46	107.0	2758.7	71717.1
0.60	0.6	15.7	348.54	81.1	1886.9	59310.0
0.70	0.7	18.5	296.48	64.1	1365.6	50454.4
0.80	0.8	21.3	257.47	52.2	1030.2	43818.5
0.90	0.9	24.1	227.16	43.6	802.1	38662.4
1.00	1.0	27.0	202.93	37.1	640.4	34542.1
1.10	1.1	29.9	183.12	32.0	521.8	31175.1
1.20	1.2	32.9	166.64	28.0	432.4	28373.2
1.30	1.3	35.9	152.70	24.7	363.4	26005.9
1.40	1.4	38.9	140.78	22.0	309.1	23980.1
1.50	1.5	42.0	130.45	19.8	265.8	22227.5
1.60	1.6	45.1	121.43	17.9	230.6	20697.0
1.70	1.7	48.3	113.48	16.2	201.7	19349.3
1.80	1.8	51.5	106.43	14.8	177.7	18154.0
1.90	1.9	54.7	100.13	13.6	157.6	17087.0
2.00	2.0	58.0	94.47	12.6	140.6	16129.1
2.10	2.1	61.3	89.35	11.6	126.1	15264.8
2.20	2.2	64.7	84.71	10.8	113.6	14481.3
2.30	2.3	68.1	80.48	10.1	102.9	13768.1
2.40	2.4	71.5	76.61	9.4	93.5	13116.5
2.50	2.5	75.0	73.05	8.8	85.4	12519.0
2.60	2.6	78.5	69.78	8.3	78.2	11969.4
2.70	2.7	82.1	66.75	7.8	71.9	11462.4
2.80	2.8	85.7	63.95	7.3	66.3	10993.6
2.90	2.9	89.3	61.34	6.9	61.3	10558.9
3.00	3.0	93.0	58.91	6.5	56.9	10155.0
3.10	3.1	96.7	56.65	6.2	52.9	9779.0
3.20	3.2	100.5	54.53	5.9	49.4	9428.1
3.30	3.3	104.3	52.54	5.6	46.2	9100.3
3.40	3.4	108.1	50.68	5.3	43.3	8793.4
3.50	3.5	112.0	48.92	5.1	40.7	8505.6
3.60	3.6	115.9	47.27	4.9	38.3	8235.6
3.70	3.7	119.9	45.70	4.6	36.1	7981.7
3.80	3.8	123.9	44.23	4.4	34.2	7742.8
3.90	3.9	127.9	42.83	4.3	32.4	7517.7
4.00	4.0	132.0	41.51	4.1	30.8	7305.4
4.10	4.1	136.1	40.25	3.9	29.3	7105.0
4.20	4.2	140.3	39.06	3.8	27.9	6915.8

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
4.30	4.3	144.5	37.92	3.6	26.6	6736.8
4.40	4.4	148.7	36.84	3.5	25.5	6567.5
~4.9 4.50	4.5	153.0	35.81	3.3	24.4	6407.2 6465.6
4.60	4.6	157.3	34.83	3.2	23.4	6255.4
4.70	4.7	161.7	33.89	3.1	22.5	6111.6
4.80	4.8	166.1	32.99	3.0	21.7	5975.2
4.90	4.9	170.5	32.13	2.9	20.9	5845.8
5.00	5.0	175.0	31.31	2.8	20.2	5723.2
5.10	5.1	179.5	30.52	2.7	19.6	5606.7
5.20	5.2	184.1	29.76	2.6	19.0	5496.3
5.30	5.3	188.7	29.04	2.5	18.4	5391.4
5.40	5.4	193.3	28.34	2.5	17.9	5292.0
5.50	5.5	198.0	27.67	2.4	17.4	5197.5
5.60	5.6	202.7	27.03	2.3	16.9	5107.9
5.70	5.7	207.5	26.41	2.2	16.5	5022.9
5.80	5.8	212.3	25.81	2.2	16.1	4942.3
5.90	5.9	217.1	25.23	2.1	15.8	4865.9
6.00	6.0	222.0	24.68	2.0	15.5	4793.5
6.10	6.1	226.9	24.15	2.0	15.2	4724.9
6.20	6.2	231.9	23.63	1.9	14.9	4659.9
6.30	6.3	236.9	23.13	1.9	14.6	4598.5
6.40	6.4	241.9	22.65	1.8	14.4	4540.4
6.50	6.5	247.0	22.18	1.8	14.1	4485.6
6.60	6.6	252.1	21.73	1.7	13.9	4433.9
6.70	6.7	257.3	21.30	1.7	13.7	4385.2
6.80	6.8	262.5	20.87	1.6	13.6	4339.4
6.90	6.9	267.7	20.47	1.6	13.4	4296.4
7.00	7.0	273.0	20.07	1.6	13.3	4256.1
7.10	7.1	278.3	19.69	1.5	13.1	4218.4
7.20	7.2	283.7	19.31	1.5	13.0	4183.2
7.30	7.3	289.1	18.95	1.4	12.9	4150.5
7.40	7.4	294.5	18.60	1.4	12.8	4120.1
7.50	7.5	300.0	18.26	1.4	12.7	4092.0
7.60	7.6	305.5	17.93	1.3	12.6	4066.1
7.70	7.7	311.1	17.61	1.3	12.5	4042.4
7.80	7.8	316.7	17.30	1.3	12.4	4020.8
7.90	7.9	322.3	17.00	1.3	12.4	4001.2
8.00	8.0	328.0	16.70	1.2	12.3	3983.7
8.10	8.1	333.7	16.42	1.2	12.3	3968.0
8.20	8.2	339.5	16.14	1.2	12.2	3954.3
8.30	8.3	345.3	15.87	1.1	12.2	3942.4
8.40	8.4	351.1	15.60	1.1	12.2	3932.3
8.50	8.5	357.0	15.35	1.1	12.2	3924.0
8.60	8.6	362.9	15.10	1.1	12.1	3917.4
8.70	8.7	368.9	14.85	1.1	12.1	3912.5
8.80	8.8	374.9	14.62	1.0	12.1	3909.2
8.90	8.9	380.9	14.38	1.0	12.1	3907.5
9.00	9.0	387.0	14.16	1.0	12.1	3907.5
9.10	9.1	393.1	13.94	1.0	12.1	3909.0
9.20	9.2	399.3	13.72	1.0	12.1	3912.0
9.30	9.3	405.5	13.51	0.9	12.1	3916.6
9.40	9.4	411.7	13.31	0.9	12.1	3922.6

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
^.50	9.5	418.0	13.11	0.9	12.2	3930.0
.60	9.6	424.3	12.91	0.9	12.2	3938.9
9.70	9.7	430.7	12.72	0.9	12.2	3949.2
9.80	9.8	437.1	12.54	0.8	12.2	3960.9
9.90	9.9	443.5	12.35	0.8	12.3	3974.0
10.00	10.0	450.0	12.18	0.8	12.3	3988.4
10.10	10.1	456.5	12.00	0.8	12.3	4004.1
10.20	10.2	463.1	11.83	0.8	12.4	4021.2
10.30	10.3	469.7	11.67	0.8	12.4	4039.5
10.40	10.4	476.3	11.50	0.8	12.5	4059.2
10.50	10.5	483.0	11.34	0.7	12.5	4080.1
10.60	10.6	489.7	11.19	0.7	12.5	4102.2
10.70	10.7	496.5	11.04	0.7	12.6	4125.6
10.80	10.8	503.3	10.89	0.7	12.6	4150.2
10.90	10.9	510.1	10.74	0.7	12.7	4176.1
11.00	11.0	517.0	10.60	0.7	12.7	4203.1
11.10	11.1	523.9	10.46	0.7	12.8	4231.3
11.20	11.2	530.9	10.32	0.7	12.9	4260.7
11.30	11.3	537.9	10.19	0.6	12.9	4291.3
11.40	11.4	544.9	10.05	0.6	13.0	4323.1
11.50	11.5	552.0	9.93	0.6	13.0	4356.0
11.60	11.6	559.1	9.80	0.6	13.1	4390.0
11.70	11.7	566.3	9.68	0.6	13.2	4425.2

(2)

-The next set of calcutions is for

Momentum Balance Analysis
with Qp of South La Cueva
and corresponding Q of
North La Cueva at Tp
of Qp(S. La Cueva).

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva SHEET 23 OF 31

PROJECT NO 96155C1.2107 BY SJG DATE 1/23/96

SUBJECT Momentum Balance CH'D [illegible] DATE 2/20/96

↑AT THIS CORRESPONDING TO UPPER OF S. LA CUEVA ↑

DATA	Q	STA. #/ HEC-2 FILE	d FLOW DEPTH	A FLOW AREA	Velocity	TOP WIDTH
1	1650 CFS	31+25 NLCWI25.SLC	1.95'	42.5'	38.79 Fps	23.79
2	788 CFS	1+00 SLCWI25.SUP xcalc. from normal depth	3.32'	35.2'	22.3 Fps	14.7
3	2436 CFS	31+00 NLCWI25.SUP	2.47'			

① Refer to p.5
- use the Q_2 Flowrate = 788 cFs to estimate the water depth (p. 16)

$$\frac{824 - 778.9}{0.1} = \frac{825 - 788}{x} \qquad x = 0.09$$

Depth = 3.4 - 0.08 = 3.32 Ft

② Calculate M_2 - for S. La Cueva Channel

$Q_2 = 788$ cFs
$d_2 = 3.32$ Ft
$A_2 = 35.2$ Ft^2 (see p. 12 for cross section)

$$M_2 = Q_2^2 / (g A_2) = (788 \text{ cFs})^2 / (32.2 \times 35.2 \text{ Ft}^2)$$
$$= 548 \text{ w. Ft}$$

③ Estimate depth for section 1 (North La Cueva - upstream of confluence) - run HEC-2 with Q = 1650 cFs in NLC channel.

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva LOMR SHEET 24 OF 31
PROJECT NO 96155C1.2107 BY sjg DATE 1/31/96
SUBJECT Momentum Balance CH'D [illegible] DATE 2/20/96

HEC-2 Model: NLCWI25.SLC -Same as NLCWI25.SUP
BUT WITH Q = 1650 cfs at 31+25 and Q = 2436 cfs at 31+00.

... Depth = 1.95' at sta. 31+25

④ Use the Momentum program to calculate F_1.

output file name = NLC2.MOM
x-section title =
incremental depth = 0.1'
discharge (Q_1) = 1650 cfs
pts = 4

elev, distance		
	11.75	0
	0	0
	0	19.8
	11.75	43.3

for $d_2 = 1.95' \rightarrow M = F_1 = 2035.1$ cu. Ft

⑤ Calculate F_3 (downstream of confluence)

$$F_3 = F_1 + M_2 \cos\theta$$

$$F_3 = 2035.1 + (548)\cos(8°)$$

$$F_3 = 2577.8 \text{ cu. Ft.}$$

⑥ Run momentum program for section 3 (NLCSLC3.MOM)

For $F_3 = 2577.8$ cu ft → Depth = 2.47 Ft

WSEL = 5067.9' + 2.47' = 5070.37'

Not worst case See p. 12

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva SHEET 25 OF 31
PROJECT NO 96155C1.2107 BY SJC DATE 7/23/96
SUBJECT Momentum Balance CH'D [illegible] DATE 8/20/96

SECTION1 - NORTH LA CUEVA UPSTREAM OF COMFLUENCE WITH SOUTH LA CUEVA.
FOR TIME WHEN PEAK FLOW IS IN SOUTH LA CUEVA.

Discharge= 1650

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	11.75	3	19.80	0.00			
2	0.00	0.00	4	43.30	11.75			

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
0.10	0.1	2.0	829.15	463.2	10675.3	42487.4
0.20	0.2	4.0	412.50	163.4	2642.4	21137.8
0.30	0.3	6.0	273.63	88.7	1162.9	14022.4
0.40	0.4	8.1	204.21	57.5	647.9	10465.7
0.50	0.5	10.1	162.56	41.0	410.8	8332.5
0.60	0.6	12.2	134.80	31.1	282.8	6911.3
0.70	0.7	14.4	114.98	24.6	206.0	5896.9
0.80	0.8	16.5	100.12	20.1	156.5	5136.9
0.90	0.9	18.6	88.57	16.8	122.7	4546.6
1.00	1.0	20.8	79.33	14.3	98.7	4075.1
1.10	1.1	23.0	71.77	12.4	81.1	3690.1
1.20	1.2	25.2	65.48	10.8	67.8	3370.0
1.30	1.3	27.4	60.15	9.6	57.5	3099.8
1.40	1.4	29.7	55.59	8.5	49.4	2869.0
1.50	1.5	32.0	51.64	7.7	42.9	2669.7
.60	1.6	34.2	48.19	7.0	37.7	2496.0
.70	1.7	36.6	45.14	6.3	33.3	2343.5
1.80	1.8	38.9	42.44	5.8	29.8	2208.7
1.90	1.9	41.2	40.02	5.3	26.8	2088.7
2.00	2.0	43.6	37.84	4.9	24.2	1981.5
2.10	2.1	46.0	35.88	4.6	22.1	1885.2
2.20	2.2	48.4	34.09	4.2	20.2	1798.4
2.30	2.3	50.8	32.46	4.0	18.7	1719.8
2.40	2.4	53.3	30.97	3.7	17.3	1648.5
2.50	2.5	55.7	29.60	3.5	16.1	1583.7
2.60	2.6	58.2	28.33	3.3	15.1	1524.5
2.70	2.7	60.7	27.16	3.1	14.2	1470.5
2.80	2.8	63.3	26.07	2.9	13.4	1421.1
2.90	2.9	65.8	25.06	2.8	12.7	1375.8
3.00	3.0	68.4	24.12	2.6	12.0	1334.2
3.10	3.1	71.0	23.24	2.5	11.5	1296.1
3.20	3.2	73.6	22.42	2.4	11.0	1261.1
3.30	3.3	76.2	21.65	2.2	10.6	1228.9
3.40	3.4	78.9	20.92	2.1	10.2	1199.4
3.50	3.5	81.5	20.23	2.0	9.9	1172.4
3.60	3.6	84.2	19.59	2.0	9.6	1147.5
3.70	3.7	86.9	18.98	1.9	9.3	1124.8
3.80	3.8	89.7	18.40	1.8	9.1	1104.0
3.90	3.9	92.4	17.85	1.7	8.8	1085.1
4.00	4.0	95.2	17.33	1.7	8.7	1067.9
4.10	4.1	98.0	16.84	1.6	8.5	1052.2
4.20	4.2	100.8	16.37	1.5	8.4	1038.1

1.95 - 2035.1

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
4.30	4.3	103.6	15.92	1.5	8.2	1025.4
1.40	4.4	106.5	15.50	1.4	8.1	1014.1
4.50	4.5	109.3	15.09	1.4	8.0	1004.1
4.60	4.6	112.2	14.70	1.3	8.0	995.2
4.70	4.7	115.1	14.33	1.3	7.9	987.6
4.80	4.8	118.1	13.97	1.2	7.8	981.0
4.90	4.9	121.0	13.63	1.2	7.8	975.5
5.00	5.0	124.0	13.31	1.1	7.7	971.0
5.10	5.1	127.0	12.99	1.1	7.7	967.5
5.20	5.2	130.0	12.69	1.1	7.7	964.9
5.30	5.3	133.0	12.40	1.0	7.7	963.3
5.40	5.4	136.1	12.13	1.0	7.7	962.5
5.50	5.5	139.1	11.86	1.0	7.7	962.5
5.60	5.6	142.2	11.60	1.0	7.7	963.4
5.70	5.7	145.3	11.35	0.9	7.7	965.1
5.80	5.8	148.5	11.11	0.9	7.7	967.5
5.90	5.9	151.6	10.88	0.9	7.7	970.7
6.00	6.0	154.8	10.66	0.9	7.8	974.6
6.10	6.1	158.0	10.44	0.8	7.8	979.2
6.20	6.2	161.2	10.24	0.8	7.8	984.5
6.30	6.3	164.4	10.03	0.8	7.9	990.5
6.40	6.4	167.7	9.84	0.8	7.9	997.1
6.50	6.5	170.9	9.65	0.7	7.9	1004.4
6.60	6.6	174.2	9.47	0.7	8.0	1012.3
6.70	6.7	177.5	9.29	0.7	8.0	1020.9
6.80	6.8	180.9	9.12	0.7	8.1	1030.0
6.90	6.9	184.2	8.96	0.7	8.1	1039.8
7.00	7.0	187.6	8.80	0.7	8.2	1050.1
.10	7.1	191.0	8.64	0.6	8.3	1061.1
7.20	7.2	194.4	8.49	0.6	8.3	1072.6
7.30	7.3	197.8	8.34	0.6	8.4	1084.6
7.40	7.4	201.3	8.20	0.6	8.4	1097.3
7.50	7.5	204.7	8.06	0.6	8.5	1110.4
7.60	7.6	208.2	7.92	0.6	8.6	1124.2
7.70	7.7	211.7	7.79	0.6	8.6	1138.4
7.80	7.8	215.3	7.66	0.5	8.7	1153.2
7.90	7.9	218.8	7.54	0.5	8.8	1168.6
8.00	8.0	222.4	7.42	0.5	8.9	1184.4
8.10	8.1	226.0	7.30	0.5	8.9	1200.8
8.20	8.2	229.6	7.19	0.5	9.0	1217.7
8.30	8.3	233.2	7.07	0.5	9.1	1235.1
8.40	8.4	236.9	6.97	0.5	9.2	1253.0
8.50	8.5	240.5	6.86	0.5	9.2	1271.5
8.60	8.6	244.2	6.76	0.5	9.3	1290.4
8.70	8.7	247.9	6.65	0.5	9.4	1309.8
8.80	8.8	251.7	6.56	0.4	9.5	1329.8
8.90	8.9	255.4	6.46	0.4	9.5	1350.2
9.00	9.0	259.2	6.37	0.4	9.6	1371.1
9.10	9.1	263.0	6.27	0.4	9.7	1392.5
9.20	9.2	266.8	6.18	0.4	9.8	1414.4
9.30	9.3	270.6	6.10	0.4	9.9	1436.8
9.40	9.4	274.5	6.01	0.4	10.0	1459.7

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
9.50	9.5	278.3	5.93	0.4	10.0	1483.0
9.60	9.6	282.2	5.85	0.4	10.1	1506.9
9.70	9.7	286.2	5.77	0.4	10.2	1531.2
9.80	9.8	290.1	5.69	0.4	10.3	1556.0
9.90	9.9	294.0	5.61	0.4	10.4	1581.3
10.00	10.0	298.0	5.54	0.4	10.5	1607.1
10.10	10.1	302.0	5.46	0.4	10.6	1633.3
10.20	10.2	306.0	5.39	0.3	10.7	1660.0
10.30	10.3	310.0	5.32	0.3	10.7	1687.2
10.40	10.4	314.1	5.25	0.3	10.8	1714.9
10.50	10.5	318.2	5.19	0.3	10.9	1743.1
10.60	10.6	322.2	5.12	0.3	11.0	1771.8
10.70	10.7	326.4	5.06	0.3	11.1	1800.9
10.80	10.8	330.5	4.99	0.3	11.2	1830.5
10.90	10.9	334.6	4.93	0.3	11.3	1860.6
11.00	11.0	338.8	4.87	0.3	11.4	1891.1
11.10	11.1	343.0	4.81	0.3	11.5	1922.2
11.20	11.2	347.2	4.75	0.3	11.6	1953.7
11.30	11.3	351.4	4.70	0.3	11.6	1985.7
11.40	11.4	355.7	4.64	0.3	11.7	2018.2
11.50	11.5	360.0	4.58	0.3	11.8	2051.1
11.60	11.6	364.2	4.53	0.3	11.9	2084.6
11.70	11.7	368.6	4.48	0.3	12.0	2118.5
11.75	11.8	370.7	4.45	0.3	12.1	2135.6

SECTION 3 - DOWNSTREAM OF SLC AND NLC CONFLUENCE

Discharge= .2436

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	11.70	3	48.40	0.00			
2	23.40	0.00	4	71.80	11.70			

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
0.10	0.1	2.5	966.67	540.8	14510.1	73130.6
0.20	0.2	5.1	479.53	190.4	3570.8	36277.8
0.30	0.3	7.7	317.19	103.2	1562.5	23997.1
0.40	0.4	10.3	236.05	66.8	865.6	17859.5
0.50	0.5	13.0	187.38	47.6	545.7	14179.3
0.60	0.6	15.7	154.96	36.1	373.5	11727.8
0.70	0.7	18.5	131.82	28.5	270.5	9978.7
0.80	0.8	21.3	114.47	23.2	204.3	8668.5
0.90	0.9	24.1	101.00	19.4	159.3	7651.1
1.00	1.0	27.0	90.22	16.5	127.4	6838.7
1.10	1.1	29.9	81.42	14.2	104.0	6175.4
1.20	1.2	32.9	74.09	12.4	86.4	5624.0
1.30	1.3	35.9	67.89	11.0	72.9	5158.8
1.40	1.4	38.9	62.59	9.8	62.2	4761.4
1.50	1.5	42.0	58.00	8.8	53.7	4418.2
1.60	1.6	45.1	53.99	7.9	46.9	4119.1
1.70	1.7	48.3	50.46	7.2	41.2	3856.5
.80	1.8	51.5	47.32	6.6	36.6	3624.2
1.90	1.9	54.7	44.52	6.1	32.7	3417.5
2.00	2.0	58.0	42.00	5.6	29.4	3232.7
2.10	2.1	61.3	39.73	5.2	26.6	3066.7
2.20	2.2	64.7	37.66	4.8	24.2	2916.8
2.30	2.3	68.1	35.78	4.5	22.2	2781.2
2.40 2.47	2.4	71.5	34.06	4.2	20.4	2658.0 -2577.8
2.50	2.5	75.0	32.48	3.9	18.9	2545.7
2.60	2.6	78.5	31.02	3.7	17.5	2443.2
2.70	2.7	82.1	29.68	3.5	16.4	2349.5
2.80	2.8	85.7	28.43	3.3	15.4	2263.5
2.90	2.9	89.3	27.27	3.1	14.4	2184.6
3.00	3.0	93.0	26.19	2.9	13.7	2112.1
3.10	3.1	96.7	25.19	2.8	13.0	2045.4
3.20	3.2	100.5	24.24	2.6	12.3	1983.9
3.30	3.3	104.3	23.36	2.5	11.8	1927.3
3.40	3.4	108.1	22.53	2.4	11.3	1875.2
3.50	3.5	112.0	21.75	2.3	10.8	1827.1
3.60	3.6	115.9	21.01	2.2	10.5	1782.9
3.70	3.7	119.9	20.32	2.1	10.1	1742.2
3.80	3.8	123.9	19.66	2.0	9.8	1704.7
3.90	3.9	127.9	19.04	1.9	9.5	1670.3
4.00	4.0	132.0	18.45	1.8	9.3	1638.8
4.10	4.1	136.1	17.90	1.7	9.1	1609.9
4.20	4.2	140.3	17.37	1.7	8.9	1583.6

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
4.30	4.3	144.5	16.86	1.6	8.7	1559.7
4.40	4.4	148.7	16.38	1.5	8.6	1538.0
4.50	4.5	153.0	15.92	1.5	8.4	1518.4
4.60	4.6	157.3	15.48	1.4	8.3	1500.8
4.70	4.7	161.7	15.07	1.4	8.2	1485.2
4.80	4.8	166.1	14.67	1.3	8.1	1471.4
4.90	4.9	170.5	14.29	1.3	8.1	1459.3
5.00	5.0	175.0	13.92	1.2	8.0	1448.9
5.10	5.1	179.5	13.57	1.2	8.0	1440.1
5.20	5.2	184.1	13.23	1.2	7.9	1432.9
5.30	5.3	188.7	12.91	1.1	7.9	1427.1
5.40	5.4	193.3	12.60	1.1	7.9	1422.8
5.50	5.5	198.0	12.30	1.1	7.9	1419.8
5.60	5.6	202.7	12.02	1.0	7.8	1418.2
5.70	5.7	207.5	11.74	1.0	7.8	1417.8
5.80	5.8	212.3	11.48	1.0	7.8	1418.7
5.90	5.9	217.1	11.22	0.9	7.9	1420.8
6.00	6.0	222.0	10.97	0.9	7.9	1424.1
6.10	6.1	226.9	10.74	0.9	7.9	1428.6
6.20	6.2	231.9	10.51	0.9	7.9	1434.1
6.30	6.3	236.9	10.28	0.8	7.9	1440.8
6.40	6.4	241.9	10.07	0.8	8.0	1448.5
6.50	6.5	247.0	9.86	0.8	8.0	1457.3
6.60	6.6	252.1	9.66	0.8	8.0	1467.1
6.70	6.7	257.3	9.47	0.7	8.1	1477.9
6.80	6.8	262.5	9.28	0.7	8.1	1489.7
6.90	6.9	267.7	9.10	0.7	8.2	1502.5
7.00	7.0	273.0	8.92	0.7	8.2	1516.2
7.10	7.1	278.3	8.75	0.7	8.3	1530.9
7.20	7.2	283.7	8.59	0.7	8.3	1546.5
7.30	7.3	289.1	8.43	0.6	8.4	1563.0
7.40	7.4	294.5	8.27	0.6	8.5	1580.4
7.50	7.5	300.0	8.12	0.6	8.5	1598.7
7.60	7.6	305.5	7.97	0.6	8.6	1617.8
7.70	7.7	311.1	7.83	0.6	8.7	1637.9
7.80	7.8	316.7	7.69	0.6	8.7	1658.8
7.90	7.9	322.3	7.56	0.6	8.8	1680.6
8.00	8.0	328.0	7.43	0.5	8.9	1703.2
8.10	8.1	333.7	7.30	0.5	8.9	1726.6
8.20	8.2	339.5	7.18	0.5	9.0	1750.9
8.30	8.3	345.3	7.06	0.5	9.1	1776.1
8.40	8.4	351.1	6.94	0.5	9.1	1802.0
8.50	8.5	357.0	6.82	0.5	9.2	1828.8
8.60	8.6	362.9	6.71	0.5	9.3	1856.3
8.70	8.7	368.9	6.60	0.5	9.4	1884.7
8.80	8.8	374.9	6.50	0.5	9.5	1913.9
8.90	8.9	380.9	6.40	0.4	9.5	1943.9
9.00	9.0	387.0	6.29	0.4	9.6	1974.7
9.10	9.1	393.1	6.20	0.4	9.7	2006.3
9.20	9.2	399.3	6.10	0.4	9.8	2038.7
9.30	9.3	405.5	6.01	0.4	9.9	2071.9
9.40	9.4	411.7	5.92	0.4	9.9	2105.8

WSEL FT	DEPTH INC. FT	FLOW AREA SQ. FT.	FLOW VEL FPS	FROUDE NO.	E	M CU. FT.
9.50	9.5	418.0	5.83	0.4	10.0	2140.6
9.60	9.6	424.3	5.74	0.4	10.1	2176.1
9.70	9.7	430.7	5.66	0.4	10.2	2212.5
9.80	9.8	437.1	5.57	0.4	10.3	2249.6
9.90	9.9	443.5	5.49	0.4	10.4	2287.5
10.00	10.0	450.0	5.41	0.4	10.5	2326.2
10.10	10.1	456.5	5.34	0.4	10.5	2365.7
10.20	10.2	463.1	5.26	0.3	10.6	2405.9
10.30	10.3	469.7	5.19	0.3	10.7	2447.0
10.40	10.4	476.3	5.11	0.3	10.8	2488.8
10.50	10.5	483.0	5.04	0.3	10.9	2531.4
10.60	10.6	489.7	4.97	0.3	11.0	2574.8
10.70	10.7	496.5	4.91	0.3	11.1	2619.0
10.80	10.8	503.3	4.84	0.3	11.2	2664.0
10.90	10.9	510.1	4.78	0.3	11.3	2709.7
11.00	11.0	517.0	4.71	0.3	11.3	2756.3
11.10	11.1	523.9	4.65	0.3	11.4	2803.6
11.20	11.2	530.9	4.59	0.3	11.5	2851.8
11.30	11.3	537.9	4.53	0.3	11.6	2900.7
11.40	11.4	544.9	4.47	0.3	11.7	2950.4
11.50	11.5	552.0	4.41	0.3	11.8	3000.9
11.60	11.6	559.1	4.36	0.3	11.9	3052.2
11.70	11.7	566.3	4.30	0.3	12.0	3104.3

APPENDIX C: Section 9

Summary of the Source of Input Parameters Used in the Revised Conditions Models

The source of input parameters used in the revised conditions models are listed below:

1. As-built drawings from channelization projects of the North La Cueva Arroyo on the west side of I-25 were used to develop cross sections. Copies of these engineering drawings are included in Volume 3 of the LOMR.

2. As-built drawings for the South El Camino Diversion were used to develop cross sections for the model. Copies of these engineering drawings are included in Volume 4 of this LOMR.

3. A momentum balance analysis for the North La Cueva and South El Camino Diversion confluence provided information for the water surface elevation just downstream of the confluence. The calculations for this are provided in Appendix C.

4. The 100-year flows were used in the HEC-2 models. These were developed by RTI. Documentation and results for the hydrology used are included in Appendix A.

5. A momentum balance analysis for the North La Cueva and South La Cueva confluence provided information for the water surface elevation just downstream of the confluence. The calculations for this are provided in Appendix C.

Appendix D

APPENDIX D

Form 4 : Riverine Hydraulic Analysis Form #3
South La Cueva Arroyo, East of I-25

Backup Data

1. Disk #4: diskette containing the HEC-2 computer model input and output files for the 100-year recurrence interval.

2. HEC-2 output for the revised conditions model for the South La Cueva Arroyo located east of I-25.

3. Calculations and HEC-2 models for water surface elevations at braided sections of the arroyo. (Note: there are four HEC-2 models included in this section).

4. Summary of the source of input parameters used in the revised conditions model.

APPENDIX D: Section 1

HEC-2 Computer Model Input And Output Files For The 100-Year Recurrence Interval

APPENDIX D: Section 2

HEC-2 Output
for the Revised Conditions Model for the
South La Cueva Arroyo Located East of I-25

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    21JUN96    TIME    9:41:34  *
*******************************************
```


```
************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
```


```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX


:::::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::::
:::                                         :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION    :::
:::                                         :::
:::::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::::
```


```
============================
H A E S T A D   M E T H O D S
============================
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 21JUN96 9:41:34

```
**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**********************************


T1       BOHANNAN-HUSTON INC.
T1       FEMA STUDY FOR THE LA CUEVA & S EL CAMINO LOMR (ALBUQUERQUE, NM)
T1       DATE: 05/06/96
T2       FILENAME: SLCREV.HC2  SUPER-CRITICAL
T2       SOUTH LA CUEVA ARROYO: I-25 TO WYOMING BLVD.
T2       STARTING WATER SURFACE ELEV AT CRITICAL DEPTH
T2       SUPER CRITICAL RUN
T2       PLOT FLOODPLAIN WITH CRITICAL WATER SURFACE ELEV
T2       MANNING'S N VALUES KEPT CONSISTENT WITH NORTH LA CUEVA HEC-2 RUN BY RTI
T2       FLOW FROM RTI'S AHYMO RUN LC100C.HYM, BASIN 117.2 (5/28/96)
T2       BULKING FACTOR FOR SEDIMENT ADDED TO FLOW USED
T2       TOTAL FLOW FOR BASIN=196 CFS; THOUGH HIGH, USED THIS FLOW FOR WHOLE BASI
T3       100 YEAR FLOW

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

         0         2         0         1        -1

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       1         0        -1       0.0       0.0       0.0        -1       0.0       0.0

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

      38        39        42        51        43         1         2         3         5         4
       8        26        25

NC    0.050     0.050     0.038       0.1       0.3
QT        1       196
          CROSS SECTION O-O
          CROSS SECTION JUST EAST OF WYOMING
X1     6560        23    500.00    590.00     200.0     200.0     200.0         0         0         0
X3       10
GR   5388.0    500.00   5386.00    520.00   5385.90    524.00   5386.00    528.00   5386.80    540.00
GR   5387.0    542.00   5386.00    550.00   5385.90    555.00   5386.00    558.00   5388.00    590.00
GR   5390.0    630.00   5390.10    640.00   5390.00    650.00   5389.00    680.00   5389.00    695.00
GR   5390.0    720.00   5390.30    735.00   5390.00    745.00   5388.00    770.00   5387.20    780.00
GR   5388.0    790.00   5390.00    812.00   5391.80    845.00
```

```
          CROSS SECTION N-N
X1      6360         19      590.00      640.00      200.0       200.0       200.0       0           0           0
X3        10
GR    5384.0      500.00    5384.20     530.00     5384.00     540.00     5382.00     555.00     5381.00     560.00
GR    5380.5      570.00    5381.00     580.00     5381.20     590.00     5381.00     600.00     5380.00     610.00
GR    5379.9      615.00    5380.00     622.00     5380.80     640.00     5380.40     655.00     5380.50     680.00
GR    5380.0      690.00    5379.00     720.00     5380.00     740.00     5381.00     770.00

          CROSS SECTION M-M
X1      6160         35      560.00      695.00      255.0       255.0       255.0       0           0
X3        10
GR    5377.6      500.00    5377.00     520.00     5376.00     532.00     5375.00     540.00     5374.50     548.00
GR    5375.0      552.00    5375.60     560.00     5375.30     580.00     5375.00     590.00     5374.00     598.00
GR    5374.8      610.00    5374.00     625.00     5374.00     640.00     5375.00     655.00     5376.00     672.00
GR    5376.8      695.00    5376.00     720.00     5375.00     740.00     5376.00     765.00     5376.60     805.00
GR    5376.0      840.00    5375.90     850.00     5376.00     860.00     5376.20     880.00     5376.10     920.00
GR    5376.0      955.00    5376.00     980.00     5374.00    1070.00     5374.50    1090.00     5374.00    1115.00
GR    5374.1     1125.00    5374.00    1138.00     5374.00    1140.00     5376.00    1170.00     5378.00    1280.00

          CROSS SECTION L2-L2
          LOCATED IN GRADED REACH OF CHANNEL
          SECTION REQUIRED IN MODEL TO ASSURE TRANSITION BETWEEN M AND L
X1      5905         14      638.00      790.00      305.0       305.0       305.0       0           0
X3        10
GR    5368.0      500.00    5368.50     535.00     5368.00     555.00     5367.30     570.00     5368.00     580.00
GR    5368.3      600.00    5368.00     625.00     5368.20     638.00     5368.00     645.00     5367.00     685.00
GR    5366.7      705.00    5367.00     730.00     5368.00     780.00     5368.10     790.00

          CROSS SECTION L-L
          LOCATED APPROX. 1000 FEET WEST OF WYOMING
          THE CHANNEL HAS BEEN GRADED OVER BETWEEN L-L AND M-M
X1      5600         36      680.00      800.00      240.0       240.0       240.0       0           0           0
X3        10
GR    5357.4      500.00    5357.00     530.00     5356.60     565.00     5357.00     590.00     5357.50     610.00
GR    5357.4      620.00    5357.80     680.00     5357.00     700.00     5356.00     725.00     5355.60     735.00
GR    5355.2      765.00    5356.00     770.00     5357.00     790.00     5357.50     800.00     5357.00     820.00
GR    5356.0      835.00    5355.00     860.00     5354.20     875.00     5354.50     900.00     5355.00     920.00
GR    5355.4      955.00    5355.00     970.00     5354.80     990.00     5355.00    1010.00     5356.00    1050.00
GR    5356.5     1060.00    5356.00    1070.00     5355.80    1072.00     5356.00    1076.00     5357.00    1088.00
GR    5357.0     1100.00    5356.00    1110.00     5355.80    1115.00     5356.00    1120.00     5356.50    1130.00
GR    5357.0     1180.00

          CROSS SECTION K-K
X1      5360         38      765.00      860.00      400.0       400.0       400.0       0           0           0
X3        10
GR    5348.7      500.00    5348.50     515.00     5348.25     525.00     5348.50     535.00     5348.75     550.00
GR    5348.5      560.00    5348.00     580.00     5348.00     595.00     5348.50     610.00     5348.50     625.00
GR    5348.8      670.00    5348.50     710.00     5348.50     765.00     5348.50     790.00     5348.00     810.00
GR    5347.2      830.00    5348.00     850.00     5348.50     860.00     5348.00     870.00     5347.00     900.00
GR    5348.0      925.00    5349.00     965.00     5349.30     985.00     5349.00    1015.00     5348.70    1045.00
GR    5349.0     1080.00    5348.80    1090.00     5349.00    1095.00     5349.50    1115.00     5349.00    1130.00
GR    5348.8     1132.00    5349.00    1135.00     5350.00    1140.00     5350.00    1145.00     5349.80    1155.00
GR    5350.0     1165.00    5351.00    1205.00     5352.00    1240.00
```

CROSS SECTION J-J

X1	4960	37	780.00	920.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5337.2	500.00	5337.00	520.00	5336.80	528.00	5337.00	535.00	5337.50	545.00
GR	5337.6	560.00	5337.50	572.00	5337.00	590.00	5338.00	610.00	5336.00	620.00
GR	5335.5	645.00	5335.50	650.00	5336.00	660.00	5337.00	685.00	5338.00	710.00
GR	5337.0	740.00	5336.00	770.00	5336.50	780.00	5336.00	790.00	5335.00	810.00
GR	5335.0	825.00	5336.00	845.00	5338.00	860.00	5338.80	920.00	5338.00	955.00
GR	5337.0	970.00	5336.60	985.00	5337.00	1005.00	5338.00	1075.00	5337.00	1090.00
GR	5337.0	1095.00	5337.80	1110.00	5337.00	1130.00	5336.80	1132.00	5337.00	1135.00
GR	5338.0	1145.00	5338.50	1185.00						

CROSS SECTION I-I

X1	4660	41	620.00	990.00	350.0	350.0	350.0	0	0	0.0
X3	10									
GR	5329.1	500.00	5330.00	575.00	5329.20	605.00	5330.00	620.00	5329.00	660.00
GR	5328.0	680.00	5327.00	700.00	5327.00	705.00	5327.50	720.00	5327.00	738.00
GR	5326.8	740.00	5327.00	745.00	5327.50	755.00	5327.50	775.00	5327.00	790.00
GR	5326.8	795.00	5327.00	800.00	5328.00	820.00	5328.20	825.00	5328.00	830.00
GR	5327.0	840.00	5326.00	845.00	5325.80	855.00	5326.00	865.00	5328.00	875.00
GR	5329.0	890.00	5330.00	920.00	5330.00	930.00	5331.00	970.00	5331.20	990.00
GR	5331.0	1010.00	5330.00	1035.00	5329.00	1060.00	5329.40	1072.00	5329.00	1085.00
GR	5328.8	1095.00	5329.00	1105.00	5329.50	1115.00	5329.00	1130.00	5328.20	1138.00
GR	5329.0	1148.00								

CROSS SECTION H-H

X1	4310	42	620.00	870.00	270.0	270.0	270.0	0	0	0
X3	10									
GR	5317.7	500.00	5317.00	540.00	5316.70	550.00	5317.00	560.00	5317.50	580.00
GR	5317.0	590.00	5316.70	600.00	5317.00	615.00	5317.90	620.00	5317.50	635.00
GR	5317.0	670.00	5316.00	680.00	5315.25	690.00	5315.25	710.00	5316.00	725.00
GR	5317.0	735.00	5318.00	750.00	5318.00	768.00	5318.40	780.00	5318.00	800.00
GR	5317.0	810.00	5317.00	812.00	5318.00	820.00	5320.00	840.00	5320.00	845.00
GR	5321.0	870.00	5321.30	940.00	5321.20	1005.00	5321.00	1030.00	5320.50	1045.00
GR	5320.0	1060.00	5319.00	1080.00	5318.00	1090.00	5317.00	1100.00	5316.80	1115.00
GR	5316.0	1135.00	5315.90	1137.00	5316.00	1140.00	5318.00	1148.00	5320.00	1163.00
GR	5320.0	1165.00	5320.30	1180.00						

CROSS SECTION G-G

X1	4040	23	615.00	790.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5311.0	500.00	5311.25	515.00	5311.00	530.00	5310.50	540.00	5310.75	565.00
GR	5310.0	590.00	5309.25	600.00	5310.00	615.00	5309.00	630.00	5308.00	650.00
GR	5307.0	670.00	5307.00	675.00	5308.00	700.00	5309.00	725.00	5310.00	740.00
GR	5310.8	790.00	5310.50	840.00	5310.80	900.00	5310.70	940.00	5311.00	985.00
GR	5311.8	1020.00	5311.00	1050.00	5310.00	1090.00				

CROSS SECTION F-F

FIRST CROSS SECTION WEST OF LOUSIANA

X1	3640	29	555.00	640.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5297.0	500.00	5297.80	520.00	5297.60	540.00	5298.00	550.00	5299.00	555.00
GR	5298.0	560.00	5296.00	565.00	5295.00	575.00	5294.80	580.00	5295.00	600.00
GR	5296.0	625.00	5297.00	630.00	5298.00	640.00	5298.50	680.00	5298.70	725.00
GR	5299.0	730.00	5299.40	760.00	5299.00	790.00	5298.00	800.00	5297.00	810.00
GR	5296.0	820.00	5295.90	822.00	5296.00	825.00	5297.00	835.00	5298.00	845.00
GR	5300.0	865.00	5301.00	890.00	5301.50	920.00	5302.00	960.00		

CROSS SECTION E-E

X1	3340	34	518.00	590.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5288.0	500.00	5289.00	506.00	5290.00	512.00	5290.10	518.00	5290.00	520.00
GR	5289.0	530.00	5288.00	535.00	5286.00	548.00	5285.00	555.00	5284.80	560.00
GR	5285.0	565.00	5286.00	570.00	5287.00	575.00	5288.00	580.00	5288.20	590.00
GR	5288.0	600.00	5287.00	620.00	5286.80	625.00	5287.00	630.00	5287.80	650.00
GR	5287.5	670.00	5287.00	690.00	5286.50	720.00	5286.00	760.00	5285.00	775.00
GR	5284.0	790.00	5283.00	800.00	5282.00	810.00	5281.60	820.00	5282.00	830.00
GR	5283.0	850.00	5284.00	865.00	5285.00	880.00	5286.00	895.00		

CROSS SECTION D-D

X1	3040	21	630.00	720.00	350.0	350.0	350.0	0	0	0
X3	10									
GR	5279.0	500.00	5278.00	550.00	5279.00	560.00	5279.50	565.00	5279.00	570.00
GR	5278.0	580.00	5277.60	585.00	5278.00	600.00	5278.75	630.00	5278.00	660.00
GR	5277.5	670.00	5277.10	680.00	5277.50	690.00	5278.00	700.00	5278.60	720.00
GR	5278.0	730.00	5277.00	790.00	5276.00	825.00	5274.80	840.00	5276.00	875.00
GR	5276.4	905.00								

CROSS SECTION C-C

X1	2690	20	700.00	930.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5271.0	500.00	5270.50	535.00	5270.50	650.00	5270.75	700.00	5270.50	720.00
GR	5270.0	740.00	5269.00	775.00	5268.50	815.00	5269.00	830.00	5270.00	850.00
GR	5270.5	855.00	5270.00	860.00	5269.00	870.00	5270.00	878.00	5272.00	930.00
GR	5273.0	970.00	5273.20	980.00	5273.10	1025.00	5273.50	1095.00	5273.00	1205.00

CROSS SECTION B-B

X1	2290	25	790.00	970.00	190.0	190.0	190.0	0	0	0
X3	10									
GR	5264.0	500.00	5263.00	575.00	5262.50	730.00	5263.00	750.00	5264.00	775.00
GR	5264.3	790.00	5264.00	810.00	5262.00	850.00	5261.00	880.00	5260.80	890.00
GR	5261.0	920.00	5261.80	970.00	5261.00	1005.00	5260.00	1020.00	5258.00	1055.00
GR	5260.0	1100.00	5260.20	1120.00	5260.00	1180.00	5259.00	1195.00	5258.80	1200.00
GR	5259.0	1220.00	5260.00	1255.00	5258.00	1290.00	5260.00	1325.00	5261.00	1350.00

CROSS SECTION A-A
FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT

```
          LOCATED APPROX. 2100 FEET EAST OF I-25
X1      2100          42      910.00     1065.00       600.0       600.0       600.0         0           0           0
X3        10
GR    5257.4      500.00    5257.00      505.00    5256.00      515.00    5255.50      525.00    5256.00      535.00
GR    5256.5      570.00    5256.00      610.00    5255.60      640.00    5255.70      730.00    5256.00      770.00
GR    5256.2      790.00    5256.00      810.00    5254.00      840.00    5253.20      880.00    5254.00      895.00
GR    5254.8      910.00    5254.00      925.00    5253.90      935.00    5254.00      950.00    5253.80      965.00
GR    5254.0      970.00    5256.00      990.00    5257.00     1040.00    5257.20     1065.00    5257.00     1090.00
GR    5256.0     1115.00    5255.00     1130.00    5254.60     1140.00    5255.00     1150.00    5256.00     1165.00
GR    5257.0     1190.00    5258.00     1265.00    5256.00     1305.00    5255.90     1310.00    5256.00     1315.00
GR    5258.0     1385.00    5256.00     1415.00    5255.40     1430.00    5255.90     1440.00    5256.00     1455.00
GR    5258.0     1480.00    5260.00     1505.00

NC     0.050       0.050       0.017         0.1         0.3
          ADDED LAST THREE DOWNSTREAM SECTIONS TO SEE WHAT HAPPENS
          WHEN FLOW SPREADS OUT, NO DEFINED CHANNEL
          CROSS SECTION A1-A1
X1      1500          13      500.00      850.00       600.0       600.0       600.0         0           0           0
X3        10
GR    5240.8      500.00    5240.00      510.00    5238.00      540.00    5237.90      545.00    5238.00      550.00
GR    5238.6      560.00    5238.40      590.00    5238.20      630.00    5238.20      670.00    5238.30      710.00
GR    5238.7      750.00    5239.00      770.00    5239.50      850.00

          CROSS SECTION A2-A2
X1       900           6      500.00      795.00       500.0       500.0       500.0         0           0           0
X3        10
GR    5223.8      500.00    5223.00      590.00    5222.40      650.00    5223.00      710.00    5224.00      750.00
GR    5224.2      795.00

          CROSS SECTION A3-A3
X1       400           9      500.00      850.00         0.0         0.0         0.0         0           0           0
X3        10
GR    5210.5      500.00    5210.00      560.00    5209.20      605.00    5208.00      670.00    5206.00      705.00
GR    5205.5      715.00    5206.00      722.00    5208.00      730.00    5210.00      850.00
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 6560.000
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5388.00 ELREA= 5388.00

CROSS SECTION O-O
CROSS SECTION JUST EAST OF WYOMING

6560.000	1.12	5387.02	5387.02	0.00	5387.35	0.33	0.00	0.00	5388.00
196.0	0.0	196.0	0.0	0.0	42.2	0.0	0.0	0.0	5388.00
0.00	0.00	4.64	0.00	0.000	0.038	0.000	0.000	5385.90	509.84
0.024873	0.	0.	0.	0	7	0	0.00	64.41	574.25

*SECNO 6360.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5381.20 ELREA= 5380.80

CROSS SECTION N-N

6360.000	0.89	5380.79	5380.80	0.00	5382.23	1.44	9.81	3.07	5381.20
196.0	0.0	196.0	0.0	0.0	20.4	0.0	0.1	0.2	5380.80
0.01	0.00	9.62	0.00	0.000	0.038	0.000	0.000	5379.90	602.06
0.138318	200.	200.	200.	20	43	0	0.00	37.81	639.87

*SECNO 6160.000

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5375.60 ELREA= 5376.80

CROSS SECTION M-M

6160.000	0.99	5374.99	5374.99	0.00	5375.33	0.33	9.82	8.53	5375.60
196.0	0.0	196.0	0.0	0.0	42.3	0.0	0.3	0.5	5376.80
0.02	0.00	4.63	0.00	0.000	0.038	0.000	0.000	5374.00	590.05
0.024913	200.	200.	200.	20	8	0	0.00	64.85	654.90

*SECNO 5905.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5368.20 ELREA= 5368.10

CROSS SECTION L2-L2
LOCATED IN GRADED REACH OF CHANNEL
SECTION REQUIRED IN MODEL TO ASSURE TRANSITION BETWEEN M AND L

5905.000	0.84	5367.54	5367.58	0.00	5367.85	0.31	7.47	0.01	5368.20
196.0	0.0	196.0	0.0	0.0	44.2	0.0	0.5	0.9	5368.10
0.03	0.00	4.43	0.00	0.000	0.038	0.000	0.000	5366.70	663.38
0.034956	255.	255.	255.	3	11	0	0.00	93.65	757.03

*SECNO 5600.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5357.80 ELREA= 5357.50

CROSS SECTION L-L
LOCATED APPROX. 1000 FEET WEST OF WYOMING
THE CHANNEL HAS BEEN GRADED OVER BETWEEN L-L AND M-M

5600.000	1.06	5356.26	5356.37	0.00	5356.74	0.48	11.09	0.02	5357.80
196.0	0.0	196.0	0.0	0.0	35.4	0.0	0.8	1.5	5357.50
0.05	0.00	5.54	0.00	0.000	0.038	0.000	0.000	5355.20	718.43
0.037863	305.	305.	305.	4	16	0	0.00	56.82	775.25

*SECNO 5360.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5348.50 ELREA= 5348.50

CROSS SECTION K-K

5360.000	1.27	5348.47	5348.54	0.00	5348.82	0.35	7.88	0.04	5348.50
196.0	0.0	196.0	0.0	0.0	41.3	0.0	1.0	1.8	5348.50
0.06	0.00	4.75	0.00	0.000	0.038	0.000	0.000	5347.20	791.29
0.028766	240.	240.	240.	7	23	0	0.00	68.07	859.36

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4960.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5336.50 ELREA= 5338.80

CROSS SECTION J-J

4960.000	1.03	5336.03	5336.10	0.00	5336.48	0.45	12.33	0.01	5336.50
196.0	0.0	196.0	0.0	0.0	36.5	0.0	1.4	2.4	5338.80
0.08	0.00	5.36	0.00	0.000	0.038	0.000	0.000	5335.00	789.44
0.033097	400.	400.	400.	3	15	0	0.00	55.77	845.21

*SECNO 4660.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5330.00 ELREA= 5331.20

CROSS SECTION I-I

4660.000	1.46	5327.26	5327.26	0.00	5327.52	0.26	9.12	4.20	5330.00
196.0	0.0	196.0	0.0	0.0	47.8	0.0	1.7	2.9	5331.20
0.10	0.00	4.10	0.00	0.000	0.038	0.000	0.000	5325.80	694.84
0.028022	300.	300.	300.	20	11	0	0.00	96.09	871.29

*SECNO 4310.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5317.90 ELREA= 5321.00

CROSS SECTION H-H

4310.000	0.97	5316.22	5316.31	0.00	5316.73	0.50	10.77	0.02	5317.90
196.0	0.0	196.0	0.0	0.0	34.5	0.0	2.0	3.5	5321.00
0.12	0.00	5.68	0.00	0.000	0.038	0.000	0.000	5315.25	677.85
0.033946	350.	350.	350.	3	19	0	0.00	49.31	727.15

*SECNO 4040.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5310.00 ELREA= 5310.80

CROSS SECTION G-G

4040.000	1.23	5308.23	5308.25	0.00	5308.60	0.37	8.09	0.04	5310.00
196.0	0.0	196.0	0.0	0.0	40.3	0.0	2.2	3.8	5310.80
0.14	0.00	4.87	0.00	0.000	0.038	0.000	0.000	5307.00	645.37
0.026621	270.	270.	270.	2	11	0	0.00	60.42	705.79

*SECNO 3640.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5299.00 ELREA= 5298.00

CROSS SECTION F-F
FIRST CROSS SECTION WEST OF LOUSIANA

3640.000	1.02	5295.82	5295.93	0.00	5296.30	0.48	12.28	0.01	5299.00
196.0	0.0	196.0	0.0	0.0	35.2	0.0	2.6	4.3	5298.00
0.16	0.00	5.56	0.00	0.000	0.038	0.000	0.000	5294.80	566.71
0.035817	400.	400.	400.	4	11	0	0.00	54.00	620.72

*SECNO 3340.000
3280 CROSS SECTION 3340.00 EXTENDED 0.52 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5290.10 ELREA= 5288.20

CROSS SECTION E-E

3340.000	1.71	5286.51	5286.61	0.00	5287.18	0.67	9.10	0.02	5290.10
196.0	0.0	196.0	0.0	0.0	29.9	0.0	2.8	4.6	5288.20
0.17	0.00	6.56	0.00	0.000	0.038	0.000	0.000	5284.80	544.65
0.026032	300.	300.	300.	3	17	0	0.00	27.94	572.58

*SECNO 3040.000
3280 CROSS SECTION 3040.00 EXTENDED 2.01 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5278.75 ELREA= 5278.60

CROSS SECTION D-D

3040.000	1.30	5278.40	5278.44	0.00	5278.75	0.35	8.34	0.10	5278.75
196.0	0.0	196.0	0.0	0.0	41.3	0.0	3.1	5.0	5278.60
0.19	0.00	4.75	0.00	0.000	0.038	0.000	0.000	5277.10	643.77
0.029735	300.	300.	300.	2	21	0	0.00	69.75	713.52

*SECNO 2690.000

3265 DIVIDED FLOW

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5270.75 ELREA= 5272.00

CROSS SECTION C-C

2690.000	0.96	5269.46	5269.46	0.00	5269.73	0.27	9.84	4.90	5270.75
196.0	0.0	196.0	0.0	0.0	47.0	0.0	3.4	5.6	5272.00
0.21	0.00	4.17	0.00	0.000	0.038	0.000	0.000	5268.50	758.82
0.026603	350.	350.	350.	20	19	0	0.00	88.76	873.70

*SECNO 2290.000
3280 CROSS SECTION 2290.00 EXTENDED 0.65 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5264.30 ELREA= 5261.80

CROSS SECTION B-B

2290.000	0.85	5261.65	5261.65	0.00	5261.89	0.25	10.65	6.50	5264.30
196.0	0.0	196.0	0.0	0.0	49.2	0.0	3.9	6.5	5261.80
0.24	0.00	3.98	0.00	0.000	0.038	0.000	0.000	5260.80	860.61
0.026666	400.	400.	400.	20	12	0	0.00	99.81	960.42

*SECNO 2100.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5254.80 ELREA= 5257.20

CROSS SECTION A-A
FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT
LOCATED APPROX. 2100 FEET EAST OF I-25

2100.000	0.77	5254.57	5254.70	0.00	5255.10	0.53	6.77	0.03	5254.80
196.0	0.0	196.0	0.0	0.0	33.6	0.0	4.0	6.8	5257.20
0.25	0.00	5.84	0.00	0.000	0.038	0.000	0.000	5253.80	914.31
0.049932	190.	190.	190.	4	29	0	0.00	61.39	975.70

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.100 CEHV= 0.300
*SECNO 1500.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3710 WSEL ASSUMED BASED ON MIN DIFF

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5240.80 ELREA= 5239.50

ADDED LAST THREE DOWNSTREAM SECTIONS TO SEE WHAT HAPPENS
WHEN FLOW SPREADS OUT, NO DEFINED CHANNEL
CROSS SECTION A1-A1

1500.000	0.61	5238.51	5238.60	0.00	5238.81	0.30	16.20	0.07	5240.80
196.0	0.0	196.0	0.0	0.0	44.5	0.0	4.6	8.5	5239.50
0.28	0.00	4.40	0.00	0.000	0.017	0.000	0.000	5237.90	532.31
0.016880	600.	600.	600.	20	11	0	0.00	184.40	731.27

*SECNO 900.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.56

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5223.80 ELREA= 5224.20

CROSS SECTION A2-A2

900.000	0.52	5222.92	5223.15	0.00	5223.73	0.81	15.04	0.05	5223.80
196.0	0.0	196.0	0.0	0.0	27.1	0.0	5.1	10.5	5224.20
0.31	0.00	7.22	0.00	0.000	0.017	0.000	0.000	5222.40	597.91
0.041036	600.	600.	600.	6	11	0	0.00	104.18	702.09

*SECNO 400.000

3301 HV CHANGED MORE THAN HVINS

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5210.50 ELREA= 5210.00

CROSS SECTION A3-A3

400.000	1.14	5206.64	5207.11	0.00	5208.20	1.56	15.45	0.07	5210.50
196.0	0.0	196.0	0.0	0.0	19.6	0.0	5.3	11.3	5210.00
0.32	0.00	10.01	0.00	0.000	0.017	0.000	0.000	5205.50	693.77
0.024109	500.	500.	500.	6	23	0	0.00	30.79	724.57

THIS RUN EXECUTED 21JUN96 9:41:37

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR FLOW

SUMMARY PRINTOUT

	SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
*	6560.000	0.00	5385.90	0.00	196.00	5387.02	5387.02	5387.35	248.73	64.41	1.12	4.64	42.2
*	6360.000	200.00	5379.90	-6.22	196.00	5380.79	5380.80	5382.23	1383.18	37.81	0.89	9.62	20.3
*	6160.000	200.00	5374.00	-5.80	196.00	5374.99	5374.99	5375.33	249.13	64.85	0.99	4.63	42.2
	5905.000	255.00	5366.70	-7.45	196.00	5367.54	5367.58	5367.85	349.56	93.65	0.84	4.43	44.2
	5600.000	305.00	5355.20	-11.28	196.00	5356.26	5356.37	5356.74	378.63	56.82	1.06	5.54	35.3
	5360.000	240.00	5347.20	-7.79	196.00	5348.47	5348.54	5348.82	287.66	68.07	1.27	4.75	41.2
	4960.000	400.00	5335.00	-12.43	196.00	5336.03	5336.10	5336.48	330.97	55.77	1.03	5.36	36.5
*	4660.000	300.00	5325.80	-8.78	196.00	5327.26	5327.26	5327.52	280.22	96.09	1.46	4.10	47.7
	4310.000	350.00	5315.25	-11.03	196.00	5316.22	5316.31	5316.73	339.46	49.31	0.97	5.68	34.5
	4040.000	270.00	5307.00	-7.99	196.00	5308.23	5308.25	5308.60	266.21	60.42	1.23	4.87	40.2
	3640.000	400.00	5294.80	-12.41	196.00	5295.82	5295.93	5296.30	358.17	54.00	1.02	5.56	35.2
	3340.000	300.00	5284.80	-9.31	196.00	5286.51	5286.61	5287.18	260.32	27.94	1.71	6.56	29.8
	3040.000	300.00	5277.10	-8.11	196.00	5278.40	5278.44	5278.75	297.35	69.75	1.30	4.75	41.2
*	2690.000	350.00	5268.50	-8.94	196.00	5269.46	5269.46	5269.73	266.03	88.76	0.96	4.17	46.9
*	2290.000	400.00	5260.80	-7.82	196.00	5261.65	5261.65	5261.89	266.66	99.81	0.85	3.98	49.2
	2100.000	190.00	5253.80	-7.08	196.00	5254.57	5254.70	5255.10	499.32	61.39	0.77	5.84	33.5
*	1500.000	600.00	5237.90	-16.06	196.00	5238.51	5238.60	5238.81	168.80	184.40	0.61	4.40	44.5

	SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
*	900.000	600.00	5222.40	-15.60	196.00	5222.92	5223.15	5223.73	410.36	104.18	0.52	7.22	27.1
	400.000	500.00	5205.50	-16.27	196.00	5206.64	5207.11	5208.20	241.09	30.79	1.14	10.01	19.5

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=   6560.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=   6360.000  PROFILE=  1  WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=   6360.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   6160.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   6160.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   6160.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4660.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4660.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4660.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2690.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2690.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2690.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2290.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2290.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2290.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   1500.000  PROFILE=  1  WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO=   1500.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=    900.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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APPENDIX D: Section 3

Calculations And HEC-2 Models For Water Surface Elevations At Braided Sections Of The Arroyo

(Note: There Are Four HEC-2 Models Included In This Section).

(*) S. LA CUEVA - EAST OF I-25.

SLC. HC2

(A) LOOK AT SECTIONS I-I (STA 4660) AND H-H (STA 4310)

- Braided Stream - Flow can go to either N or S Channel.
- Discussion with Dan 5/29/96
  - Change banks and look at at if total flow goes all to N. Channel and all to S. Channel.
- 6/3/96 ~ Can input as "split" ~best estimate given HEC-2 results and data

RUN 1 SLC1.HC2

- All flow to N channel of Braided Stream

- Section I-I (# 4660)

		elev
LB	STA = 805	(5325.2 Ft)
RB	STA = 870	(5329.0 Ft)

• CRWS = 5327.22'

*Stays in northern channel.

Depth = 1.42'

- Section H-H (#4310)

		elev
LB	STA = 780	(5318.4 Ft)
RB	STA = 840	(5320.0 Ft)

• x3 card method elevations start at 5319.0

• CRWS = 5326.7'

• 0.3 Ft above LB STA

• weir flows split into southern channel.

Depth = 1.7'

BOHANNAN-HUSTON INC.

PROJECT NAME Lom. R. SHEET 1 OF 4

PROJECT NO 96155C1.2107 BY Sig DATE 5/29/96

SUBJECT S. LA CUEVA - EAST OF I-25 CH'D [illegible] DATE 6/25/96

RUN 2 – S. LA CUEVA -EAST OF I-25

SLC2.HC2

-All Flow to S. Channel of Braided Stream.

-Section I-I (#4660)

• CRIWS= 5327.66'

		elev	
LB STA =	660	(5329.0')	*flow stays in southern channel
RB STA =	825	(5328.2')	

Depth = 0.86'

-Section H-H (#4310)

LB STA =	620	(5317.9')	•CRIWS = 5316.21'
RB STA =	780	(5318.4')	

*Flow stays in Southern Channel

Depth = 1.39'

Floodplain Boundaries for Sects. I-I and H-H

• I-I (4660) →	LB (Channel)	elev =	5327.7'	(SLC2.HC2)
	RB (R. Channel)	elev =	5327.2'	(SLC1.HC2)
• H-H (4310) →	LE	elev =	5316.31'	(SLC1.HC2)
	RE	elev =	5318.4'	(SLC1.HC2)

*Assume use for N. and S. Channels

*Small flow between I-I and H-H

BOHANNAN-HUSTON INC.

PROJECT NAME S.L.C. – SHEET 2 OF 4

PROJECT NO 96155C1.2107 BY SJO DATE 5/20/96

SUBJECT S. La Cueva - East of I-25 - HEC-2 CH'D DAD DATE 6/3/96

* S. LA CUEVA - EAST OF I-25

(E) LOOK AT SECTIONS C-C, B-B, AND A-A.
- Again, braided stream, flow can go either to N. or S. channel.
- look at total flow going to N. Channel and to S. Channel.

RUN 3 — SLC3.HC2

* Sect H-H and I-I left as is in original HEC-2 run (SLC.HC2)

- All Flow to N. Channel

-Section C-C (# 2690)

LB STA = 855 (5270.5 Ft)

RB STA = 930 (5272 Ft)

• CRIWS = 5270.87'

• 0.37' over LB ~ weir flow to S. channel (Depth = 1.87')

divided Q to add ~ X3 card ~ 5272 Ft for elev

-Section B-B (# 2290)

LB STA = 970 (5261.85 Ft)

RB STA = 1120 (5260.27 Ft)

Depth = 1.42'

CRIWS = 5259.42'

-Section A-A (± 2100)

LB STA = 1065 (5257.2 Ft)

RB STA = 1265 (5255.8 Ft)

Depth = 1.41'

CRIWS = 5256'

BOHANNAN-HUSTON INC.

PROJECT NAME LDR

SHEET 3 OF 4

PROJECT NO 96155C1.2107

BY SIG DATE 8/25/96

SUBJECT S. La Cueva - East of I-25

CH'D [illegible] DATE 8/26/96

S. LA CUEVA - EAST OF I-25

RUN-4 SLCH. HC2 Sect C-C, B-B, + A-A

- all flow to Southern channel

-Section C-C (#2690)

LB STA = 700 (5270.75 Ft)

RB STA = 855 (5270.5 Ft)

Depth = 0.97 Ft

CRIWS = 5269.47'

-Section B-B (#2290)

LB STA = 810 (5261.0 Ft)

RB STA = 970 (5260.8 Ft)

Depth = 0.85'

CRIWS = 5261.65'

-Section A-A (#2100)

LB STA = 910 (5251.5 Ft)

RB STA = 1065 (5257.2 Ft)

Depth = 0.77'

CRIWS = 5254.7'

Floodplain

Section C-C LB ~ elev = 5260.47' (SLCH HC2)

RB ~ elev = 5260.84' (SLCH HC2)

Section B-B S. channel ~ elev = 5259.5' (SLCH HC2)

N channel ~ elev = 5259.42' (SLCH HC2)

Section A-A S. channel ~ elev = 5254.1'

N. Channel ~ elev = 5254.7'

BOHANNAN-HUSTON INC.

PROJECT NAME LOMR SHEET 4 OF 4

PROJECT NO. 96155C1.2107 BY SJC DATE 5/29/96

SUBJECT S. La Cueva - C. of I-25 - HC2 CH'D [illegible] DATE 8/20/96

HEC2 1363001424 HMVersion: 6.52 Data File: E:\HE LC\SLC1.HC2

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    21JUN96    TIME    9:52:06 *
*******************************************
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************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
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X     X  XXXXXXX   XXXXX             XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
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:::                                         :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
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H A E S T A D  M E T H O D S
============================
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

- HEC-2 MODEL FOR DETERMINING FLOODPLAIN BOUNDARIES AT BRAIDED SECTION OF SOUTH LA CUEVA. SECTIONS 4/660 AND 9310.
- THIS MODEL IS FOR ALL FLOW GOING TO NORTHERN PATH OF BRAIDED STREAM

THIS RUN EXECUTED 21JUN96 9:52:06

```
**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**********************************


T1       BOHANNAN-HUSTON INC.
T1       FEMA STUDY FOR THE N. LA CUEVA LOMR (ALBUQUERQUE, NM)
T1       DATE: 05/29/96
T2       FILENAME: SLC1.HC2  SUPER-CRITICAL
T2       SOUTH LA CUEVA ARROYO 2100 FT EAST OF I-25 TO 1000 FT WEST OF WYOMING
T2       STARTING WATER SURFACE ELEV AT CRITICAL DEPTH
T2       BRAIDED STREAM AT SECTIONS 4660 AND 4310. THIS HEC-2 RUN LOOKS AT
T2       ALL FLOW AT THESE SECTIONS GOING INTO NORTHERN CHANNEL OF BRAIDED STR.
T2       SUPER CRITICAL RUN
T2       MANNING'S N VALUES KEPT CONSISTENT WITH NORTH LA CUEVA HEC-2 RUN BY RTI
T2       FLOW FROM RTI'S AHYMO RUN LC100C.HYM, BASIN 117.2 (5/28/96)
T2       TOTAL FLOW FOR BASIN=196 CFS; THOUGH HIGH, USED THIS FLOW FOR WHOLE BASI
T3       100 YEAR FLOW

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

         0         2         0         1        -1

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       1         0        -1       0.0       0.0       0.0        -1       0.0       0.0

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

       38        39        42        51        43         1         2         3         5         4
        8        26        25

NC     0.050     0.050     0.038       0.1       0.3
QT         1       196
           CROSS SECTION L-L
           LOCATED APPROX. 1000 FEET WEST OF WYOMING
           THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION
X1      5600        36    680.00    800.00     240.0     240.0     240.0         0         0         0
X3        10
GR    5357.4    500.00   5357.00    530.00   5356.60    565.00   5357.00    590.00   5357.50    610.00
GR    5357.4    620.00   5357.80    680.00   5357.00    700.00   5356.00    725.00   5355.60    735.00
GR    5355.2    765.00   5356.00    770.00   5357.00    790.00   5357.50    800.00   5357.00    820.00
GR    5356.0    835.00   5355.00    860.00   5354.20    875.00   5354.50    900.00   5355.00    920.00
GR    5355.4    955.00   5355.00    970.00   5354.80    990.00   5355.00   1010.00   5356.00   1050.00
GR    5356.5   1060.00   5356.00   1070.00   5355.80   1072.00   5356.00   1076.00   5357.00   1088.00
GR    5357.0   1100.00   5356.00   1110.00   5355.80   1115.00   5356.00   1120.00   5356.50   1130.00
GR    5357.0   1180.00
```

CROSS SECTION K-K

X1	5360	38	765.00	860.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5348.7	500.00	5348.50	515.00	5348.25	525.00	5348.50	535.00	5348.75	550.00
GR	5348.5	560.00	5348.00	580.00	5348.00	595.00	5348.50	610.00	5348.50	625.00
GR	5348.8	670.00	5348.50	710.00	5348.50	765.00	5348.50	790.00	5348.00	810.00
GR	5347.2	830.00	5348.00	850.00	5348.50	860.00	5348.00	870.00	5347.00	900.00
GR	5348.0	925.00	5349.00	965.00	5349.30	985.00	5349.00	1015.00	5348.70	1045.00
GR	5349.0	1080.00	5348.80	1090.00	5349.00	1095.00	5349.50	1115.00	5349.00	1130.00
GR	5348.8	1132.00	5349.00	1135.00	5350.00	1140.00	5350.00	1145.00	5349.80	1155.00
GR	5350.0	1165.00	5351.00	1205.00	5352.00	1240.00				

CROSS SECTION J-J

X1	4960	37	780.00	920.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5337.2	500.00	5337.00	520.00	5336.80	528.00	5337.00	535.00	5337.50	545.00
GR	5337.6	560.00	5337.50	572.00	5337.00	590.00	5338.00	610.00	5336.00	620.00
GR	5335.5	645.00	5335.50	650.00	5336.00	660.00	5337.00	685.00	5338.00	710.00
GR	5337.0	740.00	5336.00	770.00	5336.50	780.00	5336.00	790.00	5335.00	810.00
GR	5335.0	825.00	5336.00	845.00	5338.00	860.00	5338.80	920.00	5338.00	955.00
GR	5337.0	970.00	5336.60	985.00	5337.00	1005.00	5338.00	1075.00	5337.00	1090.00
GR	5337.0	1095.00	5337.80	1110.00	5337.00	1130.00	5336.80	1132.00	5337.00	1135.00
GR	5338.0	1145.00	5338.50	1185.00						

CROSS SECTION I-I

X1	4660	41	825.00	890.00	350.0	350.0	350.0	0	0	0.0
X3	10									
GR	5329.1	500.00	5330.00	575.00	5329.20	605.00	5330.00	620.00	5329.00	660.00
GR	5328.0	680.00	5327.00	700.00	5327.00	705.00	5327.50	720.00	5327.00	738.00
GR	5326.8	740.00	5327.00	745.00	5327.50	755.00	5327.50	775.00	5327.00	790.00
GR	5326.8	795.00	5327.00	800.00	5328.00	820.00	5328.20	825.00	5328.00	830.00
GR	5327.0	840.00	5326.00	845.00	5325.80	855.00	5326.00	865.00	5328.00	875.00
GR	5329.0	890.00	5330.00	920.00	5330.00	930.00	5331.00	970.00	5331.20	990.00
GR	5331.0	1010.00	5330.00	1035.00	5329.00	1060.00	5329.40	1072.00	5329.00	1085.00
GR	5328.8	1095.00	5329.00	1105.00	5329.50	1115.00	5329.00	1130.00	5328.20	1138.00
GR	5329.0	1148.00								

CROSS SECTION H-H

X1	4310	42	780.00	840.00	270.0	270.0	270.0	0	0	0
X3	10							5319.00	5319.00	
GR	5317.7	500.00	5317.00	540.00	5316.70	550.00	5317.00	560.00	5317.50	580.00
GR	5317.0	590.00	5316.70	600.00	5317.00	615.00	5317.90	620.00	5317.50	635.00
GR	5317.0	670.00	5316.00	680.00	5315.25	690.00	5315.25	710.00	5316.00	725.00
GR	5317.0	735.00	5318.00	750.00	5318.00	768.00	5318.40	780.00	5318.00	800.00
GR	5317.0	810.00	5317.00	812.00	5318.00	820.00	5320.00	840.00	5320.00	845.00
GR	5321.0	870.00	5321.30	940.00	5321.20	1005.00	5321.00	1030.00	5320.50	1045.00
GR	5320.0	1060.00	5319.00	1080.00	5318.00	1090.00	5317.00	1100.00	5316.80	1115.00
GR	5316.0	1135.00	5315.90	1137.00	5316.00	1140.00	5318.00	1148.00	5320.00	1163.00
GR	5320.0	1165.00	5320.30	1180.00						

CROSS SECTION G-G

X1	4040	23	615.00	790.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5311.0	500.00	5311.25	515.00	5311.00	530.00	5310.50	540.00	5310.75	565.00
GR	5310.0	590.00	5309.25	600.00	5310.00	615.00	5309.00	630.00	5308.00	650.00
GR	5307.0	670.00	5307.00	675.00	5308.00	700.00	5309.00	725.00	5310.00	740.00
GR	5310.8	790.00	5310.50	840.00	5310.80	900.00	5310.70	940.00	5311.00	985.00
GR	5311.8	1020.00	5311.00	1050.00	5310.00	1090.00				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 5600.000
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5357.80 ELREA= 5357.50

CROSS SECTION L-L
LOCATED APPROX. 1000 FEET WEST OF WYOMING
THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION

5600.000	1.17	5356.37	5356.37	0.00	5356.71	0.35	0.00	0.00	5357.80
196.0	0.0	196.0	0.0	0.0	41.6	0.0	0.0	0.0	5357.50
0.00	0.00	4.72	0.00	0.000	0.038	0.000	0.000	5355.20	715.82
0.024603	0.	0.	0.	0	22	0	0.00	61.52	777.34

*SECNO 5360.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5348.50 ELREA= 5348.50

CROSS SECTION K-K

5360.000	1.17	5348.37	5348.51	0.00	5348.86	0.50	7.84	0.02	5348.50
196.0	0.0	196.0	0.0	0.0	34.7	0.0	0.2	0.3	5348.50
0.01	0.00	5.65	0.00	0.000	0.038	0.000	0.000	5347.20	795.35
0.045393	240.	240.	240.	4	23	0	0.00	61.97	857.32

*SECNO 4960.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5336.50 ELREA= 5338.80

CROSS SECTION J-J

4960.000	1.10	5336.10	5336.10	0.00	5336.46	0.36	13.00	6.53	5336.50
196.0	0.0	196.0	0.0	0.0	40.6	0.0	0.6	0.9	5338.80
0.03	0.00	4.83	0.00	0.000	0.038	0.000	0.000	5335.00	788.02
0.024426	400.	400.	400.	20	11	0	0.00	57.73	845.74

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4660.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5328.20 ELREA= 5329.00

CROSS SECTION I-I

4660.000	1.25	5327.05	5327.22	0.00	5327.78	0.73	8.64	0.04	5328.20
196.0	0.0	196.0	0.0	0.0	28.5	0.0	0.8	1.2	5329.00
0.05	0.00	6.87	0.00	0.000	0.038	0.000	0.000	5325.80	839.50
0.034473	300.	300.	300.	4	11	0	0.00	30.75	870.25

*SECNO 4310.000
3280 CROSS SECTION 4310.00 EXTENDED 1.00 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5319.00 ELREA= 5319.00

CROSS SECTION H-H

4310.000	1.70	5318.70	5318.70	0.00	5319.13	0.42	10.03	1.11	5318.40
196.0	0.0	196.0	0.0	0.0	37.5	0.0	1.1	1.5	5320.00
0.07	0.00	5.22	0.00	0.000	0.038	0.000	0.000	5317.00	780.00
0.024192	350.	350.	350.	20	24	0	0.00	47.02	827.02

*SECNO 4040.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.69

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5310.00 ELREA= 5310.80

CROSS SECTION G-G

4040.000	1.01	5308.01	5308.25	0.00	5308.76	0.75	10.33	0.03	5310.00
196.0	0.0	196.0	0.0	0.0	28.1	0.0	1.3	1.8	5310.80
0.08	0.00	6.97	0.00	0.000	0.038	0.000	0.000	5307.00	649.75
0.069413	270.	270.	270.	5	19	0	0.00	50.57	700.32

THIS RUN EXECUTED 21JUN96 9:52:08

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR FLOW

SUMMARY PRINTOUT

	SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
*	5600.000	0.00	5355.20	0.00	196.00	5356.37	5356.37	5356.71	246.03	61.52	1.17	4.72	41.5
	5360.000	240.00	5347.20	-8.00	196.00	5348.37	5348.51	5348.86	453.93	61.97	1.17	5.65	34.6
*	4960.000	400.00	5335.00	-12.27	196.00	5336.10	5336.10	5336.46	244.26	57.73	1.10	4.83	40.5
	4660.000	300.00	5325.80	-9.05	196.00	5327.05	5327.22	5327.78	344.73	30.75	1.25	6.87	28.5
*	4310.000	350.00	5317.00	-8.35	196.00	5318.70	5318.70	5319.13	241.92	47.02	1.70	5.22	37.5
*	4040.000	270.00	5307.00	-10.69	196.00	5308.01	5308.25	5308.76	694.13	50.57	1.01	6.97	28.1

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=   5600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=   4960.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4960.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4960.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4310.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4310.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4310.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=   4040.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    29MAY96    TIME    8:08:57  *
*******************************************
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************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                       X
XXXXXXX  XXXX      X          XXXXX    XXXXX
X     X  X         X                  X
X     X  X         X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX


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:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
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H A E S T A D  M E T H O D S
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37 Brookside Road  *  Waterbury, Connecticut  06708  *  (203) 755-1666
```


- HEC-2 MODEL FOR DETERMINING FLOODPLAIN BOUNDARIES AT BRAIDED SECTION OF SOUTH LA CUEVA. SECTIONS 1660 AND 4310.
- THIS MODEL IS FOR ALL FLOW GOING TO SOUTHERN PATH OF BRAIDED STREAM.

THIS RUN EXECUTED 29MAY96 8:08:57

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**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**********************************


T1       BOHANNAN-HUSTON INC.
T1       FEMA STUDY FOR THE N. LA CUEVA LOMR (ALBUQUERQUE, NM)
T1       DATE: 05/29/96
T2       FILENAME: SLC2.HC2  SUPER-CRITICAL
T2       SOUTH LA CUEVA ARROYO 2100 FT EAST OF I-25 TO 1000 FT WEST OF WYOMING
T2       STARTING WATER SURFACE ELEV AT CRITICAL DEPTH
T2       BRAIDED STREAM AT SECTIONS 4660 AND 4310. THIS HEC-2 RUN LOOKS AT
T2       ALL FLOW AT THESE SECTIONS GOING INTO SOUTHERN CHANNEL OF BRAIDED STR.
T2       SUPER CRITICAL RUN
T2       MANNING'S N VALUES KEPT CONSISTENT WITH NORTH LA CUEVA HEC-2 RUN BY RTI
T2       FLOW FROM RTI'S AHYMO RUN LC100C.HYM, BASIN 117.2 (5/28/96)
T2       TOTAL FLOW FOR BASIN=196 CFS; THOUGH HIGH, USED THIS FLOW FOR WHOLE BASI
T3       100 YEAR FLOW

J1   ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

        0         2         0         1        -1

J2   NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

       1         0        -1       0.0       0.0       0.0        -1       0.0       0.0

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

      38        39        42        51        43         1         2         3         5         4
       8        26        25

NC    0.050     0.050     0.038       0.1       0.3
QT        1       196
          CROSS SECTION L-L
          LOCATED APPROX. 1000 FEET WEST OF WYOMING
          THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION
X1     5600        36    680.00    800.00     240.0     240.0     240.0         0         0         0
X3       10
GR   5357.4    500.00   5357.00    530.00   5356.60    565.00   5357.00    590.00   5357.50    610.00
GR   5357.4    620.00   5357.80    680.00   5357.00    700.00   5356.00    725.00   5355.60    735.00
GR   5355.2    765.00   5356.00    770.00   5357.00    790.00   5357.50    800.00   5357.00    820.00
GR   5356.0    835.00   5355.00    860.00   5354.20    875.00   5354.50    900.00   5355.00    920.00
GR   5355.4    955.00   5355.00    970.00   5354.80    990.00   5355.00   1010.00   5356.00   1050.00
GR   5356.5   1060.00   5356.00   1070.00   5355.80   1072.00   5356.00   1076.00   5357.00   1088.00
GR   5357.0   1100.00   5356.00   1110.00   5355.80   1115.00   5356.00   1120.00   5356.50   1130.00
GR   5357.0   1180.00
```

CROSS SECTION K-K

X1	5360	38	765.00	860.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5348.7	500.00	5348.50	515.00	5348.25	525.00	5348.50	535.00	5348.75	550.00
GR	5348.5	560.00	5348.00	580.00	5348.00	595.00	5348.50	610.00	5348.50	625.00
GR	5348.8	670.00	5348.50	710.00	5348.50	765.00	5348.50	790.00	5348.00	810.00
GR	5347.2	830.00	5348.00	850.00	5348.50	860.00	5348.00	870.00	5347.00	900.00
GR	5348.0	925.00	5349.00	965.00	5349.30	985.00	5349.00	1015.00	5348.70	1045.00
GR	5349.0	1080.00	5348.80	1090.00	5349.00	1095.00	5349.50	1115.00	5349.00	1130.00
GR	5348.8	1132.00	5349.00	1135.00	5350.00	1140.00	5350.00	1145.00	5349.80	1155.00
GR	5350.0	1165.00	5351.00	1205.00	5352.00	1240.00				

CROSS SECTION J-J

X1	4960	37	780.00	920.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5337.2	500.00	5337.00	520.00	5336.80	528.00	5337.00	535.00	5337.50	545.00
GR	5337.6	560.00	5337.50	572.00	5337.00	590.00	5338.00	610.00	5336.00	620.00
GR	5335.5	645.00	5335.50	650.00	5336.00	660.00	5337.00	685.00	5338.00	710.00
GR	5337.0	740.00	5336.00	770.00	5336.50	780.00	5336.00	790.00	5335.00	810.00
GR	5335.0	825.00	5336.00	845.00	5338.00	860.00	5338.80	920.00	5338.00	955.00
GR	5337.0	970.00	5336.60	985.00	5337.00	1005.00	5338.00	1075.00	5337.00	1090.00
GR	5337.0	1095.00	5337.80	1110.00	5337.00	1130.00	5336.80	1132.00	5337.00	1135.00
GR	5338.0	1145.00	5338.50	1185.00						

CROSS SECTION I-I

X1	4660	41	660.00	825.00	350.0	350.0	350.0	0	0	0.0
X3	10									
GR	5329.1	500.00	5330.00	575.00	5329.20	605.00	5330.00	620.00	5329.00	660.00
GR	5328.0	680.00	5327.00	700.00	5327.00	705.00	5327.50	720.00	5327.00	738.00
GR	5326.8	740.00	5327.00	745.00	5327.50	755.00	5327.50	775.00	5327.00	790.00
GR	5326.8	795.00	5327.00	800.00	5328.00	820.00	5328.20	825.00	5328.00	830.00
GR	5327.0	840.00	5326.00	845.00	5325.80	855.00	5326.00	865.00	5328.00	875.00
GR	5329.0	890.00	5330.00	920.00	5330.00	930.00	5331.00	970.00	5331.20	990.00
GR	5331.0	1010.00	5330.00	1035.00	5329.00	1060.00	5329.40	1072.00	5329.00	1085.00
GR	5328.8	1095.00	5329.00	1105.00	5329.50	1115.00	5329.00	1130.00	5328.20	1138.00
GR	5329.0	1148.00								

CROSS SECTION H-H

X1	4310	42	620.00	780.00	270.0	270.0	270.0	0	0	0
X3	10									
GR	5317.7	500.00	5317.00	540.00	5316.70	550.00	5317.00	560.00	5317.50	580.00
GR	5317.0	590.00	5316.70	600.00	5317.00	615.00	5317.90	620.00	5317.50	635.00
GR	5317.0	670.00	5316.00	680.00	5315.25	690.00	5315.25	710.00	5316.00	725.00
GR	5317.0	735.00	5318.00	750.00	5318.00	768.00	5318.40	780.00	5318.00	800.00
GR	5317.0	810.00	5317.00	812.00	5318.00	820.00	5320.00	840.00	5320.00	845.00
GR	5321.0	870.00	5321.30	940.00	5321.20	1005.00	5321.00	1030.00	5320.50	1045.00
GR	5320.0	1060.00	5319.00	1080.00	5318.00	1090.00	5317.00	1100.00	5316.80	1115.00
GR	5316.0	1135.00	5315.90	1137.00	5316.00	1140.00	5318.00	1148.00	5320.00	1163.00
GR	5320.0	1165.00	5320.30	1180.00						

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         CROSS SECTION G-G
X1     4040         23     615.00     790.00      400.0      400.0      400.0        0          0          0
X3       10
GR   5311.0      500.00   5311.25     515.00    5311.00     530.00    5310.50     540.00    5310.75     565.00
GR   5310.0      590.00   5309.25     600.00    5310.00     615.00    5309.00     630.00    5308.00     650.00
GR   5307.0      670.00   5307.00     675.00    5308.00     700.00    5309.00     725.00    5310.00     740.00
GR   5310.8      790.00   5310.50     840.00    5310.80     900.00    5310.70     940.00    5311.00     985.00
GR   5311.8     1020.00   5311.00    1050.00    5310.00    1090.00

         CROSS SECTION F-F
         FIRST CROSS SECTION WEST OF LOUSIANA
X1     3640         29     555.00     640.00      300.0      300.0      300.0        0          0          0
X3       10
GR   5297.0      500.00   5297.80     520.00    5297.60     540.00    5298.00     550.00    5299.00     555.00
GR   5298.0      560.00   5296.00     565.00    5295.00     575.00    5294.80     580.00    5295.00     600.00
GR   5296.0      625.00   5297.00     630.00    5298.00     640.00    5298.50     680.00    5298.70     725.00
GR   5299.0      730.00   5299.40     760.00    5299.00     790.00    5298.00     800.00    5297.00     810.00
GR   5296.0      820.00   5295.90     822.00    5296.00     825.00    5297.00     835.00    5298.00     845.00
GR   5300.0      865.00   5301.00     890.00    5301.50     920.00    5302.00     960.00

         CROSS SECTION E-E
X1     3340         34     518.00     590.00      300.0      300.0      300.0        0          0          0
X3       10
GR   5288.0      500.00   5289.00     506.00    5290.00     512.00    5290.10     518.00    5290.00     520.00
GR   5289.0      530.00   5288.00     535.00    5286.00     548.00    5285.00     555.00    5284.80     560.00
GR   5285.0      565.00   5286.00     570.00    5287.00     575.00    5288.00     580.00    5288.20     590.00
GR   5288.0      600.00   5287.00     620.00    5286.80     625.00    5287.00     630.00    5287.80     650.00
GR   5287.5      670.00   5287.00     690.00    5286.50     720.00    5286.00     760.00    5285.00     775.00
GR   5284.0      790.00   5283.00     800.00    5282.00     810.00    5281.60     820.00    5282.00     830.00
GR   5283.0      850.00   5284.00     865.00    5285.00     880.00    5286.00     895.00

         CROSS SECTION D-D
X1     3040         21     630.00     720.00      350.0      350.0      350.0        0          0          0
X3       10
GR   5279.0      500.00   5278.00     550.00    5279.00     560.00    5279.50     565.00    5279.00     570.00
GR   5278.0      580.00   5277.60     585.00    5278.00     600.00    5278.75     630.00    5278.00     660.00
GR   5277.5      670.00   5277.10     680.00    5277.50     690.00    5278.00     700.00    5278.60     720.00
GR   5278.0      730.00   5277.00     790.00    5276.00     825.00    5274.80     840.00    5276.00     875.00
GR   5276.4      905.00

         CROSS SECTION C-C
X1     2690         20     700.00     930.00      400.0      400.0      400.0        0          0          0
X3       10
GR   5271.0      500.00   5270.50     535.00    5270.50     650.00    5270.75     700.00    5270.50     720.00
GR   5270.0      740.00   5269.00     775.00    5268.50     815.00    5269.00     830.00    5270.00     850.00
GR   5270.5      855.00   5270.00     860.00    5269.00     870.00    5270.00     878.00    5272.00     930.00
GR   5273.0      970.00   5273.20     980.00    5273.10    1025.00    5273.50    1095.00    5273.00    1205.00
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CROSS SECTION B-B

X1	2290	25	790.00	970.00	190.0	190.0	190.0	0	0	0
X3	10									
GR	5264.0	500.00	5263.00	575.00	5262.50	730.00	5263.00	750.00	5264.00	775.00
GR	5264.3	790.00	5264.00	810.00	5262.00	850.00	5261.00	880.00	5260.80	890.00
GR	5261.0	920.00	5261.80	970.00	5261.00	1005.00	5260.00	1020.00	5258.00	1055.00
GR	5260.0	1100.00	5260.20	1120.00	5260.00	1180.00	5259.00	1195.00	5258.80	1200.00
GR	5259.0	1220.00	5260.00	1255.00	5258.00	1290.00	5260.00	1325.00	5261.00	1350.00

CROSS SECTION A-A
FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT
LOCATED APPROX. 2100 FEET EAST OF I-25

X1	2100	42	910.00	1065.00	0.0	0.0	0.0	0	0	0
X3	10									
GR	5257.4	500.00	5257.00	505.00	5256.00	515.00	5255.50	525.00	5256.00	535.00
GR	5256.5	570.00	5256.00	610.00	5255.60	640.00	5255.70	730.00	5256.00	770.00
GR	5256.2	790.00	5256.00	810.00	5254.00	840.00	5253.20	880.00	5254.00	895.00
GR	5254.8	910.00	5254.00	925.00	5253.90	935.00	5254.00	950.00	5253.80	965.00
GR	5254.0	970.00	5256.00	990.00	5257.00	1040.00	5257.20	1065.00	5257.00	1090.00
GR	5256.0	1115.00	5255.00	1130.00	5254.60	1140.00	5255.00	1150.00	5256.00	1165.00
GR	5257.0	1190.00	5258.00	1265.00	5256.00	1305.00	5255.90	1310.00	5256.00	1315.00
GR	5258.0	1385.00	5256.00	1415.00	5255.40	1430.00	5255.90	1440.00	5256.00	1455.00
GR	5258.0	1480.00	5260.00	1505.00						

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 5600.000
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5357.80 ELREA= 5357.50

CROSS SECTION L-L
LOCATED APPROX. 1000 FEET WEST OF WYOMING
THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION

5600.000	1.17	5356.37	5356.37	0.00	5356.71	0.35	0.00	0.00	5357.80
196.0	0.0	196.0	0.0	0.0	41.6	0.0	0.0	0.0	5357.50
0.00	0.00	4.72	0.00	0.000	0.038	0.000	0.000	5355.20	715.82
0.024603	0.	0.	0.	0	22	0	0.00	61.52	777.34

*SECNO 5360.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5348.50 ELREA= 5348.50

CROSS SECTION K-K

5360.000	1.17	5348.37	5348.51	0.00	5348.86	0.50	7.84	0.02	5348.50
196.0	0.0	196.0	0.0	0.0	34.7	0.0	0.2	0.3	5348.50
0.01	0.00	5.65	0.00	0.000	0.038	0.000	0.000	5347.20	795.35
0.045393	240.	240.	240.	4	23	0	0.00	61.97	857.32

*SECNO 4960.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5336.50 ELREA= 5338.80

CROSS SECTION J-J

4960.000	1.10	5336.10	5336.10	0.00	5336.46	0.36	13.00	6.53	5336.50
196.0	0.0	196.0	0.0	0.0	40.6	0.0	0.6	0.9	5338.80
0.03	0.00	4.83	0.00	0.000	0.038	0.000	0.000	5335.00	788.02
0.024426	400.	400.	400.	20	11	0	0.00	57.73	845.74

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4660.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5329.00 ELREA= 5328.20

CROSS SECTION I-I

4660.000	0.85	5327.65	5327.66	0.00	5327.89	0.23	8.54	0.04	5329.00
196.0	0.0	196.0	0.0	0.0	50.4	0.0	0.9	1.5	5328.20
0.06	0.00	3.89	0.00	0.000	0.038	0.000	0.000	5326.80	687.04
0.033575	300.	300.	300.	2	38	0	0.00	125.92	812.96

*SECNO 4310.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5317.90 ELREA= 5318.40

CROSS SECTION H-H

4310.000	0.99	5316.24	5316.31	0.00	5316.71	0.46	11.16	0.02	5317.90
196.0	0.0	196.0	0.0	0.0	35.9	0.0	1.2	2.2	5318.40
0.07	0.00	5.46	0.00	0.000	0.038	0.000	0.000	5315.25	677.57
0.030300	350.	350.	350.	3	11	0	0.00	49.85	727.43

*SECNO 4040.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5310.00 ELREA= 5310.80

CROSS SECTION G-G

4040.000	1.21	5308.21	5308.25	0.00	5308.61	0.40	8.08	0.02	5310.00
196.0	0.0	196.0	0.0	0.0	38.7	0.0	1.4	2.6	5310.80
0.09	0.00	5.06	0.00	0.000	0.038	0.000	0.000	5307.00	645.89
0.029560	270.	270.	270.	3	11	0	0.00	59.25	705.14

*SECNO 3640.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5299.00 ELREA= 5298.00

CROSS SECTION F-F
FIRST CROSS SECTION WEST OF LOUSIANA

3640.000	1.06	5295.86	5295.93	0.00	5296.30	0.44	12.30	0.00	5299.00
196.0	0.0	196.0	0.0	0.0	36.7	0.0	1.8	3.1	5298.00
0.11	0.00	5.34	0.00	0.000	0.038	0.000	0.000	5294.80	566.45
0.032003	400.	400.	400.	3	8	0	0.00	54.94	621.39

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3340.000
3280 CROSS SECTION 3340.00 EXTENDED 0.48 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5290.10 ELREA= 5288.20

CROSS SECTION E-E

3340.000	1.69	5286.49	5286.61	0.00	5287.20	0.72	9.07	0.03	5290.10
196.0	0.0	196.0	0.0	0.0	28.9	0.0	2.0	3.4	5288.20
0.12	0.00	6.79	0.00	0.000	0.038	0.000	0.000	5284.80	544.88
0.028621	300.	300.	300.	3	17	0	0.00	27.51	572.40

*SECNO 3040.000
3280 CROSS SECTION 3040.00 EXTENDED 2.03 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5278.75 ELREA= 5278.60

CROSS SECTION D-D

3040.000	1.33	5278.43	5278.45	0.00	5278.75	0.32	8.34	0.12	5278.75
196.0	0.0	196.0	0.0	0.0	42.9	0.0	2.3	3.7	5278.60
0.14	0.00	4.57	0.00	0.000	0.038	0.000	0.000	5277.10	642.85
0.026997	300.	300.	300.	2	21	0	0.00	71.44	714.29

*SECNO 2690.000

3265 DIVIDED FLOW

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5270.75 ELREA= 5272.00

CROSS SECTION C-C

2690.000	0.96	5269.46	5269.46	0.00	5269.73	0.27	9.44	4.56	5270.75
196.0	0.0	196.0	0.0	0.0	46.8	0.0	2.6	4.4	5272.00
0.16	0.00	4.19	0.00	0.000	0.038	0.000	0.000	5268.50	758.90
0.026944	350.	350.	350.	20	19	0	0.00	88.58	873.68

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2290.000
3280 CROSS SECTION 2290.00 EXTENDED 0.65 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5264.30 ELREA= 5261.80

CROSS SECTION B-B

2290.000	0.85	5261.65	5261.65	0.00	5261.89	0.25	10.75	6.59	5264.30
196.0	0.0	196.0	0.0	0.0	49.1	0.0	3.1	5.2	5261.80
0.19	0.00	3.99	0.00	0.000	0.038	0.000	0.000	5260.80	860.63
0.026810	400.	400.	400.	20	12	0	0.00	99.72	960.35

*SECNO 2100.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5254.80 ELREA= 5257.20

CROSS SECTION A-A
FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT
LOCATED APPROX. 2100 FEET EAST OF I-25

2100.000	0.77	5254.57	5254.70	0.00	5255.10	0.53	6.76	0.03	5254.80
196.0	0.0	196.0	0.0	0.0	33.7	0.0	3.2	5.6	5257.20
0.20	0.00	5.82	0.00	0.000	0.038	0.000	0.000	5253.80	914.29
0.049533	190.	190.	190.	4	29	0	0.00	61.43	975.71

THIS RUN EXECUTED 29MAY96 8:09:00

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR FLOW

SUMMARY PRINTOUT

	SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
*	5600.000	0.00	5355.20	0.00	196.00	5356.37	5356.37	5356.71	246.03	61.52	1.17	4.72	41.5
	5360.000	240.00	5347.20	-8.00	196.00	5348.37	5348.51	5348.86	453.93	61.97	1.17	5.65	34.6
*	4960.000	400.00	5335.00	-12.27	196.00	5336.10	5336.10	5336.46	244.26	57.73	1.10	4.83	40.5
	4660.000	300.00	5326.80	-8.45	196.00	5327.65	5327.66	5327.89	335.75	125.92	0.85	3.89	50.3
	4310.000	350.00	5315.25	-11.41	196.00	5316.24	5316.31	5316.71	303.00	49.85	0.99	5.46	35.8
	4040.000	270.00	5307.00	-8.03	196.00	5308.21	5308.25	5308.61	295.60	59.25	1.21	5.06	38.7
	3640.000	400.00	5294.80	-12.35	196.00	5295.86	5295.93	5296.30	320.03	54.94	1.06	5.34	36.7
	3340.000	300.00	5284.80	-9.37	196.00	5286.49	5286.61	5287.20	286.21	27.51	1.69	6.79	28.8
	3040.000	300.00	5277.10	-8.06	196.00	5278.43	5278.45	5278.75	269.97	71.44	1.33	4.57	42.8
*	2690.000	350.00	5268.50	-8.97	196.00	5269.46	5269.46	5269.73	269.44	88.58	0.96	4.19	46.7
*	2290.000	400.00	5260.80	-7.81	196.00	5261.65	5261.65	5261.89	268.10	99.72	0.85	3.99	49.1
	2100.000	190.00	5253.80	-7.07	196.00	5254.57	5254.70	5255.10	495.33	61.43	0.77	5.82	33.6

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=   5600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=   4960.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4960.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4960.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2690.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2690.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2690.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2290.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2290.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2290.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    29MAY96    TIME    8:42:24  *
*******************************************
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************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                       X
XXXXXXX  XXXX      X          XXXXX    XXXXX
X     X  X         X                  X
X     X  X         X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
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:::::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::::
:::                                         :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                         :::
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:::::::::::::::::::::::::::::::::::::::::::::::
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HAESTAD METHODS

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

- HEC-2 MODEL FOR DETERMINING FLOODPLAIN BOUNDARIES AT BRAIDED SECTION OF SOUTH LA CUEVA. SECTIONS 2690, 2290, AND 2100.

- THIS MODEL IS FOR ALL FLOW GOING TO NORTHERN PATH

THIS RUN EXECUTED 29MAY96 8:42:24

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**************************************


T1      BOHANNAN-HUSTON INC.
T1      FEMA STUDY FOR THE N. LA CUEVA LOMR (ALBUQUERQUE, NM)
T1      DATE: 05/29/96
T2      FILENAME: SLC2.HC2  SUPER-CRITICAL
T2      SOUTH LA CUEVA ARROYO 2100 FT EAST OF I-25 TO 1000 FT WEST OF WYOMING
T2      STARTING WATER SURFACE ELEV AT CRITICAL DEPTH
T2      BRAIDED STREAM AT SECTIONS 2690, 2290, & 2100. THIS HEC-2 RUN LOOKS AT
T2      ALL FLOW AT THESE SECTIONS GOING INTO NORTHERN CHANNEL OF BRAIDED STR.
T2      SUPER CRITICAL RUN
T2      MANNING'S N VALUES KEPT CONSISTENT WITH NORTH LA CUEVA HEC-2 RUN BY RTI
T2      FLOW FROM RTI'S AHYMO RUN LC100C.HYM, BASIN 117.2 (5/28/96)
T2      TOTAL FLOW FOR BASIN=196 CFS; THOUGH HIGH, USED THIS FLOW FOR WHOLE BASI
T3      100 YEAR FLOW

J1  ICHECK     INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

        0         2         0         1        -1

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

        1         0        -1       0.0       0.0       0.0        -1       0.0       0.0

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

       38        39        42        51        43         1         2         3         5         4
        8        26        25

NC     0.050     0.050     0.038       0.1       0.3
QT         1       196
           CROSS SECTION L-L
           LOCATED APPROX. 1000 FEET WEST OF WYOMING
           THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION
X1      5600        36    680.00    800.00     240.0     240.0     240.0         0         0         0
X3        10
GR    5357.4    500.00   5357.00    530.00   5356.60    565.00   5357.00    590.00   5357.50    610.00
GR    5357.4    620.00   5357.80    680.00   5357.00    700.00   5356.00    725.00   5355.60    735.00
GR    5355.2    765.00   5356.00    770.00   5357.00    790.00   5357.50    800.00   5357.00    820.00
GR    5356.0    835.00   5355.00    860.00   5354.20    875.00   5354.50    900.00   5355.00    920.00
GR    5355.4    955.00   5355.00    970.00   5354.80    990.00   5355.00   1010.00   5356.00   1050.00
GR    5356.5   1060.00   5356.00   1070.00   5355.80   1072.00   5356.00   1076.00   5357.00   1088.00
GR    5357.0   1100.00   5356.00   1110.00   5355.80   1115.00   5356.00   1120.00   5356.50   1130.00
GR    5357.0   1180.00
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CROSS SECTION K-K

X1	5360	38	765.00	860.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5348.7	500.00	5348.50	515.00	5348.25	525.00	5348.50	535.00	5348.75	550.00
GR	5348.5	560.00	5348.00	580.00	5348.00	595.00	5348.50	610.00	5348.50	625.00
GR	5348.8	670.00	5348.50	710.00	5348.50	765.00	5348.50	790.00	5348.00	810.00
GR	5347.2	830.00	5348.00	850.00	5348.50	860.00	5348.00	870.00	5347.00	900.00
GR	5348.0	925.00	5349.00	965.00	5349.30	985.00	5349.00	1015.00	5348.70	1045.00
GR	5349.0	1080.00	5348.80	1090.00	5349.00	1095.00	5349.50	1115.00	5349.00	1130.00
GR	5348.8	1132.00	5349.00	1135.00	5350.00	1140.00	5350.00	1145.00	5349.80	1155.00
GR	5350.0	1165.00	5351.00	1205.00	5352.00	1240.00				

CROSS SECTION J-J

X1	4960	37	780.00	920.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5337.2	500.00	5337.00	520.00	5336.80	528.00	5337.00	535.00	5337.50	545.00
GR	5337.6	560.00	5337.50	572.00	5337.00	590.00	5338.00	610.00	5336.00	620.00
GR	5335.5	645.00	5335.50	650.00	5336.00	660.00	5337.00	685.00	5338.00	710.00
GR	5337.0	740.00	5336.00	770.00	5336.50	780.00	5336.00	790.00	5335.00	810.00
GR	5335.0	825.00	5336.00	845.00	5338.00	860.00	5338.80	920.00	5338.00	955.00
GR	5337.0	970.00	5336.60	985.00	5337.00	1005.00	5338.00	1075.00	5337.00	1090.00
GR	5337.0	1095.00	5337.80	1110.00	5337.00	1130.00	5336.80	1132.00	5337.00	1135.00
GR	5338.0	1145.00	5338.50	1185.00						

CROSS SECTION I-I

X1	4660	41	620.00	990.00	350.0	350.0	350.0	0	0	0.0
X3	10									
GR	5329.1	500.00	5330.00	575.00	5329.20	605.00	5330.00	620.00	5329.00	660.00
GR	5328.0	680.00	5327.00	700.00	5327.00	705.00	5327.50	720.00	5327.00	738.00
GR	5326.8	740.00	5327.00	745.00	5327.50	755.00	5327.50	775.00	5327.00	790.00
GR	5326.8	795.00	5327.00	800.00	5328.00	820.00	5328.20	825.00	5328.00	830.00
GR	5327.0	840.00	5326.00	845.00	5325.80	855.00	5326.00	865.00	5328.00	875.00
GR	5329.0	890.00	5330.00	920.00	5330.00	930.00	5331.00	970.00	5331.20	990.00
GR	5331.0	1010.00	5330.00	1035.00	5329.00	1060.00	5329.40	1072.00	5329.00	1085.00
GR	5328.8	1095.00	5329.00	1105.00	5329.50	1115.00	5329.00	1130.00	5328.20	1138.00
GR	5329.0	1148.00								

CROSS SECTION H-H

X1	4310	42	620.00	870.00	270.0	270.0	270.0	0	0	0
X3	10									
GR	5317.7	500.00	5317.00	540.00	5316.70	550.00	5317.00	560.00	5317.50	580.00
GR	5317.0	590.00	5316.70	600.00	5317.00	615.00	5317.90	620.00	5317.50	635.00
GR	5317.0	670.00	5316.00	680.00	5315.25	690.00	5315.25	710.00	5316.00	725.00
GR	5317.0	735.00	5318.00	750.00	5318.00	768.00	5318.40	780.00	5318.00	800.00
GR	5317.0	810.00	5317.00	812.00	5318.00	820.00	5320.00	840.00	5320.00	845.00
GR	5321.0	870.00	5321.30	940.00	5321.20	1005.00	5321.00	1030.00	5320.50	1045.00
GR	5320.0	1060.00	5319.00	1080.00	5318.00	1090.00	5317.00	1100.00	5316.80	1115.00
GR	5316.0	1135.00	5315.90	1137.00	5316.00	1140.00	5318.00	1148.00	5320.00	1163.00
GR	5320.0	1165.00	5320.30	1180.00						

CROSS SECTION G-G

X1	4040	23	615.00	790.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5311.0	500.00	5311.25	515.00	5311.00	530.00	5310.50	540.00	5310.75	565.00
GR	5310.0	590.00	5309.25	600.00	5310.00	615.00	5309.00	630.00	5308.00	650.00
GR	5307.0	670.00	5307.00	675.00	5308.00	700.00	5309.00	725.00	5310.00	740.00
GR	5310.8	790.00	5310.50	840.00	5310.80	900.00	5310.70	940.00	5311.00	985.00
GR	5311.8	1020.00	5311.00	1050.00	5310.00	1090.00				

CROSS SECTION F-F
FIRST CROSS SECTION WEST OF LOUSIANA

X1	3640	29	555.00	640.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5297.0	500.00	5297.80	520.00	5297.60	540.00	5298.00	550.00	5299.00	555.00
GR	5298.0	560.00	5296.00	565.00	5295.00	575.00	5294.80	580.00	5295.00	600.00
GR	5296.0	625.00	5297.00	630.00	5298.00	640.00	5298.50	680.00	5298.70	725.00
GR	5299.0	730.00	5299.40	760.00	5299.00	790.00	5298.00	800.00	5297.00	810.00
GR	5296.0	820.00	5295.90	822.00	5296.00	825.00	5297.00	835.00	5298.00	845.00
GR	5300.0	865.00	5301.00	890.00	5301.50	920.00	5302.00	960.00		

CROSS SECTION E-E

X1	3340	34	518.00	590.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5288.0	500.00	5289.00	506.00	5290.00	512.00	5290.10	518.00	5290.00	520.00
GR	5289.0	530.00	5288.00	535.00	5286.00	548.00	5285.00	555.00	5284.80	560.00
GR	5285.0	565.00	5286.00	570.00	5287.00	575.00	5288.00	580.00	5288.20	590.00
GR	5288.0	600.00	5287.00	620.00	5286.80	625.00	5287.00	630.00	5287.80	650.00
GR	5287.5	670.00	5287.00	690.00	5286.50	720.00	5286.00	760.00	5285.00	775.00
GR	5284.0	790.00	5283.00	800.00	5282.00	810.00	5281.60	820.00	5282.00	830.00
GR	5283.0	850.00	5284.00	865.00	5285.00	880.00	5286.00	895.00		

CROSS SECTION D-D

X1	3040	21	630.00	720.00	350.0	350.0	350.0	0	0	0
X3	10									
GR	5279.0	500.00	5278.00	550.00	5279.00	560.00	5279.50	565.00	5279.00	570.00
GR	5278.0	580.00	5277.60	585.00	5278.00	600.00	5278.75	630.00	5278.00	660.00
GR	5277.5	670.00	5277.10	680.00	5277.50	690.00	5278.00	700.00	5278.60	720.00
GR	5278.0	730.00	5277.00	790.00	5276.00	825.00	5274.80	840.00	5276.00	875.00
GR	5276.4	905.00								

CROSS SECTION C-C

X1	2690	20	855.00	930.00	400.0	400.0	400.0	0	0	0
X3	10							5272.00	5272.00	
GR	5271.0	500.00	5270.50	535.00	5270.50	650.00	5270.75	700.00	5270.50	720.00
GR	5270.0	740.00	5269.00	775.00	5268.50	815.00	5269.00	830.00	5270.00	850.00
GR	5270.5	855.00	5270.00	860.00	5269.00	870.00	5270.00	878.00	5272.00	930.00
GR	5273.0	970.00	5273.20	980.00	5273.10	1025.00	5273.50	1095.00	5273.00	1205.00

CROSS SECTION B-B

X1	2290	25	970.00	1120.00	190.0	190.0	190.0	0	0	0
X3	10									
GR	5264.0	500.00	5263.00	575.00	5262.50	730.00	5263.00	750.00	5264.00	775.00
GR	5264.3	790.00	5264.00	810.00	5262.00	850.00	5261.00	880.00	5260.80	890.00
GR	5261.0	920.00	5261.80	970.00	5261.00	1005.00	5260.00	1020.00	5258.00	1055.00
GR	5260.0	1100.00	5260.20	1120.00	5260.00	1180.00	5259.00	1195.00	5258.80	1200.00
GR	5259.0	1220.00	5260.00	1255.00	5258.00	1290.00	5260.00	1325.00	5261.00	1350.00

CROSS SECTION A-A
FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT
LOCATED APPROX. 2100 FEET EAST OF I-25

X1	2100	42	1065.00	1265.00	0.0	0.0	0.0	0	0	0
X3	10									
GR	5257.4	500.00	5257.00	505.00	5256.00	515.00	5255.50	525.00	5256.00	535.00
GR	5256.5	570.00	5256.00	610.00	5255.60	640.00	5255.70	730.00	5256.00	770.00
GR	5256.2	790.00	5256.00	810.00	5254.00	840.00	5253.20	880.00	5254.00	895.00
GR	5254.8	910.00	5254.00	925.00	5253.90	935.00	5254.00	950.00	5253.80	965.00
GR	5254.0	970.00	5256.00	990.00	5257.00	1040.00	5257.20	1065.00	5257.00	1090.00
GR	5256.0	1115.00	5255.00	1130.00	5254.60	1140.00	5255.00	1150.00	5256.00	1165.00
GR	5257.0	1190.00	5258.00	1265.00	5256.00	1305.00	5255.90	1310.00	5256.00	1315.00
GR	5258.0	1385.00	5256.00	1415.00	5255.40	1430.00	5255.90	1440.00	5256.00	1455.00
GR	5258.0	1480.00	5260.00	1505.00						

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 5600.000
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5357.80 ELREA= 5357.50

CROSS SECTION L-L
LOCATED APPROX. 1000 FEET WEST OF WYOMING
THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION

5600.000	1.17	5356.37	5356.37	0.00	5356.71	0.35	0.00	0.00	5357.80
196.0	0.0	196.0	0.0	0.0	41.6	0.0	0.0	0.0	5357.50
0.00	0.00	4.72	0.00	0.000	0.038	0.000	0.000	5355.20	715.82
0.024603	0.	0.	0.	0	22	0	0.00	61.52	777.34

*SECNO 5360.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5348.50 ELREA= 5348.50

CROSS SECTION K-K

5360.000	1.17	5348.37	5348.51	0.00	5348.86	0.50	7.84	0.02	5348.50
196.0	0.0	196.0	0.0	0.0	34.7	0.0	0.2	0.3	5348.50
0.01	0.00	5.65	0.00	0.000	0.038	0.000	0.000	5347.20	795.35
0.045393	240.	240.	240.	4	23	0	0.00	61.97	857.32

*SECNO 4960.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5336.50 ELREA= 5338.80

CROSS SECTION J-J

4960.000	1.10	5336.10	5336.10	0.00	5336.46	0.36	13.00	6.53	5336.50
196.0	0.0	196.0	0.0	0.0	40.6	0.0	0.6	0.9	5338.80
0.03	0.00	4.83	0.00	0.000	0.038	0.000	0.000	5335.00	788.02
0.024426	400.	400.	400.	20	11	0	0.00	57.73	845.74

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4660.000

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5330.00 ELREA= 5331.20

CROSS SECTION I-I

4660.000	1.38	5327.18	5327.27	0.00	5327.52	0.34	8.93	0.01	5330.00
196.0	0.0	196.0	0.0	0.0	41.8	0.0	0.8	1.4	5331.20
0.05	0.00	4.69	0.00	0.000	0.038	0.000	0.000	5325.80	696.17
0.037078	300.	300.	300.	2	8	0	0.00	84.73	870.96

*SECNO 4310.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5317.90 ELREA= 5321.00

CROSS SECTION H-H

4310.000	1.03	5316.28	5316.31	0.00	5316.70	0.42	10.82	0.01	5317.90
196.0	0.0	196.0	0.0	0.0	37.7	0.0	1.2	1.9	5321.00
0.07	0.00	5.20	0.00	0.000	0.038	0.000	0.000	5315.25	677.21
0.026156	350.	350.	350.	3	15	0	0.00	50.59	727.79

*SECNO 4040.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5310.00 ELREA= 5310.80

CROSS SECTION G-G

4040.000	1.17	5308.17	5308.25	0.00	5308.62	0.45	8.08	0.00	5310.00
196.0	0.0	196.0	0.0	0.0	36.5	0.0	1.4	2.3	5310.80
0.09	0.00	5.36	0.00	0.000	0.038	0.000	0.000	5307.00	646.64
0.034548	270.	270.	270.	3	11	0	0.00	57.56	704.20

*SECNO 3640.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5299.00 ELREA= 5298.00

CROSS SECTION F-F
FIRST CROSS SECTION WEST OF LOUSIANA

3640.000	1.09	5295.89	5295.93	0.00	5296.29	0.40	12.32	0.01	5299.00
196.0	0.0	196.0	0.0	0.0	38.7	0.0	1.7	2.8	5298.00
0.11	0.00	5.06	0.00	0.000	0.038	0.000	0.000	5294.80	566.08
0.027622	400.	400.	400.	3	8	0	0.00	56.21	622.29

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3340.000
3280 CROSS SECTION 3340.00 EXTENDED 0.43 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5290.10 ELREA= 5288.20

CROSS SECTION E-E

3340.000	1.63	5286.43	5286.61	0.00	5287.22	0.79	9.03	0.04	5290.10
196.0	0.0	196.0	0.0	0.0	27.4	0.0	2.0	3.1	5288.20
0.12	0.00	7.14	0.00	0.000	0.038	0.000	0.000	5284.80	545.23
0.032924	300.	300.	300.	4	46	0	0.00	26.91	572.13

*SECNO 3040.000
3280 CROSS SECTION 3040.00 EXTENDED 2.04 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5278.75 ELREA= 5278.60

CROSS SECTION D-D

3040.000	1.34	5278.44	5278.44	0.00	5278.75	0.31	8.63	5.22	5278.75
196.0	0.0	196.0	0.0	0.0	44.0	0.0	2.2	3.4	5278.60
0.14	0.00	4.46	0.00	0.000	0.038	0.000	0.000	5277.10	642.25
0.025346	300.	300.	300.	20	14	0	0.00	72.55	714.79

*SECNO 2690.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5272.00 ELREA= 5272.00

CROSS SECTION C-C

2690.000	1.87	5270.87	5270.87	0.00	5271.29	0.43	8.51	6.21	5270.50
196.0	0.0	196.0	0.0	0.0	37.4	0.0	2.5	3.9	5272.00
0.16	0.00	5.23	0.00	0.000	0.038	0.000	0.000	5269.00	855.00
0.023351	350.	350.	350.	20	20	0	0.00	45.53	900.53

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2290.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5261.80 ELREA= 5260.20

CROSS SECTION B-B

2290.000	1.33	5259.33	5259.42	0.00	5259.82	0.49	11.46	0.01	5261.80
196.0	0.0	196.0	0.0	0.0	34.9	0.0	2.9	4.3	5260.20
0.18	0.00	5.62	0.00	0.000	0.038	0.000	0.000	5258.00	1031.89
0.036015	400.	400.	400.	3	15	0	0.00	52.81	1084.71

*SECNO 2100.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5257.20 ELREA= 5258.00

CROSS SECTION A-A
FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT
LOCATED APPROX. 2100 FEET EAST OF I-25

2100.000	1.40	5256.00	5256.00	0.00	5256.39	0.39	5.43	3.35	5257.20
196.0	0.0	196.0	0.0	0.0	38.9	0.0	3.0	4.6	5258.00
0.19	0.00	5.04	0.00	0.000	0.038	0.000	0.000	5254.60	1115.04
0.023252	190.	190.	190.	20	19	0	0.00	49.93	1164.96

THIS RUN EXECUTED 29MAY96 8:42:27

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR FLOW

SUMMARY PRINTOUT

	SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
*	5600.000	0.00	5355.20	0.00	196.00	5356.37	5356.37	5356.71	246.03	61.52	1.17	4.72	41.5
	5360.000	240.00	5347.20	-8.00	196.00	5348.37	5348.51	5348.86	453.93	61.97	1.17	5.65	34.6
*	4960.000	400.00	5335.00	-12.27	196.00	5336.10	5336.10	5336.46	244.26	57.73	1.10	4.83	40.5
	4660.000	300.00	5325.80	-8.92	196.00	5327.18	5327.27	5327.52	370.78	84.73	1.38	4.69	41.7
	4310.000	350.00	5315.25	-10.90	196.00	5316.28	5316.31	5316.70	261.56	50.59	1.03	5.20	37.7
	4040.000	270.00	5307.00	-8.11	196.00	5308.17	5308.25	5308.62	345.48	57.56	1.17	5.36	36.5
	3640.000	400.00	5294.80	-12.28	196.00	5295.89	5295.93	5296.29	276.22	56.21	1.09	5.06	38.7
	3340.000	300.00	5284.80	-9.46	196.00	5286.43	5286.61	5287.22	329.24	26.91	1.63	7.14	27.4
*	3040.000	300.00	5277.10	-7.98	196.00	5278.44	5278.44	5278.75	253.46	72.55	1.34	4.46	43.9
*	2690.000	350.00	5269.00	-7.58	196.00	5270.87	5270.87	5271.29	233.51	45.53	1.87	5.23	37.4
	2290.000	400.00	5258.00	-11.54	196.00	5259.33	5259.42	5259.82	360.15	52.81	1.33	5.62	34.8
*	2100.000	190.00	5254.60	-3.33	196.00	5256.00	5256.00	5256.39	232.52	49.93	1.40	5.04	38.8

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=   5600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=   4960.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4960.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4960.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   3040.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3040.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3040.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2690.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2690.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2690.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2100.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2100.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2100.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    29MAY96    TIME    8:51:57  *
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************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                   X
X     X  X        X     X             X
X     X  XXXXXXX   XXXXX              XXXXXXX


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::::::::::::::::::::::::::::::::::::::::::::::
:::                                        :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
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H A E S T A D  M E T H O D S
============================

37 Brookside Road  *  Waterbury, Connecticut  06708  *  (203) 755-1666
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- HEC-2 MODEL FOR DETERMINING FLOODPLAIN BOUNDARIES AT BRAIDED SECTION OF SOUTH LA CUEVA. SECTIONS 2690, 2290, AND 2100.

- THIS MODEL IS FOR ALL FLOW GOING TO SOUTHERN PATH

THIS RUN EXECUTED 29MAY96 8:51:58

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**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
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T1       BOHANNAN-HUSTON INC.
T1       FEMA STUDY FOR THE N. LA CUEVA LOMR (ALBUQUERQUE, NM)
T1       DATE: 05/29/96
T2       FILENAME: SLC4.HC2  SUPER-CRITICAL
T2       SOUTH LA CUEVA ARROYO 2100 FT EAST OF I-25 TO 1000 FT WEST OF WYOMING
T2       STARTING WATER SURFACE ELEV AT CRITICAL DEPTH
T2       BRAIDED STREAM AT SECTIONS 2690, 2290, & 2100. THIS HEC-2 RUN LOOKS AT
T2       ALL FLOW AT THESE SECTIONS GOING INTO SOUTHERN CHANNEL OF BRAIDED STR.
T2       SUPER CRITICAL RUN
T2       MANNING'S N VALUES KEPT CONSISTENT WITH NORTH LA CUEVA HEC-2 RUN BY RTI
T2       FLOW FROM RTI'S AHYMO RUN LC100C.HYM, BASIN 117.2 (5/28/96)
T2       TOTAL FLOW FOR BASIN=196 CFS; THOUGH HIGH, USED THIS FLOW FOR WHOLE BASI
T3       100 YEAR FLOW

J1   ICHECK     INQ        NINV       IDIR       STRT       METRIC     HVINS      Q          WSEL       FQ

         0          2          0          1         -1

J2   NPROF      IPLOT      PRFVS      XSECV      XSECH      FN         ALLDC      IBW        CHNIM      ITRACE

       1          0         -1        0.0        0.0        0.0         -1        0.0        0.0

J3   VARIABLE CODES FOR SUMMARY PRINTOUT

       38         39         42         51         43          1          2          3          5          4
        8         26         25

NC     0.050      0.050      0.038       0.1        0.3
QT         1        196
           CROSS SECTION L-L
           LOCATED APPROX. 1000 FEET WEST OF WYOMING
           THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION
X1      5600         36     680.00     800.00      240.0      240.0      240.0          0          0          0
X3        10
GR    5357.4     500.00    5357.00     530.00    5356.60     565.00    5357.00     590.00    5357.50     610.00
GR    5357.4     620.00    5357.80     680.00    5357.00     700.00    5356.00     725.00    5355.60     735.00
GR    5355.2     765.00    5356.00     770.00    5357.00     790.00    5357.50     800.00    5357.00     820.00
GR    5356.0     835.00    5355.00     860.00    5354.20     875.00    5354.50     900.00    5355.00     920.00
GR    5355.4     955.00    5355.00     970.00    5354.80     990.00    5355.00    1010.00    5356.00    1050.00
GR    5356.5    1060.00    5356.00    1070.00    5355.80    1072.00    5356.00    1076.00    5357.00    1088.00
GR    5357.0    1100.00    5356.00    1110.00    5355.80    1115.00    5356.00    1120.00    5356.50    1130.00
GR    5357.0    1180.00
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CROSS SECTION K-K

X1	5360	38	765.00	860.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5348.7	500.00	5348.50	515.00	5348.25	525.00	5348.50	535.00	5348.75	550.00
GR	5348.5	560.00	5348.00	580.00	5348.00	595.00	5348.50	610.00	5348.50	625.00
GR	5348.8	670.00	5348.50	710.00	5348.50	765.00	5348.50	790.00	5348.00	810.00
GR	5347.2	830.00	5348.00	850.00	5348.50	860.00	5348.00	870.00	5347.00	900.00
GR	5348.0	925.00	5349.00	965.00	5349.30	985.00	5349.00	1015.00	5348.70	1045.00
GR	5349.0	1080.00	5348.80	1090.00	5349.00	1095.00	5349.50	1115.00	5349.00	1130.00
GR	5348.8	1132.00	5349.00	1135.00	5350.00	1140.00	5350.00	1145.00	5349.80	1155.00
GR	5350.0	1165.00	5351.00	1205.00	5352.00	1240.00				

CROSS SECTION J-J

X1	4960	37	780.00	920.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5337.2	500.00	5337.00	520.00	5336.80	528.00	5337.00	535.00	5337.50	545.00
GR	5337.6	560.00	5337.50	572.00	5337.00	590.00	5338.00	610.00	5336.00	620.00
GR	5335.5	645.00	5335.50	650.00	5336.00	660.00	5337.00	685.00	5338.00	710.00
GR	5337.0	740.00	5336.00	770.00	5336.50	780.00	5336.00	790.00	5335.00	810.00
GR	5335.0	825.00	5336.00	845.00	5338.00	860.00	5338.80	920.00	5338.00	955.00
GR	5337.0	970.00	5336.60	985.00	5337.00	1005.00	5338.00	1075.00	5337.00	1090.00
GR	5337.0	1095.00	5337.80	1110.00	5337.00	1130.00	5336.80	1132.00	5337.00	1135.00
GR	5338.0	1145.00	5338.50	1185.00						

CROSS SECTION I-I

X1	4660	41	620.00	990.00	350.0	350.0	350.0	0	0	0.0
X3	10									
GR	5329.1	500.00	5330.00	575.00	5329.20	605.00	5330.00	620.00	5329.00	660.00
GR	5328.0	680.00	5327.00	700.00	5327.00	705.00	5327.50	720.00	5327.00	738.00
GR	5326.8	740.00	5327.00	745.00	5327.50	755.00	5327.50	775.00	5327.00	790.00
GR	5326.8	795.00	5327.00	800.00	5328.00	820.00	5328.20	825.00	5328.00	830.00
GR	5327.0	840.00	5326.00	845.00	5325.80	855.00	5326.00	865.00	5328.00	875.00
GR	5329.0	890.00	5330.00	920.00	5330.00	930.00	5331.00	970.00	5331.20	990.00
GR	5331.0	1010.00	5330.00	1035.00	5329.00	1060.00	5329.40	1072.00	5329.00	1085.00
GR	5328.8	1095.00	5329.00	1105.00	5329.50	1115.00	5329.00	1130.00	5328.20	1138.00
GR	5329.0	1148.00								

CROSS SECTION H-H

X1	4310	42	620.00	870.00	270.0	270.0	270.0	0	0	0
X3	10									
GR	5317.7	500.00	5317.00	540.00	5316.70	550.00	5317.00	560.00	5317.50	580.00
GR	5317.0	590.00	5316.70	600.00	5317.00	615.00	5317.90	620.00	5317.50	635.00
GR	5317.0	670.00	5316.00	680.00	5315.25	690.00	5315.25	710.00	5316.00	725.00
GR	5317.0	735.00	5318.00	750.00	5318.00	768.00	5318.40	780.00	5318.00	800.00
GR	5317.0	810.00	5317.00	812.00	5318.00	820.00	5320.00	840.00	5320.00	845.00
GR	5321.0	870.00	5321.30	940.00	5321.20	1005.00	5321.00	1030.00	5320.50	1045.00
GR	5320.0	1060.00	5319.00	1080.00	5318.00	1090.00	5317.00	1100.00	5316.80	1115.00
GR	5316.0	1135.00	5315.90	1137.00	5316.00	1140.00	5318.00	1148.00	5320.00	1163.00
GR	5320.0	1165.00	5320.30	1180.00						

CROSS SECTION G-G

X1	4040	23	615.00	790.00	400.0	400.0	400.0	0	0	0
X3	10									
GR	5311.0	500.00	5311.25	515.00	5311.00	530.00	5310.50	540.00	5310.75	565.00
GR	5310.0	590.00	5309.25	600.00	5310.00	615.00	5309.00	630.00	5308.00	650.00
GR	5307.0	670.00	5307.00	675.00	5308.00	700.00	5309.00	725.00	5310.00	740.00
GR	5310.8	790.00	5310.50	840.00	5310.80	900.00	5310.70	940.00	5311.00	985.00
GR	5311.8	1020.00	5311.00	1050.00	5310.00	1090.00				

CROSS SECTION F-F
FIRST CROSS SECTION WEST OF LOUSIANA

X1	3640	29	555.00	640.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5297.0	500.00	5297.80	520.00	5297.60	540.00	5298.00	550.00	5299.00	555.00
GR	5298.0	560.00	5296.00	565.00	5295.00	575.00	5294.80	580.00	5295.00	600.00
GR	5296.0	625.00	5297.00	630.00	5298.00	640.00	5298.50	680.00	5298.70	725.00
GR	5299.0	730.00	5299.40	760.00	5299.00	790.00	5298.00	800.00	5297.00	810.00
GR	5296.0	820.00	5295.90	822.00	5296.00	825.00	5297.00	835.00	5298.00	845.00
GR	5300.0	865.00	5301.00	890.00	5301.50	920.00	5302.00	960.00		

CROSS SECTION E-E

X1	3340	34	518.00	590.00	300.0	300.0	300.0	0	0	0
X3	10									
GR	5288.0	500.00	5289.00	506.00	5290.00	512.00	5290.10	518.00	5290.00	520.00
GR	5289.0	530.00	5288.00	535.00	5286.00	548.00	5285.00	555.00	5284.80	560.00
GR	5285.0	565.00	5286.00	570.00	5287.00	575.00	5288.00	580.00	5288.20	590.00
GR	5288.0	600.00	5287.00	620.00	5286.80	625.00	5287.00	630.00	5287.80	650.00
GR	5287.5	670.00	5287.00	690.00	5286.50	720.00	5286.00	760.00	5285.00	775.00
GR	5284.0	790.00	5283.00	800.00	5282.00	810.00	5281.60	820.00	5282.00	830.00
GR	5283.0	850.00	5284.00	865.00	5285.00	880.00	5286.00	895.00		

CROSS SECTION D-D

X1	3040	21	630.00	720.00	350.0	350.0	350.0	0	0	0
X3	10									
GR	5279.0	500.00	5278.00	550.00	5279.00	560.00	5279.50	565.00	5279.00	570.00
GR	5278.0	580.00	5277.60	585.00	5278.00	600.00	5278.75	630.00	5278.00	660.00
GR	5277.5	670.00	5277.10	680.00	5277.50	690.00	5278.00	700.00	5278.60	720.00
GR	5278.0	730.00	5277.00	790.00	5276.00	825.00	5274.80	840.00	5276.00	875.00
GR	5276.4	905.00								

CROSS SECTION C-C

X1	2690	20	700.00	855.00	400.0	400.0	400.0	0	0	0
X3	10							5272.00	5272.00	
GR	5271.0	500.00	5270.50	535.00	5270.50	650.00	5270.75	700.00	5270.50	720.00
GR	5270.0	740.00	5269.00	775.00	5268.50	815.00	5269.00	830.00	5270.00	850.00
GR	5270.5	855.00	5270.00	860.00	5269.00	870.00	5270.00	878.00	5272.00	930.00
GR	5273.0	970.00	5273.20	980.00	5273.10	1025.00	5273.50	1095.00	5273.00	1205.00

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*
          CROSS SECTION B-B
X1      2290          25     810.00     970.00      190.0      190.0      190.0        0          0          0
X3        10
GR    5264.0      500.00    5263.00     575.00    5262.50     730.00    5263.00     750.00    5264.00     775.00
GR    5264.3      790.00    5264.00     810.00    5262.00     850.00    5261.00     880.00    5260.80     890.00
GR    5261.0      920.00    5261.80     970.00    5261.00    1005.00    5260.00    1020.00    5258.00    1055.00
GR    5260.0     1100.00    5260.20    1120.00    5260.00    1180.00    5259.00    1195.00    5258.80    1200.00
GR    5259.0     1220.00    5260.00    1255.00    5258.00    1290.00    5260.00    1325.00    5261.00    1350.00

*         CROSS SECTION A-A
          FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT
          LOCATED APPROX. 2100 FEET EAST OF I-25
X1      2100          42     910.00    1065.00       0.0        0.0        0.0        0          0          0
X3        10
GR    5257.4      500.00    5257.00     505.00    5256.00     515.00    5255.50     525.00    5256.00     535.00
GR    5256.5      570.00    5256.00     610.00    5255.60     640.00    5255.70     730.00    5256.00     770.00
GR    5256.2      790.00    5256.00     810.00    5254.00     840.00    5253.20     880.00    5254.00     895.00
GR    5254.8      910.00    5254.00     925.00    5253.90     935.00    5254.00     950.00    5253.80     965.00
GR    5254.0      970.00    5256.00     990.00    5257.00    1040.00    5257.20    1065.00    5257.00    1090.00
GR    5256.0     1115.00    5255.00    1130.00    5254.60    1140.00    5255.00    1150.00    5256.00    1165.00
GR    5257.0     1190.00    5258.00    1265.00    5256.00    1305.00    5255.90    1310.00    5256.00    1315.00
GR    5258.0     1385.00    5256.00    1415.00    5255.40    1430.00    5255.90    1440.00    5256.00    1455.00
GR    5258.0     1480.00    5260.00    1505.00
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 5600.000
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5357.80 ELREA= 5357.50

CROSS SECTION L-L
LOCATED APPROX. 1000 FEET WEST OF WYOMING
THE CHANNEL HAS BEEN GRADED OVER EAST OF THIS CROSS SECTION

5600.000	1.17	5356.37	5356.37	0.00	5356.71	0.35	0.00	0.00	5357.80
196.0	0.0	196.0	0.0	0.0	41.6	0.0	0.0	0.0	5357.50
0.00	0.00	4.72	0.00	0.000	0.038	0.000	0.000	5355.20	715.82
0.024603	0.	0.	0.	0	22	0	0.00	61.52	777.34

*SECNO 5360.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5348.50 ELREA= 5348.50

CROSS SECTION K-K

5360.000	1.17	5348.37	5348.51	0.00	5348.86	0.50	7.84	0.02	5348.50
196.0	0.0	196.0	0.0	0.0	34.7	0.0	0.2	0.3	5348.50
0.01	0.00	5.65	0.00	0.000	0.038	0.000	0.000	5347.20	795.35
0.045393	240.	240.	240.	4	23	0	0.00	61.97	857.32

*SECNO 4960.000
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5336.50 ELREA= 5338.80

CROSS SECTION J-J

4960.000	1.10	5336.10	5336.10	0.00	5336.46	0.36	13.00	6.53	5336.50
196.0	0.0	196.0	0.0	0.0	40.6	0.0	0.6	0.9	5338.80
0.03	0.00	4.83	0.00	0.000	0.038	0.000	0.000	5335.00	788.02
0.024426	400.	400.	400.	20	11	0	0.00	57.73	845.74

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4660.000

3265 DIVIDED FLOW

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5330.00 ELREA= 5331.20

CROSS SECTION I-I

4660.000	1.38	5327.18	5327.27	0.00	5327.52	0.34	8.93	0.01	5330.00
196.0	0.0	196.0	0.0	0.0	41.8	0.0	0.8	1.4	5331.20
0.05	0.00	4.69	0.00	0.000	0.038	0.000	0.000	5325.80	696.17
0.037078	300.	300.	300.	2	8	0	0.00	84.73	870.96

*SECNO 4310.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5317.90 ELREA= 5321.00

CROSS SECTION H-H

4310.000	1.03	5316.28	5316.31	0.00	5316.70	0.42	10.82	0.01	5317.90
196.0	0.0	196.0	0.0	0.0	37.7	0.0	1.2	1.9	5321.00
0.07	0.00	5.20	0.00	0.000	0.038	0.000	0.000	5315.25	677.21
0.026156	350.	350.	350.	3	15	0	0.00	50.59	727.79

*SECNO 4040.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5310.00 ELREA= 5310.80

CROSS SECTION G-G

4040.000	1.17	5308.17	5308.25	0.00	5308.62	0.45	8.08	0.00	5310.00
196.0	0.0	196.0	0.0	0.0	36.5	0.0	1.4	2.3	5310.80
0.09	0.00	5.36	0.00	0.000	0.038	0.000	0.000	5307.00	646.64
0.034548	270.	270.	270.	3	11	0	0.00	57.56	704.20

*SECNO 3640.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5299.00 ELREA= 5298.00

CROSS SECTION F-F
FIRST CROSS SECTION WEST OF LOUSIANA

3640.000	1.09	5295.89	5295.93	0.00	5296.29	0.40	12.32	0.01	5299.00
196.0	0.0	196.0	0.0	0.0	38.7	0.0	1.7	2.8	5298.00
0.11	0.00	5.06	0.00	0.000	0.038	0.000	0.000	5294.80	566.08
0.027622	400.	400.	400.	3	8	0	0.00	56.21	622.29

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3340.000
3280 CROSS SECTION 3340.00 EXTENDED 0.43 FEET

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5290.10 ELREA= 5288.20

CROSS SECTION E-E

3340.000	1.63	5286.43	5286.61	0.00	5287.22	0.79	9.03	0.04	5290.10
196.0	0.0	196.0	0.0	0.0	27.4	0.0	2.0	3.1	5288.20
0.12	0.00	7.14	0.00	0.000	0.038	0.000	0.000	5284.80	545.23
0.032924	300.	300.	300.	4	46	0	0.00	26.91	572.13

*SECNO 3040.000
3280 CROSS SECTION 3040.00 EXTENDED 2.04 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5278.75 ELREA= 5278.60

CROSS SECTION D-D

3040.000	1.34	5278.44	5278.44	0.00	5278.75	0.31	8.63	5.22	5278.75
196.0	0.0	196.0	0.0	0.0	44.0	0.0	2.2	3.4	5278.60
0.14	0.00	4.46	0.00	0.000	0.038	0.000	0.000	5277.10	642.25
0.025346	300.	300.	300.	20	14	0	0.00	72.55	714.79

*SECNO 2690.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5272.00 ELREA= 5272.00

CROSS SECTION C-C

2690.000	0.97	5269.47	5269.47	0.00	5269.76	0.29	8.99	0.01	5270.75
196.0	0.0	196.0	0.0	0.0	45.5	0.0	2.6	4.0	5270.50
0.16	0.00	4.30	0.00	0.000	0.038	0.000	0.000	5268.50	758.61
0.026023	350.	350.	350.	3	20	0	0.00	80.75	839.37

*SECNO 2290.000
3280 CROSS SECTION 2290.00 EXTENDED 0.65 FEET

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5264.00 ELREA= 5261.80

CROSS SECTION B-B

2290.000	0.85	5261.65	5261.65	0.00	5261.89	0.25	10.51	6.39	5264.00
196.0	0.0	196.0	0.0	0.0	49.3	0.0	3.0	4.9	5261.80
0.19	0.00	3.98	0.00	0.000	0.038	0.000	0.000	5260.80	860.58
0.026522	400.	400.	400.	20	12	0	0.00	99.90	960.48

*SECNO 2100.000

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5254.80 ELREA= 5257.20

CROSS SECTION A-A
FURTHEST DOWNSTREAM SECTION BEFORE FLOW SPREADS OUT
LOCATED APPROX. 2100 FEET EAST OF I-25

2100.000	0.77	5254.57	5254.70	0.00	5255.10	0.53	6.76	0.03	5254.80
196.0	0.0	196.0	0.0	0.0	33.5	0.0	3.2	5.2	5257.20
0.20	0.00	5.85	0.00	0.000	0.038	0.000	0.000	5253.80	914.33
0.050199	190.	190.	190.	4	29	0	0.00	61.36	975.69

THIS RUN EXECUTED 29MAY96 8:52:01

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HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

100 YEAR FLOW

SUMMARY PRINTOUT

	SECNO	XLCH	ELMIN	DIFWSX	Q	CWSEL	CRIWS	EG	10*KS	TOPWID	DEPTH	VCH	AREA
*	5600.000	0.00	5355.20	0.00	196.00	5356.37	5356.37	5356.71	246.03	61.52	1.17	4.72	41.5
	5360.000	240.00	5347.20	-8.00	196.00	5348.37	5348.51	5348.86	453.93	61.97	1.17	5.65	34.6
*	4960.000	400.00	5335.00	-12.27	196.00	5336.10	5336.10	5336.46	244.26	57.73	1.10	4.83	40.5
	4660.000	300.00	5325.80	-8.92	196.00	5327.18	5327.27	5327.52	370.78	84.73	1.38	4.69	41.7
	4310.000	350.00	5315.25	-10.90	196.00	5316.28	5316.31	5316.70	261.56	50.59	1.03	5.20	37.7
	4040.000	270.00	5307.00	-8.11	196.00	5308.17	5308.25	5308.62	345.48	57.56	1.17	5.36	36.5
	3640.000	400.00	5294.80	-12.28	196.00	5295.89	5295.93	5296.29	276.22	56.21	1.09	5.06	38.7
	3340.000	300.00	5284.80	-9.46	196.00	5286.43	5286.61	5287.22	329.24	26.91	1.63	7.14	27.4
*	3040.000	300.00	5277.10	-7.98	196.00	5278.44	5278.44	5278.75	253.46	72.55	1.34	4.46	43.9
	2690.000	350.00	5268.50	-8.97	196.00	5269.47	5269.47	5269.76	260.23	80.75	0.97	4.30	45.5
*	2290.000	400.00	5260.80	-7.82	196.00	5261.65	5261.65	5261.89	265.22	99.90	0.85	3.98	49.2
	2100.000	190.00	5253.80	-7.07	196.00	5254.57	5254.70	5255.10	501.99	61.36	0.77	5.85	33.5

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=   5600.000  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=   4960.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4960.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4960.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   3040.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   3040.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   3040.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   2290.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   2290.000  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   2290.000  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL
```

APPENDIX D: Section 4

Summary of the Source of Input Parameters Used in the Revised Conditions Model

The source of input parameters used in the revised conditions model are listed below:

1. Orthophoto/topographic maps with 1"=200' scale from December 1995, were used to develop cross sections for the South La Cueva Arroyo on the east side of I-25. The maps were developed by Koogle & Pouls Engineering, Inc., Albuquerque, NM.

2. The 100-year flows were used in the HEC-2 models. These were developed by RTI. Documentation and results for the hydrology used are included in Appendix A.

APPENDIX E

Form 4 : Riverine Hydraulic Analysis Form #4
South La Cueva Arroyo, West of I-25

Backup Data

1. Disk #5: diskette containing the HEC-2 computer model input and output files for the 100-year recurrence interval.

2. Summary of the file names and contents for the HEC-2 revised conditions models for the South La Cueva Arroyo, west of I-25.

3. HEC-2 output for the revised conditions models for the South La Cueva Arroyo located west of I-25. (Note: there are two HEC-2 models included in this section, one for supercritical flow and one for subcritical flow).

4. HEC-2 output for the revised conditions model for the Wildflower Training Dike located west of I-25.

5. Summary of the source of input parameters used in the revised conditions models.

APPENDIX E: Section 1

HEC-2 Computer Model Input And Output Files For The 100-Year Recurrence Interval

APPENDIX E: Section 2

Summary of the File Names and Contents for the HEC-2 Revised Conditions Models for the South La Cueva Arroyo

The HEC-2 revised conditions models for the South La Cueva Arroyo are provided on Disk #5. All of the HEC-2 runs use the 100-year, existing conditions flows. The files for the Wildflower Training Dike model are also included because of the diversion's hydraulic connection with the South La Cueva Channel. Table E1 below summarizes the model file names and contents.

Table E1: Summary of HEC-2 Models for the South La Cueva Arroyo, West of I-25

Input File Name	Output File Name	Contents
SLCWI25.HC2	SLCWI25.OUT	This file contains the HEC-2 run for the South La Cueva Arroyo on the west side of I-25. The upstream limit of the reach is at I-25 and the downstream limit is at the inlet to the 96" underground conduit. The model is for supercritical flow.
SLCWI25.SUB	SLCWI25.SOU	This file contains the HEC-2 run for the South La Cueva Arroyo on the west side of I-25. The upstream limit of the reach is at I-25 and the downstream limit is at the inlet to the 96" underground conduit. The model is for subcritical flow.
WILDFL.SUB	WILDFL.OUT	This file contains the HEC-2 run for the Wildflower Training Dike on the west side of I-25. The model is for subcritical flow.

APPENDIX E: Section 3

HEC-2 Output for the Revised Conditions Models for the South La Cueva Arroyo Located West of I-25

(Note: There Are Two HEC-2 Models Included In This Section, One For Supercritical Flow And One For Subcritical Flow).

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    18JUL96    TIME   13:23:25  *
*******************************************
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************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
```


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 X     X  XXXXXXX   XXXXX              XXXXX
 X     X  X         X     X           X     X
 X     X  X         X                       X
 XXXXXXX  XXXX      X          XXXXX    XXXXX
 X     X  X         X                  X
 X     X  X         X     X            X
 X     X  XXXXXXX   XXXXX              XXXXXXX
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:::                                        :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION   :::
:::                                        :::
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H A E S T A D   M E T H O D S
==============================
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 18JUL96 13:23:25

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**********************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**********************************


T1   SOUTH LA CUEVA CHANNEL WEST OF I-25
T1   FROM I-25 TO 96" UNDERGROUND PIPE INLET (BY JEFFERSON ST.)
T2   CROSS SECTIONS DEVELOPED FROM AS-BUILT PLANS
T2   BOHANNAN-HUSTON, INC. ALBUQUERQUE, NM   MAY 1996
T2   HEC-2 DEVELOPED FOR LOMR STUDY OF THE NORTH LA CUEVA
T2   100 YEAR FLOWS.  FLOW FROM RTI'S NEW AHYMO 5/29/96 (FILE: LC100C.HYM)
T3          SUPERCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

            2.                      1        -1

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   -1.          0       -1.                                     -1.


J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.       42.        4.        26.        1.        2.        3.        8.        14.

QT      1.0      282.0
NC     .045       .040      .030        .1         .3
NH      3         0.045     515.00     0.030     583.00     0.040     598.00
          UPSTREAM END OF S LA CUEVA CHANNEL, AT I-25, STRUCTURE 12
          EARTH CHANNEL, WIRED RIP RAP ON NORTH SIDE OF CHANNEL
          LOOSE ROCKS WITH VEGETATION ON SOUTH SIDE OF CHANNEL
X1   5016.8       4.0     500.00     598.0      54.26      54.3       54.3
GR   5192.2     500.0    5187.23     515.0    5187.23     583.0    5192.23      598.0

NH      3         0.045     515.00     0.030     570.90     0.040     585.90
X1   4962.5       4.0     500.00     585.9      50.00      50.0       50.0
GR   5191.4     500.0    5186.43     515.0    5186.43     570.9    5191.43      585.9

NH      3         0.045     515.00     0.030     560.20     0.040     575.20
X1   4912.5       4.0     500.00     575.2      50.00      50.0       50.0
GR   5190.7     500.0    5185.70     515.0    5185.70     560.2    5190.70      575.2

NH      3         0.045     515.00     0.030     550.40     0.040     565.40
X1   4862.5       4.0     500.00     565.4      27.74      27.7       27.7
GR   5190.0     500.0    5184.97     515.0    5184.97     550.4    5189.97      565.4
```

```
NH     3         0.015     515.00      0.030      545.00       0.045      560.00
          EARTH CHANNEL, LOOSE ROCKS WITH VEGETATION ON NORTH SIDE OF CHANNEL
          LOOSE ROCKS WITH VEGETATION ON SOUTH SIDE OF CHANNEL
X1   4834.8       4.0     500.00      560.0       22.26        22.3       22.3
GR   5189.6     500.0    5184.56      515.0      5184.56       545.0    5189.56       560.0

NH     3         0.045     515.00      0.030      540.20       0.045      555.20
X1   4812.5       4.0     500.00      555.2       47.74        47.7       47.7
GR   5189.2     500.0    5184.23      515.0      5184.23       540.2    5189.23       555.2

NH     3         0.045     515.00      0.030      530.00       0.040      545.00
          EARTH CHANNEL, WIRE TIRED RIP RAP ON NORTH SIDE OF CHANNEL
          LOOSE ROCKS WITH VEGETATION ON SOUTH SIDE OF CHANNEL
X1   4764.8       4.0     500.00      545.0       52.26        52.3       52.3
GR   5188.5     500.0    5183.53      515.0      5183.53       530.0    5188.53       545.0

QT     1.0       606.0
X1   4712.5       4.0     500.00      545.0       47.74        47.7       47.7
GR   5187.8     500.0    5182.76      515.0      5182.76       530.0    5187.76       545.0

NH     3         0.045     515.00      0.030      530.00       0.045      545.00
          EARTH CHANNEL, LOOSE ROCK WITH VEGETATION ON CHANNEL SIDES
X1   4664.8       4.0     500.00      545.0       52.26        52.3       52.3
GR   5186.6     500.0    5181.64      515.0      5181.64       530.0    5186.64       545.0

X1   4612.5       4.0     500.00      545.0       50.00        50.0       50.0
GR   5185.0     500.0    5179.99      515.0      5179.99       530.0    5184.99       545.0

X1   4562.5       4.0     500.00      545.0       50.00        50.0       50.0
GR   5183.4     500.0    5178.41      515.0      5178.41       530.0    5183.41       545.0

X1   4512.5       4.0     500.00      545.0       37.74        37.7       37.7
GR   5181.8     500.0    5176.83      515.0      5176.83       530.0    5181.83       545.0

NH     3         0.040     515.00      0.030      530.00       0.045      545.00
          EARTH CHANNEL, WIRE TIED RIP RAP ON SOUTH SIDE OF CHANNEL
          LOOSE ROCKS WITH VEGETATION ON NORTH SIDE OF CHANNEL
X1   4474.8       4.0     500.00      545.0       40.00        40.0       40.0
GR   5180.6     500.0    5175.64      515.0      5175.64       530.0    5180.64       545.0

          BEGIN TRANSITION FROM 15' TO 10' WIDE BOTTOM
X1   4434.8       4.0     500.00      545.0       60.00        60.0       60.0
GR   5179.4     500.0    5174.38      515.0      5174.38       530.0    5179.38       545.0

NH     3         0.025     521.00      0.015      539.00       0.025      560.00
X1   4374.8       8.0     500.00      560.0       12.26        12.3       12.3
GR   5177.8     500.0    5177.48      507.5      5174.48       521.0    5172.48       525.0    5172.48       535.0
GR   5174.5     539.0    5177.48      552.5      5177.48       560.0
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X1   4362.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5177.2    500.0     5177.17    507.5     5174.17     521.0     5172.17     525.0     5172.17     535.0
GR   5174.2    539.0     5177.17    552.5     5177.17     560.0

X1   4312.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5175.9    500.0     5175.92    507.5     5172.92     521.0     5170.92     525.0     5170.92     535.0
GR   5172.9    539.0     5175.92    552.5     5175.92     560.0

X1   4262.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5174.7    500.0     5174.67    507.5     5171.67     521.0     5169.67     525.0     5169.67     535.0
GR   5171.7    539.0     5174.67    552.5     5174.67     560.0

X1   4212.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5173.4    500.0     5173.42    507.5     5170.42     521.0     5168.42     525.0     5168.42     535.0
GR   5170.4    539.0     5173.42    552.5     5173.42     560.0

X1   4162.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5172.2    500.0     5172.20    507.5     5169.17     521.0     5167.17     525.0     5167.17     535.0
GR   5169.2    539.0     5172.17    552.5     5172.17     560.0

X1   4112.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5170.9    500.0     5170.92    507.5     5167.92     521.0     5165.92     525.0     5165.92     535.0
GR   5167.9    539.0     5170.92    552.5     5170.92     560.0

X1   4062.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5169.7    500.0     5169.67    507.5     5166.67     521.0     5164.67     525.0     5164.67     535.0
GR   5166.7    539.0     5169.67    552.5     5169.67     560.0

X1   4012.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5168.4    500.0     5168.42    507.5     5165.42     521.0     5163.42     525.0     5163.42     535.0
GR   5165.4    539.0     5168.42    552.5     5168.42     560.0

X1   3962.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5167.2    500.0     5167.17    507.5     5164.42     521.0     5162.17     525.0     5162.17     535.0
GR   5164.2    539.0     5167.17    552.5     5167.17     560.0

X1   3912.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5165.9    500.0     5165.92    507.5     5162.92     521.0     5160.92     525.0     5160.92     535.0
GR   5162.9    539.0     5165.92    552.5     5165.92     560.0

X1   3862.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5164.7    500.0     5164.67    507.5     5161.67     521.0     5159.67     525.0     5159.67     535.0
GR   5161.7    539.0     5164.67    552.5     5164.67     560.0

X1   3812.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5163.4    500.0     5163.42    507.5     5160.42     521.0     5158.42     525.0     5158.42     535.0
GR   5160.4    539.0     5163.42    552.5     5163.42     560.0
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X1   3762.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5162.2    500.0     5162.17    507.5     5159.17    521.0    5157.17    525.0    5157.17    535.0
GR   5159.2    539.0     5162.17    552.5     5162.17    560.0

X1   3712.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5160.9    500.0     5160.90    507.5     5157.92    521.0    5155.92    525.0    5155.92    535.0
GR   5157.9    539.0     5160.92    552.5     5160.92    560.0

X1   3662.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5159.7    500.0     5159.67    507.5     5156.67    521.0    5154.67    525.0    5154.67    535.0
GR   5156.7    539.0     5159.67    552.5     5159.67    560.0

X1   3612.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5158.4    500.0     5158.42    507.5     5155.42    521.0    5153.42    525.0    5153.42    535.0
GR   5155.4    539.0     5158.42    552.5     5158.42    560.0

X1   3562.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5157.2    500.0     5157.17    507.5     5154.17    521.0    5152.17    525.0    5152.17    535.0
GR   5154.2    539.0     5157.17    552.5     5157.17    560.0

X1   3512.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5155.9    500.0     5155.92    507.5     5152.92    521.0    5150.92    525.0    5150.92    535.0
GR   5152.9    539.0     5155.92    552.5     5155.92    560.0

X1   3462.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5154.7    500.0     5154.67    507.5     5151.67    521.0    5149.67    525.0    5149.67    535.0
GR   5151.7    539.0     5154.67    552.5     5154.67    560.0

X1   3412.5      8.0     500.00     560.0      47.00      47.0      47.0
GR   5153.4    500.0     5153.42    507.5     5150.42    521.0    5148.42    525.0    5148.42    535.0
GR   5150.4    539.0     5153.42    552.5     5153.42    560.0

NH      3      0.015      502.40    0.015      520.40    0.015      522.80
X1   3365.5      6.0     500.00     522.8      50.00      50.0      50.0
GR   5152.3    500.0     5150.25    502.4     5147.25    506.4    5147.25    516.4    5150.25    520.4
GR   5152.3    522.8

NH      3      0.015      512.00    0.015      522.00    0.015      534.00
X1   3315.5      4.0     500.00     534.0      10.00      10.0      10.0
GR   5150.8    500.0     5144.75    512.0     5144.75    522.0    5150.75    534.0

QT      1.0    717.0
NH      3      0.015      504.50    0.015      514.50    0.015      519.00
X1   3305.5      6.0     500.00     519.0      86.00      86.0      86.0
GR   5145.8    500.0     5142.75    500.0     5139.25    504.5    5139.25    514.5    5142.25    519.0
GR   5145.8    519.0

NH      3      0.015      510.50    0.015      520.50    0.015      531.00
X1   3219.5      4.0     500.00     531.0      69.50      69.5      69.5
GR   5147.0    500.0     5139.97    510.5     5139.97    520.5    5146.97    531.0
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X1	3150.0	4.0	500.00	530.0	50.00	50.0	50.0	
GR	5143.0	500.0	5137.97	510.0	5137.97	520.0	5142.97	530.0
X1	3100.0	4.0	500.00	530.0	50.00	50.0	50.0	
GR	5142.1	500.0	5137.12	510.0	5137.12	520.0	5142.12	530.0
X1	3050.0	4.0	500.00	530.0	20.00	20.0	20.0	
GR	5141.3	500.0	5136.27	510.0	5136.27	520.0	5141.27	530.0
NH	3	0.015	506.00	0.015	516.00	0.015	526.00	
X1	3030.0	4.0	500.00	526.0	20.00	20.0	20.0	
GR	5138.9	500.0	5135.93	506.0	5135.93	516.0	5140.93	526.0
X1	3010.0	4.0	500.00	526.0	20.00	20.0	20.0	
GR	5138.6	500.0	5135.60	506.0	5135.60	516.0	5140.60	526.0
NH	3	0.015	506.00	0.015	516.00	0.015	527.00	
X1	2990.0	4.0	500.00	527.0	40.00	40.0	40.0	
GR	5138.3	500.0	5135.26	506.0	5135.26	516.0	5140.76	527.0
X1	2950.0	4.0	500.00	527.0	50.00	50.0	50.0	
GR	5137.6	500.0	5134.58	506.0	5134.58	516.0	5140.08	527.0
X1	2900.0	4.0	500.00	527.0	50.00	50.0	50.0	
GR	5136.6	500.0	5133.58	506.0	5133.58	516.0	5139.08	527.0
X1	2850.0	4.0	500.00	527.0	50.00	50.0	50.0	
GR	5135.6	500.0	5132.58	506.0	5132.58	516.0	5138.08	527.0
X1	2800.0	4.0	500.00	527.0	50.00	50.0	50.0	
GR	5134.6	500.0	5131.58	506.0	5131.58	516.0	5137.08	527.0
X1	2750.0	4.0	500.00	527.0	50.00	50.0	50.0	
GR	5133.6	500.0	5130.58	506.0	5130.58	516.0	5136.08	527.0
X1	2700.0	4.0	500.00	527.0	40.00	40.0	40.0	
GR	5132.6	500.0	5129.58	506.0	5129.58	516.0	5135.08	527.0
NH	3	0.015	506.00	0.015	516.00	0.015	526.00	
X1	2660.0	4.0	500.00	526.0	60.00	60.0	60.0	
GR	5131.8	500.0	5128.78	506.0	5128.78	516.0	5133.78	526.0
X1	2600.0	4.0	500.00	526.0	50.00	50.0	50.0	
GR	5130.6	500.0	5127.58	506.0	5127.58	516.0	5132.58	526.0
X1	2550.0	4.0	500.00	526.0	50.00	50.0	50.0	
GR	5129.6	500.0	5126.58	506.0	5126.58	516.0	5131.58	526.0

X1	2500.0	4.0	500.00	526.0	50.00	50.0	50.0	
GR	5128.6	500.0	5125.58	506.0	5125.58	516.0	5130.58	526.0
X1	2450.0	4.0	500.00	526.0	50.00	50.0	50.0	
GR	5127.6	500.0	5124.58	506.0	5124.58	516.0	5129.58	526.0
X1	2400.0	4.0	500.00	526.0	50.00	50.0	50.0	
GR	5126.6	500.0	5123.58	506.0	5123.58	516.0	5128.58	526.0
X1	2350.0	4.0	500.00	530.0	50.00	50.0	50.0	
GR	5125.6	500.0	5122.58	506.0	5122.58	516.0	5127.58	526.0
X1	2300.0	4.0	500.00	526.0	50.00	50.0	50.0	
GR	5124.6	500.0	5121.58	506.0	5121.58	516.0	5126.58	526.0
NH	3	0.015	508.00	0.015	518.00	0.015	528.00	
X1	2250.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5124.6	500.0	5120.58	508.0	5120.58	518.0	5125.58	528.0
X1	2200.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5123.6	500.0	5119.58	508.0	5119.58	518.0	5124.58	528.0
X1	2150.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5122.6	500.0	5118.57	508.0	5118.57	518.0	5123.57	528.0
X1	2100.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5121.6	500.0	5117.56	508.0	5117.56	518.0	5122.56	528.0
X1	2050.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5120.5	500.0	5116.55	508.0	5116.55	518.0	5121.55	528.0
X1	2000.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5119.5	500.0	5115.54	508.0	5115.54	518.0	5120.54	528.0
X1	1950.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5118.5	500.0	5114.53	508.0	5114.53	518.0	5119.53	528.0
X1	1900.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5117.5	500.0	5113.52	508.0	5113.52	518.0	5118.52	528.0
X1	1850.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5116.5	500.0	5112.51	508.0	5112.51	518.0	5117.51	528.0
X1	1800.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5115.5	500.0	5111.50	508.0	5111.50	518.0	5116.50	528.0
X1	1750.0	4.0	500.00	528.0	50.00	50.0	50.0	
GR	5114.5	500.0	5110.52	508.0	5110.52	518.0	5115.52	528.0

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X1   1700.0       4.0     500.00      528.0      50.00       50.0       50.0
GR   5113.5     500.0     5109.54     508.0     5109.54      518.0     5114.54      528.0

X1   1650.0       4.0     500.00      528.0      50.00       50.0       50.0
GR   5112.6     500.0     5108.55     508.0     5108.55      518.0     5113.55      528.0

X1   1600.0       4.0     500.00      528.0      50.00       50.0       50.0
GR   5111.6     500.0     5107.57     508.0     5107.57      518.0     5112.57      528.0

NH      3       0.015      509.20     0.015      519.20      0.015      529.20
X1   1550.0       4.0     500.00      529.2        9.00        9.0        9.0
GR   5110.8     500.0     5106.23     509.2     5106.23      519.2     5111.23      529.2

QT      1.0     798.0
NH      3       0.015      510.00     0.015      520.00      0.015      530.00
X1   1541.0       4.0     500.00      530.0       46.00       46.0       46.0
GR   5110.9     500.0     5105.95     510.0     5105.95      520.0     5110.95      530.0

X1   1495.0       4.0     500.00      530.0       25.00       25.0       25.0
GR   5109.5     500.0     5104.51     510.0     5104.51      520.0     5109.51      530.0

NH      3       0.015      507.50     0.015      517.00      0.015      524.00
X1   1470.0       6.0     500.00      524.0       25.00       25.0       25.0
GR   5108.7     500.0     5107.47     500.0     5103.72      507.5     5103.72      517.0     5107.47      524.0
GR   5109.2     524.0

NH      3       0.015      505.00     0.015      514.00      0.015      519.00
X1   1445.0       6.0     500.00      519.0       40.00       40.0       40.0
GR   5109.2     500.0     5105.44     500.0     5102.94      505.0     5102.94      514.0     5105.44      519.0
GR   5109.2     519.0

NH      3       0.015      501.00     0.015      509.00      0.015      510.20
X1   1405.0       6.0     500.00      510.2       10.00       10.0       10.0
GR   5103.0     500.0     5096.20     500.0     5095.70      501.0     5095.70      509.0     5096.20      510.2
GR   5103.0     510.2

NH      1       0.015         508
X1   1395.0       4.0     500.00      508.0        5.00        5.0        5.0
GR   5103.9     500.0     5093.89     500.0     5093.89      508.0     5103.89      508.0

X1   1390.0       6.0     500.00      508.0        5.00        5.0        5.0
GR   5103.1     500.0     5094.57     500.0     5093.61      500.9     5093.61      507.1     5094.57      508.0
GR   5103.1     508.0

X1   1385.0       6.0     500.00      508.0        5.00        5.0        5.0
GR   5103.4     500.0     5095.52     500.0     5093.31      501.8     5093.31      506.3     5095.52      508.0
GR   5103.4     508.0
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X1	1380.0	8.0	500.00	508.0	5.00	5.0	5.0			
GR	5104.1	500.0	5095.90	500.0	5094.77	500.6	5093.18	502.6	5093.18	505.4
GR	5094.8	507.4	5095.90	508.0	5104.10	508.0				
X1	1375.0	8.0	500.00	508.0	5.00	5.0	5.0			
GR	5103.0	500.0	5096.42	500.0	5094.92	500.4	5093.08	503.2	5093.08	504.6
GR	5094.9	507.6	5096.42	508.0	5103.00	508.0				
X1	1370.0	8.0	500.00	508.0	0.00	0.0	0.0			
GR	5103.0	500.0	5096.98	500.0	5094.90	500.5	5092.98	503.5	5092.98	504.7
GR	5094.9	507.5	5096.98	508.0	5102.98	508.0				

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
1490 NH CARD USED
*SECNO 5016.800
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED
UPSTREAM END OF S LA CUEVA CHANNEL, AT I-25, STRUCTURE 12
EARTH CHANNEL, WIRED RIP RAP ON NORTH SIDE OF CHANNEL
LOOSE ROCKS WITH VEGETATION ON SOUTH SIDE OF CHANNEL

5016.800	0.80	5188.03	5188.03	0.00	5188.42	0.39	0.00	0.00	5192.20
282.0	0.0	282.0	0.0	0.0	56.2	0.0	0.0	0.0	5192.23
0.00	0.00	5.01	0.00	0.000	0.031	0.000	0.000	5187.23	512.59
0.015458	0.	0.	0.	0	16	0	0.00	72.81	585.40

1490 NH CARD USED
*SECNO 4962.500
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4962.500	0.91	5187.34	5187.34	0.00	5187.77	0.43	0.83	0.36	5191.40
282.0	0.0	282.0	0.0	0.0	53.3	0.0	0.1	0.1	5191.43
0.00	0.00	5.29	0.00	0.000	0.031	0.000	0.000	5186.43	512.26
0.015076	54.	54.	54.	20	8	0	0.00	61.37	573.63

1490 NH CARD USED
*SECNO 4912.500
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4912.500	1.04	5186.74	5186.74	0.00	5187.23	0.49	0.75	0.33	5190.70
282.0	0.0	282.0	0.0	0.0	50.4	0.0	0.1	0.1	5190.70
0.01	0.00	5.60	0.00	0.000	0.032	0.000	0.000	5185.70	511.87
0.014819	50.	50.	50.	20	8	0	0.00	51.45	563.33

1490 NH CARD USED

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4862.500
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4862.500	1.21	5186.18	5186.18	0.00	5186.73	0.56	0.75	0.34	5190.00
282.0	0.0	282.0	0.0	0.0	47.1	0.0	0.2	0.2	5189.97
0.01	0.00	5.98	0.00	0.000	0.032	0.000	0.000	5184.97	511.40
0.015062	50.	50.	50.	20	8	0	0.00	42.63	554.02

1490 NH CARD USED
*SECNO 4834.800
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
EARTH CHANNEL, LOOSE ROCKS WITH VEGETATION ON NORTH SIDE OF CHANNEL
LOOSE ROCKS WITH VEGETATION ON SOUTH SIDE OF CHANNEL

4834.800	1.33	5185.89	5185.89	0.00	5186.49	0.61	0.43	0.21	5189.60
282.0	0.0	282.0	0.0	0.0	45.2	0.0	0.2	0.2	5189.56
0.01	0.00	6.24	0.00	0.000	0.034	0.000	0.000	5184.56	511.04
0.015989	28.	28.	28.	20	8	0	0.00	37.95	548.99

1490 NH CARD USED
*SECNO 4812.500
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4812.500	1.48	5185.71	5185.71	0.00	5186.35	0.65	0.36	0.19	5189.20
282.0	0.0	282.0	0.0	0.0	43.7	0.0	0.2	0.2	5189.23
0.01	0.00	6.45	0.00	0.000	0.034	0.000	0.000	5184.23	510.55
0.016270	22.	22.	22.	20	8	0	0.00	34.08	544.63

1490 NH CARD USED
*SECNO 4764.800
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
EARTH CHANNEL, WIRE TIRED RIP RAP ON NORTH SIDE OF CHANNEL
LOOSE ROCKS WITH VEGETATION ON SOUTH SIDE OF CHANNEL

4764.800	1.94	5185.47	5185.47	0.00	5186.23	0.76	0.79	0.39	5188.50
282.0	0.0	282.0	0.0	0.0	40.3	0.0	0.3	0.3	5188.53
0.01	0.00	6.99	0.00	0.000	0.036	0.000	0.000	5183.53	509.15
0.016943	48.	48.	48.	20	11	0	0.00	26.66	535.81

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4712.500
3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4712.500	2.99	5185.75	5185.75	0.00	5186.86	1.11	0.87	0.72	5187.80
606.0	0.0	606.0	0.0	0.0	71.6	0.0	0.3	0.3	5187.76
0.01	0.00	8.47	0.00	0.000	0.037	0.000	0.000	5182.76	506.10
0.016585	52.	52.	52.	20	14	0	0.00	32.87	538.97

1490 NH CARD USED
*SECNO 4664.800
EARTH CHANNEL, LOOSE ROCK WITH VEGETATION ON CHANNEL SIDES

4664.800	2.67	5184.31	5184.63	0.00	5185.83	1.52	1.00	0.04	5186.60
606.0	0.0	606.0	0.0	0.0	61.3	0.0	0.4	0.4	5186.64
0.01	0.00	9.88	0.00	0.000	0.038	0.000	0.000	5181.64	506.95
0.027190	48.	48.	48.	4	5	0	0.00	31.04	537.99

*SECNO 4612.500

4612.500	2.55	5182.54	5182.99	0.00	5184.26	1.72	1.54	0.02	5185.00
606.0	0.0	606.0	0.0	0.0	57.5	0.0	0.5	0.4	5184.99
0.02	0.00	10.54	0.00	0.000	0.038	0.000	0.000	5179.99	507.39
0.032158	52.	52.	52.	6	8	0	0.00	30.24	537.63

*SECNO 4562.500

4562.500	2.56	5180.97	5181.42	0.00	5182.66	1.69	1.59	0.01	5183.40
606.0	0.0	606.0	0.0	0.0	58.0	0.0	0.6	0.4	5183.41
0.02	0.00	10.44	0.00	0.000	0.038	0.000	0.000	5178.41	507.31
0.031419	50.	50.	50.	6	8	0	0.00	30.37	537.68

*SECNO 4512.500

4512.500	2.55	5179.38	5179.83	0.00	5181.08	1.70	1.58	0.00	5181.80
606.0	0.0	606.0	0.0	0.0	57.9	0.0	0.6	0.5	5181.83
0.02	0.00	10.46	0.00	0.000	0.038	0.000	0.000	5176.83	507.29
0.031635	50.	50.	50.	7	8	0	0.00	30.37	537.66

1490 NH CARD USED
*SECNO 4474.800
EARTH CHANNEL, WIRE TIED RIP RAP ON SOUTH SIDE OF CHANNEL

LOOSE ROCKS WITH VEGETATION ON NORTH SIDE OF CHANNEL

4474.800	2.53	5178.17	5178.65	0.00	5179.91	1.75	1.17	0.00	5180.60
606.0	0.0	606.0	0.0	0.0	57.2	0.0	0.7	0.5	5180.64
0.02	0.00	10.60	0.00	0.000	0.037	0.000	0.000	5175.64	507.36
0.030443	38.	38.	38.	8	8	0	0.00	30.23	537.58

*SECNO 4434.800

BEGIN TRANSITION FROM 15' TO 10' WIDE BOTTOM

4434.800	2.51	5176.89	5177.37	0.00	5178.67	1.78	1.23	0.00	5179.40
606.0	0.0	606.0	0.0	0.0	56.5	0.0	0.7	0.5	5179.38
0.02	0.00	10.72	0.00	0.000	0.037	0.000	0.000	5174.38	507.50
0.031272	40.	40.	40.	8	11	0	0.00	30.03	537.53

1490 NH CARD USED
*SECNO 4374.800

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.56

4374.800	3.04	5175.52	5176.22	0.00	5177.67	2.14	0.97	0.04	5177.80
606.0	0.0	606.0	0.0	0.0	51.6	0.0	0.8	0.6	5177.48
0.02	0.00	11.75	0.00	0.000	0.019	0.000	0.000	5172.48	516.30
0.009859	60.	60.	60.	7	11	0	0.00	27.34	543.64

*SECNO 4362.500

4362.500	2.94	5175.11	5175.89	0.00	5177.51	2.40	0.13	0.03	5177.20
606.0	0.0	606.0	0.0	0.0	48.7	0.0	0.8	0.6	5177.17
0.02	0.00	12.44	0.00	0.000	0.018	0.000	0.000	5172.17	516.77
0.011082	12.	12.	12.	13	11	0	0.00	26.36	543.13

*SECNO 4312.500

3301 HV CHANGED MORE THAN HVINS

4312.500	2.67	5173.59	5174.63	0.00	5176.79	3.20	0.64	0.08	5175.90
606.0	0.0	606.0	0.0	0.0	42.2	0.0	0.9	0.6	5175.92
0.02	0.00	14.37	0.00	0.000	0.018	0.000	0.000	5170.92	517.98
0.014783	50.	50.	50.	6	11	0	0.00	24.10	542.09

*SECNO 4262.500

3301 HV CHANGED MORE THAN HVINS

4262.500	2.55	5172.22	5173.40	0.00	5175.95	3.73	0.79	0.05	5174.70
606.0	0.0	606.0	0.0	0.0	39.1	0.0	0.9	0.6	5174.67
0.02	0.00	15.51	0.00	0.000	0.017	0.000	0.000	5169.67	518.54
0.016896	50.	50.	50.	7	11	0	0.00	22.81	541.35

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 4212.500									
4212.500	2.45	5170.87	5172.15	0.00	5175.02	4.15	0.89	0.04	5173.40
606.0	0.0	606.0	0.0	0.0	37.1	0.0	1.0	0.6	5173.42
0.03	0.00	16.36	0.00	0.000	0.017	0.000	0.000	5168.42	518.98
0.018759	50.	50.	50.	8	11	0	0.00	22.11	541.09
*SECNO 4162.500									
4162.500	2.40	5169.57	5170.89	0.00	5174.03	4.46	0.96	0.03	5172.20
606.0	0.0	606.0	0.0	0.0	35.7	0.0	1.0	0.7	5172.17
0.03	0.00	16.95	0.00	0.000	0.017	0.000	0.000	5167.17	519.23
0.019683	50.	50.	50.	8	14	0	0.00	21.44	540.67
*SECNO 4112.500									
4112.500	2.34	5168.26	5169.63	0.00	5172.99	4.73	1.02	0.03	5170.90
606.0	0.0	606.0	0.0	0.0	34.7	0.0	1.0	0.7	5170.92
0.03	0.00	17.46	0.00	0.000	0.017	0.000	0.000	5165.92	519.47
0.020965	50.	50.	50.	8	14	0	0.00	21.14	540.61
*SECNO 4062.500									
4062.500	2.31	5166.98	5168.39	0.00	5171.91	4.93	1.06	0.02	5169.70
606.0	0.0	606.0	0.0	0.0	34.0	0.0	1.1	0.7	5169.67
0.03	0.00	17.81	0.00	0.000	0.016	0.000	0.000	5164.67	519.58
0.021359	50.	50.	50.	9	14	0	0.00	20.72	540.30
*SECNO 4012.500									
4012.500	2.28	5165.70	5167.13	0.00	5170.80	5.10	1.09	0.02	5168.40
606.0	0.0	606.0	0.0	0.0	33.4	0.0	1.1	0.7	5168.42
0.03	0.00	18.13	0.00	0.000	0.016	0.000	0.000	5163.42	519.75
0.022291	50.	50.	50.	9	14	0	0.00	20.59	540.34
*SECNO 3962.500									
3962.500	2.30	5164.47	5165.95	0.00	5169.72	5.25	1.07	0.02	5167.20
606.0	0.0	606.0	0.0	0.0	33.0	0.0	1.2	0.8	5167.17
0.03	0.00	18.39	0.00	0.000	0.016	0.000	0.000	5162.17	520.77
0.020417	50.	50.	50.	9	14	0	0.00	19.44	540.21

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 3912.500									
3912.500	2.22	5163.14	5164.63	0.00	5168.60	5.46	1.09	0.02	5165.90
606.0	0.0	606.0	0.0	0.0	32.3	0.0	1.2	0.8	5165.92
0.03	0.00	18.76	0.00	0.000	0.016	0.000	0.000	5160.92	519.99
0.023515	50.	50.	50.	9	14	0	0.00	20.10	540.09
*SECNO 3862.500									
3862.500	2.22	5161.89	5163.39	0.00	5167.43	5.54	1.17	0.01	5164.70
606.0	0.0	606.0	0.0	0.0	32.1	0.0	1.2	0.8	5164.67
0.03	0.00	18.88	0.00	0.000	0.016	0.000	0.000	5159.67	520.01
0.023353	50.	50.	50.	10	14	0	0.00	19.85	539.86
*SECNO 3812.500									
3812.500	2.20	5160.62	5162.13	0.00	5166.23	5.61	1.18	0.01	5163.40
606.0	0.0	606.0	0.0	0.0	31.9	0.0	1.3	0.8	5163.42
0.03	0.00	19.01	0.00	0.000	0.016	0.000	0.000	5158.42	520.09
0.024010	50.	50.	50.	10	14	0	0.00	19.90	539.99
*SECNO 3762.500									
3762.500	2.20	5159.37	5160.89	0.00	5165.03	5.66	1.19	0.01	5162.20
606.0	0.0	606.0	0.0	0.0	31.7	0.0	1.3	0.9	5162.17
0.03	0.00	19.10	0.00	0.000	0.016	0.000	0.000	5157.17	520.09
0.023747	50.	50.	50.	10	14	0	0.00	19.69	539.78
*SECNO 3712.500									
3712.500	2.19	5158.11	5159.63	0.00	5163.83	5.72	1.20	0.01	5160.90
606.0	0.0	606.0	0.0	0.0	31.6	0.0	1.3	0.9	5160.92
0.03	0.00	19.19	0.00	0.000	0.016	0.000	0.000	5155.92	520.16
0.024367	50.	50.	50.	10	14	0	0.00	19.77	539.92
*SECNO 3662.500									
3662.500	2.19	5156.86	5158.39	0.00	5162.61	5.75	1.21	0.00	5159.70
606.0	0.0	606.0	0.0	0.0	31.5	0.0	1.4	0.9	5159.67
0.03	0.00	19.25	0.00	0.000	0.016	0.000	0.000	5154.67	520.15
0.024018	50.	50.	50.	10	14	0	0.00	19.57	539.72

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 3612.500									
3612.500	2.17	5155.59	5157.13	0.00	5161.39	5.80	1.22	0.00	5158.40
606.0	0.0	606.0	0.0	0.0	31.4	0.0	1.4	0.9	5158.42
0.03	0.00	19.32	0.00	0.000	0.016	0.000	0.000	5153.42	520.21
0.024596	50.	50.	50.	10	14	0	0.00	19.67	539.88
*SECNO 3562.500									
3562.500	2.18	5154.35	5155.89	0.00	5160.17	5.82	1.22	0.00	5157.20
606.0	0.0	606.0	0.0	0.0	31.3	0.0	1.4	0.9	5157.17
0.03	0.00	19.36	0.00	0.000	0.016	0.000	0.000	5152.17	520.19
0.024215	50.	50.	50.	10	14	0	0.00	19.49	539.68
*SECNO 3512.500									
3512.500	2.17	5153.09	5154.63	0.00	5158.94	5.86	1.22	0.00	5155.90
606.0	0.0	606.0	0.0	0.0	31.2	0.0	1.5	1.0	5155.92
0.04	0.00	19.42	0.00	0.000	0.016	0.000	0.000	5150.92	520.24
0.024774	50.	50.	50.	10	14	0	0.00	19.60	539.84
*SECNO 3462.500									
3462.500	2.17	5151.84	5153.39	0.00	5157.71	5.87	1.23	0.00	5154.70
606.0	0.0	606.0	0.0	0.0	31.2	0.0	1.5	1.0	5154.67
0.04	0.00	19.45	0.00	0.000	0.016	0.000	0.000	5149.67	520.22
0.024361	50.	50.	50.	10	14	0	0.00	19.43	539.65
*SECNO 3412.500									
3412.500	2.16	5150.58	5152.13	0.00	5156.48	5.90	1.23	0.00	5153.40
606.0	0.0	606.0	0.0	0.0	31.1	0.0	1.6	1.0	5153.42
0.04	0.00	19.48	0.00	0.000	0.016	0.000	0.000	5148.42	520.27
0.024897	50.	50.	50.	10	14	0	0.00	19.55	539.82
1490 NH CARD USED									
*SECNO 3365.500									
3365.500	2.36	5149.61	5151.26	0.00	5155.47	5.86	1.00	0.01	5152.30
606.0	0.0	606.0	0.0	0.0	31.2	0.0	1.6	1.0	5152.30
0.04	0.00	19.42	0.00	0.000	0.015	0.000	0.000	5147.25	503.24
0.018329	47.	47.	47.	10	14	0	0.00	16.32	519.56

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 3315.500

3301 HV CHANGED MORE THAN HVINS

3315.500	1.99	5146.74	5148.49	0.00	5154.17	7.43	1.14	0.16	5150.80
606.0	0.0	606.0	0.0	0.0	27.7	0.0	1.6	1.0	5150.75
0.04	0.00	21.87	0.00	0.000	0.015	0.000	0.000	5144.75	508.06
0.029172	50.	50.	50.	8	14	0	0.00	17.91	525.97

1490 NH CARD USED
*SECNO 3305.500

3301 HV CHANGED MORE THAN HVINS

3305.500	2.00	5141.25	5143.54	0.00	5153.34	12.09	0.37	0.47	5145.80
717.0	0.0	717.0	0.0	0.0	25.7	0.0	1.6	1.1	5145.80
0.04	0.00	27.90	0.00	0.000	0.015	0.000	0.000	5139.25	501.92
0.045313	10.	10.	10.	13	17	0	0.00	15.59	517.51

1490 NH CARD USED
*SECNO 3219.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 0.67

3219.500	2.50	5142.47	5144.29	0.00	5149.25	6.78	2.50	1.59	5147.00
717.0	0.0	717.0	0.0	0.0	34.3	0.0	1.7	1.1	5146.97
0.04	0.00	20.89	0.00	0.000	0.015	0.000	0.000	5139.97	506.77
0.020203	86.	86.	86.	7	17	0	0.00	17.48	524.25

*SECNO 3150.000

3301 HV CHANGED MORE THAN HVINS

3150.000	2.26	5140.23	5142.07	0.00	5147.62	7.40	1.56	0.06	5143.00
717.0	0.0	717.0	0.0	0.0	32.9	0.0	1.7	1.1	5142.97
0.04	0.00	21.82	0.00	0.000	0.015	0.000	0.000	5137.97	505.50
0.025200	70.	70.	70.	8	14	0	0.00	19.03	524.53

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3100.000

3301 HV CHANGED MORE THAN HVINS

3100.000	2.34	5139.46	5141.22	0.00	5146.26	6.80	1.19	0.18	5142.10
717.0	0.0	717.0	0.0	0.0	34.3	0.0	1.8	1.1	5142.12
0.04	0.00	20.93	0.00	0.000	0.015	0.000	0.000	5137.12	505.31
0.022442	50.	50.	50.	10	14	0	0.00	19.35	524.67

*SECNO 3050.000

3050.000	2.38	5138.65	5140.38	0.00	5145.07	6.42	1.08	0.12	5141.30
717.0	0.0	717.0	0.0	0.0	35.3	0.0	1.8	1.2	5141.27
0.04	0.00	20.33	0.00	0.000	0.015	0.000	0.000	5136.27	505.25
0.020628	50.	50.	50.	10	14	0	0.00	19.53	524.78

1490 NH CARD USED

*SECNO 3030.000

3030.000	2.40	5138.33	5139.98	0.00	5144.62	6.29	0.41	0.04	5138.90
717.0	0.0	717.0	0.0	0.0	35.6	0.0	1.8	1.2	5140.93
0.04	0.00	20.12	0.00	0.000	0.015	0.000	0.000	5135.93	501.15
0.020109	20.	20.	20.	9	14	0	0.00	19.66	520.81

*SECNO 3010.000

3010.000	2.43	5138.03	5139.66	0.00	5144.19	6.16	0.40	0.04	5138.60
717.0	0.0	717.0	0.0	0.0	36.0	0.0	1.9	1.2	5140.60
0.04	0.00	19.92	0.00	0.000	0.015	0.000	0.000	5135.60	501.15
0.019505	20.	20.	20.	9	14	0	0.00	19.70	520.85

1490 NH CARD USED

*SECNO 2990.000

2990.000	2.44	5137.70	5139.32	0.00	5143.77	6.07	0.39	0.03	5138.30
717.0	0.0	717.0	0.0	0.0	36.3	0.0	1.9	1.2	5140.76
0.04	0.00	19.78	0.00	0.000	0.015	0.000	0.000	5135.26	501.18
0.019068	20.	20.	20.	9	14	0	0.00	19.70	520.88

*SECNO 2950.000

2950.000	2.45	5137.03	5138.64	0.00	5142.99	5.95	0.75	0.04	5137.60
717.0	0.0	717.0	0.0	0.0	36.6	0.0	1.9	1.2	5140.08
0.04	0.00	19.58	0.00	0.000	0.015	0.000	0.000	5134.58	501.12
0.018559	40.	40.	40.	12	14	0	0.00	19.80	520.92

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2900.000									
2900.000	2.45	5136.03	5137.64	0.00	5142.04	6.01	0.93	0.01	5136.60
717.0	0.0	717.0	0.0	0.0	36.4	0.0	1.9	1.2	5139.08
0.04	0.00	19.68	0.00	0.000	0.015	0.000	0.000	5133.58	501.14
0.018837	50.	50.	50.	12	14	0	0.00	19.76	520.90
*SECNO 2850.000									
2850.000	2.44	5135.02	5136.64	0.00	5141.09	6.07	0.95	0.01	5135.60
717.0	0.0	717.0	0.0	0.0	36.3	0.0	2.0	1.2	5138.08
0.04	0.00	19.77	0.00	0.000	0.015	0.000	0.000	5132.58	501.15
0.019077	50.	50.	50.	12	14	0	0.00	19.73	520.88
*SECNO 2800.000									
2800.000	2.43	5134.01	5135.64	0.00	5140.13	6.11	0.96	0.00	5134.60
717.0	0.0	717.0	0.0	0.0	36.1	0.0	2.0	1.3	5137.08
0.05	0.00	19.84	0.00	0.000	0.015	0.000	0.000	5131.58	501.17
0.019278	50.	50.	50.	12	14	0	0.00	19.70	520.87
*SECNO 2750.000									
2750.000	2.43	5133.01	5134.64	0.00	5139.16	6.15	0.97	0.00	5133.60
717.0	0.0	717.0	0.0	0.0	36.0	0.0	2.1	1.3	5136.08
0.05	0.00	19.90	0.00	0.000	0.015	0.000	0.000	5130.58	501.18
0.019423	50.	50.	50.	12	14	0	0.00	19.68	520.86
*SECNO 2700.000									
2700.000	2.42	5132.00	5133.64	0.00	5138.18	6.18	0.97	0.00	5132.60
717.0	0.0	717.0	0.0	0.0	35.9	0.0	2.1	1.3	5135.08
0.05	0.00	19.94	0.00	0.000	0.015	0.000	0.000	5129.58	501.18
0.019554	50.	50.	50.	12	14	0	0.00	19.66	520.85
1490 NH CARD USED									
*SECNO 2660.000									
2660.000	2.42	5131.20	5132.84	0.00	5137.39	6.19	0.78	0.00	5131.80
717.0	0.0	717.0	0.0	0.0	35.9	0.0	2.1	1.3	5133.78
0.05	0.00	19.97	0.00	0.000	0.015	0.000	0.000	5128.78	501.19
0.019628	40.	40.	40.	14	14	0	0.00	19.65	520.84

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2600.000									
2600.000	2.42	5130.00	5131.64	0.00	5136.21	6.21	1.18	0.00	5130.60
717.0	0.0	717.0	0.0	0.0	35.8	0.0	2.2	1.4	5132.58
0.05	0.00	20.00	0.00	0.000	0.015	0.000	0.000	5127.58	501.20
0.019716	60.	60.	60.	10	14	0	0.00	19.64	520.84
*SECNO 2550.000									
2550.000	2.42	5129.00	5130.64	0.00	5135.22	6.23	0.99	0.00	5129.60
717.0	0.0	717.0	0.0	0.0	35.8	0.0	2.2	1.4	5131.58
0.05	0.00	20.02	0.00	0.000	0.015	0.000	0.000	5126.58	501.20
0.019776	50.	50.	50.	12	14	0	0.00	19.63	520.83
*SECNO 2500.000									
2500.000	2.42	5128.00	5129.64	0.00	5134.23	6.24	0.99	0.00	5128.60
717.0	0.0	717.0	0.0	0.0	35.8	0.0	2.3	1.4	5130.58
0.05	0.00	20.04	0.00	0.000	0.015	0.000	0.000	5125.58	501.20
0.019821	50.	50.	50.	12	14	0	0.00	19.63	520.83
*SECNO 2450.000									
2450.000	2.42	5127.00	5128.64	0.00	5133.24	6.24	0.99	0.00	5127.60
717.0	0.0	717.0	0.0	0.0	35.8	0.0	2.3	1.4	5129.58
0.05	0.00	20.04	0.00	0.000	0.015	0.000	0.000	5124.58	501.20
0.019821	50.	50.	50.	11	14	0	0.00	19.63	520.83
*SECNO 2400.000									
2400.000	2.41	5125.99	5127.64	0.00	5132.25	6.25	0.99	0.00	5126.60
717.0	0.0	717.0	0.0	0.0	35.7	0.0	2.4	1.5	5128.58
0.05	0.00	20.07	0.00	0.000	0.015	0.000	0.000	5123.58	501.21
0.019895	50.	50.	50.	12	14	0	0.00	19.62	520.83
*SECNO 2350.000									
2350.000	2.41	5124.99	5126.64	0.00	5131.25	6.26	1.00	0.00	5125.60
717.0	0.0	717.0	0.0	0.0	35.7	0.0	2.4	1.5	5127.58
0.05	0.00	20.07	0.00	0.000	0.015	0.000	0.000	5122.58	501.21
0.019910	50.	50.	50.	12	14	0	0.00	19.62	520.82

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2300.000									
2300.000	2.42	5124.00	5125.64	0.00	5130.26	6.25	1.00	0.00	5124.60
717.0	0.0	717.0	0.0	0.0	35.7	0.0	2.4	1.5	5126.58
0.05	0.00	20.07	0.00	0.000	0.015	0.000	0.000	5121.58	501.21
0.019895	50.	50.	50.	11	14	0	0.00	19.62	520.83
1490 NH CARD USED									
*SECNO 2250.000									
2250.000	2.41	5122.99	5124.67	0.00	5129.26	6.27	1.00	0.00	5124.60
717.0	0.0	717.0	0.0	0.0	35.7	0.0	2.5	1.5	5125.58
0.05	0.00	20.09	0.00	0.000	0.015	0.000	0.000	5120.58	503.20
0.019962	50.	50.	50.	11	14	0	0.00	19.62	522.82
*SECNO 2200.000									
2200.000	2.42	5122.00	5123.68	0.00	5128.26	6.26	1.00	0.00	5123.60
717.0	0.0	717.0	0.0	0.0	35.7	0.0	2.5	1.5	5124.58
0.05	0.00	20.07	0.00	0.000	0.015	0.000	0.000	5119.58	503.20
0.019917	50.	50.	50.	11	14	0	0.00	19.62	522.82
*SECNO 2150.000									
2150.000	2.41	5120.98	5122.66	0.00	5127.26	6.28	1.00	0.00	5122.60
717.0	0.0	717.0	0.0	0.0	35.7	0.0	2.6	1.6	5123.57
0.05	0.00	20.11	0.00	0.000	0.015	0.000	0.000	5118.57	503.22
0.020005	50.	50.	50.	11	14	0	0.00	19.60	522.82
*SECNO 2100.000									
2100.000	2.41	5119.97	5121.66	0.00	5126.26	6.29	1.00	0.00	5121.60
717.0	0.0	717.0	0.0	0.0	35.6	0.0	2.6	1.6	5122.56
0.06	0.00	20.12	0.00	0.000	0.015	0.000	0.000	5117.56	503.23
0.020033	50.	50.	50.	12	14	0	0.00	19.59	522.82
*SECNO 2050.000									
2050.000	2.40	5118.95	5120.63	0.00	5125.25	6.30	1.01	0.00	5120.50
717.0	0.0	717.0	0.0	0.0	35.6	0.0	2.6	1.6	5121.55
0.06	0.00	20.14	0.00	0.000	0.015	0.000	0.000	5116.55	503.14
0.020172	50.	50.	50.	11	14	0	0.00	19.66	522.80

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 2000.000									
2000.000	2.41	5117.95	5119.62	0.00	5124.24	6.29	1.01	0.00	5119.50
717.0	0.0	717.0	0.0	0.0	35.6	0.0	2.7	1.6	5120.54
0.06	0.00	20.12	0.00	0.000	0.015	0.000	0.000	5115.54	503.15
0.020109	50.	50.	50.	10	14	0	0.00	19.66	522.81
*SECNO 1950.000									
1950.000	2.40	5116.93	5118.61	0.00	5123.23	6.30	1.01	0.00	5118.50
717.0	0.0	717.0	0.0	0.0	35.6	0.0	2.7	1.7	5119.53
0.06	0.00	20.14	0.00	0.000	0.015	0.000	0.000	5114.53	503.16
0.020153	50.	50.	50.	11	14	0	0.00	19.64	522.80
*SECNO 1900.000									
1900.000	2.41	5115.93	5117.60	0.00	5122.22	6.29	1.01	0.00	5117.50
717.0	0.0	717.0	0.0	0.0	35.6	0.0	2.8	1.7	5118.52
0.06	0.00	20.12	0.00	0.000	0.015	0.000	0.000	5113.52	503.17
0.020090	50.	50.	50.	10	14	0	0.00	19.64	522.81
*SECNO 1850.000									
1850.000	2.41	5114.92	5116.60	0.00	5121.21	6.30	1.01	0.00	5116.50
717.0	0.0	717.0	0.0	0.0	35.6	0.0	2.8	1.7	5117.51
0.06	0.00	20.14	0.00	0.000	0.015	0.000	0.000	5112.51	503.18
0.020134	50.	50.	50.	12	14	0	0.00	19.63	522.81
*SECNO 1800.000									
1800.000	2.41	5113.91	5115.59	0.00	5120.21	6.30	1.01	0.00	5115.50
717.0	0.0	717.0	0.0	0.0	35.6	0.0	2.9	1.7	5116.50
0.06	0.00	20.14	0.00	0.000	0.015	0.000	0.000	5111.50	503.19
0.020132	50.	50.	50.	11	14	0	0.00	19.62	522.81
*SECNO 1750.000									
1750.000	2.41	5112.93	5114.61	0.00	5119.19	6.27	1.00	0.01	5114.50
717.0	0.0	717.0	0.0	0.0	35.7	0.0	2.9	1.7	5115.52
0.06	0.00	20.09	0.00	0.000	0.015	0.000	0.000	5110.52	503.16
0.019999	50.	50.	50.	10	14	0	0.00	19.65	522.81

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 1700.000									
1700.000	2.41	5111.95	5113.62	0.00	5118.19	6.24	1.00	0.01	5113.50
717.0	0.0	717.0	0.0	0.0	35.8	0.0	2.9	1.8	5114.54
0.06	0.00	20.04	0.00	0.000	0.015	0.000	0.000	5109.54	503.13
0.019882	50.	50.	50.	10	14	0	0.00	19.69	522.82
*SECNO 1650.000									
1650.000	2.42	5110.97	5112.64	0.00	5117.19	6.22	0.99	0.00	5112.60
717.0	0.0	717.0	0.0	0.0	35.8	0.0	3.0	1.8	5113.55
0.06	0.00	20.02	0.00	0.000	0.015	0.000	0.000	5108.55	503.22
0.019732	50.	50.	50.	11	14	0	0.00	19.62	522.84
*SECNO 1600.000									
1600.000	2.43	5110.00	5111.66	0.00	5116.20	6.21	0.99	0.00	5111.60
717.0	0.0	717.0	0.0	0.0	35.9	0.0	3.0	1.8	5112.57
0.06	0.00	19.99	0.00	0.000	0.015	0.000	0.000	5107.57	503.20
0.019677	50.	50.	50.	10	14	0	0.00	19.64	522.84
1490 NH CARD USED									
*SECNO 1550.000									
1550.000	2.37	5108.60	5110.33	0.00	5115.15	6.54	1.02	0.03	5110.80
717.0	0.0	717.0	0.0	0.0	34.9	0.0	3.1	1.8	5111.23
0.06	0.00	20.53	0.00	0.000	0.015	0.000	0.000	5106.23	504.43
0.021263	50.	50.	50.	11	14	0	0.00	19.50	523.94
1490 NH CARD USED									
*SECNO 1541.000									
1541.000	2.59	5108.54	5110.29	0.00	5114.92	6.37	0.18	0.05	5110.90
798.0	0.0	798.0	0.0	0.0	39.4	0.0	3.1	1.8	5110.95
0.06	0.00	20.26	0.00	0.000	0.015	0.000	0.000	5105.95	504.77
0.018803	9.	9.	9.	6	14	0	0.00	20.41	525.18
*SECNO 1495.000									
3301 HV CHANGED MORE THAN HVINS									
1495.000	2.51	5107.02	5108.85	0.00	5113.95	6.92	0.92	0.05	5109.50
798.0	0.0	798.0	0.0	0.0	37.8	0.0	3.1	1.9	5109.51
0.06	0.00	21.11	0.00	0.000	0.015	0.000	0.000	5104.51	504.96
0.021079	46.	46.	46.	12	14	0	0.00	20.07	525.03

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 1470.000

1470.000	2.58	5106.30	5108.09	0.00	5113.40	7.10	0.53	0.02	5108.70
798.0	0.0	798.0	0.0	0.0	37.3	0.0	3.1	1.9	5109.20
0.06	0.00	21.39	0.00	0.000	0.015	0.000	0.000	5103.72	502.35
0.021265	25.	25.	25.	10	14	0	0.00	19.46	521.81

1490 NH CARD USED
*SECNO 1445.000

1445.000	2.60	5105.54	5107.38	0.00	5112.84	7.30	0.54	0.02	5109.20
798.0	0.0	798.0	0.0	0.0	36.8	0.0	3.1	1.9	5109.20
0.06	0.00	21.68	0.00	0.000	0.015	0.000	0.000	5102.94	500.00
0.021774	25.	25.	25.	10	14	0	0.00	19.00	519.00

1490 NH CARD USED
*SECNO 1405.000

3301 HV CHANGED MORE THAN HVINS

1405.000	2.79	5098.49	5101.49	0.00	5111.19	12.70	1.11	0.54	5103.00
798.0	0.0	798.0	0.0	0.0	27.9	0.0	3.2	1.9	5103.00
0.06	0.00	28.60	0.00	0.000	0.015	0.000	0.000	5095.70	500.00
0.036414	40.	40.	40.	12	17	0	0.00	10.20	510.20

1490 NH CARD USED
*SECNO 1395.000

3301 HV CHANGED MORE THAN HVINS

1395.000	3.39	5097.28	5100.63	0.00	5110.74	13.46	0.38	0.08	5103.90
798.0	0.0	798.0	0.0	0.0	27.1	0.0	3.2	1.9	5103.89
0.06	0.00	29.44	0.00	0.000	0.015	0.000	0.000	5093.89	500.00
0.039328	10.	10.	10.	6	17	0	0.00	8.00	508.00

*SECNO 1390.000

1390.000	3.50	5097.11	5100.48	0.00	5110.54	13.43	0.19	0.01	5103.10
798.0	0.0	798.0	0.0	0.0	27.1	0.0	3.2	1.9	5103.10
0.06	0.00	29.41	0.00	0.000	0.015	0.000	0.000	5093.61	500.00
0.036168	5.	5.	5.	8	14	0	0.00	8.00	508.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 1385.000									
1385.000	3.93	5097.24	5100.53	0.00	5110.24	12.99	0.17	0.13	5103.40
798.0	0.0	798.0	0.0	0.0	27.6	0.0	3.2	1.9	5103.40
0.06	0.00	28.93	0.00	0.000	0.015	0.000	0.000	5093.31	500.00
0.033148	5.	5.	5.	3	17	0	0.00	8.00	508.00
*SECNO 1380.000									
1380.000	4.24	5097.42	5100.66	0.00	5109.93	12.51	0.16	0.14	5104.10
798.0	0.0	798.0	0.0	0.0	28.1	0.0	3.2	1.9	5104.10
0.06	0.00	28.39	0.00	0.000	0.015	0.000	0.000	5093.18	500.00
0.030882	5	5.	5.	2	14	0	0.00	8.00	508.00
*SECNO 1375.000									
1375.000	4.50	5097.58	5100.75	0.00	5109.65	12.07	0.15	0.13	5103.00
798.0	0.0	798.0	0.0	0.0	28.6	0.0	3.2	1.9	5103.00
0.06	0.00	27.88	0.00	0.000	0.015	0.000	0.000	5093.08	500.00
0.029670	5.	5.	5.	0	14	0	0.00	8.00	508.00
*SECNO 1370.000									
1370.000	4.70	5097.68	5100.79	0.00	5109.40	11.72	0.15	0.11	5103.00
798.0	0.0	798.0	0.0	0.0	29.0	0.0	3.2	1.9	5102.98
0.06	0.00	27.47	0.00	0.000	0.015	0.000	0.000	5092.98	500.00
0.028589	5.	5.	5.	3	14	0	0.00	8.00	508.00

THIS RUN EXECUTED 18JUL96 13:23:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUPERCRITICAL RUN

SUMMARY PRINTOUT

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
*	5016.800	5187.23	72.81	5.01	5188.03	5188.03	5188.42	0.80	282.00
*	4962.500	5186.43	61.37	5.29	5187.34	5187.34	5187.77	0.91	282.00
*	4912.500	5185.70	51.45	5.60	5186.74	5186.74	5187.23	1.04	282.00
*	4862.500	5184.97	42.63	5.98	5186.18	5186.18	5186.73	1.21	282.00
*	4834.800	5184 56	37.95	6.24	5185.89	5185.89	5186.49	1.33	282.00
*	4812.500	5184.23	34.08	6.45	5185.71	5185.71	5186.35	1.48	282.00
*	4764.800	5183.53	26.66	6.99	5185.47	5185.47	5186.23	1.94	282.00
*	4712.500	5182.76	32.87	8.47	5185.75	5185.75	5186.86	2.99	606.00
	4664.800	5181.64	31.04	9.88	5184.31	5184.63	5185.83	2.67	606.00
	4612.500	5179.99	30.24	10.54	5182.54	5182.99	5184.26	2.55	606.00
	4562.500	5178.41	30.37	10.44	5180.97	5181.42	5182.66	2.56	606.00
	4512.500	5176.83	30.37	10.46	5179.38	5179.83	5181.08	2.55	606.00
	4474.800	5175.64	30.23	10.60	5178.17	5178.65	5179.91	2.53	606.00
	4434.800	5174.38	30.03	10.72	5176.89	5177.37	5178.67	2.51	606.00
*	4374.800	5172.48	27.34	11.75	5175.52	5176.22	5177.67	3.04	606.00
	4362.500	5172.17	26.36	12.44	5175.11	5175.89	5177.51	2.94	606.00
	4312.500	5170.92	24.10	14.37	5173.59	5174.63	5176.79	2.67	606.00

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
	4262.500	5169.67	22.81	15.51	5172.22	5173.40	5175.95	2.55	606.00
	4212.500	5168.42	22.11	16.36	5170.87	5172.15	5175.02	2.45	606.00
	4162.500	5167.17	21.44	16.95	5169.57	5170.89	5174.03	2.40	606.00
	4112.500	5165.92	21.14	17.46	5168.26	5169.63	5172.99	2.34	606.00
	4062.500	5164.67	20.72	17.81	5166.98	5168.39	5171.91	2.31	606.00
	4012.500	5163.42	20.59	18.13	5165.70	5167.13	5170.80	2.28	606.00
	3962.500	5162.17	19.44	18.39	5164.47	5165.95	5169.72	2.30	606.00
	3912.500	5160.92	20.10	18.76	5163.14	5164.63	5168.60	2.22	606.00
	3862.500	5159.67	19.85	18.88	5161.89	5163.39	5167.43	2.22	606.00
	3812.500	5158.42	19.90	19.01	5160.62	5162.13	5166.23	2.20	606.00
	3762.500	5157.17	19.69	19.10	5159.37	5160.89	5165.03	2.20	606.00
	3712.500	5155.92	19.77	19.19	5158.11	5159.63	5163.83	2.19	606.00
	3662.500	5154.67	19.57	19.25	5156.86	5158.39	5162.61	2.19	606.00
	3612.500	5153.42	19.67	19.32	5155.59	5157.13	5161.39	2.17	606.00
	3562.500	5152.17	19.49	19.36	5154.35	5155.89	5160.17	2.18	606.00
	3512.500	5150.92	19.60	19.42	5153.09	5154.63	5158.94	2.17	606.00
	3462.500	5149.67	19.43	19.45	5151.84	5153.39	5157.71	2.17	606.00
	3412.500	5148.42	19.55	19.48	5150.58	5152.13	5156.48	2.16	606.00
	3365.500	5147.25	16.32	19.42	5149.61	5151.26	5155.47	2.36	606.00
	3315.500	5144.75	17.91	21.87	5146.74	5148.49	5154.17	1.99	606.00
	3305.500	5139.25	15.59	27.90	5141.25	5143.54	5153.34	2.00	717.00
*	3219.500	5139.97	17.48	20.89	5142.47	5144.29	5149.25	2.50	717.00
	3150.000	5137.97	19.03	21.82	5140.23	5142.07	5147.62	2.26	717.00
	3100.000	5137.12	19.35	20.93	5139.46	5141.22	5146.26	2.34	717.00
	3050.000	5136.27	19.53	20.33	5138.65	5140.38	5145.07	2.38	717.00
	3030.000	5135.93	19.66	20.12	5138.33	5139.98	5144.62	2.40	717.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
3010.000	5135.60	19.70	19.92	5138.03	5139.66	5144.19	2.43	717.00
2990.000	5135.26	19.70	19.78	5137.70	5139.32	5143.77	2.44	717.00
2950.000	5134.58	19.80	19.58	5137.03	5138.64	5142.99	2.45	717.00
2900.000	5133.58	19.76	19.68	5136.03	5137.64	5142.04	2.45	717.00
2850.000	5132.58	19.73	19.77	5135.02	5136.64	5141.09	2.44	717.00
2800.000	5131.58	19.70	19.84	5134.01	5135.64	5140.13	2.43	717.00
2750.000	5130.58	19.68	19.90	5133.01	5134.64	5139.16	2.43	717.00
2700.000	5129.58	19.66	19.94	5132.00	5133.64	5138.18	2.42	717.00
2660.000	5128.78	19.65	19.97	5131.20	5132.84	5137.39	2.42	717.00
2600.000	5127.58	19.64	20.00	5130.00	5131.64	5136.21	2.42	717.00
2550.000	5126.58	19.63	20.02	5129.00	5130.64	5135.22	2.42	717.00
2500.000	5125.58	19.63	20.04	5128.00	5129.64	5134.23	2.42	717.00
2450.000	5124.58	19.63	20.04	5127.00	5128.64	5133.24	2.42	717.00
2400.000	5123.58	19.62	20.07	5125.99	5127.64	5132.25	2.41	717.00
2350.000	5122.58	19.62	20.07	5124.99	5126.64	5131.25	2.41	717.00
2300.000	5121.58	19.62	20.07	5124.00	5125.64	5130.26	2.42	717.00
2250.000	5120.58	19.62	20.09	5122.99	5124.67	5129.26	2.41	717.00
2200.000	5119.58	19.62	20.07	5122.00	5123.68	5128.26	2.42	717.00
2150.000	5118.57	19.60	20.11	5120.98	5122.66	5127.26	2.41	717.00
2100.000	5117.56	19.59	20.12	5119.97	5121.66	5126.26	2.41	717.00
2050.000	5116.55	19.66	20.14	5118.95	5120.63	5125.25	2.40	717.00
2000.000	5115.54	19.66	20.12	5117.95	5119.62	5124.24	2.41	717.00
1950.000	5114.53	19.64	20.14	5116.93	5118.61	5123.23	2.40	717.00
1900.000	5113.52	19.64	20.12	5115.93	5117.60	5122.22	2.41	717.00
1850.000	5112.51	19.63	20.14	5114.92	5116.60	5121.21	2.41	717.00
1800.000	5111.50	19.62	20.14	5113.91	5115.59	5120.21	2.41	717.00

SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
1750.000	5110.52	19.65	20.09	5112.93	5114.61	5119.19	2.41	717.00
1700.000	5109.54	19.69	20.04	5111.95	5113.62	5118.19	2.41	717.00
1650.000	5108.55	19.62	20.02	5110.97	5112.64	5117.19	2.42	717.00
1600.000	5107.57	19.64	19.99	5110.00	5111.66	5116.20	2.43	717.00
1550.000	5106.23	19.50	20.53	5108.60	5110.33	5115.15	2.37	717.00
1541.000	5105.95	20.41	20.26	5108.54	5110.29	5114.92	2.59	798.00
1495.000	5104.51	20.07	21.11	5107.02	5108.85	5113.95	2.51	798.00
1470.000	5103.72	19.46	21.39	5106.30	5108.09	5113.40	2.58	798.00
1445.000	5102.94	19.00	21.68	5105.54	5107.38	5112.84	2.60	798.00
1405.000	5095.70	10.20	28.60	5098.49	5101.49	5111.19	2.79	798.00
1395.000	5093.89	8.00	29.44	5097.28	5100.63	5110.74	3.39	798.00
1390.000	5093.61	8.00	29.41	5097.11	5100.48	5110.54	3.50	798.00
1385.000	5093.31	8.00	28.93	5097.24	5100.53	5110.24	3.93	798.00
1380.000	5093.18	8.00	28.39	5097.42	5100.66	5109.93	4.24	798.00
1375.000	5093.08	8.00	27.88	5097.58	5100.75	5109.65	4.50	798.00
1370.000	5092.98	8.00	27.47	5097.68	5100.79	5109.40	4.70	798.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=   5016.800  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=   4962.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4962.500  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4962.500  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4912.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4912.500  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4912.500  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4862.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4862.500  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4862.500  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4834.800  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4834.800  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4834.800  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4812.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4812.500  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4812.500  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4764.800  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4764.800  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4764.800  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=   4712.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=   4712.500  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=   4712.500  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=   4374.800  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=   3219.500  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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HEC2 S 1363001424 HMVersion: 6.52 Data File: e:\hec2 \slcwi25.sub

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*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    18JUL96    TIME   13:31:16  *
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************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
************************************
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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                       X
XXXXXXX  XXXX      X          XXXXX    XXXXX
X     X  X         X                  X
X     X  X         X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
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:::                                          :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION     :::
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H A E S T A D   M E T H O D S
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 18JUL96 13:31:16

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**************************************


T1   SOUTH LA CUEVA CHANNEL WEST OF I-25, (ABQ. NM)
T1   FROM INLET OF 96" UNDERGROUND PIPE(BY JEFFERSON ST.) TO I-25
T2   CROSS SECTIONS DEVELOPED FROM AS-BUILT PLANS
T2   BOHANNAN-HUSTON, INC. ALBUQUERQUE, NM   MAY 1996
T2   HEC-2 DEVELOPED FOR LOMR STUDY OF THE NORTH LA CUEVA
T2   100 YEAR FLOWS.  FLOW FROM RTI'S UPDATED AHYMO (FILE: LC100C.HYM)
T3          SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

            2.                      0       -1

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   -1.          0       -1.                                     -1.

J3  VARIABLE CODES FOR SUMMARY PRINTOUT
    38.       42.        4.       26.        1.        2.        3.        8.       14.

QT      1.0      798.0
NC     .015       .015       .015        .1         .3
          INLET OF THE 96" UNDERGROUND CONDUIT
X1   1395.0        4.0     500.00      508.0      10.00      10.0      10.0
GR   5103.9      500.0    5093.89      500.0    5093.89      508.0    5103.89     508.0

X1   1405.0        6.0     500.00      510.2      35.00      35.0      35.0
GR   5103.0      500.0    5096.20      500.0    5095.70      501.0    5095.70     509.0    5096.20    510.2
GR   5103.0      510.2

X1   1445.0        6.0     500.00      519.0      40.00      40.0      40.0
GR   5109.2      500.0    5105.44      500.0    5102.94      505.0    5102.94     514.0    5105.44    519.0
GR   5109.2      519.0

          END TRANSITION FROM CHANNEL TO 96" PIPE
X1   1495.0        4.0     500.00      530.0      50.00      50.0      25.0
GR   5109.5      500.0    5104.51      510.0    5104.51      520.0    5109.51     530.0

X1   1541.0        4.0     500.00      530.0      46.00      46.0      46.0
GR   5110.9      500.0    5105.95      510.0    5105.95      520.0    5110.95     530.0
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QT      1.0     717.0
X1   1583.0       4.0     500.00     528.0      42.00      42.0      42.0
GR   5111.2     500.0    5107.24     508.0    5107.24     518.0   5112.24     528.0

X1   1650.0       4.0     500.00     528.0      67.00      67.0      67.0
GR   5112.6     500.0    5108.55     508.0    5108.55     518.0   5113.55     528.0

X1   1700.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5113.5     500.0    5109.54     508.0    5109.54     518.0   5114.54     528.0

X1   1750.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5114.5     500.0    5110.52     508.0    5110.52     518.0   5115.52     528.0

X1   1800.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5115.5     500.0    5111.50     508.0    5111.50     518.0   5116.50     528.0

X1   1850.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5116.5     500.0    5112.51     508.0    5112.51     518.0   5117.51     528.0

X1   1900.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5117.5     500.0    5113.52     508.0    5113.52     518.0   5118.52     528.0

X1   1950.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5118.5     500.0    5114.53     508.0    5114.53     518.0   5119.53     528.0

X1   2000.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5119.5     500.0    5115.54     508.0    5115.54     518.0   5120.54     528.0

X1   2050.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5120.5     500.0    5116.55     508.0    5116.55     518.0   5121.55     528.0

X1   2100.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5121.6     500.0    5117.56     508.0    5117.56     518.0   5122.56     528.0

X1   2150.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5122.6     500.0    5118.57     508.0    5118.57     518.0   5123.57     528.0

X1   2200.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5123.6     500.0    5119.58     508.0    5119.58     518.0   5124.58     528.0

X1   2250.0       4.0     500.00     528.0      50.00      50.0      50.0
GR   5124.6     500.0    5120.58     508.0    5120.58     518.0   5125.58     528.0

X1   2270.0       4.0     500.00     526.0      20.00      20.0      20.0
GR   5124.0     500.0    5120.98     506.0    5120.98     516.0   5125.98     526.0

X1   2300.0       4.0     500.00     526.0      30.00      30.0      30.0
GR   5124.6     500.0    5121.58     506.0    5121.58     516.0   5126.58     526.0
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X1   2350.0      4.0    500.00     530.0     50.00      50.0      50.0
GR   5125.6    500.0   5122.58     506.0   5122.58     516.0   5127.58     526.0

X1   2400.0      4.0    500.00     526.0     50.00      50.0      50.0
GR   5126.6    500.0   5123.58     506.0   5123.58     516.0   5128.58     526.0

X1   2450.0      4.0    500.00     526.0     50.00      50.0      50.0
GR   5127.6    500.0   5124.58     506.0   5124.58     516.0   5129.58     526.0

X1   2500.0      4.0    500.00     526.0     50.00      50.0      50.0
GR   5128.6    500.0   5125.58     506.0   5125.58     516.0   5130.58     526.0

X1   2550.0      4.0    500.00     526.0     50.00      50.0      50.0
GR   5129.6    500.0   5126.58     506.0   5126.58     516.0   5131.58     526.0

X1   2600.0      4.0    500.00     526.0     50.00      50.0      50.0
GR   5130.6    500.0   5127.58     506.0   5127.58     516.0   5132.58     526.0

X1   2650.0      4.0    500.00     526.0     50.00      50.0      50.0
GR   5131.6    500.0   5128.58     506.0   5128.58     516.0   5133.58     526.0

X1   2660.0      4.0    500.00     526.0     10.00      10.0      10.0
GR   5131.8    500.0   5128.78     506.0   5128.78     516.0   5133.78     526.0

X1   2680.0      4.0    500.00     527.0     20.00      20.0      20.0
GR   5132.2    500.0   5129.18     506.0   5129.18     516.0   5134.68     527.0

X1   2700.0      4.0    500.00     527.0     20.00      20.0      20.0
GR   5132.6    500.0   5129.58     506.0   5129.58     516.0   5135.08     527.0

X1   2750.0      4.0    500.00     527.0     50.00      50.0      50.0
GR   5133.6    500 0   5130.58     506.0   5130.58     516.0   5136.08     527.0

X1   2800.0      4.0    500.00     527.0     50.00      50.0      50.0
GR   5134.6    500.0   5131.58     506.0   5131.58     516.0   5137.08     527.0

X1   2850.0      4.0    500.00     527.0     50.00      50.0      50.0
GR   5135.6    500.0   5132.58     506.0   5132.58     516.0   5138.08     527.0

X1   2900.0      4.0    500.00     527.0     50.00      50.0      50.0
GR   5136.6    500.0   5133.58     506.0   5133.58     516.0   5139.08     527.0

X1   2950.0      4.0    500.00     527.0     50.00      50.0      50.0
GR   5137.6    500.0   5134.58     506.0   5134.58     516.0   5140.08     527.0

X1   3000.0      4.0    500.00     526.5     50.00      50.0      50.0
GR   5138.4    500.0   5135.43     506.0   5135.43     516.0   5140.68     526.5
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X1   3010.0      4.0     500.00     526.0      10.00      10.0      10.0
GR   5138.6    500.0    5135.60     506.0    5135.60     516.0   5140.60      526.0

X1   3030.0      4.0     500.00     526.0      20.00      20.0      20.0
GR   5138.9    500.0    5135.93     506.0    5135.93     516.0   5140.93      526.0

X1   3050.0      4.0     500.00     530.0      20.00      20.0      20.0
GR   5141.3    500.0    5136.27     510.0    5136.27     520.0   5141.27      530.0

X1   3100.0      4.0     500.00     530.0      50.00      50.0      50.0
GR   5142.1    500.0    5137.12     510.0    5137.12     520.0   5142.12      530.0

X1   3150.0      4.0     500.00     530.0      50.00      50.0      50.0
GR   5143.0    500.0    5137.97     510.0    5137.97     520.0   5142.97      530.0

X1   3200.0      4.0     500.00     531.1      50.00      50.0      50.0
GR   5145.2    500.0    5138.99     510.5    5138.99     520.5   5145.20      531.1

X1   3219.6      6.0     500.00     519.0      19.60      19.6      19.6
GR   5146.0    500.0    5142.97     500.0    5139.97     504.5   5139.97      514.5    5142.97     519.0
GR   5146.0    519.0

QT      1.0    425.0
X1   3305.5      6.0     500.00     519.0      85.90      85.9      85.9
GR   5145.8    500.0    5142.75     500.0    5139.25     504.5   5139.25      514.5    5142.25     519.0
GR   5145.8    519.0

X1   3315.5      4.0     500.00     534.0      10.00      10.0      10.0
GR   5150.8    500.0    5144.75     512.0    5144.75     522.0   5150.75      534.0

X1   3365.5      6.0     500.00     522.8      50.00      50.0      50.0
GR   5152.3    500.0    5150.25     502.4    5147.25     506.4   5147.25      516.4    5150.25     520.4
GR   5152.3    522.8

NH         3   0.025     521.00     0.015      539.00     0.025     560.00
X1   3367.5      8.0     500.00     560.0        2.00       2.0       2.0
GR   5152.3    500.0    5152.30     507.5    5149.30     521.0   5147.30      525.0    5147.30     535.0
GR   5149.3    539.0    5152.30     552.5    5152.30     560.0

X1   3412.5      8.0     500.00     560.0      45.00      45.0      45.0
GR   5153.4    500.0    5153.42     507.5    5150.42     521.0   5148.42      525.0    5148.42     535.0
GR   5150.4    539.0    5153.42     552.5    5153.42     560.0

X1   3462.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5154.7    500.0    5154.67     507.5    5151.67     521.0   5149.67      525.0    5149.67     535.0
GR   5151.7    539.0    5154.67     552.5    5154.67     560.0

X1   3512.5      8.0     500.00     560.0      50.00      50.0      50.0
GR   5155.9    500.0    5155.92     507.5    5152.92     521.0   5150.92      525.0    5150.92     535.0
GR   5152.9    539.0    5155.92     552.5    5155.92     560.0
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X1   3562.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5157.2    500.0    5157.17     507.5   5154.17    521.0  5152.17    525.0  5152.17    535.0
GR   5154.2    539.0    5157.17     552.5   5157.17    560.0

X1   3612.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5158.4    500.0    5158.42     507.5   5155.42    521.0  5153.42    525.0  5153.42    535.0
GR   5155.4    539.0    5158.42     552.5   5158.42    560.0

X1   3662.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5159.7    500.0    5159.67     507.5   5156.67    521.0  5154.67    525.0  5154.67    535.0
GR   5156.7    539.0    5159.67     552.5   5159.67    560.0

X1   3712.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5160.9    500.0    5160.90     507.5   5157.92    521.0  5155.92    525.0  5155.92    535.0
GR   5157.9    539.0    5160.92     552.5   5160.92    560.0

X1   3762.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5162.2    500.0    5162.17     507.5   5159.17    521.0  5157.17    525.0  5157.17    535.0
GR   5159.2    539 0    5162.17     552.5   5162.17    560.0

X1   3812.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5163.4    500.0    5163.42     507.5   5160.42    521.0  5158.42    525.0  5158.42    535.0
GR   5160.4    539.0    5163.42     552.5   5163.42    560.0

X1   3862.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5164.7    500.0    5164.67     507.5   5161.67    521.0  5159.67    525.0  5159.67    535.0
GR   5161.7    539.0    5164.67     552.5   5164.67    560.0

X1   3912.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5165.9    500.0    5165.92     507.5   5162.92    521.0  5160.92    525.0  5160.92    535.0
GR   5162.9    539.0    5165.92     552.5   5165.92    560.0

X1   3962.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5167.2    500.0    5167.17     507.5   5164.42    521.0  5162.17    525.0  5162.17    535.0
GR   5164.2    539.0    5167.17     552.5   5167.17    560.0

X1   4012.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5168.4    500.0    5168.42     507.5   5165.42    521.0  5163.42    525.0  5163.42    535.0
GR   5165.4    539.0    5168.42     552.5   5168.42    560.0

X1   4062.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5169.7    500.0    5169.67     507.5   5166.67    521.0  5164.67    525.0  5164.67    535.0
GR   5166.7    539.0    5169.67     552.5   5169.67    560.0

X1   4112.5      8.0     500.00     560.0     50.00     50.0     50.0
GR   5170.9    500.0    5170.92     507.5   5167.92    521.0  5165.92    525.0  5165.92    535.0
GR   5167.9    539.0    5170.92     552.5   5170.92    560.0
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X1   4162.5      8.0    500.00     560.0     50.00      50.0      50.0
GR   5172.2    500.0   5172.20     507.5   5169.17     521.0   5167.17     525.0   5167.17     535.0
GR   5169.2    539.0   5172.17     552.5   5172.17     560.0

X1   4212.5      8.0    500.00     560.0     50.00      50.0      50.0
GR   5173.4    500.0   5173.42     507.5   5170.42     521.0   5168.42     525.0   5168.42     535.0
GR   5170.4    539.0   5173.42     552.5   5173.42     560.0

X1   4262.5      8.0    500.00     560.0     50.00      50.0      50.0
GR   5174.7    500.0   5174.67     507.5   5171.67     521.0   5169.67     525.0   5169.67     535.0
GR   5171.7    539.0   5174.67     552.5   5174.67     560.0

X1   4312.5      8.0    500.00     560.0     50.00      50.0      50.0
GR   5175.9    500.0   5175.92     507.5   5172.92     521.0   5170.92     525.0   5170.92     535.0
GR   5172.9    539.0   5175.92     552.5   5175.92     560.0

X1   4362.5      8.0    500.00     560.0     50.00      50.0      50.0
GR   5177.2    500.0   5177.17     507.5   5174.17     521.0   5172.17     525.0   5172.17     535.0
GR   5174.2    539.0   5177.17     552.5   5177.17     560.0

NH      3      0.040    517.50     0.030    527.50     0.045    545.00
X1   4375.1      6.0    500.00     545.0      12.6      12.6      12.6
GR   5177.5    500.0   5174.49     513.5   5172.49     517.5   5172.49     527.5   5174.49     531.5
GR   5177.5    545.0

NH      3      0.040    515.00     0.030    530.00     0.045    545.00
X1   4434.8      4.0    500.00     545.0      59.70      59.7      59.7
GR   5179.4    500.0   5174.38     515.0   5174.38     530.0   5179.38     545.0

X1   4474.8      4.0    500.00     545.0     40.00      40.0      40.0
GR   5180.6    500.0   5175.64     515.0   5175.64     530.0   5180.64     545.0

X1   4512.5      4.0    500.00     545.0     37.70      37.7      37.7
GR   5181.8    500.0   5176.83     515.0   5176.83     530.0   5181.83     545.0

X1   4562.5      4.0    500.00     545.0     50.00      50.0      50.0
GR   5183.4    500.0   5178.41     515.0   5178.41     530.0   5183.41     545.0

X1   4612.5      4.0    500.00     545.0     50.00      50.0      50.0
GR   5185.0    500.0   5179.99     515.0   5179.99     530.0   5184.99     545.0

X1   4662.5      4.0    500.00     545.0      50.0      50.0      50.0
GR   5186.6    500.0   5181.57     515.0   5181.57     530.0   5186.57     545.0

NH      3      0.045    515.00     0.030    530.00     0.045    545.00
X1   4712.5      4.0    500.00     545.0      50.00      50.0      50.0
GR   5187.8    500.0   5182.76     515.0   5182.76     530.0   5187.76     545.0
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NH      3        0.045     515.00      0.030     530.00      0.040     545.00
QT      1.0      282.0
X1   4764.8        4.0     500.00      545.0      52.30       52.3       52.3
GR   5188.5      500.0    5183.53      515.0    5183.53      530.0    5188.53      545.0

NH      3        0.045     515.00      0.030     540.20      0.040     555.20
X1   4812.5        4.0     500.00      555.2      47.70       47.7       47.7
GR   5189.2      500.0    5184.23      515.0    5184.23      540.2    5189.23      555.2

NH      3        0.045     515.00      0.030     550.40      0.040     565.40
X1   4862.5        4.0     500.00      565.4      50.00       50.0       50.0
GR   5190.0      500.0    5184.97      515.0    5184.97      550.4    5189.97      565.4

NH      3        0.045     515.00      0.030     560.20      0.040     575.20
X1   4912.5        4.0     500.00      575.2      50.0        50.0       50.0
GR   5190.7      500.0    5185.70      515.0    5185.70      560.2    5190.70      575.2

NH      3        0.045     515.00      0.030     570.90      0.040     585.90
X1   4962.5        4.0     500.00      585.9      50.00       50.0       50.0
GR   5191.4      500.0    5186.43      515.0    5186.43      570.9    5191.43      585.9

NH      3        0.045     515.00      0.030     582.10      0.040     597.10
X1   5012.5        4.0     500.00      597.1      50.0        50.0       50.0
GR   5192.2      500.0    5187.17      515.0    5187.17      582.1    5192.17      597.1

NH      3        0.045     515.00      0.030     583.00      0.040     598.00
X1   5016.8        4.0     500.00      598.0       4.26        4.3        4.3
GR   5192.2      500.0    5187.23      515.0    5187.23      583.0    5192.23      598.0
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SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300
*SECNO 1395.000
2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED
3720 CRITICAL DEPTH ASSUMED
INLET OF THE 96" UNDERGROUND CONDUIT

1395.000	6.74	5100.63	5100.63	0.00	5104.03	3.40	0.00	0.00	5103.90
798.0	0.0	798.0	0.0	0.0	53.9	0.0	0.0	0.0	5103.89
0.00	0.00	14.81	0.00	0.000	0.015	0.000	0.000	5093.89	500.00
0.006548	10.	10.	10.	0	10	0	0.00	8.00	508.00

*SECNO 1405.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1405.000	5.79	5101.49	5101.49	0.00	5104.38	2.89	0.20	0.05	5103.00
798.0	0.0	798.0	0.0	0.0	58.5	0.0	0.0	0.0	5103.00
0.00	0.00	13.64	0.00	0.000	0.015	0.000	0.000	5095.70	500.00
0.004834	35.	35.	35.	0	11	0	0.00	10.20	510.20

*SECNO 1445.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1445.000	4.44	5107.38	5107.38	0.00	5109.29	1.92	0.15	0.10	5109.20
798.0	0.0	798.0	0.0	0.0	71.8	0.0	0.1	0.0	5109.20
0.00	0.00	11.11	0.00	0.000	0.015	0.000	0.000	5102.94	500.00
0.002928	40.	40.	40.	0	15	0	0.00	19.00	519.00

*SECNO 1495.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

END TRANSITION FROM CHANNEL TO 96" PIPE

1495.000	4.35	5108.86	5108.86	0.00	5110.35	1.49	0.07	0.04	5109.50
798.0	0.0	798.0	0.0	0.0	81.3	0.0	0.1	0.0	5109.51
0.00	0.00	9.81	0.00	0.000	0.015	0.000	0.000	5104.51	501.29
0.002532	50.	25.	50.	0	8	0	0.00	27.41	528.70

*SECNO 1541.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1541.000	4.34	5110.29	5110.29	0.00	5111.79	1.50	0.12	0.00	5110.90
798.0	0.0	798.0	0.0	0.0	81.2	0.0	0.2	0.1	5110.95
0.00	0.00	9.82	0.00	0.000	0.015	0.000	0.000	5105.95	501.23
0.002546	46.	46.	46.	0	5	0	0.00	27.44	528.68

*SECNO 1583.000
3280 CROSS SECTION 1583.00 EXTENDED 0.12 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1583.000	4.08	5111.32	5111.32	0.00	5112.77	1.44	0.11	0.01	5111.20
717.0	0.0	717.0	0.0	0.0	74.3	0.0	0.3	0.1	5112.24
0.00	0.00	9.65	0.00	0.000	0.015	0.000	0.000	5107.24	500.00
0.002601	42.	42.	42.	0	11	0	0.00	26.17	526.17

*SECNO 1650.000
3280 CROSS SECTION 1650.00 EXTENDED 0.05 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1650.000	4.10	5112.65	5112.65	0.00	5114.09	1.44	0.17	0.00	5112.60
717.0	0.0	717.0	0.0	0.0	74.5	0.0	0.4	0.1	5113.55
0.01	0.00	9.62	0.00	0.000	0.015	0.000	0.000	5108.55	500.00
0.002583	67.	67.	67.	0	5	0	0.00	26.21	526.21

*SECNO 1700.000
3280 CROSS SECTION 1700.00 EXTENDED 0.12 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1700.000	4.08	5113.62	5113.62	0.00	5115.07	1.45	0.13	0.00	5113.50
717.0	0.0	717.0	0.0	0.0	74.2	0.0	0.5	0.2	5114.54
0.01	0.00	9.66	0.00	0.000	0.015	0.000	0.000	5109.54	500.00
0.002610	50.	50.	50.	0	5	0	0.00	26.16	526.16

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1750.000
3280 CROSS SECTION 1750.00 EXTENDED 0.12 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1750.000	4.10	5114.62	5114.62	0.00	5116.05	1.44	0.13	0.00	5114.50
717.0	0.0	717.0	0.0	0.0	74.6	0.0	0.6	0.2	5115.52
0.01	0.00	9.62	0.00	0.000	0.015	0.000	0.000	5110.52	500.00
0.002578	50.	50.	50.	0	5	0	0.00	26.19	526.19

*SECNO 1800.000
3280 CROSS SECTION 1800.00 EXTENDED 0.09 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1800.000	4.09	5115.59	5115.59	0.00	5117.03	1.44	0.13	0.00	5115.50
717.0	0.0	717.0	0.0	0.0	74.4	0.0	0.7	0.2	5116.50
0.01	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5111.50	500.00
0.002593	50.	50.	50.	0	5	0	0.00	26.18	526.18

*SECNO 1850.000
3280 CROSS SECTION 1850.00 EXTENDED 0.10 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1850.000	4.09	5116.60	5116.60	0.00	5118.04	1.44	0.13	0.00	5116.50
717.0	0.0	717.0	0.0	0.0	74.5	0.0	0.8	0.2	5117.51
0.01	0.00	9.63	0.00	0.000	0.015	0.000	0.000	5112.51	500.00
0.002585	50.	50.	50.	0	5	0	0.00	26.19	526.19

*SECNO 1900.000
3280 CROSS SECTION 1900.00 EXTENDED 0.11 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1900.000	4.09	5117.61	5117.61	0.00	5119.05	1.44	0.13	0.00	5117.50
717.0	0.0	717.0	0.0	0.0	74.4	0.0	0.9	0.3	5118.52
0.01	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5113.52	500.00
0.002598	50.	50.	50.	0	5	0	0.00	26.17	526.17

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 1950.000
3280 CROSS SECTION 1950.00 EXTENDED 0.12 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

1950.000	4.09	5118.62	5118.62	0.00	5120.06	1.44	0.13	0.00	5118.50
717.0	0.0	717.0	0.0	0.0	74.4	0.0	0.9	0.3	5119.53
0.02	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5114.53	500.00
0.002594	50.	50.	50.	0	5	0	0.00	26.17	526.17

*SECNO 2000.000
3280 CROSS SECTION 2000.00 EXTENDED 0.12 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2000.000	4.08	5119.62	5119.62	0.00	5121.07	1.44	0.13	0.00	5119.50
717.0	0.0	717.0	0.0	0.0	74.4	0.0	1.0	0.3	5120.54
0.02	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5115.54	500.00
0.002598	50.	50.	50.	0	5	0	0.00	26.17	526.17

*SECNO 2050.000
3280 CROSS SECTION 2050.00 EXTENDED 0.13 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2050.000	4.08	5120.63	5120.63	0.00	5122.08	1.44	0.13	0.00	5120.50
717.0	0.0	717.0	0.0	0.0	74.4	0.0	1.1	0.4	5121.55
0.02	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5116.55	500.00
0.002594	50.	50.	50.	0	5	0	0.00	26.17	526.17

*SECNO 2100.000
3280 CROSS SECTION 2100.00 EXTENDED 0.06 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2100.000	4.10	5121.66	5121.66	0.00	5123.10	1.44	0.13	0.00	5121.60
717.0	0.0	717.0	0.0	0.0	74.5	0.0	1.2	0.4	5122.56
0.02	0.00	9.63	0.00	0.000	0.015	0.000	0.000	5117.56	500.00
0.002586	50.	50.	50.	0	5	0	0.00	26.20	526.20

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2150.000
3280 CROSS SECTION 2150.00 EXTENDED 0.06 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2150.000	4.09	5122.66	5122.66	0.00	5124.11	1.44	0.13	0.00	5122.60
717.0	0.0	717.0	0.0	0.0	74.4	0.0	1.3	0.4	5123.57
0.02	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5118.57	500.00
0.002599	50	50.	50.	0	5	0	0.00	26.19	526.19

*SECNO 2200.000
3280 CROSS SECTION 2200.00 EXTENDED 0.07 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2200.000	4.09	5123.67	5123.67	0.00	5125.12	1.44	0.13	0.00	5123.60
717.0	0.0	717.0	0.0	0.0	74.4	0.0	1.4	0.5	5124.58
0.02	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5119.58	500.00
0.002595	50.	50.	50.	0	5	0	0.00	26.19	526.19

*SECNO 2250.000
3280 CROSS SECTION 2250.00 EXTENDED 0.07 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2250.000	4.09	5124.67	5124.67	0.00	5126.12	1.44	0.13	0.00	5124.60
717.0	0.0	717.0	0.0	0.0	74.4	0.0	1.4	0.5	5125.58
0.02	0.00	9.64	0.00	0.000	0.015	0.000	0.000	5120.58	500.00
0.002595	50.	50.	50.	0	5	0	0.00	26.19	526.19

*SECNO 2270.000
3280 CROSS SECTION 2270.00 EXTENDED 1.03 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2270.000	4.05	5125.03	5125.03	0.00	5126.56	1.53	0.05	0.03	5124.00
717.0	0.0	717.0	0.0	0.0	72.1	0.0	1.5	0.5	5125.98
0.02	0.00	9.94	0.00	0.000	0.015	0.000	0.000	5120.98	500.00
0.002687	20.	20.	20.	0	5	0	0.00	24.10	524.10

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2300.000
3280 CROSS SECTION 2300.00 EXTENDED 1.05 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2300.000	4.07	5125.65	5125.65	0.00	5127.16	1.51	0.08	0.00	5124.60
717.0	0.0	717.0	0.0	0.0	72.6	0.0	1.5	0.5	5126.58
0.03	0.00	9.87	0.00	0.000	0.015	0.000	0.000	5121.58	500.00
0.002639	30.	30.	30.	0	5	0	0.00	24.14	524.14

*SECNO 2350.000
3280 CROSS SECTION 2350.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2350.000	4.06	5126.64	5126.64	0.00	5128.16	1.52	0.13	0.00	5125.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	1.6	0.5	5127.58
0.03	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5122.58	500.00
0.002651	50.	50.	50.	0	5	0	0.00	24.13	524.13

*SECNO 2400.000
3280 CROSS SECTION 2400.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2400.000	4.06	5127.64	5127.64	0.00	5129.16	1.52	0.13	0.00	5126.60
717.0	0.0	717.0	0.0	0.0	72.4	0.0	1.7	0.6	5128.58
0.03	0.00	9.91	0.00	0.000	0.015	0.000	0.000	5123.58	500.00
0.002664	50.	50.	50.	0	5	0	0.00	24.12	524.12

*SECNO 2450.000
3280 CROSS SECTION 2450.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2450.000	4.06	5128.64	5128.64	0.00	5130.16	1.52	0.13	0.00	5127.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	1.8	0.6	5129.58
0.03	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5124.58	500.00
0.002651	50.	50.	50.	0	5	0	0.00	24.13	524.13

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2500.000
3280 CROSS SECTION 2500.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2500.000	4.06	5129.64	5129.64	0.00	5131.16	1.52	0.13	0.00	5128.60
717.0	0.0	717.0	0.0	0.0	72.4	0.0	1.9	0.6	5130.58
0.03	0.00	9.91	0.00	0.000	0.015	0.000	0.000	5125.58	500.00
0.002664	50.	50.	50.	0	5	0	0.00	24.12	524.12

*SECNO 2550.000
3280 CROSS SECTION 2550.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2550.000	4.06	5130.64	5130.64	0.00	5132.16	1.52	0.13	0.00	5129.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	1.9	0.7	5131.58
0.03	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5126.58	500.00
0.002651	50.	50.	50.	0	5	0	0.00	24.13	524.13

*SECNO 2600.000
3280 CROSS SECTION 2600.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2600.000	4.06	5131.64	5131.64	0.00	5133.16	1.52	0.13	0.00	5130.60
717.0	0.0	717.0	0.0	0.0	72.4	0.0	2.0	0.7	5132.58
0.03	0.00	9.91	0.00	0.000	0.015	0.000	0.000	5127.58	500.00
0.002664	50.	50.	50.	0	5	0	0.00	24.12	524.12

*SECNO 2650.000
3280 CROSS SECTION 2650.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2650.000	4.06	5132.64	5132.64	0.00	5134.16	1.52	0.13	0.00	5131.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	2.1	0.7	5133.58
0.04	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5128.58	500.00
0.002651	50.	50.	50.	0	5	0	0.00	24.13	524.13

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2660.000
3280 CROSS SECTION 2660.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2660.000	4.06	5132.84	5132.84	0.00	5134.36	1.52	0.03	0.00	5131.80
717.0	0.0	717.0	0.0	0.0	72.4	0.0	2.1	0.7	5133.78
0.04	0.00	9.91	0.00	0.000	0.015	0.000	0.000	5128.78	500.00
0.002664	10.	10.	10.	0	5	0	0.00	24.12	524.12

*SECNO 2680.000
3280 CROSS SECTION 2680.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2680.000	4.06	5133.24	5133.24	0.00	5134.76	1.52	0.05	0.00	5132.20
717.0	0.0	717.0	0.0	0.0	72.5	0.0	2.2	0.7	5134.68
0.04	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5129.18	500.00
0.002651	20.	20.	20.	0	5	0	0.00	24.13	524.13

*SECNO 2700.000
3280 CROSS SECTION 2700.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2700.000	4.06	5133.64	5133.64	0.00	5135.16	1.52	0.05	0.00	5132.60
717.0	0.0	717.0	0.0	0.0	72.4	0.0	2.2	0.7	5135.08
0.04	0.00	9.91	0.00	0.000	0.015	0.000	0.000	5129.58	500.00
0.002664	20.	20.	20.	0	5	0	0.00	24.12	524.12

*SECNO 2750.000
3280 CROSS SECTION 2750.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2750.000	4.06	5134.64	5134.64	0.00	5136.16	1.52	0.13	0.00	5133.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	2.3	0.8	5136.08
0.04	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5130.58	500.00
0.002651	50.	50.	50.	0	5	0	0.00	24.13	524.13

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 2800.000
3280 CROSS SECTION 2800.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2800.000	4.06	5135.64	5135.64	0.00	5137.16	1.52	0.13	0.00	5134.60
717.0	0.0	717.0	0.0	0.0	72.4	0.0	2.4	0.8	5137.08
0.04	0.00	9.91	0.00	0.000	0.015	0.000	0.000	5131.58	500.00
0.002664	50.	50.	50.	0	5	0	0.00	24.12	524.12

*SECNO 2850.000
3280 CROSS SECTION 2850.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2850.000	4.06	5136.64	5136.64	0.00	5138.16	1.52	0.13	0.00	5135.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	2.4	0.8	5138.08
0.04	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5132.58	500.00
0.002651	50.	50.	50.	0	5	0	0.00	24.13	524.13

*SECNO 2900.000
3280 CROSS SECTION 2900.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2900.000	4.06	5137.64	5137.64	0.00	5139.16	1.52	0.13	0.00	5136.60
717.0	0.0	717.0	0.0	0.0	72.4	0.0	2.5	0.9	5139.08
0.04	0.00	9.91	0.00	0.000	0.015	0.000	0.000	5133.58	500.00
0.002664	50.	50.	50.	0	5	0	0.00	24.12	524.12

*SECNO 2950.000
3280 CROSS SECTION 2950.00 EXTENDED 1.04 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

2950.000	4.06	5138.64	5138.64	0.00	5140.16	1.52	0.13	0.00	5137.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	2.6	0.9	5140.08
0.04	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5134.58	500.00
0.002651	50.	50.	50.	0	5	0	0.00	24.13	524.13

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3000.000
3280 CROSS SECTION 3000.00 EXTENDED 1.08 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3000.000	4.05	5139.48	5139.48	0.00	5141.01	1.52	0.13	0.00	5138.40
717.0	0.0	717.0	0.0	0.0	72.4	0.0	2.7	0.9	5140.68
0.05	0.00	9.90	0.00	0.000	0.015	0.000	0.000	5135.43	500.00
0.002661	50.	50.	50.	0	5	0	0.00	24.11	524.11

*SECNO 3010.000
3280 CROSS SECTION 3010.00 EXTENDED 1.06 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3010.000	4.06	5139.66	5139.66	0.00	5141.18	1.52	0.03	0.00	5138.60
717.0	0.0	717.0	0.0	0.0	72.5	0.0	2.7	0.9	5140.60
0.05	0.00	9.89	0.00	0.000	0.015	0.000	0.000	5135.60	500.00
0.002650	10.	10.	10.	0	5	0	0.00	24.13	524.13

*SECNO 3030.000
3280 CROSS SECTION 3030.00 EXTENDED 1.09 FEET

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3030.000	4.06	5139.99	5139.99	0.00	5141.51	1.52	0.05	0.00	5138.90
717.0	0.0	717.0	0.0	0.0	72.4	0.0	2.7	0.9	5140.93
0.05	0.00	9.90	0.00	0.000	0.015	0.000	0.000	5135.93	500.00
0.002658	20.	20.	20.	0	5	0	0.00	24.11	524.11

*SECNO 3050.000
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3050.000	4.11	5140.38	5140.38	0.00	5141.81	1.42	0.05	0.01	5141.30
717.0	0.0	717.0	0.0	0.0	74.9	0.0	2.8	0.9	5141.27
0.05	0.00	9.57	0.00	0.000	0.015	0.000	0.000	5136.27	501.82
0.002559	20.	20.	20.	0	5	0	0.00	26.41	528.23

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 3100.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
3100.000	4.09	5141.21	5141.21	0.00	5142.65	1.44	0.13	0.00	5142.10
717.0	0.0	717.0	0.0	0.0	74.5	0.0	2.9	1.0	5142.12
0.05	0.00	9.62	0.00	0.000	0.015	0.000	0.000	5137.12	501.78
0.002598	50.	50.	50.	0	5	0	0.00	26.41	528.19
*SECNO 3150.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
3150.000	4.10	5142.08	5142.08	0.00	5143.51	1.43	0.13	0.00	5143.00
717.0	0.0	717.0	0.0	0.0	74.7	0.0	3.0	1.0	5142.97
0.05	0.00	9.60	0.00	0.000	0.015	0.000	0.000	5137.97	501.84
0.002580	50.	50.	50.	0	5	0	0.00	26.37	528.21
*SECNO 3200.000									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
3200.000	4.22	5143.21	5143.21	0.00	5144.73	1.52	0.13	0.03	5145.20
717.0	0.0	717.0	0.0	0.0	72.5	0.0	3.0	1.0	5145.20
0.05	0.00	9.88	0.00	0.000	0.015	0.000	0.000	5138.99	503.36
0.002619	50.	50.	50.	0	8	0	0.00	24.35	527.71
*SECNO 3219.600									
7185 MINIMUM SPECIFIC ENERGY									
3720 CRITICAL DEPTH ASSUMED									
3219.600	4.23	5144.20	5144.20	0.00	5145.99	1.78	0.05	0.08	5146.00
717.0	0.0	717.0	0.0	0.0	66.9	0.0	3.1	1.0	5146.00
0.05	0.00	10.72	0.00	0.000	0.015	0.000	0.000	5139.97	500.00
0.002867	20.	20.	20.	0	5	0	0.00	19.00	519.00
*SECNO 3305.500									
3280 CROSS SECTION 3305.50 EXTENDED 0.19 FEET									
3301 HV CHANGED MORE THAN HVINS									

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.13

3305.500	6.74	5145.99	5142.48	0.00	5146.21	0.22	0.06	0.16	5145.80
425.0	0.0	425.0	0.0	0.0	113.4	0.0	3.2	1.1	5145.80
0.06	0.00	3.75	0.00	0.000	0.015	0.000	0.000	5139.25	500.00
0.000223	86.	86.	86.	3	15	0	0.00	19.00	519.00

*SECNO 3315.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3315.500	3.08	5147.83	5147.83	0.00	5148.97	1.13	0.01	0.27	5150.80
425.0	0.0	425.0	0.0	0.0	49.7	0.0	3.3	1.1	5150.75
0.06	0.00	8.55	0.00	0.000	0.015	0.000	0.000	5144.75	505.89
0.002778	10.	10.	10.	0	14	0	0.00	22.27	528.16

*SECNO 3365.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3365.500	3.27	5150.52	5150.52	0.00	5151.79	1.28	0.14	0.04	5152.30
425.0	0.0	425.0	0.0	0.0	46.9	0.0	3.3	1.1	5152.30
0.06	0.00	9.07	0.00	0.000	0.015	0.000	0.000	5147.25	502.09
0.002839	50.	50.	50.	0	8	0	0.00	18.62	520.71

1490 NH CARD USED
*SECNO 3367.500

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.19

3367.500	4.25	5151.55	5150.43	0.00	5151.89	0.34	0.00	0.09	5152.30
425.0	0.0	425.0	0.0	0.0	91.5	0.0	3.3	1.1	5152.30
0.06	0.00	4.65	0.00	0.000	0.014	0.000	0.000	5147.30	510.85
0.000592	2.	2.	2.	5	8	0	0.00	38.29	549.15

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3412.500

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3412.500	3.12	5151.54	5151.54	0.00	5152.50	0.97	0.06	0.19	5153.40
425.0	0.0	425.0	0.0	0.0	53.9	0.0	3.4	1.1	5153.42
0.06	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5148.42	515.97
0.004440	45.	45.	45.	0	15	0	0.00	28.12	544.09

*SECNO 3462.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3462.500	3.13	5152.80	5152.80	0.00	5153.77	0.96	0.22	0.00	5154.70
425.0	0.0	425.0	0.0	0.0	53.9	0.0	3.5	1.2	5154.67
0.06	0.00	7.88	0.00	0.000	0.019	0.000	0.000	5149.67	515.91
0.004422	50.	50.	50.	0	5	0	0.00	28.09	544.00

*SECNO 3512.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3512.500	3.11	5154.03	5154.03	0.00	5155.00	0.97	0.22	0.00	5155.90
425.0	0.0	425.0	0.0	0.0	53.7	0.0	3.5	1.2	5155.92
0.06	0.00	7.91	0.00	0.000	0.019	0.000	0.000	5150.92	516.00
0.004471	50.	50.	50.	0	5	0	0.00	28.06	544.06

*SECNO 3562.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3562.500	3.13	5155.30	5155.30	0.00	5156.27	0.97	0.22	0.00	5157.20
425.0	0.0	425.0	0.0	0.0	53.9	0.0	3.6	1.2	5157.17
0.07	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5152.17	515.92
0.004424	50.	50.	50.	0	5	0	0.00	28.08	544.00

*SECNO 3612.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3612.500	3.11	5156.53	5156.53	0.00	5157.50	0.98	0.22	0.00	5158.40
425.0	0.0	425.0	0.0	0.0	53.6	0.0	3.6	1.3	5158.42
0.07	0.00	7.93	0.00	0.000	0.019	0.000	0.000	5153.42	516.01
0.004486	50.	50.	50.	0	5	0	0.00	28.04	544.05

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3662.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3662.500	3.13	5157.80	5157.80	0.00	5158.77	0.97	0.22	0.00	5159.70
425.0	0.0	425.0	0.0	0.0	53.9	0.0	3.7	1.3	5159.67
0.07	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5154.67	515.92
0.004424	50.	50.	50.	0	5	0	0.00	28.08	544.00

*SECNO 3712.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3712.500	3.12	5159.04	5159.04	0.00	5160.00	0.97	0.22	0.00	5160.90
425.0	0.0	425.0	0.0	0.0	53.8	0.0	3.8	1.3	5160.92
0.07	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5155.92	515.94
0.004455	50.	50.	50.	0	5	0	0.00	28.14	544.08

*SECNO 3762.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3762.500	3.13	5160.30	5160.30	0.00	5161.27	0.97	0.22	0.00	5162.20
425.0	0.0	425.0	0.0	0.0	53.8	0.0	3.8	1.4	5162.17
0.07	0.00	7.90	0.00	0.000	0.019	0.000	0.000	5157.17	515.93
0.004438	50.	50.	50.	0	5	0	0.00	28.06	543.99

*SECNO 3812.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3812.500	3.11	5161.53	5161.53	0.00	5162.50	0.98	0.22	0.00	5163.40
425.0	0.0	425.0	0.0	0.0	53.6	0.0	3.9	1.4	5163.42
0.08	0.00	7.92	0.00	0.000	0.019	0.000	0.000	5158.42	516.01
0.004483	50.	50.	50.	0	5	0	0.00	28.04	544.05

*SECNO 3862.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3862.500	3.13	5162.80	5162.80	0.00	5163.77	0.96	0.22	0.00	5164.70
425.0	0.0	425.0	0.0	0.0	53.9	0.0	4.0	1.4	5164.67
0.08	0.00	7.88	0.00	0.000	0.019	0.000	0.000	5159.67	515.91
0.004422	50.	50.	50.	0	5	0	0.00	28.09	544.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 3912.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3912.500	3.11	5164.03	5164.03	0.00	5165.00	0.97	0.22	0.00	5165.90
425.0	0.0	425.0	0.0	0.0	53.7	0.0	4.0	1.5	5165.92
0.08	0.00	7.91	0.00	0.000	0.019	0.000	0.000	5160.92	516.00
0.004471	50.	50.	50.	0	5	0	0.00	28.06	544.06

*SECNO 3962.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3962.500	3.18	5165.35	5165.35	0.00	5166.32	0.97	0.22	0.00	5167.20
425.0	0.0	425.0	0.0	0.0	53.8	0.0	4.1	1.5	5167.17
0.08	0.00	7.90	0.00	0.000	0.019	0.000	0.000	5162.17	516.43
0.004366	50.	50.	50.	0	5	0	0.00	27.80	544.23

*SECNO 4012.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4012.500	3.12	5166.54	5166.54	0.00	5167.50	0.97	0.22	0.00	5168.40
425.0	0.0	425.0	0.0	0.0	53.9	0.0	4.1	1.5	5168.42
0.08	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5163.42	515.97
0.004442	50.	50.	50.	0	8	0	0.00	28.12	544.09

*SECNO 4062.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4062.500	3.13	5167.80	5167.80	0.00	5168.77	0.97	0.22	0.00	5169.70
425.0	0.0	425.0	0.0	0.0	53.9	0.0	4.2	1.6	5169.67
0.08	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5164.67	515.92
0.004424	50.	50.	50.	0	5	0	0.00	28.08	544.00

*SECNO 4112.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4112.500	3.11	5169.03	5169.03	0.00	5170.00	0.98	0.22	0.00	5170.90
425.0	0.0	425.0	0.0	0.0	53.6	0.0	4.3	1.6	5170.92
0.09	0.00	7.93	0.00	0.000	0.019	0.000	0.000	5165.92	516.01
0.004486	50.	50.	50.	0	5	0	0.00	28.04	544.05

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4162.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4162.500	3.13	5170.30	5170.30	0.00	5171.27	0.97	0.22	0.00	5172.20
425.0	0.0	425.0	0.0	0.0	53.9	0.0	4.3	1.6	5172.17
0.09	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5167.17	515.97
0.004417	50.	50.	50.	0	5	0	0.00	28.03	544.00

*SECNO 4212.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4212.500	3.11	5171.53	5171.53	0.00	5172.50	0.98	0.22	0.00	5173.40
425.0	0.0	425.0	0.0	0.0	53.6	0.0	4.4	1.6	5173.42
0.09	0.00	7.93	0.00	0.000	0.019	0.000	0.000	5168.42	516.01
0.004486	50.	50.	50.	0	5	0	0.00	28.04	544.05

*SECNO 4262.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4262.500	3.13	5172.80	5172.80	0.00	5173.77	0.97	0.22	0.00	5174.70
425.0	0.0	425.0	0.0	0.0	53.9	0.0	4.4	1.7	5174.67
0.09	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5169.67	515.92
0.004424	50.	50.	50.	0	5	0	0.00	28.08	544.00

*SECNO 4312.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4312.500	3.11	5174.03	5174.03	0.00	5175.00	0.98	0.22	0.00	5175.90
425.0	0.0	425.0	0.0	0.0	53.6	0.0	4.5	1.7	5175.92
0.09	0.00	7.93	0.00	0.000	0.019	0.000	0.000	5170.92	516.01
0.004486	50.	50.	50.	0	5	0	0.00	28.04	544.05

*SECNO 4362.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4362.500	3.13	5175.30	5175.30	0.00	5176.27	0.97	0.22	0.00	5177.20
425.0	0.0	425.0	0.0	0.0	53.9	0.0	4.6	1.7	5177.17
0.09	0.00	7.89	0.00	0.000	0.019	0.000	0.000	5172.17	515.92
0.004424	50.	50.	50.	0	5	0	0.00	28.08	544.00

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 4375.100
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4375.100	3.12	5175.61	5175.61	0.00	5176.58	0.97	0.10	0.00	5177.50
425.0	0.0	425.0	0.0	0.0	53.8	0.0	4.6	1.8	5177.50
0.10	0.00	7.91	0.00	0.000	0.038	0.000	0.000	5172.49	508.48
0.018597	13.	13.	13.	0	5	0	0.00	28.04	536.52

1490 NH CARD USED
*SECNO 4434.800
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4434.800	2.45	5176.83	5176.83	0.00	5177.77	0.94	1.05	0.00	5179.40
425.0	0.0	425.0	0.0	0.0	54.7	0.0	4.7	1.8	5179.38
0.10	0.00	7.77	0.00	0.000	0.037	0.000	0.000	5174.38	507.68
0.016800	60.	60.	60.	0	15	0	0.00	29.67	537.35

*SECNO 4474.800
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4474.800	2.45	5178.09	5178.09	0.00	5179.02	0.94	0.67	0.00	5180.60
425.0	0.0	425.0	0.0	0.0	54.8	0.0	4.7	1.8	5180.64
0.10	0.00	7.76	0.00	0.000	0.037	0.000	0.000	5175.64	507.60
0.016808	40.	40.	40.	0	5	0	0.00	29.75	537.34

*SECNO 4512.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4512.500	2.46	5179.29	5179.29	0.00	5180.21	0.93	0.63	0.00	5181.80
425.0	0.0	425.0	0.0	0.0	55.0	0.0	4.8	1.8	5181.83
0.10	0.00	7.73	0.00	0.000	0.037	0.000	0.000	5176.83	507.59
0.016612	38.	38.	38.	0	5	0	0.00	29.78	537.37

*SECNO 4562.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4562.500	2.45	5180.86	5180.86	0.00	5181.79	0.93	0.83	0.00	5183.40
425.0	0.0	425.0	0.0	0.0	54.9	0.0	4.8	1.9	5183.41
0.10	0.00	7.75	0.00	0.000	0.037	0.000	0.000	5178.41	507.63
0.016708	50.	50.	50.	0	5	0	0.00	29.73	537.36

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*SECNO 4612.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4612.500	2.45	5182.44	5182.44	0.00	5183.38	0.93	0.84	0.00	5185.00
425.0	0.0	425.0	0.0	0.0	54.8	0.0	4.9	1.9	5184.99
0.10	0.00	7.75	0.00	0.000	0.037	0.000	0.000	5179.99	507.66
0.016722	50.	50.	50.	0	5	0	0.00	29.70	537.36

*SECNO 4662.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4662.500	2.45	5184.02	5184.02	0.00	5184.96	0.94	0.84	0.00	5186.60
425.0	0.0	425.0	0.0	0.0	54.7	0.0	4.9	1.9	5186.57
0.11	0.00	7.77	0.00	0.000	0.037	0.000	0.000	5181.57	507.69
0.016783	50.	50.	50.	0	5	0	0.00	29.66	537.35

1490 NH CARD USED
*SECNO 4712.500
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

4712.500	2.45	5185.21	5185.21	0.00	5186.15	0,93	0.87	0.00	5187.80
425.0	0.0	425.0	0.0	0.0	54.8	0.0	5.0	2.0	5187.76
0.11	0.00	7.75	0.00	0.000	0.038	0.000	0.000	5182.76	507.70
0.017959	50.	50.	50.	0	5	0	0.00	29.67	537.36

1490 NH CARD USED
*SECNO 4764.800

3301 HV CHANGED MORE THAN HVINS

4764.800	2.88	5186.40	5185.47	0.00	5186.67	0.27	0.46	0.07	5188.50
282.0	0.0	282.0	0.0	0.0	68.1	0.0	5.1	2.0	5188.53
0.11	0.00	4.14	0.00	0.000	0.037	0.000	0.000	5183.53	506.32
0.004127	52.	52.	52.	2	15	0	0.00	32.31	538.63

1490 NH CARD USED
*SECNO 4812.500

4812.500	2.41	5186.64	5185.70	0.00	5186.84	0.20	0.17	0.01	5189.20
282.0	0.0	282.0	0.0	0.0	78.5	0.0	5.2	2.1	5189.23
0.11	0.00	3.59	0.00	0.000	0.035	0.000	0.000	5184.23	507.71
0.002970	48.	48.	48.	2	11	0	0.00	39.74	547.45

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

1490 NH CARD USED
*SECNO 4862.500

4862.500	1.83	5186.80	5186.18	0.00	5187.02	0.22	0.17	0.01	5190.00
282.0	0.0	282.0	0.0	0.0	74.6	0.0	5.3	2.1	5189.97
0.12	0.00	3.78	0.00	0.000	0.033	0.000	0.000	5184.97	509.55
0.003857	50.	50.	50.	2	8	0	0.00	46.33	555.88

1490 NH CARD USED
*SECNO 4912.500

4912.500	1.30	5187.00	5186.74	0.00	5187.30	0.31	0.26	0.03	5190.70
282.0	0.0	282.0	0.0	0.0	63.6	0.0	5.3	2.2	5190.70
0.12	0.00	4.43	0.00	0.000	0.032	0.000	0.000	5185.70	511.11
0.007260	50.	50.	50.	2	11	0	0.00	52.97	564.09

1490 NH CARD USED
*SECNO 4962.500

4962.500	0.98	5187.41	5187.33	0.00	5187.78	0.37	0.46	0.02	5191.40
282.0	0.0	282.0	0.0	0.0	57.5	0.0	5.4	2.2	5191.43
0.12	0.00	4.91	0.00	0.000	0.031	0.000	0.000	5186.43	512.05
0.011875	50.	50.	50.	2	19	0	0.00	61.78	573.83

1490 NH CARD USED
*SECNO 5012.500

5012.500	0.87	5188.04	5187.98	0.00	5188.38	0.33	0.59	0.00	5192.20
282.0	0.0	282.0	0.0	0.0	60.8	0.0	5.5	2.3	5192.17
0.13	0.00	4.64	0.00	0.000	0.031	0.000	0.000	5187.17	512.40
0.011914	50.	50.	50.	2	15	0	0.00	72.31	584.71

1490 NH CARD USED
*SECNO 5016.800

5016.800	0.87	5188.10	5188.03	0.00	5188.43	0.33	0.05	0.00	5192.20
282.0	0.0	282.0	0.0	0.0	61.0	0.0	5.5	2.3	5192.23
0.13	0.00	4.62	0.00	0.000	0.031	0.000	0.000	5187.23	512.39
0.011924	4.	4.	4.	0	11	0	0.00	73.20	585.59

THIS RUN EXECUTED 18JUL96 13:31:21

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUBCRITICAL RUN

SUMMARY PRINTOUT

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
*	1395.000	5093.89	8.00	14.81	5100.63	5100.63	5104.03	6.74	798.00
*	1405.000	5095.70	10.20	13.64	5101.49	5101.49	5104.38	5.79	798.00
*	1445.000	5102.94	19.00	11.11	5107.38	5107.38	5109.29	4.44	798.00
*	1495.000	5104.51	27.41	9.81	5108.86	5108.86	5110.35	4.35	798.00
*	1541.000	5105.95	27.44	9.82	5110.29	5110.29	5111.79	4.34	798.00
*	1583.000	5107.24	26.17	9.65	5111.32	5111.32	5112.77	4.08	717.00
*	1650.000	5108.55	26.21	9.62	5112.65	5112.65	5114.09	4.10	717.00
*	1700.000	5109.54	26.16	9.66	5113.62	5113.62	5115.07	4.08	717.00
*	1750.000	5110.52	26.19	9.62	5114.62	5114.62	5116.05	4.10	717.00
*	1800.000	5111.50	26.18	9.64	5115.59	5115.59	5117.03	4.09	717.00
*	1850.000	5112.51	26.19	9.63	5116.60	5116.60	5118.04	4.09	717.00
*	1900.000	5113.52	26.17	9.64	5117.61	5117.61	5119.05	4.09	717.00
*	1950.000	5114.53	26.17	9.64	5118.62	5118.62	5120.06	4.09	717.00
*	2000.000	5115.54	26.17	9.64	5119.62	5119.62	5121.07	4.08	717.00
*	2050.000	5116.55	26.17	9.64	5120.63	5120.63	5122.08	4.08	717.00
*	2100.000	5117.56	26.20	9.63	5121.66	5121.66	5123.10	4.10	717.00
*	2150.000	5118.57	26.19	9.64	5122.66	5122.66	5124.11	4.09	717.00

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
*	2200.000	5119.58	26.19	9.64	5123.67	5123.67	5125.12	4.09	717.00
*	2250.000	5120.58	26.19	9.64	5124.67	5124.67	5126.12	4.09	717.00
*	2270.000	5120.98	24.10	9.94	5125.03	5125.03	5126.56	4.05	717.00
*	2300.000	5121.58	24.14	9.87	5125.65	5125.65	5127.16	4.07	717.00
*	2350.000	5122.58	24.13	9.89	5126.64	5126.64	5128.16	4.06	717.00
*	2400.000	5123.58	24.12	9.91	5127.64	5127.64	5129.16	4.06	717.00
*	2450.000	5124.58	24.13	9.89	5128.64	5128.64	5130.16	4.06	717.00
*	2500.000	5125.58	24.12	9.91	5129.64	5129.64	5131.16	4.06	717.00
*	2550.000	5126.58	24.13	9.89	5130.64	5130.64	5132.16	4.06	717.00
*	2600.000	5127.58	24.12	9.91	5131.64	5131.64	5133.16	4.06	717.00
*	2650.000	5128.58	24.13	9.89	5132.64	5132.64	5134.16	4.06	717.00
*	2660.000	5128.78	24.12	9.91	5132.84	5132.84	5134.36	4.06	717.00
*	2680.000	5129.18	24.13	9.89	5133.24	5133.24	5134.76	4.06	717.00
*	2700.000	5129.58	24.12	9.91	5133.64	5133.64	5135.16	4.06	717.00
*	2750.000	5130.58	24.13	9.89	5134.64	5134.64	5136.16	4.06	717.00
*	2800.000	5131.58	24.12	9.91	5135.64	5135.64	5137.16	4.06	717.00
*	2850.000	5132.58	24.13	9.89	5136.64	5136.64	5138.16	4.06	717.00
*	2900.000	5133.58	24.12	9.91	5137.64	5137.64	5139.16	4.06	717.00
*	2950.000	5134.58	24.13	9.89	5138.64	5138.64	5140.16	4.06	717.00
*	3000.000	5135.43	24.11	9.90	5139.48	5139.48	5141.01	4.05	717.00
*	3010.000	5135.60	24.13	9.89	5139.66	5139.66	5141.18	4.06	717.00
*	3030.000	5135.93	24.11	9.90	5139.99	5139.99	5141.51	4.06	717.00
*	3050.000	5136.27	26.41	9.57	5140.38	5140.38	5141.81	4.11	717.00
*	3100.000	5137.12	26.41	9.62	5141.21	5141.21	5142.65	4.09	717.00
*	3150.000	5137.97	26.37	9.60	5142.08	5142.08	5143.51	4.10	717.00
*	3200.000	5138.99	24.35	9.88	5143.21	5143.21	5144.73	4.22	717.00

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
*	3219.600	5139.97	19.00	10.72	5144.20	5144.20	5145.99	4.23	717.00
*	3305.500	5139.25	19.00	3.75	5145.99	5142.48	5146.21	6.74	425.00
*	3315.500	5144.75	22.27	8.55	5147.83	5147.83	5148.97	3.08	425.00
*	3365.500	5147.25	18.62	9.07	5150.52	5150.52	5151.79	3.27	425.00
*	3367.500	5147.30	38.29	4.65	5151.55	5150.43	5151.89	4.25	425.00
*	3412.500	5148.42	28.12	7.89	5151.54	5151.54	5152.50	3.12	425.00
*	3462.500	5149.67	28.09	7.88	5152.80	5152.80	5153.77	3.13	425.00
*	3512.500	5150.92	28.06	7.91	5154.03	5154.03	5155.00	3.11	425.00
*	3562.500	5152.17	28.08	7.89	5155.30	5155.30	5156.27	3.13	425.00
*	3612.500	5153.42	28.04	7.93	5156.53	5156.53	5157.50	3.11	425.00
*	3662.500	5154.67	28.08	7.89	5157.80	5157.80	5158.77	3.13	425.00
*	3712.500	5155.92	28.14	7.89	5159.04	5159.04	5160.00	3.12	425.00
*	3762.500	5157.17	28.06	7.90	5160.30	5160.30	5161.27	3.13	425.00
*	3812.500	5158.42	28.04	7.92	5161.53	5161.53	5162.50	3.11	425.00
*	3862.500	5159.67	28.09	7.88	5162.80	5162.80	5163.77	3.13	425.00
*	3912.500	5160.92	28.06	7.91	5164.03	5164.03	5165.00	3.11	425.00
*	3962.500	5162.17	27.80	7.90	5165.35	5165.35	5166.32	3.18	425.00
*	4012.500	5163.42	28.12	7.89	5166.54	5166.54	5167.50	3.12	425.00
*	4062.500	5164.67	28.08	7.89	5167.80	5167.80	5168.77	3.13	425.00
*	4112.500	5165.92	28.04	7.93	5169.03	5169.03	5170.00	3.11	425.00
*	4162.500	5167.17	28.03	7.89	5170.30	5170.30	5171.27	3.13	425.00
*	4212.500	5168.42	28.04	7.93	5171.53	5171.53	5172.50	3.11	425.00
*	4262.500	5169.67	28.08	7.89	5172.80	5172.80	5173.77	3.13	425.00
*	4312.500	5170.92	28.04	7.93	5174.03	5174.03	5175.00	3.11	425.00
*	4362.500	5172.17	28.08	7.89	5175.30	5175.30	5176.27	3.13	425.00
*	4375.100	5172.49	28.04	7.91	5175.61	5175.61	5176.58	3.12	425.00

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	EG	DEPTH	QCH
*	4434.800	5174.38	29.67	7.77	5176.83	5176.83	5177.77	2.45	425.00
*	4474.800	5175.64	29.75	7.76	5178.09	5178.09	5179.02	2.45	425.00
*	4512.500	5176.83	29.78	7.73	5179.29	5179.29	5180.21	2.46	425.00
*	4562.500	5178.41	29.73	7.75	5180.86	5180.86	5181.79	2.45	425.00
*	4612.500	5179.99	29.70	7.75	5182.44	5182.44	5183.38	2.45	425.00
*	4662.500	5181.57	29.66	7.77	5184.02	5184.02	5184.96	2.45	425.00
*	4712.500	5182.76	29.67	7.75	5185.21	5185.21	5186.15	2.45	425.00
	4764.800	5183.53	32.31	4.14	5186.40	5185.47	5186.67	2.88	282.00
	4812.500	5184.23	39.74	3.59	5186.64	5185.70	5186.84	2.41	282.00
	4862.500	5184.97	46.33	3.78	5186.80	5186.18	5187.02	1.83	282.00
	4912.500	5185.70	52.97	4.43	5187.00	5186.74	5187.30	1.30	282.00
	4962.500	5186.43	61.78	4.91	5187.41	5187.33	5187.78	0.98	282.00
	5012.500	5187.17	72.31	4.64	5188.04	5187.98	5188.38	0.87	282.00
	5016.800	5187.23	73.20	4.62	5188.10	5188.03	5188.43	0.87	282.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 1395.000 PROFILE= 1 CRITICAL DEPTH ASSUMED

CAUTION SECNO= 1405.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 1405.000 PROFILE= 1 MINIMUM SPECIFIC ENERGY

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CAUTION SECNO=    4562.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    4562.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    4612.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    4612.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    4662.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    4662.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=    4712.500  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    4712.500  PROFILE=  1  MINIMUM SPECIFIC ENERGY
```

APPENDIX E: Section 4

HEC-2 Output for the
Revised Conditions Model for the
Wildflower Training Dike Located West of I-25

HEC2 S/N: 1363001424 HMVersion: 6.52 Data File: E:\HEC2\WILDFL.SUB

```
*******************************************
*  HEC-2 WATER SURFACE PROFILES           *
*                                         *
*  Version   4.6.2;  May 1991             *
*                                         *
*  RUN DATE    17JUN96    TIME   13:39:48  *
*******************************************
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*************************************
*  U.S. ARMY CORPS OF ENGINEERS
*  HYDROLOGIC ENGINEERING CENTER
*  609 SECOND STREET, SUITE D
*  DAVIS, CALIFORNIA 95616-4687
*          (916) 756-1104
*************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X           X     X
X     X  X        X                       X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
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::::::::::::::::::::::::::::::::::::::::::::::::
:::                                          :::
:::   FULL MICRO-COMPUTER IMPLEMENTATION    :::
:::                                          :::
::::::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::::::
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============================
H A E S T A D  M E T H O D S
============================
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS RUN EXECUTED 17JUN96 13:39:48

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**************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
**************************************


T1   WILDFLOWER DIVERSION CHANNEL
T1   S LA CUEVA CHANNEL BY SIGNETICS TO WEST OF I-25 (STURCTURE 13)
T1   FLOWS FROM RTI'S REVISED AHYMO (FILE: LC100C.HYM)
T1   SPECIAL CULVERT USED FOR RCP UNDER OLD ALAMEDA
T2   HEC-2 RUN FOR N LA CUEVA LOMR (MAY 1996)
T3          SUBCRITICAL RUN

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

            2.                      0         0                               5185.45

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

   -1.          0       -1.                                     -1.

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.       42.        4.       26.        1.        2.        8.       14.       33.
   101.      105.
    38.        1.        2.        8.        3.       23.       24.       39.       26.       43.

QT      1.0       165
NC     .045      .045      .030       .1         .3
          CHANNEL ENTERS SOUTH LA CUEVA, BY SIGNETICS
X1      0.0       4.0     500.00     558.0      0.00      0.0       0.0
GR   5191.2     500.0    5183.19     524.0   5183.19     534.0   5191.19     558.0

X1     25.0       4.0      500.0     558.0     25.00      25.0      25.0
GR   5191.3     500.0    5183.31     524.0   5183.31     534.0   5191.31     558.0

X1     50.0       4.0     500.00     558.0     25.00      25.0      25.0
GR   5191.4     500.0    5183.43     524.0   5183.43     534.0   5191.43     558.0

X1    100.0       4.0     500.00     558.0     50.00      50.0      50.0
GR   5191.7     500.0    5183.68     524.0   5183.68     534.0   5191.68     558.0

          CROSS SECTION 1 FOR SPECIAL CULVERT METHOD
```

```
          DOWNSTREAM OF CULVERT
X1    160.0        4.0     500.00      558.0       60.00        60.0        60.0
GR   5192.0      500.0    5183.97      524.0     5183.97       534.0     5191.97       558.0

NC                                                    .6          .8
          CROSS SECTION 2 FOR SPECIAL CULVERT METHOD
          AT DOWNSTREAM CULVERT FACE
          LEFT AND RIGHT BANKS REDIFINED TO LIMIT FLOW TO CULVERT WIDTH
X1    225.0        6.0     525.30      532.8       85.00        85.0        85.0
X3    10                                                                  5192.2     5192.20
GR   5192.3      500.0    5184.29      524.0     5184.29       525.3     5184.29       532.8     5184.29       534.0
GR   5192.3      558.0

SC    1.015        0.5         2.6                    6.0                    80.0         1.3     5184.69     5184.29
          CROSS SECTION 3 FOR SPECIAL CULVERT METHOD
          AT UPSTREAM CULVERT FACE
          FLOW LIMITED TO CULVERT WIDTH
          BT RECORDS DEFINE TOP OF ROAD FOR WEIR CALCUALTIONS
X1    306.0        7.0     526.00      533.5        81.0        81.0        81.0
X2                               2                5193.00
X3      10                                                                5194.0     5194.0
BT     -16       500.0    5194.00                   520.00     5194.50                830.0     5194.50
BT               850.0    5194.00                   855.00     5193.00                860.0     5194.00
BT               885.0    5195.00                   910.0      5196.00                930.0     5197.00
BT               950.0    5196.00                   965.0      5195.00                980.0     5196.00
BT              1330.0    5196.00                  1400.0      5195.00               1420.0     5196.00
BT              1470.0    5196.00
GR   5193.0      500.0    5188.00      511.0     5184.69       526.0     5184.69       533.5     5190.00       547.5
GR   5191.0      548.5    5193.00      556.5

          CROSS SECTION 4 FOR SPECIAL CULVERT METHOD
          UPSTREAM OF CULVERT
X1    355.0        6.0     500.00      584.3       49.00        49.0        49.0
GR   5193.5      500.0    5193.47      515.0     5184.67       541.4     5184.67       553.4     5189.97       569.3
GR   5191.0      584.3

NC                                                    .1          .3
X1    400.0        6.0     500.00      591.2       40.00        40.0        40.0
GR   5194.5      500.0    5194.50      515.0     5184.72       544.3     5184.72       560.3     5190.00       576.2
GR   5191.0      591.2

X1    405.1        6.0     500.00      591.2        5.08         5.1         5.1
GR   5194.5      500.0    5194.50      515.0     5185.00       543.5     5185.00       561.5     5190.00       576.5
GR   5191.0      591.2

X1    450.0        6.0     500.00      592.0       44.92        44.9        44.9
GR   5194.5      500.0    5194.50      515.0     5185.18       543.0     5185.18       563.0     5190.00       577.5
GR   5191.0      592.0
```

```
X1    500.0        6.0     500.00      592.5       50.00       50.0       50.0
GR   5194.5      500.0    5194.50      515.0     5185.46      542.1    5185.46      562.1    5190.00      575.7
GR   5191.0      592.5

X1    550.0        6.0     500.00      589.1       50.00       50.0       50.0
GR   5194.5      500.0    5194.50      515.0     5185.74      541.3    5185.74      561.3    5190.00      574.1
GR   5191.0      589.1

NH      2         0.045    540.4        0.030     572.4
          START RIP RAP ON CHANNEL SIDE
X1    600.0        6.0     500.00      587.4       50.00       50.0       50.0
GR   5194.5      500.0    5194.50      515.0     5186.02      540.4    5186.02      560.4    5190.00      572.4
GR   5191.0      587.4

NH      2         0.045    540.2        0.030     571.9
X1    614.1        6.0     500.00      586.9       14.08       14.1       14.1
GR   5194.5      500.0    5194.50      515.0     5186.10      540.2    5186.10      560.2    5190.00      571.9
GR   5191.0      586.9

NH      2         0.045    539.5        0.030     570.6
X1    641.1        6.0     500.00      585.6       27.00       27.0       27.0
GR   5194.5      500.0    5194.50      515.0     5186.30      539.5    5186.30      559.5    5190.00      570.6
GR   5191.0      585.6
```

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CRITICAL DEPTH TO BE CALCULATED AT ALL CROSS SECTIONS

CCHV= 0.100 CEHV= 0.300

*SECNO 0.000

CHANNEL ENTERS SOUTH LA CUEVA, BY SIGNETICS

0.000	2.26	5185.45	5184.89	5185.45	5185.74	0.29	0.00	0.00	5191.20
165.0	0.0	165.0	0.0	0.0	37.9	0.0	0.0	0.0	5191.19
0.00	0.00	4.35	0.00	0.000	0.030	0.000	0.000	5183.19	517.23
0.004261	0.	0.	0.	0	14	0	0.00	23.55	540.78

*SECNO 25.000

25.000	2.24	5185.55	5185.01	0.00	5185.85	0.30	0.11	0.00	5191.30
165.0	0.0	165.0	0.0	0.0	37.6	0.0	0.0	0.0	5191.31
0.00	0.00	4.39	0.00	0.000	0.030	0.000	0.000	5183.31	517.25
0.004359	25.	25.	25.	0	15	0	0.00	23.49	540.74

*SECNO 50.000

50.000	2.23	5185.66	5185.13	0.00	5185.97	0.30	0.11	0.00	5191.40
165.0	0.0	165.0	0.0	0.0	37.3	0.0	0.0	0.0	5191.43
0.00	0.00	4.42	0.00	0.000	0.030	0.000	0.000	5183.43	517.28
0.004464	25.	25.	25.	0	15	0	0.00	23.42	540.70

*SECNO 100.000

100.000	2.20	5185.88	5185.38	0.00	5186.20	0.32	0.23	0.00	5191.70
165.0	0.0	165.0	0.0	0.0	36.6	0.0	0.1	0.1	5191.68
0.01	0.00	4.51	0.00	0.000	0.030	0.000	0.000	5183.68	517.41
0.004716	50.	50.	50.	0	15	0	0.00	23.20	540.61

*SECNO 160.000

CROSS SECTION 1 FOR SPECIAL CULVERT METHOD
DOWNSTREAM OF CULVERT

160.000	2.19	5186.16	5185.67	0.00	5186.49	0.32	0.29	0.00	5192.00
165.0	0.0	165.0	0.0	0.0	36.2	0.0	0.1	0.1	5191.97
0.01	0.00	4.56	0.00	0.000	0.030	0.000	0.000	5183.97	517.46
0.004842	60.	60.	60.	0	15	0	0.00	23.10	540.56

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

CCHV= 0.600 CEHV= 0.800
*SECNO 225.000

3301 HV CHANGED MORE THAN HVINS

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5192.20 ELREA= 5192.20

CROSS SECTION 2 FOR SPECIAL CULVERT METHOD
AT DOWNSTREAM CULVERT FACE
LEFT AND RIGHT BANKS REDIFINED TO LIMIT FLOW TO CULVERT WIDTH

225.000	2.46	5186.75	5186.75	0.00	5187.99	1.24	0.57	0.73	5184.29
165.0	0.0	165.0	0.0	0.0	18.5	0.0	0.2	0.1	5184.29
0.01	0.00	8.94	0.00	0.000	0.030	0.000	0.000	5184.29	525.30
0.009796	85.	85.	85.	0	8	0	0.00	7.50	532.80

SPECIAL CULVERT

SC	CUNO	CUNV	ENTLC	COFQ	RDLEN	RISE	SPAN	CULVLN	CHRT	SCL	ELCHU	ELCHD
	1	0.015	0.50	2.60	0.00	6.00	0.00	80.00	1	3	5184.69	5184.29

CHART 1 - CONCRETE PIPE CULVERT; NO BEVELED RING ENTRANCE
SCALE 3 - GROOVE END ENTRANCE, PIPE PROJECTING FROM FILL

*SECNO 306.000

SPECIAL CULVERT OUTLET CONTROL
EGIC = 5189.770 EGOC = 5190.354 PCWSE= 5186.751 ELTRD= 5193.000

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.71

SPECIAL CULVERT

EGIC	EGOC	H4	QWEIR	QCULV	VCH	ACULV	ELTRD	WEIRLN
5189.77	5190.35	2.36	0.	165.	4.068	28.3	5193.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 5194.00 ELREA= 5194.00

CROSS SECTION 3 FOR SPECIAL CULVERT METHOD
AT UPSTREAM CULVERT FACE
FLOW LIMITED TO CULVERT WIDTH
BT RECORDS DEFINE TOP OF ROAD FOR WEIR CALCUALTIONS

306.000	5.41	5190.10	0.00	0.00	5190.35	0.26	2.36	0.00	5184.69
165.0	0.0	165.0	0.0	0.0	40.6	0.0	0.2	0.1	5184.69
0.02	0.00	4.07	0.00	0.000	0.030	0.000	0.000	5184.69	526.00
0.000710	81.	81.	81.	2	0	0	0.00	7.50	533.50

*SECNO 355.000

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.98

CROSS SECTION 4 FOR SPECIAL CULVERT METHOD
UPSTREAM OF CULVERT

355.000	5.82	5190.49	5186.24	0.00	5190.51	0.01	0.01	0.15	5193.50
165.0	0.0	165.0	0.0	0.0	173.3	0.0	0.4	0.2	5191.00
0.03	0.00	0.95	0.00	0.000	0.030	0.000	0.000	5184.67	523.93
0.000080	49.	49.	49.	2	14	0	0.00	53.01	576.94

CCHV= 0.100 CEHV= 0.300
*SECNO 400.000

400.000	5.78	5190.50	5186.08	0.00	5190.51	0.01	0.00	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	194.9	0.0	0.5	0.2	5191.00
0.05	0.00	0.85	0.00	0.000	0.030	0.000	0.000	5184.72	526.95
0.000059	40.	40.	40.	0	17	0	0.00	56.90	583.85

*SECNO 405.100

405.100	5.50	5190.50	5186.27	0.00	5190.51	0.01	0.00	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	191.3	0.0	0.6	0.2	5191.00
0.05	0.00	0.86	0.00	0.000	0.030	0.000	0.000	5185.00	527.00
0.000063	5.	5.	5.	0	17	0	0.00	56.87	583.86

*SECNO 450.000

450.000	5.32	5190.50	5186.38	0.00	5190.52	0.01	0.00	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	193.1	0.0	0.8	0.3	5191.00
0.06	0.00	0.85	0.00	0.000	0.030	0.000	0.000	5185.18	527.01
0.000062	45.	45.	45.	0	17	0	0.00	57.79	584.80

*SECNO 500.000

500.000	5.05	5190.51	5186.66	0.00	5190.52	0.01	0.00	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	179.0	0.0	1.0	0.3	5191.00
0.08	0.00	0.92	0.00	0.000	0.030	0.000	0.000	5185.46	526.97
0.000078	50.	50.	50.	0	17	0	0.00	57.24	584.21

SECNO	DEPTH	CWSEL	CRIWS	WSELK	EG	HV	HL	OLOSS	L-BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	R-BANK ELEV
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST
*SECNO 550.000									
550.000	4.77	5190.51	5186.94	0.00	5190.52	0.02	0.00	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	165.2	0.0	1.2	0.4	5191.00
0.09	0.00	1.00	0.00	0.000	0.030	0.000	0.000	5185.74	526.98
0.000097	50.	50.	50.	0	14	0	0.00	54.76	581.74
1490 NH CARD USED									
*SECNO 600.000									
START RIP RAP ON CHANNEL SIDE									
600.000	4.49	5190.51	5187.22	0.00	5190.53	0.02	0.01	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	152.1	0.0	1.3	0.5	5191.00
0.10	0.00	1.08	0.00	0.000	0.034	0.000	0.000	5186.02	526.94
0.000159	50.	50.	50.	0	11	0	0.00	53.15	580.09
1490 NH CARD USED									
*SECNO 614.100									
614.100	4.41	5190.51	5187.30	0.00	5190.53	0.02	0.00	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	148.3	0.0	1.4	0.5	5191.00
0.11	0.00	1.11	0.00	0.000	0.034	0.000	0.000	5186.10	526.96
0.000170	14.	14.	14.	0	14	0	0.00	52.66	579.62
1490 NH CARD USED									
*SECNO 641.100									
641.100	4.22	5190.52	5187.50	0.00	5190.54	0.02	0.01	0.00	5194.50
165.0	0.0	165.0	0.0	0.0	139.3	0.0	1.5	0.5	5191.00
0.11	0.00	1.18	0.00	0.000	0.034	0.000	0.000	5186.30	526.90
0.000202	27.	27.	27.	0	14	0	0.00	51.48	578.38

THIS RUN EXECUTED 17JUN96 13:39:50

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

SUBCRITICAL RUN

SUMMARY PRINTOUT

	SECNO	ELMIN	TOPWID	VCH	CWSEL	CRIWS	DEPTH	QCH	K*CHSL
	0.000	5183.19	23.55	4.35	5185.45	5184.89	2.26	165.00	0.00
	25.000	5183.31	23.49	4.39	5185.55	5185.01	2.24	165.00	4.80
	50.000	5183.43	23.42	4.42	5185.66	5185.13	2.23	165.00	4.80
	100.000	5183.68	23.20	4.51	5185.88	5185.38	2.20	165.00	5.00
	160.000	5183.97	23.10	4.56	5186.16	5185.67	2.19	165.00	4.83
*	225.000	5184.29	7.50	8.94	5186.75	5186.75	2.46	165.00	3.76
*	306.000	5184.69	7.50	4.07	5190.10	0.00	5.41	165.00	4.94
*	355.000	5184.67	53.01	0.95	5190.49	5186.24	5.82	165.00	-0.41
	400.000	5184.72	56.90	0.85	5190.50	5186.08	5.78	165.00	1.26
	405.100	5185.00	56.87	0.86	5190.50	5186.27	5.50	165.00	54.86
	450.000	5185.18	57.79	0.85	5190.50	5186.38	5.32	165.00	4.01
	500.000	5185.46	57.24	0.92	5190.51	5186.66	5.05	165.00	5.60
	550.000	5185.74	54.76	1.00	5190.51	5186.94	4.77	165.00	5.61
	600.000	5186.02	53.15	1.08	5190.51	5187.22	4.49	165.00	5.60
	614.100	5186.10	52.66	1.11	5190.51	5187.30	4.41	165.00	5.68
	641.100	5186.30	51.48	1.18	5190.52	5187.50	4.22	165.00	7.40

SUBCRITICAL RUN

SUMMARY PRINTOUT

	SECNO	CWSEL	CRIWS	DEPTH	EG	XLBEL	RBEL	XLCH	VCH	Q
	0.000	5185.45	5184.89	2.26	5185.74	5191.20	5191.19	0.00	4.35	165.00
	25.000	5185.55	5185.01	2.24	5185.85	5191.30	5191.31	25.00	4.39	165.00
	50.000	5185.66	5185.13	2.23	5185.97	5191.40	5191.43	25.00	4.42	165.00
	100.000	5185.88	5185.38	2.20	5186.20	5191.70	5191.68	50.00	4.51	165.00
	160.000	5186.16	5185.67	2.19	5186.49	5192.00	5191.97	60.00	4.56	165.00
*	225.000	5186.75	5186.75	2.46	5187.99	5184.29	5184.29	85.00	8.94	165.00
*	306.000	5190.10	0.00	5.41	5190.35	5184.69	5184.69	81.00	4.07	165.00
*	355.000	5190.49	5186.24	5.82	5190.51	5193.50	5191.00	49.00	0.95	165.00
	400.000	5190.50	5186.08	5.78	5190.51	5194.50	5191.00	40.00	0.85	165.00
	405.100	5190.50	5186.27	5.50	5190.51	5194.50	5191.00	5.10	0.86	165.00
	450.000	5190.50	5186.38	5.32	5190.52	5194.50	5191.00	44.90	0.85	165.00
	500.000	5190.51	5186.66	5.05	5190.52	5194.50	5191.00	50.00	0.92	165.00
	550.000	5190.51	5186.94	4.77	5190.52	5194.50	5191.00	50.00	1.00	165.00
	600.000	5190.51	5187.22	4.49	5190.53	5194.50	5191.00	50.00	1.08	165.00
	614.100	5190.51	5187.30	4.41	5190.53	5194.50	5191.00	14.10	1.11	165.00
	641.100	5190.52	5187.50	4.22	5190.54	5194.50	5191.00	27.00	1.18	165.00

SUBCRITICAL RUN

SUMMARY PRINTOUT TABLE 101

	SECNO	EGOC	ELLC	EGIC	ELTRD	QCULV	QWEIR	CLASS	H4	DEPTH	CWSEL	VCH	EG
*	306.000	5190.35	0.00	5189.77	5193.00	165.00	0.00	7.00	2.36	5.41	5190.10	4.07	5190.3

SUBCRITICAL RUN

SUMMARY PRINTOUT TABLE 105

	SECNO	CWSEL	HL	OLOSS	TOPWID	QLOB	QCH	QROB
	160.000	5186.16	0.29	0.00	23.10	0.00	165.00	0.00
*	225.000	5186.75	0.57	0.73	7.50	0.00	165.00	0.00
*	306.000	5190.10	2.36	0.00	7.50	0.00	165.00	0.00
*	355.000	5190.49	0.01	0.15	53.01	0.00	165.00	0.00

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=    225.000  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=    225.000  PROFILE=  1  MINIMUM SPECIFIC ENERGY

WARNING SECNO=    306.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=    355.000  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
```

APPENDIX E: Section 5

Summary of the Source of Input Parameters Used in the Revised Conditions Models

The source of input parameters used in the revised conditions models are listed below:

1. As-built drawings from channelization projects of the South La Cueva Arroyo on the west side of I-25 were used to develop cross sections. Copies of these engineering drawings are included in Volume 3 of this LOMR.

2. As-built drawings for the Wildflower Training Dike were used to develop cross sections for the model. Copies of these engineering drawings are included in Volume 4 of this LOMR.

3. The 100-year flows were used in the HEC-2 models. These were developed by RTI. Documentation and results for the hydrology used are included in Appendix A.

APPENDIX F

Form 7 : Bridge/Culvert Form #1
Three 10' x 10' Concrete Box Culverts Under I-25 for the North La Cueva Arroyo

Backup Data

1. AHYMO summary output - hydrographs by I-25 include sediment bulking factors

2. Rating curve for drainage structure 8 under I-25.

3. Rating curve for drainage structure 9 under I-25.

4. Rating curve for drainage structure 10 under I-25.

5. Rating curve for drainage structure 11 under I-25.

6. Rating curve for weir 1, located around structure 8.

7. Rating curve for weir 2, located around structure 9.

8. Rating curve for weir 3, located around structure 10.

9. Rating curve for weir 4, located around structure 11.

10. Total discharge tables (culvert and weir flow) for the South El Camino (structures 8, 9, and 10) and for the North La Cueva (structure 11).

11. Normal depth calculations for sections along the east side of I-25.

12. Letter from Resource Technology, Inc. providing and explaining the sediment bulking factor equation. May 23, 1996.

APPENDIX F: Section 1

AHYMO Summary Output -
Hydrographs by I-25 Include Sediment Bulking Factors

AH JMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - Ja , 1994 RUN DATE (MON/DAY/YR) =08/14/1996
IN LE = ec100cnc.hym USER NO.= BOHN_HNM.STE

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	
START										TIME=	.00
RAINFALL TYPE= 2										RAIN24=	3.990
COMPUTE NM HYD	300.00	-	1	.88400	1193.12	104.732	2.22142	1.800	2.109	PER IMP=	34.00
ROUTE MCUNGE	300.80	1	2	.88400	1162.70	104.229	2.21073	2.050	2.055	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.590
COMPUTE NM HYD	301.00	-	1	.85200	1018.92	77.706	1.71007	1.800	1.869	PER IMP=	27.00
ADD HYD	301.90	1& 2	11	1.73600	1902.36	181.934	1.96502	2.000	1.712		
*S NORTH EL CAMINO ARROYO AT TRAMWAY ROAD											
RAINFALL TYPE= 2										RAIN24=	3.370
COMPUTE NM HYD	201.00	-	1	.13390	207.70	6.497	.90979	1.500	2.424	PER IMP=	5.00
RAINFALL TYPE= 2										RAIN24=	3.500
COMPUTE NM HYD	200.00	-	3	.30300	487.60	15.384	.95201	1.550	2.514	PER IMP=	.00
*S EL CAMINO ARROYO AT TRAMWAY BLVD (200.0)											
ADD HYD	200.70	11& 3	3	2.03900	1969.13	197.319	1.81448	1.950	1.509		
ROUTE MCUNGE	200.80	3	4	2.03900	1961.86	197.319	1.81448	2.050	1.503	CCODE =	.2
ADD HYD	201.90	4& 1	5	2.17290	1984.38	203.816	1.75873	2.000	1.427		
*S EL CAMINO ARROYO (MAIN) AT BROWNING (201.9)											
ROUTE MCUNGE	201.80	5	2	2.17290	1979.70	203.496	1.75597	2.050	1.424	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.250
COMPUTE NM HYD	202.10	-	1	.10310	164.12	5.334	.97014	1.500	2.487	PER IMP=	8.00
ADD HYD	202.19	1& 2	5	2.27600	1997.41	208.831	1.72038	2.050	1.371		
*S EL CAMINO ARROYO (MAIN) AT EUBANK (202.19)											
ROUTE MCUNGE	202.18	5	2	2.27600	1987.58	208.732	1.71956	2.150	1.364	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.190
COMPUTE NM HYD	202.20	-	1	.10990	180.49	6.162	1.05124	1.500	2.566	PER IMP=	10.00
ADD HYD	202.29	1& 2	5	2.38590	2002.77	214.894	1.68878	2.150	1.312		
*S EL CAMINO ARROYO (MAIN) AT HOLBROOK (202.29)											
ROUTE MCUNGE	202.28	5	2	2.38590	1986.05	214.694	1.68721	2.250	1.301	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.070
COMPUTE NM HYD	202.30	-	1	.06840	118.36	4.064	1.11411	1.500	2.704	PER IMP=	15.00
ADD HYD	202.39	1& 2	6	2.45430	1992.98	218.758	1.67124	2.250	1.269		
*S EL CAMINO ARROYO (MAIN) AT VENTURA (202.39)											
RAINFALL TYPE= 2										RAIN24=	3.140
COMPUTE NM HYD	203.10	-	1	.12580	192.92	6.547	.97587	1.500	2.396	PER IMP=	10.00
*S EL CAMINO ARROYO (TRIBUTARY) AT HOLBROOK (203.1)											
ROUTE MCUNGE	203.18	1	2	.12580	176.32	6.466	.96366	1.700	2.190	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.070
COMPUTE NM HYD	203.20	-	1	.04850	74.17	2.466	.95343	1.500	2.389	PER IMP=	10.00
ADD HYD	203.29	1& 2	5	.17430	211.27	8.932	.96081	1.700	1.894		
ADD HYD	202.90	5& 6	5	2.62860	2020.67	227.690	1.62413	2.200	1.201		
ROUTE MCUNGE	202.80	5	2	2.62860	2016.23	223.471	1.59404	2.285	1.198	CCODE =	.1
RAINFALL TYPE= 2										RAIN24=	3.020
COMPUTE NM HYD	203.30	-	1	.05580	83.29	2.757	.92642	1.500	2.332	PER IMP=	10.00
ADD HYD	203.39	1& 2	5	2.68440	2020.68	226.176	1.57979	2.285	1.176		
*S EL CAMINO ARROYO (MAIN) AT BARSTOW (203.39)											
ROUTE MCUNGE	203.98	5	2	2.68440	2015.25	226.306	1.58070	2.350	1.173	CCODE =	.2
RAINFALL TYPE= 2										RAIN24=	2.960
COMPUTE NM HYD	204.00	-	1	.21190	235.18	10.122	.89562	1.600	1.734	PER IMP=	10.00
ADD HYD	204.90	1& 2	5	2.89630	2036.07	236.428	1.53058	2.300	1.098		
*S EL CAMINO ARROYO AT WYOMING (204.9)											

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 = NOTATION
ROUTE MCUNGE	204.80	5	2	2.89630	2031.24	236.435	1.53063	2.400	1.096	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 2.890
COMPUTE NM HYD	204.20	-	1	.13330	185.49	6.169	.86774	1.500	2.174	PER IMP= 10.00
ADD HYD	204.29	1& 2	5	3.02960	2038.89	242.604	1.50146	2.400	1.052	
RAINFALL TYPE= 2										RAIN24= 2.910
COMPUTE NM HYD	204.10	-	1	.14840	181.03	7.086	.89528	1.550	1.906	PER IMP= 10.00
ROUTE MCUNGE	204.18	1	2	.14840	177.98	7.092	.89603	1.599	1.874	CCODE = .2
ADD HYD	204.19	2& 5	5	3.17800	2051.62	249.610	1.47268	2.399	1.009	
*S EL CAMINO ARROYO AT CORONADO AIRPORT (204.29)										
ROUTE MCUNGE	204.28	5	2	3.17800	2048.60	232.917	1.37420	2.402	1.007	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.850
COMPUTE NM HYD	205.00	-	1	.04590	123.43	5.191	2.12030	1.500	4.202	PER IMP= 70.00
ADD HYD	205.90	1& 2	5	3.22390	2053.58	237.637	1.38208	2.402	.995	
*S EL CAMINO ARROYO AT I-25 (205.90)										
RECALL HYD	205.9BF	-	2	3.22390	2197.33	251.563	1.46307	2.402	1.065	
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.10	-	1	.12210	154.08	5.425	.83315	1.550	1.972	PER IMP= 10.00
RAINFALL TYPE= 2										RAIN24= 2.830
COMPUTE NM HYD	206.20	-	2	.05610	76.53	2.493	.83315	1.500	2.132	PER IMP= 10.00
ADD HYD	206.29	1& 2	5	.17820	228.80	7.918	.83315	1.500	2.006	
ROUTE	206.28	5	3	.17820	232.98	7.918	.83315	1.550	2.043	
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	206.40	-	1	.03270	59.24	2.164	1.24111	1.500	2.831	PER IMP= 30.00
ROUTE	206.48	1	2	.03270	58.63	2.165	1.24112	1.500	2.802	
ADD HYD	206.49	2& 3	5	.21090	289.80	10.083	.89640	1.550	2.147	
RAINFALL TYPE= 2										RAIN24= 2.760
COMPUTE NM HYD	206.30	-	1	.04800	138.49	5.921	2.31273	1.500	4.508	PER IMP= 86.00
ADD HYD	206.39	1& 5	6	.25890	415.02	16.003	1.15899	1.500	2.505	
FINISH										

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
START										TIME= .00
*S FILE NAME LC100CBF.EXT										
*S HYDROGRAPHS BY I-25 INCLUDE BULKING FACTORS										
*S HYDROGRAPHS AT I-25 ARE ORIGINAL HYDROGRAPHS PLUS BULKING FACTORS.										
*S PUNCH HYDS OF ORIGINAL HYDROGRAPHS WERE REMOVED TO SPREADSHEET, BULKING										
*S FACTORS WERE ADDED TO EACH POINT ON HYDROGRAPH, AND THESE HYDROGRAPHS										
*S WERE RECALLED BACK INTO AHYMO MODEL (5/28/96),										
*S SJG AT BOHANNAN-HUSTON, INC.										
*S BECAUSE OF THIS CHANGE, FLOWS AFTER I-25 ARE NOT USEABLE, MIXES BULKED AND										
*S NON-BULKED FLOWS. REFER TO FILE LC100C.HYM FOR CORRECT FLOWS (NON-BULKED)										
RAINFALL TYPE= 2										RAIN24= 4.050
COMPUTE NM HYD	101.00	-	1	.60700	953.84	45.841	1.41600	1.650	2.455	PER IMP= .00
ROUTE MCUNGE	101.80	1	2	.60700	912.90	45.469	1.40451	1.850	2.350	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 4.200
COMPUTE NM HYD	100.00	-	1	1.21400	1201.70	87.881	1.35730	1.850	1.547	PER IMP= .00
ROUTE MCUNGE	100.80	1	3	1.21400	1177.21	87.700	1.35451	2.100	1.515	CCODE = .1
ADD HYD	101.88	3& 2	5	1.82100	1882.13	133.168	1.37117	1.950	1.615	
RAINFALL TYPE= 2										RAIN24= 3.650
COMPUTE NM HYD	102.00	-	1	.87500	1033.60	54.313	1.16386	1.700	1.846	PER IMP= .00
ADD HYD	102.90	1& 5	5	2.69600	2554.30	187.482	1.30389	1.900	1.480	
*S LA CUEVA TRIBUTARY ARROYO @ TRAMWAY BLVD. (102.9)										
ROUTE MCUNGE	102.80	5	2	2.69600	2515.07	187.100	1.30123	2.050	1.458	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.370
COMPUTE NM HYD	107.20	-	1	.17200	237.40	9.430	1.02797	1.550	2.157	PER IMP= 9.00
ADD HYD	107.29	1& 2	4	2.86800	2552.53	196.529	1.28484	2.050	1.391	
*S NORTH LA CUEVA AT GLENDALE AND BROWNING (107.29)										
RAINFALL TYPE= 2										RAIN24= 3.500
COMPUTE NM HYD	102.10	-	1	.09300	147.55	4.405	.88811	1.500	2.479	PER IMP= .00
*S LA CUEVA TRIBUTARY @ TRAMWAY BLVD.										
ROUTE MCUNGE	102.18	1	2	.09300	134.74	4.349	.87687	1.700	2.264	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.380
COMPUTE NM HYD	107.10	-	1	.18080	280.74	8.922	.92528	1.500	2.426	PER IMP= 5.00
ADD HYD	107.19	1& 2	5	.27380	303.70	13.271	.90883	1.600	1.733	
*S NORTH LA CUEVA (TRIB) AT FLORENCE AND BROWNING (107.19)										
ADD HYD	107.90	5& 4	3	3.14180	2611.52	209.801	1.25207	2.000	1.299	
RAINFALL TYPE= 2										RAIN24= 3.400
COMPUTE NM HYD	106.00	-	1	.04360	77.44	2.829	1.21672	1.500	2.775	PER IMP= 17.00
ROUTE MCUNGE	106.80	1	2	.04360	69.78	2.777	1.19435	1.700	2.501	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.340
COMPUTE NM HYD	106.10	-	1	.11160	187.37	6.465	1.08624	1.500	2.623	PER IMP= 10.00
ADD HYD	106.19	1& 2	6	.15520	196.76	9.243	1.11660	1.600	1.981	
*S LA CUEVA TRIBUTARY ARROYO @ BROWNING (106.19)										
ADD HYD	107.99	3& 6	5	3.29700	2658.92	219.043	1.24570	2.000	1.260	
ROUTE MCUNGE	107.80	5	2	3.29700	2647.18	218.906	1.24491	2.100	1.255	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.230
COMPUTE NM HYD	109.00	-	1	.10060	164.16	5.441	1.01402	1.500	2.550	PER IMP= 10.00
ADD HYD	109.90	1& 2	5	3.39760	2662.81	224.346	1.23808	2.100	1.225	
RAINFALL TYPE= 2										RAIN24= 3.250
COMPUTE NM HYD	108.00	-	7	.20550	311.04	11.246	1.02605	1.550	2.365	PER IMP= 10.00

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PL DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION
ADD HYD	109.99	5& 7	5	3.60310	2698.71	235.592	1.22598	2.100	1.170	
*S LA CUEVA ARROYO @ EUBANK (MAIN) (109.99)										
ROUTE MCUNGE	109.88	5	2	3.60310	2673.21	235.416	1.22507	2.200	1.159	CCODE = .1
RAINFALL TYPE= 2										RAIN24= 3.130
COMPUTE NM HYD	110.00	-	1	.16340	202.35	8.385	.96218	1.550	1.935	PER IMP= 10.00
ADD HYD	110.90	1& 2	5	3.76650	2695.65	243.801	1.21366	2.200	1.118	
*S LA CUEVA ARROYO @ VENTURA (MAIN) (110.90)										
ROUTE MCUNGE	110.80	5	2	3.76650	2692.04	243.873	1.21402	2.200	1.117	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 3.020
COMPUTE NM HYD	111.10	-	1	.10690	164.18	5.338	.93630	1.500	2.400	PER IMP= 10.00
ADD HYD	111.19	1& 2	5	3.87340	2702.74	249.211	1.20636	2.200	1.090	
RAINFALL TYPE= 2										RAIN24= 3.050
COMPUTE NM HYD	111.00	-	1	.06740	88.80	2.940	.81779	1.500	2.059	PER IMP= 5.00
ADD HYD	111.99	1& 5	5	3.94080	2709.09	252.151	1.19971	2.200	1.074	
*S LA CUEVA ARROYO @ BARSTOW (111.99)										
ROUTE MCUNGE	111.80	5	2	3.94080	2706.80	251.104	1.19473	2.229	1.073	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.960
COMPUTE NM HYD	112.00	-	1	.17650	436.35	17.654	1.87543	1.500	3.863	PER IMP= 50.00
ADD HYD	112.90	1& 2	5	4.11730	2739.06	268.055	1.22071	2.229	1.039	
*S LA CUEVA ARROYO @ WYOMING (112.90)										
ROUTE MCUNGE	112.80	5	2	4.11730	2734.41	267.959	1.22028	2.273	1.038	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.930
COMPUTE NM HYD	113.00	-	1	.11360	160.25	4.875	.80462	1.500	2.204	PER IMP= 5.00
ADD HYD	113.90	1& 2	5	4.23090	2742.42	272.834	1.20911	2.273	1.013	
*S LA CUEVA MAIN ARROYO @ LOUISIANA (113.90)										
ROUTE MCUNGE	113.80	5	4	4.23090	2738.20	272.791	1.20892	2.300	1.011	CCODE = .2
RAINFALL TYPE= 2										RAIN24= 2.850
COMPUTE NM HYD	115.00	-	3	.13370	183.65	5.503	.77170	1.500	2.146	PER IMP= 5.00
ADD HYD	115.90	4& 3	5	4.36460	2746.52	278.294	1.19553	2.300	.983	
*S RECALL HYD IS HYD 115.9 WITH BULKING FACTORS ADDED AT EVERY HYDGROGRAPH POINT										
RECALL HYD	115.9BF	-	5	4.36460	2993.70	298.091	1.28057	2.300	1.072	
*S HYDROGRAPH 205.9BF TAKEN FROM THE FILE EC100CNC.EXT.										
*S HYDROGRAPH POINTS INCLUDE BULKING FACTORS										
RECALL HYD	205.9BF	-	2	3.22390	2217.87	252.870	1.47067	2.402	1.075	
*S ADD EL CAMINO AND LA CUEVA FLOW										
*S ADD 115.9BF AND 205.9BF										
ADD HYD	115.9BF	5& 2	5	7.58850	5165.22	549.213	1.35702	2.348	1.064	
FINISH										

SOUTH E[illegible] .INO ARROYO

Bulking Factors added to Hydrograph

Punch Hyd Without Bulking Factors From AHYMO FILE: EC100CNC.EXT 'RECALL HYD ID= 5 HYD=205.90 DT=.018058 HRS DA=3.2239 SQ MI PEAK=2053.584CFS RO= 1.3821 INCHES NO PTS=600 FLOW RATES					Bulking Factors calculated using RTI's equation. RTI Used BF rounded up to nearest whole interger. BULKING FACTORS					Punch Hyd With Bulking Factors Input to AHYMO FILE: LC100CBF.HYM RECALL HYD ID= 5 HYD= 205.90 DT= .018058 HRS DA= 3.2239 SQ MI PEAK= 2217.871 CFS RO= 1.3821 INCHES NO PTS=60(FLOW RATES				
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.2	0.3	0.8	4	4	4	4	4	0.0	0.0	0.2	0.3	0.8
2.0	3.3	5.6	8.8	12.2	4	4	4	4	4	2.1	3.4	5.8	9.2	12.7
17.3	23.0	29.1	38.2	47.6	4	4	4	4	4	18.0	23.9	30.2	39.7	49.5
63.6	81.8	103.8	150.7	199.8	4	4	4	4	4	66.2	85.1	107.9	156.7	207.8
259.8	322.0	381.8	444.1	494.3	5	5	5	5	5	272.8	338.1	400.9	466.3	519.0
536.9	570.5	604.4	619.7	636.3	5	5	5	5	5	563.8	599.0	634.6	650.6	668.1
659.0	683.1	707.7	734.1	762.3	5	5	5	5	6	691.9	717.3	743.1	770.8	808.0
788.5	808.5	826.4	849.9	879.2	6	6	6	6	6	835.8	857.0	876.0	900.9	932.0
911.5	946.5	993.0	1040.5	1090.3	6	6	6	6	6	966.1	1003.3	1052.5	1103.0	1155.7
1147.4	1205.2	1268.5	1337.6	1401.0	6	6	7	7	7	1216.3	1277.5	1357.3	1431.2	1499.1
1465.3	1527.7	1579.7	1620.8	1658.9	7	7	7	7	7	1567.9	1634.7	1690.3	1734.3	1775.1
1688.3	1706.9	1728.9	1746.3	1763.2	7	7	7	7	7	1806.5	1826.4	1850.0	1868.5	1886.6
1783.3	1807.9	1833.4	1859.5	1890.6	7	8	8	8	8	1908.1	1952.6	1980.0	2008.3	2041.8
1919.9	1948.1	1975.2	2000.6	2019.2	8	8	8	8	8	2073.5	2103.9	2133.3	2160.6	2180.8
2034.8	2048.4	2051.6	2053.6	2052.3	8	8	8	8	8	2197.5	2212.3	2215.8	2217.9	2216.5
2039.4	2026.6	2008.9	1983.2	1958.5	8	8	8	8	8	2202.5	2188.8	2169.7	2141.9	2115.1
1927.4	1892.9	1858.5	1819.1	1779.0	8	8	8	8	7	2081.6	2044.3	2007.2	1964.6	1903.5
1739.1	1694.5	1650.0	1605.8	1560.8	7	7	7	7	7	1860.8	1813.1	1765.5	1718.2	1670.1
1515.7	1470.1	1425.1	1381.2	1337.7	7	7	7	7	7	1621.8	1573.0	1524.9	1477.9	1431.4
1294.5	1252.1	1212.6	1172.6	1132.7	7	6	6	6	6	1385.1	1327.2	1285.3	1243.0	1200.7
1095.6	1059.1	1022.9	987.8	953.3	6	6	6	6	6	1161.3	1122.7	1084.3	1047.1	1010.5
920.9	888.8	856.4	827.3	799.5	6	6	6	6	6	976.2	942.1	907.8	876.9	847.5
770.6	743.0	716.0	690.3	668.0	6	6	5	5	5	816.9	787.5	751.8	724.8	701.4
645.0	621.6	599.5	577.2	557.8	5	5	5	5	5	677.2	652.7	629.4	606.0	585.7
538.6	519.2	503.4	488.2	471.8	5	5	5	5	5	565.5	545.2	528.5	512.6	495.4
456.7	440.8	426.5	414.7	402.8	5	5	5	5	5	479.5	462.8	447.8	435.4	422.9
391.5	381.1	370.3	359.7	347.3	5	5	5	5	5	411.1	400.2	388.8	377.7	364.6
336.3	325.9	316.3	307.2	300.0	5	5	5	5	5	353.2	342.2	332.2	322.6	315.0
292.9	286.1	280.6	274.7	269.3	5	5	5	5	5	307.6	300.4	294.6	288.4	282.8

SOUTH _ INO ARROYO

265.0	260.0	254.8	249.3	244.0	5	5	5	5	5	278.3	273.0	267.6	261.7	256.2
238.7	233.4	228.4	223.8	219.2	5	5	5	5	5	250.6	245.1	239.8	235.0	230.1
214.7	210.4	206.1	202.7	198.8	5	5	5	5	4	225.4	220.9	216.4	212.9	206.8
195.0	191.1	187.3	183.7	180.4	4	4	4	4	4	202.8	198.8	194.8	191.0	187.6
177.3	174.3	171.8	169.3	167.3	4	4	4	4	4	184.4	181.3	178.7	176.1	174.0
165.7	163.8	161.4	158.5	156.1	4	4	4	4	4	172.4	170.3	167.8	164.9	162.3
153.8	151.6	149.3	147.2	145.0	4	4	4	4	4	159.9	157.6	155.3	153.1	150.8
142.9	141.0	139.4	137.4	135.7	4	4	4	4	4	148.6	146.6	144.9	142.9	141.1
133.9	132.2	130.4	128.7	127.0	4	4	4	4	4	139.3	137.5	135.7	133.9	132.1
125.3	123.5	121.4	119.5	117.6	4	4	4	4	4	130.4	128.5	126.3	124.2	122.3
115.8	114.1	112.4	110.8	109.1	4	4	4	4	4	120.5	118.6	116.9	115.2	113.5
107.5	105.8	104.2	102.5	100.9	4	4	4	4	4	111.8	110.1	108.3	106.6	104.9
99.3	97.8	96.3	94.9	93.6	4	4	4	4	4	103.3	101.7	100.2	98.7	97.4
92.3	91.2	90.1	89.0	87.8	4	4	4	4	4	96.0	94.9	93.7	92.5	91.3
86.7	86.0	85.3	84.6	83.8	4	4	4	4	4	90.2	89.5	88.8	88.0	87.2
82.8	81.7	80.7	79.7	78.8	4	4	4	4	4	86.1	85.0	83.9	82.9	81.9
77.9	77.1	76.2	75.4	74.6	4	4	4	4	4	81.0	80.2	79.3	78.4	77.6
73.7	72.9	72.0	71.1	70.3	4	4	4	4	4	76.7	75.8	74.9	74.0	73.1
69.4	68.6	67.8	67.0	66.2	4	4	4	4	4	72.2	71.3	70.5	69.7	68.9
65.4	64.7	64.1	63.5	62.8	4	4	4	4	4	68.0	67.3	66.7	66.0	65.4
62.1	61.4	60.7	60.0	59.3	4	4	4	4	4	64.6	63.9	63.1	62.4	61.7
58.6	58.0	57.3	56.7	56.1	4	4	4	4	4	61.0	60.3	59.6	59.0	58.3
55.4	54.9	54.3	53.8	53.3	4	4	4	4	4	57.7	57.1	56.5	55.9	55.4
52.8	52.4	52.0	51.6	51.3	4	4	4	4	4	54.9	54.5	54.1	53.7	53.3
50.9	50.6	50.3	49.9	49.6	4	4	4	4	4	53.0	52.6	52.3	51.9	51.6
49.2	48.9	48.5	48.2	47.8	4	4	4	4	4	51.2	50.8	50.5	50.1	49.7
47.5	47.1	46.8	46.5	46.1	4	4	4	4	4	49.4	49.0	48.6	48.3	48.0
45.9	45.6	45.3	45.0	44.8	4	4	4	4	4	47.7	47.4	47.1	46.8	46.6
44.5	44.2	44.0	43.8	43.5	4	4	4	4	4	46.3	46.0	45.8	45.5	45.2
43.2	42.9	42.6	42.3	42.0	4	4	4	4	4	44.9	44.6	44.3	43.9	43.6
41.6	41.3	41.0	40.8	40.5	4	4	4	4	4	43.3	43.0	42.7	42.4	42.1
40.2	39.9	39.6	39.4	39.1	4	4	4	4	4	41.8	41.5	41.2	40.9	40.7
38.9	38.6	38.4	38.2	38.0	4	4	4	4	4	40.4	40.2	40.0	39.7	39.5
37.8	37.6	37.5	37.3	37.1	4	4	4	4	4	39.3	39.1	39.0	38.8	38.6
36.9	36.7	36.5	36.3	36.1	4	4	4	4	4	38.4	38.2	37.9	37.7	37.5
35.9	35.7	35.5	35.4	35.2	4	4	4	4	4	37.3	37.1	37.0	36.8	36.6
35.0	34.8	34.7	34.5	34.4	4	4	4	4	4	36.4	36.2	36.1	35.9	35.7
34.2	34.1	33.9	33.8	33.6	4	4	4	4	4	35.6	35.4	35.3	35.1	35.0
33.5	33.4	33.2	33.1	33.0	4	4	4	4	4	34.8	34.7	34.5	34.4	34.3
32.8	32.7	32.6	32.4	32.3	4	4	4	4	4	34.1	34.0	33.9	33.7	33.6
32.2	32.0	31.9	31.8	31.7	4	4	4	4	4	33.5	33.3	33.2	33.1	32.9
31.5	31.4	31.3	31.2	31.1	4	4	4	4	4	32.8	32.7	32.5	32.4	32.3
30.9	30.8	30.7	30.6	30.5	4	4	4	4	4	32.2	32.1	32.0	31.8	31.8
30.4	30.4	30.3	30.2	30.1	4	4	4	4	4	31.7	31.6	31.5	31.4	31.3
30.1	30.0	29.9	29.9	29.8	4	4	4	4	4	31.3	31.2	31.1	31.1	31.0
29.8	29.8	29.7	29.7	29.6	4	4	4	4	4	31.0	30.9	30.9	30.9	30.8
29.6	29.5	29.5	29.4	29.4	4	4	4	4	4	30.8	30.7	30.7	30.6	30.6
29.3	29.3	29.3	29.2	29.2	4	4	4	4	4	30.5	30.5	30.4	30.4	30.3
29.1	29.1	29.1	29.0	29.0	4	4	4	4	4	30.3	30.3	30.2	30.2	30.1

SOUTH EL NO ARROYO

28.9	28.9	28.8	28.8	28.7	4	4	4	4	4	30.1	30.0	30.0	29.9	29.9
28.7	28.6	28.6	28.5	28.5	4	4	4	4	4	29.8	29.8	29.7	29.7	29.6
28.4	28.4	28.3	28.3	28.2	4	4	4	4	4	29.6	29.5	29.5	29.4	29.4
28.2	28.1	28.1	28.0	28.0	4	4	4	4	4	29.3	29.3	29.2	29.2	29.1
27.9	27.9	27.8	27.8	27.8	4	4	4	4	4	29.0	29.0	29.0	28.9	28.9
27.7	27.7	27.7	27.6	27.6	4	4	4	4	4	28.9	28.8	28.8	28.7	28.7
27.5	27.5	27.4	27.4	27.3	4	4	4	4	4	28.6	28.6	28.5	28.5	28.4
27.3	27.2	27.2	27.1	27.1	4	4	4	4	4	28.4	28.3	28.3	28.2	28.2
27.0	27.0	27.0	26.9	26.9	4	4	4	4	4	28.1	28.1	28.0	28.0	27.9
26.8	26.8	26.7	26.7	26.6	4	4	4	4	4	27.9	27.8	27.8	27.7	27.7
26.6	26.5	26.5	26.5	26.4	4	4	4	4	4	27.7	27.6	27.6	27.5	27.5
26.4	26.3	26.3	26.2	26.2	4	4	4	4	4	27.4	27.4	27.3	27.3	27.2
26.2	26.1	26.1	26.0	26.0	4	4	4	4	4	27.2	27.2	27.1	27.1	27.0
26.0	25.9	25.9	25.8	25.8	4	4	4	4	4	27.0	27.0	26.9	26.9	26.8
25.8	25.7	25.7	25.6	25.6	4	4	4	4	4	26.8	26.8	26.7	26.7	26.6
25.6	25.5	25.5	25.5	25.4	4	4	4	4	4	26.6	26.6	26.5	26.5	26.4
25.4	25.4	25.3	25.3	25.3	4	4	4	4	4	26.4	26.4	26.3	26.3	26.3
25.2	25.2	25.2	25.1	25.1	4	4	4	4	4	26.2	26.2	26.2	26.1	26.1
25.0	25.0	25.0	24.9	24.9	4	4	4	4	4	26.0	26.0	26.0	25.9	25.9
24.9	24.8	24.8	24.8	24.7	4	4	4	4	4	25.9	25.8	25.8	25.8	25.7
24.7	24.7	24.6	24.6	24.6	4	4	4	4	4	25.7	25.7	25.6	25.6	25.6
24.5	24.5	24.5	24.5	24.4	4	4	4	4	4	25.5	25.5	25.5	25.4	25.4
24.4	24.4	24.3	24.3	24.3	4	4	4	4	4	25.4	25.3	25.3	25.3	25.2
24.2	24.2	24.2	24.2	24.1	4	4	4	4	4	25.2	25.2	25.2	25.1	25.1
24.1	24.1	24.0	24.0	24.0	4	4	4	4	4	25.1	25.0	25.0	25.0	24.9
24.0	23.9	23.9	23.9	23.8	4	4	4	4	4	24.9	24.9	24.9	24.8	24.8
23.8	23.8	23.8	23.7	23.7	4	4	4	4	4	24.8	24.8	24.7	24.7	24.7
23.7	23.7	23.6	23.6	23.6	4	4	4	4	4	24.6	24.6	24.6	24.5	24.5
23.5	23.5	23.5	23.5	23.4	4	4	4	4	4	24.5	24.5	24.4	24.4	24.4
23.4	23.4	23.4	23.3	0.5	4	4	4	4	4	24.4	24.3	24.3	24.3	0.5

NORTH LA \ VA ARROYO

Bulking Factors added to Hydrograph

Punch Hyd for LC100C.HYM
(DOES NOT INCLUDE BULKING FACTORS)

'RECALL HYD
ID= 5 HYD=115.90 DT=.050000 HRS DA= 4.3646 SQ MI
PEAK=2746.517CFS RO= 1.1955 INCHES NO PTS=501

Bulking Factors calculated using RTI's equation.
RTI Used BF rounded up to nearest whole interger.

Punch Hyd With Bulking Factors
Input to AHYMO FILE: LC100CBF.HYM

'RECALL HYD
ID= 5 HYD=115.9BF DT=.050000 HRS DA= 4.3646 SQ MI
PEAK= 2993.704 CFS RO= 1.1955 INCHES NO PTS=501

FLOW RATES					BULKING FACTORS					FLOW RATES				
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.1	0.7	4	4	4	4	4	0.0	0.0	0.0	0.1	0.8
2.4	5.1	22.2	78.2	173.3	4	4	4	4	4	2.5	5.3	23.1	81.3	180.2
402.3	726.2	958.7	1083.1	1154.4	5	5	6	6	6	422.4	762.6	1016.2	1148.0	1223.6
1346.1	1552.0	1628.1	1626.6	1662.9	7	7	7	7	7	1440.3	1660.7	1742.1	1740.5	1779.3
1775.5	1918.3	2099.3	2325.1	2539.6	7	8	8	8	9	1899.7	2071.8	2267.2	2511.1	2768.2
2684.1	2746.5	2721.4	2637.9	2515.2	9	9	9	9	9	2925.7	2993.7	2966.3	2875.3	2741.6
2365.7	2202.1	2036.3	1869.5	1709.5	9	8	8	8	7	2578.6	2378.3	2199.2	2019.1	1829.1
1550.0	1408.7	1275.1	1152.5	1044.4	7	7	7	6	6	1658.5	1507.3	1364.4	1221.6	1107.1
948.1	856.8	778.0	702.8	641.0	6	6	6	5	5	1005.0	908.2	824.7	738.0	673.1
582.4	532.0	484.3	444.5	408.5	5	5	5	5	5	611.5	558.6	508.5	466.7	428.9
372.9	346.0	316.9	293.0	275.6	5	5	5	5	5	391.5	363.3	332.7	307.7	289.3
255.6	236.9	221.9	210.5	201.5	5	5	5	5	4	268.4	248.7	233.0	221.0	209.6
193.2	180.7	171.6	165.6	157.9	4	4	4	4	4	200.9	187.9	178.4	172.2	164.2
151.9	144.9	138.3	134.0	127.6	4	4	4	4	4	158.0	150.7	143.8	139.4	132.7
121.2	114.5	109.8	105.3	100.5	4	4	4	4	4	126.1	119.0	114.2	109.5	104.5
95.2	91.3	87.3	84.0	81.9	4	4	4	4	4	99.0	94.9	90.8	87.4	85.2
79.2	75.4	72.0	69.1	66.7	4	4	4	4	4	82.3	78.4	74.9	71.9	69.3
64.1	61.8	58.7	55.9	53.3	4	4	4	4	4	66.7	64.3	61.0	58.1	55.4
50.8	48.5	46.5	44.9	43.8	4	4	4	4	4	52.8	50.4	48.4	46.7	45.5
42.7	41.3	40.6	39.2	37.9	4	4	4	4	4	44.4	43.0	42.2	40.8	39.5
36.8	25.7	34.6	33.5	32.4	4	4	4	4	4	38.3	26.8	36.0	34.8	33.7
31.5	30.6	29.6	28.7	27.8	4	4	4	4	4	32.7	31.8	30.8	29.9	28.9
26.8	25.9	24.9	24.2	23.4	4	4	4	4	4	27.9	26.9	25.9	25.1	24.4
22.7	21.8	21.0	20.2	19.5	4	4	4	4	4	23.6	22.7	21.9	21.0	20.2
18.7	18.0	17.4	16.7	16.1	4	4	4	4	4	19.5	18.7	18.0	17.4	16.8
15.5	15.0	14.5	14.0	13.6	4	4	4	4	4	16.2	15.6	15.1	14.6	14.2
13.3	12.9	12.7	12.5	12.1	4	4	4	4	4	13.8	13.5	13.2	13.0	12.6
11.8	11.5	11.1	10.8	10.5	4	4	4	4	4	12.3	11.9	11.6	11.2	10.9
10.2	9.9	9.7	9.4	9.2	4	4	4	4	4	10.6	10.3	10.0	9.8	9.5
8.9	8.7	8.5	8.3	8.1	4	4	4	4	4	9.3	9.1	8.8	8.6	8.4
7.9	7.8	7.6	7.4	7.3	4	4	4	4	4	8.2	8.1	7.9	7.7	7.6
7.1	7.0	6.9	6.7	6.6	4	4	4	4	4	7.4	7.3	7.1	7.0	6.9
6.5	6.4	6.3	6.2	6.1	4	4	4	4	4	6.8	6.6	6.5	6.4	6.3
6.0	5.9	5.8	5.7	5.6	4	4	4	4	4	6.2	6.1	6.0	5.9	5.9
5.5	5.5	5.4	5.3	5.3	4	4	4	4	4	5.8	5.7	5.6	5.6	5.5
5.2	5.2	5.1	5.1	5.0	4	4	4	4	4	5.4	5.4	5.3	5.3	5.2

NORTH L_ _ 'A ARROYO

4.9	4.9	4.8	4.8	4.8	4	4	4	4	4	5.1	5.1	5.0	5.0	4.9
4.7	4.7	4.6	4.6	4.6	4	4	4	4	4	4.9	4.9	4.8	4.8	4.7
4.5	4.5	4.5	4.4	4.4	4	4	4	4	4	4.7	4.7	4.6	4.6	4.6
4.4	4.3	4.3	4.3	4.2	4	4	4	4	4	4.5	4.5	4.5	4.4	4.4
4.2	4.2	4.2	4.1	4.1	4	4	4	4	4	4.4	4.4	4.3	4.3	4.3
4.1	4.1	4.1	4.0	4.0	4	4	4	4	4	4.3	4.2	4.2	4.2	4.2
4.0	4.0	4.0	3.9	3.9	4	4	4	4	4	4.2	4.1	4.1	4.1	4.1
3.9	3.9	3.9	3.9	3.8	4	4	4	4	4	4.1	4.1	4.0	4.0	4.0
2.8	3.8	3.8	3.8	3.8	4	4	4	4	4	2.9	4.0	4.0	3.9	3.9
3.8	3.7	3.7	3.7	3.7	4	4	4	4	4	3.9	3.9	3.9	3.9	3.9
3.7	3.7	3.7	3.7	3.6	4	4	4	4	4	3.8	3.8	3.8	3.8	3.8
3.6	3.6	3.6	3.6	3.6	4	4	4	4	4	3.8	3.8	3.8	3.7	3.7
3.6	3.6	3.6	3.5	3.5	4	4	4	4	4	3.7	3.7	3.7	3.7	3.7
3.5	3.5	3.5	3.5	3.5	4	4	4	4	4	3.7	3.7	3.6	3.6	3.6
3.5	3.5	3.5	3.4	3.4	4	4	4	4	4	3.6	3.6	3.6	3.6	3.6
3.4	3.4	3.4	3.4	3.4	4	4	4	4	4	3.6	3.6	3.5	3.5	3.5
3.4	3.4	3.4	3.4	3.4	4	4	4	4	4	3.5	3.5	3.5	3.5	3.5
3.3	3.3	3.3	3.3	3.3	4	4	4	4	4	3.5	3.5	3.5	3.4	3.4
3.3	3.3	3.3	3.3	3.3	4	4	4	4	4	3.4	3.4	3.4	3.4	3.4
3.3	3.2	3.2	3.2	3.2	4	4	4	4	4	3.4	3.4	3.4	3.4	3.3
3.2	3.2	3.2	3.2	3.2	4	4	4	4	4	3.3	3.3	3.3	3.3	3.3
3.2	3.2	3.2	3.2	3.2	4	4	4	4	4	3.3	3.3	3.3	3.3	3.3
3.2	3.1	3.1	3.1	3.1	4	4	4	4	4	3.3	3.3	3.3	3.2	3.2
3.1	3.1	3.1	3.1	3.1	4	4	4	4	4	3.2	3.2	3.2	3.2	3.2
3.1	3.1	3.1	2.7	2.0	4	4	4	4	4	3.2	3.2	3.2	2.8	2.1
3.1	3.1	3.1	2.7	2.0	4	4	4	4	4	3.2	3.2	3.2	2.8	2.1
1.3	0.8	0.5	0.3	0.2	4	4	4	4	4	1.4	0.8	0.5	0.3	0.2
0.2	0.2	0.2	0.2	0.2	4	4	4	4	4	0.2	0.2	0.2	0.2	0.2
0.2	0.2	0.2	0.2	0.2	4	4	4	4	4	0.2	0.2	0.2	0.2	0.2
0.2	0.2	0.2	0.2	0.2	4	4	4	4	4	0.2	0.2	0.2	0.2	0.2
0.2	0.2	0.2	0.2	0.1	4	4	4	4	4	0.2	0.2	0.2	0.2	0.2
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.2	0.2	0.2	0.2	0.2
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.2	0.2	0.2	0.2	0.2
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.2	0.2	0.2	0.2
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.2	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1

NORTH LA[illegible]VA ARROYO

0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.1	0.1	0.1	0.1	4	4	4	4	4	0.1	0.1	0.1	0.1	0.1
0.1	0.0	0.0	0.0	0.0	4	4	4	4	4	0.1	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	4	4	4	4	4	0.0	0.0	0.0	0.0	0.0
0.0														

APPENDIX F: Section 2

Rating Curve for Drainage Structure 8 Under I-25

Structure 8, under I-25, consists of 12- 48" RCP. The invert elevation on the east side of I-25 is 5194.9 feet. A weir equation program is used to estimate the flow through structure 8, up to an elevation of 5196.9 feet, when the pipe is flowing under half full. Above the elevation of 5196.9 feet, the flow through the pipe is estimated using an orifice equation program. The overall rating curve for flow through structure 8 is presented in Table F1. The weir and orifice program outputs are provided following Table F1.

Table F1: Rating Curve for Structure 8

Elevation (ft)	Flow (1-48" RCP)	Flow (12-48" RCP)
5195.0	0.01	0.12
5195.5	1.02	12.2
5196.0	4.6	55.2
5196.5	11.0	132.0
5197.0	19.1	229.2
5197.5	46.8	561.6
5198.0	63.4	760.8
5198.5	76.5	918.0
5199.0	87.6	1051.2
5199.5	97.5	1170.0
5200.0	106.5	1278.0
5200.5	114.8	1377.6
5201.0	122.5	1470.0
5201.5	129.7	1556.4
5202.0	136.6	1639.2
5202.5	143.1	1717.2
5203.0	149.4	1792.8
5203.5	155.4	1864.8
5204.0	161.3	1935.6
5204.5	166.7	2000.4
5205.0	172.1	2065.2

WEIR PROGRAM

STRUCTURE 8 : WEIR FLOW IN PIPE UP TO HALF FULL

Note:
1) Program output is for 1-48" diameter pipe. Structure 8 consists of 12-48" pipes, so flow rate must be multiplied by 12.
2) Weir coefficient estimated from table of values for broadcrested weirs, Handbood of Hydraulics.

WEIR COEFFICENT = 2.6800
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	5196.90	3	2.00	5194.90	5	4.00	5196.90
2	0.30	5195.90	4	3.70	5195.90			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
5195.00	0.10	0.02	0.01	0.66	0.34
5195.10	0.20	0.07	0.06	0.95	0.68
5195.20	0.30	0.15	0.18	1.17	1.02
5195.30	0.40	0.27	0.37	1.35	1.36
5195.40	0.50	0.43	0.64	1.51	1.70
5195.50	0.60	0.61	1.02	1.66	2.04
5195.60	0.70	0.83	1.49	1.79	2.38
195.70	0.80	1.09	2.08	1.92	2.72
195.80	0.90	1.38	2.80	2.03	3.06
5195.90	1.00	1.70	3.64	2.14	3.40
5196.00	1.10	2.04	4.61	2.26	3.46
5196.10	1.20	2.39	5.69	2.38	3.52
5196.20	1.30	2.75	6.87	2.50	3.58
5196.30	1.40	3.11	8.14	2.62	3.64
5196.40	1.50	3.48	9.51	2.74	3.70
5196.50	1.60	3.85	10.96	2.85	3.76
5196.60	1.70	4.23	12.50	2.96	3.82
5196.70	1.80	4.61	14.12	3.06	3.88
5196.80	1.90	5.00	15.82	3.16	3.94
5196.90	2.00	5.40	17.61	3.26	4.00

Table 5-3. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs

Measured head in feet, H	Breadth of crest of weir in feet										
	0.50	0.75	1.00	1.50	2.00	2.50	3.00	4.00	5.00	10.00	15.00
0.2	2.80	2.75	2.69	2.62	2.54	2.48	2.44	2.38	2.34	2.49	2.68
0.4	2.92	2.80	2.72	2.64	2.61	2.60	2.58	2.54	2.50	2.56	2.70
0.6	3.08	2.89	2.75	2.64	2.61	2.60	2.68	2.69	2.70	2.70	2.70
0.8	3.30	3.04	2.85	2.68	2.60	2.60	2.67	2.68	2.68	2.69	2.64
1.0	3.32	3.14	2.98	2.75	2.66	2.64	2.65	2.67	2.68	2.68	2.63
1.2	3.32	3.20	3.06	2.86	2.70	2.65	2.64	2.67	2.66	2.69	2.64
1.4	3.32	3.26	3.20	2.92	2.77	2.68	2.64	2.65	2.65	2.67	2.64
1.6	3.32	3.29	3.28	3.07	2.89	2.75	2.68	2.66	2.65	2.64	2.63
1.8	3.32	3.32	3.31	3.07	2.88	2.74	2.68	2.66	2.65	2.64	2.63
2.0	3.32	3.31	3.30	3.03	2.85	2.76	2.72	2.68	2.65	2.64	2.63
2.5	3.32	3.32	3.31	3.28	3.07	2.89	2.81	2.72	2.67	2.64	2.63
3.0	3.32	3.32	3.32	3.32	3.20	3.05	2.92	2.73	2.66	2.64	2.63
3.5	3.32	3.32	3.32	3.32	3.32	3.19	2.97	2.76	2.68	2.64	2.63
4.0	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.70	2.64	2.63
4.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.74	2.64	2.63
5.0	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.07	2.79	2.64	2.63
5.5	3.32	3.32	3.32	3.32	3.32	3.32	3.32	3.32	2.88	2.64	2.63

Table 5-4. Values of C in the Formula $Q = CLH^{3/2}$ for Models of Broad-crested Weirs with Rounded Upstream Corner

Name of experimenter	Radius of curve in feet	Breadth of weir in feet, B	Height of weir in feet, P	Head in feet, H									
				0.4	0.6	0.8	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Bazin	0.33	2.62	2.46	2.93	2.97	2.98	3.01	3.04					
Bazin	0.33	6.56	2.46	2.70	2.82	2.87	2.89	2.92					
U. S. Deep Waterways	0.33	2.62	4.57	..	2.77	2.80	2.83	2.92	3.00	3.06	3.17	3.34	3.50
U. S. Deep Waterways	0.33	6.56	4.56	....	....	2.83	2.83	2.83	2.82	2.82	2.82	2.82	2.81

Table 5-5. Values of C in the Formula $Q = CLH^{3/2}$ for Broad-crested Weirs with Crests Inclined Slightly Downward

(a)

Crest	Energy head = H_e								
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.5
Level	2.78	2.79	2.80	2.81	2.82	2.83	2.85	2.85	2.85
Slope = 0.004	2.95	2.94	2.93	2.92	2.91	2.90	2.88	2.87	2.87
Slope = 0.020	3.07	3.06	3.05	3.04	3.03	3.02	3.00	2.99	

(b)

Slope of crest	Length of weir in feet	Head in feet, H						
		0.1	0.2	0.3	0.4	0.5	0.6	0.7
12 to 1	3.0	2.58	2.87	2.57	2.60	2.84	2.81	2.70
18 to 1	3.0	2.91	2.92	2.53	2.60	2.80	2.74	2.62
18 to 1	10.0	2.52	2.68	2.73	2.80	2.90	2.80	2.68

Table 5-6. Values of C in the Formula $Q = CLH^{3/2}$ for Weirs of Triangular Cross Section with Vertical Upstream Face and Sloping Downstream Face

Slope of downstream face	Height of weir in feet, P	Head in feet, H										
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5
Hor. Vert.												
1 to 1	2.46	3.88	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
2 to 1	2.46	3.48	3.48	3.49	3.49	3.50	3.50	3.50	3.50	3.50	3.51	3.51
2 to 1	1.64	3.56	3.47	3.47	3.51	3.54	3.57	3.58	3.58	3.58	3.59	3.57
3 to 1	1.64	....	2.90	3.11	3.22	3.26	3.33	3.37	3.40	3.40	3.41	3.41
5 to 1	2.46	....	3.08	3.06	3.05	3.05	3.07	3.09	3.12	3.13	3.13	3.13
10 to 1	2.46	....	2.82	2.83	2.84	2.86	2.89	2.90	2.91	2.91	2.92	2.93

ORIRIFCE PROGRAM

STRUCTURE 8

NOTE: OUTPUT IS FOR ELEVATION INCREMENTS OF 0.1 FT.
PROGRAM ONLY ALLOWS LIMITED OUTPUT POINTS, SO
THE TOP OF DAM ELEV. IS NOT REACHED. PROGRAM
MUST BE RUN AGAIN WITH LARGER ELEVATION INCREMENT.

ELEVATION (FT)	DISCHARGE (CFS)
5197.00000	19.12618
5197.10010	27.04851
5197.19971	33.12752
5197.29980	38.25237
5197.39990	42.76744
5197.50000	46.84939
5197.60010	50.60312
5197.69971	54.09702
5197.79980	57.37855
5197.89990	60.48230
5198.00000	63.43438
5198.10010	66.25504
5198.19971	68.96044
5198.29980	71.56363
5198.39990	74.07539
5198.50000	76.50474
5198.60010	78.85928
5198.69971	81.14552
5198.79980	83.36910
5198.89990	85.53489
5199.00000	87.64718
5199.10010	89.70975
5199.19971	91.72595
5199.29980	93.69878
5199.39990	95.63091
5199.50000	97.52477
5199.60010	99.38255
5199.69971	101.20623
5199.79980	102.99763
5199.89990	104.75840
5200.00000	106.49006
5200.10010	108.19401
5200.19971	109.87154
5200.29980	111.52383
5200.39990	113.15200
5200.50000	114.75707
5200.60010	116.34000
5200.69971	117.90169
5200.79980	119.44295
5200.89990	120.96458
5201.00000	122.46729
5201.10010	123.95181
5201.19971	125.41873
5201.29980	126.86872
5201.39990	128.30231
5201.50000	129.72005
5201.60010	131.12247
5201.69971	132.51006
5201.79980	133.88326
5201.89990	135.24249
5202.00000	136.58823
5202.10010	137.92084
5202.19971	139.24068
5202.29980	140.54813
5202.39990	141.84354
DISCHARGE AT TOP	172.13669

ORIFICE PROGRAM

STRUCTURE 8

Top of Dam Elev. = 5205 ft.
Pipe Elev. (middle of pipe) = 5196.9 ft.
Diameter of pipe = 48"

Notes:
1) weir flow when pipe is less than half full
(refer to weir program output for structure 8)
2) output below is for one 48" pipe. Structure
8 consists of 12-18" pipes, so discharge must
be multiplied by 12. (Refer to table F1 in App. F)

ELEVATION (FT)	DISCHARGE (CFS)
5197.10010	27.04851
5197.29980	38.25237
5197.50000	46.84939
5197.69971	54.09702
5197.89990	60.48230
5198.10010	66.25504
5198.29980	71.56363
5198.50000	76.50474
5198.69971	81.14552
5198.89990	85.53489
5199.10010	89.70975
5199.29980	93.69878
5199.50000	97.52479
5199.69971	101.20625
5199.89990	104.75842
5200.10010	108.19404
5200.29980	111.52386
5200.50000	114.75710
5200.69971	117.90172
5200.89990	120.96461
5201.10010	123.95184
5201.29980	126.86874
5201.50000	129.72008
5201.69971	132.51007
5201.89990	135.24252
5202.10010	137.92085
5202.29980	140.54816
5202.50000	143.12723
5202.69971	145.66064
5202.89990	148.15074
5203.10010	150.59970
5203.29980	153.00945
5203.50000	155.38182
5203.69971	157.71852
5203.89990	160.02110
5204.10010	162.29100
5204.29980	164.52960
5204.50000	166.73816
5204.69971	168.91783
5204.89990	171.06973
DISCHARGE AT TOP	172.13669

Estimate Q for flow through Structure 8

Interpolation between elevations produced by Orifice Eqn. Program

elev. 5204.1 → 5204.4

$$\frac{2000.4 - 1935.6}{5204.5 - 5204} = \frac{x}{0.1} \Rightarrow 12.96 \text{ cfs / 0.1' change in elev.}$$

elev	Q (cfs)
5204.1	1948.56
5204.2	1961.52
5204.3	1974.48
5204.4 =	1987.44

$$\frac{2065.2 - 2000.4}{5205 - 5204.5} = \frac{x}{0.1} \Rightarrow 12.96 \text{ cfs / 0.1' change in elev,}$$

elev	Q (cfs)
5204.6	2013.36
5204.7	2026.32
5204.8	2039.28
5204.9	2052.24

BOHANNAN-HUSTON INC.

PROJECT NAME LOMR SHEET 1 OF 1

PROJECT NO 96155C1.2107 BY SJG DATE 8/5/96

SUBJECT Orifice - Structure 8 CH'D DATE

APPENDIX F: Section 3

Rating Curve for Drainage Structure 9 Under I-25

Structure 9, under I-25, consists of one 24" RCP. The invert elevation on the east side of I-25 is 5197.9 feet. A weir equation program is used to estimate the flow through structure 9, up to an elevation of 5198.9 feet, when the pipe is flowing under half full. Above the elevation of 5198.9 feet, the flow through the pipe is estimated using an orifice equation program. The overall rating curve for flow through structure 9 is presented in Table F2. The weir and orifice program outputs are provided following Table F2.

Table F2: Rating Curve for Structure 9

Elevation (ft)	Flow (I-24 RCP)
5198.0	0.01
5198.5	1.03
5199.0	4.8
5199.5	11.7
5200.0	15.9
5200.5	19.0
5201.0	21.9
5201.5	24.4
5202.0	26.6
5202.5	28.7
5203.0	30.6
5203.5	32.4
5204.0	34.1
5204.5	35.8
5205.0	37.3

WEIR PROGRAM

STRUCTURE 9: WEIR FLOW IN PIPE UP TO HALF FULL

WEIR COEFFICENT = 2.6600
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	5198.90	3	1.00	5197.90	5	2.00	5198.90
2	0.13	5198.40	4	1.87	5198.40			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
5198.00	0.10	0.02	0.01	0.65	0.35
5198.10	0.20	0.07	0.07	0.94	0.70
5198.20	0.30	0.16	0.18	1.16	1.04
5198.30	0.40	0.28	0.37	1.34	1.39
5198.40	0.50	0.44	0.65	1.50	1.74
5198.50	0.60	0.61	1.02	1.67	1.79
5198.60	0.70	0.79	1.46	1.84	1.84
5198.70	0.80	0.98	1.96	2.00	1.90
5198.80	0.90	1.17	2.52	2.15	1.95
5198.90	1.00	1.37	3.14	2.29	2.00

ORIFICE PROGRAM

STRUCTURE 9

Top of Dam Elev.= 5205 ft.
Pipe Elev. (middle of pipe) = 5198.9
Pipe Diameter = 24"

1) Weir flow when pipe is less than half full
   (refer to weir program output for structue 9)

ELEVATION (FT)	DISCHARGE (CFS)
5199.00000	4.78155
5199.10010	6.76213
5199.19971	8.28188
5199.29980	9.56309
5199.39990	10.69186
5199.50000	11.71235
5199.60010	12.65078
5199.69971	13.52425
5199.79980	14.34464
5199.89990	15.12058
5200.00000	15.85859
5200.10010	16.56376
5200.19971	17.24011
5200.29980	17.89091
5200.39990	18.51885
5200.50000	19.12618
5200.60010	19.71482
5200.69971	20.28638
5200.79980	20.84228
5200.89990	21.38372
5201.00000	21.91179
5201.10010	22.42744
5201.19971	22.93149
5201.29980	23.42469
5201.39990	23.90773
5201.50000	24.38119
5201.60010	24.84564
5201.69971	25.30156
5201.79980	25.74941
5201.89990	26.18960
5202.00000	26.62251
5202.10010	27.04850
5202.19971	27.46788
5202.29980	27.88096
5202.39990	28.28800
5202.50000	28.68927
5202.60010	29.08500
5202.69971	29.47542
5202.79980	29.86074
5202.89990	30.24114
5203.00000	30.61682
5203.10010	30.98795
5203.19971	31.35468
5203.29980	31.71718
5203.39990	32.07558
5203.50000	32.43001
5203.60010	32.78062
5203.69971	33.12751
5203.79980	33.47081
5203.89990	33.81062
5204.00000	34.14706

5204.10010	34.48021
5204.19971	34.81017
5204.29980	35.13703
5204.39990	35.46088
T SCHARGE AT TOP	37.34536

ORIFICE PROGRAM

STRUCTURE 9

*PROGRAM OUTPUT USING ELEVATION INCREMENT OF 0.2 FT

ELEVATION (FT)	DISCHARGE (CFS)
5199.10010	6.76213
5199.29980	9.56309
5199.50000	11.71235
5199.69971	13.52425
5199.89990	15.12058
5200.10010	16.56376
5200.29980	17.89091
5200.50000	19.12618
5200.69971	20.28638
5200.89990	21.38372
5201.10010	22.42744
5201.29980	23.42470
5201.50000	24.38120
5201.69971	25.30156
5201.89990	26.18961
5202.10010	27.04851
5202.29980	27.88096
5202.50000	28.68928
5202.69971	29.47543
5202.89990	30.24115
5203.10010	30.98796
5203.29980	31.71718
5203.50000	32.43002
5203.69971	33.12752
5203.89990	33.81063
5204.10010	34.48021
5204.29980	35.13704
5204.50000	35.78181
5204.69971	36.41516
5204.89990	37.03769
DISCHARGE AT TOP	37.34536

APPENDIX F: Section 4

Rating Curve for Drainage Structure 10 Under I-25

Structure 10, under I-25, consists of one 24" RCP. The invert elevation on the east side of I-25 is 5197.9 feet. A weir equation program is used to estimate the flow through structure 10, up to an elevation of 5198.9 feet, when the pipe is flowing under half full. Above the elevation of 5198.9 feet, the flow through the pipe is estimated using an orifice equation program. The overall rating curve for flow through structure 10 is presented in Table F3. The weir and orifice program outputs are provided following Table F3.

Table F3: Rating Curve for Structure 10

Elevation (ft)	Flow (1-24" RCP)
5198.0	0.01
5198.5	1.03
5199.0	4.8
5199.5	11.7
5200.0	15.9
5200.5	19.0
5201.0	21.9
5201.5	24.4
5202.0	26.6
5202.5	28.7
5203.0	30.6
5203.5	32.4
5204.0	34.1
5204.5	35.8
5205.0	37.3

WEIR PROGRAM

STRUCTURE 10: WEIR FLOW IN PIPE UP TO HALF FULL

WEIR COEFFICENT = 2.6600
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	5198.90	3	1.00	5197.90	5	2.00	5198.90
2	0.13	5198.40	4	1.87	5198.40			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
5198.00	0.10	0.02	0.01	0.65	0.35
5198.10	0.20	0.07	0.07	0.94	0.70
5198.20	0.30	0.16	0.18	1.16	1.04
5198.30	0.40	0.28	0.37	1.34	1.39
5198.40	0.50	0.44	0.65	1.50	1.74
5198.50	0.60	0.61	1.02	1.67	1.79
5198.60	0.70	0.79	1.46	1.84	1.84
5198.70	0.80	0.98	1.96	2.00	1.90
5198.80	0.90	1.17	2.52	2.15	1.95
5198.90	1.00	1.37	3.14	2.29	2.00

ORIFICE PROGRAM

STRUCTURE 10

Top of dam elev. = 5205 FT.
Pipe elev. (middle of pipe) = 5198.9 FT.
Diameter of pipe = 24"

Notes:
1) weir flow when pipe is less than half full
(refer to weir program output for structure 10)

ELEVATION (FT)	DISCHARGE (CFS)
5198.00000	4.78155
5198.10010	6.76213
5198.19971	8.28188
5198.29980	9.56309
5198.39990	10.69186
5198.50000	11.71235
5198.60010	12.65078
5198.69971	13.52425
5198.79980	14.34464
5198.89990	15.12058
5199.00000	15.85859
5199.10010	16.56376
5199.19971	17.24011
5199.29980	17.89091
5199.39990	18.51885
5199.50000	19.12618
5199.60010	19.71482
5199.69971	20.28638
5199.79980	20.84228
5199.89990	21.38372
5200.00000	21.91179
5200.10010	22.42744
5200.19971	22.93149
5200.29980	23.42469
5200.39990	23.90773
5200.50000	24.38119
5200.60010	24.84564
5200.69971	25.30156
5200.79980	25.74941
5200.89990	26.18960
5201.00000	26.62251
5201.10010	27.04850
5201.19971	27.46788
5201.29980	27.88096
5201.39990	28.28800
5201.50000	28.68927
5201.60010	29.08500
5201.69971	29.47542
5201.79980	29.86074
5201.89990	30.24114
5202.00000	30.61682
5202.10010	30.98795
5202.19971	31.35468
5202.29980	31.71718
5202.39990	32.07558
5202.50000	32.43001
5202.60010	32.78062
5202.69971	33.12751
5202.79980	33.47081
5202.89990	33.81062
5203.00000	34.14706
5203.10010	34.48021
5203.19971	34.81017

	5203.29980	35.13703
	5203.39990	35.46088
DISCHARGE AT TOP		40.29030

ORIFICE PROGRAM

STRUCTURE 10

INCREMENTAL ELEVATION OF 0.2 FT USED

ELEVATION (FT)	DISCHARGE (CFS)
5199.10010	6.76213
5199.29980	9.56309
5199.50000	11.71235
5199.69971	13.52425
5199.89990	15.12058
5200.10010	16.56376
5200.29980	17.89091
5200.50000	19.12618
5200.69971	20.28638
5200.89990	21.38372
5201.10010	22.42744
5201.29980	23.42470
5201.50000	24.38120
5201.69971	25.30156
5201.89990	26.18961
5202.10010	27.04851
5202.29980	27.88096
5202.50000	28.68928
5202.69971	29.47543
5202.89990	30.24115
5203.10010	30.98796
5203.29980	31.71718
5203.50000	32.43002
5203.69971	33.12752
5203.89990	33.81063
5204.10010	34.48021
5204.29980	35.13704
5204.50000	35.78181
5204.69971	36.41516
5204.89990	37.03769
DISCHARGE AT TOP	37.34536

APPENDIX F: Section 5

Rating Curve for Drainage Structure 11 Under I-25

Structure 11 under I-25 consists of 3-10'x10' CBC. The invert elevation on the east side of I-25 is 5186.1 feet. The elevation at which flow begins to pass over weir 4, to the south along the east side of I-25, is approximately 5203 feet. A weir equation program was used to estimate the flow through Structure 11, up to 5289 feet, when the culverts are flowing under half full. Above the elevation of 5189 feet, the flow is estimated using the Federal Highway Department's Nomographs. The weir program output and the nomographs used are included in this appendix for reference. The resulting rating curve is provided in Table F4.

Table F4: Rating Curve for Structure 11

Elevation (ft)	Flow (3-10'x10' CBC)
5186.5	20.0
5187.0	67.6
5187.5	131.2
5188.0	207.4
5188.5	294.5
5189.0	391.2
5190.0	750
5191.0	1050
5192.0	1350
5193.0	1710
5194.0	2070
5195.0	2430
5196.0	2790
5197.0	3240
5198.0	3540
5199.0	3870
5200.0	4170
5201.0	4290
5202.0	4710
5203.0	4950

weir flow through structure 11, until half full

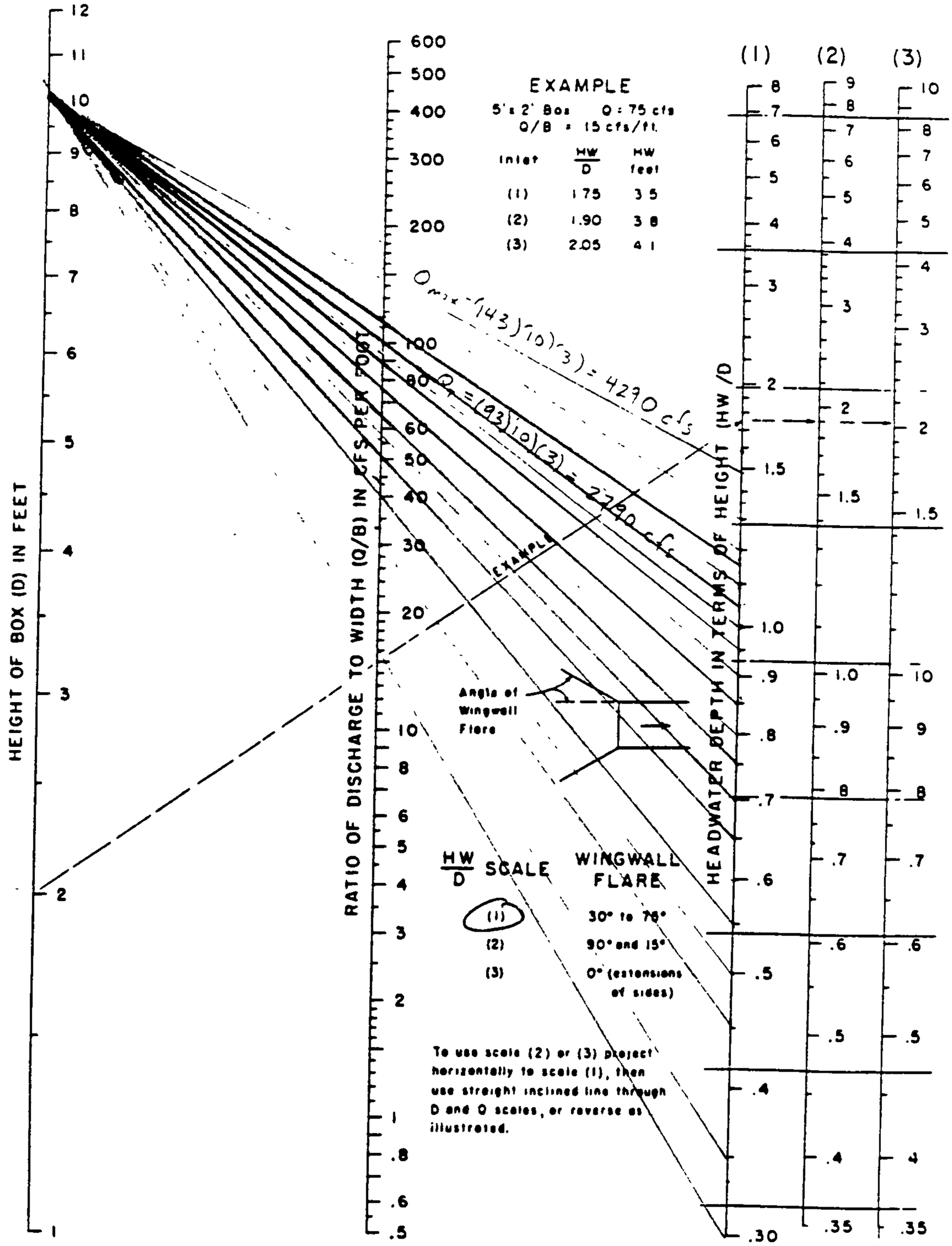
Flow shown in column 4 is for flow through 1-10'x10' CBC
Actual flow through structure 11 is the flow rate in column 4
multiplied by 3, for the 3 CBCs, refer to far left column.

WEIR COEFFICENT = 2.6400
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	5189.10	3	10.00	5186.10			
2	0.00	5186.10	4	10.00	5189.10			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	1 CBC FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS	3 CBCs FLOW RATE (CFS)
5186.20	0.10	1.00	0.83	0.83	10.00	2.49
5186.30	0.20	2.00	2.36	1.18	10.00	
5186.40	0.30	3.00	4.34	1.45	10.00	
5186.50	0.40	4.00	6.68	1.67	10.00	20.04
5186.60	0.50	5.00	9.33	1.87	10.00	
5186.70	0.60	6.00	12.27	2.04	10.00	
5186.80	0.70	7.00	15.46	2.21	10.00	
5186.90	0.80	8.00	18.89	2.36	10.00	
5187.00	0.90	9.00	22.54	2.50	10.00	67.62
5187.10	1.00	10.00	26.40	2.64	10.00	
5187.20	1.10	11.00	30.46	2.77	10.00	
5187.30	1.20	12.00	34.70	2.89	10.00	
5187.40	1.30	13.00	39.13	3.01	10.00	
5187.50	1.40	14.00	43.73	3.12	10.00	131.19
5187.60	1.50	15.00	48.50	3.23	10.00	
5187.70	1.60	16.00	53.43	3.34	10.00	
5187.80	1.70	17.00	58.52	3.44	10.00	
5187.90	1.80	18.00	63.75	3.54	10.00	
5188.00	1.90	19.00	69.14	3.64	10.00	207.42
5188.10	2.00	20.00	74.67	3.73	10.00	
5188.20	2.10	21.00	80.34	3.83	10.00	
5188.30	2.20	22.00	86.15	3.92	10.00	
5188.40	2.30	23.00	92.09	4.00	10.00	
5188.50	2.40	24.00	98.16	4.09	10.00	294.48
5188.60	2.50	25.00	104.36	4.17	10.00	
5188.70	2.60	26.00	110.68	4.26	10.00	
5188.80	2.70	27.00	117.13	4.34	10.00	
5188.90	2.80	28.00	123.69	4.42	10.00	
5189.00	2.90	29.00	130.38	4.50	10.00	391.14
5189.10	3.00	30.00	137.18	4.57	10.00	

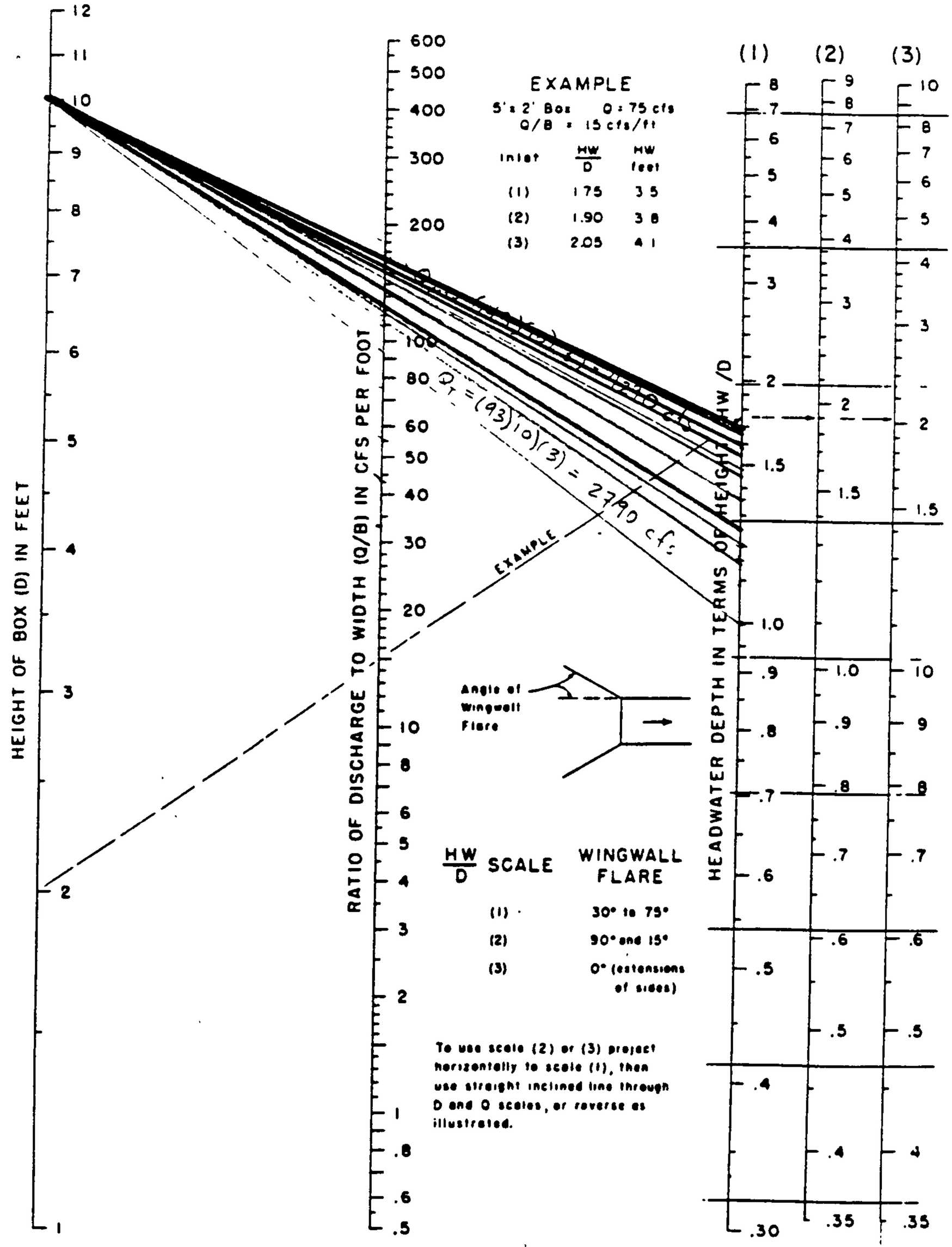
CHART 8



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN 1963

CHART 8



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN 1963

APPENDIX F: Section 6

Rating Curve for Weir 1, Located Around Structure 8

WEIR 1 & WEIR BETWEEN S EL CAMINO AND N LA CUEVA AT I-25

WEIR COEFFICENT = 2.6300
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	5211.00	9	385.00	5205.90	17	1138.00	5206.00
2	20.00	5210.00	10	420.00	5206.00	18	1142.00	5205.00
3	100.00	5208.00	11	445.00	5206.40	19	1150.00	5206.00
4	160.00	5206.00	12	452.00	5206.00	20	1152.00	5205.50
5	255.00	5204.00	13	485.00	5205.00	21	1155.00	5206.00
6	305.00	5203.00	14	510.00	5206.00	22	1240.00	5208.00
7	340.00	5202.50	15	935.00	5207.00	23	1320.00	5210.00
8	358.00	5204.00	16	1120.00	5206.60			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
5202.60	0.10	0.41	0.27	0.67	8.20
5202.70	0.20	1.64	1.54	0.94	16.40
5202.80	0.30	3.69	4.25	1.15	24.60
5202.90	0.40	6.56	8.73	1.33	32.80
5203.00	0.50	10.25	15.25	1.49	41.00
5203.10	0.60	14.66	23.99	1.64	47.20
5203.20	0.70	19.69	34.99	1.78	53.40
5203.30	0.80	25.34	48.34	1.91	59.60
5203.40	0.90	31.61	64.16	2.03	65.80
5203.50	1.00	38.50	82.54	2.14	72.00
5203.60	1.10	46.01	103.61	2.25	78.20
5203.70	1.20	54.14	127.45	2.35	84.40
5203.80	1.30	62.89	154.18	2.45	90.60
5203.90	1.40	72.26	183.89	2.54	96.80
5204.00	1.50	82.25	216.68	2.63	103.00
5204.10	1.60	92.86	252.64	2.72	109.17
5204.20 5204.13' WSEL	1.70	104.08	291.86 264cfs	2.80	115.34
5204.30	1.80	115.93	334.43	2.88	121.51
5204.40	1.90	128.39	380.43	2.96	127.68
5204.50	2.00	141.46	429.95	3.04	133.86
5204.60	2.10	155.16	483.07	3.11	140.03
5204.70	2.20	169.47	539.87	3.19	146.20
5204.80	2.30	184.40	600.43	3.26	152.37
5204.90	2.40	199.94	664.83	3.33	158.54
5205.00	2.50	216.11	733.15	3.39	164.71
5205.10	2.60	233.24	805.68	3.45	177.88
5205.20	2.70	251.68	883.12	3.51	191.05
5205.30	2.80	271.45	965.93	3.56	204.22
5205.40	2.90	292.53	1054.45	3.60	217.40
5205.50	3.00	314.93	1148.98	3.65	230.57
5205.60	3.10	338.69	1249.84	3.69	244.74
5205.70	3.20	363.87	1357.37	3.73	258.91
5205.80	3.30	390.47	1471.86	3.77	273.08
5205.90	3.40	418.49	1593.58	3.81	287.28
5206.00	3.50	449.60	1723.88	3.83	335.00
5206.10	3.60	486.14	1866.42	3.84	395.75
5206.20	3.70	528.75	2024.35	3.83	456.50
5206.30	3.80	577.44	2199.96	3.81	517.25
5206.40	3.90	632.20	2395.09	3.79	578.00
5206.50	4.00	692.64	2611.12	3.77	630.75
5206.60	4.10	758.35	2848.80	3.76	683.50
5206.70	4.20	831.50	3110.50	3.74	779.46
5206.80	4.30	914.25	3401.00	3.72	875.48
5206.90	4.40	1006.59	3723.54	3.70	971.49
5207.00	4.50	1108.54	4080.77	3.68	1067.50
5207.10	4.60	1215.66	4472.06	3.68	1074.75
5207.20	4.70	1323.49	4891.66	3.70	1082.00

5207.30	4.80	1432.05	5336.79	3.73	1089.25
5207.40	4.90	1541.34	5805.72	3.77	1096.50
5207.50	5.00	1651.35	6297.24	3.81	1103.75
5207.60	5.10	1762.09	6810.40	3.86	1111.00
5207.70	5.20	1873.55	7344.43	3.92	1118.25
5207.80	5.30	1985.74	7898.69	3.98	1125.50
5207.90	5.40	2098.65	8472.66	4.04	1132.75
5208.00	5.50	2212.29	9065.88	4.10	1140.00
5208.10	5.60	2326.69	9677.92	4.16	1148.00
5208.20	5.70	2441.89	10308.63	4.22	1156.00
5208.30	5.80	2557.89	10957.58	4.28	1164.00
5208.40	5.90	2674.69	11624.65	4.35	1172.00
5208.50	6.00	2792.29	12309.55	4.41	1180.00
5208.60	6.10	2910.69	13012.06	4.47	1188.00
5208.70	6.20	3029.89	13732.06	4.53	1196.00
5208.80	6.30	3149.89	14469.33	4.59	1204.00
5208.90	6.40	3270.69	15223.76	4.65	1212.00
5209.00	6.50	3392.29	15995.21	4.72	1220.00
5209.10	6.60	3514.69	16783.53	4.78	1228.00
5209.20	6.70	3637.89	17588.62	4.83	1236.00
5209.30	6.80	3761.89	18410.39	4.89	1244.00
5209.40	6.90	3886.69	19248.71	4.95	1252.00
5209.50	7.00	4012.29	20103.52	5.01	1260.00
5209.60	7.10	4138.69	20974.72	5.07	1268.00
5209.70	7.20	4265.89	21862.24	5.12	1276.00
5209.80	7.30	4393.89	22766.04	5.18	1284.00
5209.90	7.40	4522.69	23686.01	5.24	1292.00
5210.00	7.50	4652.29	24622.14	5.29	1300.00

APPENDIX F: Section 7

Rating Curve for Weir 2, Located Around Structure 9

WEIR PROGRAM

STRUCTURE 9

WEIR 2: WEIR SECTION FOR FLOW AT STRUCTURE 9 GOING SOUTH ALONG I-25

WEIR COEFFICENT = 2.6300
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	500.00	5210.00	5	720.00	5202.00	9	855.00	5205.30
2	550.00	5208.00	6	790.00	5200.50	10	1085.00	5205.90
3	600.00	5206.00	7	810.00	5202.00			
4	650.00	5204.00	8	825.00	5204.00			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
5200.60	0.10	0.30	0.20	0.67	6.00
5200.70	0.20	1.20	1.13	0.94	12.00
5200.80	0.30	2.70	3.11	1.15	18.00
5200.90	0.40	4.80	6.39	1.33	24.00
5201.00	0.50	7.50	11.16	1.49	30.00
5201.10	0.60	10.80	17.60	1.63	36.00
5201.20	0.70	14.70	25.88	1.76	42.00
5201.30	0.80	19.20	36.13	1.88	48.00
5201.40	0.90	24.30	48.50	2.00	54.00
5201.50	1.00	30.00	63.12	2.10	60.00
5201.60	1.10	36.30	80.10	2.21	66.00
5201.70	1.20	43.20	99.57	2.30	72.00
5201.80	1.30	50.70	121.63	2.40	78.00
5201.90	1.40	58.80	146.38	2.49	84.00
5202.00	1.50	67.50	173.94	2.58	90.00
5202.10	1.60	76.71	204.34	2.66	94.25
5202.20 5202.17 WSEL	1.70	86.35	237.51 236.7 CFS	2.75	98.50
5202.30	1.80	96.41	273.47	2.84	102.75
5202.40	1.90	106.90	312.22	2.92	107.00
5202.50	2.00	117.81	353.81	3.00	111.25
5202.60	2.10	129.15	398.25	3.08	115.50
5202.70	2.20	140.91	445.58	3.16	119.75
5202.80	2.30	153.10	495.85	3.24	124.00
5202.90	2.40	165.71	549.10	3.31	128.25
5203.00	2.50	178.75	605.35	3.39	132.50
5203.10	2.60	192.21	664.65	3.46	136.75
5203.20	2.70	206.10	727.05	3.53	141.00
5203.30	2.80	220.41	792.59	3.60	145.25
5203.40	2.90	235.15	861.29	3.66	149.50
5203.50	3.00	250.31	933.21	3.73	153.75
5203.60	3.10	265.90	1008.38	3.79	158.00
5203.70	3.20	281.91	1086.85	3.86	162.25
5203.80	3.30	298.35	1168.65	3.92	166.50
5203.90	3.40	315.21	1253.83	3.98	170.75
5204.00	3.50	332.50	1342.42	4.04	175.00
5204.10	3.60	350.24	1434.48	4.10	179.81
5204.20	3.70	368.46	1530.09	4.15	184.62
5204.30	3.80	387.16	1629.34	4.21	189.42
5204.40	3.90	406.35	1732.27	4.26	194.23
5204.50	4.00	426.01	1838.95	4.32	199.04
5204.60	4.10	446.15	1949.42	4.37	203.85
5204.70	4.20	466.78	2063.74	4.42	208.66
5204.80	4.30	487.89	2181.97	4.47	213.46
5204.90	4.40	509.47	2304.14	4.52	218.27
5205.00	4.50	531.54	2430.31	4.57	223.08
5205.10	4.60	554.09	2560.53	4.62	227.89
5205.20	4.70	577.12	2694.84	4.67	232.70

5205.30	4.80	600.63	2833.29	4.72	237.57
5205.40	4.90	626.43	2977.12	4.75	278.40
5205.50	5.00	656.31	3129.57	4.77	319.23
5205.60	5.10	690.27	3292.61	4.77	360.06
5205.70	5.20	728.32	3467.73	4.76	400.88
5205.80	5.30	770.45	3656.19	4.75	441.71
5205.90	5.40	816.61	3858.89	4.73	482.50

APPENDIX F: Section 8

Rating Curve for Weir 3, Located Around Structure 10

WEIR PROGRAM

STRUCTURE 10

WEIR SECTION FOR STRUCTURE 10 FLOW, FLOWING SOUTH ALONG E. SIDE I-25

WEIR COEFFICENT = 2.6300
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	500.00	5210.00	5	750.00	5202.00	9	820.00	5204.90
2	570.00	5208.00	6	765.00	5201.00	10	890.00	5202.00
3	640.00	5206.00	7	775.00	5202.00	11	1000.00	5205.30
4	700.00	5204.00	8	800.00	5204.00			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
5201.10	0.10	0.13	0.08	0.66	2.50
5201.20	0.20	0.50	0.47	0.94	5.00
5201.30	0.30	1.13	1.30	1.15	7.50
5201.40	0.40	2.00	2.66	1.33	10.00
5201.50	0.50	3.13	4.65	1.49	12.50
5201.60	0.60	4.50	7.33	1.63	15.00
5201.70	0.70	6.13	10.78	1.76	17.50
5201.80	0.80	8.00	15.05	1.88	20.00
5201.90	0.90	10.13	20.21	2.00	22.50
5202.00	1.00	12.50	26.30	2.10	25.00
5202.10	1.10	15.47	33.61	2.17	34.50
5202.20	1.20	19.40	42.80	2.21	43.99
5202.30	1.30	24.27	54.31	2.24	53.49
5202.40	1.40	30.10	68.44	2.27	62.99
5202.50	1.50	36.87	85.49	2.32	72.49
5202.60	1.60	44.60	105.69	2.37	81.98
5202.70	1.70	53.27	129.28	2.43	91.48
5202.80	1.80	62.89	156.46	2.49	100.98
5202.90	1.90	73.46	187.44	2.55	110.48
5203.00 (5202.905' WSEL)	2.00	84.99	222.39 (2065 cfs)	2.62	119.97
5203.10	2.10	97.46	261.49	2.68	129.47
5203.20	2.20	110.88	304.92	2.75	138.97
5203.30	2.30	125.25	352.84	2.82	148.47
5203.40	2.40	140.57	405.40	2.88	157.96
5203.50	2.50	156.85	462.75	2.95	167.46
5203.60	2.60	174.07	525.04	3.02	176.96
5203.70	2.70	192.24	592.42	3.08	186.46
5203.80	2.80	211.36	665.01	3.15	195.95
5203.90	2.90	231.43	742.96	3.21	205.45
5204.00	3.00	252.45	826.39	3.27	214.95
5204.10	3.10	274.49	915.48	3.34	225.92
5204.20	3.20	297.63	1010.49	3.40	236.89
5204.30	3.30	321.87	1111.62	3.45	247.86
5204.40	3.40	347.20	1219.04	3.51	258.83
5204.50	3.50	373.63	1332.92	3.57	269.80
5204.60	3.60	401.16	1453.42	3.62	280.77
5204.70	3.70	429.79	1580.70	3.68	291.74
5204.80	3.80	459.51	1714.89	3.73	302.71
5204.90	3.90	490.33	1856.14	3.79	313.67
5205.00	4.00	522.01	2004.44	3.84	320.01
5205.10	4.10	554.33	2159.51	3.90	326.34
5205.20	4.20	587.28	2321.24	3.95	332.67
5205.30	4.30	620.80	2489.21	4.01	338.99

APPENDIX F: Section 9

Rating Curve for Weir 4, Located Around Structure 11

WEIR AT I-25 AROUND N LA CUEVA AND S EL CAMINO

WEIR COEFFICENT = 2.7000
CROSS SECTION DIVIDED INTO VERTICAL SLICES 0. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	5212.00	10	830.00	5205.00	19	1923.00	5206.00
2	80.00	5210.00	11	1170.00	5205.90	20	1927.00	5205.00
3	160.00	5208.00	12	1205.00	5206.00	21	1935.00	5206.00
4	195.00	5206.00	13	1230.00	5206.40	22	1937.00	5205.50
5	340.00	5204.00	14	1237.00	5206.00	23	1940.00	5206.00
6	375.00	5203.00	15	1270.00	5205.00	24	2025.00	5208.00
7	420.00	5203.80	16	1295.00	5206.00	25	2105.00	5210.00
8	465.00	5204.00	17	1720.00	5207.00			
9	530.00	5204.80	18	1905.00	5206.60			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
5203.10	0.10	0.46	0.31	0.68	9.13
5203.20	0.20	1.83	1.76	0.97	18.25
5203.30	0.30	4.11	4.86	1.18	27.38
5203.40	0.40	7.30	9.97	1.37	36.51
5203.50	0.50	11.41	17.42	1.53	45.63
5203.60	0.60	16.43	27.49	1.67	54.76
5203.70	0.70	22.36	40.41	1.81	63.88
5203.80	0.80	29.20	56.42	1.93	73.04
5203.90	0.90	37.81	76.32	2.02	99.02
5204.00	1.00	49.01	101.83	2.08	125.00
5204.10	1.10	62.28	133.71	2.15	140.38
5204.20	1.20	77.08	171.87	2.23	155.75
5204.30	1.30	93.43	216.48	2.32	171.13
5204.40	1.40	111.31	267.79	2.41	186.51
5204.50	1.50	130.73	326.04	2.49	201.88
5204.60	1.60	151.69	391.49	2.58	217.26
5204.70	1.70	174.18	464.39	2.67	232.64
5204.80	1.80	198.22	545.00	2.75	248.29
5204.90	1.90	230.90	638.42	2.76	405.40
5205.00	2.00	279.29	757.73	2.71	562.50
5205.10	2.10	338.15	907.41	2.68	614.53
5205.20	2.20	402.20	1083.98	2.70	666.56
5205.30	2.30	471.46	1286.74	2.73	718.60
5205.40	2.40	545.92	1515.88	2.78	770.63
5205.50	2.50	625.58	1771.85	2.83	822.66
5205.60	2.60	710.50	2055.30	2.89	875.69
5205.70	2.70	800.72	2366.94	2.96	928.72
5205.80	2.80	896.25	2707.50	3.02	981.75
5205.90	2.90	997.07	3077.70	3.09	1034.78
5206.00	3.00	1103.06	3478.16	3.15	1085.00
5206.10	3.10	1214.54	3909.66	3.22	1144.50
5206.20	3.20	1331.96	4373.58	3.28	1204.00
5206.30	3.30	1455.34	4871.01	3.35	1263.50
5206.40	3.40	1584.66	5402.93	3.41	1323.00
5206.50	3.50	1719.54	5969.93	3.47	1374.50
5206.60	3.60	1859.56	6572.17	3.53	1426.00
5206.70	3.70	2006.90	7211.55	3.59	1520.71
5206.80	3.80	2163.70	7892.42	3.65	1615.48
5206.90	3.90	2329.99	8617.72	3.70	1710.24
5207.00	4.00	2505.75	9389.74	3.75	1805.00
5207.10	4.10	2686.55	10207.48	3.80	1811.00
5207.20	4.20	2867.95	11064.70	3.86	1817.00
5207.30	4.30	3049.95	11958.25	3.92	1823.00
5207.40	4.40	3232.55	12886.05	3.99	1829.00
5207.50	4.50	3415.75	13846.59	4.05	1835.00
5207.60	4.60	3599.55	14838.64	4.12	1841.00

NOTE:
NO WATER GOES OVER THIS WEIR. WSEL FOR STRUCTURE 11 = 5196.90 Ft. THIS IS WELL BELOW THE LOW POINT OF THE WEIR.

5207.70	4.70	3783.95	15861.23	4.19	1847.00
5207.80	4.80	3968.95	16913.50	4.26	1853.00
5207.90	4.90	4154.55	17994.64	4.33	1859.00
5208.00	5.00	4340.75	19103.99	4.40	1865.00
5208.10	5.10	4527.65	20241.06	4.47	1873.00
5208.20	5.20	4715.35	21405.47	4.54	1881.00
5208.30	5.30	4903.85	22596.84	4.61	1889.00
5208.40	5.40	5093.15	23814.87	4.68	1897.00
5208.50	5.50	5283.25	25059.15	4.74	1905.00
5208.60	5.60	5474.15	26329.39	4.81	1913.00
5208.70	5.70	5665.85	27625.36	4.88	1921.00
5208.80	5.80	5858.35	28946.68	4.94	1929.00
5208.90	5.90	6051.65	30293.14	5.01	1937.00
5209.00	6.00	6245.75	31664.58	5.07	1945.00
5209.10	6.10	6440.65	33060.74	5.13	1953.00
5209.20	6.20	6636.35	34481.28	5.20	1961.00
5209.30	6.30	6832.85	35926.23	5.26	1969.00
5209.40	6.40	7030.15	37395.27	5.32	1977.00
5209.50	6.50	7228.25	38888.24	5.38	1985.00
5209.60	6.60	7427.15	40404.92	5.44	1993.00
5209.70	6.70	7626.85	41945.38	5.50	2001.00
5209.80	6.80	7827.35	43509.23	5.56	2009.00
5209.90	6.90	8028.65	45096.44	5.62	2017.00
5210.00	7.00	8230.75	46706.89	5.67	2025.00

APPENDIX F: Section 10

Total Discharge Tables (Culvert and Weir Flow) for the South El Camino (Structures 8, 9, and 10) and for the North La Cueva (Structure 11)

South El Camino Arroyo: Structure 8

Total discharge table (structure 8 and weir)

Elevation (ft)	S. El Camino Structure #8 12-48" CMP Flow (cfs)	C=2.63 Weir 1 flow from S. El Camino, south along east side of I-25	**Total Discharge** Sum of Structure #8 & Weir 1 Flows (cfs)
5194.90	0		0.0
5195.00	0.1		0.1
5195.50	12		12.2
5196.00	55		55.3
5196.50	132		131.5
5197.00	230		229.6
5197.50	562		561.6
5198.00	761		760.8
5198.50	918		918.0
5199.00	1051		1051.2
5199.50	1170		1170.0
5200.00	1278		1278.0
5200.50	1378		1377.6
5201.00	1470		1470.0
5201.50	1556		1556.0
5202.00	1639		1639.2
5202.50	1717	0.0	1717.2
5203.00	1793	15.3	1808.1
5203.50	1857	82.5	1939.5
5204.00	1936	216.7	2152.3
5204.10	1949	252.6	2201.2
5204.13	**1954**	**264.0**	**2218.0**
5204.20	1962	291.9	2253.4
5204.30	1974	334.4	2308.9
5204.40	1987	380.4	2367.9
5204.50	2000	430.0	2430.4
5204.60	2013	483.1	2496.4
5204.70	2026	539.9	2566.2
5204.80	2039	600.4	2639.7
5204.90	2052	664.8	2717.1
5205.00	2065	733.2	2798.4

Notes:

1) The rating curve for structure #8 was developed using weir and orifice equation programs The program outputs and total rating curve are provided in Appendix F, Section 2.

2) The rating curve for weir 1 was developed using a weir equation program. The output is provided in Appendix F, Section 6. The weir section is shown on the LOMR FIGURE 5.6.

South El Camino Arroyo: Structure 9

Total discharge table (structure 9 and weir)

Elevation (ft)	S. El Camino Structure #9 1-24" RCP Flow (cfs)	C=2.63 Weir 2 flow from structure #9, south along east side of I-25	**Total Discharge** Sum of Structure #9 & Weir 2 Flows (cfs)
5197.90	0.0		0.0
5198.00	0.0		0.0
5198.50	1.0		1.0
5199.00	4.8		4.8
5199.50	11.7		11.7
5200.00	15.9		15.9
5200.50	19.1	0.0	19.1
5201.00	21.9	11.2	33.1
5201.50	24.4	63.1	87.5
5202.00	26.6	173.9	200.5
5202.17	**27.3**	**236.7**	**264.0**
5202.50	28.7	353.8	382.5
5203.00	30.6	605.4	636.0
5203.50	32.4	933.2	965.6
5204.00	34.1	1342.4	1376.5
5204.50	35.8	1839.0	1874.8
5205.00	37.3	2430.3	2467.6

Notes:

1) The rating curve for structure #9 was developed using weir and orifice equation programs The program outputs and total rating curve are shown in Appendix F, Section 3.

2) The rating curve for weir 2 was developed using a weir equation program. The output is provided in Appendix F, Section 7. The weir section is shown on the LOMR FIGURE 5.6.

South El Camino Arroyo: Structure 10

Total discharge table (structure 10 and weir)

Elevation (ft)	S. El Camino Structure #10 1-24" RCP Flow (cfs)	C=2.63 Weir 3 flow from structure #10, south along east side of I-25	**Total Discharge** Sum of Structure #10 & Weir 3 Flows (cfs)
5197.90	0.0		0.0
5198.00	0.0		0.0
5198.50	1.0		1.0
5199.00	4.8		4.8
5199.50	11.7		11.7
5200.00	15.9		15.9
5200.50	19.1		19.1
5201.00	21.9	0.0	21.9
5201.50	24.4	4.7	29.1
5202.00	26.6	26.3	52.9
5202.50	28.7	85.5	114.2
5202.90	**30.2**	**206.5**	**236.7**
5203.00	30.6	222.4	253.0
5203.50	32.4	462.8	495.2
5204.00	34.1	826.4	860.5
5204.50	35.8	1332.9	1368.7
5205.00	37.3	2004.4	2041.7

Notes:

1) The rating curve for structure #10 was developed using weir and orifice equation program The program outputs and total rating curve are shown in Appendix F, Section 4.

2) The rating curve for weir 3 was developed using a weir equation program. The output is provided in Appendix F, Section 8. The weir section is shown on the LOMR FIGURE 5.6.

North La Cueva Arroyo and Weir Flow From South El Camino: Structure 11

Total discharge table (structure 11 and weir)

Elevation (ft)	North La Cueva Structure #11 3-10'x10' CBC Flow (cfs)	C=2.63 Weir 4 flow from structure #11, south along east side of I-25	**Total Discharge** Sum of Structure #11 & Weir 4 Flows (cfs)
5186.10	0.0		0.0
5186.50	20.0		20.0
5187.00	67.6		67.6
5188.00	207.4		207.4
5189.00	391.2		391.2
5190.00	750		750.0
5191.00	1050		1050.0
5192.00	1350		1350.0
5193.00	1710		1710.0
5194.00	2070		2070.0
5195.00	2430		2430.0
5196.00	2790		2790.0
5196.90	**3201**		3200.5
5197.00	3240		3240.0
5198.00	3540		3540.0
5199.00	3870		3870.0
5200.00	4170		4170.0
5201.00	4290		4290.0
5202.00	4710		4710.0
5203.00	4950	0.0	4950.0
5204.00	5100	101.8	5201.8

1) The rating curve for structure #11 was developed using Highway Department Nomograph The nomographs and total rating curve are shown in Appendix F, Section 5.

2) The rating curve for weir 4 was developed using a weir equation program. The output is provided in Appendix F, Section 9. The weir section is shown on the LOMR FIGURE 5.6. The water surface elevation does not reach the low point of the weir.

APPENDIX F: Section 11

Normal Depth Calculations for Sections Along the East Side of I-25

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

SECTION SOUTH OF WEIR 1 ON THE EAST SIDE OF I-25 Q = 264 cfs

MANNING'S N= .038 SLOPE= .017

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	100.00	5204.00	3	125.00	5201.00	5	215.00	5204.00
2	110.00	5202.00	4	145.00	5202.00	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
5201.05	0.05	0.04	0.0	1.75	0.44	1.75	0.00	0.05
5201.10	0.10	0.18	0.1	3.51	0.69	3.50	0.01	0.11
5201.15	0.15	0.39	0.4	5.26	0.91	5.25	0.01	0.16
5201.20	0.20	0.70	0.8	7.01	1.10	7.00	0.02	0.22
5201.25	0.25	1.09	1.4	8.76	1.27	8.75	0.03	0.28
5201.30	0.30	1.58	2.3	10.52	1.44	10.50	0.03	0.33
5201.35	0.35	2.14	3.4	12.27	1.59	12.25	0.04	0.39
5201.40	0.40	2.80	4.9	14.02	1.74	14.00	0.05	0.45
5201.45	0.45	3.54	6.7	15.78	1.88	15.75	0.06	0.51
5201.50	0.50	4.38	8.8	17.53	2.02	17.50	0.06	0.56
5201.55	0.55	5.29	11.4	19.28	2.15	19.25	0.07	0.62
5201.60	0.60	6.30	14.4	21.03	2.28	21.00	0.08	0.68
5201.65	0.65	7.39	17.8	22.79	2.41	22.75	0.09	0.74
5201.70	0.70	8.58	21.7	24.54	2.53	24.50	0.10	0.80
5201.75	0.75	9.84	26.1	26.29	2.65	26.25	0.11	0.86
5201.80	0.80	11.20	31.0	28.05	2.76	28.00	0.12	0.92
5201.85	0.85	12.64	36.4	29.80	2.88	29.75	0.13	0.98
5201.90	0.90	14.18	42.4	31.55	2.99	31.50	0.14	1.04
5201.95	0.95	15.79	49.0	33.31	3.10	33.25	0.15	1.10
5202.00	1.00	17.50	56.1	35.06	3.21	35.00	0.16	1.16
202.05	1.05	19.30	63.7	37.06	3.30	37.00	0.17	1.22
202.10	1.10	21.20	71.9	39.07	3.39	39.00	0.18	1.28
5202.15	1.15	23.20	80.8	41.08	3.48	41.00	0.19	1.34
5202.20	1.20	25.30	90.5	43.08	3.58	43.00	0.20	1.40
5202.25	1.25	27.50	100.8	45.09	3.67	45.00	0.21	1.46
5202.30	1.30	29.80	112.0	47.09	3.76	47.00	0.22	1.52
5202.35	1.35	32.20	123.9	49.10	3.85	49.00	0.23	1.58
5202.40	1.40	34.70	136.7	51.10	3.94	51.00	0.24	1.64
5202.45	1.45	37.30	150.3	53.11	4.03	53.00	0.25	1.70
5202.50	1.50	40.00	164.7	55.11	4.12	55.00	0.26	1.76
5202.55	1.55	42.80	180.0	57.12	4.21	57.00	0.27	1.82
5202.60	1.60	45.70	196.2	59.13	4.29	59.00	0.29	1.89
5202.65	1.65	48.70	213.4	61.13	4.38	61.00	0.30	1.95
5202.70	1.70	51.80	231.5	63.14	4.47	63.00	0.31	2.01
5202.75	1.75	55.00	250.5	65.14	4.55	65.00	0.32	2.07
5202.80	1.80	58.30	270.5	67.15	4.64	67.00	0.33	2.13
5202.85	1.85	61.70	291.6	69.15	4.73	69.00	0.35	2.20
5202.90	1.90	65.20	313.6	71.16	4.81	71.00	0.36	2.26
5202.95	1.95	68.80	336.7	73.17	4.89	73.00	0.37	2.32
5203.00	2.00	72.50	360.8	75.17	4.98	75.00	0.38	2.38
5203.05	2.05	76.30	386.1	77.18	5.06	77.00	0.40	2.45
5203.10	2.10	80.20	412.4	79.18	5.14	79.00	0.41	2.51
5203.15	2.15	84.20	439.9	81.19	5.22	81.00	0.42	2.57
5203.20	2.20	88.30	468.5	83.19	5.31	83.00	0.44	2.64
5203.25	2.25	92.50	498.2	85.20	5.39	85.00	0.45	2.70

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
203.35	2.35	101.20	561.2	89.21	5.55	89.00	0.48	2.83
5203.40	2.40	105.70	594.6	91.22	5.63	91.00	0.49	2.89
5203.45	2.45	110.30	629.1	93.22	5.70	93.00	0.51	2.96
5203.50	2.50	115.00	664.9	95.23	5.78	95.00	0.52	3.02
5203.55	2.55	119.80	702.0	97.23	5.86	97.00	0.53	3.08
5203.60	2.60	124.70	740.4	99.24	5.94	99.00	0.55	3.15
5203.65	2.65	129.70	780.0	101.25	6.01	101.00	0.56	3.21

5203.70	2.70	134.80	821.0	103.25	6.09	103.00	0.58	3.28
5203.75	2.75	140.00	863.3	105.26	6.17	105.00	0.59	3.34
5203.80	2.80	145.30	907.0	107.26	6.24	107.00	0.61	3.41
5203.85	2.85	150.70	952.0	109.27	6.32	109.00	0.62	3.47
5203.90	2.90	156.20	998.5	111.27	6.39	111.00	0.63	3.53
5203.95	2.95	161.80	1046.3	113.28	6.47	113.00	0.65	3.60
5204.00	3.00	167.50	1095.6	115.28	6.54	115.00	0.66	3.66

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

SECTION SOUTH OF WEIR 2 ON EAST SIDE OF I-25 . Q=237 cfs

MANNING'S N= .038 SLOPE= .017

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	100.00	5205.00	4	145.00	5200.00	7	220.00	5202.00
2	120.00	5204.00	5	160.00	5199.00	8	305.00	5204.00
3	135.00	5202.00	6	180.00	5200.00	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
5199.05	0.05	0.04	0.0	1.75	0.44	1.75	0.00	0.05
5199.10	0.10	0.18	0.1	3.51	0.69	3.50	0.01	0.11
5199.15	0.15	0.39	0.4	5.26	0.91	5.25	0.01	0.16
5199.20	0.20	0.70	0.8	7.01	1.10	7.00	0.02	0.22
5199.25	0.25	1.09	1.4	8.76	1.27	8.75	0.03	0.28
5199.30	0.30	1.58	2.3	10.52	1.44	10.50	0.03	0.33
5199.35	0.35	2.14	3.4	12.27	1.59	12.25	0.04	0.39
5199.40	0.40	2.80	4.9	14.02	1.74	14.00	0.05	0.45
5199.45	0.45	3.54	6.7	15.78	1.88	15.75	0.06	0.51
5199.50	0.50	4.38	8.8	17.53	2.02	17.50	0.06	0.56
5199.55	0.55	5.29	11.4	19.28	2.15	19.25	0.07	0.62
5199.60	0.60	6.30	14.4	21.03	2.28	21.00	0.08	0.68
5199.65	0.65	7.39	17.8	22.79	2.41	22.75	0.09	0.74
5199.70	0.70	8.58	21.7	24.54	2.53	24.50	0.10	0.80
5199.75	0.75	9.84	26.1	26.29	2.65	26.25	0.11	0.86
5199.80	0.80	11.20	31.0	28.05	2.76	28.00	0.12	0.92
5199.85	0.85	12.64	36.4	29.80	2.88	29.75	0.13	0.98
5199.90	0.90	14.18	42.4	31.55	2.99	31.50	0.14	1.04
5199.95	0.95	15.79	49.0	33.31	3.10	33.25	0.15	1.10
5200.00	1.00	17.50	56.1	35.06	3.21	35.00	0.16	1.16
5200.05	1.05	19.28	64.5	36.31	3.34	36.25	0.17	1.22
5200.10	1.10	21.13	73.4	37.57	3.47	37.50	0.19	1.29
5200.15	1.15	23.03	82.9	38.83	3.60	38.75	0.20	1.35
5200.20	1.20	25.00	93.1	40.08	3.72	40.00	0.22	1.42
5200.25	1.25	27.03	103.8	41.34	3.84	41.25	0.23	1.48
5200.30	1.30	29.12	115.3	42.60	3.96	42.50	0.24	1.54
5200.35	1.35	31.28	127.3	43.85	4.07	43.75	0.26	1.61
5200.40	1.40	33.50	140.1	45.11	4.18	45.00	0.27	1.67
5200.45	1.45	35.78	153.5	46.36	4.29	46.25	0.29	1.74
5200.50	1.50	38.12	167.6	47.62	4.40	47.50	0.30	1.80
5200.55	1.55	40.53	182.4	48.88	4.50	48.75	0.31	1.86
5200.60	1.60	43.00	197.9	50.13	4.60	50.00	0.33	1.93
5200.65	1.65	45.53	214.2	51.39	4.70	51.25	0.34	1.99
5200.70	1.70	48.12	231.1	52.65	4.80	52.50	0.36	2.06
5200.75	1.75	50.78	248.8	53.90	4.90	53.75	0.37	2.12
5200.80	1.80	53.50	267.3	55.16	5.00	55.00	0.39	2.19
5200.85	1.85	56.28	286.5	56.41	5.09	56.25	0.40	2.25
5200.90	1.90	59.12	306.5	57.67	5.18	57.50	0.42	2.32
5200.95	1.95	62.03	327.3	58.93	5.28	58.75	0.43	2.38
5201.00	2.00	65.00	348.9	60.18	5.37	60.00	0.45	2.45
5201.05	2.05	68.03	371.3	61.44	5.46	61.25	0.46	2.51
5201.10	2.10	71.12	394.5	62.69	5.55	62.50	0.48	2.58
5201.15	2.15	74.28	418.5	63.95	5.63	63.75	0.49	2.64
5201.20	2.20	77.50	443.4	65.21	5.72	65.00	0.51	2.71

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
5201.30	2.30	84.12	495.7	67.72	5.89	67.50	0.54	2.84
5201.35	2.35	87.53	523.1	68.98	5.98	68.75	0.55	2.90
5201.40	2.40	91.00	551.4	70.23	6.06	70.00	0.57	2.97
5201.45	2.45	94.53	580.7	71.49	6.14	71.25	0.59	3.04
5201.50	2.50	98.12	610.8	72.74	6.22	72.50	0.60	3.10
5201.55	2.55	101.78	641.8	74.00	6.31	73.75	0.62	3.17
5201.60	2.60	105.50	673.8	75.26	6.39	75.00	0.63	3.23

5201.65	2.65	109.28	706.7	76.51	6.47	76.25	0.65	3.30
5201.70	2.70	113.12	740.5	77.77	6.55	77.50	0.67	3.37
5201.75	2.75	117.03	775.3	79.03	6.62	78.75	0.68	3.43
5201.80	2.80	121.00	811.0	80.28	6.70	80.00	0.70	3.50
5201.85	2.85	125.03	847.7	81.54	6.78	81.25	0.71	3.56
201.90	2.90	129.12	885.4	82.79	6.86	82.50	0.73	3.63
5201.95	2.95	133.28	924.1	84.05	6.93	83.75	0.75	3.70
5202.00	3.00	137.50	963.8	85.31	7.01	85.00	0.76	3.76
5202.05	3.05	141.81	995.3	87.81	7.02	87.50	0.76	3.81
5202.10	3.10	146.25	1028.3	90.31	7.03	90.00	0.77	3.87
5202.15	3.15	150.81	1062.8	92.82	7.05	92.50	0.77	3.92
5202.20	3.20	155.50	1098.7	95.32	7.07	95.00	0.78	3.98
5202.25	3.25	160.31	1136.2	97.83	7.09	97.50	0.78	4.03
5202.30	3.30	165.25	1175.1	100.33	7.11	100.00	0.79	4.09
5202.35	3.35	170.31	1215.6	102.83	7.14	102.50	0.79	4.14
5202.40	3.40	175.50	1257.6	105.34	7.17	105.00	0.80	4.20
5202.45	3.45	180.81	1301.1	107.84	7.20	107.50	0.80	4.25
5202.50	3.50	186.25	1346.2	110.35	7.23	110.00	0.81	4.31
5202.55	3.55	191.81	1392.9	112.85	7.26	112.50	0.82	4.37
5202.60	3.60	197.50	1441.2	115.35	7.30	115.00	0.83	4.43
5202.65	3.65	203.31	1491.1	117.86	7.33	117.50	0.84	4.49
5202.70	3.70	209.25	1542.6	120.36	7.37	120.00	0.84	4.54
5202.75	3.75	215.31	1595.7	122.86	7.41	122.50	0.85	4.60
5202.80	3.80	221.50	1650.5	125.37	7.45	125.00	0.86	4.66
5202.85	3.85	227.81	1707.0	127.87	7.49	127.50	0.87	4.72
5202.90	3.90	234.25	1765.2	130.38	7.54	130.00	0.88	4.78
5202.95	3.95	240.81	1825.1	132.88	7.58	132.50	0.89	4.84
5203.00	4.00	247.50	1886.7	135.38	7.62	135.00	0.90	4.90
5203.05	4.05	254.31	1950.1	137.89	7.67	137.50	0.91	4.96
5203.10	4.10	261.25	2015.2	140.39	7.71	140.00	0.92	5.02
5203.15	4.15	268.31	2082.2	142.90	7.76	142.50	0.94	5.09
203.20	4.20	275.50	2150.9	145.40	7.81	145.00	0.95	5.15
203.25	4.25	282.81	2221.5	147.90	7.85	147.50	0.96	5.21
5203.30	4.30	290.25	2293.9	150.41	7.90	150.00	0.97	5.27
5203.35	4.35	297.81	2368.1	152.91	7.95	152.50	0.98	5.33
5203.40	4.40	305.50	2444.3	155.42	8.00	155.00	0.99	5.39
5203.45	4.45	313.31	2522.3	157.92	8.05	157.50	1.01	5.46
5203.50	4.50	321.25	2602.3	160.42	8.10	160.00	1.02	5.52
5203.55	4.55	329.31	2684.2	162.93	8.15	162.50	1.03	5.58
5203.60	4.60	337.50	2768.0	165.43	8.20	165.00	1.04	5.64
5203.65	4.65	345.81	2853.9	167.94	8.25	167.50	1.06	5.71
5203.70	4.70	354.25	2941.7	170.44	8.30	170.00	1.07	5.77
5203.75	4.75	362.81	3031.5	172.94	8.36	172.50	1.08	5.83
5203.80	4.80	371.50	3123.4	175.45	8.41	175.00	1.10	5.90
5203.85	4.85	380.31	3217.3	177.95	8.46	177.50	1.11	5.96
5203.90	4.90	389.25	3313.3	180.45	8.51	180.00	1.13	6.03
5203.95	4.95	398.31	3411.4	182.96	8.56	182.50	1.14	6.09

WSEL	DEPTH INC	FLOW AREA	FLOW RATE	WETTED PER	FLOW VEL	TOPWID	VEL HEAD	ENERGY HEAD
(FT)	(FT)	SQ.FT.	(CFS)	(FT)	(FPS)	(FT)	(FT)	(FT)
5204.05	5.05	416.78	3632.7	186.46	8.72	186.00	1.18	6.23
5204.10	5.10	426.10	3755.8	187.47	8.81	187.00	1.21	6.31
5204.15	5.15	435.48	3880.7	188.47	8.91	188.00	1.23	6.38
5204.20	5.20	444.90	4007.5	189.47	9.01	189.00	1.26	6.46
5204.25	5.25	454.38	4136.2	190.47	9.10	190.00	1.29	6.54
5204.30	5.30	463.90	4266.8	191.47	9.20	191.00	1.31	6.61
5204.35	5.35	473.48	4399.2	192.47	9.29	192.00	1.34	6.69
5204.40	5.40	483.10	4533.6	193.47	9.38	193.00	1.37	6.77
204.45	5.45	492.78	4669.8	194.47	9.48	194.00	1.39	6.84
204.50	5.50	502.50	4807.9	195.48	9.57	195.00	1.42	6.92
5204.55	5.55	512.28	4948.0	196.48	9.66	196.00	1.45	7.00
5204.60	5.60	522.10	5089.8	197.48	9.75	197.00	1.48	7.08
5204.65	5.65	531.98	5233.6	198.48	9.84	198.00	1.50	7.15
5204.70	5.70	541.90	5379.3	199.48	9.93	199.00	1.53	7.23
5204.75	5.75	551.88	5526.9	200.48	10.01	200.00	1.56	7.31
5204.80	5.80	561.90	5676.3	201.48	10.10	201.00	1.58	7.38

5204.85	5.85	571.98	5827.7	202.48	10.19	202.00	1.61	7.46
5204.90	5.90	582.10	5980.9	203.49	10.27	203.00	1.64	7.54
5204.95	5.95	592.28	6136.1	204.49	10.36	204.00	1.67	7.62
5205.00	6.00	602.50	6293.1	205.49	10.44	205.00	1.69	7.69

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

WEIR 3 EAST OF I-25

Q = 207 cfs

MANNING'S N= .038 SLOPE= .01

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	100.00	5204.90	4	170.00	5201.00	7	265.00	5205.00
2	110.00	5204.00	5	180.00	5202.00	8	0.00	0.00
3	145.00	5202.00	6	240.00	5204.00	9	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
5201.05	0.05	0.04	0.0	1.75	0.33	1.75	0.00	0.05
5201.10	0.10	0.17	0.1	3.51	0.53	3.50	0.00	0.10
5201.15	0.15	0.39	0.3	5.26	0.69	5.25	0.01	0.16
5201.20	0.20	0.70	0.6	7.01	0.84	7.00	0.01	0.21
5201.25	0.25	1.09	1.1	8.77	0.98	8.75	0.01	0.26
5201.30	0.30	1.58	1.7	10.52	1.10	10.50	0.02	0.32
5201.35	0.35	2.14	2.6	12.27	1.22	12.25	0.02	0.37
5201.40	0.40	2.80	3.7	14.03	1.34	14.00	0.03	0.43
5201.45	0.45	3.54	5.1	15.78	1.44	15.75	0.03	0.48
5201.50	0.50	4.38	6.8	17.53	1.55	17.50	0.04	0.54
5201.55	0.55	5.29	8.7	19.29	1.65	19.25	0.04	0.59
5201.60	0.60	6.30	11.0	21.04	1.75	21.00	0.05	0.65
5201.65	0.65	7.39	13.6	22.80	1.85	22.75	0.05	0.70
5201.70	0.70	8.58	16.6	24.55	1.94	24.50	0.06	0.76
5201.75	0.75	9.84	20.0	26.30	2.03	26.25	0.06	0.81
5201.80	0.80	11.20	23.7	28.06	2.12	28.00	0.07	0.87
5201.85	0.85	12.64	27.9	29.81	2.21	29.75	0.08	0.93
5201.90	0.90	14.18	32.5	31.56	2.29	31.50	0.08	0.98
5201.95	0.95	15.79	37.5	33.32	2.38	33.25	0.09	1.04
5202.00	1.00	17.50	43.1	35.07	2.46	35.00	0.09	1.09
5202.05	1.05	19.31	48.6	37.45	2.51	37.38	0.10	1.15
5202.10	1.10	21.24	54.6	39.82	2.57	39.75	0.10	1.20
5202.15	1.15	23.28	61.3	42.20	2.63	42.13	0.11	1.26
5202.20	1.20	25.45	68.5	44.58	2.69	44.50	0.11	1.31
5202.25	1.25	27.73	76.3	46.96	2.75	46.87	0.12	1.37
5202.30	1.30	30.14	84.9	49.33	2.82	49.25	0.12	1.42
5202.35	1.35	32.66	94.0	51.71	2.88	51.62	0.13	1.48
5202.40	1.40	35.30	103.9	54.09	2.94	54.00	0.13	1.53
5202.45	1.45	38.06	114.4	56.47	3.01	56.37	0.14	1.59
5202.50	1.50	40.94	125.7	58.84	3.07	58.75	0.15	1.65
5202.55	1.55	43.93	137.7	61.22	3.13	61.12	0.15	1.70
5202.60	1.60	47.05	150.5	63.60	3.20	63.50	0.16	1.76
5202.65	1.65	50.28	164.1	65.97	3.26	65.87	0.17	1.82
5202.70	1.70	53.64	178.5	68.35	3.33	68.25	0.17	1.87
5202.75	1.75	57.11	193.6	70.73	3.39	70.62	0.18	1.93
5202.80	1.80	60.70	209.7	73.11	3.45	73.00	0.19	1.99
5202.85	1.85	64.41	226.6	75.48	3.52	75.37	0.19	2.04
5202.90	1.90	68.24	244.4	77.86	3.58	77.75	0.20	2.10
5202.95	1.95	72.18	263.1	80.24	3.64	80.12	0.21	2.16
5203.00	2.00	76.25	282.7	82.62	3.71	82.50	0.21	2.21
5203.05	2.05	80.43	303.2	84.99	3.77	84.87	0.22	2.27
5203.10	2.10	84.74	324.7	87.37	3.83	87.25	0.23	2.33
5203.15	2.15	89.16	347.1	89.75	3.89	89.62	0.24	2.39
5203.20	2.20	93.70	370.6	92.12	3.95	92.00	0.24	2.44

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
5203.30	2.30	103.14	420.5	96.88	4.08	96.75	0.26	2.56
5203.35	2.35	108.03	447.0	99.26	4.14	99.12	0.27	2.62
5203.40	2.40	113.05	474.6	101.63	4.20	101.50	0.27	2.67
5203.45	2.45	118.18	503.2	104.01	4.26	103.87	0.28	2.73
5203.50	2.50	123.44	533.0	106.39	4.32	106.25	0.29	2.79
5203.55	2.55	128.81	563.8	108.76	4.38	108.62	0.30	2.85

5203.60	2.60	134.30	595.8	111.14	4.44	111.00	0.31	2.91
5203.65	2.65	139.91	628.9	113.52	4.50	113.37	0.31	2.96
5203.70	2.70	145.64	663.2	115.90	4.55	115.75	0.32	3.02
5203.75	2.75	151.48	698.6	118.27	4.61	118.12	0.33	3.08
5203.80	2.80	157.45	735.3	120.65	4.67	120.50	0.34	3.14
5203.85	2.85	163.53	773.1	123.03	4.73	122.87	0.35	3.20
5203.90	2.90	169.74	812.2	125.41	4.78	125.25	0.36	3.26
5203.95	2.95	176.06	852.5	127.78	4.84	127.62	0.36	3.31
5204.00	3.00	182.50	894.0	130.16	4.90	130.00	0.37	3.37
5204.05	3.05	189.04	939.4	131.97	4.97	131.81	0.38	3.43
5204.10	3.10	195.68	986.0	133.78	5.04	133.61	0.39	3.49
5204.15	3.15	202.41	1033.9	135.59	5.11	135.42	0.41	3.56
5204.20	3.20	209.22	1082.9	137.40	5.18	137.22	0.42	3.62
5204.25	3.25	216.13	1133.2	139.20	5.24	139.03	0.43	3.68
5204.30	3.30	223.12	1184.8	141.01	5.31	140.83	0.44	3.74
5204.35	3.35	230.21	1237.6	142.82	5.38	142.64	0.45	3.80
5204.40	3.40	237.39	1291.7	144.63	5.44	144.44	0.46	3.86
5204.45	3.45	244.66	1347.1	146.44	5.51	146.25	0.47	3.92
5204.50	3.50	252.01	1403.7	148.25	5.57	148.06	0.48	3.98
5204.55	3.55	259.46	1461.7	150.06	5.63	149.86	0.49	4.04
5204.60	3.60	267.00	1520.9	151.87	5.70	151.67	0.50	4.10
5204.65	3.65	274.63	1581.5	153.68	5.76	153.47	0.51	4.16
5204.70	3.70	282.35	1643.4	155.48	5.82	155.28	0.53	4.23
5204.75	3.75	290.16	1706.7	157.29	5.88	157.08	0.54	4.29
5204.80	3.80	298.06	1771.3	159.10	5.94	158.89	0.55	4.35
5204.85	3.85	306.05	1837.2	160.91	6.00	160.70	0.56	4.41
5204.90	3.90	314.13	1904.5	162.72	6.06	162.50	0.57	4.47
5204.95	3.95	322.28	1977.5	163.97	6.14	163.75	0.58	4.53
5205.00	4.00	330.50	2051.8	165.22	6.21	165.00	0.60	4.60

APPENDIX F: Section 12

Letter from Resource Technology, Inc.
Providing and Explaining the Sediment Bulking Factor Equation
May 23, 1996

Resource Technology, Inc.

2129 OSUNA ROAD NE, SUITE 200
ALBUQUERQUE, NEW MEXICO 87113
(505) 345-3115
FAX (505) 345-4132

May 23, 1996

Dan Grochowski, P.E.
Bohannan-Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

RE: Revised Hydrology Model for North Camino, El Camino and La Cueva Arroyos
RTI File No. 95-190

Dear Dan:

The hydrology model on the enclosed disk incorporates the following changes:

1. Rock outcrop areas in the Sandia Mountains have been modeled as land treatment type "C" instead of type "D."

2. Bulking factors for sediment have been taken out.

3. Minor changes west of I-25 to reflect the City Corp site have been added.

Bulking factors are now added to analysis points external to the "clean water" model utilizing the following equation:

$$BF \text{ (in percent)} = 3.622 + .001875Q \text{ (in cfs)}$$

The equation was derived from statistical analysis of over forty reaches between Sandia Heights and I-25 with 10- and 100-year flow rates for the three arroyos of concern. Our flow rates in the revised Table 4.1 reflect bulking factors derived from this equation, rounded to the nearest whole percent. We feel it is valid for these three watersheds for natural channels with a D_{50} between 1.5 mm and 3.0 mm.

Sincerely,

RESOURCE TECHNOLOGY, INC.

Donald S. Dixon, P.E.
Vice President for Engineering

DSD/ljc

cc: Kurt Browning, P.E., AMAFCA

B:\95-190\GROBOWKI.LT1

APPENDIX G

Form 8 : Levee/Floodwall System Analyses Form #2
South El Camino Diversion

Backup Data

1. Water surface elevation calculations for the South El Camino Diversion Channel.

2. Worksheets on the design of the improved inlet conditions for the concrete box culvert.

3. New Mexico Highway Department and Transportation Department Standard Specifications for slope and erosion protection of structures (Section 602).

APPENDIX G : SECTION 1

Water Surface Elevation Calculations for the South El Camino Diversion Channel

SOUTH EL CAMINO DIVERSION CHANNEL — X-SECTIONS

① USED LOMR FIGURE 8.2.2 to estimate x-sections at stations along the channel of the diversion.

② Channel bottom slope = 0.013
(determined from as-built elevations of the channel bottom)

③ Manning's n for channel bottom used = 0.03

STATION 12+90 - SECTION — file: REV1290.OUT

elev	dist	elev	dist	elev	dist
96	0	89	62	96	92
89	14	90	77		

STATION 11+90 - SECTION — file: REV1190.OUT

elev	dist	elev	dist	elev	dist
96	0	88	85	96	111
88	16	89	91		

STATION 10+91.92 - SECTION — file: REV1091.OUT

elev	dist	elev	dist	elev	dist
96	0	87	98	96	128
87	18	88	105		

STATION 10+20 - SECTION — file: REV1020.OUT

elev	dist	elev	dist
96	0	86.2	135
86.2	19.6	96	163

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

SOUTH EL CAMINO DIVERSION CHANNEL
CROSS SECTION STATION 12+90

STATIONING CORRESPONDS TO CHANNEL BOTTOM STATIONING (LOMR FIGURE 8.2.2)

100-YR FLOW FOR SOUTH EL CAMINO CHANNEL = 1981.3 CFS

MANNING'S N= .03 SLOPE= .013

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	96.00	3	62.00	89.00	5	92.00	96.00
2	14.00	89.00	4	77.00	90.00	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
89.20	0.20	9.94	18.8	51.45	1.89	51.40	0.06	0.26
89.40	0.40	20.56	60.3	54.91	2.93	54.80	0.13	0.53
89.60	0.60	31.86	120.2	58.36	3.77	58.20	0.22	0.82
89.80	0.80	43.84	196.9	61.82	4.49	61.60	0.31	1.11
90.00	1.00	56.50	289.8	65.27	5.13	65.00	0.41	1.41
90.20	1.20	69.59	406.1	66.26	5.84	65.90	0.53	1.73
90.40	1.40	82.86	537.9	67.24	6.49	66.80	0.65	2.05
90.60	1.60	96.31	684.5	68.23	7.11	67.70	0.78	2.38
90.80	1.80	109.94	845.3	69.21	7.69	68.60	0.92	2.72
91.00	2.00	123.75	1019.9	70.20	8.24	69.50	1.05	3.05
91.20	2.20	137.74	1207.9	71.18	8.77	70.40	1.19	3.39
91.40	2.40	151.91	1409.1	72.17	9.28	71.30	1.34	3.74
91.60	2.60	166.26	1623.1	73.16	9.76	72.20	1.48	4.08
91.80	2.80	180.79	1849.8	74.14	10.23	73.10	1.63	4.43
92.00	3.00	195.50	2088.9	75.13	10.68	74.00	1.77	4.77
92.20	3.20	210.39	2340.3	76.11	11.12	74.90	1.92	5.12
92.40	3.40	225.46	2603.9	77.10	11.55	75.80	2.07	5.47
92.60	3.60	240.71	2879.5	78.08	11.96	76.70	2.22	5.82
92.80	3.80	256.14	3167.1	79.07	12.36	77.60	2.37	6.17
93.00	4.00	271.75	3466.5	80.06	12.76	78.50	2.53	6.53
93.20	4.20	287.54	3777.7	81.04	13.14	79.40	2.68	6.88
93.40	4.40	303.51	4100.7	82.03	13.51	80.30	2.83	7.23
93.60	4.60	319.66	4435.3	83.01	13.87	81.20	2.99	7.59
93.80	4.80	335.99	4781.5	84.00	14.23	82.10	3.14	7.94
94.00	5.00	352.50	5139.4	84.98	14.58	83.00	3.30	8.30
94.20	5.20	369.19	5508.8	85.97	14.92	83.90	3.46	8.66
94.40	5.40	386.06	5889.7	86.96	15.26	84.80	3.61	9.01
94.60	5.60	403.11	6282.2	87.94	15.58	85.70	3.77	9.37
94.80	5.80	420.34	6686.2	88.93	15.91	86.60	3.93	9.73
95.00	6.00	437.75	7101.8	89.91	16.22	87.50	4.09	10.09
95.20	6.20	455.34	7528.8	90.90	16.53	88.40	4.25	10.45
95.40	6.40	473.11	7967.3	91.88	16.84	89.30	4.40	10.80
95.60	6.60	491.06	8417.4	92.87	17.14	90.20	4.56	11.16
95.80	6.80	509.19	8879.0	93.86	17.44	91.10	4.72	11.52
96.00	7.00	527.50	9352.1	94.84	17.73	92.00	4.88	11.88

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

SOUTH EL CAMINO DIVERSION CHANNEL
CROSS SECTION STATION 11+90

STATIONING CORRESPONDS TO CHANNEL BOTTOM STATIONING (LOMR FIGURE 8.2.2)

100-YR FLOW FOR DIVERSION CHANNEL = 1981.3 CFS

MANNING'S N= .03 SLOPE= .013

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	96.00	3	85.00	88.00	5	92.00	96.00
2	16.00	88.00	4	91.00	89.00	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
88.20	0.20	13.96	26.7	70.66	1.92	70.60	0.06	0.26
88.40	0.40	28.24	85.2	72.33	3.02	72.20	0.14	0.54
88.60	0.60	42.84	168.1	73.99	3.92	73.80	0.24	0.84
88.80	0.80	57.76	272.5	75.66	4.72	75.40	0.35	1.15
89.00	1.00	73.00	396.8	77.32	5.44	77.00	0.46	1.46
89.20	1.20	88.44	543.3	77.97	6.14	77.43	0.59	1.79
89.40	1.40	103.97	707.5	78.62	6.80	77.86	0.72	2.12
89.60	1.60	119.59	888.4	79.27	7.43	78.29	0.86	2.46
89.80	1.80	135.29	1085.3	79.92	8.02	78.71	1.00	2.80
90.00	2.00	151.07	1297.4	80.57	8.59	79.14	1.15	3.15
90.20	2.20	166.94	1524.3	81.21	9.13	79.57	1.29	3.49
90.40	2.40	182.90	1765.4	81.86	9.65	80.00	1.45	3.85
90.60	2.60	198.94	2020.2	82.51	10.15	80.43	1.60	4.20
90.80	2.80	215.07	2288.5	83.16	10.64	80.86	1.76	4.56
91.00	3.00	231.29	2569.9	83.81	11.11	81.29	1.92	4.92
91.20	3.20	247.59	2864.0	84.46	11.57	81.71	2.08	5.28
91.40	3.40	263.97	3170.6	85.11	12.01	82.14	2.24	5.64
91.60	3.60	280.44	3489.4	85.76	12.44	82.57	2.40	6.00
91.80	3.80	297.00	3820.3	86.41	12.86	83.00	2.57	6.37
92.00	4.00	313.64	4162.9	87.06	13.27	83.43	2.74	6.74
92.20	4.20	330.37	4517.0	87.71	13.67	83.86	2.90	7.10
92.40	4.40	347.19	4882.6	88.36	14.06	84.29	3.07	7.47
92.60	4.60	364.09	5259.3	89.01	14.45	84.71	3.24	7.84
92.80	4.80	381.07	5647.2	89.65	14.82	85.14	3.41	8.21
93.00	5.00	398.14	6045.9	90.30	15.19	85.57	3.58	8.58
93.20	5.20	415.30	6455.5	90.95	15.54	86.00	3.75	8.95
93.40	5.40	432.54	6875.6	91.60	15.90	86.43	3.92	9.32
93.60	5.60	449.87	7306.4	92.25	16.24	86.86	4.10	9.70
93.80	5.80	467.29	7747.5	92.90	16.58	87.29	4.27	10.07
94.00	6.00	484.79	8198.9	93.55	16.91	87.71	4.44	10.44
94.20	6.20	502.37	8660.6	94.20	17.24	88.14	4.61	10.81
94.40	6.40	520.04	9132.3	94.85	17.56	88.57	4.79	11.19
94.60	6.60	537.80	9614.1	95.50	17.88	89.00	4.96	11.56
94.80	6.80	555.64	10105.8	96.15	18.19	89.43	5.14	11.94
95.00	7.00	573.57	10607.4	96.80	18.49	89.86	5.31	12.31
95.20	7.20	591.59	11118.8	97.45	18.79	90.29	5.49	12.69
95.40	7.40	609.69	11639.9	98.09	19.09	90.71	5.66	13.06
95.60	7.60	627.87	12170.6	98.74	19.38	91.14	5.83	13.43
95.80	7.80	646.14	12711.0	99.39	19.67	91.57	6.01	13.81
96.00	8.00	664.50	13260.8	100.04	19.96	92.00	6.18	14.18

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

SOUTH LA CUEVA DIVERSION CHANNEL
CROSS SECTION STATION 10+91.92

STATIONING CORRESPONDS WITH DIVERSION CHANNEL BOTTOM (LOMR FIGURE 8.2.2)

100-YR FLOW FOR DIVERSION CHANNEL = 1981.3 CFS

MANNING'S N= .03 SLOPE= .013

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	96.00	3	98.00	87.00	5	128.00	96.00
2	18.00	87.00	4	105.00	88.00	6	0.00	0.00

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
87.20	0.20	16.18	31.0	81.86	1.92	81.80	0.06	0.26
87.40	0.40	32.72	98.8	83.72	3.02	83.60	0.14	0.54
87.60	0.60	49.62	194.9	85.58	3.93	85.40	0.24	0.84
87.80	0.80	66.88	315.9	87.45	4.72	87.20	0.35	1.15
88.00	1.00	84.50	459.9	89.31	5.44	89.00	0.46	1.46
88.20	1.20	102.40	628.6	90.36	6.14	89.97	0.59	1.79
88.40	1.40	120.49	818.0	91.42	6.79	90.95	0.72	2.12
88.60	1.60	138.78	1027.3	92.48	7.40	91.92	0.85	2.45
88.80	1.80	157.26	1255.8	93.53	7.99	92.90	0.99	2.79
89.00	2.00	175.94	1502.8	94.59	8.54	93.88	1.13	3.13
89.20	2.20	194.81	1767.9	95.64	9.07	94.85	1.28	3.48
89.40	2.40	213.88	2050.5	96.70	9.59	95.83	1.43	3.83
89.60	2.60	233.14	2350.4	97.76	10.08	96.80	1.58	4.18
89.80	2.80	252.60	2667.1	98.81	10.56	97.78	1.73	4.53
90.00	3.00	272.25	3000.5	99.87	11.02	98.75	1.89	4.89
90.20	3.20	292.10	3350.3	100.92	11.47	99.73	2.04	5.24
90.40	3.40	312.14	3716.3	101.98	11.91	100.70	2.20	5.60
90.60	3.60	332.38	4098.2	103.04	12.33	101.68	2.36	5.96
90.80	3.80	352.81	4496.0	104.09	12.74	102.65	2.52	6.32
91.00	4.00	373.44	4909.5	105.15	13.15	103.63	2.68	6.68
91.20	4.20	394.26	5338.5	106.20	13.54	104.60	2.85	7.05
91.40	4.40	415.28	5782.9	107.26	13.93	105.58	3.01	7.41
91.60	4.60	436.49	6242.6	108.32	14.30	106.55	3.18	7.78
91.80	4.80	457.90	6717.6	109.37	14.67	107.52	3.34	8.14
92.00	5.00	479.50	7207.7	110.43	15.03	108.50	3.51	8.51
92.20	5.20	501.30	7713.0	111.48	15.39	109.47	3.68	8.88
92.40	5.40	523.29	8233.2	112.54	15.73	110.45	3.84	9.24
92.60	5.60	545.48	8768.5	113.60	16.07	111.42	4.01	9.61
92.80	5.80	567.86	9318.6	114.65	16.41	112.40	4.18	9.98
93.00	6.00	590.44	9883.7	115.71	16.74	113.38	4.35	10.35
93.20	6.20	613.21	10463.6	116.76	17.06	114.35	4.52	10.72
93.40	6.40	636.18	11058.3	117.82	17.38	115.32	4.69	11.09
93.60	6.60	659.34	11667.8	118.88	17.70	116.30	4.86	11.46
93.80	6.80	682.70	12292.2	119.93	18.01	117.27	5.03	11.83
94.00	7.00	706.25	12931.2	120.99	18.31	118.25	5.21	12.21
94.20	7.20	730.00	13585.1	122.04	18.61	119.22	5.38	12.58
94.40	7.40	753.94	14253.7	123.10	18.91	120.20	5.55	12.95
94.60	7.60	778.08	14937.0	124.16	19.20	121.17	5.72	13.32
94.80	7.80	802.41	15635.1	125.21	19.49	122.15	5.90	13.70
95.00	8.00	826.94	16347.9	126.27	19.77	123.12	6.07	14.07
95.20	8.20	851.66	17075.5	127.32	20.05	124.10	6.24	14.44
95.40	8.40	876.58	17817.9	128.38	20.33	125.07	6.42	14.82
95.60	8.60	901.69	18575.0	129.44	20.60	126.05	6.59	15.19
95.80	8.80	927.00	19346.9	130.49	20.87	127.02	6.76	15.56
96.00	9.00	952.50	20133.7	131.55	21.14	128.00	6.94	15.94

***** PC PROGRAM STREAM SEPTEMBER 1994 *****

SOUTH EL CAMINO DIVERSION CHANNEL
CROSS SECTION STATION 10+20

TATIONING CORRESPONDS WITH DIVERSION CHANNEL BOTTOM (LOMR FIGURE 8.2.2)

100-YR FLOW FOR DIVERSION CHANNEL = 1981.3 CFS

MANNING'S N= .03 SLOPE= .013

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	96.00	3	135.00	86.20			
2	19.60	86.20	4	163.00	96.00			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)
86.40	0.20	23.18	44.6	116.45	1.93	116.37	0.06	0.26
86.60	0.40	46.55	141.8	117.51	3.05	117.34	0.14	0.54
86.80	0.60	70.11	279.0	118.56	3.98	118.31	0.25	0.85
87.00	0.80	93.87	451.1	119.61	4.81	119.29	0.36	1.16
87.20	1.00	117.83	655.0	120.66	5.56	120.26	0.48	1.48
87.40	1.20	141.98	888.5	121.72	6.26	121.23	0.61	1.81
87.60	1.40	166.32	1150.1	122.77	6.91	122.20	0.74	2.14
87.80	1.60	190.86	1438.3	123.82	7.54	123.17	0.88	2.48
88.00	1.80	215.59	1752.3	124.87	8.13	124.14	1.03	2.83
88.20	2.00	240.51	2091.0	125.93	8.69	125.11	1.17	3.17
88.40	2.20	265.63	2453.9	126.98	9.24	126.09	1.33	3.53
88.60	2.40	290.95	2840.2	128.03	9.76	127.06	1.48	3.88
88.80	2.60	316.46	3249.5	129.08	10.27	128.03	1.64	4.24
89.00	2.80	342.16	3681.2	130.14	10.76	129.00	1.80	4.60
89.20	3.00	368.06	4134.9	131.19	11.23	129.97	1.96	4.96
89.40	3.20	394.15	4610.2	132.24	11.70	130.94	2.12	5.32
89.60	3.40	420.43	5106.9	133.29	12.15	131.91	2.29	5.69
89.80	3.60	446.91	5624.6	134.35	12.59	132.89	2.46	6.06
90.00	3.80	473.59	6163.0	135.40	13.01	133.86	2.63	6.43
90.20	4.00	500.46	6721.9	136.45	13.43	134.83	2.80	6.80
90.40	4.20	527.52	7301.1	137.51	13.84	135.80	2.97	7.17
90.60	4.40	554.78	7900.3	138.56	14.24	136.77	3.15	7.55
90.80	4.60	582.23	8519.5	139.61	14.63	137.74	3.32	7.92
91.00	4.80	609.87	9158.3	140.66	15.02	138.71	3.50	8.30
91.20	5.00	637.71	9816.7	141.72	15.39	139.69	3.68	8.68
91.40	5.20	665.75	10494.6	142.77	15.76	140.66	3.86	9.06
91.60	5.40	693.98	11191.7	143.82	16.13	141.63	4.04	9.44
91.80	5.60	722.40	11908.0	144.87	16.48	142.60	4.22	9.82
92.00	5.80	751.02	12643.4	145.93	16.84	143.57	4.40	10.20
92.20	6.00	779.83	13397.7	146.98	17.18	144.54	4.58	10.58
92.40	6.20	808.83	14170.9	148.03	17.52	145.51	4.77	10.97
92.60	6.40	838.03	14963.0	149.08	17.85	146.49	4.95	11.35
92.80	6.60	867.43	15773.7	150.14	18.18	147.46	5.13	11.73
93.00	6.80	897.02	16603.1	151.19	18.51	148.43	5.32	12.12
93.20	7.00	926.80	17451.1	152.24	18.83	149.40	5.51	12.51
93.40	7.20	956.78	18317.6	153.29	19.15	150.37	5.69	12.89
93.60	7.40	986.95	19202.6	154.35	19.46	151.34	5.88	13.28
93.80	7.60	1017.31	20106.1	155.40	19.76	152.31	6.07	13.67
94.00	7.80	1047.87	21027.9	156.45	20.07	153.29	6.25	14.05
94.20	8.00	1078.63	21968.1	157.51	20.37	154.26	6.44	14.44
94.40	8.20	1109.58	22926.6	158.56	20.66	155.23	6.63	14.83
94.60	8.40	1140.72	23903.4	159.61	20.95	156.20	6.82	15.22
94.80	8.60	1172.06	24898.5	160.66	21.24	157.17	7.01	15.61
95.00	8.80	1203.59	25911.8	161.72	21.53	158.14	7.20	16.00
95.20	9.00	1235.31	26943.3	162.77	21.81	159.11	7.39	16.39

WSEL (FT)	DEPTH INC (FT)	FLOW AREA SQ.FT.	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOPWID (FT)	VEL HEAD (FT)	ENERGY HEAD (FT)

s/o

- Interpolation between flows and water surface elevations from STREAM program outputs

STATION 12+90

$$\frac{2088.9\ cfs - 1849.8\ cfs}{92' - 91.8'} = \frac{2088.9\ cfs - 1981.3\ cfs}{x}$$

$$1195.5x = 107.6$$

$$x = 0.09'$$

$$92' - 0.09 = 91.9'$$

Velocity ≅ 10.46 Fps

5191.9'

STATION 11+90

$$\frac{2020.2 - 1765.4}{90.6 - 90.4} = \frac{2020.2 - 1981.3}{x}$$

$$127.4x = 38.9$$

$$x = 0.03$$

$$90.6' - 0.03' \simeq 90.6'$$

Velocity ≅ 10.15 fps

5190.6'

STATION 10+91.92

$$\frac{2050.5 - 1767.9}{89.4 - 89.2} = \frac{2050.5 - 1981.3}{x}$$

$$1413x = 69.2$$

$$x = 0.05$$

$$89.4' - 0.05' \simeq 89.35'$$

Velocity ≅ 9.59 fps

5189.4'

STATION 10+20

$$\frac{2091 - 1752.3}{88.2 - 88} = \frac{2091 - 1981.3}{x}$$

$$1693.5x = 109.7$$

$$x \cong 0.06$$

5188.1'

Velocity
$\cong$ 8.41 Fps

$88.2' - 0.06' \cong 88.1'$

BOHANNAN-HUSTON INC.

PROJECT NAME LA CUEVA + S. EL CAMINO LOMR SHEET 7 OF 9

PROJECT NO 96IEEC2.2107 BY SJG DATE 8/13/96

SUBJECT S. EL CAMINO DIVERSION-WSEL CHKD [illegible] DATE 8/20/96

EL CAMINO CHANNEL DIVERSION
WEIR ANALYSIS FOR WIDENED INLET TO BOX CULVERT

WEIR COEFFICENT = 3.0500
CROSS SECTION DIVIDED INTO VERTICAL SLICES 1. FEET APART

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	10.00	3	24.00	0.00			
2	0.00	0.00	4	24.00	10.00			

WSEL (FT)	DEPTH INC (FT)	FLOW AREA (SQ FT)	FLOW RATE (CFS)	FLOW VEL (FPS)	TOP WID PLUS OBSTRUCTIONS
0.50	0.50	12.00	25.88	2.16	24.00
1.00	1.00	24.00	73.20	3.05	24.00
1.50	1.50	36.00	134.48	3.74	24.00
2.00	2.00	48.00	207.04	4.31	24.00
2.50	2.50	60.00	289.35	4.82	24.00
3.00	3.00	72.00	380.36	5.28	24.00
3.50	3.50	84.00	479.31	5.71	24.00
4.00	4.00	96.00	585.60	6.10	24.00
4.50	4.50	108.00	698.76	6.47	24.00
5.00	5.00	120.00	818.40	6.82	24.00
5.50	5.50	132.00	944.18	7.15	24.00
6.00	6.00	144.00	1075.82	7.47	24.00
6.50	6.50	156.00	1213.06	7.78	24.00
7.00	7.00	168.00	1355.68	8.07	24.00
7.50	7.50	180.00	1503.50	8.35	24.00
8.00	8.00	192.00	1656.33	8.63	24.00
8.50	8.50	204.00	1814.01	8.89	24.00
9.00	9.00	216.00	1976.40	9.15	24.00
9.50	9.50	228.00	2143.37	9.40	24.00
10.00	10.00	240.00	2314.79	9.64	24.00

Q = 19813cFs

WSEL = ~ 9' → 5183' + 9' = 5192'

Inlet Control Entrance

-For CBC inlet to handle 1981.3 cfs,
WSEL = 5192 ft

-Normal depth in channel upstream of inlet ~ all lower than 5192 ft.

SO - Backwater from the box culvert entrance controls the water surface elevation of the channel

-so WSEL for channel = 5192 Ft. to box inlet

- berm top elev. = 5196'

- so freeboard =
5196 - 5192 = 4.0 Ft

BOHANNAN-HUSTON INC.

PROJECT NAME N. La Cueva / S. El Camino Loop SHEET 9 OF 9
PROJECT NO 96155C2.2107 BY SJG DATE 8/7/96
SUBJECT S. El Camino Diversion WSEL CHK'D BY DATE

APPENDIX G : SECTION 2

Worksheets on the Design of the Improved Inlet Conditions for the Concrete Box Culvert.

PROJECT: S. EL CAMINO
STATION: _____

SLOPE-TAPERED INLET DESIGN CALCULATIONS

DESIGNER: HCS/LMM
DATE: 6-29-94

INITIAL DATA

Q100 = 2300 cfs So = 0.01
AHW EL. 93 ft L_s = _____ ft

El. Stream bed at crest 83 ft

El stream bed at face 82.5 ft

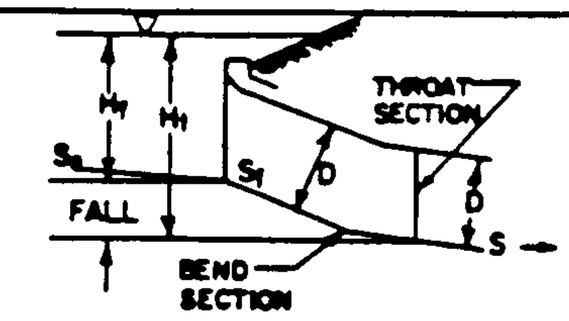
TAPER = 4 :1 (4:1 to 6:1)

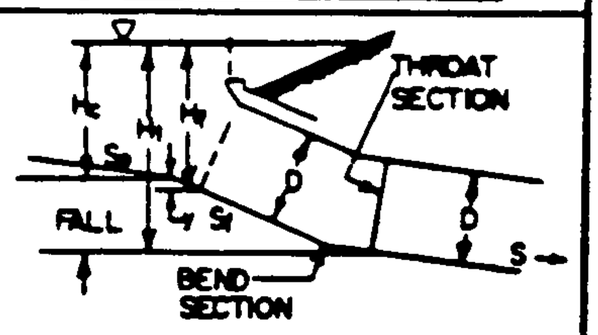
S_f = 2 :1 (2:1 to 3:1)

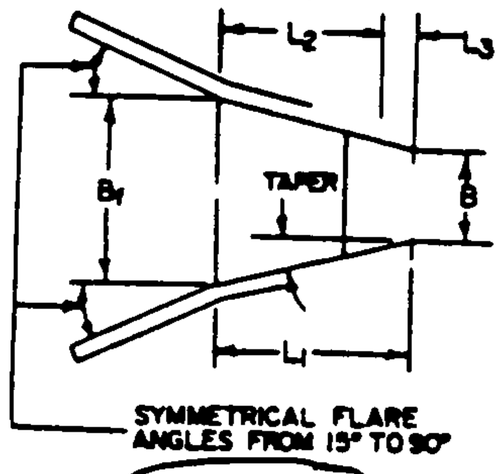
Barrel Shape and Material CBC

Inlet Edge Description SQUARE

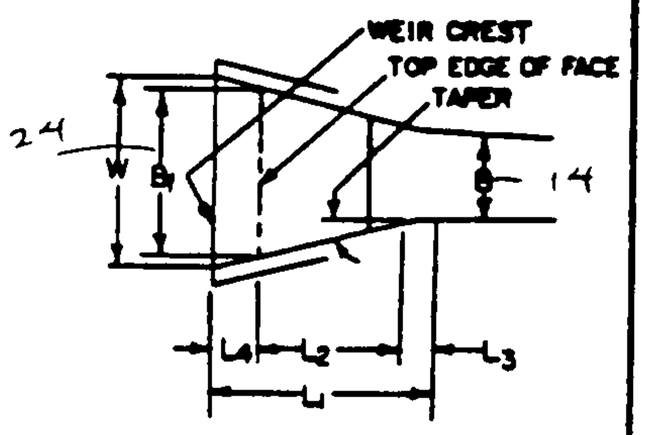
N= 2, B= 12 ft, D= 10 ft







VERTICAL



MITERED

Chart 16

	Q	HWi	El Throat Invert	(1.) El. Face Invert	(2.) Hf	Hf/D	$\frac{Q}{B_f D^{3/2}}$	$D^{3/2}$	(3.) Min Bf	Bf	S	Comments
1.0	~~2300~~	~~93~~	~~78~~	~~82.5~~	~~10.5~~	~~1.05~~	~~3.0~~	~~31.6~~	~~24.2~~	~~24~~	~~0.01~~	~~$B_f D^{3/2}$ = 2.9~~
X.0 Trial 2	2300		78.6	83	10	1.0						$B_f D^{3/2}$ = _____

Have 3.0
Need 2.9 OK

:a Use only throat designs with FALL > 0.25D

(1.) El. face invert: Vertical = Approx. stream bed elevation at face
Mitered = El. Crest − y, where y = 0.4D (Approx.), but higher than throat invert elevation.

(2.) Hf = HWi − El face invert

(3.) Min $B_f = \frac{Q}{(D^{3/2})(Q / B_f D^{3/2})}$

Try B = 14' check Throat Control - Chart 14

$D^{3/2}$ = 31.63

$NBD^{3/2}$ = 442.7

$\frac{Q}{NBD^{3/2}} = \frac{2300}{442.7} = 5.2$

$\frac{H_T}{D}$ = 1.5 OK

Try 78.6

$\frac{H_T}{D}$ = 1.49 OK

(4) Min. L_3	(5) L_4	(6) L_2	(7) Check L_2	(8) Adj L_3	(9) Adj TAPER	(10) L_1	(11.) W	$\frac{Q}{W}$	H_c	(12) Max. Crest El.	GEOMETRY
											B_f = ___ ft. L_3 = ___ ft.
~~8.0~~	~~13~~	~~-2~~	~~8.0~~	~~22~~		~~43'~~					L_1 = ___ ft. L_4 = ___ ft.
											L_2 = ___ ft. d = ___ in.
7.0	13	7.0	13.0	13.0		33'			Use -	35'	b = ___ in.
											TAPER = ___ :1

(4) Min. L_3 = 0.5 NB

(5) L_4 = S_f + D/S_f (Mitered only)

(6.) L_2 = (El Face (Crest) Invert − El. Throat Invert) S_f − L_4

Check L = $\frac{B_f - NB}{2}$ TAPER − L_3

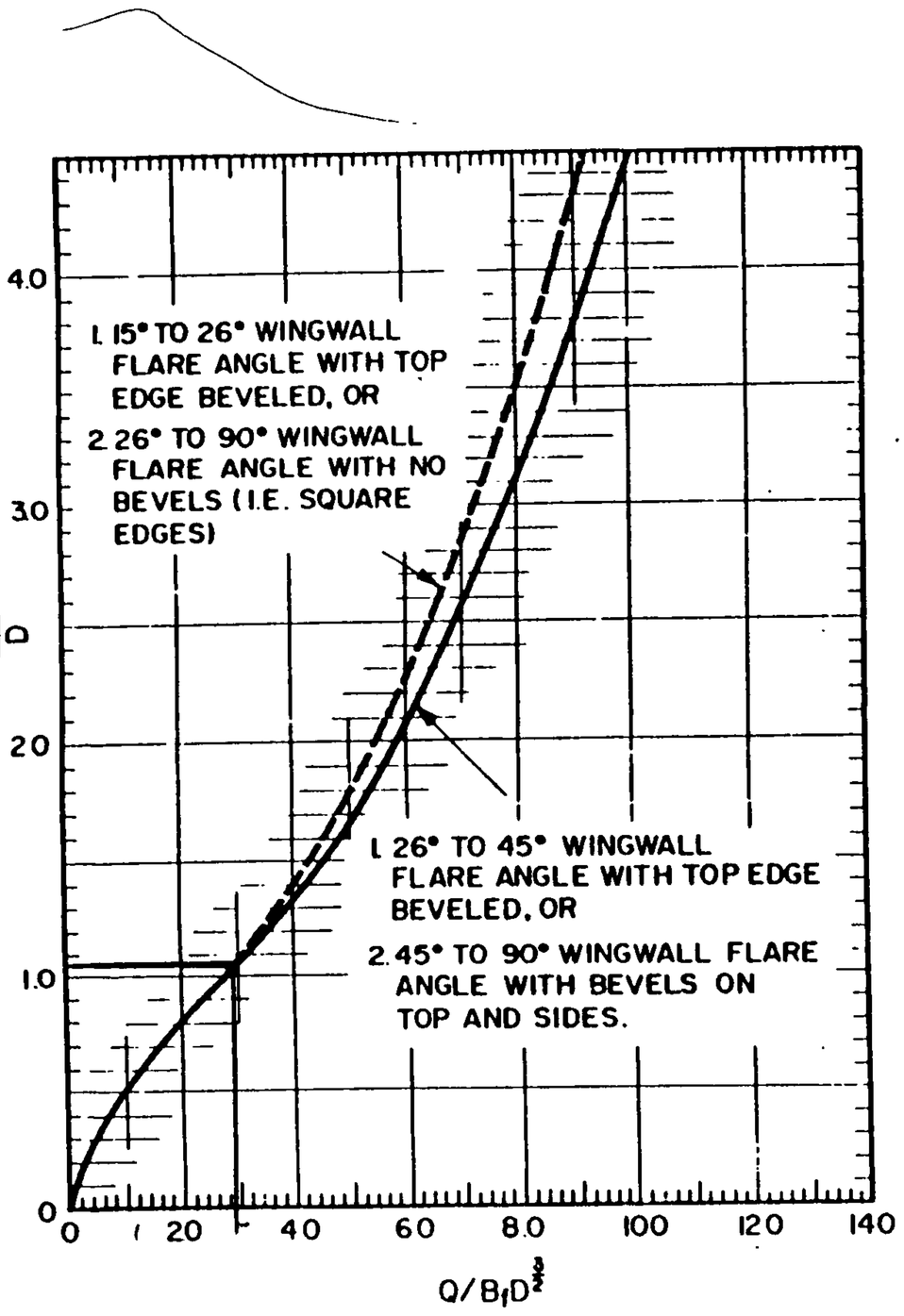
(7) If (7) > (6), Adj. L_3 = $\frac{B_f - NB}{2}$ TAPER − L_2

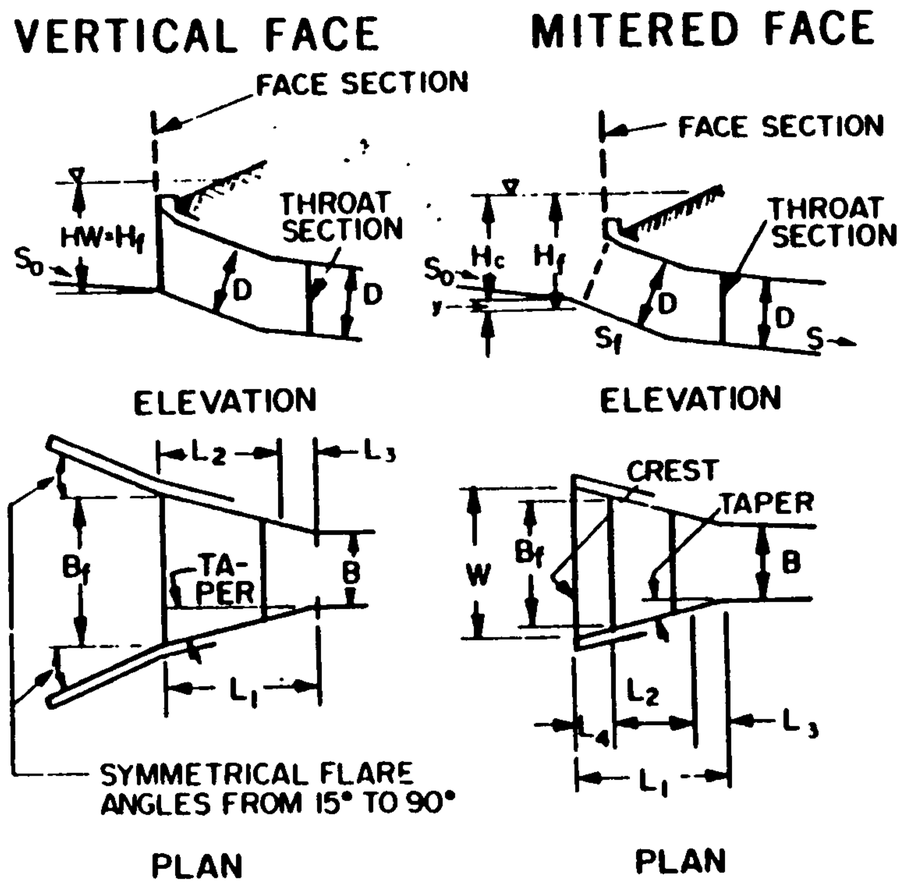
(9) If (6)×(7) Adj. TAPER = $(L_2 + L_3) / \frac{B_f - NB}{2}$

(10.) L_1 = L_2 + L_3 + L_4

(11.) Mitered W = NB + $2\left[\frac{L_1}{TAPER}\right]$

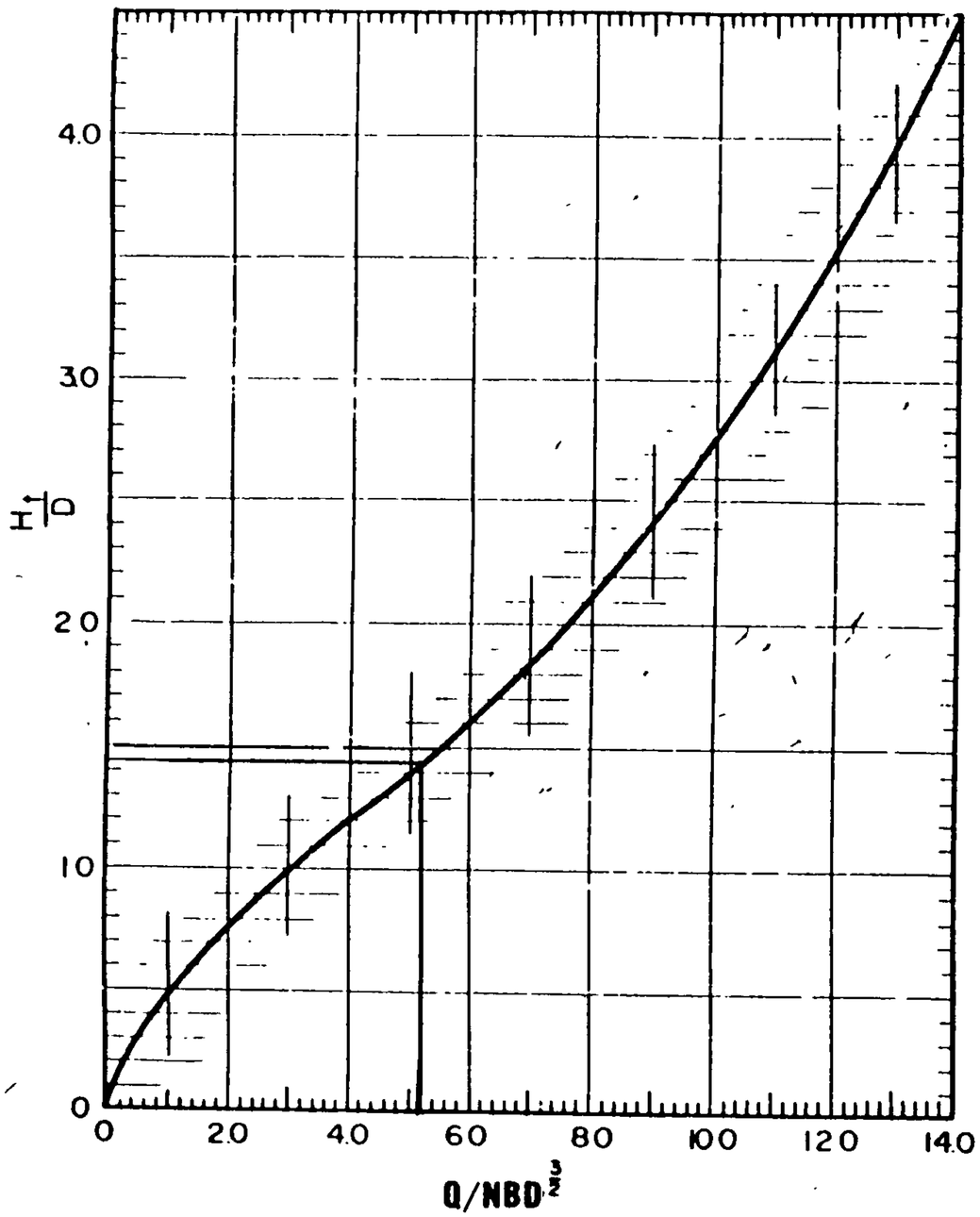
(12.) Max. Crest El. = HWi − H_c





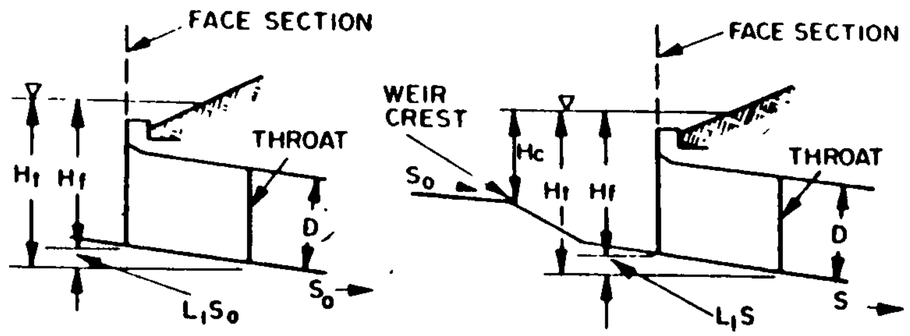
FACE CONTROL CURVES FOR BOX CULVERTS SLOPE-TAPERED INLETS

FEDERAL HIGHWAY ADMINISTRATION
OCTOBER 1971



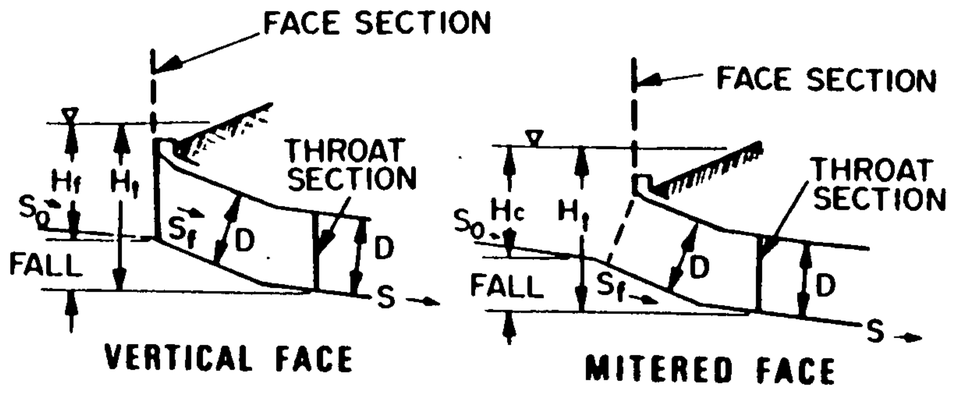
FEDERAL HIGHWAY ADMINISTRATION
OCTOBER 1971

SIDE-TAPERED



WITH FALL

SLOPE-TAPERED



THROAT CONTROL CURVE FOR BOX CULVERTS TAPERED INLETS

APPENDIX G: Section 3

New Mexico Highway Department And Transportation Department Standard Specifications For Slope And Erosion Protection Of Structures (Section 602)

MAT'L
SPECIFICES

New Mexico State Highway and Transportation Department

1994 EDITION

STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION

SECTION 602—SLOPE & EROSION PROTECTION STRUCTURES

602.1 DESCRIPTION.

602.11 This work shall consist of furnishing and placing riprap, gabions, sacked concrete revetment, concrete block revetment and other systems specified in the contract on the slopes of embankments and the sides and bottoms of channels, drain outlets, ditches and other locations shown in the contract. The work shall be performed in compliance with and to the lines, grades, dimensions and at the locations, shown in the contract.

The type(s) of slope protection structures to be furnished and placed shall be as specified in the contract.

602.2 MATERIALS

602.21 Classifications. Riprap will be classified as shown in Table 602–A. Riprap of the class specified and gabions shall meet the requirements shown.

At least eighty percent (80%) of the stones used shall meet the size requirements cified.

Stones less than the minimum dimension shown may be used only to fill the voids between stones. For riprap Class A and gabions stones smaller than the least dimension of the mesh openings shall not be used.

TABLE 602–A
RIPRAP CLASSIFICATIONS & GABION REQUIREMENTS

Class	Description	Stone Cubic Min.	Volume, Feet Max.	*Minimum Dimension, Inches
A	Wire Enclosed Riprap	1/6	2/3	4
B	Non-Enclosed Riprap	1	2	6
C	Non-Enclosed Riprap	2	4	9
D	Derrick Stone	14	27	12
E	Grouted Riprap	1/3	1	3
F	Grouted Riprap	1	2	6
G	Rock Plating	—	—	**4 to 8
n/a	Gabions	—	—	**4 to 8

*Minimum size in the least dimension.
**Seventy to eighty percent (70%–80%) of the stone shall be at least four (4) inches but not more than eight (8) inches in least dimension The remainder of the stone shall be no larger than four (4) inches in any dimension.

602.22 Riprap.

602.221 Stone for Riprap. Stone to be used for riprap, except for riprap Class G, shall be rocks or rough quarry stone with a percent wear of not more than sixty (60) as determined by AASHTO T 96 and a soundness loss of not more than twenty one (21) as determined by AASHTO T 104 using a magnesium sulfate solution with a test duration of five (5) cycles.

602.222 Wire Mesh. The wire mesh shall be fabricated so as to be non-raveling and shall be furnished in such lengths and widths as to reduce the number of splices to a minimum. Wire mesh shall conform to the details shown in the contract. The composite wire mesh shall meet the testing requirements specified in Subsection 602.35 Wire Mesh Testing & Certification.

(a) Wire. Wire used in the wire mesh shall conform to the requirements of ASTM A 641 for soft hardness, and shall have a Class 3 zinc coating. The zinc coating shall be determined in accordance with ASTM A90.

Wire composing the mesh shall be 11 1/4 gage (0.118 inches in dia.) or larger.

(b) Mesh Openings. Openings of the mesh shall be uniform in size measuring not more than 4 3/4 inches in the largest dimension but must have at least one dimension of 3 1/4 or less.

(c) Selvedge End Connectors. Connectors (fasteners) for selvedge ends may be ties, clips, hog rings, or lacing wire. Only clips listed as approved on the Department's "Approved Product Listing" may be used.

Ties, clips, and hog rings shall be nine (9) gage (approx. 0.148 inches dia.) or larger. Hard drawn, twelve (12) gage (approx. 0.106 inches dia.) or larger, wire clips, having a method of closure such that the clips remain closed after installation, may be used in lieu of soft nine (9) gage wire. Hard drawn wire shall conform to the requirements of ASTM A 764 for galvanized MB, Type III.

Lacing wire shall be 13 1/2 gage (approx. 0.092 inches dia.) or larger.

602.223 Stakes. Stakes shall be steel railroad rails, standard weight galvanized steel pipe, or steel angles.

Steel railroad rails shall have a unit weight of at least thirty (30) lbs. per yard.

Standard weight galvanized steel pipe shall be at least four (4) inches O.D.

Steel angles shall be at least four (4) by four (4) by 3/8 inches in dimension.

602.224 Grout. Portland cement, aggregate and water for grout shall conform to the requirements of Section 510—Portland Cement Concrete.

602.23 Sacked Concrete Revetment. The sacked concrete revetment manufacturer must be listed as an approved vendor on the Department's "Approved Products Listing."

Bags of sacked concrete shall weigh between sixty (60) to eighty (80) pounds each, dry weight and shall contain between—to 2/3 cubic feet of concrete material.

Each bag shall contain a concrete mix of one (1) part cement to three (3) parts sand or a mix design shown in the contract or a mix design having first been approved by the Central Materials Laboratory.

The concrete mix shall be capable of attaining a minimum compressive strength of 3,500 psi after twenty eight (28) days unless otherwise specified in the contract.

The sacked concrete shall be kept in dry storage at all times until application.

(a) Packaging. Sacks used for concrete riprap shall be made of jute, cotton, or scrim reinforced paper and shall be completely biodegradable and capable of holding the sand-cement mix without significant leakage.

The sack material shall be permeable and shall permit passage of sufficient water to ensure complete hydration of the concrete mix.

Paper sacks shall be made of non-asphaltic, three (3) layer laminated paper reinforced with polyester fiber scrim. Paper sack perforations shall be uniform and offset in the three (3) layer bag to prevent the dry cement from escaping.

Only one (1) type and size of sack shall be used throughout the project unless otherwise shown in the contract.

(b) Portland Cement. Portland cement shall conform to the requirements of Section 510—Portland Cement Concrete.

(c) egate. Aggregate shall conform to the requirements of Section 510—Pc Cement Concrete for fine aggregate.

.eel Anchorage. Steel staples shall conform to the requirements of Section 540—Steel Reinforcement and shall be epoxy coated or shall be galvanized in accordance with ASTM A 123.

602.24 Concrete Block Revetment. Concrete block revetment products must be listed as approved in the Department's "Approved Products Listing" before incorporation into the work.

Concrete block revetment shall be of the type and size shown in the contract.

Concrete block units shall have a minimum compressive strength of 3,000 psi, unless otherwise shown in the contract, and shall be compatible with drainage geotextile(s) filter fabrics) used in conjunction with this work.

602.25 Gabions.

602.251 Stone for Gabions. Rock used in constructing gabions shall meet the quality requirements in accordance with Subsection 602.221 Stone for Riprap and the requirements of Subsection 602.21 Classifications.

602.252 Wire Mesh For Gabions. Wire mesh and connectors for gabions shall meet the requirements of Subsection 602.222 Wire Mesh.

602.26 Drainage Geotextiles. Drainage geotextile(s) (filter fabric) shall conform to the requirements of Section 604—Soils & Drainage Geotextiles., and the requirements shown in the contract.

602.3 CONSTRUCTION REQUIREMENTS.

602.31 General Placement Requirements. Slope and erosion protection structures shall be constructed in accordance with the details shown in the contract or established by the Project Manager.

Riprap stones shall be placed to form a continuous blanket of the minimum thickness shown in the contract. Stones shall be placed with their long axis parallel to the toe of the · and such that they have stable bearing upon the underlying soil or stones.

The joints between the larger stones shall be as close as practicable and shall be chinked with smaller stones except when Class E or F (grouted) riprap is called for.

The finished surface of the riprap shall not vary more than three (3) inches from the designated slope, except that derrick stone riprap shall not vary more than eight (8) inches from the designated plane.

Unless otherwise specified, the foundation course shall be placed in a trench excavated to a depth of two (2) feet below the toe of the slope of the embankment or side of channel.

A layer of drainage geotextile (filter fabric) shall be placed at the interface between all slope and erosion protection structures and the supporting soil or backfill material or placed as shown in the contract. Slope and erosion protection structures shall be placed in a manner which will not tear or otherwise damage the geotextile.

602.311 Grouted Riprap Placement. Voids in grouted riprap shall be completely filled with grout for the full thickness of the riprap. After the grout is placed, the surface of the riprap shall be swept with a stiff broom.

Grout shall be protected from freezing for at least four (4) days after placement.

Grouted riprap placed in hot, dry weather shall be cured in accordance with the requirements of Subsection 511.39 Curing.

(a) Proportioning & Mixing Grout. Grout used in riprap shall consist of one (1) part portland cement and three (3) parts fine aggregate by volume. The cement and fine aggregate shall be mixed with water to a thick workable consistency.

602.312 Class A Riprap Placement. The stones in Class A (wire enclosed) riprap shall be enclosed on all sides with wire mesh. The wire mesh shall be drawn tightly against the stone on all sides. Edges of wire mesh may be connected using approved fasteners or lacing wire, but shall be double loop woven to adjacent edges at least once with lacing wire to ensure that strength and flexibility at the point of connection is equal to or greater than that of the mesh.

Lacing shall be continuous as far as is practicable and shall pass through each mesh opening. Where splicing is necessary, an overlap of lacing of at least one (1) foot shall be provided.

Galvanized wire ties to connect the top and bottom layers of mesh shall be spaced approximately two (2) feet on centers and shall be anchored to the bottom layer of wire fabric, extended through the rock layer, and tied securely to the top layer of wire fabric. When indicated in the contract, wire enclosed riprap shall be anchored to the slopes by steel stakes driven through the riprap into the embankment. Stakes shall be spaced as shown in the contract.

602.32 Sacked Concrete Revetment Placement. Placement of sacked concrete revetment shall conform to the details and requirements shown in the contract or as directed by the Project Manager. Sacked concrete revetment shall be placed within a tolerance of 0.2 feet of the established grade and slope.

Unless otherwise specified, the foundation course shall be placed in a trench excavated to a depth of two (2) feet below the toe of the slope of the embankment or side of channel. The remaining courses shall be placed as shown in the contract and shall be

placed in a manner such that sack ends and steel staple anchors in succeeding courses are staggered.

Each row of sacks shall be tamped sufficiently to round out the bags, eliminate wrinkles, minimize voids and prepare an even surface for the next row.

The Contractor shall place and compact the backfill behind each row of sacked concrete revetment before placing the next row. The method of compaction shall be as approved by the Project Manager. Backfill adjacent to the bags shall be free of large stones and jagged objects.

Sacked concrete revetment shall be anchored using steel staples. Anchoring shall be done in such a manner so as not to damage the bags excessively. All bags damaged to the point that the integrity of the bag is compromised, will be rejected and shall be replaced at no additional cost to the Department.

After placement of sacked concrete revetment, the Contractor shall wet it thoroughly and keep it moist for at least three (3) days unless otherwise directed by the Project Manager.

602.33 Concrete Block Revetment Placement. Concrete block revetment systems shall be constructed in strict accordance with the manufacturer's recommendations and the details shown in the contract.

Slopes shall be prepared by removing all obstructions and by filling voids with approved material or by contouring slopes so that sudden or sharp variations in contour are eliminated.

602.34 Gabions. Gabions shall be supplied in the dimensions shown in the contract. Gabion dimensions are subject to a tolerance limit of plus or minus five percent ($\pm 5\%$) of manufacturer's stated sizes.

602.341 Assembly of Gabion Baskets. Gabions shall be fabricated so that the sides, ends, lids and diaphragms can be assembled at the construction site into rectangular baskets of the specified sizes. Gabions shall be of single unit construction.

Where the length of the gabion exceeds one and one half ($1\frac{1}{2}$) times the horizontal width, the gabion shall be equally divided by diaphragms composed of the same mesh as the body of the gabions, into cells whose length does not exceed the horizontal width. The gabion shall be furnished with the necessary diaphragms secured in proper position on the base section so that no additional tying at this juncture will be necessary.

Perimeter edges shall be securely selvaged or bound so that the joints formed by tying the selvages have strength equal to or greater than that of the body of the mesh.

Perimeter edges of the gabion baskets and diaphrams shall be assembled using approved fasteners or lacing wire. Fasteners, other than lacing wire, shall be placed in each mesh opening. Lacing shall be done by double looping tightly through every other mesh opening.

In all cases gabions shall be assembled by either:

1. Double looped lacing twice; or,
2. Connected with approved fasteners and then double looped lacing once.

602.342 Foundation Preparation. The top six (6) inches of the gabion foundation shall be leveled and compacted to at least ninety five percent (95%) of maximum density. Density requirements will be determined by AASHTO T 99 and field densities will be determined by AASHTO T 205.

602.343 Placement of Gabion Baskets. Assembled, empty gabion baskets shall be set into position as shown in the contract or directed by the Project Manager. To ensure proper alignment gabion stretching shall be effected in a manner approved by the Project Manager. Each unit shall be securely wired to adjacent units along the top and vertical edges prior to placing the stone.

602.344 Placement of Gabion Stone. The aggregate shall be placed to eliminate as many open pockets as possible in equal lifts of nine (9) inches to twelve (12) inches depending on the desired finished gabion height. In order to minimize local deformations, gabions shall be filled in stages and shall not be filled to a height exceeding one (1) foot more than an adjoining gabion. Stone at exposed surfaces shall be hand placed to provide an aesthetic appearance.

Cross connecting wires shall be provided on gabions whose cells are eighteen (18) inches in height or greater. These cross connecting wires shall be inserted directly above each lift of stone in a manner shown in the contract or as directed by the Project Manager. Two (2) connecting wires in each direction for each lift, shall be equally spaced horizontally and tightly tied through two (2) mesh openings at opposite faces of each gabion cell.

Gabions shall be filled in a manner which will result in minimum of voids or bulges and which will provide the proper alignment and will give the gabion a neat, square appearance.

After filling the gabion lid shall be bent over and shall be tightly bound to the perimeters and diaphragms in accordance with Subsection 602.341 Assembly of Gabion Baskets.

Gabions having poor alignment or construction will be rejected and shall be reconstructed at no additional cost to the Department.

602.345 Gabion Marking. Each gabion shall be clearly marked by color code or some other readily identifiable means to indicate size.

602.35 Wire Mesh Testing & Certification. A section of wire mesh, six (6) feet by three (3) feet minimum, shall have the ends securely clamped for three (3) feet along the width of the sample. When the width of the section under test exceeds three (3) feet, the clamps shall be placed at the center of the width and the excess width shall be allowed to fall free on each side of the clamped section.

602.351 Elongation Test. The clamped sample shall be subjected to tension sufficient to cause ten percent (10%) elongation of the length of the sample.

To be acceptable, after elongation, the diameter of individual wire strands shall not be reduced to values less than those for similar wire one (1) gage smaller in diameter. Additionally, the tested mesh sample shall not exhibit breakage of any individual wire strand nor shall the integrity of the sample have been impaired.

602.352 Rupture Test. After elongation and while clamped and otherwise unsupported, the section shall be subjected to a 6000 pound load applied in the approximate center of the sample section between the clamps and in a direction perpendicular to the direction of the tension force. The ram head used in the test shall be circular, not more than 13.5 inches in diameter and shall have its edges beveled or rounded to prevent cutting of the wire strands.

To be acceptable, the sample shall withstand the applied load without rupture of any strand.

602.353 Non-Raveling Test. Wire mesh shall be tested for non-raveling properties by having a single wire strand of mesh cut and then subjecting the section of mesh to the elongation test as described herein.

To be acceptable, the mesh shall be able to resist pulling apart at any of the twists or connections forming the mesh or other unraveling under these conditions.

602.354 Certification. The Contractor shall furnish certified test reports made by an independent testing laboratory indicating that a sample of the same manufacture as the product to be supplied, equals or exceeds these specifications.

602.4 METHOD OF MEASUREMENT

602.41 Riprap, except Class G, will be measured by the cubic yard.

Riprap Class G will be measured by the square yard.

Sacked concrete revetment will be measured by the cubic yard.

Concrete block revetment will be measured by the square yard.

Gabions will be measured by the cubic yard.

602.42 Measurement of riprap will be based on the thickness shown in the contract and the area measured on the surface of the riprap.

Measurement of concrete block revetment will be based on the area measured on the surface of the revetment.

Measurement of gabions will be based on basket dimensions shown in the contract.

602.5 BASIS OF PAYMENT.

602.51 Riprap, except Class G, will be paid for at the contract unit price per cubic yard.

Riprap Class G will be paid for at the contract unit price per square yard.

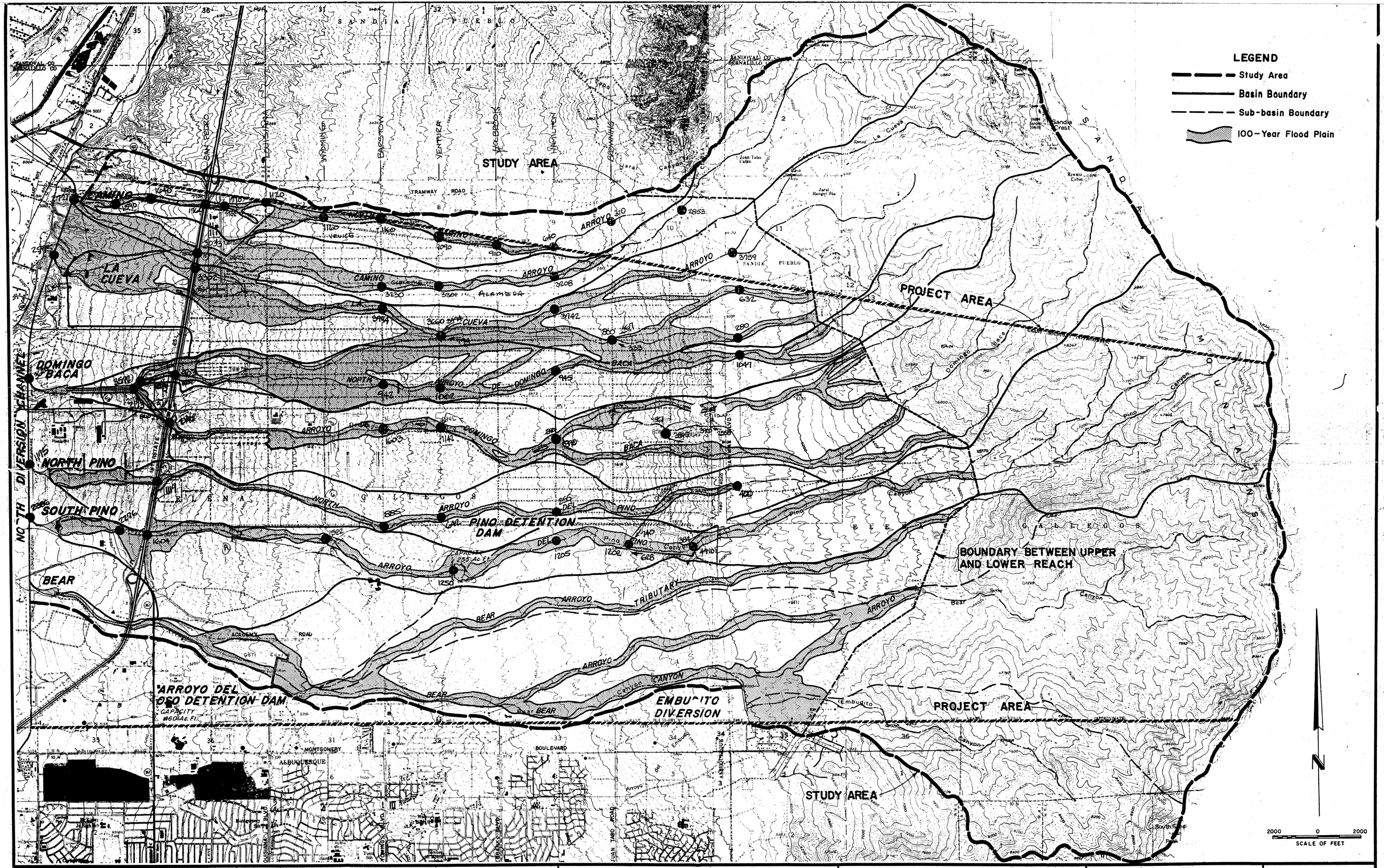
Sacked concrete revetment will be paid for at the contract unit price per cubic yard.

Concrete block revetment will be paid for at the contract unit price per square yard.

Gabions will be paid for at the contract unit price per cubic yard.

Payment will be made under:

Pay Item	Pay Unit
Riprap Class ____	Cubic Yard
Riprap Class G	Square Yard
Sacked Concrete Revetment	Cubic Yard
Concrete Block Revetment	Square Yard



BASE MAP 7-1/2 MINUTE QUADRANGLE BY U. S. GEOLOGICAL SURVEY 1:24,000

Leonard Rice Consulting Water Engineers, Inc.
Denver Albuquerque

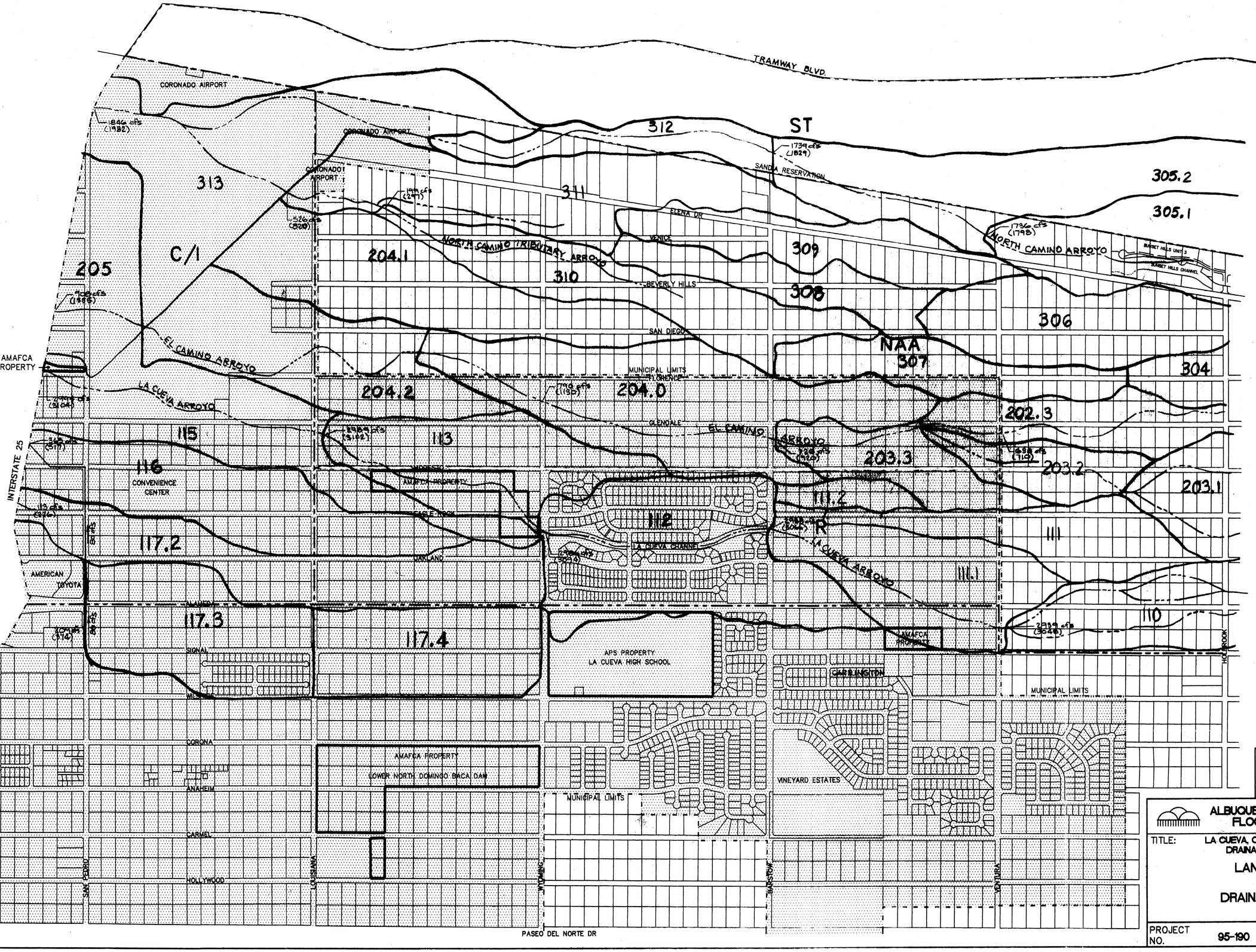
DESIGNED C.N.	DATE JAN 1974
DRAWN J.F.	DATE FEB 1974
CHECKED H.F.B.	DATE FEB 1974
REVISED	DATE

ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

DRAINAGE MANAGEMENT PLAN
NORTHEAST HEIGHTS

EXISTING BASIN BOUNDARIES AND FLOOD PLAINS

SHEET NUMBER 4
4 OF 4



LEGEND

- DRAINAGE BASIN BOUNDARY
- 311 — DRAINAGE BASIN DESIGNATION
- ST — SANDIA TRIBE
- NAA — NORTH ALBUQUERQUE ACRES
- C/I — COMMERCIAL/INDUSTRIAL
- R — HIGH DENSITY RESIDENTIAL
- LAND USE BOUNDARY
- MUNICIPAL LIMIT
- PROPERTY/R.O.W. LINE
- AREA WITHIN CITY LIMITS
- AMAFCA OR APS PROPERTY LINE
- DRAINAGE FLOWLINE

100 YEAR FLOW RATES

EXIST. COND. 3601 cfs
FUTURE DEVELOPED (3852)

500 250 0 500 1000

SCALE: 1" = 500'

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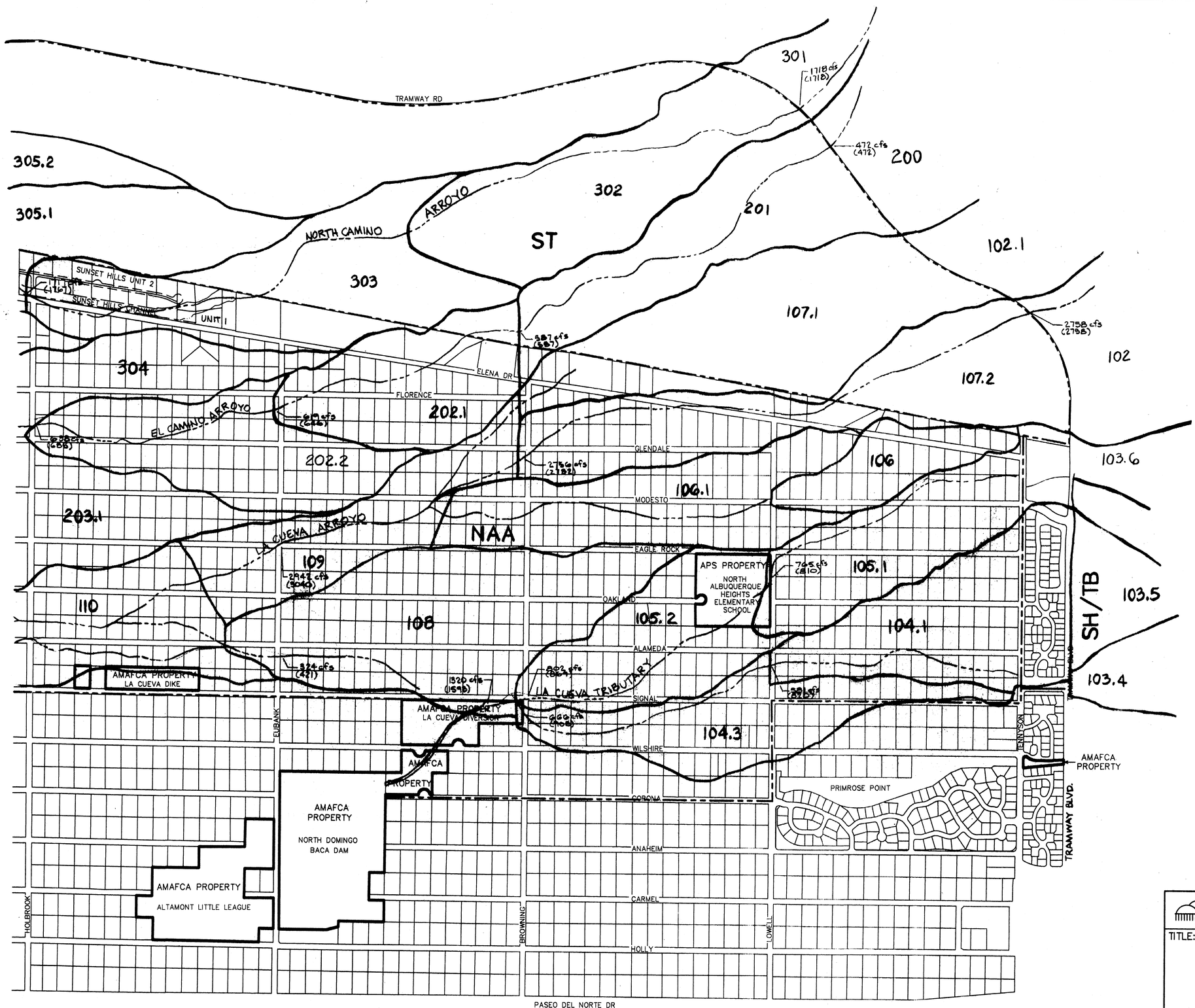
ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA, CAMINO AND NORTH CAMINO DRAINAGE MANAGEMENT PLAN

LAND TREATMENT AND DRAINAGE BASIN MAPS

FIGURE 2.2

PROJECT NO.	MAP NO.	SHEET OF
95-190	B-C18,19,20	



LEGEND

- DRAINAGE FLOWLINE
- DRAINAGE BASIN BOUNDARY
- 201 — DRAINAGE BASIN DESIGNATION
- ST — SANDIA TRIBE
- NAA — NORTH ALBUQUERQUE ACRES
- SH/TB — SANDIA HEIGHTS/ TRAMWAY BLVD.
- LAND USE BOUNDARY
- PROPERTY/R.O.W. LINE
- AMAFCA OR APS PROPERTY LINE

100 YEAR FLOW RATES	
EXIST. COND.	3601 cfs
FUTURE DEVELOPED	(3852)

500 250 0 500 1000

SCALE: 1" = 500'

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ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA, CAMINO AND NORTH CAMINO DRAINAGE MANAGEMENT PLAN

LAND TREATMENT AND DRAINAGE BASIN MAPS

FIGURE 2.3

PROJECT NO.	MAP NO.	SHEET	OF
95-190	B-C21,22,23		

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3/28/96



LEGEND

- DRAINAGE BASIN BOUNDARY (EXISTING)
- 128 — DRAINAGE BASIN DESIGNATION
- ST — SANDIA TRIBE
- BF — BALLOON FIESTA PARK
- C/1 — COMMERCIAL/INDUSTRIAL
- M/1 — MEDIUM DENSITY INDUSTRIAL
- R — HIGH DENSITY RESIDENTIAL
- LAND USE BOUNDARY (FUTURE)
- MUNICIPAL LIMIT
- PROPERTY/R.O.W. LINE
- AREA WITHIN CITY LIMITS
- AMAFCA OR APS PROPERTY LINE

100 YEAR FLOW RATES

EXIST. COND. 1868 cfs
FUTURE DEVELOPED (2422)

500 250 0 500 1000

SCALE: 1" = 500'

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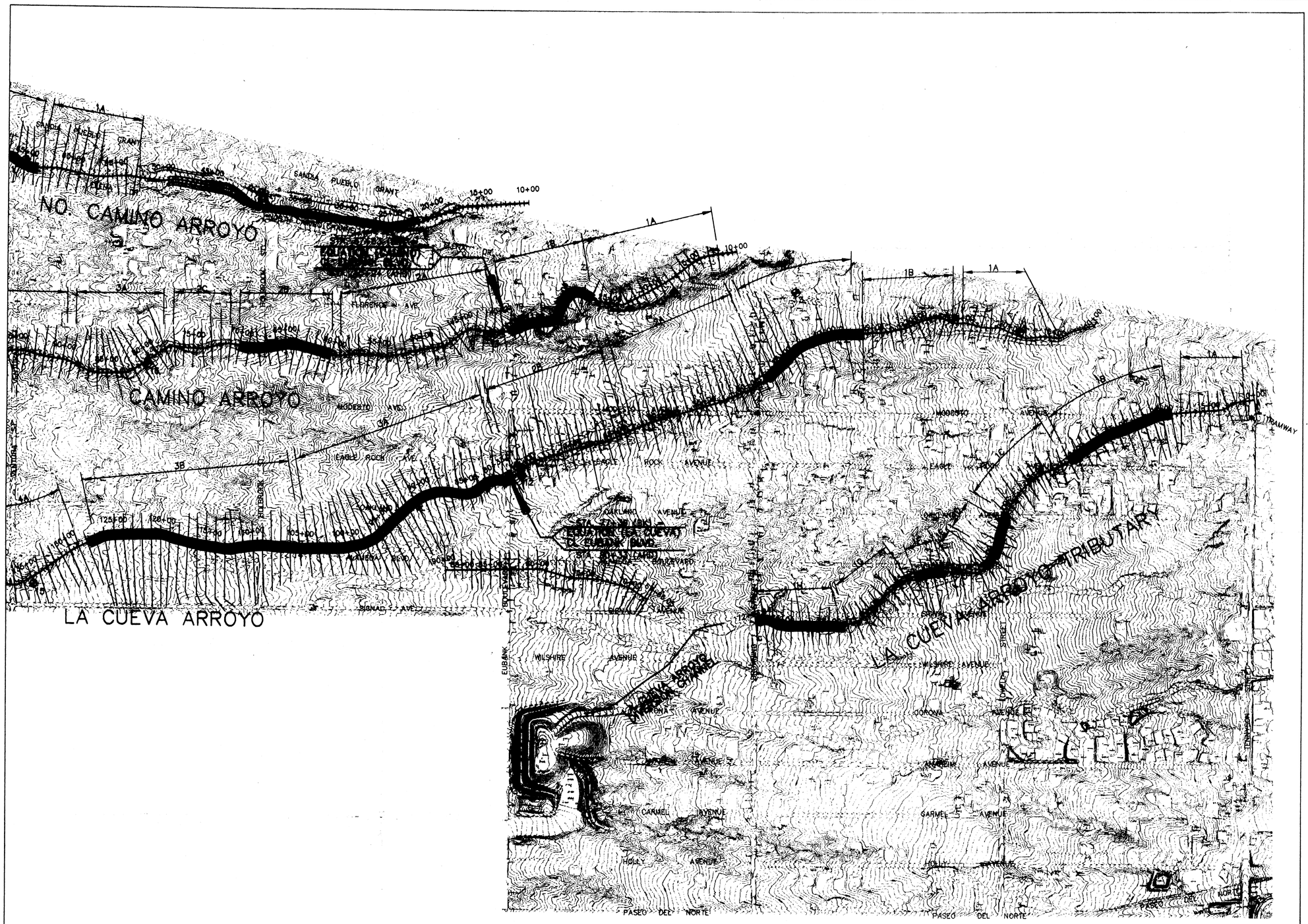
ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA, CAMINO AND NORTH CAMINO DRAINAGE MANAGEMENT PLAN

LAND TREATMENT AND DRAINAGE BASIN MAPS

FIGURE 2.1

PROJECT NO.	MAP NO.	SHEET	OF
95-190	B-C18,19,20		



LEGEND

- 1A — REACH DESIGNATION
- ARROYO FLOWLINE
- 1 — SEDIMENT SAMPLE LOCATION
- SEDIMENT AGGREDATION
- SEDIMENT DEGRADATION

NOTE:

SEDIMENT LOCATIONS 5-10 ARE NOT SHOWN. THEY ARE LOCATED OUTSIDE THE LIMITS OF THIS MAPPING.

500 250 0 500 1000

SCALE: 1" = 500'

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ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

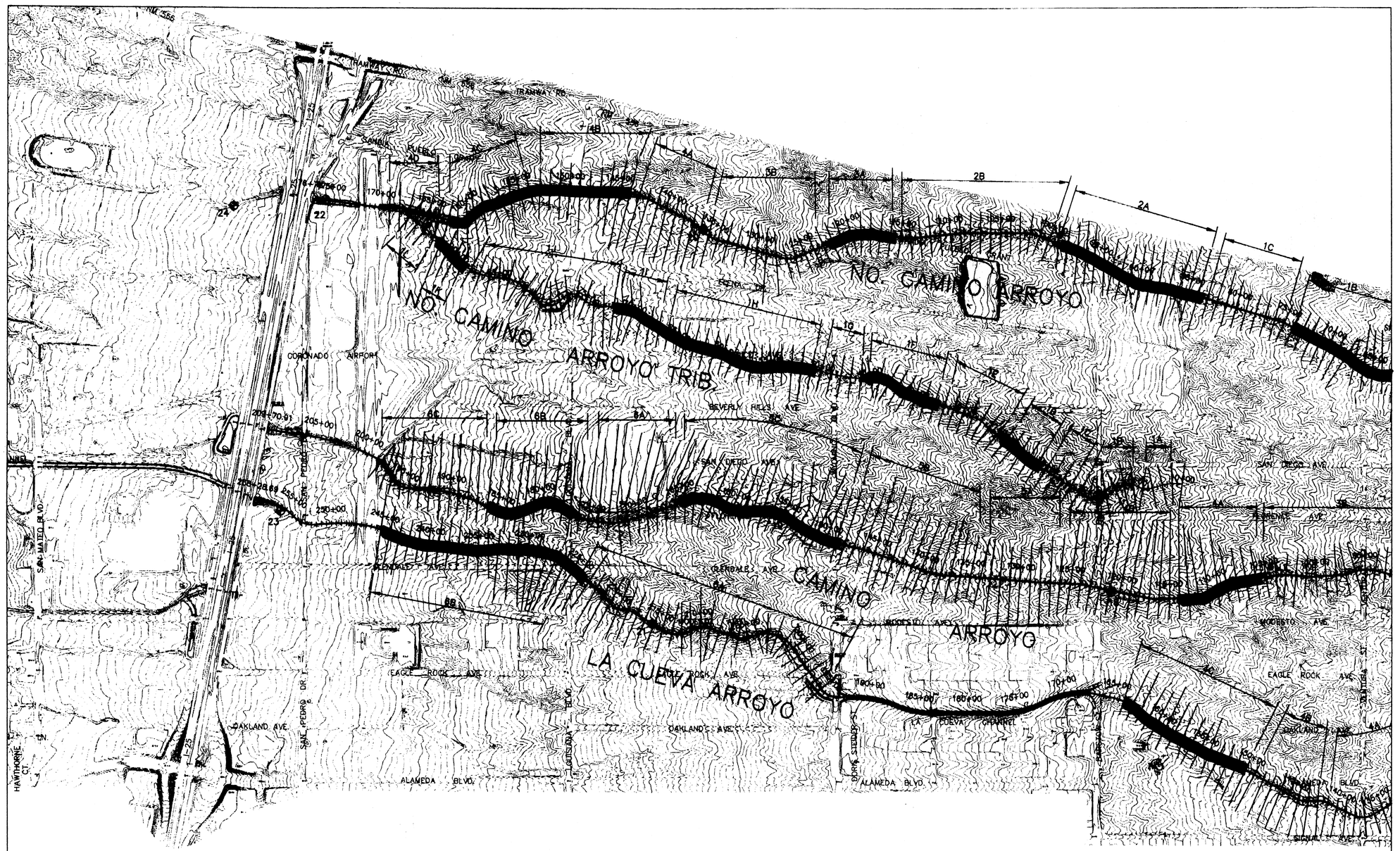
TITLE: LA CUEVA, CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

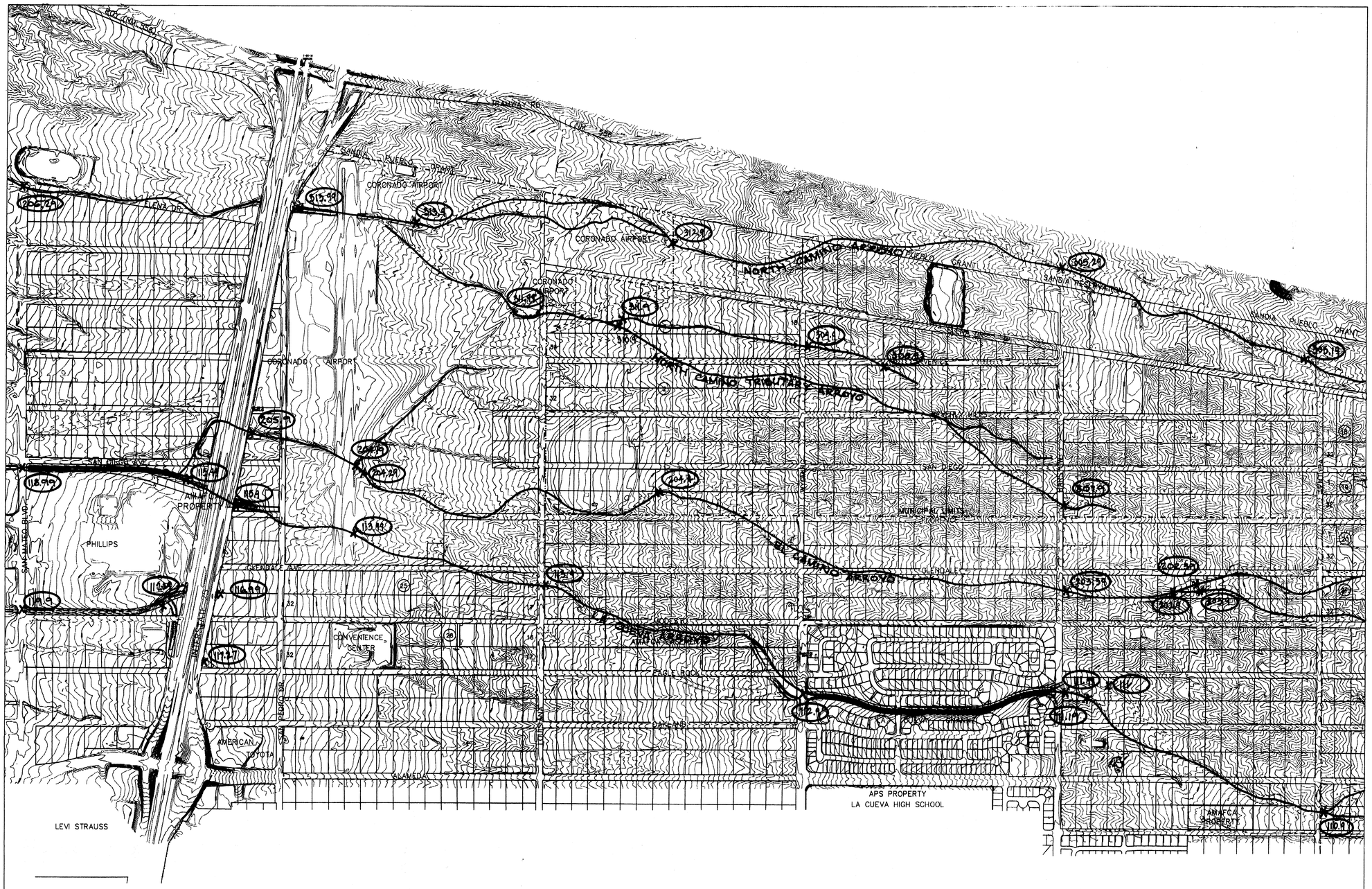
SEDIMENT AND EROSION MAP

FIGURE 3.2

PROJECT NO.	95-190	MAP NO.	B-C18,19,20	SHEET	OF

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NO. CAMINO ARROYO
NO. CAMINO ARROYO TRIB.
CAMINO ARROYO
LA CUEVA ARROYO
LA CUEVA CHANNEL
TRAMWAY RD.
CORONADO AIRPORT
SAN MATEO BLVD.
SAN DIEGO AVE.
BEVERLY HILLS AVE.
GLENDALE AVE.
MODESTO AVE.
EAGLE ROCK AVE.
OAKLAND AVE.
ALAMEDA BLVD.
SIGNAL AVE.
HAWTHORNE CT.
SAN PEDRO DR.
LOUISIANA BLVD.
SAN PEDRO
I-25
1A
1B
1C
2A
2B
3A
3B
4A
4B
5A
5B
6A
6B
7A
7B
8A
8B
1G
1H
1I
1J
1K
1L
1M
1N
1O
1P
1Q
1R
1S
1T
1U
1V
1W
1X
1Y
1Z
2C
2D
2E
2F
2G
2H
2I
2J
2K
2L
2M
2N
2O
2P
2Q
2R
2S
2T
2U
2V
2W
2X
2Y
2Z
3C
3D
3E
3F
3G
3H
3I
3J
3K
3L
3M
3N
3O
3P
3Q
3R
3S
3T
3U
3V
3W
3X
3Y
3Z
4C
4D
4E
4F



LEGEND

(305.19) ANALYSIS POINT

ARROYO FLOWLINE

N

500 250 0 500 1000

SCALE: 1" = 500'

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ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

ANALYSIS POINT LOCATION MAP

FIGURE 4.1

PROJECT NO.	MAP NO.	SHEET	OF
95-190	B-C18,19,20		

C:\DATA\95-190KP\DMPOPT1.DWG

LEGEND

305.19 ANALYSIS POINT

ARROYO FLOWLINE

NORTH CAMINO ARROYO

EL CAMINO ARROYO

LA CUEVA ARROYO

LA CUEVA MILITARY ARROYO

AMAFCA PROPERTY LA CUEVA DIVERSION

AMAFCA PROPERTY LA CUEVA DIKE

AMAFCA PROPERTY

APS PROPERTY

NORTH ALBUQUERQUE ACRES ELEMENTARY SCHOOL

PRIMROSE POINT

EUBANK

TRAMWAY

PASEO DEL NORTE

110.9 | 109.9 | 108.9 | 107.9 | 106.9 | 105.9 | 104.9 | 103.99 | 103.49

500 250 0 500 1000

SCALE: 1" = 500'

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ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY

TITLE: LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE MANAGEMENT PLAN

ANALYSIS POINT LOCATION MAP

FIGURE 4.2

PROJECT NO.	MAP NO.	SHEET	OF
95-190	B-C18,19,20		

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