# **Design Analysis Report for**

# **Borrega Detention Dam** and North Borrega Channel

in Bernalillo County, NM

# Prepared for

Albuquerque Metropolitan Arroyo Flood Control Authority Albuquerque, NM

Submitted by:

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#### 1.0 INTRODUCTION

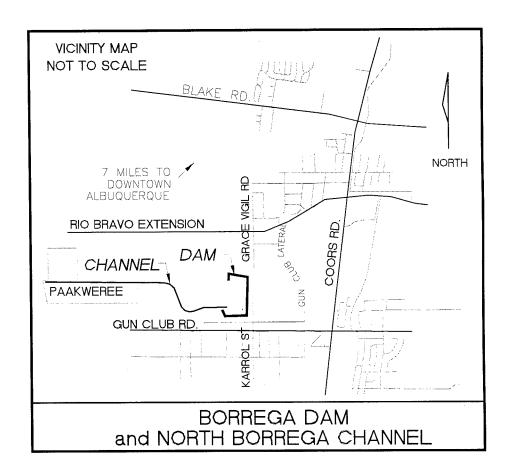
#### 1.1 Purpose

Wilson & Company was contracted by the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA) to provide the analysis and design for the proposed Borrega Detention Dam and North Borrega Channel, southwest of Albuquerque, New Mexico.

The purpose of this report includes: the hydrologic and sediment analysis for the basins discharging to the proposed facilities, and hydraulic analysis of all the structures associated with the Borrega Detention Dam and North Borrega Channel.

## 1.2 Background Information

The Borrega Dam site is located in the Borrega Drainage Basin within the Amole Watershed southwest of the city of Albuquerque. The site is immediately west (upstream) of Karrol Street, which turns into Grace Vigil Road north of the site. The dam will be constructed to resemble a landform that blends with the local gently sloping landscape. The North Borrega Channel will be built to convey the Borrega watershed runoff to the dam.



Currently the Borrega watershed upstream of Karrol Street is undeveloped. The only signs of development are a 200-ft. wide power line easement 6000 feet upstream of the dam site, scattered barbwire fence lines and two-track dirt trails, and the earthen Borrega Arroyo Diversion Channel.

The Borrega Arroyo Diversion Channel was built in 1986. It begins 1500 feet upstream of Karrol Street where it diverts the existing Borrega Arroyo from its southeast path and conveys it east in a 20-ft. wide channel with gabion grade control structures. It outfalls via the Borrega Inlet (a 60" conduit with headwall) to the Hubbell Lake Detention Area approximately 2000 feet downstream of Karrol Street.

The existing channel capacity is 640 cfs. Without upstream detention or diversion, the channel does not have capacity to convey the developed discharge of 1600 cfs. The Borrega Inlet does not have the capacity to convey existing or developed flows. These conditions were addressed in the Amole-Hubbell Drainage Management Plan adopted by AMAFCA in July 1999 (hereinafter referred to as the A-H DMP).

The developers of Paakweree, a residential development upstream of the proposed dam in the Borrega basin, plan to hard-line the North Borrega Channel, intercept its tributaries, and confine the flood plain. These improvements also require detention to control the flow rates to the Borrega inlet.

#### 1.3 Phasing

AMAFCA will build the following facilities within the next year: the Borrega Detention Dam, the North Borrega Channel downstream of the residential development, the confluence of the North and South Borrega Channels, and a portion of the Borrega Diversion Storm Drain. The construction of the Borrega Dam will be done in two phases: Phase "A" and Phase "B". The following compares the conditions of the phases:

#### PHASE "A"

- Construction scheduled to begin in spring 2000.
- Dam is not fully excavated in the north portion.
- Does not include recreational field.
- Total area draining to dam=1.25 sq mi.

#### PHASE "B"

- Construction in the future.
- Dam north portion fully excavated to provide additional flood storage.
- Has recreational field, by others.
- Total area draining to dam=1.75 sq mi.

AMAFCA will receive certification for Borrega Dam Phase "A" by the State Engineer upon completion of the construction of Phase "A".

Phase "B" will include full excavation of the north portion of the dam. Full excavation will be required to accommodate fully developed diverted runoff that will be delivered to the dam by two storm drains. One storm drain conveys flow from property owned

by American Southwest Homes northwest of the dam (Basin B-6). The other is the Borrega Diversion Storm Drain from Gun Club Road, which conveys flow from the south (Basin 6B).

#### 1.4 AMAFCA Agreements

Cost sharing is to be implemented for the design and construction of the proposed North Borrega Channel and the Borrega Dam. AMAFCA has agreed to pay for the construction of the dam and public channels. The owner of Paakweree has agreed to pay for land acquisition, dam design, and construction of the private channels through the proposed development. See the "AMAFCA Agreement" dated 10 August 1999 in Appendix F.

In the A-H DMP the proposed Borrega Dam was planned to be a storage facility for runoff from only the Borrega watershed. The owner of the land within the Rio Bravo basin "B-6" (directly north of the Borrega watershed) wished to be able to divert runoff from that basin into the proposed dam. In December 1999, AMAFCA entered into an agreement with the landowner to ultimately accept the diverted runoff into the dam. This increased the drainage area to the dam from approximately 1.25 square miles to 1.75 square miles. See the "First Amendment to Agreement" dated 16 December 1999 in Appendix F.

#### 2.0 HYDROLOGY

## 2.1 Hydrologic Model

The 100-year 24-hour runoff under existing, revised (post-project), interim, and future conditions was analyzed for this report. The hydrologic model is based on the Borrega Basin and Rio Bravo Basin AHYMO97 models taken from the Amole-Hubbell Drainage Management Plan by Leedshill-Herkenhoff, December 1998 (hereinafter referred to as the A-H DMP).

The rainfall data is summarized in Table 1 below. The hydrology was analyzed using the following assumptions:

- 1. The 100-year 24-hour event was modeled.
- 2. Sediment bulking was added only for undeveloped basins upstream of 118<sup>th</sup> Street.
- 3. The Principal Maximum Flood was modeled assuming a dam of High Hazard classification per the classification system given in New Mexico Dam Safety Design Criteria, 1997.
- 4. For the Principal Maximum Precipitation (PMP), the 6-hour local storm and the 24-hour general storm were analyzed per the requirements in Section 22.2 of the Albuquerque DPM. The local PMP storm resulted in higher discharge through the watershed; therefore the more intense local PMP storm was used to size the emergency spillway. The emergency spillway was sized for the full PMP local storm.

TABLE 1. DESIGN STORM RAINFALL AMOUNTS

Time	100-Year	PMP 6-hour
	(inches)	Local Storm
		(inches)
1 hour	1.87	11.5
6 hours	2.20	16.0
24 hours	2.66	

## 2.2 Development Conditions Summary

The drainage basin maps are in Appendix E of this report. The following summarizes the conditions presented in the maps:

- Existing Conditions Exhibit 3, is based on the A-H DMP under existing conditions. Treatment types average 75% A, 25% B, 0% C and 0% D. Treatment type B is used for steep-sloped undeveloped areas per Table A-4 in the Albuquerque Development Process Manual (DPM).
- Revised (Post-Project) Conditions Exhibit 4, is undeveloped except for the residential development Paakweree, the flood control channels, and the Borrega Dam has a 100-year storage volume of 64 acre-feet, sized for Phase "A".

The Revised (Post-Project) is the condition required by FEMA for submittal of the Conditional Letter of Map Revision (CLOMR), which is required to begin the process of removing or relocating the flood plain through the project area.

The treatment types approximate those used in the A-H DMP. Treatment types for the undeveloped basins average 75% A, 25% B, 0% C and 0% D. Treatment types for the developed basins average 0% A, 28% B, 23% C, and 49% D.

- Interim Phase "A" Dam Exhibit 4A, has fully developed conditions in the Borrega watershed except for Basin 50201. The Phase "A" dam has a 100-year storage volume of 64 acre-feet. Treatment types match those used in the A-H DMP, with average of approximately 0% A, 28% B, 23% C, and 49% D.
- Future Conditions Exhibit 5, has additional drainage area to the dam from the north and south. The Phase "B" dam was sized for Future Conditions with 100-year storage volume of 90 acre-feet. Treatment types match those used in the A-H DMP, with average of approximately 0% A, 28% B, 23% C, and 49% D. In the B-6 basin northwest of the dam, treatment types are 0% A, 60% B, 15% C, and 25% D. American Southwest Homes, the owner of most of B-6, plans to develop the land as half-golf course and half-residential. Higher levels of development may require additional detention storage.

The following sections describe the stages of development in the existing, revised, interim, and future models.

## 2.3 Existing Conditions

- 1. The Basin 50201 (6B) is not added to the analysis. This is because 50201 will not discharge to Hubbell Lake until the Borrega Diversion Storm Drain from Gun Club Road proposed in the A-H DMP is built.
- 2. The basins are undeveloped except for small pockets of development at the east side of the study area.
- 3. 15% sediment bulking was added to all basins, same as the A-H DMP.

# 2.4 Revised (Post-Project) Conditions

- 1. This condition is included because it is the condition required by FEMA for submittal of the Conditional Letter of Map Revision (CLOMR). The only fully developed basins are the Paakweree development, which is analyzed as developed with no bulking for sediment.
- 2. Sediment at culverts (see Section 3.2 below) is analyzed per this development condition.
- 3. The Borrega Dam Phase "A" and North Borrega Channel are built to accommodate Paakweree runoff.
- 4. The South Borrega Tributary Storm Drain is constructed to convey flows from basins 50101 and 50102 to the North Borrega Channel.
- 5. 118<sup>th</sup> Street from Rio Bravo Boulevard is constructed to provide access to Paakweree.
- 6. Basins 50103, 50104, and 50105 West are analyzed as existing with 15% bulking, and are routed south via the 118<sup>th</sup> Street Channel to be discharged to the North Borrega Channel.
- 7. Basins B-2 and B-4 West are analyzed as existing with 15% bulking, are routed to the southwest corner of 118<sup>th</sup> Street and Rio Bravo Boulevard intersection. This flow is discharged through a culvert to a channel currently under construction on the north side of Rio Bravo Boulevard.
- 8. AMAFCA builds only the first 300 linear feet of the Borrega Diversion Storm Drain that discharges into the Phase "A" Borrega Dam (see 1, above in Existing Conditions). Therefore, only a small portion of Basin 50201 runoff discharges to the Borrega Channel and dam system, and most of Basin 50201 remains undeveloped.

#### 2.5 Interim Conditions

- 1. The Borrega Dam remains Phase "A".
- 2. The entire Borrega watershed is developed except Basin 50201, so only the 300 linear feet of the Borrega Diversion Storm Drain has been built (the remainder is built in Future Conditions, see Number 4 in Future Conditions below).
- 3. No sediment bulking is added to the model. In the A-H DMP, sediment bulking was added to only two of the basins: 2% bulking in Basin 50101, and 4% bulking in Basin 50104.

- 4. Discharge from developed Basins 50105 West, 50103, and 50104 is routed through "Pond 7", which is proposed by the A-H DMP to be located upstream of 118<sup>th</sup> St.
- 5. The routed flows from "Pond 7" are discharged south via the 118<sup>th</sup> Street Channel to the North Borrega Channel. The A-H DMP took these flows *north*, therefore the A-H DMP will require an amendment by AMAFCA.
- 6. Basins B-2 and B-4 West will discharge developed runoff to "Pond 8", which is proposed by the A-H DMP to be located upstream of 118<sup>th</sup> Street. The pond discharges through the culvert under Rio Bravo Boulevard to the north side of Rio Bravo Blvd. See Number 7 in Revised (Post-Project) Conditions, above.

# 2.6 Future Conditions

- 1. The Borrega Dam Phase "B" is constructed. This increases the volume of the dam and accommodates the developed flow that is diverted from basins B-4 East, B-6 and 50201.
- 2. No sediment bulking was added to the model.
- 3. The flows from developed Rio Bravo Basins B-4 East and B-6 are discharged to the Borrega Dam through a storm drain to the northwest corner of the dam per the AMAFCA Agreement dated 16 December 1999.
- 4. The flow from developed Basin 50201 is discharged to the Borrega Dam through an extension of the Borrega Diversion Storm Drain to Gun Club Road.

#### 3.0 SEDIMENT

#### 3.1 Sediment Discharge to the Borrega Dam

A comprehensive sediment analysis, <u>Borrega Diversion Sediment Issues Floodplain Study for AMAFCA</u>, was performed for the Borrega watershed in 1992. Resource Consultants, Inc. (RCI) prepared this report for Bohannan-Huston, Inc. The purpose of the report was to support the BHI hydrologic analysis of the watershed.

The report used the Modified Universal Soil Loss Equation (MUSLE) calibrated with sediment removal records from the nearby Don Felipe Dam to calculate sediment yield. The calculations indicated a sediment yield for the 100-year storm under existing conditions to be 8.56 tons/acre and the annual sediment yield to be 0.54 tons/acre.

The AMAFCA requirement for dams is 5 times the annual plus one 100-year event sediment yield. Using the information from the Borrega sediment report by RCI, the AMAFCA requirement is 3.8 acre-feet of sediment under post-project conditions, and 1.5 acre-feet under fully developed conditions. Table 2 below, Dam Storage Volume Summary shows that there is adequate volume to accommodate sediment storage. See Appendix B for the calculations of the sediment yield.

TABLE 2. BORREGA DAM STORAGE VOLUME SUMMARY

DESCRIPTION	PHASE "A"	PHASE "B"
Storage to Emergency	88.4	99.3
Spillway Crest 4997 (ac-ft)		
100-Yr Storage (ac-ft)	64.1	87.9
Sediment Storage (ac-ft)	3.8	1.5
Allowance for Bell (to meet 30	N/A	8.2
ac-ft allowance per AMAFCA		
Agreement)		
Excess Storage (ac-ft)	20.5	1.7

The table indicates that in the Phase "A" dam, there is a great amount of excess (20 acft) beyond what is required. This is because in the Phase "A" dam, the channel will be excavated to the northwest corner of the dam to intercept the Bell property runoff. This is being done in Phase "A" to avoid disturbing the dam embankment in the future.

# 3.2 Sediment Trapping at Upstream Culverts

At the two entrances to culverts (AP3, 96" under 118<sup>th</sup> Street and AP5, 66" South Borrega Trib Storm Drain, see Post-Project Basin Map), only the undeveloped condition sediment was analyzed. The developed condition is not analyzed because it is likely that in the future the drainage conveyances to the culvert structures will be altered so that sediment is trapped upstream.

To illustrate, in the future there will be a pond ("Pond 7") at the 118<sup>th</sup> Street Channel upstream of AP3. Pond 7 is proposed by the A-H DMP to act as a sediment-trapping and detention pond. Likewise, a storm drain connection is conceived as the ultimate conveyance for discharge to the South Borrega Trib Storm Drain at AP5. There would be no sediment deposited at this location because the structure would be underground.

The program TRAPMIX was used to compute the amount of sediment that is deposited at the entrance to the culvert under 118<sup>th</sup> Street and at the entrance to the South Borrega Tributary Storm Drain. The runoff to these culverts is undeveloped in the Revised (Post-Project) condition. The results of the analysis are summarized in the table below. Calculations for the sediment trapping are in Appendix B.

TABLE 3. SEDIMENT TRAP ANALYSIS RESULTS (100-Year)

	AP3	AP5
	96" under 118 <sup>th</sup> Street	66" South Borrega SD
Bulked V100 (ac-ft)	10.1	8.3
Bulking factor	1.15	1.15
Sediment load (ac-ft)	1.32	1.08
% Sediment passing	70	71
% Sediment trapped	30	29
Available sediment	0.18	0.13
storage (ac-ft)		

## 4.0 GEOTECHNICAL STUDY FINDINGS

The report entitled <u>Geotechnical Engineering Study Proposed Borrega Detention Dam</u> was produced for this project by AGRA Earth & Environmental of Albuquerque, New Mexico. The report includes the results of test drilling, laboratory analyses, and recommended criteria relative to embankment geometry, foundation treatment, and dam design.

The proposed embankment should have slopes no steeper than 3:1 upstream and 2.5:1 downstream. See Exhibit 1 below. The crest width should be 20 feet. The key trench (or "cutoff trench") with bottom width of 20 feet and depth of 5 feet should be excavated in the native soils beneath the embankment. The key trench should have side slopes no steeper than 2:1.

Foundation treatment should extend laterally a minimum distance of 25 feet from the upstream toe and 5 feet from the downstream toe of the embankment. The prepared surface should be pre-wetted per specifications to a depth of 5 feet, followed by vibratory roller compaction per specifications. A ground compaction of 0.5 foot (loss) should be used in earthwork quantity calculations for foundation treatment areas.

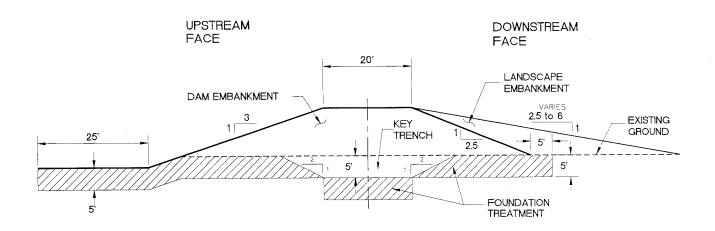


FIGURE 1. TYPICAL EMBANKMENT SECTION
NOT TO SCALE

Although the storage period for the 100-year storm is less than 40 hours, the study used a conservative storage time length of 6 days (144 hours) for the seepage analysis. The seepage analysis indicated that the wetted front would probably advance about 3.0 feet horizontally during a 6-day full retention period.

A shrinkage factor is 25% from cut to fill sections should be used for earthwork calculations. The specifications for earthwork are included in the geotechnical report appendix.

#### **5.0 HYDRAULICS**

#### 5.1 North Borrega Channel

The concrete-lined North Borrega Channel will be constructed through Paakweree past the bridge at Perdiz Street by the developer of Paakweree. AMAFCA will construct the channel from downstream of Perdiz Street to the Borrega Dam.

The HEC-RAS analysis for the channel is in Appendix C. Exhibit 1 in Appendix C is provided to show the locations of the HEC-RAS cross sections. HEC-RAS format requires the highest station upstream; therefore the HEC-RAS stationing does not match the channel stationing in the plans.

At the upstream end of the North Borrega Channel, there is an intake structure with headwalls and a 96" culvert to convey the 118<sup>th</sup> St. Channel flow east under 118<sup>th</sup> Street (see analysis in Appendix C). The channel then conveys discharge east through Paakweree.

The channel is trapezoidal with approximately 2:1 side slopes. The cross section varies from 5-ft. depth with 10-ft. bottom width to 6-ft. depth with 12-ft. bottom width. At the confluence of the South Borrega Arroyo 1000 feet upstream of the dam, the width is 20 ft.

The channel is situated below existing ground level. Freeboard in the channel is minimum 2 feet above water surface elevation to comply with City of Albuquerque DPM. Additional freeboard is provided above the channel sill to account for superelevation at curves. Freeboard calculations are provided in Appendix C.

# 5.2 Intake Structure for Principal Spillway

The intake structure for the principal spillway is located 475 feet east of the channel chute of the incoming North Borrega Channel. The slope from the chute to the intake structure is 0.2%.

Th intake structure is a 10-ft. by 10-ft. concrete riser tower with thirty-nine 8" inclined circular orifices. The ground elevation is 4985 at the foot of the structure. The top of the riser is open and at elevation 4994. This is 0.68 ft. below the Phase "A" 100-year

water surface elevation of 4994.68, and 2.14 ft. below the Phase "B" 100-year elevation of 4996.14.

# 5.3 Principal Spillway Outlet Pipe

The principal spillway outlet is 176 linear feet of 54" pre-stressed concrete cylinder pipe (PCCP) which connects to a manhole and then discharges to 57 feet of 54" reinforced concrete pipe (RCP). The inlet invert is 4984.7 and the outlet invert is 4982.74 and the average slope is 0.8%. The maximum flow in the pipe is 170 cfs for the Phase "A" 100-year event, and 191 cfs for the Phase "B" 100-year event. A U.S. Bureau of Reclamation Type VI energy dissipator will be used at the outlet end to dissipate the energy of the outflow into the existing channel

The outlet was analyzed using the orifice equation. The area of the small orifices at the inlet structure controls the discharge until the water surface reaches the top of the riser. At that point the 47.5" orifice plate on the 54" PCCP controls the discharge. The 54" PCCP was designed to be non-pressurized flow in the 100-year event under fully developed conditions.

To alleviate scour at the outlet, a riprap blanket will extend 20 feet from the outlet of the energy dissipator. Downstream of the outlet, the existing channel is earthen with a trapezoidal cross section with 20-ft. bottom width; 3:1 side slopes, and a longitudinal slope of 0.4%.

#### 5.4 Reservoir Storage and Routing

The storage-discharge curve was developed to allow a maximum outflow of approximately 191 cfs (non-pressurized flow) through the principal spillway pipe in the fully developed 100-year event. This limit is based on the 220-cfs capacity at the Borrega Inlet downstream. See Appendix C for the sheet showing the Borrega Dam outflow calculations for Borrega Dam Phase "A" and Phase "B". The storage-discharge curves are shown on the Dam Filing Sheet in the construction plans included in Appendix D.

Two levels of storage provide the storage within the dam. The lower level with invert at the principal spillway and top at 4991 is designed to hold the fully developed 5-year runoff of approximately 38 acre-feet. The upper level lies directly north of the lower level and is designed to accommodate the runoff greater than the 5-year up to the 100-year event. This maintains the water surface below the upper level invert for the more frequent storms. Therefore the upper level can be a multi-use facility, with recreational fields that will not be built with this project but are planned for the future.

The table below summarizes the Phase "A" Borrega Dam design data.

TABLE 4. PHASE "A" BORREGA DAM SUMMARY

DESCRIPTION	UNIT	VALUE
Detention Pond AHYMO Analysis Point No.		110.20
Return Period / Duration	(yr / hr)	100 / 24
Development Condition		Interim Developed
Total Drainage Area	(sq mi)	1.246
Inflow Time to Peak	(hrs)	1.60
Inflow Peak Discharge	(cfs)	1473
Inflow Total Runoff Volume	(ac-ft)	99.1
Outflow Time to Peak	(hrs)	2.80
Outflow Peak Discharge	(cfs)	170
Outflow Max Storage Volume at Peak	(ac-ft)	64.1
Outflow Total Runoff Volume	(ac-ft)	99.1
Max Storage at Emergency Spillway Elev	(ac-ft)	88.4
Dead Storage Volume	(ac-ft)	0
Total Reservoir Storage Time	(hrs)	26
Reservoir Invert Elev	(ft)	4985.0
Principal Spillway Elev	(ft)	4984.7
Emergency Spillway Elev	(ft)	4997.0
Top of Embankment Elev	(ft)	5003.0
Max 100-Yr Water Surface Elev	(ft)	4994.7
Max 100-Yr Water Depth	(ft)	9.7
Freeboard to Emergency Spillway Elev	(ft)	2.3
Freeboard to Top of Embankment	(ft)	8.3

Note that the table above is for the Phase "A" Borrega Dam. For further information on the Phase "A" and Phase "B" dams, see the Dam Filing Sheet in the construction plans.

## 5.5 Emergency Spillway

The soil cement-armored spillway has an overall length of 350 feet at the crest elevation of 4997. The top of the dam elevation is 5003. In the fully developed Phase "B" PMF, the maximum water surface elevation is 5002.81. The spillway discharges east to Karrol Street. Excess flows will likely spill over the top of the Borrega Channel downstream of Karrol Street and ultimately go east to Hubbell Lake or southeast to the existing Borrega Arroyo flood plain.

The spillway will be constructed of soil cement in 1-ft. lifts with a two-step 5-ft drop discharging to a plunge pool adjacent to Karrol Street. See sheet 8 in the construction plans in Appendix D. The design is based on the design for the Lower North Domingo Baca Dam, which was based on research done by Dr. Richard Heggen of UNM. The research showed that drop chutes with 2 or 3 silt blocks at the end of each apron provided the best performance.

# 5.6 Borrega Diversion Storm Drain from Gun Club Road

Runoff from basin 6B currently discharges east to the historic Borrega Arroyo. Per the A-H DMP the runoff from basin 6B will be diverted in the future from north of Gun Club Road to the Borrega Dam via a storm drain.

The storm drain will be 66" diameter and the Future Conditions peak 100-year flow rate is 230 cfs, with a 72" ring chamber energy dissipator at the downstream end to alleviate erosion at the outlet. The storm drain will discharge to the southwest corner of the dam. AMAFCA will build only the storm drain from the easement on the south side of the dam to the dam at this time. In the future, the storm drain will be extended to the south to Gun Club Road.

## 5.7 Future Basin B-6 Diversion Storm Drain

Per the Amendment to the AMAFCA Agreement (see Appendix F), the flow from Basins B-4 East and B-6 will be diverted to the dam in the future. The AHYMO Future Conditions 100-year peak runoff from this diverted area is 375 cfs. The AMAFCA Agreement allows 30 ac-ft to be discharged.

This flow will be conveyed into the dam through a storm drain with headwall and energy dissipator to be designed and built in the future by the developer. The storm drain will discharge into the northwest corner of the dam. From there, an open earthen channel will convey the flow south to the lower dam level.

#### 6.0 CONCLUSIONS

The A-H DMP recommended a regional detention facility in the Borrega watershed. The construction of the Borrega Dam will fulfill this recommendation. When the dam construction is complete a Letter of Map revision (LOMR) will be required for submittal to FEMA.

A separate Conditional Letter of Map Revision (CLOMR) is being submitted to FEMA by the developer of Paakweree. The Paakweree CLOMR is for the Borrega Arroyo and tributary floodplain through Paakweree. It extends from upstream of Paakweree at 118<sup>th</sup> Street to the point where the North Borrega Channel crosses the existing Borrega Arroyo at approximately Station 43+00.

After the Borrega Dam LOMR is accepted by FEMA, the floodplain will be confined to the North Borrega Channel from Station 43+00 to the dam.

## **REFERENCES**

AHYMO. Albuquerque Metropolitan Arroyo Flood Control Authority, 1997.

<u>Amole-Hubbell Drainage Management Plan</u>, for AMAFCA by Leedshill-Herkenhoff, Inc., 1999.

<u>Borrega Diversion Sediment Issues Floodplain Study for AMAFCA</u>, for Bohannan-Huston, Inc. by Resource Consultants, Inc., June 1992.

Development Process Manual - Volume 2, City of Albuquerque, 1993.

New Mexico Dam Safety Design Criteria, 1997 Edition, State Engineer, Santa Fe, New Mexico.

# **APPENDIX A - Hydrology**

# **AHYMO97 Models**

# **Existing Conditions**

- Input
- 100-Yr 24-Hr Summary

# **Post-Project Conditions**

- Input
- 100-Yr 24-Hr Summary

# **Interim Conditions**

- Input
- 100-Yr 24-Hr Summary
- PMP 24-Hr Summary

# **Future Conditions**

- Input
- 100-Yr 24-Hr Summary
- PMP 24-Hr Summary

# **AHYMO Maps**

- Existing Conditions
- Interim Conditions
- Future Conditions

```
0.0 HOURS PC=0 PL=-1
START
                   BORREGA WATERSHED
*S
*S
*S 100-YR, 24-HR STORM WITH SEDIMENT
*S FILE NAME: BR100E1B.DAT (EXISTING CONDITIONS)
*S BY: RICHARD STOCKTON

*S LAST REVISION: 05-14-96

*S <a href="mailto:record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-record-
*S BY: RICHARD STOCKTON
*S THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF FROM THE BORREGA
*S BASIN. FLOWS FROM THIS BASIN IS CONVEYED TO HUBBLE LAKE DETENTION FACILITY
*S VIA THE BORREGA DIVERSION CHANNEL.
*S
*S ANALYSIS ASSUMPTIONS:
*S 1. ALL LAND IN THIS BASIN IS MODELED AS EXISTING CONDITION.
 *S
 *$ 2. THE PUNCH HYD COMMAND WAS ADDED TO THE END OF THIS FILE SO THE OUTFALL

*$ HYDROGRAPH COULD BE USED IN THE AMOLE DEL NORTE EXISTING CONDITIONS MODEL

*$ AA100E1B.DAT, WHICH WILL BE USED IN THE ANALYSIS OF THE AMOLE ARROYO SYSTEM.
 *S 3. A BULKING FACTOR OF 15% HAS BEEN ADDED TO EACH UNDEVELOPED SUB-BASIN AND
*S A BULKING FACTOR OF 6% HAS BEEN ADDED TO EACH DEVELOPED SUB-BASIN LIKELY
*S TO PRODUCE SEDIMENT. A BULKING FACTOR OF 3% HAS BEEN ADDED TO EACH
                DEVELOPED SUB-BASIN THAT WOULD PROBIBLY PRODUCE SEDIMENT, SUCH AS PARKS AND SCHOOL PLAY GROUNDS. AND, NO BULKING FACTOR FOR WELL DEFINED RESIDENTIAL
 * S
 *S
                 DEVELOPMENTS.
 *S
 *RAINFALL TYPE=2 0.0 0.74 0.95 1.15
**S 5 YEAR 24HR STORM EXISTING CONDITION
*RAINFALL TYPE=2 0.0 1.00
 *RAINFALL TYPE=2 0.0 1.00 1.
**S 10 YEAR 24HR STORM EXISTING CONDITION
                                                                                                                                                 DT = 0.05
 **S 10 IEAR 24HR STORM EXISTING CONDITION

*RAINFALL TYPE=2 0.0 1.25 1.47 1.77

**S 25 YEAR 24HR STORM EXISTING CONDITION

*RAINFALL TYPE=2 0.0 1.50 1.90 2.20
                                                                                                                                                  DT=0.05
                                                                                                                                                  DT=0.05
  *RAINFALL 1192 1.30 2.30
**S 50 YEAR 24HR STORM EXISTING CONDITION
*RAINFALL TYPE=2 0.0 1.75 2.10 2.50
*S 100 YEAR 24HR STORM EXISTING CONDITION
                                                                                                                                                  DT=0.05
  *RAINFALL
                                                      TYPE=2 0.0 1.87 2.20 2.66
  **S PMP GENERAL STORM
  *RAINFALL TYPE=4 0.0 6.0 12.0 19.0
                                                                                                                                                  DT = 0
   * HYDROLOGIC MODEL FOR BORREGA DIVISION SYSTEM
                                                          INPUT FILE HYDRO: [H9027610] BORCHAN_24HRE.HYM
                                                           100-YEAR STORM
                                                           24-hour STORM
                                                          EXISTING CONDITIONS
ORIGINATED 5/13/91 BY D. GREGG
REVISED 9/11/91 BY C. HOOVER
                                                           BOHANNAN-HUSTON, INC.
        SUMMARY
    *************
       HYDROLOGY BASED SECTION 22.3 OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, FOR THE CITY OF ALBUQUERQUE NEW MEXICO AUGUST 14, 1991
                 24-hour rainfall distribution based on NOAA Atlas 2
NFALL TYPE=2 RAIN QUARTER=0.0 RAIN ONE=1.91
RAIN SIX=2.24 RAIN DAY=2.68 DT=.05
    **RAINFALL
     * COMPUTE HYD ABOVE AP 101 BASIN 7-A
                                                        CODE=1 BK=1.15

ID=1 HYD=101.1 DA=0.154 SQ MI

PER A=74.4 PER B=25.6 PER C=0.0 PER D=0.0

TP=-0.1344 RAIN=-1
     *S BULK FLOWS 15%
    SEDIMENT BULK
    COMPUTE NM HYD
    PRINT HYD
                                                          ID=1
                                                                              CODE=10
    * ROUTE OLF FROM AP 101 TO AP 102
COMPUTE RATING CURVE ID=1 VS NO=1 PELMIN=52 ELMAX=58
                                                                                                               NO SEGS=3
                                                                                                             FP SLP=.0338
                                                          CH SLP=.0338
                                                                                                                           AHYMO Input - Existing - Page 1
```

Br100e1b

```
NO SEGS=3
COMPUTE RATING CURVE ID=1 VS NO=1
                       ELMIN=43.8 ELMAX=50
CH SLP=.0289 FP
N=.035 STA=117 N=.03
                       ELMIN=43.8
                                            FP SLP=.0289
                                                                   N=.035 STA=259
                                            N=.035 STA=240
                                                                            ELEV
                                                                   DIST
                                           DIST
                                                    ELEV
                       DIST
                                ELEV
                                                                   130
                                                                            46
                                                     48
                                50
                       100
                                                                            43.8
                                                     43.8
                                                                   182
                       133
                       190
                                44
                                            220
                                                     46
                                49
                       ID=4 REACH=1
L=1696 SLP=.0289
ID=4
                       259
COMPUTE TRAVEL TIME ID=4
                                                NO VS=1
ROUTE
                        INFLOW ID=3
                                         DT=.05
* ROUTED OLF AT AP 105
                                   CODE=10
                       ID=4
PRINT HYD
ID=1 CODE=10
PRINT HYD
* ADD COMBINED ROUTED OLF FROM BASINS 7-K AND 7-B TO BASIN 7-E
                      ID=4
                                  HYD=105.3
ADD HYD
                       ID=1
                                   ID=4
PRINT HYD
                       ID=4
* COMPUTE HYD ABOVE AP 106 BASIN 7-D

COMPUTE NM HYD ID=1 HYD=106.1 DA=0.09702 SQ MI

PER A=79.7 PER B=20.3 PER C=0.0 PER D=0.0

TP=-0.1684 RAIN=-1
                                CODE=10
                        ID=1
 PRINT HYD
 * ADD OLF FROM BASINS 7-K, 7-B, AND 7-E TO BASIN 7-D
                       ID=4 HYD=106.3
ID=1 ID=4
 ADD HYD
                                   CODE=10
 PRINT HYD
 * ROUTE FLOW FROM BASINS 7-K, 7-B, 7-E, AND 7-D THROUGH BASIN 7-F TO AP 102
COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=3

ELMIN=26 ELMAX=34
                       ELMIN=26 ELL

CH SLP=.0310
N=.035 STA=263 N=.035
DIST ELEV DIST
100 34 170
28 305
366
N
                                            FP SLP=.0310
N=.035 STA=366
DIST ELEV
                                                                    N=.035 STA=380
                                                                    DIST
                                                                             ELEV
                                                      32
                                                                    263
                                                                             30
                                                                    328
                                                                             26
                        346 28 366

ID=3 REACH=1

L=613 SLP=.0310

ID=3 HYD=106.4
                                                                              30.8
                                                                    380
                                                      3.0
                                                NO VS=1
 COMPUTE TRAVEL TIME ID=3
 ROTTE
                        INFLOW ID=4
                                          DT=.05
 * ROUTED OLF AT AP 102
                        TD=3
                                   CODE=10
 PRINT HYD
 COMPUTE NM HYD
 PRINT HYD
                        ID=1
                                CODE=10
  * ADD OLF FROM BASINS 7-K, 7-B, 7-E AND 7-D TO BASIN 7-F
                                HYD=107.3
                        ID=3
 ADD HYD
                         ID±1
                                    ID=3
                                    CODE=10
  PRINT HYD
                         ID=3
  * ADD OLF FROM BASINS 7-K, 7-B, 7-E, 7-D AND 7-F TO OLF FROM BASINS 7-A AND 7-C
                                 HYD=107.4
                         ID=2
  ADD HYD
                         ID=2
                                    ID=3
  PRINT HYD
  * ROUTE FLOW ABOVE AP 107 THROUGH BASIN 7-H COMPUTE RATING CURVE ID=1 VS NO=1 NO S
                        LU=1 VS NO=1
ELMIN=46 EIMIT
                                               NO SEGS=3
                                       ELMAX=51.3
                         CH SLP=.0236
N=.035
STA=119
N=.035
STA=181
DIST
ELEV
DIST
ELEV
ELEV
                                                                     DIST
                                                                              ELEV
                                                                     131
                                              119
159
                                                     50
46
                                                                              48
                         100
                                  50.4
                                                                            48.
                                                                     172
                                                     AHYMO Input - Existing - Page 3
```

```
Br100e1b
                                          ELEV
                                                     DIST
                                                            ELEV
                                  DIST
                         ELEV
DIST
                                                     40
* ROUTED OLF FROM AP 110
                  ID=4
                            CODE=10
PRINT HYD
** SLH *** AP52 INFLOW INTO 60" PIPE

* ADD OLF FROM AP 110 TO BASIN 7-I AT AP 111
ADD HYD

ID=4
HYD=BR100E1B.HYD
ID=1
ID=4
PRINT HYD
TD=4
CODE=10
                      ID=4
PUNCH HYD
FINISH
```

(s16.66H AHYMO PROGRAM INPUT FILE =	16.66H AHYMO PROGRAM SUMMARY TABLE (AHYMO INPUT FILE = x:\public\projects\99	LE (AHY ojects\	_   0	7) - 9\ahym\exi	97) - 99\ahym\exist\BR100e1b.dat	ı	VERSION: 1997	.02c U	RUN DATE (USER NO. = P	MON/DAY/ HYMO-I-9	(MON/DAX/YR) =02/04/2000 AHYMO-I-9702a01000C05-AH	/2000 105-AH
COMMAND	HYDROGRAPH IDENTIFICATION	FF APH I		TO NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION	1 N
START *S *S BORR	EGA WATERSHED								1		TIME=	00.
*S *S 100-YR, 2' *S FILE NAME	4-HR STORM WIT BRIOCEIB.DAT	rh SED] I (EX)	IMENT ESTIN	3 CONDITIONS)	ONS)							
*S BY: RICHA *S LAST REVI: *S < <rev 12="" <="" td=""><td>RD STOCKTON SION: 05-14-9( 99 BY WCEA. 1</td><td>6 REMOVEI</td><td>BAS:</td><td>IN 6B BECA</td><td>BECAUSE IT DON</td><td>DOES NOT FLOW TO HUBBELL</td><td>о ниввегг</td><td></td><td></td><td></td><td></td><td></td></rev>	RD STOCKTON SION: 05-14-9( 99 BY WCEA. 1	6 REMOVEI	BAS:	IN 6B BECA	BECAUSE IT DON	DOES NOT FLOW TO HUBBELL	о ниввегг					
*S UNDER EX: *S THE PURPO: *S BASIN. FI	ISTING CONDIT. SE OF THIS MOI LOWS FROM THIS	IONS.>> DEL IS S BASIN	TO CL		THE RUNOFF TO HUBBLE I	· FROM THE BORREGA LAKE DETENTION FA	4 THE BORREGA DETENTION FACILITY		·			
*S *S ANALYSIS 'S *S 1. ALL LA	ASSUMPTIONS: ND IN THIS BAS	SI NIS	MODE	LED AS EX.	EXISTING CON	CONDITION.						
*S 2. THE PUI *S HYDROGI *S AA100E	NCH HYD COMMAI RAPH COULD BE 1B.DAT, WHICH	ND WAS USED 1	ADDEI IN THI	D TO THE DE AMOLE DE	O THE END OF THIS FILE S MOLE DEL NORTE EXISTING IN THE ANALYSIS OF THE S	FILE S STING THE A	SO THE OUTFALL GONDITIONS MODEL AMOLE ARROYO SYSTE					
*S  *S  *BULKING FACTOR OF 15% HAS BEEN ADDED  *S  TO PRODUCE SEDIMENT. A BULKING FACTOR  *S  TO PRODUCE SEDIMENT. A BULKING FACTOR  *S  DEVELOPED SUB-BASIN THAT WOULD PROBIBL  *S  AND SCHOOL PLAY GROUNDS. AND, NO BULK  *S  *S  *S  *S  *S  *S  **S  **S  **	A BULKING FACTOR OF 15% HAS BEEN ADDED TO EACH UNDEVELOPED SUB-BASII A BULKING FACTOR OF 6% HAS BEEN ADDED TO EACH DEVELOPED SUB-BASIN LO PRODUCE SEDIMENT. A BULKING FACTOR OF 3% HAS BEEN ADDED TO EACH DEVELOPED SUB-BASIN THAT WOULD PROBIBLY PRODUCE SEDIMENT, SUCH AS PAND SCHOOL PLAY GROUNDS. AND, NO BULKING FACTOR FOR WELL DEFINED DEVELOPED PLAY GROUNDS.	15% HJ 6% HAS . A BU THAT V	AS BES S BEES JLKING WOULD AND	EN ADDED TO TO TABLE TO	TO EACH UNI D EACH DEVI OF 3% HAS I PRODUCE SI	N ADDED TO EACH UNDEVELOPED SUB-BASIN AND ADDED TO EACH DEVELOPED SUB-BASIN LIKELY FACTOR OF 3% HAS BEEN ADDED TO EACH PROBIELY PRODUCE SEDIMENT, SUCH AS PARKS NO BULKING FACTOR FOR WELL DEFINED RESIDEN	PED SUB-BASIN AND SUB-BASIN LIKELY DDED TO EACH I, SUCH AS PARKS ELL DEFINED RESIDEN					
*S 100 YEAR 24HF	24HR STORM EX	ISTING	COND	ITION					. *		RAIN24=	2.660
*S BULK FLOWS 15%	158 158										PK BF =	1.15
COMPUTE NM HYD	XD 101.10		, ,	.⊣ (	.15400	169.57	4.626	.56327	25.0	1.721	PER IMP=	00.
ROUTE COMPUTE NM HYD			٠,	7 H	.19530	155.27		53942			PER IMP=	00.
ADD HYD COMPUTE NM HYD			. Kr (2)	1 7	.34930	71.53		68892		2.070	PER IMP=	00.
ROUTE COMPUTE NM H			H .	e H	.05400	50.37 58.19		.76631		2.317	PER IMP=	00.
		104.30	1 3& 4	<b>4.</b> E	.03925	40.11 90.48	1.604 3.588	.76633	1.600	1.597		
ROUTE			ю,	4-	.09325	67.57		.72150		1.132 $1.214$	PER IMP=	00.
2			16.4	<b>ੀ</b> ਵਾਜ	.27195	184.85	•	.60014	• •	1.062	PER IMP=	00.
TE NM YD	HYD 106	П	1 78 44	<b>ন বা</b> ণ	36897	264.76		.58711	•			
ROUTE COMPUTE NM H	106 HYD 107	.40	4,	m⊢	.01146	10.85		. 50526		1.479	PER IMP=	00.
	107	. 30	16 3 26 3	r 2	804 297	273.32	11.862 22.107	.58465	1.600	.12		
ROUTE COMPUTE NM HYD	107	.50	7 <sub>1</sub>	нз	.21455	395.29 124.22		.50526	1.650	. 905	PER IMP=	00.
					AHYMO Su	Summary - Existing	ing - Page 1					

00.	_,	0.60
PER IMP=	PAGE = 2 NOTATION	PER IMP=
.849	CFS PER ACRE	. 852 . 853 . 954 . 744 . 744
1.700	TIME TO PEAK (HOURS)	1.700 1.700 1.650 1.650 1.650
.55377	RUNOFF (INCHES)	.54714 .54714 .54714 .64295 .54295 .53091 .54577
27.889 5.251	RUNOFF VOLUME (AC-FT)	33.140 33.140 4.946 33.140 2.972 36.112
Br100e1b 512.92 112.06	PEAK DISCHARGE (CFS)	618.93 619.85 611.60 99.58 544.67 56.66
.94428	AREA (SQ MI)	1.13568 1.13568 1.13568 1.13568 1.13568 1.24063
3 3 1 CHANNEL	TO IO NO.	ਲਿਖਾਲਜਥਾਜ ਥਾ
	FROM ID NO.	16.3 3 4 - 3 3 3 1 10.4
108.30 16 109.10 - HEAD OF DIVERSION	HYDROGRAPH IDENTIFICATION	109.30 109.40 109.50 110.10 110.40 111.10 INFLOW INTO 60 BRIOOEIB.HYD
ADD HYD 108.30 16. COMPUTE NM HYD 109.10 - *S LH *** AP51 HEAD OF DIVERSION	COMMAND	ADD HYD 109.30 12.3  ROUTE 109.40 3  ROUTE 109.50 4  COMPUTE NM HYD 110.10 -  *S LH *** AP52 INFLOW INTO 60" PIPE ADD HYD BR100E1B.HYD 12.4  FINISH (510H

```
Bor_revb .
START
                    0.0 HOURS PC=0 PL=-1
  << WILSON&COMPANY (WCEA) AHYMO ANALYSIS FOR DESIGN OF THE BORREGA DAM.
*S
    BASED ON LEEDSHILL AHYMO MODEL FOR THE AMOLE-HUBBELL DMP (A-H DMP).
     THE LEEDSHILL MODEL WAS BASED ON THE '92 BHI AHYMO MODEL.
*S
* S
   FILENAME: BOR_REVB.DAT - POST-PROJECT CONDITIONS
*s
                                 ONLY PAAKWEREE IS DEVELOPED
*S
                                 FOR BASINS W OF 118TH ST - SEDIMENT BULK 15%
* S
*S
   WCEA CHANGES TO THE AMOLE-HUBBELL DMP (A-H DMP) MODEL NOTED WITH "<< >>".
   MODIFICATIONS INCLUDE MUSKINGUM CUNGE ROUTING. ALSO DIVERTED THE
   A-H DMP SOUTH POWERLINE BASINS 50105 WEST, 50103, AND 50104
   UNDER EXISTING CONDITIONS FLOW BULKED 15% & CONVEYED THEM TO THE
   PROPOSED NORTH BORREGA CHANNEL THROUGH PAAKWEREE AND ON EAST TO THE
   PROPOSED BORREGA DAM. (8/99 BY NM OF WCEA)
    WCEA ADJUSTED THE FOLLOWING IN THE A-H DMP AHYMO MODEL:
      AREAS: 50109 WAS INCREASED FROM 0.1914 TO 0.2344
             50110 WAS REDUCED FROM 0.105 TO 0.0826
             BASINS 105 & 106 CUT OFF AT 118TH ST EMBANKMENT
      TP'S: 50105 WAS RECALCED DUE TO SUBDIVISION OF BASIN
            50106 WAS RECALCED DUE TO SUBDIVISION OF BASIN
    NOTE 1: 50103 & 50104 LABELS WERE SWITCHED IN THE A-H MAP. IN THE
     A-H AHYMO, 7B=BASIN 104 AND 7K=BASIN 103, WHICH MATCHES THE
     ORIGINAL BHI MODEL.
    NOTE 2: WCEA MODIFIED THE BASIN 50201 BOUNDARY.
     THE BASIN 50201 AREA IS 0.1473 SQ MI IN THE A-H DMP & BHI AHYMO MODELS,
     BUT THE A-H MAP MEASURED 0.238 SQ MI. THE BHI MAP USED 2-FT CONTOURS, WHILE THE A-H MAP USED 5-FT CONTOURS. WCEA DECREASED THE 50201 AREA
     ON THE A-H MAP TO MATCH THE BHI BASIN MAP FOR BASIN 50201.
*S
*S
*S
        BORREGA WATERSHED
*S
*S
* 100-YR, 24-HR STORM
* FILE NAME: BR DMP1.DAT (Final Draft Submittal #3)
* BY: RICHARD STOCKTON
* LAST REVISION: 06-03-98
* THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF FROM THE BORREGA
  BASIN. FLOWS FROM THIS BASIN IS CONVEYED TO HUBBLE LAKE DETENTION FACILITY
  VIA THE BORREGA DIVERSION CHANNEL.
* 2 YEAR 24HR STORM
                      TYPE=2 0.0 0.74 0.95 1.15
*RAINFALL
  5 YEAR 24HR STORM
                      TYPE=2 0.0
                                  1.00 1.30 1.60
                                                        DT=0.05
*RAINFALL
  10 YEAR 24HR STORM
                                                        DT=0.05
                      TYPE=2 0.0 1.25 1.47 1.77
*RAINFALL
  25 YEAR 24HR STORM
                                                        DT=0.05
*RAINFALL
                      TYPE=2 0.0 1.50 1.90 2.20
  50 YEAR 24HR STORM
 *RAINFALL
                      TYPE=2 0.0 1.75 2.10 2.50
                                                        DT=0.05
 *S 100 YEAR 24HR STORM POST-PROJECT CONDITION
RAINFALL
                     TYPE=2 0.0 1.87 2.20 2.66
                                                       DT=0.05
 * PMP GENERAL STORM
                      TYPE=4 0.0 6.0 12.0 19.0
                                                        DT = 0.05
 *RAINFALL
 * PMP LOCAL STORM
 *RAINFALL
                        TYPE=3 0.0 11.5 16.0
                                                  0
                                                       DT = 0.05
 *S****************
   <<THE WCEA ANALYSIS OF BASINS B-2 AND B-4 WEST IS TAKEN FROM AHYMO FILE
     FILE NAME: RB100E1B.DAT (EXISTING CONDITIONS) FROM A-H DMP,
     TO OBTAIN EXISTING FLOW AT THE SW CORNER OF 118TH & RIO BRAVO BLVD.
    WCEA REDUCED THE AREAS OF BASINS B-2 AND B-4 TO MODEL THE BASINS SOUTH OF
     RIO BRAVO: B-2 WAS REDUCED FROM 0.0754 TO 0.0445, AND B-4 WAS REDUCED
     FROM 0.190 TO 0.0641. >>
 * GENERATION OF SEDIMENT LIKELY, BULK FLOWS 15\%
 SEDIMENT BULK
                         CODE=1
                                  BK=1.15
 *S COMPUTE HYDROGRAPH FOR B-2
                         ID=2 HYD NO=204.0 DA=0.0445 SQ MI
 COMPUTE NM HYD
                         %A=100.0 %B=0.0 %C=0.0 %D=0.0
TP=0.1333 HR
                          MASS RAINFALL=-1
 PRINT HYD
                         ID=2 CODE=1
 **LH* *S NOTE: DO NOT ROUTE, SINCE FLOW RUNS AWAY FROM ROADWAY
**LH* *S FLOW REACHES HUBBLE LAKE IN ARROYO THROUGH BASINS B-4 AND B-6
 *S ROUTE ADD BY LH - ROUTE B-2 THROUGH B-4
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEGS=1
 COMPUTE RATING CURVE
                          MIN ELEV=100.0 FT MAX ELEV=106.0 FT
```

CH SLP=0.0386 FP SLOPE=0.0386

Revised

AHYMO Input - (Post Project) - Page 1

```
*S <<ADD 50105 WEST TO ROUTED OLF
                                 HYD=105.1
ADD HYD
                     TD=12
                                ID=12
                     TD=1
                     ID=12
                                 CODE=1
PRINT HYD
*S << ROUTE SOUTH ALONG 118TH/POWERLINE THRU BASIN 50106
    ASSUMED EARTHEN CHANNEL SECTION, 10 FT BOTTOM 3:1 SIDE SLOPES>>
                          CID=1 VS NO=1 NO SEGS=1
COMPUTE RATING CURVE
                          MIN ELEV=100.0 FT MAX ELEV=105.0 FT
                          CH SLP=0.01 FP SLOPE=0.01
                          N=0.030 DIST=40
                                          DIST
                                                            DIST
                                                                     ELEV
                          DIST
                                ELEV
                                                   ELEV
                                                  100.0
                                                            25.0
                                                                     100.0
                          0
                                  105.0
                                           15.0
                          40.0
                                  105.0
                          ID=12 REACH NO=2 NO VS=1 L=1000 FT
COMPUTE TRAVEL TIME
                          SLP=0.01
                          OUTFLOW ID=2 OUTFLOW HYD=106.1 INFLOW ID=12 DT=0.0
ROUTE MCUNGE
                          L=1000 NS=0 S=0.01
PRINT HYD
                          ID=2 CODE=1
SEDIMENT BULK
                      CODE=1 BK=1.15
*S BASIN NO. 50106
*S << BASIN CUT OFF AT 118TH/POWERLINE TO DIVERT SOUTH, CALCED NEW AREA & TP

* << L-H AREA FOR 50106 WAS 0.09702, TP WAS .1505>>

COMPUTE LT TP LCODE = 1 UPLAND/LAG TIME METHOD
COMPUTE LT TP
                                   ISLOPE = 0
                      NK = 3
                                         SLOPE = 0.100 K = 0.7
                      LENGTH = 400 FT
                                        SLOPE = 0.063 K = 2.0
SLOPE = 0.047 K = 3.0
                      HYD=106 DA=0.0856 SQ MI
                      ID=3
COMPUTE NM HYD
                      PER A=79.7 PER B=20.3 PER C=0
                                                              PER D=0
                      TP=0.0 RAIN=-1
PRINT HYD
                      ID=3
                              CODE=1
 *S <<ADD 50106 TO ROUTED OLF FROM BASINS 50103,50104,50105WEST
 *S << TOTAL FLOW AT UPSTREAM END OF PROPOSED N BORREGA CHANNEL >>
                                 HYD=106.2
                      ID=2
 ADD HYD
                      ID=3
                                 ID=2
                                 CODE=1
 PRINT HYD
                      ID=2
 *S ROUTE FLOW THRU NPROPOSED BORREGA CHAN TO 48" PIPE UPSTRM OF AVESTRUZ ST
 *S << ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
                              VS NO=1
                                         NO SEGS=1
 COMPUTE RATING CURVE ID=1
                       ELMIN=100
                                   ELMAX=106
                       CH SLP=.05
N=.017 DIST=34
                                         FP SLP=.05
                                                                DIST
                                                                         FLEV
                       DIST
                                ELEV
                                          DIST
                                                   VH.TH
                        0
                                106
                                           12
                                                   100
                                                                22
                                                                         100
                        34
                                106
                                   REACH=1
                                                 NO VS=1
 *COMPUTE TRAVEL TIME ID=14
                                 SLP=.05
                        L=700
 ROUTE MCUNGE
                        ID=14
                                  HYD=106.3
                       INFLOW ID=2 DT=(
L=700 NS=0 S=0.02
                                      DT=0
                                    CODE=1
 PRINT HYD
                       ID=14
 *S << PAAKWEREE BASIN C >>
 ** NO BULKING FACTOR THIS BASIN
                         CODE=1 BK=1.0
                      _ mrD=BASIN_C DA=0.0138 SQ MI
PER A=0 PER B=30 PER C=42 PER D=28
TP=-0.1333 RAIN=-1
ID=1 CODE=^
 SEDIMENT BULK
 COMPUTE NM HYD
 PRINT HYD
 *S <<TOTAL FLOW IN CHAN UPSTRM OF 48" PIPE, AT AVESTRUZ ST
                                  HYD=106.31
 ADD HYD
                       ID=14
                                 ID=14
                       ID=1
                                  CODE=1
 PRINT HYD
                       ID=14
 *S << PAAKWEREE BASIN A >>
                       CODE=1 BK=1.0
 ** NO BULKING FACTOR THIS BASIN
                       ID=1 HYD=BASIN_A DA=0.0513 SQ MI
PER A=0 PER R=40
 **SEDIMENT BULK
 COMPUTE NM HYD
                       PER A=0 PER B=40 PER C=55 PER D=5
TP=-0.1333 RAIN=-1
 PRINT HYD
                       ID=1
                              CODE=0
 *S <<TOTAL FLOW IN CHAN DNSTRM OF 48" PIPE, AT AVESTRUZ ST
                                 HYD=105E.1
                       ID=14
 ADD HYD
                                   ID=14
                       ID=1
 PRINT HYD
```

```
** << ROUTE FLOW IN PROPOSED N BORREGA CHANNEL
* ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                                    ELMAX=105
                      ELMIN=100
                       CH SLP=.03
                                         FP SLP=.03
                       N=.017 STA=34
                               ELEV
                                          DIST
                                                   ELEV
                                                                DIST
                                                                         ELEV
                       DIST
                                                                         100
                                          12
                                                   100
                                                                22
                               106
                       0
                       34
                               106
                                 HYD=106.4
ROUTE MCUNGE
                       ID=3
                       INFLOW ID=15 DT=0
L=500 NS=0 S=0.03
                                  CODE=1
PRINT HYD
                       ID=3
*S << PAAKWEREE BASIN E >>
** NO BULKING FACTOR THIS BASIN
                            CODE=1 BK=1.0
**SEDIMENT BULK
                      ID=1 HYD=BASIN_E DA=0.0144 SQ MI
PER A=0 PER B=28 PER C=23 PER D=49
TP=-0.1333 RAIN=-1
COMPUTE NM HYD
                      ID=1
                              CODE=0
PRINT HYD
                      ID=15
                                 HYD=106.5
ADD HYD
                                  ID=1
                      ID=3
PRINT HYD
                      ID=15
                                  CODE=1
** << ROUTE FLOW IN PROPOSED N BORREGA CHANNEL TO PERDIZ ST
 * ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                       ELMIN=100
                                   ELMAX=105
                       CH SLP=.03
                                          FP SLP=.03
                       N=.017 STA=34
                       DIST
                                ELEV
                                           DIST
                                                                DIST
                                                                         ELEV
                                106
                                          12
                                                   100
                                                                22
                                                                         100
                       34
                                106
ROUTE MCUNGE
                       ID=3
                                HYD=106.6
                       INFLOW ID=15
                                        DT=0
                       L=300 NS=0 S=0.03
PRINT HYD
                       ID=3
                                  CODE=1
 *S << PAAKWEREE BASIN B >>
                      CODE=1 BK=1.0
 ** NO BULKING FACTOR THIS BASIN
                      ID=1 HYD=BASIN_B DA=0.0641 SQ MI
PER A=0 PER B=28 PER C=23 PER D=49
TP=-0.1333 RAIN=-1
 **SEDIMENT BULK
 COMPUTE NM HYD
 PRINT HYD
                      ID=1
                               CODE = 0
 *S TOTAL FLOW IN PROPOSED N BORREGA CHANNEL AT PERDIZ ST>>
                                  HYD=107.1
 ADD HYD
                       ID=2
                                  ID=3
                       ID=1
                                  CODE=1
 PRINT HYD
                       TD=2
 ** << ROUTE FLOW IN PROPOSED N BORREGA CHANNEL TO GRULLA ST
 * ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>> COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
 COMPUTE RATING CURVE ID=1
                        ELMIN=100
                                    ELMAX=106
                        CH SLP=.03
                                           FP SLP=.03
                        N=.017 STA=34
                                ELEV
                                           DIST
                                                    ELEV
                                                                 DIST
                                                                          ELEV
                        DIST
                                106
                                                    100
                        0
                                            12
                                106
                        34
                        ID=3
                                 HYD=107.2
 ROUTE MCUNGE
                        INFLOW ID=2 DT=
L=900 NS=0 S=0.03
                                        DT = 0
 PRINT HYD
                        ID=3
                                   CODE=1
 *S << PAAKWEREE BASIN F >>
 ** NO BULKING FACTOR THIS BASIN
                            CODE=1 BK=1.0
 **SEDIMENT BULK
                       ID=1
                              HYD=BASIN_F DA=0.0336 SQ MI
0 PER B=28 PER C=23 PER D=-
 COMPUTE NM HYD
                       PER A=0
                                              PER C=23 PER D=49
                       TP=-0.1333
                                     RAIN=-1
                              CODE=0
 PRINT HYD
                       ID=1
                                   HYD=107.3
 ADD HYD
                                   ID=3
 PRINT HYD
                        ID=2
                                   CODE=1
 ** << ROUTE FLOW THRU PROPOSED BORREGA CHANNEL TO PARDAL ST
     ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
 COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                        ELMIN=100
                                     ELMAX=106
                        CH SLP=.03
                                           FP SLP=.03
                        N=.017 STA=34
                        DIST
                                ELEV
                                           DIST
                                                    ELEV
                                                                 DIST
                                                                          ELEV
```

Bor\_revb

```
ELMIN=0
                                   ELMAX=5
                                          FP SLP=.0286
                       CH SLP=.0286
                       N=.032 STA=60
                                ELEV
                                           DIST
                                                    VELEV
                                                                 DIST
                                                                          ET.EV
                                 5
                                           20
                                                     0
                                                                  40
                                                                           0
                         60
                                  REACH=1
                                               NO VS=1
*COMPUTE TRAVEL TIME ID=4
                       L=230
                                  SLP=.0286
                       ID=4
                                  HYD=109.4
*ROUTE
                                 DT=0
                INFLOW ID=3
                                   CODE=1
*PRINT HYD
                       ID=4
** ROUTE FLOW FROM FIRST DROP STRUCTURE TO CONFLUENCE WITH BASIN 6-B
* ASSUME NATURAL ARROYO
*COMPUTE RATING CURVE ID=1
                                VS NO=1
                                            NO SEGS=1
                        ELMIN=0
                                   ELMAX=7
                        CH SLP=.004
                        N=.033 STA=60
                                                                 DIST
                                                                          ELEV
                        DIST
                                ELEV
                                           DIST
                         0
                                 7
                                            28
                                                                  48
                                                                           0
                         76
*S ROUTE FLOW ABOVE AP109 TO CONFLUENCE WITH BASIN 50201
*S << ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 20' BOTTOM
COMPUTE RATING CURVE ID=1 VS NO=1
                                          NO SEGS=1
                       ELMIN=100 ELMAX=106
                       CH SLP=.025
                                         FP SLP=.025
                       N=.017 STA=44
                               ELEV
                                         DIST
                                                   ELEV
                                                                DIST
                                                                         FLEV
                       DIST
                                                                32
                               106
                                          12
                                                   100
                                                                         100
                               106
                                REACH=1
*COMPUTE TRAVEL TIME ID=4
                                               NO VS=1
                        L=1230
                                  SLP=.025
                                HYD=109.5
                       ID=4
ROUTE MCUNGE
                       INFLOW ID=3 DT=0
L=1230 NS=0 S=0.025
PRINT HYD
                       ID=4
                                  CODE=1
*S LH BASIN NO. 50201
*S BASIN 50201 (6B) DOES NOT CONTRIBUTE TO BORREGA DAM UNTIL THE
     BORREGA DIVERSION STORM DRAIN IS BUILT PER THE AMOLE-HUBBELL DMP
** COMPUTE HYD ABOVE AP 110 BASIN 6-B
COMPUTE NM HYD ID=1 HYD=201.0
                                            DA=0.1473 SQ MI
                       PER A=76.9 PER B=0 PER C=22.2 PER D=0.9
                                     RAIN=-1
                       TP=-0.2330
                               CODE=1
PRINT HYD
                       ID=1
*S LH BASIN NO. 50110
** COMPUTE HYD ABOVE AP 111 BASIN 7-I
** COMPUTE HID ABOVE AT THE STATE OF T
                       ID=2 HYD=110.0 DA=0.1018 SQ MI
PER A=88 PER B=0 PER C=10 PER D=2
TP=-0.1333 RAIN=-1
                       ID=2
                               CODE=1
PRINT HYD
** ADD OLF FROM AP 110 TO BASIN 7-I AT AP 111
*S << TOTAL INTO BORREGA DAM >>
                       ID=4 HYD=110.2 ID=2
ADD HYD
 ** TOTAL FLOW AT AP 110 *
 PRINT HYD
                       ID=4
 *S
 **S ***************
    BORREGA DAM PER WCEA DESIGN.
 *5 ***************
 *S BORREGA DAM PHASE "A' PER WCEA DESIGN. NORTH PART NOT FULLY EXCAVATED BECAUSE
     BASIN 6B (50201) AND BASINS TO NORTH (B4EAST, B6) NOT ADDED.
 * << 54" PIPE W/47.5" ORIF INV=5984.7. 350-FT WIDE EMERG SPILLWAY CREST=4997 >>
 *5
                          OUTFLOW
                                    STORAGE
                                                 ELEV
 * S
                           0
                                        0
                                                     4985
                           0.4
                                         2.02
                                                     4986
                           4
                                         7.94
                                                     4987
                           8
                                        14.10
                                                     4988
                           14
                                        20.51
                                                     4989
                           24
                                        27.17
                                                     4990
                           36
                                        34.08
                                                     4991
                           49
                                        41.36
                                                     4992
                           69
                                        49.21
                                                     4993
                                        57.72
67.03
                           163
                                                     4994
 *S
                           174
                                                     4995
 *S
                           184
                                        77.26
                                                     4996
 *S
                           191
                                        88.36
                                                     4997
                                                     4997.1
 *S
                           225
                                        89.51
 *S
                          1252
                                       100.23
                                                     4998
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - INPUT FILE = X:\PUBLIC\PROJECTS\99099\AHYM\POSTPAAK\BOR_REVB.DAT	PAAK\BOR_RE	1	VERSION: 1997.	.02c R	RUN DATE (M USER NO.= AH	(MON/DAY/YR) =04/09/2000 AHYMO-I-9702a01000C05-AH	=04/09/	2000 5-AH
FROM TO HYDROGRAPH ID ID COMMAND IDENTIFICATION NO. NO. (5	AREA DI (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION	н
START  *S << WILSONECOMPANY (WCEA) AHYMO ANALYSIS FOR DESIGN OF THE BORREGA DA  *S BASED ON LEEDSHILL AHYMO MODEL FOR THE AMOLE-HUBBELL DMP (A-H DMP)  *S THE LEEDSHILL MODEL WAS BASED ON THE '92 BHI AHYMO MODEL.	FOR DESIGN OF THE AMOLE-HUBBELL DMP 92 BHI AHYMO MODEL	THE BORREGA D DAP (A-H DMP TODEL.	DAM. IP).			TIME	<b>日</b>	000.
FILENAME: BOR_REVB.DAT - POST-PROJECT ONLY PAAKWERE FOR BASINS W	CONDITIONS, ME IS DEVELOPED OF 118TH ST -	ID - SEDIMENT BULK	LK 15%					
**************************************	* * * * * * * * * * * * * * * * * * * *	*	* * * * * * *					
		* * * * * * * * * * * * * * * * * * *	* * * *					
*S************************************	***	******	k k k k			R.A.1	RAIN24= 2	.660
****** BIII.K	********	*********	* * * *			PK	田子 ==	1.15
PH FOR B-2 2	.04450	42.10	1.199	.50526	1.500	1.478 PER	R IMP=	00.
*S ROUTE ADD BY LH - ROUTE B-2 THROUGH B-4  *S 202.40 2 3  *S	.04450	24.99	1.199	.50530	1.650	.877		
DIMENT BULK						PK	BF ::	1.15
DROGRAPH FOR B-4 << B-4 WEST >> D 205.00 - 2 B-4 TO ROITTED FLOW	.06410	40.86	1.727	.50526	1.600	.996 PER	R IMP=	00.
*S < <flow &="" *s***********************************<="" 118th="" add="" bravo="" corner="" hyd="" of="" rio="" sw="" td="" to=""><td>*</td><td>*</td><td>2.927</td><td>.50527</td><td>1.600</td><td>.941</td><td></td><td></td></flow>	*	*	2.927	.50527	1.600	.941		
103 (7K) FROM	BORREGA < <a< td=""><td>&lt;<a-h 5<="" map="" says="" td=""><td>50104&gt;&gt;</td><td></td><td></td><td></td><td>BF ==</td><td>1.15</td></a-h></td></a<>	< <a-h 5<="" map="" says="" td=""><td>50104&gt;&gt;</td><td></td><td></td><td></td><td>BF ==</td><td>1.15</td></a-h>	50104>>				BF ==	1.15
103.00 - 1	.05400	71.53	1.984	.68892	1.500	2.070 PER	R IMP=	00.
ALINE 1 13		71.08	1.977	.68646	1.650	2.057 CC	CCODE =	<del>-</del> :
(7B) FROM 1	BOKKEGA < <a-h< td=""><td>58.27</td><td>1.606</td><td>.76631</td><td>1.500</td><td>2.317 PER</td><td>R IMP=</td><td>00.</td></a-h<>	58.27	1.606	.76631	1.500	2.317 PER	R IMP=	00.
ROUTE TO 118TH CORRIDOR/POWERLINE JTE MCUNGE 104.50 1 14 ADD THE ROUTED FLOWS FROM SUB-BASIN 103 TO	.03930 THE ROUTED 1	57.84 FLOWS	1.601	.76365	1.700	2.300 CC	CCODE =	ਜ਼
13 12 (mm)	.09330	124.65	3.578	.71896	1.700	2.088		
LUS (WEST) 1	FROM BORKEGA	131.30	4.045	.53681	1.550	1.452 PER	R IMP=	00.
	.23460	213.31	7.623	.60925	1.650	1.421		
*S < <route along="" ban<br="" funekline="" libth="" south="" thku="">ROUTE MCUNGE 106.10 12 2 SEDITAMENT BITIK</route>	.23460	210.59	7.630	.60982	1.700	1.403 CC	CCODE = PK BF =	1.15
50106 UT OFF AT 118TH/POWERLINE TO D 106.00 - 3	DIVERT SOUTH, CA	CALCED NEW AREA 82.37	A & TP 2.514	.55059	1.550	1.504 PER IMP	R IMP=	00.
	, no. 1	100-100	1 00.00					

Rewised (Post Project) 100-yr - Page 1

Bor\_revb

\*S << ADD 50106 TO ROUTED OLF FROM BASINS 50103,50104,50105WEST

\*S << TOTAL FLOW AT UPSTREAM END OF PROPOSED N BORREGA CHANNEL >>

1.00 1.00 1.15 ۰. ? 3 00 ٥. 7 1.00 5.00 00. 49.00 49.00 49.00 N NOTATION PK BF = PER IMP= IMP= PK BF = 3.003 PER IMP= 3.329 PER IMP= PER IMP= PER IMP= PER IMP= PER IMP= PER IMP= 1.640 PER IMP= II PAGE 1.296 1.281 CCODE Ħ CCODE CCODE CCODE CCODE CCODE CCODE 1.278 CCODE CCODE PER PK PK 1.219 1.351 .800 1.018 3.329 1.280 1.441 2.585 3.328 3.328 1.288 3.328 .894 1.058 1.018 1.280 ACRE CFS PER 1.550 1.8501.500 1.550 1.550 1.550 1.550 1.550 1.550 1.550 1.650 1.500 1.500 1.500 1.700 1.500 1.500 1.800 1.500 1.600 TIME TO PEAK (HOURS) 1.650 1.700 1.500 1.59741 .77340 .80617 .56327 .73439 .66082 .53942 .55006 .63482 63482 65474 1.59742 .77093 .77108 1.59742 43936 .59398 .59236 91999 1.59741 .65474 .59741 1.28597 .62101 (INCHES) RUNOFF ^ 37.536 37.549 2.863 32.626 32.632 29.758 29.763 (AC-FT) 13.579 4.626 TRIB) 1.227 23.070 24.297 24.297 5.461 2.999 35.631 .946 1.227 1.905 11.062 3.674 8.264 10.144 10.116 RUNOFF VOLUME 2.517 UPSTRM OF AVESTRUZ ST NEW TP MPUTE NM HYD 102.10 - 1 .12770 134.02 << FLOW INTO THE UPSTREAM END OF THE CULVERT UNDER PAVO ST.(S BORREGAD HYD S\_CULV 1&10 5 .28170 161.21 MPUTE NM HYD 108.00 - 1 .08130 41.64 << TOTAL FLOW DNSTREAM OF PAAKWEREE IN PROPOSED N BORREGA CHANNEL>> D HYD 754.81 UTE MCUNGE 108.40 2 3 .91000 745.82 OLD AREA 0.2146 SQ MI, CALC PROPOSED (BELL PROPERTY) >> << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >> 71.56 653.95 649.50 716.39 315.67 315.67 30.68 443.75 **4**71.12 **4**71.12 26.52 30.68 590.11 74.97 DISCHARGE 261.98 84.88 136.51 592.91 264.01 273.71 (CFS) ST>> AT PARDAL ST>> ST SŢ .01380 AT AVESTRUZ : AT AVESTRUZ .38530 AT PERDIZ .75990 ) HYD 106.20 3& 2 2 .32020 ROUTE FLOW THRU NPROPOSED BORREGA CHAN TO 48" FIPE .01440 .69580 .69580 .03360 .79350 .79350 82870 .15400 .01440 .68140 .68140 38530 .06410 .75990 .03520 AREA (SQ MI) .32020 05130 CHANNEL 2 3 BORREGA CHANNEL 1 48" PIPE, TRIB>> PIPE, HALF RESIDENTIAL/HALF GOLFCOURSE OFF AT PAAKWEREE BNDRY, 15 ខ្ពះទ 1.4 15 2 6 COMPUTE NM HYD BASIN\_A - 1
\*S <<TOTAL FLOW IN CHAN DNSTRM OF 48" ] ADD HYD DI 5£ 1 15 ts <<FLOW IN CHAN DNSTRM OF S BORREGA COMPUTE NM HYD BASIN\_G -\*S TOTAL FLOW IN PROPOSED N BORREGA ADD HYD 107.50 1& 3 ROUTE MCUNGE 107.60 2 1514 1.8.3 \*S <<TOTAL FLOW IN CHAN UPSTRM OF 4 ADD HYD 1614 106.35 15&13 'n 유 당 당 ~ . Я 15 <u>1</u> 105E.1 106.33 \*S TOTAL FLOW IN PROPOSED N 107.10 107.20 101.10 201.10 BASIN\_D 106.50 106.60 106.40 HYDROGRAPH IDENTIFICATION BASIN C << PAAKWEREE BASIN A >>
dPUTE NM HYD BASIN\_A BASIN\_B BASIN\_F 107.30 107.40 \*S << PAAKWEREE BASIN B >> BASIN F >> \*S << PAAKWEREE BASIN G >> PAAKWEREE BASIN D >> << PAAKWEREE BASIN C >> ROUTE MCUNGE \*S LH BASIN NO. 50108 \*S << BASIN CUT OFF AT 50102 LH BASIN NO. 50101 \*S << PAAKWEREE LH BASIN NO. COMPUTE NM HYD SEDIMENT BULK SEDIMENT BULK SEDIMENT BULK ROUTE MCUNGE ADD HYD ADD HYD ADD HYD ADD HYD ADD HYD ري ×

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	00.	m Z	1.	06.	2.00																				18.238	c		00.		
	PER IMP=	PAGE = NOTATION	CCODE =	PER IMP=	PER IMP=																				1 AC-FT= 3	1 3000	1000	7 PER IMP= 3		
	1.003	CFS PER ACRE	1.224	1.042	1.492	1.213																			.054	7 4 6		1.357		
	1.600	TIME TO PEAK (HOURS)	1.600	1.600	1.500	1.600																			2.750	ć	7.300	1.500		
	.44734	RUNOFF (INCHES)	.70683	.54747	.51796	.69056																			.54770		. 54047	.46166		
	5.592	RUNOFF VOLUME (AC-FT)	43.141	4.301	2.812	45.897		ATED BECAUS																	36.402	١.	36.251	.933		
Bor_revb	150.53 AT AP 109	PEAK DISCHARGE (CFS)	896.35 BOTTOM 890.74	DAM UNTIL THE AMOLE-HUBBELL DMP 98.24	97.20	967.14		DESIGN. NORTH PART NOT FULLY EXCAVATED BECAUS NORTH PART NOT FULLY																	43.42	,	43.42	32.92		
	.23440 CHANNEL	AREA (SQ MI)	1.14440 IBASIN 50201 SLOPES, 20' 1.14440	BORREGA DAM PER THE AMOI .14730	.10180	1.24620	**************************************	NORTH PART N	2	4985	4986	4.988	4989	4990	4 4	4993	4094	4996	4997	4997.1	4999	5000	5007 5002	5003	1.24620	,	1.24620	.03790		
,	1 EGA ARROYO	NO.	3 ENCE WITH 2:1 SIDE	CONTRIBUTE TO RAIN IS BUILT - 1	73	4	1	A DESIGN.	딦	0	2.02	14.10	20.51	27.17	41.36	49.21	57.72	77.26	88.36	89.51	112.77	125.94	139.90	169.38	66		4	01 0	   *   *	
	. 1 N BORREGA	FROM ID NO.	16 3 CONFLU	CONTR DRAIN	ı	>> 26. 4	GN.	WCEA	OT CATE																4	*	<b>6</b>	48.2	522 * 1	
	50109 109.10 IN PROPOSED	HYDROGRAPH IDENTIFICATION	109.30 1£ 3 7 ABOVE AP109 TO CONFL CONC CHANNEL SECTION, 109.50		. 50110 110.00	O BORREGA DAM 110.20	BORREGA DAM PER WCEA DESIGN.	**************************************	OUTFLOW	0	4.0	<b>≠</b> ∞	14	24	0 <b>7</b>	69	163	184	191	225	3176	5667	8620	15667		** SI	110.50		HYD IS ****AI	
	*S LH BASIN NO. COMPUTE NM HYD *S << TOTAL FLOW	COMMAND	*S ROUTE FLOW ABOVE AP109 TO CONFLUENCE *S < <assumed 2:1="" channel="" conc="" mcunge<="" route="" s="" section,="" td=""><td>*S LH BASIN NO. 50201  *S BASIN 50201 (6B) D  *S BORREGA DIVERSION  COMPUTE NM HYD</td><td>*S LH BASIN NO. COMPUTE NM HYD</td><td>*S &lt;&lt; TOTAL INTO BORREGA DAM ADD HYD</td><td></td><td></td><td></td><td>* . w</td><td><b>S</b> 1</td><td>νι εν * *</td><td>۲ *</td><td><b>S</b>* *</td><td>ν2 (V * *</td><td>* •</td><td>* ÷</td><td>vs vs * *</td><td>۲ دی د</td><td>ໝ ! * ÷</td><td>מט מי *</td><td><b>1</b>02</td><td>ب ب ب</td><td>ν * * ν τν</td><td>ROUTE RESERVOIR</td><td>*S HYD=BPOND.OUT</td><td>ROUTE MCUNGE</td><td></td><td>*S HYDER DMP1.HYD IS ****AP</td><td>(slon</td></assumed>	*S LH BASIN NO. 50201  *S BASIN 50201 (6B) D  *S BORREGA DIVERSION  COMPUTE NM HYD	*S LH BASIN NO. COMPUTE NM HYD	*S << TOTAL INTO BORREGA DAM ADD HYD				* . w	<b>S</b> 1	νι εν * *	۲ *	<b>S</b> * *	ν2 (V * *	* •	* ÷	vs vs * *	۲ دی د	ໝ ! * ÷	מט מי *	<b>1</b> 02	ب ب ب	ν * * ν τν	ROUTE RESERVOIR	*S HYD=BPOND.OUT	ROUTE MCUNGE		*S HYDER DMP1.HYD IS ****AP	(slon

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START 0.0 HOURS PC=0 PL=-1
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*S << WILSON&COMPANY (WCEA) AHYMO ANALYSIS FOR DESIGN OF THE BORREGA DAM.
     BASED ON LEEDSHILL AHYMO MODEL FOR THE '99 AMOLE-HUBBELL DMP (A-H DMP).
* S
     THE LEEDSHILL MODEL WAS BASED ON THE '92 BHI AHYMO MODEL.
* S
*S
*S
    FILENAME: BOR_intU.DAT
     BORREGA DAM PHASE "A" CONSTRUCTION, INTERIM DEVELOPMENT, 100YR, UNBULKED.
* S
* S
* S
    1.BORREGA WATERSHED IS FULLY DEVELOPED.
* S
    2.AM SW HOMES (BELL PROPERTY) IS NOT ADDED TO DAM (BASINS B-4EAST & B-6).
    3.BASIN 6B (50201) IS NOT ADDED TO DAM.
* S
*S
    UNTIL THESE BASINS ARE ADDED, BORREGA DAM DOES NOT REQUIRE FULL EXCAVATION
*S
     OF THE NORTH POOL. THE STAGE-STORAGE TABLE FOR THE BORREGA DAM IS
*S
     PER THIS NOT FULLY EXCAVATED CONDITION.
*S
*S*
*S
    WCEA CHANGES TO THE AMOLE-HUBBELL DMP (A-H DMP) MODEL NOTED WITH " << >>".
*s
*s
    MODIFICATIONS INCLUDE MUSKINGUM CUNGE ROUTING. ALSO DIVERTED THE A-H DMP BASINS 50105WEST, 50103, AND 50104 THRU "POND 7" THEN S IN THE 118TH ST CHAN
*S
*S
* s
    & THEN TO THE PROPOSED N BORREGA CHANNEL THRU PAAKWEREE AND ON
    EAST TO THE PROPOSED BORREGA DAM.
*S
* S
    WCEA ADJUSTMTS INCLUDE THE FOLLOWING IN THE A-H DMP AHYMO MODEL: AREAS: 50109 WAS INCREASED FROM 0.1914 TO 0.2344
              50110 WAS REDUCED FROM 0.105 TO 0.0826
      BASINS 105 & 106 CUT OFF AT 118TH ST EMBANKMENT TP'S: 50105 WAS RECALCED DUE TO SUBDIVISION OF BASIN
             50106 WAS RECALCED DUE TO SUBDIVISION OF BASIN
    NOTE 1: 50103 & 50104 LABELS WERE SWITCHED IN THE A-H MAP. IN THE
      A-H AHYMO, 7B=BASIN 104 AND 7K=BASIN 103, WHICH MATCHES THE
      ORIGINAL BHI MODEL.
    NOTE 2: WCEA MODIFIED THE BASIN 50201 BOUNDARY.
THE BASIN 50201 AREA IS 0.1473 SQ MI IN THE A-H DMP & BHI AHYMO MODELS,
     BUT THE A-H MAP MEASURED 0.238 SQ MI. THE BHI MAP USED 2-FT CONTOURS, WHILE THE A-H MAP USED 5-FT CONTOURS. WCEA DECREASED THE 50201 AREA
      ON THE A-H MAP TO MATCH THE BHI BASIN MAP FOR BASIN 50201.
*5
*5****
 *5
 *S
         BORREGA WATERSHED
 * C
 * S
 * 100~YR. 24-HR STORM
  FILE NAME: BR DMP1.DAT (Final Draft Submittal #3)
  BY: RICHARD STOCKTON
 * LAST REVISION: 06-03-98
                                ------
  THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF FROM THE BORREGA
  BASIN. FLOWS FROM THIS BASIN IS CONVEYED TO HUBBLE LAKE DETENTION FACILITY
  VIA THE BORREGA DIVERSION CHANNEL.
 * ANALYSIS ASSUMPTIONS:
 * 1. ALL LAND IN THIS BASIN IS MODELED AS DEVELOPED CONDITION. DEVELOPED
      CONDITIONS ARE BASED ON LH'S RUNOFF CATAGORY COLOR MAP.
   2. THE PUNCH HYD COMMAND WAS ADDED TO THE END OF THIS FILE SO THE OUTFALL
      HYDROGRAPH COULD BE USED IN THE AMOLE DEL NORTE DEVELOPED CONDITIONS MODEL
      AA DMP1.DAT, WHICH WILL BE USED IN THE ANALYSIS OF THE AMOLE ARROYO SYSTEM.
 * 3. BULKING FACTORS FOR THE ESCARPMENT EASEMENT UNDER DEVELOPED CONDITIONS,
      HAVE BEEN REMOVED DUE TO BORREGA DETENTION BASIN IN THIS ALTERNATIVE.
 * 100 YEAR 24HR STORM
                          TYPE=2 0.0 1.87 2.20 2.66
 *RAINFALL
                                                             DT=0.05
 * 50 YEAR 24HR STORM
                        TYPE=2 0.0 1.75 2.10 2.50
                                                           DT = 0.05
 *RAINFALL
 * 10 YEAR 24HR STORM
 *RAINFALL
                        TYPE=2 0.0 1.25 1.47 1.77
                                                           DT=0.05
    2 YEAR 24HR STORM
                        TYPE=2 0.0 0.74 0.95 1.15
                                                           DT = 0.05
 *RAINFALL
 * PMP GENERAL STORM
                          TYPE=4 0.0 6.0 12.0 19.0
                                                           DT = 0.05
 *RAINFALL
 *S PMP LOCAL STORM
 RATNEALL
                         TYPE=3 0.0 11.5 16.0 0 DT=0.05
 *5
 * <<WCEA REDUCED THE AREAS OF BASINS B-2 AND B-4 TO MODEL THE BASINS SOUTH OF
     RIO BRAVO: B-2 WAS REDUCED FROM 0.0754 TO 0.0445, AND B-4 WAS REDUCED FROM 0.190 TO 0.0641. >>
```

Bor intu MIN ELEV=100.0 FT MAX ELEV=106.0 FT CH SLP=0.045 FP SLOPE=0.045 N=0.030 DIST=34 ELEV DIST ELEV DIST ELEV DIST 106.0 100.0 22.0 100.0 O 12.0 34.0 106.0 ID=13 REACH NO=2 NO VS=1 L=2000 FT \*COMPUTE TRAVEL TIME SLP=0.045 ID=13 HYD=104.5 ROUTE MCUNGE INFLOW ID=1 DT=0.0 L=2000 NS=0 S=0.045 PRINT HYD ID=13 CODE=1 \*s \*S ADD THE ROUTED FLOWS FROM SUB-BASIN 50103.5 TO THE ROUTED FLOWS ID=12 HYD=104.6 I=12 II=13 ID=12 CODE=1 ADD HYD PRINT HYD \* S \*S COMPUTE FLOWS FROM SUB-BASIN 50105 (WEST) FROM BORREGA \* << TRY RECALC TP TO COMPARE L-H TP=.1333 3700-FT LONG BASIN LCODE = 1 UPLAND/LAG TIME METHOD COMPUTE LT TP NK = 3ISLOPE = 0LENGTH = 400 FT SLOPE = 0.120LENGTH = 1600 FT LENGTH = 1700 FT SLOPE = 0.078 SLOPE = 0.044 K = 2.0K = 3.0KN = 0.025 CENTROID DISTANCE = 0 FT ID=1 HYD=105W DA=0.1413 SM COMPUTE NM HYD A=0 B=28 C=23 D=49 TP=0.0 RAIN=-1 ID=1 CODE=10 PRINT HYD \*S ADD THE ROUTED FLOWS FROM SUB-BASIN 50105 (WEST) TO THE ROUTED FLOWS ADD HYD ID=12 HYD=POND7.IN I=1 II=12 PRINT HYD ID=12 CODE=1 \*S \*S ROUTE FLOWS THROUGH POND 7 \* << MODIFIED THE A-H DMP POND 7 OUTFLOW CURVE- ASSUMED 2-48" OUTFLOW PIPE>> \* OLD ROUTE RESERVOIR ELEV O OUT STORE 0 10 0 39.7 6 48.6 11.5 56.2 12 12 12.5 62.8 68.8 15 ID=70 HYD=POND7.OUT I=12 CODE=10 ROUTE RESERVOIR ELEV TUO Q STORE 10 0 0 6 12 48 13 100 160 9 14 PRINT HYD ID=70 CODE=1 \*S \*S ROUTE FLOWS IN 118TH ST CHAN TO N BORREGA CHAN INTAKE UNDER 118TH ST \* <<ASSUMED EARTHEN CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BOTTOM>> COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1 COMPUTE RATING CURVE ID=1 ELMAX=106 ELMIN=100 CH SLP=.005 FP SLP=.02 N=.030 DIST=36 ELEV DIST DIST ELEV DIST FLEV 100 0 106 12 100 24 36 106 ID=12 REACH NO=1 NO VS=1 L=400 FT \*COMPUTE TRAVEL TIME SLP=0.01 OUTFLOW ID=12 OUTFLOW HYD=106.05 INFLOW ID=70 DT=0.0 L=1200 NS=0 S=0.005 ROUTE MCUNGE ID=12 CODE=1 PRINT HYD CODE=1 BK=1.00 SEDIMENT BULK \*S BASIN NO. 50106 \*S << BASIN CUT OFF AT 118TH/POWERLINE TO DIVERT SOUTH, CALCED NEW AREA & TP \* << L-H AREA FOR 50106 WAS 0.09702, TP WAS .1505>> COMPUTE LT TP LCODE = 1 UPLAND/LAG TIME METHOD ISLOPE = 0 NK = 3K = 0.7LENGTH = 400 FT SLOPE = 0.100 SLOPE = 0.100 K = 2.0 LENGTH = 1600 FT LENGTH = 1390 FT SLOPE = 0.047 K
KN = 0.025 CENTROID DISTANCE = 0 FT K = 3.0KN = 0.025HYD=106 DA=0.0856 SQ MI TD=3COMPUTE NM HYD PER B=28 PER C=23 PER D=49 PER A=0 RAIN=-1 TP=0.0 CODE=1 PRINT HYD ID=3 \*S <<ADD 50106 TO ROUTED OLF FROM BASINS 50103,50104,50105WEST

\*S << TOTAL FLOW AT UPSTREAM END OF PROPOSED N BORREGA CHANNEL >>

ID=12

HYD=106.2

ID=2

ID=3

ADD HYD

AHYMO Input - Interim - Page 3

```
DIST
                                                                        ELEV
                                                   ELEV
                      DIST
                               ELEV
                                          DIST
                                                                123
                                                                         52
                      100
                               56
                                          111
                                                   54
                      140
                               52
                                          162
                      210
                               58
*COMPUTE TRAVEL TIME
                      ID=10
                                 REACH=1
                                               NO VS=1
                       L=2362.5
                                   SLP=.0338
                      ID=10
                              HYD=201.1
ROUTE MCUNGE
                      INFLOW ID=1 DT=
L=3500 NS=0 S=0.03
                                       DT=0
PRINT HYD
                                  CODE=1
*S LH BASIN NO. 50102
  << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >>
                       CODE=1 BK=1.0
**SEDIMENT BULK
** COMPUTE HYD ABOVE AP 102 BASIN 7-C
                     ID=1 HYD=102.1
PER A=0 PER B=28
                                           DA=0.1277 SQ MI
COMPUTE NM HYD
                                          PER C=23 PER D=49
                      TP=-0.1333 RAIN=-1
                      ID=1
                            CODE=1
PRINT HYD
*S <<FLOW INTO THE UPSTREAM END OF THE CULVERT UNDER PAVO ST. >>
                      ID=5
                                HYD=S_CULV
                      ID=1
                                 ID=10
PRINT HYD
                      ID=5
                                 CODE=1
*S << PAAKWEREE BASIN D >>
** NO BULKING FACTOR THIS BASIN
                          CODE=1 BK=1.0
SEDIMENT BULK
                      ID=1 HYD=BASIN_D DA=0.0144 SQ MI
PER A=0 PER B=28 PER C=23 PER D=4
TP=-0.1333 RAIN=-1
COMPUTE NM HYD
                                             PER C=23 PER D=49
                              CODE=0
                      ID=1
PRINT HYD
                      TD=15
                                  HYD=D1
ADD HYD
                      ID=5
                                  ID=1
                                  CODE=1
PRINT HYD
                      ID=15
*S <<FLOW IN CHAN DNSTRM OF 8X4 CBC>>
                      ID=15
                                 HYD=106.35
ADD HYD
                      ID=15
                                   ID=13
                                  CODE=1
PRINT HYD
                      ID=15
 ** << ROUTE FLOW IN PROPOSED N BORREGA CHANNEL
 * ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
 COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                       ELMIN=100
                                    ELMAX=105
                       CH SLP=.03
                                           FP SLP=.03
                       N=.017 STA=34
                       DIST
                                ELEV
                                           DIST
                                                                 DIST
                                                                          ELEV
                                                    100
                                                                 22
                                                                          100
                        0
                                106
                        34
                                106
                                 HYD=106.4
 ROUTE MCUNGE
                        ID=3
                        INFLOW ID=15 DT=0
                        L=500 NS=0 S=0.03
 PRINT HYD
                                   CODE=1
 *S << PAAKWEREE BASIN E >>
 ** NO BULKING FACTOR THIS BASIN
                      CODE=1 BK=1.0
ID=1 HYD=BASIN_E DA=0.0144 SQ MI
PER A=0 PER B=28 PER C=23 PER D=49
 **SEDIMENT BULK
 COMPUTE NM HYD
                       TP=-0.1333 RAIN=-1
                             CODE=0
 PRINT HYD
                       ID=1
 ADD HYD
                       ID=15
                                   HYD=106.5
                       ID=3
                                   ID=1
 PRINT HYD
                       ID=15
                                   CODE=1
 ** <<ROUTE FLOW IN PROPOSED N BORREGA CHANNEL TO PERDIZ ST
 * ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>> COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                        ELMIN=100
                                     ELMAX=105
                        CH SLP=.03
                                           FP SLP=.03
                        N=.017 STA=34
                                                                          ELEV
                                ELEV
                                           DIST
                                                    ELEV
                                                                 DIST
                        DIST
                                                                          100
                                 106
                                                    100
                                                                 22
                        O
                                            12
                        34
                                 106
                        TD=3
                                  HYD=106.6
 ROUTE MCUNCE
                        INFLOW ID=15 DT=0
L=300 NS=0 S=0.03
                                   CODE=1
                        ID=3
 PRINT HYD
```

\*S << PAAKWEREE BASIN B >>

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```
SLOPE = 0.0281 K = 2.0
SLOPE = 0.022 K = 3.0
                    LENGTH = 1600 FT
                    LENGTH = 2000 FT
                    KN = 0.025 CENTROID DISTANCE = 0 FT
                     ID=1 HYD=108 DA=0.0813 SQ MI
COMPUTE NM HYD
                     PER A=0 PER B=60 PER C=15 PER D=25
                     TP=0
                             RAIN=-1
                             CODE=1
PRINT HYD
                     ID=1
*S << TOTAL FLOW DNSTREAM OF PAAKWEREE IN PROPOSED N BORREGA CHANNEL>>
                     ID=2
                               HYD=108.3
ADD HYD
                      ID=1
                                ID=3
                                CODE=1
                     ID=2
PRINT HYD
* << ROUTE FLOW TO AP BASIN 109
  ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
COMPUTE RATING CURVE ID=1
                            VS NO=1 NO SEGS=1
                                 ELMAX=106
                      ELMIN=100
                      CH SLP=.02
                                       FP SLP=.02
                     N=.017 STA=34
                              ELEV
                                        DIST
                                                ELEV
                                                            DIST
                                                                     ELEV
                      DIST
                                        12
                              106
                                                100 -
                                                             22
                                                                     100
                      34
                              106
                              REACH=1
SLP=.0286
                      ID=3
                                             NO VS=1
*COMPUTE TRAVEL TIME
                       L=1500
ROUTE MCUNGE
                      ID=3
                               HYD=108.4
                      INFLOW ID=2 DT=0
L=1500 NS=0 S=0.0286
PRINT HYD
                      ID=3
                               CODE=1
*S LH BASIN NO. 50109
                      ID=1 HYD=109.1 DA=0.2344 SQ MI
PER A=0 PER B=28 PER C=23 PER
TP=-0.2031 RAIN=-1
** COMPUTE HYD ABOVE AP 109 BASIN 7-G
COMPUTE NM HYD
                                                      PER D=49
                              CODE=1
PRINT HYD
                      ID=1
*S << TOTAL FLOW IN PROPOSED N BORREGA ARROYO CHANNEL AT AP 109
                            HYD=109.3 ID=1
ADD HYD
                      ID=3
                                CODE=1
PRINT HYD
                      ID=3
** ROUTE FLOW ABOVE AP 109 TO FIRST CHANNEL DROP STRUCTURE
** ASSUME NATURAL ARROYO
                               VS NO=1
*COMPUTE RATING CURVE ID=1
                                          NO SEGS=1
                       ELMIN=0
                                  ELMAX=5
                       CH SLP=.0286
                                          FP SLP=.0286
                       N=.032 STA=60
                                                              DIST
                                                                      ELEV
                               ELEV
                                          DIST
                                                  ELEV
                       DIST
                                                               40
                                                                       0
                        0
                        60
 *COMPUTE TRAVEL TIME ID=4
                                 REACH=1
                                              NO VS=1
                       L=230
                                 SLP=.0286
                       ID=4
                                 HYD=109.4
 *ROUTE
                INFLOW ID=3
                                DT=0
                                  CODE=1
                       ID=4
 *PRINT HYD
 ** ROUTE FLOW FROM FIRST DROP STRUCTURE TO CONFLUENCE WITH BASIN 6-B
 * ASSUME NATURAL ARROYO
 *COMPUTE RATING CURVE ID=1
                               VS NO=1
                                          NO SEGS=1
                       ELMIN=0 ELMAX=7
                       CH SLP=.004
                                          FP SLP=.004
                       N=.033 STA=60
                       DIST
                               ELEV
                                          DIST
                                                  ELEV
                                                              DIST
                                                                      ELEV
                        0
                                7
                                           28
                                                   0
                                                               48
                                                                       0
                         76
 *S ROUTE FLOW ABOVE AP109 TO CONFLUENCE WITH BASIN 50201
 *S << ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BOTTOM
 COMPUTE RATING CURVE ID=1 VS NO=1
                      NO SEGS=1
                                         FP SLP=.025
                      N=.017 STA=36
                                                                      ELEV
                                         DIST
                                                 ELEV
                                                             DIST
                      DIST
                               ELEV
                                         12
                                                                      100
                                                              24
                       0
                               106
                                                 100
                       36
                               106
                                REACH=1
                                              NO VS=1
 *COMPUTE TRAVEL TIME ID=4
                                  ST.P= . 025
                       L=1230
                                HYD=109.5
 ROUTE MCUNGE
                       ID=4
                       INFLOW ID=3 DT=0
L=1230 NS=0 S=0.025
 PRINT HYD
                       ID=4
                                 CODE=1
 *S LH BASIN NO. 50110
 ** COMPUTE HYD ABOVE AP 111 BASIN 7-I
 * <<(APPROX HALF IS BELL PROPERTY) >>
                                          DA=0.1018 SQ MI
                               HYD=110.0
                       ID=1
 COMPUTE NM HYD
```

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* << 54" PIPE W/47.5" ORIF INV=5984.7. 350-FT WIDE EMERG SPILLWAY CREST=4997 >>
```

```
STORAGE
                                                    ELEV
*S
                         OUTFLOW
*S
                          0
                                         0
                                                     4985
                                         2.02
                          0.4
                                                     4986
*S
                                         7.94
                                                     4987
                          4
*S
                          8
                                        14.10
                                                     4988
* S
                                                     4989
                          14
                                        20.51
*S
*S
                                        27.17
                                                     4990
                           36
                                        34.08
                                                     4991
*S
*s
                           49
                                        41.36
                                                     4992
                           69
                                        49.21
                                                     4993
*S
                                        57.72
                                                     4994
                          163
* S
                           174
                                        67.03
                                                     4995
*S
                           184
                                        77.26
                                                     4996
*S
                           191
                                        88.36
                                                     4997
*s
                           225
                                        89.51
                                                      4997.1
*s
*S
                         1252
                                       100.23
                                                      4998
                          3176
                                       112.77
                                                      4999
*s
*S
                          5667
                                       125.94
                                                     5000
                                                      5001
* S
                          8620
                                       139.90
                         11966
                                       154.34
                                                      5002
*S
                        15667
                                       169.38
                                                      5003
*S
                       ID=99 HYD=BPOND.OUT ID=4 CODE=5
ROUTE RESERVOIR
                           0
                                         0
                                                      4985
                                         2.02
                                                      4986
                           0.4
                                                      4987
                                         7.94
                           4
                                                      4988
                                        14.10
                           8
                                                      4989
                                        20.51
                           14
                                                      4990
                                        27.17
                           24
                                                      4991
                           36
                                        34.08
                                                      4992
                           49
                                        41.36
                                                      4993
                                        49.21
                           69
                                        57.72
                                                      4994
                           163
                           174
                                        67.03
                                                      4995
                                        77.26
                                                      4996
                           184
                                        88.36
                                                      4997
                           191
                                                      4997.1
                                        89.51
                           225
                                                      4998
                                       100.23
                          1252
                                       112.77
                                                      4999
                          3176
                                                      5000
                          5667
                                       125.94
                                                      5001
                                       139.90
                          8620
                                                      5002
                         11966
                                       154.34
                         15667
                                       169.38
                                                      5003
                         ID=99 CODE=1
PRINT HYD
 *S
 *S HYD=BPOND.OUT IS *****AP 51*****
 ** ROUTE FLOW ABOVE AP 110 TO THE BORREGA OUTFALL IN HUBBELL
 COMPUTE RATING CURVE ID=1
                               VS NO=1
                                           NO SEGS=1
                        ELMIN=0
                                   ELMAX=7
                        CH SLP=.004
                                             FP SLP=.004
                        N=.033 STA=60
                        DIST
                                 ELEV
                                            DIST
                                                     ELEV
                                                                  DIST
                                                                           ELEV
                                 7
                                            28
                                                     0
                                                                   48
                                                                            n
                         0
                         76
 *COMPUTE TRAVEL TIME
                        ID=4
                                   REACH=1
                                                 NO VS=1
                          L=1849.5 SLP=.004
 ROUTE MCUNGE
                        ID=4
                                 HYD=110.5
                        INFLOW ID=99 DT=0
L=1849.4 NS=0 S=0.004
 PRINT HYD
                        ID=4
                                    CODE=1
 *s LH BASIN NO. 50111
 ** COMPUTE HYD ABOVE AP 111 BASIN 7-I
 * << REMOVED THE PART THAT IS IN THE DAM, OLD AREA WAS 0.05247>>
                        ID=2 HYD=111.0 DA=0.0379 SQ MI
PER A=0 PER B=45 PER C=10 PER
TP=-0.1333 RAIN=-1
 COMPUTE NM HYD
                                                           PER D=45
 PRINT HYD
                        ID=2
                                 CODE=1
 ** ADD OLF FROM AP 110 TO BASIN 7-I AT AP 111 ADD HYD ID=2 HYD=BR_DMP1.HYD ID=4
                                                             ID=2
                                 CODE=1
 PRINT HYD
                        ID=2
 *S HYD=BR_DMP1.HYD IS ****AP 52****
                        ID=2
 PUNCH HYD
 FINISH
```

AHYMO PROGRA INPUT FILE =	AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) INPUT FILE = X:\PUBLIC\PROJECTS\99099\	AHYMO_ TS\990	97) - 99\AHYM\	MO_97) - 99099\ahym\interim\bor_intu.dat	1	VERSION: 1997.02c		RUN DATE ( USER NO.= A	(MON/DAY/YR) AHYMO-I-9702a		=04/09/2000 101000C05-AH
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	NO N	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION	1 ON
START *S << WILSON *S BASED O	RT << WILSON&COMPANY (WCEA) AHYMO ANALYSIS FOR BASED ON LEEDSHILL AHYMO MODEL FOR THE '92 THE LEEDSHILL MODEL WAS BASED ON THE '92 I	HYMO A MODEL BASED	NALYSIS FOR THE ON THE '	DESIGN PAMOLE- SHI AHYD	F-1	GA DAM. (A-H DMP).				TIME=	00.
	FILENAME: BOR_intU.DAT BORREGA DAM PHASE "A" CONSTRUCTION,	NSTRUC	TION, IN	INTERIM DEVELOPMENT,	PMENT, 100YR,	UNBULKED.					
	1.BORREGA WATERSHED IS FULLY DEVELOPED. 2.AM SW HOMES (BELL PROPERTY) IS NOT AL 3.BASIN 6B (50201) IS NOT ADDED TO DAM.	ILLY DE RTY) I ADDED	DEVELOPED. IS NOT ADDED	TO DAM	(BASINS B-4EAST	T & B-6).				¥	
P *	UNTIL THESE BASINS ARE ADDED, BORREGA DA OF THE NORTH POOL. THE STAGE-STORAGE T PER THIS NOT FULLY EXCAVATED CONDITION.	DED, E STAGE- ATED C	SORREGA D STORAGE CONDITION	BORREGA DAM DOES NOT REQUIRE -STORAGE TABLE FOR THE BORRECONDITION.	FULL 3A DAL	EXCAVATION f IS					
	WCEA CHANGES TO THE AMOLE-HUBBELL DMP	-HUBBE		A-H DMP) MOI	(A-H DMP) MODEL NOTED WITH	."<< >>"					
*S MODIFICA *S BASINS 5 *S & THEN T	MODIFICATIONS INCLUDE MUSKINGUM CUNGE ROUTING. BASINS 50105WEST, 50103, AND 50104 THRU "POND 'E THEN TO THE PROPOSED N BORREGA CHANNEL THRU EAST TO THE PROPOSED BORREGA DAM.	KINGUM ( AND 501( BORREGA EGA DAM	CUNGE R 1104 THRU IA CHANNE		ALSO DIVERTED THE A-H 7" THEN S IN THE 118TH PAAKWEREE AND ON	: A-H DMP .18TH ST CHAN		·			
	*****	* * * * *	****	****	***************************************	****					
*S *S BORR	*S BORREGA WATERSHED *S										
***********	***************************************	***	****	*****	****************	****					
*S 100 YEAR 24HR STORM RAINFALL TYPE= 2 *S********	*S 100 YEAR 24HR STORM RAINFALL TYPE= 2 *S***********************************	* * * *	****	****	***************************************	* * * *				RAIN24=	2.660
*S SEDIMENT BULK	¥									PK BF =	1.00
*S COMPUTE HYD:	*S COMPUTE HYDROGRAPH FOR B-2 COMPUTE NM HYD 204.00	1	71	.04450	87.36	3,236	1.36343	1.500	3.067	PER IMP=	34.00
*S ROUTE FLO	*S ROUTE FLOWS TO POND 8 ROUTE MCUNGE	7	11	.04450	87.31	3.246	1.36779	1.600	3.066	CCODE =	7.
	COMPUTE HYDROGRAPH FOR B-4 PUTE NM HYD 204.00	(WEST)	r) FROM RIO	IO BRAVO REDUCE .06410	AREA TO 125.84	41 AC 4.661	1.36343	1.500	3.067	PER IMP=	34.00
*S ADD THE R ADD HYD	*S *S ADD THE ROUTED FLOWS FROM ADD HYD 204.10	SUB-BA 1&11	-BASIN 202.5 11 11	5 TO THE FLOWS .10860	WS FROM SUB-BASIN 204 196.42 7.90	3ASIN 204 7.907	1.36521	1.550	2.826		
*S *S ROUTE FLOWS : ROUTE RESERVOIR	OWS THROUGH POND 8	11	80	.10860	42.96	7.907	1.36520	2.000	.618	.618 AC-FT=	4.100
*S ROUTE FLOI *S <> FLOW TV *S GETS ADI ROUTE MCUNGE *S***********************************	*S ROUTE FLOWS TO JUNCTION  *S << FLOW TO CULVERT CROSSING UNDER  *S GETS ADDED TO RIO BRAVO CHAN N S  ROUTE MCUNGE  *S**********************************	1G UNDE CHAN N 80 80	ER RIO BR I SIDE OF 11	BRAVO BLVD/118TH OF RIO BRAVO BLV .10860 ***********************************	NDER RIO BRAVO BLVD/118TH ST TO NE N N SIDE OF RIO BRAVO BLVD EXTENSION>> 0 11 .10860 42.98 7.907 ************************************	7>> 7.907 *********	1.36521	2.000	.618	.618 CCODE =	7.

BC

\*S COMPUTE FLOWS FROM SUB-BASIN 50104 FROM BORREGA (7B)

COMMAND IDEN	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA DI SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PAGE = PER NOTATION	on 2	
COMPUTE NM HYD	104.00	.1	Ħ	.03930	72.17	2.667	1.27251	1.500	2.869 PER IMP=	32.00	
**S ROUTE FLOWS TO POND	POND 7 103.50	Ħ	12	.03930	71.63	2.674	1.27559	1.550	2.848 CCODE =	7.	
COMPUTE MPUTE NM	FLOWS FROM SUB-BASIN HYD 103.00	EN 50103	FROM 1	BORREGA (7K) .05400	102.13	3.834	1.33141	1.500	2.955 PER IMP=	35.00	
*S ROUTE FLOWS TO POND TROUTE MCUNGE	POND 7 104.50	н	13	.05400	101.60	3.831	1.33030	1.600	2.940 CCODE =	<del>-</del> :	
*S ADD THE ROUTED FLOWS FROM ADD HYD 104.60	FLOWS FROM SUB- 104.60 12&:	SUB-BASIN 12&13 12	SIN 50103.5 12	TO THE . 09330	ROUTED FLOWS 171.56	6.505	1.30724	1.600	2.873		
*S  *S COMPUTE FLOWS FROM SUB-BASIN 5010  COMPUTE NM HYD  105W -	ROM SUB-BAS	IN 501	5 (WEST) 1	FROM BORREGA .14130	270.97	12.038	1.59742	1.500	2.996 PER IMP=	49.00	
*S ADD THE ROUTED FLOWS FROM ADD HYD POND7.IN	FLOWS FROM POND7.IN	SUB-BASIN 1&12 12	50105	(WEST) TO THE .23460	E ROUTED FLOWS	18.543	1.48201	1.550	2.854		
*S ROUTE FLOWS THROUGH POND 7 **S ROUTE RESERVOIR POND7.OUT	OUGH POND 7 POND7.OUT	12	70	.23460	146.29	18.433	1.47323	1.850	.974 AC-FT=	8.314	
*S *S ROUTE FLOWS IN 118TH ST CHAN SEDIMENT BULK SEDIMENT BULK	118TH ST CH 106.05	5 to	N BORREGA C 12	CHAN INTAKE 1.23460	UNDER 118TH ST 145.75	18.401	1.47068	1.950	.971 CCODE = PK BF =	1.00	
*S BASIN NO. 50106  *S << BASIN CUT OFF AT 118TH/POWERLINE COMPUTE NM HYD 106.00 - 3	6 F AT 118TH/ 106.00	POWERL		SOUTH, 3560	CALCED NEW AREA 170.83	7.293	1.59741	1.500	3.118 PER IMP=	49.00	
*S < <add *s="" 106.20="" 2<="" 3&12="" 50106="" <<="" add="" at="" basins="" end="" flow="" from="" hyd="" kouted="" of="" ole="" propo="" td="" to="" total="" upstream=""><td>T UPSTREAM 1.06.20</td><td>FROM B END OF 3&amp;12</td><td></td><td>N BORREGA CH.</td><td>GANNEL &gt;&gt; 198.12 IDSTEM OF AVESTRIES</td><td>25.694 ST</td><td>1.50456</td><td>1.800</td><td>.967</td><td></td><td></td></add>	T UPSTREAM 1.06.20	FROM B END OF 3&12		N BORREGA CH.	GANNEL >> 198.12 IDSTEM OF AVESTRIES	25.694 ST	1.50456	1.800	.967		
*S KOUTE FLOW THRU FROFISED BOKKES *S < <assume of="" section="" t<="" td="" the="" to=""><td>CHANNEL SEC 106.30</td><td>4</td><td>2:1 SIDE 14</td><td>SLOPES, 10' BG. 32020</td><td>10' BOTTOM&gt;&gt;</td><td>n</td><td>1.50382</td><td>1.800</td><td>.967 CCODE =</td><td>ч.</td><td></td></assume>	CHANNEL SEC 106.30	4	2:1 SIDE 14	SLOPES, 10' BG. 32020	10' BOTTOM>>	n	1.50382	1.800	.967 CCODE =	ч.	
*S << PAAKWEREE BASIN C >> SEDIMENT BULK COMPUTE NM HYD BASIN_	ASIN C >> BASIN_C			01380	26.52	.946	1.28597	1.500	PK BF = 3.003 PER IMP=	1.00	
**************************************	CHAN UPSTR 106.31	F1 H	48" PIPE, AT 14	AVESTRUZ ST.	T 205.93	26.628	1.49482	1.800	.963		
*S << PAAKWEREE BASIN A COMPUTE NM HYD BASI	ASIN A >> BASIN_A			05130	84.88	2.517	.91999	1.500	2.585 PER IMP=	5.00	
*S < <total chan="" dnstrm="" flow="" in="" of<br="">ADD HYD 105E.1 1&amp;1 ROUTE MCUNGE 106.33 14</total>	CHAN DNSTR 105E.1 106.33	4	48" PIPE, AT 14 13	. AVESTRUZ ST .38530 .38530	T 275.04 275.04	29.145 29.145	1.41828	1.550	1.115 1.115 CCODE =	0.	
*S LH BASIN NO. 5 SEDIMENT BULK COMPUTE NM HYD ROUTE MCUNGE	50101 101.10 201.10	, +	10	.15400	271.03 259.78	12.024 11.953	1.46394	1.550	PK BF = 2.750 PER IMP= 2.636 CCODE =	1.00	
*S LH BASIN NO. 5 COMPUTE NM HYD	50102 102.10			.12770	271	10.879	1.59742	1.500	3.328 PER IMP=	49.00	
*S < <flow end<br="" into="" the="" upstream="">ADD HYD S_CULV 1\ *S &lt;&lt; PAAKWEREE BASIN D &gt;&gt;</flow>	UPSTREAM E S_CULV ASIN D >>	K10	THE CULVERT 5	.28170	ST. >> 345.75	22.833	1.51974	1.800	1.918 PK RF =	1.00	
SEDIMENT BULK COMPUTE NM HYD	BASIN_D	ı	н	.01440	30.68	1.227	1.59741	1.500	A K	49.00	
				124	D 1 100-11	6 404					

Interim 100-yr - Page 2

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PAGE = NOTATI	CODE =	ER IMP=	ER IMP=	CODE =	ER IMP=	$\Box$		CODE =	F F	4	CODE =	PER IMP=		CODE =	MP										
CFS PER ACRE	1.338 1.338 C	3.329 F 1.332 1.332 C	3.328 E	1.496	28	549	. 610	.610	000		.625	2.609 1	1.819	.807	.261	.847									
TIME TO PEAK (HOURS)	1.800	1.500	1.500	1.500	1.500	.55	. 55	.55	4	7.000	1.550	1.550	1.600	1.600	002.1										
RUNOFF (INCHES)	1.46402	1.59741 1.46678 1.46678	1.59742	1.47780		•		•	,	. 149U	1.45645	1.59742	1.48467	4848	8 6 7 4	.4912									
RUNOFF VOLUME (AC-FT)	53.204 53.204	1.227 54.431 54.431	5.461	59.892 59.898	~ ~ ~	101 (	24 12	Ŋ	ć	2	70.687 70.646	19.970	90.616	Ç		. 11			ED BECAUS						
PEAK (SCHARGE (CFS)	583.55 583.55	30.68 593.25 593.25	Π,	727.59	71.56	786.79	7.4 > 853			ຄວ	946.37 943.74				10.00	1473.08			FULLY FADDEI						
AREA DE	.68140	.01440.69580	06410	FERDIA 75990 75990	.03360	79350	Ä	70	חחשפ)			.23440	CHANNEL AT 1.14440	50201	0 00 00 00 00 00 00 00 00 00 00 00 00 0	.10180 FLOW TO DAM>> 1.24620		***	*********** DRTH PART NOT IRAST B6) NO	) ' R	444	4.988	4 4 . 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	C C C #
TO IO NO.	15 3	11 3			нc	v m				NI	İ	Ħ		ENCE WITH	<b>*</b> ,	CHANNEL	:	***	* •	63	2.02	14.10	27.17	34.08 41.36	ת
FROM ID NO.	15&13 15	36. 15	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	BORREG 16 3 2	1 4	7		7	GOLF	PAAKWE	16 3 2	ı	N BORR		n	1 to 1	^	*	* 4 E						
HYDROGRAPH INTIFICATION	106.35	BASIN E >> BASIN E 106.50 106.60	BASIN B >> BASIN_B	1 PROPOSED N 107.10 107.20	BASIN F >> BASIN F	107.40 107.40 BASIN G >>	BASIN_G PROPOSED N	107.60	DENTIAL/HALF	108.00 DNSTREAM OF	108.40	50109 109.10	IN PROPOSED 109.30	OVE AP109 TO	50110	110.00 CHANNEL. 110.10	BORREGA DAM	**************************************	HASE "A' PER		4.0	4 00	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	დ. <b>4</b> 1 დ	ס
MAND	OUTE MCUNGE	P4 E	S << PARKWEREE OMPUTE NM HYD	S TOTAL FLOW IN LDD HYD	S << PAAKWEREE COMPUTE NM HYD	ADD HYD COUTE MCUNGE S << PAAKWEREE			<pre>&lt;&lt; HALF DIMENT BULN</pre>	COMPUTE NM HYD	ADD HYD	SOMPUTE NM HYD	S << TOTAL FLOW	S CASSUMED CONC	COUTE MCUNGE S LH BASIN NO.	COMPUTE NM HYD 'S < <add 1="" 50110="" hyd<="" od="" td=""><td></td><td></td><td></td><td></td><td>ន្ទីន</td><td>ស៊ីស៊ី</td><td>ស្ត</td><td>ស្ត</td><td>2</td></add>					ន្ទីន	ស៊ីស៊ី	ស្ត	ស្ត	2
	FROM TO PEAK RUNOFF TIME TO CFS PAGE = ID ID AREA DISCHARGE VOLUME RUNOFF PEAK PER NOTATION NO. (SQ MI) (CFS) (AC-FT) (INCHES) (HOURS) ACRE NOTATION	FROM TO AREA DISCHARGE VOLUME RUNOFF PEAK PER NOTATION NO. NO. (SQ MI) (CFS) (AC-FT) (INCHES) (HOURS) ACRE NOTATION	HYDROGRAPH ID ID AREA DISCHARGE VOLUME RUNOFF PEAK PER PEAK PEAK PEAK PEAK PEAK PEAK PEAK PEAK	HYDROGRAPH   ID   ID   ID   AREA   DISCHARGE   VOLUME   RUNOFF   PEAK   PER   PEAK   PER   PEAK   PER   PEAK   P	HYDROGRAPH   ID   ID   ID   ID   ID   ID   ID   I	HYDROGRAPH   ID   ID   ID   AREA   DISCHARGE   VOLUME   FEAK   FER   PEAK   PER   PEAK   PEAK	PEAK   PEAK	HYDROGRAPH   ID   ID   ID   ID   ID   ID   ID   I	HYDROGRAPH   ID   ID   ID   ID   ID   ID   ID   I	HYDROGRAPH   ID   LD   AREA   DISCHARGE   VOLUME   RUNOFF   PEAK   PER   PAGE   PAGE	HYDROGRAPH   ID   ID   AREA   DISCIRAGE   VOLUME   TINGFE   PEAK   PEA	Handle   The program   From to   Section   From to   Section   The program   From to   Section   The program   T	Handle   H	PERM	Handle   IDENTIFICATION   NO.   (SQ MI)   DISCHARGE   VOLUME   PERK   PERK	Harden   Tentractication   From to area   Discrimina   From to area   Discrimina   Tentractication   Tentracticaticati	PROPRESSION NO.   CORP.   CO	FECON TO SERVINGER   FROM TO   COP MIN.   COP MIN.	Hand   Hander   Han	NEW COLORS   COLORS	Part   Part	Part	Particular   Par	Name	Part

					CFS PAGE = 4	ACRE NOTATION					1		144 PH - HB - DK 110			.214 CCODE = .2	3 124 PER TMP= 45.00		603.				
						(HOURS)							6	000.7	1	2.750							
						(INCHES)								1.269/2		1.26723	10501	T. 4000T	1.2/3/1				
					RUNOFF	(AC-FT)							;	84.391		84.225	6	3.006	87.230				
Bor_intu					PEAK	DISCHARGE (CFS)								170.49		170.47	1	15.78	171.72				
	4994	4995	4996	4997		AREA (SQ MI)	4997.1	4998	4999	2000	5001	5002	5003	1.24620		1.24620		.03790	1.28410				
	57.72	67.03	77.26	88.36		NO.	89.51	100.23	112.77	125.94	139.90	154.34	169.38	66		4		7	7	* *			
					FROM	NO IS								4	*****	66		ı		52****			
	163	174	184	191		HYDROGRAPH IDENTIFICATION	225	1252	3176	2967	8620	11966	15667	BPOND.OUT	TS **** YE	110.50	50111	111.00	BR DMP1.HYD	YD IS ****AP			
	۲۵ *	*	۳ *	າ ທາ *	<b>,</b>	COMMAND	t: *	*	ι <b>છ</b>	· W	: M	*	າ ໝ *	ROUTE RESERVOIR	*S *S HYD=BPOND.OUT IS ****AP 51	ROUTE MCUNGE	*S LH BASIN NO. 50111	COMPUTE NM HYD	ADD HYD	*S HYD=BR_DMP1.HYD IS ****AP	FINISH	(s10H	

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - INPUT FILE = X:\PUBLIC\PROJECTS\99099\AHYM\INTERIM\BOR_INTU.DAT	- HYM\INTERIM\BOR_	1	VERSION: 1997	1997.02c	RUN DATE ( USER NO.= A	MON/DAY/ HYMO-I-9'	(MON/DAY/YR) =04/10/2000 AHYMO-I-9702a01000C05-AH	2000 5- <b>AH</b>
		PEAK	RUNOFF		TIME TO	CFS	PAGE =	1
HYDROGRAPH IN ID COMMAND IDENTIFICATION NO. NO.	AREA (SQ MI)	DISCHARGE (CFS)	VOLUME (AC-FT)	RUNOFF (INCHES)	PEAK (HOURS)	PER	NOTATION	
**************************************	SIS FOR DESIGN OF THE BORRI THE '99 AMOLE-HUBBELL DMP	BORR	EGA DAM. (A-H DMP).				Time=	00.
*S THE LEEDSHILL MODEL WAS BASED ON THE  *S *S FILENAME: BOR_intU.DAT  *S BORREGA DAM PHASE "A" CONSTRUCTION, :	HE '92 BHI AHYMO MODEL , INTERIM DEVELOPMENT,	100YR,	UNBULKED.					
*\$ 1.BORREGA WATERSHED IS FULLY DEVELOPED  *\$ 2.AM SW HOMES (BELL PROPERTY) IS NOT AL  *\$ 3.BASIN 6B (50201) IS NOT ADDED TO DAM	ED. ADDED TO DAM AM.	(BASINS B-4EAST	. & В-б).					
*S UNTIL THESE BASINS ARE ADDED, BORREGA DAM DOES NOT REQUIRE FULL EXC.  S OF THE NORTH POOL. THE STAGE-STORAGE TABLE FOR THE BORREGA DAM IS  S PER THIS NOT FULLY EXCAVATED CONDITION.  SG***********************************		M DOES NOT REQUIRE FULL EXCAVATION ABLE FOR THE BORREGA DAM IS	FULL EXCAVATION A DAM IS					
*\$ WCEA CHANGES TO THE AMOLE-HUBBELL DMP	(A-H DMP)	MODEL NOTED WITH						
*S  *S  MODIFICATIONS INCLUDE MUSKINGUM CUNGE ROUTING. ALSO DIVERTED THE *S  *S  *A  *A  *S  *THEN 70  *THE PROPOSED N BORREGA CHANNEL THRU PAAKWEREE AND ON  *S  *S  *S  *S  *S  *S  *S  *S  *S  *	GE ROUTING. ALSC THRU "POND 7" TE ANNEL THRU PAAKW		IE A-H DMP 118TH ST CHAN					
********	******************	**********	***					
*S *								
***********	**************	**********	***					
* *	******************	*****	* * * * * * * * * * * * * * * * * * * *				RAIN6= 16	16.000
** SEDIMENT BILK							PK BF =	1.00
*S COMPUTE HYDROGRAPH FOR B-2 COMPUTE NM HYD 204.00 - 2	.04450	901.25	30.735	12.95028	2.250	31.645	PER IMP= 3	34.00
*S ROUTE FLOWS TO POND 8 ROUTE MCUNGE 202.50 2 11	.04450	897.22	30.780	12.96923	2.300	31.504	CCODE =	.2
COMPUTE HYDROGRAPH FOR B-4 (WEST) 1PUTE NM HYD 204.00 -	FROM RIO BRAVO REDUCE	OUCE AREA TO 41 1298.08	1 AC 44.273	12.95027	2.250	31.642	PER IMP=	34.00
ADD THE ROUTED FLOWS FROM SUB-BASIN 204.10 1£11 11	202.5 TO THE FLOWS .10860	FROM 2098.	SUB-BASIN 204 52 75.053	12.95803	2.250	30.193		
*S *S ROUTE FLOWS THROUGH POND 8 *SOUTE RESERVOIR POND8.OUT 11 80	.10860	221.17	75.053	12.95804	2.900	3.182	3.182 AC-FT= 91	91.185
*S ROUTE FLOWS TO JUNCTION  *S << FLOW TO CULVERT CROSSING UNDER RIO  *S GETS ADDED TO RIO BRAVO CHAN N SIDE  ROUTE MCUNGE  *S**********************************	NDER RIO BRAVO BLVD/118TH ST TO NE N N SIDE OF RIO BRAVO BLVD EXTENSION>> 0 11 .10860 220.38 75.007 ***********************************	3TH ST TO NE 3LVD EXTENSION>> 220.38	>> 75.007 ********	12.95010	3.000	3.171 CCODE	CCODE =	

\*S \*S COMPUTE FLOWS FROM SUB-BASIN 50104 FROM BORREGA (7B)

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID	N H TO	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PAGE = PER ACRE NOTATION	= 2 rion
NM HYD	104.00	-1	Ħ	.03930	790.91	26.636	12.70823	2.250	31.445 PER IMP	32.00
*S *S ROUTE FLOWS TO POND *SOUTE MCUNGE	POND 7 103.50	H	12	.03930	781.01	26.681	12.72932	2.300	31.052 CCODE =	7.
*S  *S COMPUTE FLOWS FROM SUB-BASIN  COMPUTE NM HYD  103.00	FROM SUB-BA	SIN 50	50103 FROM . 1	FROM BORREGA (7K)	1089.89	37.044	12.86259	2.250	31.536 PER IMP	= 35.00
*S *S ROUTE FLOWS TO POND *SOUTE MCUNGE	POND 7 104.50	Н	13	.05400	1049.28	37.084	12.87646	2.300	30.361 CCODE =	.5
*S *S ADD THE ROUTED FLOWS FROM ADD HYD 104.60	FLOWS FROM S 104.60 1	SUB-BASIN   12&13 12	ASIN 50103 12	.5 TO THE . 09330	ROUTED FLOWS 1830.29	63.765	12.81447	2.300	30.652	
*S  *S COMPUTE FLOWS FROM SUB-BASIN  COMPUTE NM HYD  105W	FROM SUB-BA	SIN 50	50105 (WEST)	T) FROM BORREGA. .14130	GA 2592.08	102.202	13.56188	2.250	28,663 PER IMP	= 49.00
*S ADD THE ROUTED FLOWS FROM SUB-BASIN ADD HYD POND7.IN 1£12 12	FLOWS FROM POND7.IN	SUB-B	ASIN 50105 12	(WEST) TO .23460	THE ROUTED FL	FLOWS 165.967	13.26463	2.300	29.197	
*S *S ROUTE FLOWS THROUGH POND 7 *SOUTE RESERVOIR POND7.OUT *C	ROUGH POND POND7.OUT	7 12	70	.23460	1341.27	165.960	13.26406	2.550	8.933 AC-FT=	68.063
ROUTE FLOWS TE MCUNGE IMENT BULK	1 118TH ST C) 106.05	HAN TO	N BORREGA 12	GA CHAN INTAKE .23460	E UNDER 118TH 1339.51	ST 165.956	13.26378	2.550	8.922 CCODE = PK BF =	1.00
*S BASIN NO. 50106  *S << BASIN CUT OFF AT 118TH/POWERLINE TO COMPUTE NM HYD 106.00  COMPUTE NM HYD 10.00  COM	.06 )FF AT 118TH 106.00	I/POWER		DIVERT SOUTH, CALCED .08560 1640	NEW	AREA & TP 61.914	13.56188	2.250	29.949 PER IMP	49.00
*S < <ald by<br="" from="" nouted="" our="" sulo="" to="">AS &lt; TOTAL FLOW AT UPSTREAM END OF ADD HYD 1106.20 3£12 *S ROUTE FLOW THRU PROPOSED BORREGA</ald>	AT UPSTREAM 106.20 TO PROPOSED 1	FACAL DA I END OF 3&12 BORREGA		ED N BORREGA .32020	. N BORREGA CHANNEL >> .32020 2268.01 22 48" PIPE UPSTRM OF AVESTRUZ	227.871 RUZ ST	13.34347	2.300	11.067	
*S < <assumed 106.30="" 2<="" channel="" conc="" mcunge="" route="" section,="" td=""><td>CHANNEL SE</td><td>CTION,</td><td>2:1 SIDE 14</td><td>)E SLOPES, 10' BOTTOM&gt;&gt; .32020 2268.0</td><td>BOTTOM&gt;&gt; 2268.01</td><td>227.871</td><td>13.34347</td><td>2.300</td><td>11.067 CCODE =</td><td>0.</td></assumed>	CHANNEL SE	CTION,	2:1 SIDE 14	)E SLOPES, 10' BOTTOM>> .32020 2268.0	BOTTOM>> 2268.01	227.871	13.34347	2.300	11.067 CCODE =	0.
*S << PAAKWEREE BASIN C >> SEDIMENT BULK COMPUTE NM HYD BASIN_	BASIN C >> BASIN_C	1	н	•		9.384	12.75063	2.250	PK BF = 31.578 PER IMP	1.00
~	IN CHAN UPST 106.31	OF 1&14	48" PIPE 14	, AT AVESTRUZ .33400	ST 2507.40	237.255	13.31897	2.300	11.730	
*S << PAAKWEREE BASIN A >> COMPUTE NM HYD BASIN	BASIN A >> BASIN_A	1 (	Ч:	·	1020.90	32.264	11.79246	2.250	31.095 PER IMP	5.00
*S < <total 105e.1="" 106.33<="" add="" chan="" dnstrm="" flow="" hyd="" in="" mcunge="" route="" td=""><td>IN CHAN DNSTR 105E.1 106.33</td><td>0F 1&amp;14 14</td><td>4. xo</td><td>. AT AVESTRUZ .38530 .38530</td><td></td><td>269.520 269.520</td><td>13.11573 13.11573</td><td>2.300</td><td>13.731 13.731 CCODE =</td><td>0.</td></total>	IN CHAN DNSTR 105E.1 106.33	0F 1&14 14	4. xo	. AT AVESTRUZ .38530 .38530		269.520 269.520	13.11573 13.11573	2.300	13.731 13.731 CCODE =	0.
*S LH BASIN NO. SEDIMENT BULK COMPUTE NM HYD ROUTE MCUNGE	50101 101.10 201.10	۱ ۲۰	10	.15400	2726.09 2612.64	108.509 107.991	13.21138 13.14820	2.300	PK BF = 27.659 PER IMP: 26.508 CCODE =	1.00 42.00
*S LH BASIN NO. COMPUTE NM HYD	50102 102.10	•	₽	12770		92.365	13.56187	2.250	31.853 PER IMP	49.00
*S < <flow *c="" add="" bactn="" d="" dankeredee="" en="" hyd="" into="" the="" upstream="">&gt;</flow>	HE UPSTREAM S_CULV	END OF 7 1&10	THE 5	CULVERT UNDER PA .28170	PAVO ST. >> 3853.85	200.356	13.33572	2.400	21.376	
SEDIMENT BULK COMPUTE NM HYD	BASIN_D	,	Ħ	.01440	294.45	10.416	13.56188	2.250	PK BF = 31.950 PER IMP	1.00

Interim PMP - Page 2

3	
Page	
F	
PMP	
Interim	

HYDROGRAPH IN  IDENTIFICATION ID	ADD HYD *S < <flow c!<="" in="" th=""><th>HYD DI CHAN DNSTRM OF 83</th><th>1 5e 1 8x4 CBC&gt;</th><th>15</th><th>.29610</th><th>Pmp_intu 3993.71</th><th>210.771</th><th>13.34673</th><th>2.400</th><th>21.075</th><th></th></flow>	HYD DI CHAN DNSTRM OF 83	1 5e 1 8x4 CBC>	15	.29610	Pmp_intu 3993.71	210.771	13.34673	2.400	21.075	
1	COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	or con oo.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	AC DC	ы	NO N
15   15   15   15   15   15   15   15	ADD HYD ROUTE MCUNGE	106.35	5£1	15 3	.68140	968.1 968.1	480.291 480.291	3.2161	2.300	5.978	н
	*S << PAAKWER COMPUTE NM HYD ADD HYD POTTER MCINGE	EE BASIN E >> BASIN E 106.50	38.1		.01440	294.4 220.3 220.3	10.416 490.706 490.706	.5618 .2232 .2232	2.250 2.300 2.300	.950 PER .214 .214 CCOI	4
DOWERS CLANNEL AT PERRIZ STY-  1	*S << PARWER: COMPUTE NM HYD	EE BASIN B >> BASIN B	1	, 4		1310.2	46.364	r.	.25	.938 PER	11
Land	*S TOTAL FLOW ADD HYD ROUTE MCUNGE	IN PROPOSED N 107.10 107.20	BORREG 1& 3 2	A CHANNEI 2 3	AT PERDI .75990 .75990	8342.9 8342.9	37.07 37.07	3.5		.155	11
BORREGA CHANNEL AT PARDAL ST.>   L	*S << PAAKWER COMPUTE NM HYD ADD HYD POTTE MCINGE	EE BASIN F >> BASIN_F 107.30	N	ним		686.8 931.3 931.3	24.30 61.37 61.37	3.5618 3.2649 3.2649	4.66	.942 PER .587 .587 CCOI	4
Record Channel Attachment	*S << PAAKWER COMPUTE NM HYD	EE BASIN G >> BASIN G	ı	H	.03520	719.6	5.46	3.5618	7	.942 PER	11 4
F GOLF COURSE PROPOSED (BELL PROPERTY) >>  - 1	*S TOTAL FLOW ADD HYD ROUTE MCUNGE	IN PROPOSED N 107.50 107.60	BORREG 1& 3 2	A CHANNEI 2 3	. AT PARDAL .82870 .82870	ST>> 9639.1 9639.1	86.83 86.83	3.2775	.25	8.1748.174	II
PARKWEREE IN PROPOSED 1192.66 53.700 12.38461 2.350 22.922 PER IMP= 2  1	,	O. 50108 ESIDENTIAL/HALF	GOLF	E	ROPOSED (BE:	PROPERTY) >				R H	
PAAKWEREE IN PROPOSED N BORREGA CHANNELLY   13.19778   2.300   18.275   18.045   18.	SEDIMENT BULK COMPUTE NM HYD	108.00	1		.08130	1192.66	53.7	2.3846	.35	2.922 PER	12
N BORREGA ARROYO CHANNEL AT AP 109  N BORREGA ARROYO CHANNEL AT AP 109  16. 3  1.14440  1.14440  1.14440  1.14440  1.14440  1.14440  1.14440  1.14440  1.14440  1.14440  2073.25  73.151  13.47335  2.250  19.409  CCODE =   1.24620  15993.52  882.807  13.28248  2.300  20.053  ***********************************	*S << TOTAL FL ADD HYD ROUTE MCUNGE	OW DNSTREAM OF 108.30 108.40	PAAKWE. 16-3 2	Z H	.91000	ORREGA CHANNEL 10643.19 10509.22	640.53 640.11	3.1977 3.1891	m m	8.275	II
N BORREGA ARROYO CHANNEL AT AP 109  16. 3 3 1.14440 14215.45 809.656 13.26551 2.300 19.409  CONTENDENCE WITH BASIN 50201  TOTAL CHANNEL FLOW TO DAM>  18. 4 4 1.24620 15993.52 882.807 13.28248 2.300 20.053  TOTAL CHANNEL FLOW TO DAM>  18. 4 4 1.24620 15993.52 882.807 13.28248 2.300 20.053  TOTAL CHANNEL FLOW TO DAM>  18. 4 4 1.24620 15993.52 882.807 13.28248 2.300 20.053  SYNER TO NORTH PART NOT FULLY EXCAVATED BECAUS  SINS TO NORTH BAESST, B6) NOT ADDED.  ON STORAGE ELEV  ON STORAGE ELEV  ON 4985  2.02 4986  7.94 4987  14.10 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989  20.51 4989	*S LH BASIN N COMPUTE NM HYD	o. 50109	1	Ħ	.23440	9	69.54	3.5618	r.	4.849 PER	4
CONFLUENCE WITH BASIN 50201  CTION, 2:1 SIDE SLOPES, 12' BOTTOM  3 4 1.1440 14215.45 809.656 13.26551 2.300 19.409 CCODE =  - 1 .10180 2073.25 73.151 13.47335 2.250 31.822 PER IMP= 4  TOTAL CHANNEL FLOW TO DAM>> 1£ 4 4 1.24620 15993.52 882.807 13.28248 2.300 20.053  >>>  *******************************	*S << TOTAL FL ADD HYD	OW IN PROPOSED 109.30	N BORR	ARRO	CHANNEL 1.14440	T AP 109 14215.4	9.65	3.2655	e.	9.40	
- 1 .10180 2073.25 73.151 13.47335 2.250 31.822 PER IMP= 4  TOTAL CHANNEL FLOW TO DAM>> 1£.4 4 1.24620 15993.52 882.807 13.28248 2.300 20.053  ***********************************	*S ROUTE FLOW *S < <assumed c<br="">ROUTE MCUNGE</assumed>	ABOVE AP109 TO ONC CHANNEL SEC 109.50	CONFLU FION, 3	WITS	HEASIN 502 SLOPES, 12 1.14440	1 BOTTOM 14215.4	09.65	3.2655	•	9.409	II
TOTAL CHANNEL FLOW TO DAM>>  1& 4 & 1.24620	*S LH BASIN N	o. 50110 110.00	ı	H	.10180	2073.2	3.1	3.4733	.25	.822 PER	11
**************************************	*S < <add 5011<="" td=""><td>0 TO CHANNEL.</td><td>TOTAL</td><td>CHANNEL</td><td>FLOW TO DA</td><td>15993.5</td><td>82.80</td><td>3.2824</td><td>ĸ,</td><td>0.05</td><td></td></add>	0 TO CHANNEL.	TOTAL	CHANNEL	FLOW TO DA	15993.5	82.80	3.2824	ĸ,	0.05	
**************************************	*S << TOTAL IN		* * * *	,	1 1 1 1						
BORREGA DAM PER WCEA DESIGN.  ***********************************		********	*	****	*****	*					
BORREGA DAM PHASE "A' PER WCEA DESIGN. NORTH PART NOT BASIN 6B (50201) AND BASINS TO NORTH (BAEAST, B6) NOT OUTFLOW STORAGE ELLEV 0 4 2.02 4985 4 7.94 4987 8 14.10 4988 14 20.51 4989 24 27.17 4990 36 34.36 4991		M PER WCEA DESI	*	****	*****						
OUTFLOW STORAGE ELEV  0 0 0 4985  0.4 7.94 4986  8 14.10 4987  14 20.51 4990  24 27.17 4990  36 34.08 4991  49 49		M PHASE "A' PER	ΚĔ	DESIGN.	B6	TON	/ATED BECAUS	ro			
0.4 2.02 4.98 4 7.94 4.98 8 14.10 4.98 14 20.51 4.98 24 27.17 4.99 49 41.36 4.99		OUTFLO	) )   	STORAGE	ELEV						
4 7.94 4.98 8 14.10 4.98 14 20.51 4.98 24 27.17 4.99 49 41.36 4.99	<b>ن</b> ن د +	0 0		0.02	നന			7			
8 14.10 498 14 . 20.51 498 24 27.17 499 36 34.08 499 49 41.36 499	ກ ເກ ' *	; •		7.94	000						
24 27.17 499 36 34.08 499 49 41.36 499	w .	14		14.10 20.51	മെ						
36 34.08 499 49 41.36 499	. *	224		27.17	00 0						
	x x	36 9 9		34.08 41.36	<b>700</b> 0						

					TIME TO	RUNOFF PEAK PER	(Silver)							•	13.08836 2.400 I/.9/8 AC-FT 103.303		13 00455 2 450 17.528 CCODE = .2		מיני	13.6/130 6.630 31./33 6.63 12.	7.450				
5					RUNOFF	VOLUME	(AC-FT)							1	869.905		316 070	010.070		70.870	897.142				
Pmp_intu					PEAK	DISCHARGE	(CFS)								14338.81		01000	139/9.30	4	769.73	14267.00				
	4994	4995	4996	4997		AREA	( RQ MI)	4997.1	4998	4999	2000	5001	5002	5003	1.24620			1.2462U	• • • • • •	.03790	1.28410				
	57.72	67.03	77.26	88.36		QI C		89.51	100.23	112.77	125.94	139.90	154.34	169.38	99	4 4 4		4		7	2	P 52****			
-	163	174	184	191	FRC	HYDROGRAPH ID	IDENTIFICATION NO	225	1252	3176	5667	8620	11966	15667	A BPOND.OUT 4		TS *** AL ST	110.50 99	). 50111	111.00 -	BR_DMP1.HYD 4&	*S HYD=BR_DMP1.HYD IS ****AP 52			
	<b>ω</b> *	* د	ν. *	*	,		COMMAND	تن *	**	₩ *	×	× *	ω *	* *	ROUTE RESERVOIR	72 ×	*S HYD=BPOND.OUT	ROUTE MCUNGE	*S LH BASIN NO. 50111	COMPUTE NM HYD	ADD HYD	*S HYD=BR_DMP1.	FINISH	(s10H	

```
START
*S
*S
*S
*S
*S
* S
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Bor_futu
                    0.0 HOURS PC=0 PL=-1
*S << WILSON&COMPANY (WCEA) AHYMO ANALYSIS FOR DESIGN OF THE BORREGA DAM.
    BASED ON LEEDSHILL AHYMO MODEL FOR THE '99 AMOLE-HUBBELL DMP (A-H DMP).
     THE LEEDSHILL MODEL WAS BASED ON THE '92 BHI AHYMO MODEL.
  FILENAME: BOR_FUTU.DAT
     BORREGA DAM PHASE "B", FUTURE CONDITIONS, FULL DEVELOPMENT, UNBULKED.
   1. BORREGA WATERSHED FULLY DEVELOPED
    2. AM SW HOMES (BELL PROPERTY) IS DEVELOPED & ADDED TO BORREGA DAM.
    3. BASIN 50201 IS DEVELOPED & ADDED TO BORREGA DAM.
   WCEA CHANGES TO THE AMOLE-HUBBELL DMP (A-H DMP) MODEL NOTED WITH "<< >>".
   MODIFICATIONS INCLUDE MUSKINGUM CUNGE ROUTING. (8/99 BY NM OF WCEA)
   THE A-H DMP IS AMENDED SO THAT THE SOUTH POWERLINE BASINS 50105 WEST, 50103, AND 50104 UNDER DEVELOPED CONDITIONS ARE DIVERTED SOUTH TO THE N BORREGA CHAN INTAKE CULVERT
   UNDER 118TH ST.
    WCEA ADJUSTMTS INCLUDE THE FOLLOWING IN THE A-H DMP AHYMO MODEL:
      AREAS: 50109 WAS INCREASED FROM 0.1914 TO 0.2344
50110 WAS REDUCED FROM 0.105 TO 0.0826
             BASINS 105 & 106 CUT OFF AT 118TH ST EMBANKMENT
      TP'S: 50105 WAS RECALCED DUE TO SUBDIVISION OF BASIN
             50106 WAS RECALCED DUE TO SUBDIVISION OF BASIN
    NOTE 1: 50103 & 50104 LABELS WERE SWITCHED IN THE A-H MAP. IN THE
     A-H AHYMO, 7B=BASIN 104 AND 7K=BASIN 103, WHICH MATCHES THE
     ORIGINAL BHI MODEL.
    NOTE 2: WCEA MODIFIED THE BASIN 50201 BOUNDARY.
     THE BASIN 50201 AREA IS 0.1473 SQ MI IN THE A-H DMP & BHI AHYMO MODELS,
     BUT THE A-H MAP MEASURED 0.238 SQ MI. THE BHI MAP USED 2-FT CONTOURS, WHILE THE A-H MAP USED 5-FT CONTOURS. WCEA DECREASED THE 50201 AREA
     ON THE A-H MAP TO MATCH THE BHI BASIN MAP FOR BASIN 50201.
    NOTE 3: NICK BELL PROPERTY (TO BE RESID/GOLF COURSE) NORTH OF BORREGA
     WATERSHED IS DIVERTED TO THE BORREGA WATERSHED AND INTO THE BORREGA DAM.
*s
*S**
*S
*S
        BORREGA WATERSHED
* S
*S
  100-YR, 24-HR STORM
  FILE NAME: BR_DMP1.DAT (Final Draft Submittal #3)
  BY: RICHARD STOCKTON
  LAST REVISION: 06-03-98
 * THE PURPOSE OF THIS MODEL IS TO CALCULATE THE RUNOFF FROM THE BORREGA
  BASIN. FLOWS FROM THIS BASIN IS CONVEYED TO HUBBLE LAKE DETENTION FACILITY
  VIA THE BORREGA DIVERSION CHANNEL.
 ***************
 * ANALYSIS ASSUMPTIONS:
 * 1. ALL LAND IN THIS BASIN IS MODELED AS DEVELOPED CONDITION. DEVELOPED
      CONDITIONS ARE BASED ON LH'S RUNOFF CATAGORY COLOR MAP.
 * 2. THE PUNCH HYD COMMAND WAS ADDED TO THE END OF THIS FILE SO THE OUTFALL
      HYDROGRAPH COULD BE USED IN THE AMOLE DEL NORTE DEVELOPED CONDITIONS MODEL
      AA_DMP1.DAT, WHICH WILL BE USED IN THE ANALYSIS OF THE AMOLE ARROYO SYSTEM.
 * 3. BULKING FACTORS FOR THE ESCARPMENT EASEMENT UNDER DEVELOPED CONDITIONS,
      HAVE BEEN REMOVED DUE TO BORREGA DETENTION BASIN IN THIS ALTERNATIVE.
                    _____
 *S 100 YEAR 24HR STORM DEVELOPED CONDITION
                       TYPE=2 0.0 1.87 2.20 2.66
 RAINFALL
 * 10 YEAR 24HR STORM DEVELOPED CONDITION
                       TYPE=2 0.0 1.25 1.47 1.77
 *RAINFALL
 * 5 YEAR 24HR STORM
                       TYPE=2 0.0 1.00 1.30 1.60
 *RAINFALL
 ** 2 YEAR 24HR STORM DEVELOPED CONDITION
                       TYPE=2 0.0 0.74 0.95 1.15
 **RAINFALL
                                                          DT=0.05
 * PMP LOCAL STORM
                         TYPE=3 0.0 11.5 16.0 0 DT=0.05
 *RAINFALL
 *S****************************
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*S COMPUTE FLOWS FROM SUB-BASIN B-2 OF RIO BRAVO
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\*S <<A-H AREA WAS 0.0754. WCEA REDUCED AREA TO 0.0445 BECAUSE THE RIO BRAVO

BLVD EXTENSION DIVIDES THE BASIN >>

ID=1 HYD NO=202.0 DA=0.0445 SQ MI %A=0 %B=33 %C=33 %D=34 COMPUTE NM HYD TP=0.1333 HR

Bor\_futu

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ID=13 REACH NO=2 NO VS=1 L=2000 FT
*COMPUTE TRAVEL TIME
                           SLP=0.045
                          ID=13 HYD=104.5
INFLOW ID=1 DT=0.0 L=2000 NS=0 S=0.045
ID=13 CODE=1
ROUTE MCUNGE
PRINT HYD
*S ADD THE ROUTED FLOWS FROM SUB-BASIN 50103.5 TO THE ROUTED FLOWS
                          ID=12 HYD=104.6 I=12 II=13 ID=12 CODE=1
ADD HYD
PRINT HYD
*S COMPUTE FLOWS FROM SUB-BASIN 50105 (WEST) FROM BORREGA
* << TRY RECALC TP TO COMPARE L-H TP=.1333 3700-FT LONG BASIN COMPUTE LT TP LCODE = 1 UPLAND/LAG TIME METHOD
                      NK = 3
                                    ISLOPE = 0
                      LENGTH = 400 FT
                                          SLOPE = 0.120 K = 0.7
                                           SLOPE = 0.078 K = 2.0
SLOPE = 0.044 K = 3.0
                      LENGTH = 1600 FT
LENGTH = 1700 FT
                      KN = 0.025 CENTROID DISTANCE = 0 FT
                           ID=1 HYD=105W DA=0.1413 SM
COMPUTE NM HYD
                          A=0 B=28 C=23 D=49
TP=0.0 RAIN=-1
                          ID=1 CODE=10
PRINT HYD
*S ADD THE ROUTED FLOWS FROM SUB-BASIN 50105 (WEST) TO THE ROUTED FLOWS ADD HYD ID=12 HYD=POND7.IN I=1 II=12 PRINT HYD ID=12 CODE=1
* S
*S ROUTE FLOWS THROUGH POND 7
* <<MODIFIED THE A-H DMP POND 7 OUTFLOW CURVE- ASSUMED 2-48" OUTFLOW PIPE>>
* OLD ROUTE RESERVOIR
                                     STORE
                            O OUT
                                        0
                                               10
                            0
                                              11
                            39.7
                            48.6
                                              11.5
                            56.2
                                      12
                            62.8
                                               12.5
                            68.8
                                               13
                           ID=70 HYD=POND7.OUT I=12 CODE=10
ROUTE RESERVOIR
                                    STORE
                           Q OUT
                                              ELEV
                                              10
                                      0
                           48
                                      4
                                              12
                          100
                                              13
                          160
                                      9
                                              14
                                     12
                          220
                           ID=70 CODE=1
PRINT HYD
 *S
 *S ROUTE FLOWS IN 118TH ST CHAN TO N BORREGA CHAN INTAKE UNDER 118TH ST
 * << ASSUMED EARTHEN CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BOTTOM>>
 COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                                     ELMAX=106
                        ELMIN=100
                        CH SLP=.005
                                             FP SLP=.02
                        N=.030 DIST=36
                        DIST
                                 ELEV
                                            DIST
                                                     FLEV
                                                                  DIST
                                                                           ELEV
                        n
                                 106
                                             12
                                                     100
                                                                  24
                                                                           100
                        36
                                 106
 *COMPUTE TRAVEL TIME
                            ID=12 REACH NO=1 NO VS=1 L=400 FT
                            SLP=0.01
                           OUTFLOW ID=12 OUTFLOW HYD=106.05
 ROUTE MCUNGE
                           INFLOW ID=70 DT=0.0 L=1200 NS=0 S=0.005
                           ID=12 CODE=1
 PRINT HYD
 *S
 *S BASIN NO. 50106
 *S << BASIN CUT OFF AT 118TH/POWERLINE TO DIVERT SOUTH, CALCED NEW AREA & TP
   << L-H AREA FOR 50106 WAS 0.09702, TP WAS .1505>>
                       LCODE = 1
 COMPUTE LT TP
                                     UPLAND/LAG TIME METHOD
                                     ISLOPE = 0 .100 K = 0.7 0 FT SLOPE = 0.063 K = 2.0 0 FT SLOPE = 0.047 K = 3.0
                       NK = 3
                       LENGTH = 400 FT
                       LENGTH = 1600 FT
                       LENGTH = 1390 FT
                       KN = 0.025 CENTROID DISTANCE = 0 FT
                       ID=3 HYD=106 DA=0.0856 SQ MI
 COMPUTE NM HYD
                       PER A=0 PER B=28 PER C=23
TP=0.0 RAIN=-1
                       ID=3
                                CODE=1
 PRINT HYD
 *S
 *S ADD THE FLOW FROM SUB-BASIN 106 TO THE FLOW FROM POND7
                           ID=3 HYD=106.1 I=3 II=12
 ADD HYD
                            ID=3 CODE=10
 PRINT HYD
 *S
 *S ROUTE FLOW THU PROPOSED N BORREGA CHAN TO 48" PIPE UPSTRM OF AVESTRUZ ST
 *S <<ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
 COMPUTE RATING CURVE ID=1 VS NO=1
                                            NO SEGS=1
                         ELMIN=100
                                      ELMAX=106
                         CH SLP=.05
                                            FP SLP=.05
```

N=.017 DIST=34

```
L=3500 NS=0 S=0.03
                       ID=10 CODE=1
PRINT HYD
*s LH BASIN NO. 50102
    << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >>
** NO BULKING THIS BASIN
**SEDIMENT BULK
                       CODE=1 BK=1.0
** COMPUTE HYD ABOVE AP 102 BASIN 7-C
                     ID=1 HYD=102.1 DA=0.1277 SQ MI
PER A=0 PER B=28 PER C=23 PER D=49
COMPUTE NM HYD
                      TP=-0.1333 RAIN=-1
                      ID=1
                             CODE=1
PRINT HYD
*S <<FLOW INTO THE UPSTREAM END OF THE CULVERT UNDER PAVO ST. >>
                      ID=5
                              HYD=S_CULV
ADD HYD
                      ID=1
                                  ID=10
PRINT HYD
                      ID=5
                                 CODE=1
*S << PAAKWEREE BASIN D >>
** NO BULKING FACTOR THIS BASIN
                         CODE=1 BK=1.0
SEDIMENT BULK
                      ID=1 HYD=BASIN_D DA=0.0144 SQ MI
PER A=0 PER B=28 PER C=23 PER D=49
TP=-0.1333 RAIN=-1
COMPUTE NM HYD
                             CODE=0
PRINT HYD
                      ID=1
ADD HYD
                       ID=15
                                  HYD=D1
                       TD=5
                                   ID=1
                       ID=15
                                   CODE=1
PRINT HYD
*S <<FLOW IN CHAN DNSTRM OF 8X4 CBC>>
                       ID=15
                                  HYD=106.35
ADD HYD
                       ID=15
                                    ID=13
                                   CODE=1
PRINT HYD
                       ID=15
 ** << ROUTE FLOW IN PROPOSED N BORREGA CHANNEL
* ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>> COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                        ELMIN=100 ELMAX=105
                        CH SLP=.03
                                            FP SLP=.03
                        N=.017 STA=34
                                            DIST
                                                                  DIST
                                                                           FLEV
                        DIST
                                ELEV
                                                     ELEV
                                                     100
                                                                  22
                                                                           100
                                 106
                                            12
                        34
                                106
                        ID=3
                                  HYD=106.4
 ROUTE MCUNGE
                        INFLOW ID=15
                                          DT = 0
                        L=500 NS=0 S=0.03
 PRINT HYD
                        ID=3
                                    CODE=1
     << PAAKWEREE BASIN E >>
 ** NO BULKING FACTOR THIS BASIN
                       TD=1 HYD=BASIN_E DA=0.0144 SQ MI
PER A=0 PER B=28 PER C=23 PER D=49
TP=-0.1333 RAIN=-1
 **SEDIMENT BULK
 COMPUTE NM HYD
 PRINT HYD
                       ID=1
                              CODE=0
                                   HYD=106.5
 ADD HYD
                       ID=15
                       ID=3
                                   ID=1
                                   CODE=1
 PRINT HYD
                       ID=15
 ** << ROUTE FLOW IN PROPOSED N BORREGA CHANNEL TO PERDIZ ST
 * ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>> COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                        ELMIN=100
                                     ELMAX=105
                        CH SLP=.03
                                            FP SLP=.03
                        N=.017 STA=34
                                            DIST
                                                     ELEV
                                                                   DIST
                                                                            ELEV
                         DIST
                                 ELEV
                                                                   22
                                                                            100
                                 106
                                             12
                                                     100
                         0
                         34
                                 106
                                  HYD=106.6
                        ID=3
 ROUTE MCUNGE
                         INFLOW ID=15
                                          DT = 0
                         L=300 NS=0 S=0.03
                                    CODE=1
 PRINT HYD
                         ID=3
 *S << PAAKWEREE BASIN B >>
 ** NO BULKING FACTOR THIS BASIN
                       CODE=1 BK=1.0

ID=1 HYD=BASIN_B DA=0.0641 SQ MI

TD=1 HYD=BASIN_B DER C=23 PER D=
 **SEDIMENT BULK
                       COMPUTE NM HYD
                                                PER C=23 PER D=49
                                      RAIN=-1
 PRINT HYD
```

```
*S << TOTAL FLOW DNSTREAM OF PAAKWEREE IN PROPOSED N BORREGA CHANNEL>>
                            HYD=108.3
                     ID=2
                      ID=1
                                ID=3
PRINT HYD
                      ID=2
                                CODE=1
* <<ROUTE FLOW TO AP BASIN 109
* ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                      ELMIN=100 ELMAX=106
                      CH SLP=.02
                                       FP SLP=.02
                      N=.017 STA=34
                                                                       ELEV
                              ELEV
                                         DIST
                                                 ELEV
                                                              DIST
                      DIST
                              106
                                         12
                                                 100
                                                              22
                                                                       100
                      34
                              106
                               REACH=1
SLP=.0286
*COMPUTE TRAVEL TIME ID=3
                                              NO VS=1
                       L=1500
ROUTE MCUNGE
                      ID=3
                                HYD=108.4
                      INFLOW ID=2 DT=0
L=1500 NS=0 S=0.0286
PRINT HYD
                      TD=3
                                 CODE=1
*S LH BASIN NO. 50109
** COMPUTE HYD ABOVE AP 109 BASIN 7-G
                      ID=1 HYD=109.1 DA=0.2344 SQ MI
PER A=0 PER B=28 PER C=23 PER D=49
TP=-0.2031 RAIN=-1
COMPUTE NM HYD
                      ID=1
                              CODE=1
PRINT HYD
*S << FLOW IN PROPOSED N BORREGA ARROYO CHANNEL AT AP 109
                      ID=3 HYD=109.3 ID=1
                                                  ID=3
ADD HYD
                      ID=3
                                CODE=1
PRINT HYD
** ROUTE FLOW ABOVE AP 109 TO FIRST CHANNEL DROP STRUCTURE
 ** ASSUME NATURAL ARROYO
                       ID=1 VS NO=1
ELMIN=0 ELMAX=5
 *COMPUTE RATING CURVE ID=1
                                           NO SEGS=1
                       CH SLP=.0286
                                           FP SLP=.0286
                       N=.032 STA=60
                                                   ELEV
                                                                DIST
                                                                        ELEV
                       DIST
                                ELEV
                                          DIST
                        0
                                                   0
                                                                 40
                                                                         O
                        60
                                 REACH=1
                                               NO VS=1
 *COMPUTE TRAVEL TIME ID=4
                       L=230
                                  SLP=.0286
                                  HYD=109.4
                       ID=4
 *ROUTE
                INFLOW ID=3
                                 DT = 0
                                  CODE=1
 *PRINT HYD
                       ID=4
 ** ROUTE FLOW FROM FIRST DROP STRUCTURE TO CONFLUENCE WITH BASIN 6-B
 * ASSUME NATURAL ARROYO
 *COMPUTE RATING CURVE ID=1
                                VS NO=1
                                           NO SEGS=1
                        ELMIN=0 ELMAX=7
                        CH SLP=.004
                                           FP SLP=.004
                        N=.033 STA=60
                        DIST
                                ELEV
                                           DIST
                                                   ELEV
                                                                DIST
                                                                        ELEV
                         0
                                7
                                            28
                                                    0
                                                                 48
                                                                         0
                         76
                                 7
 *S ROUTE FLOW ABOVE AP109 TO CONFLUENCE WITH BASIN 50201
 *S << ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BOTTOM
 COMPUTE RATING CURVE ID=1 VS NO=1 NO SEGS=1
                       ELMIN=100
                                   ELMAX=106
                                          FP SLP=.025
                       CH SLP=.025
                       N=.017 STA=36
                                                               DIST
                                                                       ELEV
                       DIST
                               ELEV
                                          DIST
                                                  ELEV
                                                               24
                                                                       100
                       0
                               106
                                           12
                                                  100
                       36
                               106
                                REACH=1
                                               NO VS=1
 *COMPUTE TRAVEL TIME ID=4
                        L=1230
                                  SLP=.025
                                 HYD=109.5
=3 DT=0
 ROUTE MCUNGE
                       ID=4
                       INFLOW ID=3 DT=0
L=1230 NS=0 S=0.025
                                  CODE=1
 PRINT HYD
                       ID=4
 *S LH BASIN NO. 50110
 ** COMPUTE HYD ABOVE AP 111 BASIN 7-I
 *S <<CHANGED TO HALF RESID/HALF GOLF COURSE PROPOSED (BELL PROPERTY) >>
 * <<WAS A=4, B=26, C=22 D=48>>
                       TD=1 HYD=110.0 DA=0.1018 SQ MI
PER A=0 PER B=60 PER C=15 PER D=25
TP=-0.1333 RAIN=-1
 COMPUTE NM HYD
                       TP=-0.1333
                               CODE=1
 PRINT HYD
                       ID=1
 *S <<ADD 50110 TO CHANNEL. TOTAL CHANNEL FLOW TO DAM>>
                                 HYD=110.1
                       ID=2
 ADD HYD
                       ID=1
                                  ID=4
 PRINT HYD
                       ID=2
                                  CODE=1
```

```
Bor_futu
                                      50.84
                                                   4993
                         69
*S
                                      61.26
                                                   4994
                         163
*S
                                      73.20
                                                   4995
                         174
*S
                                                   4996
*S
                         184
                                      86.10
                                                   4997
                                      99.30
* S
                         191
                                                   4997.1
*s
                         225
                                     100.64
                                                   4998
                                     112.80
*S
                        1252
                                                   4999
                        3176
                                     126.55
                                     140.56
                                                   5000
*S
                        5667
                                     154.85
                                                   5001
                        8620
*S
                       11966
                                     169.29
                                                   5002
                       15667
                                     184.32
                                                   5003
ROUTE RESERVOIR
                      ID=99 HYD=BPOND.OUT ID=4 CODE=5
                                                   4985
                          0
                                       0
                          0.4
                                       2.02
                                                    4986
                                                   4987
                          4
                                       7.94
                                      14.10
                                                    4988
                          8
                                                    4989
                          14
                                      20.51
                                                    4990
                                      27.17
                          24
                                                    4991
                          36
                                      34.08
                                       41.78
                                                    4992
                          49
                          69
                                       50.84
                                                    4993
                          163
                                       61.26
                                                    4994
                          174
                                                    4995
                                       73.20
                                      86.10
                                                    4996
                          184
                                      99.30
                                                    4997
                          191
                                      100.64
                                                    4997.1
                          225
                                      112.80
                                                    4998
                         1252
                                                    4999
                                      126.55
                         3176
                                      140.56
                                                    5000
                         5667
                                      154.85
                                                    5001
                         8620
                                                    5002
                        11966
                                      169.29
                        15667
                                      184.32
                                                    5003
PRINT HYD
                        ID=99 CODE=1
*S HYD=BPOND.OUT IS ****AP 51*****
** ROUTE FLOW ABOVE AP 110 TO THE BORREGA OUTFALL IN HUBBELL
COMPUTE RATING CURVE ID=1
                              VS NO=1 NO SEGS=1
                       ELMIN=0
                                ELMAX=7
                       CH SLP=.004
                                          FP SLP=.004
                       N=.033 STA=60
                       DIST ELEV
                                          DIST
                                                   ELEV
                                                                DIST
                                                                        ELEV
                                          28
                                                    0
                                                                 48
                                                                         0
                        76
                       ID=4
                                  REACH=1
                                               NO VS=1
*COMPUTE TRAVEL TIME
                         L=1849.5 SLP=.004
ROUTE MCUNGE
                       ID=4
                                HYD=110.5
                       INFLOW ID=99 DT=0
L=1849.4 NS=0 S=0.004
PRINT HYD
                                  CODE=1
 *S LH BASIN NO. 50111
** COMPUTE HYD ABOVE AP 111 BASIN 7-I
 * << REMOVED THE PART THAT IS IN THE DAM, OLD AREA WAS 0.05247>>
                       ID=2 HYD=111.0 DA=0.0379 SQ MI
PER A=0 PER B=45 PER C=10 PER
TP=-0.1333 RAIN=-1
 COMPUTE NM HYD
                                                         PER D=45
 PRINT HYD
                       ID=2
                               CODE=1
 ** ADD OLF FROM AP 110 TO BASIN 7-I AT AP 111
                       ID=2 HYD=BR_DMP1.HYD ID=4
                                                           ID=2
 ADD HYD
                               CODE=1
 PRINT HYD
                       ID=2
 *S HYD=BR_DMP1.HYD IS ****AP 52****
                       ID=2
 PUNCH HYD
 FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - INPUT FILE = X:\PUBLIC\PROJECTS\99099\AHYM\FUTURE\BOR_FUTU.DAT	VERSION:	1997.02c U	RUN DATE (	(MON/DAY/YR) =04/09/2000 AHYMO-I-9702a01000C05-AH	(R) =04/09	3/2000 205-AH
FROM TO PEAK HYDROGRAPH ID ID AREA DISCHARGE COMMAND IDENTIFICATION NO. NO. (SQ MI) (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION	1 NO
START  *S << WILSON&COMPANY (WCEA) AHYMO ANALYSIS FOR DESIGN OF THE BORREGA DAM.  *S BASED ON LEEDSHILL AHYMO MODEL FOR THE '99 AMOLE-HUBBELL DMP (A-H DW.  *S THE LEEDSHILL MODEL WAS BASED ON THE '92 BHI AHYMO MODEL.	EGA DAM. (A-H DMP).			н	TIME=	00.
FILENAME: BOR_FUTU.DAT BORREGA DAM PHASE "B", FUTURE CONDITIONS, FULL DEVELOPMENT,	UNBULKED.					
*\$ 1. BORREGA WATERSHED FULLY DEVELOPED  *\$ 2. AM SW HOMES (BELL PROPERTY) IS DEVELOPED & ADDED TO BORREGA DAM  *\$ 3. BASIN 50201 IS DEVELOPED & ADDED TO BORREGA DAM.	A DAM.					
**************************************	****					
**************************************	*********					
*S BORREGA WATERSHED *S						
*S *S 100 YEAR 24HR STORM DEVELOPED CONDITION RAINFALL TYPE=	* * * * * * * * * * * * * * * * * * * *			щ	RAIN24=	2.660
20 C . *						
*S COMPUTE FLOWS FROM SUB-BASIN B-2 OF RIO BRAVO  *S < <a-h *s="" 0.0445="" 0.0754.="" area="" basin="" because="" blvd="" divides="" extension="" reduced="" the="" to="" was="" wcea="">&gt;  COMPUTE NM HYD 202.00 - 1 .04450 87.36</a-h>	RIO BRAVO 3.236	1.36343	1.500	3.067 E	PER IMP=	34.00
*S ROUTE FLOWS TO POND 8 *S ROUTE MCUNGE 202.50 1 11 .04450 87.31	3.246	1.36779	1.600	3.066	CCODE =	
*S COMPUTE HYDROGRAPH FOR B-4 (WEST) FROM RIO BRAVO REDUCE AREA TO COMPUTE NM HYD 204.00 - 1 .06410 125.84	0 41 AC 4.661	1.36343	1.500	3.067	PER IMP=	34.00
ADD THE ROUTED FLOWS FROM SUB-BASIN 202.5 TO THE FLOWS FROM 1960 196.	SUB-BASIN 204 42 7.907	1.36521	1.550	2.826		
*S ROUTE FLOWS THROUGH POND 8 ROUTE RESERVOIR POND8.OUT 11 80 .10860 42.96	7.907	1.36520	2.000	.618	AC-FT=	4.100
NDER RIO BRAVO BLVD/118TH S N N SIDE OF RIO BRAVO BLVD 0 11 .	E ION>> 7.907	1.36521	2.000	.618	CCODE =	
**************************************	***************************************	1.27251	1.500	2.869	PER IMP=	32.00
*S ROUTE FLOWS TO POND 7 *S ROUTE MCUNGE 103.50 1 12 .03930 71.63	2.674	1.27559	1.550	2.848	CCODE ≈	?
*S COMPUTE FLOWS FROM SUB-BASIN 50103 FROM BORREGA (7K) COMPUTE NM HYD 103.00 - 1 .05400 102.13	3.834	1.33141	1.500	2.955 1	2.955 PER IMP=	35.00
701-001 Aritim	r Dage 1					

Future 100-yr - Page 1

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m

\*S ROUTE FLOWS TO POND 7

FROM HYDROGRAPH ID IDENTIFICATION NO.
13
SUB-BASIN 50103.5 TO TH 12&13 12 .09330
0105 (WEST) FROM BORREGA 1 .14130
SUB-BASIN 50105 (WEST) : 1£12 12 .23460
70 .23460
N BORREGA CHAN INTAKE 12 .23460
RLINE TO DIVERT SOUTH,
TO THE FLOW FROM 3
ROUTE FLOW THU PROPOSED N BORREGA CHAN TO 48" PIPE
8" PIPE, AT AVESTRUZ 14 .33400
48" PIPE, AT AVESTRUZ 14 13 .38530
1 .15400 10 .15400
THE CULVERT UNDER 5 .28170
101440 15 .29610
<pre>&lt;<rlow 8x4="" cbc="" chan="" dnstrm="" in="" of="">&gt; . HYD</rlow></pre>
1 .01440 15 .69580

Future 100-yr - Page 2

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Page
1
00-yr
Н
Future

ROUTE MCUNGE *S << PAAKWER	E MCUNGE 106.60 << PAAKWEREE BASIN B >>	15	m	.69580	Bor_futu 593.25	54.431	1.46678	1.800	1.332 0	CCODE =	0.
COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO TD NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION	m M
ğ	BASIN_B	- 4534404	1 CHANNEL	.06410 . at PERDIZ	136.51 ST>>	5.461	1.59742	1.500	œ	PER IMP=	49.00
*S TOTAL FLOW ADD HYD ROUTE MCUNGE		16 3 2			727.59	59.892 59.898	1.47780	1.500	1.496 1.479 C	CCODE =	2
*S << PAAKWER. COMPUTE NM HYD	EE BASII	i	н	.03360	71.56	2.863	•	1.500	3.328 F	PER IMP=	49.00
ADD HYD ROUTE MCUNGE	107.30	1& 3 2	01 FB	.79350	787.47 786.79	62.760 62.706	1.48299	1.500	.549	CCODE =	τ.
*S << PAAKWEREE BASIN COMPUTE NM HYD BA	EE BASIN	ı	н	Ÿ.	74.97	2.999	1.59742	1.500	3.328 E	PER IMP=	49.00
*S TOTAL FLOW ADD HYD	IN PROPOSED N 107.50	BORREGA 1& 3 2		Ε	ST>> 853.67 853.67	65.704 65.704	1.48661	1.550	1.610 1.610	CCODE =	•
*S LH BASIN NO. *S << HALF RES	50108	GOLF	COURSE PR	)PC	LL PROPERTY) >>				•	5	6
SEDIMENT BULK COMPUTE NM HYD	108.00	1		.08130	06.66		1.14903	1.600	1.920 E	MP=	25.00
*S << TOTAL FI ADD HYD ROUTE MCUNGE	< TOTAL FLOW DNSTREAM OF PAAKWEREE ) HYD 108.40 2 3	<b>PAA</b> KWE 1& 3 2	N N	PROPOSED N BG .91000 .91000	BORREGA CHANNEL> 946.37 943.74	70.687	1.45645	1.550	1.625 1.620 C	CCODE =	۲.
*S LH BASIN NO.	NO. 50109	1		.23440	391.32	19.970	1.59742	1.550	2.609 E	PER IMP=	49.00
*S << FLOW IN ADD HYD	PROPOSEI	EGA AH		CHANNEL AT AP 1.14440	109 1332.23	90.616	1.48467	1.600	1.819		
*S < <assumed *s="" <<assumed="" croute="" flow="" mcunge<="" td=""><td>*S ROUTE FLOW ABOVE AP109 TO CONFLUENCE  *S &lt;<a style="color: blue;">*S &lt;<a style="color: blue;">*S CTION, 2:1 \$</a></a></td><td>CONFLU TION,</td><td>WITH SIDE</td><td>BASIN 502 SLOPES, 12 1.14440</td><td>01 ' BOTTOM 1323.51</td><td>90.625</td><td>1.48481</td><td>1.600</td><td>1.807 0</td><td>CCODE =</td><td>. "</td></assumed>	*S ROUTE FLOW ABOVE AP109 TO CONFLUENCE  *S < <a style="color: blue;">*S &lt;<a style="color: blue;">*S CTION, 2:1 \$</a></a>	CONFLU TION,	WITH SIDE	BASIN 502 SLOPES, 12 1.14440	01 ' BOTTOM 1323.51	90.625	1.48481	1.600	1.807 0	CCODE =	. "
*S - LH BASIN NO. 50110  *S << CHANGED TO HALF RU	D. 5011( D HALF 1	LF GOLF	COURSE	PROPOSED (1	(BELL PROPERTY)	>> 6.238	1.14904	1.500	2.718	PER IMP=	25.00
COMPUTE NM RYD *S < <add 5011<br="">ADD HYD</add>	TO CHANNEL. 110.10	TOTAL	CHANNEL F	FLOW TO DAM>	, ,	.86	1.45738	1.600	1.821		
*S LH BASIN 50201 COMPUTE NM HYD	201	1	н	.14730	229.72	12.549	1.59741	1.600	2.437	PER IMP=	49.00
<pre>&lt;&lt; BORREGA VIDE HYD</pre>	DIVERSIO 2 2	I DRAIN 1 and	21.	.14730	229.72	12.549	1.59741	1.600	2.437		
*S ADD 50201 ADD HYD	TO DAM 110.15	18 2	4	1.39350	1681.86	109.413	1.47219	1.600	1.886		
*S < <basin no.<br="">COMPUTE NM HYD</basin>	O. 70102 (B-4 EAST) D B4EAST	ST) 4	4 ACRES>> 6	.06770	109.76	4.288	1.18751	1.550	2.533 1	PER IMP=	16.00
*S < <route b-4<br="">ROUTE MCUNGE</route>		9-6>>	ιΛ	.06770	105.13	4.260	1.17984	1.850	2.426	CCODE =	다.
*S << BASIN NO *S << HALF RES: COMPUTE NM HYD	. 70103 (B-6) ID/HALF GOLF C B6	>> URSE	PROPOSED (	(BELL PROPERTY)	RTY) >> 357.99	17.582	1.14903	1.600	1.950 1	PER IMP=	25.00
*S < <total b-4<br="">ADD HYD</total>	< <total and="" b-4="" b-6="" east="">&gt; HYD B6.1</total>	16 5	ļ			21.842	1.15491	1.650	1.604		
*S << PROPOSEI DIVIDE HYD	PROPOSED FUTURE STORM DRAI E HYD B6.1DIV1 ar	RAIN 7 and	FROM BELL 7 22	PROPERTY TO .35460 .00000	DAN DAN	21.842	1.15491	1.650	1.604		
*S << TOTAL IN	*S << TOTAL INTO BORREGA DAM ADD HYD 110.20	>> 76.4	4	1.74810	2045.39	131.254	1.40783	1.600	1.828		

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*S BORREGA *S *S	BORREGA DAM PHASE "B' PER WCEA DESIGN OUTFLOW STORAG 0 0 0	"B' PER OUTFLOW 0	WCEA 1	DESIGN STORAGE 0 2.02	ELEV 4985 4986							
COMMAND	HYDROGRAPH IDENTIFICATION		FROM ID NO.	NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION	4
დე <b>ა</b>		∢ 0		7.94	4987							
v v v		14		20.51	4989							
8		24		27.17	4990							
w w		36 9 9		34.08 41.78	4 9 9 1 4 9 9 1 1 2 9 9 2							
* S		69		50.84	4993							
ທ ທ * *		163		61.26	4994 4995							
າ ເກ *		184		86.10	4996							
* *		191		99.30	4997							
τΩ ( * ÷		225		100.64	4997.1							
ις * *		3176		126.55	# 4 0 0 0 0 0 0							
מ מ *		5667		140.56	2000							
* S		8620	.7	154.85	5001							
* S		11966	. 1	169.29	2002							
<b>ب</b>		15667		184.32	5003					1		
ROUTE RESERVOIR			4	66	1.74810	184.95	115.283	1.23652	2.700	. Tob AC-FT=		αα αα
*S HYD=BPOND.OUT	D.OUT IS **	IS ***** 51	21****				1		0	10.		C
ROUTE MCUNGE		110.50	66	4	1.74810	184.94	115.091	1.23446	2.800	322 691.	CCODE =	
*S LH BASIN NO.	0. 50111					1			i	- TWE THE		1
COMPUTE NM HYD		111.00	,	7	.03790	75.78	3.006	1.48691	1.500	3.124 42.5		00.0
ADD HYD	BR_DM		4 & 2	7	1.78600	186.15	118.097	1.23982	7.650	. 103		
*S HYD=BR_DMP1.HYD IS ****AR	MP1.HYD IS		52****	*								
****												

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AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) - INPUT FILE = X:\PUBLIC\PROJECTS\99099\AHYM\FUTURE\BOR_FUTU.DAT	- VERSION: 1997	1997.02c F	RUN DATE ( USER NO.= A	(MON/DAY/YR) =04/09/2000 AHYMO-I-9702a01000C05-AH	) =04/09 2a01000C	/2000 05-AH	
FROM TO PEAK HYDROGRAPH ID ID AREA DISCHARGE COMMAND IDENTIFICATION NO. NO. (SQ MI) (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = NOTATION	H H	
ILSON&COMPANY (WCEA) AHYMO ANALYSIS FOR DESIGN OF SED ON LEEDSHILL AHYMO MODEL FOR THE '99 AMOLE-HUE E LEEDSHILL MODEL WAS BASED ON THE '92 BHI AHYMO M	THE BORREGA DAM. SBELL DMP (A-H DMP). IODEL.		•	Ţ	TIME=	00.	
*S *S FILENAME: BOR_FUTU.DAT *S BORREGA DAM PHASE "B", FUTURE CONDITIONS, FULL DEVELOPMENT, UNBULKED	, UNBULKED.						
*S 1. BORREGA WATERSHED FULLY DEVELOPED *S 2. AM SW HOMES (BELL PROPERTY) IS DEVELOPED & ADDED TO BORREGA *S 3. BASIN 50201 IS DEVELOPED & ADDED TO BORREGA DAM.	EGA DAM.	r					
***************************************	******						
**************************************	*******						
*S BORREGA WATERSHED *S							
PMP LOCAL STORM INFALL TYPE= 3 ************************************	****			R.	RAIN6= 1	16.000	
*S *S COMPUTE FLOWS FROM SUB-BASIN B-2 OF RIO BRAVO *S < <a-h 0.0445="" 0.0754.="" area="" because="" reduced="" td="" th<="" to="" was="" wcea=""><td>THE RIO BRAVO</td><td></td><td></td><td></td><td></td><td></td><td></td></a-h>	THE RIO BRAVO						
BLVD EXTENSION DIVIDES THE BASIN >> 104450 901	.25 30.735	12.95028	2,250	31.645 PER	R IMP=	34.00	
*S ROUTE FLOWS TO POND 8  ROUTE MCUNGE 202.50 1 11 .04450 897.22	30.780	12.96923	2.300	31.504 CC	CCODE =	4	
COMPUTE HYDROGRAPH FOR B-4 (WEST) FROM RIO BRAVO REDUCE AREA APPER 1298.(	. TO 41 AC 08 44.273	12.95027	2.250	31.642 PER	SR IMP=	34.00	
ADD THE ROUTED FLOWS FROM SUB-BASIN 202.5 TO THE FLOWS FROM D HYD .10860 2098.	SUB-BASIN 204 52 75.053	12.95803	2.250	30.193			
*S *S ROUTE FLOWS THROUGH POND 8 *S ROUTE RESERVOIR POND8.OUT 11 80 .10860 221.17	17 75.053	12.95804	2.900	3.182 AC	AC-FT=	91.185	
*S *S *S *S *S *S *S *COUTE FLOWS TO JUNCTION *S *S *S *C *ELOW TO CULVERT CROSSING UNDER RIO BRAVO BLVD/118TH ST TO NE *S *S *S *C *S *C	rr to NE EXTENSION>> 220.38 75.007	12.95010	3.000	3.171 CC	ccode =	?	
*S************************************	91 26.636	12.70823	2.250	31.445 PE	PER IMP=	32.00	
*S *S ROUTE FLOWS TO POND 7 ROUTE MCUNGE 103.50 1 12 .03930 781.01	01 26.681	12.72932	2.300	31.052 CC	CCODE =	5.	
*S COMPUTE FLOWS FROM SUB-BASIN 50103 FROM BORREGA (7K) COMPUTE NM HYD 103.00 - 1 .05400 1089.89	89 37.044	12.86259	2.250	31.536 PER IMP=	SR IMP=	35.00	
	1 9 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						

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\*S
\*S ROUTE FLOWS TO POND

1.00 1.00 5.00 1.00 ٥. 7 7 49.00 ٥. ۰. 49.00 49.00 49.00 68.063 N NOTATION PAGE = PK BF = PER IMP= PER IMP= CCODE = 28.663 PER IMP= PK BF = PER IMP= 31.853 PER IMP= PER IMP= 29.949 PER IMP= 31.095 PER IMP= H 8.933 AC-FT= CCODE 11.067 CCODE CCODE PK BF CCODE 8.922 CCODE 13.731 27.659 26.508 15.978 15.978 31.950 31.950 31.578 21.075 21.376 30,361 11.067 11.730 29.197 30.652 ACRE 2.300 2.250 2.300 2.300 2.400 2.250 2.300 2.250 2.550 2.250 2.300 2.250 2.250 2.300 2.550 2.300 TIME TO 2.300 2.300 2.250 (HOURS) PEAK 13.56188 13.34673 13.21610 13.21610 13.56188 13.22325 13.11573 13.21138 13.56188 13.26406 13.26378 13.56188 13.34347 13.34347 12.75063 13.31897 11.79246 13.56187 13.33572 12.87646 12.81447 13.26463 (INCHES) RUNOFF VOLUME (AC-FT) 10.416 ST 165.956 269.520 108.509 10.416 480.291 9.384 << BASIN CUT OFF AT 118TH/POWERLINE TO DIVERT SOUTH, CALCED NEW AREA & TP
ADUTE NM HYD 106.00 61.914</pre> 237.255 32.264 92.365 200.356 63.765 102.202 : ROUTED FLOWS 4383.68 165.967 165.960 227.871 227.871 37.084 RUNOFF \*S ROUTE FLOW THU PROPOSED N BORREGA CHAN TO 48" PIPE UPSTRW OF AVESTRUZ ST
\*S <<ASSUMED CONC CHANNEL SECTION, 2:1 SIDE SLOPES, 10' BOTTOM>>
ROUTE MCUNGE 106.30 3 14 .32020 2268.01 227.8' UNDER 118TH 1339.51 ۸ SEDIMENT COMPUTE NN HYD 101.1. 1 10 ....

ROUTE NCUNGE 201.10 1 10 ....
\*S LH BASIN NO. 50102

\*S << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >

\*S << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >

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\*S << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >

\*S <= CONTRACTOR SQ MI >

\*S << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >

\*S << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >

\*S << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >

\*S <= CONTRACTOR SQ MI >

\*S << BASIN DIVIDED AT PAAKWEREE BNDRY, OLD AREA WAS 0.182 SQ MI >

\*S <= CONTRACTOR SQ MI >

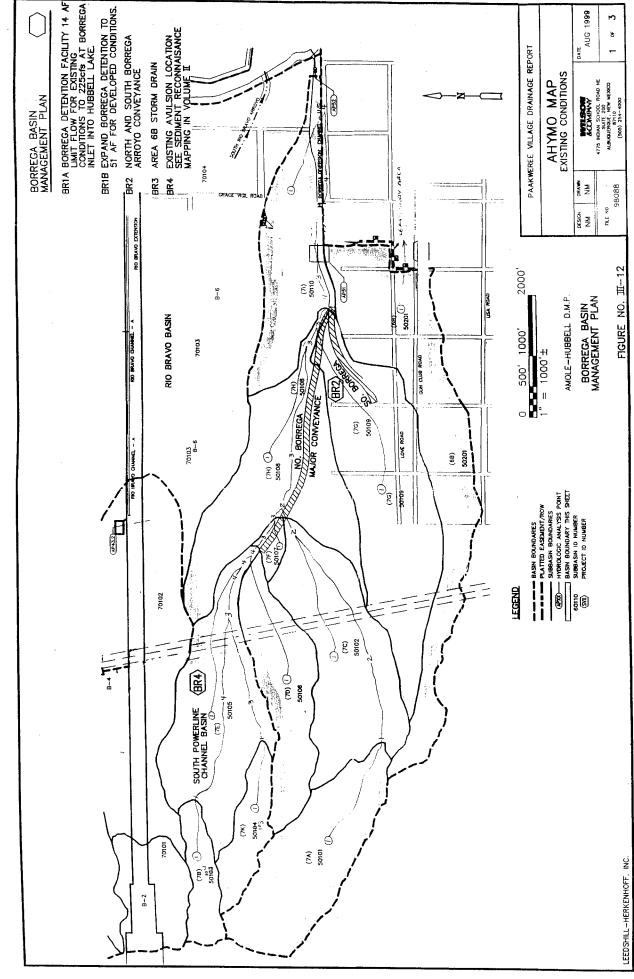
\*S << BASIN DIVIDED AT PAAKWEREE BNDRY ROUTED FLOWS 1830.29 294.45 3993.71 PEAK DISCHARGE 6968.10 6968.10 3385.87 2507.40 294.45 7220.36 278.89 1020.90 2592.08 1341.27 2268.01 1049.28 (CFS) SI S TO THE \*S <<FLOW INTO THE UPSTREAM END OF THE CULVERT UNDER PAVO
S\_CULV 1&10 5 .28170 FROM BORREGA THE FLOW FROM POND7 CHAN INTAKE .23460 COMPUTE NM HYD BASIN\_C - 1 .01380 \*S <<TOTAL FLOW IN CHAN UPSTRM OF 48" PIPE, AT AVESTRUZ ADD HYD .33400 COMPUTE NM HYD BASIN A - 1 .05130
\*\$ <<TOTAL FLOW IN CHAN DNSTRM OF 48" PIPE, AT AVESTRUZ
ADD HYD 105E,1 1&14 14 .38530
ROUTE MCUNGE 106.33 14 13 .38530 50103.5 TO THE .01440 .68140 .01440 .23460 .32020 .14130 .23460 .05400 .09330 AREA (SQ MI) (WEST) \*S ADD THE ROUTED FLOWS FROM SUB-BASIN 50105 ADD HYD POND7.IN 1£12 12 SUB-BASIN 50105 (WEST) N BORREGA 12 SUB-BASIN m D1 5£ 1 15 3TRM OF 8X4 CBC>> 106.35 15£13 15 106.40 15 3 ខ្ពះទ 13 15 15 15 15 70 \*S ADD THE FLOW FROM SUB-BASIN 106 TO TO 70 н 104.60 12813 FROM 106.10 3&12 H 12 3& \*S ROUTE FLOWS IN 118TH ST CHAN ROUTE MCUNGE 7 BASIN\_D D1 BASIN\_E 106.50 FLOWS FROM 105W HYDROGRAPH IDENTIFICATION 104.50 POND7.OUT \*S
\*S ROUTE FLOWS THROUGH POND DNSTRM OF \*S << PAAKWEREE BASIN C >> SEDIMENT BULK << PAAKWEREE BASIN D >> \*S << PAAKWEREE BASIN E >> \*S << PAAKWEREE BASIN A >> \*S LH BASIN NO. 50101 SEDIMENT BULK \*S COMPUTE FLOWS FROM COMPUTE NM HYD BASIN NO. 50106 \*S <<FLOW IN CHAN ADD HYD ADD THE ROUTED ROUTE RESERVOIR COMPUTE NM HYD COMPUTE NM HYD COMPUTE NM HYD SEDIMENT BULK ROUTE MCUNGE ROUTE MCUNGE ROUTE MCUNGE ADD HYD COMMAND

Future PMP - Page 2

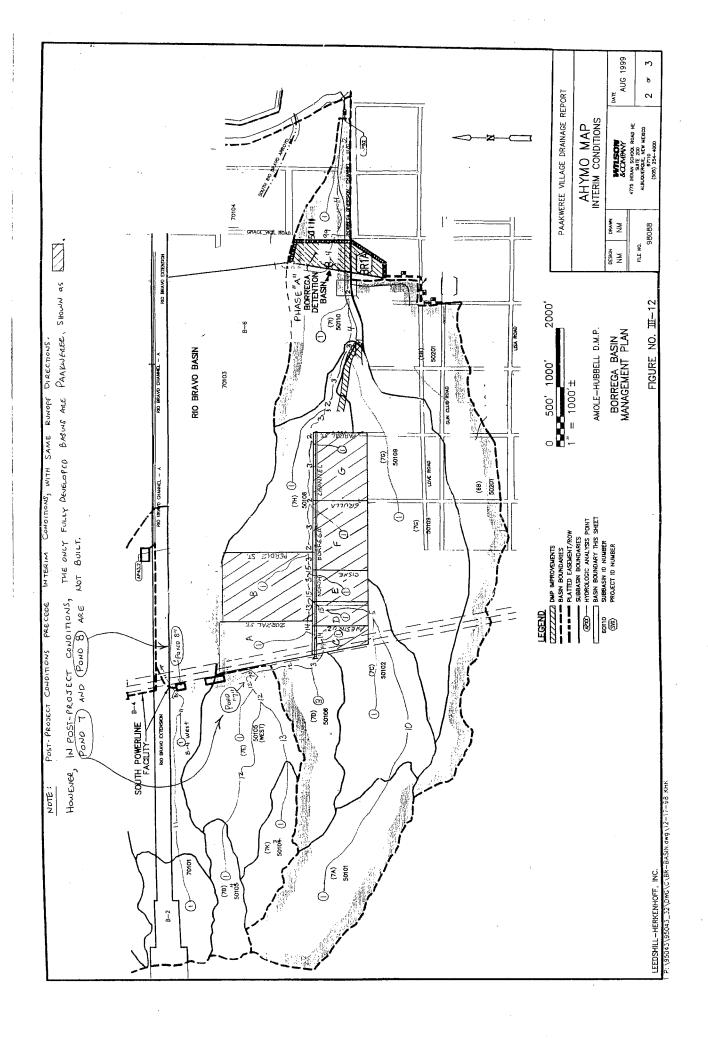
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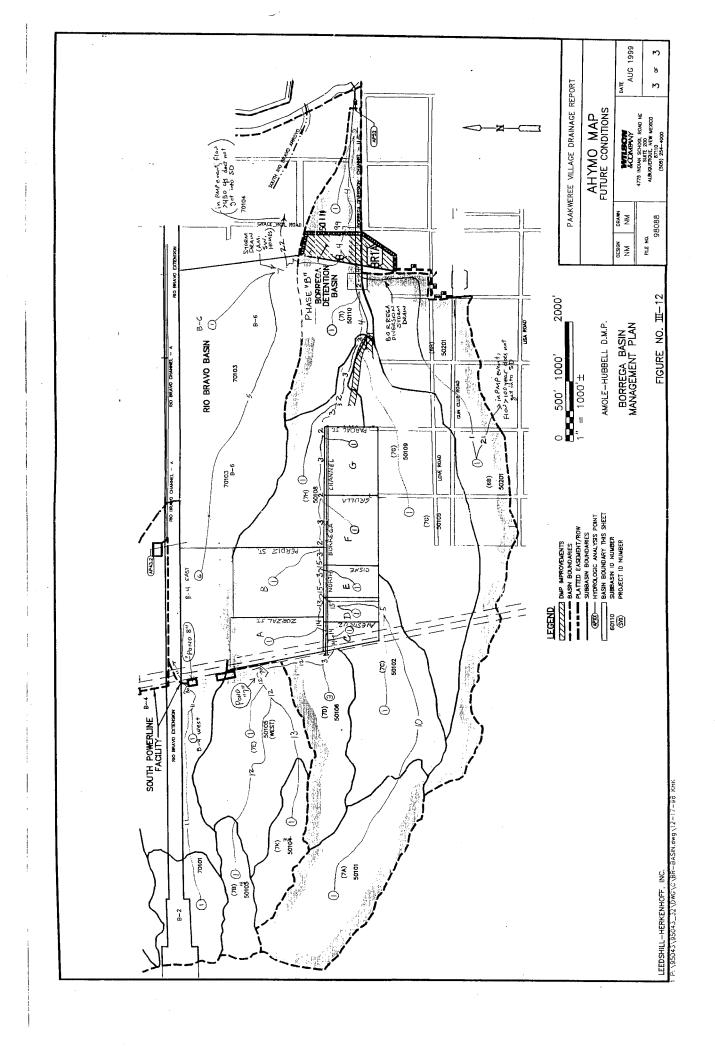
	FROM TO SQ MI)  - 1 .06410  - 1 .06410  1k 3 2 .75990  1k 3 2 .75990  - 1 .03360  1k 3 2 .79350  - 1 .03520  BORREGA CHANNEL AT PERDIZ ST>  - 1 .03520  BORREGA CHANNEL AT PARDAL ST>  1k 3 2 .79350  - 1 .03520  BORREGA CHANNEL AT PARDAL ST>  1k 3 2 .79350  - 1 .03520  BORREGA CHANNEL AT AP 109  1k 3 2 .91000  1 2 3 3 .11440  - 1 .23440  1 2 .91000  1 2 3 4 .14440  LEGA ARROYO CHANNEL AT AP 109  1 3 3 .11440  LEGA ARROYO CHANNEL AT AP 109  1 2 3 4 .11440  1 14440  1 14440  1 14440  1 14440  1 14440  1 14440  1 1 2 .05988  1 1 2 .05770  1 2 . 1 2105 SLOPES, 12' BO  1 2 . 124620  1 2 . 124620  1 2 . 26590  1 2 . 35460  DRAIN >> .05988  1 185 7 .35460  DRAIN FROM BELL PROPERTY TO DARAN TO DARAN FROM BELL PROPERTY TO DARAN FROM BELL PROPERTY TO DARAN TO DARAN TO DARAN FROM BELL PROPERTY TO DARAN TO DARAN TO DARAN FROM BELL PROPERTY TO DARAN TO DARAN TO DARAN TO DARAN FROM BELL PROPERTY TO DARAN TO DARAN TO DARAN TO DARAN FROM BELL PROPERTY TO DARAN TO	PEAK DISCHARGE (CFS)	Bechar			0.00		
Name	EE BASIN_B - 1 . 06410  IN PROPOSED N BORREGA CHANNEL AT PERDIZ ST>  107.10 1& 3 2 . 75990  107.20 2 3 . 75990  107.40 2 3 . 79350  107.40 2 3 2 . 79350  107.40 2 3 2 . 79350  EE BASIN F >>  107.40 2 3 2 . 79350  IN PROPOSED N BORREGA CHANNEL AT PARDAL ST>  IN PROPOSED N BORREGA CHANNEL AT PARDAL ST>  107.60 2 3 . 82870  O. 50108  OW DNSTREAM OF PARWHERE IN PROPOSED N BORREGA CHANNEL AT AP 109  IN 8.30 1& 3 2 . 91000  IN 8.30 1& 3 3 . 91000  IN 8.40 2 3 . 91000  IN 8.50 1	(2.5)	VOLUME (AC-FT)		PEAK HOURS)	ы		
The Proposed Bright State	IN PROPOSED N BORREGA CHANNEL AT PERDIA STRUCTOR 107.20	1310.2	46.364	3.561	7	.938 PER IMP		
ER BARIN F - 1 03360 666.69 24.301 13.56187 2.250 31.242 FER INP= 49  107.100 14.2 3 .79350 8931.37 561.373 13.56485 2.350 17.587 CODE = 107.101 10.010 14.2 3 .79350 8931.37 561.373 13.56485 2.350 17.587 CODE = 107.101 10.010 14.2 3 10.010 14.2 51.010 17.587 CODE = 107.101 10.010 14.2 51.010 17.587 CODE = 107.101 10.010 14	EE BASIN F >>  BASIN_F - 1 .03360 107.30	8342.9 8342.9	37.	3.2		.155 .155 CCODE	٥.	
The property of the party of	EE BASIN 1E 3 2 .79350  107.40 2 3 .79350  107.40 2 3 .79350  IN PROPOSED N BORREGA CHANNEL AT PARDAL STYLES 107.50 1& 3 2 .82870  107.50 1& 3 2 .82870  107.50 1& 3 2 .82870  107.50 1& 3 2 .82870  0.50108  ON DNSTREAM OF PAAKWEREE IN PROPOSED N BORREGA 108.40 2 3 .91000 1 108.40 2 3 .91000 1 108.40 2 3 .91000 1 109.50 1 2 .91000 1 109.30 1& 3 3 1.14440 1 109.50 1 109.50 1 3 3 4 1.14440 1 109.50 1 3 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14440 1 109.50 1 3 4 1.14450 1 109.50 1 109.50 1 3 4 1.14450 1 109.50 1 109.50 1 3 4 1.14450 1 109.50 1 109	686.89			2.250	PER	9	
No. 50108   No.	EREE BASIN G >>  VED  BASIN G  107.50 16.3 2 .82870  107.50 12.3 3 .82870  107.50 2 3 .82870  NO. 50108  RESIDENTIAL/HALF GOLF COURSE PROPOSED (BELL P)  RESIDENTIAL/HALF GOLF COURSE PROPOSED N BORRE  TO HALF RESID  109.30 16.3 3 .91000 1  NO. 50109  N PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  N PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  N PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  N PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  N PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  N PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  N PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  NO. 50109  TO HALF RESID/HALF GOLF COURSE PROPOSED (BELL YOUR ABOVE AP 109 TO CONFLUENCE WITH BASIN 50201  TO HALF RESID/HALF GOLF COURSE PROPOSED (BELL ABOVE AP 109 TO CONFLUENCE AP 110.00  110.10 TO CHANNEL. TOTAL CHANNEL FLOW TO DAM>>  110.10 16.4 2 1.1440  A DIVERSION STORM DAIN >>  110.10 16.4 2 1.24620  A DIVERSION STORM DAIN >>  10.50201  A DIVERSION STORM DAIN >>  10.50201  A DIVERSION STORM DAIN >>  10.508  A DIVERSION STORM DAIN PROM BELL PROPERTY TO DA SELIDIVAL BORREGY TO ABELL PROPERTY TO DA BELLINY AND BELL PROPERTY TO DA BELLINY AND BELL PROPERTY TO DA BELLINY AND BELL PROPERTY TO DA BELLINY AND	931 931	61. 61.		2.300	CCODE	0.	
OW IN PROPOSED N GONEGA CHANNEL AT PARAL STYNON IN PROPERTY NO. 50108   13.27755   2.250   18.174 (CODE = 10.050   2 3   3.2870   9639.13   586.833   13.27755   2.250   18.174 (CODE = 10.050   2 3   3.2870   9639.13   586.833   13.27755   2.250   18.174 (CODE = 10.050   2 3   3.2870   9639.13   586.833   13.27755   2.250   18.174 (CODE = 10.050   2 3   3.2870   3.2756   53.700   12.38461   2.380   18.275   2.292 PER INF= 25   2.000   108.00   2.380   2.386   2.380   2.292 PER INF= 25   2.380   2.380   2.380   2.292 PER INF= 25   2.380   2.380   2.380   2.292 PER INF= 25   2.380   2.3	OW IN PROPOSED N BORREGA CHANNEL AT PARDAL STYON 107.50 1£ 3 2 .82870  NO. 50108  RESIDENTIAL/HALF GOLF COURSE PROPOSED (BELL P)  KEYD 108.40 - 1 .08130  108.40 2 3 .91000 1  108.40 2 3 .91000 1  NO. 50109  NO. 50109  NO FOLOS 109.30 1£ 3 2 .91000 1  NO. 50100 - 1 .23440  NO FOLOS 109.30 1£ 3 3 1.14440 1  NO. 5010 - 1 .23440  NO FALF RESID/HALF GOLF COURSE PROPOSED (BELL P)  TO HALF RESID/HALF GOLF COURSE PROPOSED (BELL PO A DOTT RESID/HALF GOLF COURSE PROPOSED (BELL TO HALF RESID/HALF GOLF COURSE PROPOSED (BELL TO HALF RESID/HALF GOLF COURSE PROPOSED (BELL TO TAL TAND NO. 50110  NO. 50110  TO HALF RESID/HALF GOLF COURSE PROPOSED (BELL TO DANN)  110.10 TO CHANNEL. TOTAL CHANNEL FLOW TO DANN)  201DIV2 and 21 .08742  1 TO DAN	19	Ŋ.			.942 PER IMP	o,	
107.50   12   3   4   12.85   1   12.55   15.7755   15.7755   15.174   CODE =   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50   12   107.50	NO. 50108  NO. 50108  RESIDENTIAL/HALF GOLF COURSE PROPOSED (BELL F)  TO 108.30		4			8.17		
10.0108   10.000	D. 50108  108.00 - 1 .08130  108.00 - 1 .08130  108.30 1£ 3 2 .91000 1  108.30 1£ 3 2 .91000 1  108.30 1£ 3 2 .91000 1  20.50109 - 109.30 1£ 3 3 1.4440 1  ABOVE AP109 TO CONFLUENCE WITH BASIN 50201  DNC CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BO  TO CHANNEL TOTAL CHANNEL FLOW TO DAM>  110.00 - 1  201.00 - 1	639.1	86.83			8.174 CCODE	0.	
108.00   -   1	108.00 - 1 .08130  108.30 16.3 2 .91000 1  108.40 2 3 .91000 1  108.40 2 3 .91000 1  20.50109  109.30 16.3 3 .91000 1  20.100 109.30 12.3 40  ABOVE AP109 TO CONFLUENCE WITH BASIN 50201  30.50110  30.4440 110.00 3 4 1.14440  30.50110  30.50110  30.4440 110.00 0 1110.00  30.4440 110.00 0 110.00  30.50110  3	PROPERTY)				,	•	
WINDEVEREE IN PROPOSED N BORREACE  NUMBERS OF PARAMEREE IN PROPOSED N BORREACE  NUMBERS OF PARAMEREE IN PROPOSED N BORREACE  108.40 12 3 2 91000 10643.19 640.514 13.18916 2.350 18.045 0.000000  108.40 12 3 2 91000 10659.22 640.114 13.18916 2.350 18.045 0.00000  108.40 12 3 2 91000 10659.22 640.114 13.18916 2.350 18.045 0.00000  PROPOSED N BORREACA ARROY CHANNEL AT AP 109 14215.45 809.656 13.2651 2.300 19.409  PROPOSED N BORREACA ARROY CHANNEL AT AP 109.30 14415.45 809.656 13.26551 2.300 19.409  PROPOSED N BORREACA ARROY CHANNEL ARROY N STAND N CHANNEL SECTION, 1.0180 1.	DW DNSTREAM OF PAAKWEREE IN PROPOSED N BORKE 108.30 1& 3 2 .91000 1 108.40 2 3 .91000 1 108.40 2 3 .91000 1 108.40 2 3 .91000 1 109.10 - 1 .23440 1 PROPOSED N BORREGA ARROYO CHANNEL AT AP 109 1 ABOVE AP109 TO CONFLUENCE WITH BASIN 50201 3 4 1.14440 1 D. 50110 3 4 1.14440 1 D. 50110 3 4 1.14440 1 D. 50110 0 - 1 .14440 1 110.00 - 1 .14440 1 201 10.00 - 1 .14440 1 201 10 1£ 4 2 1.24620 1 DIVERSION STORM DRAIN >> .05988 1 201DIV2 and 21 .05988 1 CO DAM 110.15 1& 2 4 1.30608 1 TO DAM 110.15 1& 2 4 1.30608 1 EAST THROUGH B-6> 6 5 .06770 1 B4E.1 6 5 .06770 1 EAST AND B-6> 1 .28690 1 EAST AND B-6> 1 .35460 1 FAUTURE STORM DRAIN FROM BELL PROPERTY TO DA B6.1DIV2 and 22 .23534 1 B6.1DIV2 AND 3 .23534	32.66		12.38461	ω.	.922 PER IMP	ıΩ	
DEFINITION OF THE PROPERTY NOT CHANNEL ARROYO CHANNEL SECTION, 2:1 SIDE SIDERS, 12:100 109:409  NECCHANNEL SECTION, 2:1 SIDE SIDERS, 12:100 100:409  NECCHANNEL SECTION, 2:1 SIDE SIDERS, 12:100 100:409  NECCHANNEL SECTION, 2:1 SIDE SIDERS, 12:100 100:409  NECCHANNEL SECTION, 2:1 SIDE SIDERS, 12:100 100:400 100:409  NEAL RESIDIATION OF A	D. 50109  109.10  109.10  109.10  109.30  109.30  109.30  109.30  109.30  109.30  109.30  109.30  109.30  109.30  109.40  109.50  3  4  1.14440  109.50  3  4  1.14440  109.50  9  10.10  10.00  1  10.00  1  10.00  1  201.00  201012  1  201.00  1  10.15  14  201012  EAST AND B-6>  BAEAST  BAE.1  BAE.	CHANNEL> 13.19	640.53	3.1977	2.300	.275 .045 CCODE		
PROPOSED N BORREAA ARROYO CHANNEL AT AP 109  RADOY PROPOSED N BORREAA ARROYO CHANNEL AT AP 109  RADOY PAID 108 1 114440 14215.45 809.656 13.26551 2.300 19.409  RADOY PAID 109 16 2 3 11.14440 14215.45 809.656 13.26551 2.300 19.409 CCODE = 1.4440 14215.45 809.656 13.26551 2.300 19.409 CCODE = 1.4440 14215.45 809.656 13.26551 2.300 19.409 CCODE = 1.4440 14215.45 809.656 13.26551 2.300 19.409 CCODE = 1.000 - 1 1.0180 2.014.61 67.240 12.38461 2.250 31.229 PER IMP= 25 0.0018 PER IMP 10.00 - 1 1.4430 12.965.39 876.896 13.19355 2.300 20.018 PER IMP= 49 0.0000 PAR IMP 1 10.10 L& 4 2 1.24620 15.965.39 876.896 13.19355 2.300 20.018 PER IMP= 49 0.0000 PAR IMP 2.0000 PAR	PROPOSED N BORREGA ARROYO CHANNEL AT AP 109  109.30  108.30  108.30  10.4440  109.30  20.01  20.00 CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BO  3 4 1.14440  109.50  3 4 1.14440  1.14440  20.10  3 4 1.14440  1.14440  1.10.00  1.10.10  1 0.10.80  20.110  0 TO CHANNEL. TOTAL CHANNEL FLOW TO DAM>>  110.10  1 0.10 1£ 4 2 1.24620  110.10  1 1 0.14730  DIVERSION STORM DRAIN >>  20.1100  1 1 0.05988  20.1101  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.0598  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 0.05988  20.1012  1 1 1 0.05988  20.1012  1 1 1 0.05988  20.1017  1 1 0.05988  20.1017  1 1 1 0.05988  20.1017  20.1018  1 1 1 0.05988  20.1017  20.1018  20.101	3727.68	69.54		2.300	.849 PER IMP	6	
ABOVE ARIOS TO CONFLUENCE WITH IALISTS SOLUTION TO CONFLUENCE WITH ARIEN S	ABOVE A109.30 LR 5 S I.I.4440 I.D. CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BO NC CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BO NC CHANNEL SECTION, 2:1 SIDE SLOPES, 12' BO NO CHANNEL TOTAL GOLF COURSE PROPOSED (BELL 110.00 - 1 10.00 - 1 10.100 - 1 10.100 - 1 10.100 - 1 10.100 - 1 10.100 - 1 10.100 - 1 10.100 I.E 4 2 1.24620 I.D. COLTANNEL TOTAL CHANNEL FLOW TO DAM>> 1.00 DAM>> 110.10 LE 4 2 1.24620 I.D. COLTANNEL STORM DRAIN >> 0.5988 201DIV1 1 1 0.5988 201DIV2 and 21 0.6598 I.D. COLTAN BAENT - 6 COLTAN BAENT - 7 0.6770 BELL PROPERTY TO DAM BELL DRAPERTY TO DAM BELL DRAPERTY TO DAM BELL DRAPERTY TO DAM BELL DRAP STARM DRAIN FROM BELL PROPERTY TO DAM BELLDIVY AND 22 0.23634	9 71,715	מ פ	13 26551	2.300	19.409		
NGC CHANNEL SECTION, 2:1 SIDE SLOCKED   13.16459, 12. DATE   11.440.   14.1545, 14. DATE   11.440.   14.1545, 14. DATE   11.440.   14.1545, 14. DATE   100.560   3 4.0409 CCODE =   100.560   3 4.0409 CCODE   11.040.   11.040.   11.040.   11.040.   11.040.   11.040.   11.040.   11.040.   11.040.   11.040.   11.040.   12.046.   12.38461   2.250   31.229 PER IMP= 25	DNC CHANNEL SECTION, 2:1 SIDE SLOVES, 12 DO  5. 50110  5. 50110  6. 110.00  7. 110.00  9. TO CHANNEL. TOTAL CHANNEL FLOW TO DAM>> 110.10  110.10  1201.00  110.10  1201.00  110.10  1201.00  110.10  1201.00  110.10  1201.00  110.10  1201.00  110.15  12  1201.01  130608  1  100.0AM  110.15  12  44  130608  1  70102 (B-4 EAST) 44 ACRES>> 106770  EAST THROUGH B-6>> 106770  EAST THROUGH B-6>> 106770  EAST AND B-6>> 10 CATO  EAST AND B-6>> 10 CATO  EAST AND B-6>> 110.18  EAST AND B-6>> 110.18  EAST AND B-6>> 110.18  EAST AND B-6>> 10 CATO  EAST AND B-6>> 110.18  EAST AND B-1>> 110.18  EAST AND B-1	•						
DIOLIDIAL RESIDINAL COURSE PROPOSED (BELL PROPERTY) >> 0.0010 - 1 10.00 - 1	D. SULLO D. SULLO D. HALF RESID/HALF GOLF COURSE PROPOSED (BELL 110.00 - 1 .10180  0 TO CHANNEL. TOTAL CHANNEL FLOW TO DAM>> 110.10 1& 4 2 .1.24620 1  201 201.00 - 1 .14730  DIVERSION STORM DRAIN >> .05988 201DIV1 1 1 .08742  FO DAM 110.15 1& 2 4 1.30608 1  70102 (B-4 EAST) 44 ACRES>> .06770  BAEAST - 6 5 .06770  EAST THROUGH B-6> BAEL PROPERTY)  BAEL	14215.45	. 65	3.265	e.	9.409 CCODE	٥.	
0 TO CHANNEL. TOTAL CHANNEL FLOW TO DAM>  10.10 1	D TO CHANNEL. TOTAL CHANNEL FLOW TO DAM>>  201 201 2010 2010 201.00 - 1 .14730  DIVERSION STORM DRAIN >> 201DIV1 1 1 .05988 201DIV2 and 21 .08742  TO DAM 110.15 1& 2 4 1.30608 1  7 70102 (B-4 EAST) 44 ACRES>> B4 EAST - 6 EAST THROUGH B-6> B4 EAST - 6 EAST THROUGH B-6> 1D/HALF GOLF COURSE PROPOSED (BELL PROPERTY) B6 - 1 .28690 EAST AND B-6> B6 - 1 & 5 7 .35460 FUTURE STORM DRAIN FROM BELL PROPERTY TO DA B6.1DIV1 7 7 .11826	PROPERTY)	> 67.2 <b>4</b>		7	.229 PER IMP	25.00	
DILYCRESTON STORM DRAIN >> 14730 2197.86 106.542 13.56187 2.350 23.314 PER IMP= 49  DILYCRESTON STORM DRAIN >> 0.65988 230.00 43.311 13.56188 2.150 6.002  ZOLDIVUZ and 21 .08742 1967.86 63.231 13.56188 2.150 6.002  TO DAM	201.00 - 1 .14730  DIVERSION STORM DRAIN >> 201DIV1 1 1 .05988  201DIV2 and 21 .08742  FO DAM 110.15 1£ 2 4 1.30608 1  . 70102 (B-4 EAST) 44 ACRES>> .06770  EAST THROUGH B-6> .06770  ID/HALF GOLF COURSE PROPOSED (BELL PROPERTY)  EAST AND B-6> 1 .28690  EAST AND B-6> 2 .35460  FUTURE STORM DRAIN FROM BELL PROPERTY TO DA B6.11£ 5 7 .35460  FUTURE STORM DRAIN FROM BELL PROPERTY TO DA B6.1DIV1 7 7 .11826  B6.1DIV2 and 22 .23634		8	3.1935	2.300	0		
201.00 - 1 .14730	201.00 - 1 .14/30  DIVERSION STORM DRAIN >> .05988 201DIV1 1 1 .08742  FO DAM 110.15 1& 4 1.30608 1  .70102 (B-4 EAST) 44 ACRES>> .06770  EAST THROUGH B-6>> B44.    DAM.    .70103 (B-6) >> .06770  EAST AND B-6>    EAST AND B-6>				. "	3 314 DER TWD	00.64	
TO DAM  TO DO SELLE PROPERTY  TO DO SELLE PROPERTY  BAE:1	TO DAM  10.15 1& 2 4 1.30608 1  70102 (B-4 EAST) 44 ACRES> EAST THROUGH B-6> 70103 (B-6) >> 10/HALF GOLF COURSE PROPOSED (BELL PROPERTY) BAST AND B-6> BAST	œ.	n.	'n	?	VIII - 10:0		
TO DAM  TO LO (B-4 EAST) 44 ACRES>  TO LO (B-4 EAST) 45 ACRES>  TO LO (B-6) 5  TO L	TO DAM  110.15 1& 2 4 1.30608 1  . 70102 (B-4 EAST) 44 ACRES>	230 967	ю ю	3.5618 3.5618	ન. લ	വയ		
EAST THROUGH B-6> TO 103 (B-6) TO 104 (B-6) TO 105	## ACRES   44 ACRES   106770  ## BACRT   6	6195.3	920.207	.2104	2.300	9.37		
EAST THROUGH B-6>> B4E.1 6 5 .06770 1169.13 45.262 12.53560 2.350 26.983 CCODE =  1. 70103 (B-6) >>	EAST THROUGH B-6>> 10103 (B-6) > 10/HALF GOLF COURSE PROPOSED (BELL PROPERTY)  EAST AND B-6>	5.3	T)			.127 PER IMP	16	
CUNGE  CUNGE  Definition  Location	CUNGE  ASIN NO. 70103 (B-6) >>  ALE RESID/HALF GOLF COURSE PROPOSED (BELL PROPERTY)  NM HYD  TAL B-4 EAST AND B-6>  ROPOSED FUTURE STORM DRAIN FROM BELL PROPERTY TO DA  HYD  HYD  HYD  B6.1DIV1  7  11826  OTAL INTO BORREGA DAM >>	*-	T.			6.983 CCODE		
ALF RESID/HALF GOLK COURSE FUCUSED (DELL FROTERII)  NM HYD  BG - 1 .28690 4168.26 189.501 12.38461 2.350 22.701 PER IMP= 25.  TAL B-4 EAST AND B-6>  B6.1 1& 5 7 .35460 5337.39 234.763 12.41344 2.350 23.519  ROPOSED FUTURE STORM DRAIN FROM BELL PROPERTY TO DAM >>  ROPOSED FUTURE STORM DRAIN FROM BELL PROPERTY TO DAM >>  HYD  B6.1DIV1 7 7 .11826 450.00 78.293 12.41344 2.350 32.312  B6.1DIV2 and 22 .23634 4887.39 156.470 12.41344 2.350 32.312  OTAL INTO BORREGA DAM >>  110.20 7& 4 4 1.42434 16645.39 998.500 13.14426 2.300 18.260	ALF RESID/HALF GOLE COURSE PROPOSED (DELL FROFENCI) NM HYD B-6 - 1 .28690 TAL B-4 EAST AND B-6> B6.1 1& 5 7 .35460 ROPOSED FUTURE STORM DRAIN FROM BELL PROPERTY TO DA HYD B6.1DIV1 7 7 .11826 OTAL INTO BORREGA DAM >>		)					
TAL B-4 EAST AND B-5>>  ROPOSED FUTURE STORM DRAIN FROM BELL PROPERTY TO DAM >>  HYD  B6.1DIV1 7 7 .11826 450.00 78.293 12.41344 2.150 5.9  HYD  B6.1DIV2 and 22 .23634 4887.39 156.470 12.41344 2.350 32.3  OTAL INTO BORREGA DAM >>  110.20 7& 4 4 1.42434 16645.39 998.500 13.14426 2.300 18.2	TAL B-4 EAST AND B-6>>  ROPOSED FUTURE STORM DRAIN FROM BELL PROPERTY TO D HYD B6.1DIV1 7 7 .11826 OTAL INTO BORREGA DAM >>	4168.2	ω	7	.35	2.701 PER IMP	25.	
FROM BELL PROPERTY TO DAM >> 78.293 12.41344 2.150 5.9 7 .11826 450.00 78.293 12.41344 2.350 32.3 22 .23634 4887.39 156.470 12.41344 2.350 32.3 4 4 1.42434 16645.39 998.500 13.14426 2.300 18.2	FROM BELL PROPERTY TO D 7 .11826 22 .23634	۳.	٠.		•	3.51		
>> 7& 4 4 1.42434 16645.39 998.500 13.14426 2.300 18.2	^		78.293 156.470	77.77	2.150	5.94		
	78.4.4 1.42434	ĸ.	98	13.14426	2.300	8.2		

	CFS PAGE = 4 PER NOTATION			16.399 AC-FT= 181.403		31.733 PER IMP= 45.00 15.878
	TIME TO PEAK (HOURS)			2.400	2.450	2.250
	RUNOFF (INCHES)			12.96548	12.97110	13.27138 12.97888
	RUNOFF VOLUME (AC-FT)			984.919	985.346	26.826 1012.172
Pmp_futu	PEAK DISCHARGE (CFS)			14948.60	14571.53	769.73 14858.95
ELEV 4985 4986	AREA (SQ MI)	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	5 4 4 4 4 4 9 9 9 6 6 4 4 4 4 9 9 9 6 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5003	1.42434	.03790
A DESIGN STORAGE 0 2.02	M TO ID	7.04 7.04 7.04 7.04 7.04 7.08 7.08 7.08 7.08 7.08 7.08 7.08 7.08	86.10 100.64 112.80 126.55 156.55 154.85	184.32 99	* *	0 0 * * *
R WCEZ	FROM ID NO.				51***** 99	- 64 - 53 - 53 - 53 - 53 - 53 - 53 - 53 - 53
BORREGA DAM PHASE "B' PER WCEA DESIGN OUTFLOW STORAG 0 0	HYDROGRAPH IDENTIFICATION	4 8 11 13 14 16 14 16 14 16 16 16 16 16 16 16 16 16 16 16 16 16	184 191 191 225 1252 3176 5667 8660 11966	щ	OUT IS ****AP 51* 110.50	; Ħ
*S BORREGA DA *S *S	COMMAND	w w w w w w w w w w w w w w w w w w w	រូបៈ ល ល ល ល ល ល ល ល ល ល ល ល ល ល ល ល ល ល ល	*S ROUTE RESERVOIR	*S HYD=BPOND.OUT ROUTE MCUNGE	COMPUTE NW HYD ADD HYD *S HYD=BR_DMP1 FINISH (s10H



BOCKS STYDWG/C. JOHN BASIN. DWG/S. STORE





## **APPENDIX B - Sediment**

Calculations for sediment discharge to Borrega Dam

Calculations for sediment trapping

Excerpt from Borrega Diversion Sediment Issues

# CALCULATIONS FOR WATERSHED SEDIMENT YIELD, Ys Used RCI's numbers for tons/acre

POST-PROJECT CONDITION (3)	FUTURE CONDITION (4)
Total Area to dam (acre) 797  Dev Acreage 145  Undev Acreage 652	Total Area to dam (acre) 1119  Dev Acreage 1063  Undev Acreage 56
(tons/acre) 8.56 (tons) 5584	Ys from Undev Areas: 100-year Annual (tons/acre) 8.56 0.54 (tons) 479 30 (cu ft)(2) 9577 604
(tons/acre) 2.36 (tons) 343	Ys from Dev Areas:     100-year     Annual       15     (tons/acre)     2.36     0.15       8     (tons)     2508     8       57     (cu ft)(2)     50166     168
TOTAL Post-Project Sediment Store (acre-ft)	e (1): TOTAL Post-Project Sediment Storage (1) .8 (acre-ft) 1.5

### **NOTES**

- (1) TOTAL is one 100-year + 5 times the annual event.
- (2) Assume 100 lbs/cu ft. of sediment
- (3) Post-Project condition: only Paakweree, the channels, and the dam are built.
- (4) Future condition: Assume 95% of the watershed is developed.

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.DWC

J088 ... , RAIN ...

FIGURE D-1 SEDIMENT TRAP LOCATIONS (AP3 & AP5) 3-20-2000 17:13

TRAPMIX data set for AP3, Entrance to 96".

Input File: TRAP\_AP3.IN

TRAPMIX (Version 1.0)

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Resource Consultants & Engineers, Inc.

The computational procedure used in this program is based on concepts presented in "Solid Particle Settlement in Open Channel Flow"
Li and Shen, 1975, J. Hydraulic Engineering, v101, HY7.
RCE accepts no liability or responsibility for the consequences of any actions resulting from the use of this program.
Use of results obtained from this program and determination of their applicability to a particular problem is entirely the responsibility of the user.

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Point #	Average Velocity (fps)	Settling Depth (ft)	Settling Length (ft)	Fines Concentration (ppm)	Percent Trapped
=======	========	=======			
1	1.80	5.50	47.00	196000.	28.5
2	4.00	5.50	104.00	196000.	36.2
3	2.90	5.30	73.00	196000.	33.1
4	.30	5.60	8.00	196000.	27.0
5	.10	5.60	3.00	196000.	27.0

Aug = 30.4 %

Trap\_ap3

TRAPMIX data set for AP3, Entrance to 96".

3-20-2000 17:13

Input File: TRAP\_AP3.IN

TRAPMIX (Version 1.0)

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TABLE OF RESULTS FOR TRAPPED SEDIMENT MIXTURE

DATA SET # 1

AVERAGE VELOCITY = 1.80 fps SETTLING DEPTH = 5.50 ft SETTLING LENGTH = 47.00 ft

INFLOWING SEDIMENT CONCENTRATION = 196000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
			1002 60	24	5.98
.110	6.00	.97E-02	1023.60	.34	
.200	17.00	.30E-01	325.80	2.76	16.53
.330	23.00	.71E-01	140.09	2.38	22.45
.500	19.00	.12E+00	80.65	7.49	17.58
.690	8.00	.17E+00	57.76	25.45	5.96
1.020	12.00	.24E+00	41.75	75.29	2.97
1.800	9.00	.35E+00	28.59	100.00	.00
4.610	4.00	.58E+00	16.93	100.00	.00

TOTAL % OF MIXTURE PASSING = 71.47

TOTAL % OF MIXTURE TRAPPED = 28.53

DATA SET # 2

DATA SET # 2

\_\_\_\_\_

AVERAGE VELOCITY = 4.00 fps SETTLING DEPTH = 5.50 ft SETTLING LENGTH = 104.00 ft

INFLOWING SEDIMENT CONCENTRATION = 196000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.97E-02	2274.67	.33	5.98
.200	17.00	.30E-01	724.00	5.65	16.04
.330	23.00	.71E-01	311.31	17.42	18.99
.500	19.00	.12E+00	179.22	25.81	14.10
.690	8.00	.17E+00	128.35	41.44	4.69
1.020	12.00	.24E+00	92.78	69.11	3.71
1.800	9.00	.35E+00	63.53	97.18	.25
4.610	4.00	.58E+00	37.62	100.00	.00

TOTAL % OF MIXTURE PASSING = 63.75

TOTAL % OF MIXTURE TRAPPED = 36.25

#### DATA SET # 3

AVERAGE VELOCITY = 2.90 fps

SETTLING DEPTH = 5.30 ft
SETTLING LENGTH = 73.00 ft
INFLOWING SEDIMENT CONCENTRATION = 196000. ppm by weight

Dg(mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.97E-02	1589.17	.34	5.98
.200	17.00	.30E-01	505.81	5.71	16.03
.330	23.00	.71E-01	217.49	10.11	20.67
.500	19.00	.12E+00	125.21	18.05	15.57
.690	8.00	.17E+00	89.67	35.55	5.16
1.020	12.00	.24E+00	64.82	71.15	3.46
1.800	9.00	.35E+00	44.38	100.00	.00
4.610	4.00	.58E+00	26.29	100.00	.00

TOTAL % OF MIXTURE PASSING = 66.87

TOTAL % OF MIXTURE TRAPPED =

\_\_\_\_\_\_ DATA SET # 4. \_\_\_\_\_

> .30 fps 5.60 ft 8.00 ft AVERAGE VELOCITY = SETTLING DEPTH = SETTLING LENGTH =

INFLOWING SEDIMENT CONCENTRATION = 196000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.97E-02	173.70	.00	6.00
.200	17.00	.30E-01	55.29	.00	17.00
.330	23.00	.71E-01	23.77	.00	23.00
.500	19.00	.12E+00	13.69	.00	19.00
.690	8.00	.17E+00	9.80	.23	7.98
1.020	12.00	.24E+00	7.08	100.00	.00
1.800	9.00	.35E+00	4.85	100.00	.00
4.610	4.00	.58E+00	2.87	100.00	.00
.330 .500 .690 1.020	23.00 19.00 8.00 12.00 9.00	.30E-01 .71E-01 .12E+00 .17E+00 .24E+00 .35E+00	55.29 23.77 13.69 9.80 7.08 4.85	.00 .00 .00 .23 100.00	17.00 23.00 19.00 7.98 .00

TOTAL % OF MIXTURE PASSING =

72.98

TOTAL % OF MIXTURE TRAPPED = 27.02

DATA SET # 5 -----

AVERAGE VELOCITY = .10 fps SETTLING DEPTH = 5.60 ft SETTLING LENGTH = 3.00 ft INFLOWING SEDIMENT CONCENTRATION = 196000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.97E-02	57.90	.00	6.00
.200	17.00	.30E-01	18.43	.00	17.00
.330	23.00	.71E-01	7.92	.00	23.00
.500	19.00	.12E+00	4.56	.00	19.00
.690	8.00	.17E+00	3.27	.26	7.98
1.020	12.00	.24E+00	2.36	100.00	.00
1.800	9.00	.35E+00	1.62	100.00	.00
4.610	4.00	.58E+00	.96	100.00	.00

TOTAL % OF MIXTURE PASSING =

TOTAL % OF MIXTURE TRAPPED =

3-20-2000 17: 4

TRAPMIX data set for AP5, Entrance to 66".

Input File: trap\_ap5.in

TRAPMIX (Version 1.0)

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Point #	Average Velocity (fps)	Settling Depth (ft)	Settling Length (ft)	Fines Concentration (ppm)	Percent Trapped
=======		======			
1	1.90	4.20	38.00	193000.	29.4
2	2.40	5.10	58.00	193000.	31.5
3	1.90	4.30	39.00	193000.	29.5
4	.80	3.10	12.00	193000.	27.0

Aug = 29,4 %

Trap ap5

TRAPMIX data set for AP5, Entrance to 66".

3-20-2000 17: 4

Input File: trap\_ap5.in

TRAPMIX (Version 1.0)

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Use of results obtained from this program and determination of their applicability to a particular problem is entirely the responsibility of the user.

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TABLE OF RESULTS FOR TRAPPED SEDIMENT MIXTURE

DATA SET # 1

VERAGE VELOCITY = 1.90 fps SETTLING DEPTH = 4.20 ft SETTLING LENGTH = 38.00 ft AVERAGE VELOCITY =

INFLOWING SEDIMENT CONCENTRATION = 193000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.99E-02	808.63	.36	5.98
.200	17.00	.31E-01	257.78	3.31	16.44
.330	23.00	.72E-01	111.24	3.02	22.31
.500	19.00	.12E+00	64.30	8.98	17.29
.690	8.00	.17E+00	46.16	27.84	5.77
1.020	12.00	.24E+00	33.44	76.16	2.86
1.800	9.00	.35E+00	22.93	100.00	.00
4.610	4.00	.59E+00	13.59	100.00	.00

TOTAL % OF MIXTURE PASSING = 70.65

TOTAL % OF MIXTURE TRAPPED = 29.35

\_ DATA SET # 2 \_\_\_\_\_

> AVERAGE VELOCITY = 2.40 fps 5.10 ft SETTLING DEPTH = SETTLING DEFIN = 5.10 10 SETTLING LENGTH = 58.00 ft

INFLOWING SEDIMENT CONCENTRATION = 193000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.99E-02	1240.30	.35	5.98
.200	17.00	.31E-01	395.39	5.92	15.99
.330	23.00	.72E-01	170.63	6.37	21.54
.500	19.00	.12E+00	98.62	13.80	16.38
-690	8.00	.17E+00	70.80	32.16	5.43
1.020	12.00	.24E+00	51.28	73.16	3.22
1.800	9.00	.35E+00	35.17	100.00	.00
4.610	4.00	.59E+00	20.85	100.00	-00

TOTAL % OF MIXTURE PASSING = 68.53

#### Trap\_ap5

TOTAL % OF MIXTURE TRAPPED = 31.47

DATA SET # 3

AVERAGE VELOCITY = 1.90 fps
SETTLING DEPTH = 4.30 ft
SETTLING LENGTH = 39.00 ft
INFLOWING SEDIMENT CONCENTRATION = 193000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.99E-02	827.88	.36	5.98
.200	17.00	.31E-01	263.91	3.34	16.43
.330	23.00	.72E-01	113.89	3.06	22.30
.500	19.00	.12E+00	65.83	9.10	17.27
.690	8.00	.17E+00	47.26	28.15	5.75
1.020	12.00	.24E+00	34.23	76.51	2.82
1.800	9.00	.35E+00	23.48	100.00	.00
4.610	4.00	.59E+00	13.92	100.00	.00

TOTAL % OF MIXTURE PASSING = 70.55

TOTAL % OF MIXTURE TRAPPED = 29.45

\_\_\_\_\_\_\_

DATA SET # 4 \_\_\_\_\_

AVERAGE VELOCITY = .80 fps SETTLING DEPTH = 3.10 ft SETTLING LENGTH = 12.00 ft INFLOWING SEDIMENT CONCENTRATION = 193000. ppm by weight

Dg (mm)	DELTA%	FALL VELOCITY (fps)	AVG. SETTLING LENGTH(ft)	%TRAPPED	%MIXTURE PASSING
.110	6.00	.99E-02	251.30	.37	5.98
.200	17.00	.31E-01	80.11	.07	16.99
.330	23.00	.72E-01	34.57	.05	22.99
.500	19.00	.12E+00	19.98	.40	18.92
.690	8.00	.17E+00	14.35	11.88	7.05
1.020	12.00	.24E+00	10.39	91.09	1.07
1.800	9.00	.35E+00	7.13	100.00	.00
4.610	4.00	.59E+00	4.22	100.00	.00
				•	

TOTAL % OF MIXTURE PASSING = 73.00

TOTAL % OF MIXTURE TRAPPED = 27.00

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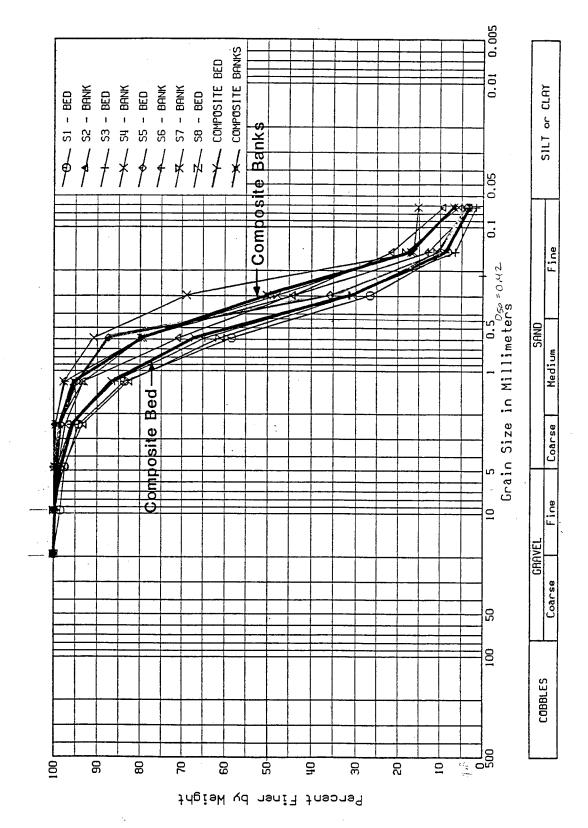


Figure 5.3: INDIVIDUAL AND REPRESENTATIVE GRAIN SIZE DISTRIBUTIONS (See Figure 1/2 for Sample Locations)

25

FIGURE D-2

From: "BORREGA DIVERSION SEDIMENT ISSUES"

SEDIMENT GRADATION

9/22

<b>1P.</b>	NM		<b>WILSON</b> COMPANY	LOC. BORREGA	FILE 99099 SHEET		
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and the second s	Assume 1	00 lbs / cuft	= lut. og std.me	1			
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# RATING CURVE FOR SEDIMENTATION POND AT ENTRANCE TO 66" SD (AP5)

TOTAL Q	STORAGE (ac-ft)	ELEV	ELEV	AREA (sq ft)	AREA (acre)	INCR. VOL (ac-ft)	CUMUL VOL
0	0.00	5154.5	5154.5	676	0.01	0.00	0.00
10	0.02	5156	5156	784	0.02	0.02	0.02
45	0.04	5157	5157	841	0.02	0.02	0.04
177	0.08	5159	5159	961	0.02	0.04	0.08
221	0.10	5160	5160	1024	0.02	0.02	0.10
291	0.16	5162	5162	1296	0.03	0.05	0.16
347	0.22	5164	5164	1600	0.04	0.07	0.22
395	0.36	5166	5166	4800	0.11	0.14	0.36

## RATING CURVE FOR SEDIMENTATION POND AT ENTRANCE TO 96" (AP3)

TOTAL Q	STORAGE (ac-ft)	ELEV	ELEV	AREA (sq ft)	AREA (acre)	INCR. VOL (ac-ft)	CUMUL
			5192.4				
#8	0.00	5191.7	- <del>5191.7</del>	750	0.01	0.00	0.00
10	0.02	5193	5193	1200	0.03	0.02	0.02
20	0.06	5194	5194	2240	0.05	0.04	0.06
80	0.15	5195.3	5195.3	3400	0.08	0.08	0.15
140	0.32	5197	5197	5760	0.13	0.18	0.32
200	0.47	5198	5198	7220	0.17	0.15	0.47
280	0.66	5199	5199	9000	0.21	0.19	0.66
345	0.90	5200	5200	12480	0.29	0.25	0.90

HYDROGRAPHS FOR SEDIMENTATION PONDS

- Version: 1997.02c

AHYMO PROGRAM (AHYMO\_97) 
RUN DATE (MON/DAY/YR) = 03/16/2000

START TIME (HR:MIN:SEC) = 18:10:44

INPUT FILE = X:\PUBLIC\PROJECTS\99099\AHYM\POSTPAAK\SED\_REVB.DAT

USE 'ROUTE RESERVOIRS' FOR SEDIMENTATION CONDITION AT 2 CULVERT ENTRANCES: 96" UNDER 118TH ST (HYD=106.20) AND 66" S BORREGA TRIB (HYD=S\_CULV) FILENAME: SED\_REVB.DAT - POST-PROJECT CONDITIONS, ALL LANDS UPSTREAM OF PAAKWEREE ARE UNDEVELOPED \* \* \* \* \* \* \*

AP 3

TIME HRS 4.500 5.000 5.250 5.500 5.750 FLOW 106.20 3.000 3.250 3.500 3.750 4.000 PARTIAL HYDROGRAPH CFS 177.1 219.9 58.9 25.3 15.0 FLOW 1.500 1.750 2.000 2.250 2.500 2.750 HRS RUNOFF VOLUME .750 1.250 TIME

FLOW

TIME HRS 6.000 6.250

.3202 SQ. MI. BASIN AREA = 1.650 HOURS BASIN ¥ .59398 INCHES 264.01 CFS PEAK DISCHARGE RATE

\*8\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* SEDIMENT POND AT 96" \* CODE=5 ID=99 HYD=106.25 ID=2 OUTFLOW STORAGE ROUTE RESERVOIR

5191.7 5194 5195.3 5197 5198 5199 90.0 0.15 0.32 0.47 0.66 20 80 1140 2200 345

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177.07	219.91	58.94	25.34	15.02	90.6	5.43	3.24	1.94	1.16	.70	.42	.25	.15	60.	.05	.03	.02	.01	00.	00.	= <b>∃</b> 5	R SURFACE	AGE =
1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25	5.50	5.75	6.00	6.25	6.50	PEAK DISCHARGE	MAXIMUM WATER	MAXIMUM STORAG

PRINT HYD ID=99 CODE=5

	TIME	HRS	6.000	6.250	6.500				
	FLOW	CFS	۳.	.5	۲.	٠.	٥.	٥.	
	TIME	HRS	4.500	4.750	5.000	5.250	5.500	5.750	.3202 SO. MI.
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ROGRAPH 106.25	TIME	HRS	3.000	238.5 3.250	3.500	3.750	4.000	4.250	10.1436 ACRE-FEET
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PART	TIME	HRS	1.500	1.750	2.000	2.250	2.500	2.750	.59398 INCHES = 258.80 CFS
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	TIME	HRS	000.	.250	. 500	.750	1.000	1.250	RUNOFF VOLUME = PEAK DISCHARGE RATE

FLOW CFS .0

\*S <<FLOW INTO THE UPSTREAM END OF THE CULVERT UNDER PAVO ST. >> ADD HYD ID=5 HYD=S\_CULV ID=10

	TIME	HRS	4.500	4.750	5.000	5.250	5.500	5.750
CULV	FLOW	CFS	5.7	3.6	2.2	1.4	6.	ŗ.
FROM AREA	TIME	HRS	3.000	3.250	3.500	3.750	4.000	4.250
HYDROGRAPE	FLOW	CFS	134.0	137.4	94.5	29.4	14.7	9.1
	TIME	HRS	1.500	1.750	2.000	2.250	2.500	2.750
	FLOW	CFS	٥.	٥.	0.	0.	0.	0.
(AP5)	TIME	HRS	000.	.250	.500	.750	1.000	1.250
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FLOW CFS

TIME HRS 6.000 6.250 6.500 6.750

FLOW GFS CFS .33 .1

Page 2

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Sedponds	.2640 ACRE-FEET HOURS BASIN AREA =
	8.2640 A 1.800 HOURS
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	.55006 INCHES = 8.2640 ACRE-FEET 161.21 CFS AT 1.800 HOURS BASIN AREA
	RUNOFF VOLUME = PEAK DISCHARGE RATE =

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FLOW CFS

TIME HRS 6.000

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1.250	۰.	2.750	4.6	4.250	9.	5.750	٥.		
RUNOFF VOLUME PEAK DISCHARGE	RATE	.55006 INCHES = 160.83 CFS	a.	8.2640 ACRE-FEET 1.800 HOURS BASIN AREA	-FEET ASIN AREA =	.2817 SQ. MI.			

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FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 18:10:46

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V 227	channel	1200	113	5197.20	1.03	98.0	5198.23	5198.45	5199.05	0.02709	7.3	15.6	18.2	1.38
	channel	1200	16	5197.20	1.56	1.22	5198.76		5198.76	0.00012	9.0	26.0	21.3	0.10
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	channel	1175.*	218	5196.40	1.44	1.14	5197.84	5198.24	5199.18	0.03067	9.3	23.4	20.6	1.54
	channel	1175.*	113	5196.40	2.32	1.70	5198.72		5198.82	0.00138	2.6	44.0	25.9	0.35
	channel	1175.*	16	5196.40	2.36	1.72	5198.76		5198.76	0.00003	0.4	45.0	26.1	0.05
	channel	1175.*	5	5196.40	2.36	1.72	5198.76		5198.76	0.00000	0.1	45.0	26.1	0.01
	channel	1150.*	100	5195.60	3.15	2.18	5198.75		5198.78	0.00033	1.5	67.4	30.9	0.18
	channel	1150.*	218	5195.60	3.10	2.16	5198.70		5198.87	0.00167	3.3	62.9	30.6	0.40
	channel	1150.*	113	5195.60	3.14	2.18	5198.74		5198.79	0.00042	1.7	4.79	30.9	0.20
	channel	1150.*	16	5195.60	3.16	2.19	5198.76		5198.76	0.00001	0.2	67.8	30.9	0.03
	channel	1150.*	5	5195.60	3.16	2.19	5198.76		5198.76	0.00000	0.1	67.8	30.9	0.01
	channel	1125.*	100	5194.80	3.95	2.64	5198.75		5198.77	0.00013	1.1	94.3	35.7	0.11
	channel	1125.*	218	5194.80	3.93	2.63	5198.73		5198.85	0.00064	2.3	93.5	35.6	0.25
	channel	1125.*	113	5194.80	3.95	2.64	5198.75		5198.78	0.00017	1.2	94.3	35.7	0.13
	channel	1125.*	16	5194.80	3.96	2.64	5198.76		5198.76	0.00000	0.2	94.5	35.7	0.02
	channel	1125.*	٠	5194.80	3.96	2.64	5198.76		5198.76	0.00000	0.1	94.5	35.7	0.01
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_	channel	1100.*	100	5194.00	4.76	3.08	5198.76		5198.77	0.00006	0.8	124.9	40.5	0.08
£	channel	1100.*	218	5194.00	4.75	3.08	5198.75		5198.79	0.00029	8	124.5	40.5	0.18
7 601	channel	1100.*	113	5194.00	4.76	3.08	5198.76		5198.77	0.00008	6.0	124.9	40.5	0.09
	channel	1100.*	16	5194.00	4.76	3.08	5198.76		5198.76	0.00000	0.1	125.0	40.5	0.01
_	channel	1100.*	5	5194.00	4.76	3.08	5198.76		5198.76	0.00000	0.0	125.0	40.5	0.00
	channel	1075.*	100	5193.20	5.56	3.59	5198.76		5198.77	0.00003	9.0	159.0	44.3	0.06
	channel	1075.*	218	5193.20	5.56	3.59	5198.76	-	5198.78	0.00014	1.4	158.9	44.3	0.12
	channel	1075.*	113	5193.20	5.56	3.59	5198.76		5198.77	0.00004	0.7	159.0	44.3	90.0
	channel	1075.*	16	5193.20	5.56	3.59	5198.76		5198.76	0.00000	0.1	129.1	44.3	0.01
	channel	1075.*	S	5193.20	5.56	3.59	5198.76		5198.76	0.00000	0.0	159.1	44.3	00.00
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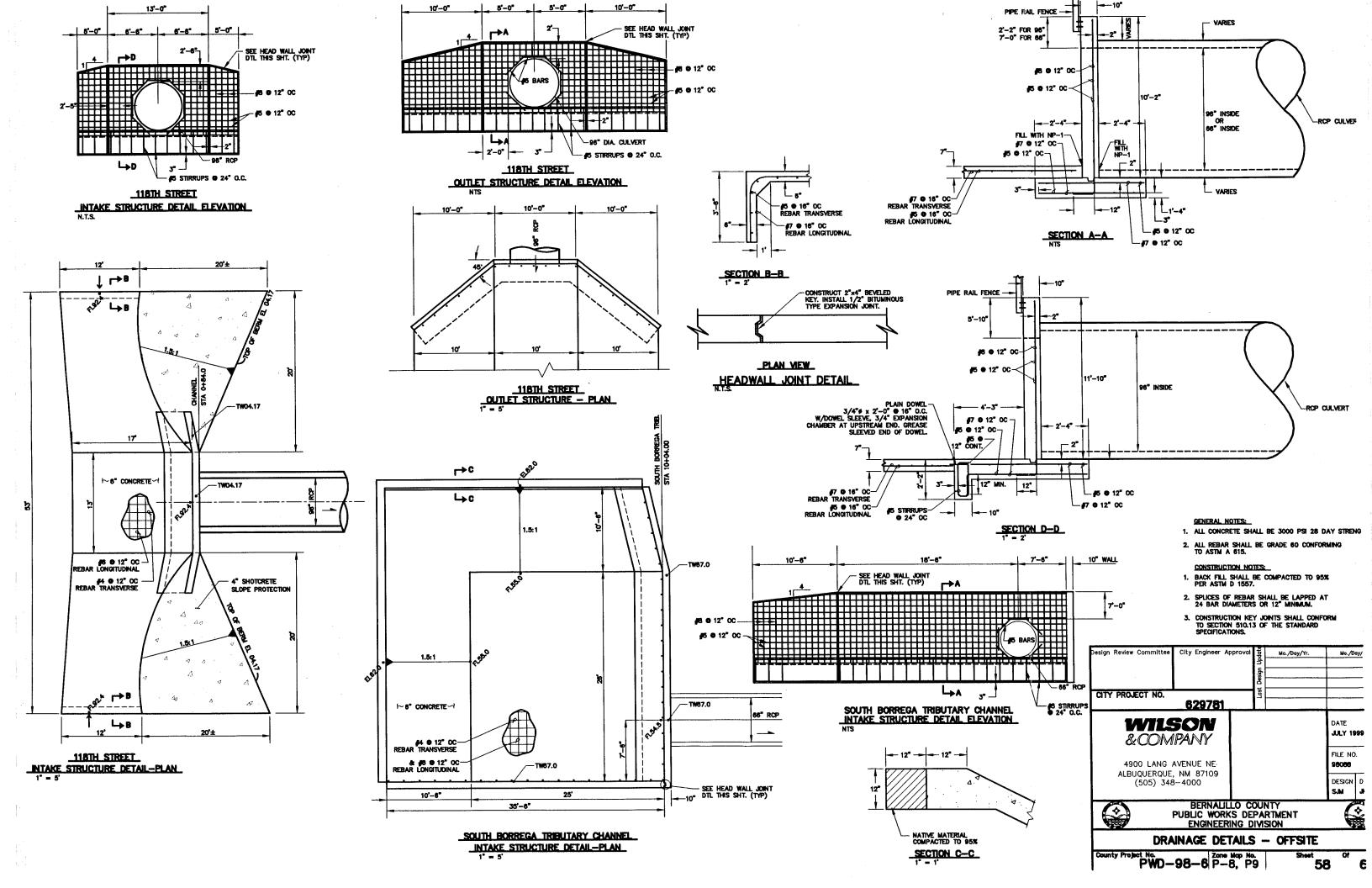
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HEC-RAS P.	HEC-RAS Plan: trapmix_AP3 Hiver: 118StChannel Reach: channel	3 River: 1185.	tChannel Hea	ten: channel (Cont	ntinuea)								
Reach	Beach Biver Sta	O Total Min Ch El Max Chi	Min Ch El	Max Chi Doth	Hydr Depth	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chul	Flow Area	Top Width	Froude # Chi
		(cfs)	#		. €	(#)	(£)	(#)	(#/#)	(ft/s)	(sd ft)	(H)	
channel 1050	1050	218	5192 40		4.16				0.00007	1.1	195.5	46.9	60.0
channel 1050	1050	113		9	4.16					9.0	195.5	46.9	0.05
charmed	1050	16			4.16	5198.76	5192.77	5198.76	- 0.00000	- 0.1		46.9	
	000	5 4	5102.10		4 16					0.0	195.5	46.9	00.00

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HEC-RAS Plan: AP5 trapmix	P5 trapmix												
Reach	River Sta	Q Total	Min Ch El	Max Chl Dpth	Hydr Depth	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chul	Flow Area	Top Width	Fronge # Chi
		(cfs)	(¥)	(11)	(#)	(#)	(#)	(#)		(ft/s)	(sd ft)	(#)	
BR 1	23	64	5195.70	99.0	0.40	5196.36	5196.36			3.7	17.3	42.8	1.02
BR 1	23	135	5195.70	0.94	0.55	5196.64	5196.64	5196.93		4.3	31.7	57.1	1.01
BB 1	23	89	5195.70		0.42			5196.59	0.01804	3.7	18.3	44.0	1.01
BR 1	23	8	5195.70		0.16		5195.92	5196.01	0.02360	2.3	3.5	21.2	0.99
													1
BR 1	21	64	5186.70	0.37	0.24					8.2	7.8	32.1	2.95
BB 1	21	135	5186.70	0.51	0.32	5187.21				10.5	12.9	40.6	
BR 1	21	89	5186.70		0.25		5187.35	5188.11	0.16924	8.1	8.4	33.2	2.85
BR 1	21	8	5186.70	0.14	0.11			5187.09	0.12952	4.0	2.0	18.4	2.17
BB 1	20	64	5183.70	09.0	0.36	5184.30	5184.30	5184.48	0.01907	3.4	18.6	52.0	1.02
BB 1	20	135	5183.70						0.01749	4.0	33.5	69.2	1.02
BB 1	20	89	5183.70					5184.51	0.01910	3.5	19.4	53.1	1.02
8B 1	20	00	5183.70		0.14				0.03074	2.4	3.4	24.0	1.10
BR 1	19	64	5178.70	0.43	0:30	5179.13	5179.43	5180.25	0.14518	8.5	7.6	25.1	2.72
1 88	19	135	5178.70	0.64	0.42	5179.34	5179.76	5180.88	0.12931	10.0	13.6	32.4	2.71
1 2 2	19	89	5178.70	0.45			5179.45	5180.27	0.13920	8.5	8.0	25.7	2.68
n n	10	α	5178 70	0.16		5178.86			0.08619	3.8	2.1	15.7	1.83
	0												
BB 1	18	64	5175.70	0.57	0.34	5176.27	5176.27	5176.45	0.01976	3.4	18.9		1.02
BB 1	18	135	5175.70	0.81	0.46			5176.75	0.01748	3.9	34.6	75.0	1.01
BB 1	18	89	5175.70		0.35			5176.47	0.01872	3.4	20.2	57.7	1.00
BR 1	18	8	5175.70		0.14			5175.98	0.02357	2.1	3.8	26.7	0.97
BB 1	17	64	5173.20	0.33	0.29	5173.53	5173.60	5173.80	0.03674	4.2	15.4	53.2	
BR 1	17	135	5173.20	0.49	0.41	5173.69		5174.16		5.5	24.6	29.7	
BR 1	17	89	5173.20		0.30			5173.83	0.03843	4.3	15.8		
BR 1	17	8	5173.20						0.03116	1.9	4.3	44.1	1.05
S Borrega Trib	10.4	64	5155.00	7.42	6.34	5162.42		5162.42		0.3	212.5		
S Borrega Trib	10.4	135	5155.00	9.24	6.22	5164.24		5164.25		0.5	284.9		
S Borrega Trib	10.4	89	5155.00	7.53	6.31	5162.53		5162.53		0.3	216.4	34.3	
S Borrega Trib	10.4	8	5155.00	5.14	4.83	5160.14		5160.14	0.00000	0.1	143.0		00.00
S Borrega Trib	10.2	64	5154.50	7.92	6.56	5162.42				0.3	227.8		
S Borrega Trib	10.2	135	5154.50	9.74						0.5	301.9		
S Borrega Trib	10.2	89	5154.50	8.03	6.54	5162.53	5155.10			0.3	231.9		
S Borrega Trib	10.2	8	5154.50	5.64	5.28			5160.14	0.00000	0.1	157.4	29.8	00.00
,													
S Borrega Trib	10.04	Culvert											

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#### BORREGA DIVERSION SEDIMENT ISSUES FLOODPLAIN STUDY FOR AMAFCA

#### Prepared for:

Bohannan-Huston, Inc.

#### Prepared by:

Resource Consultants, Inc. P.O. Box Q Fort Collins, Colorado 80522

Ref: 91-612

June 1992



where Q<sub>s</sub> is the bed material load in cubic feet per second (cfs), Q is the instantaneous water discharge in cfs and a and b are constants. The resulting rating curves are summarized in Table 5.1. These rating curves reflect the bed material transport capacity assuming relatively low suspended sediment concentrations. In computing the total sediment load associated with each discharge, the clear water bed material load was estimated using the rating curves and then adjusted to account for the high concentration of suspended load using the Colby procedure. This computational procedure is discussed in detail in RCI, 1991. Average suspended sediment concentrations for each storm event were estimated from the results of the watershed sediment yield analysis discussed above.

#### 5.4. Calibration of the Sediment Load Relationships

The sediment yields associated with each storm hydrograph were computed by integrating the bed material loads, corrected for suspended sediment concentration, over the individual storm hydrographs and adding the result to the watershed sediment yield estimates. The results were then calibrated, to the extent possible, using available data.

Previous studies have indicated annual sediment yields for existing watershed conditions in the Albuquerque area ranging from about 1 to 3.5 tons/acre. (RCI, 1989; BHI, 1990 and 1991) In addition, RCI (1989) estimated sediment yields associated with the 100 , 25 and 10 year storm for Calabacillas Arroyo for existing conditions of 19.0, 10.5 and 5.1 tons/acre respectively. As discussed in RCI, 1991, watershed conditions vary considerably throughout the Albuquerque area which can be expected to result in considerable variation in the sediment yield. For this reason, data from watersheds in the Northwest Quadrant (e.g. Calabacillas, Black or Ladera) may not be directly applicable to watersheds in the Southwest quadrant.

Table 5.2. Fluid matrix characteristics (0'Brien, 1986). .

Type of Flow	Solids Concentration by Volume C <sub>v</sub>	Solids Concentration by Weight C <sub>w</sub>	Flow Characteristics
Landslide .	>64%	>88X	Will not flow; failure by block sliding or tumbling. Unsaturated soil conditions.
Landslide	50 <b>x-64</b> x	73x-88x	Will not flow; block sliding failure with some internal deformation, slow creep prior to failure; saturated.
Hudflow	45 <b>x</b> -50 <b>x</b>	69X-73X	Flow initiates; plastic deformation with slow sustained creep. Begins spreading; moves subject to repeated vibration.
Mudflow	40x-45x	65 <b>x-</b> 69 <b>x</b>	Mixes easily; shows some fluid properties. Surface may be inclined at rest. Waves dissipate rapidly.
Hud flood	35x-40x	59 <b>x</b> -65 <b>x</b>	Spreads on horizontal surface; marked particle settling, liquid horizontal surface, two-phase separation in quiescent condition; waves travel easily.
Mud flood	30x-35x	54 <b>x</b> -59 <b>x</b>	Sand and gravel settle; distinct wave action.
Mud flood	20%-30%	41x-54x	Particles rest on bottom in wave motion.
Water flood	<20%	<41%	Water flood with bed and suspended load.

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Table 5.3. Summary of Borrega Watershed sediment yields computations using MUSLE.

		EXISTING	EXISTING CONDITIONS		· .	DEVEL OP	DEVELOPED CONDITIONS	
Return Period (yrs)	ap (cfs)	VW (ac-ft)	Sediment Yield (t/ac)	Concentration (ppm)	ap (cfs)	Vw (ac-ft)	Sediment Yield (t/ac)	Concentration (ppm)
2	0	0.00	0.00	0	321.4	24.7	00.00	0
25	. 22	2.22	0.32	77,700	552.3	37.68	0.09	1,300
10	7.76	7.01	1.39	106,000	6.797	48.69	0.38	4,200
52	248	15.53	3.72	128,300	1067.9	63.71	1.03	8,600
20	401.7	22.91	6.07	141,600	1302.4	75.59	1.67	11,800
100	561	30.35	8.56	151,000	1534.0	86.35	2.36	14,600
ANNUAL		2,42	0.54			26.29	0.15	

Table 5.4. Sediment yields at tributary confluence and Hubbell Lake Inlet for Existing and Developed Conditions.

Total Sediment Yields (Tons/Acre)

REACH

Return Period	Main Channel <sup>(1)</sup> U/S Tributary	Tributary <sup>(2)</sup>	Main Channel Hubbell Lake	(3) E Inlet
	Existing Condition			<u>.</u>
100	21.9	7.4	10.4	
50	15.0	4.9	6.9	
25	8.0	2.8	4.0	
10	2.4	0.9	1.4	
5	0.5	0.2	0.3	- 4-4.
2	. •••			
Annual	1.2	0.4	0.6	
	Developed Condition			
100	11.7	8.0	4.3	
50	8.9	6.4	3.1	
25	6.5	5.0	2.1	
10	4.1	3.3	1.1	
5	2.6	2.2	.6	
2	1.3	1.1	.3	
Annual	1.9	1.6	.5	

<sup>(1)</sup> Drainage Area = 604 acres
(2) Drainage Area = 122.5 acres
(3) Drainage Area = 821 acres

over time. This process will eventually result in a long-term reduction in the annual sediment yield from the Borrega Arroyo watershed.

Until the incision process has occurred, sediment yields from the main arroyo and tributary channel appear to be significantly greater than the transport capacity of the channelized portion of the main arroyo between the tributary confluence and the Hubbell Lake inlet. The annual sediment yield at the Hubbell Lake inlet for existing and developed conditions is approximately 0.6 tons/acre and 0.5 tons/acre, respectively. Significant deposition in that reach can, therefore, be expected until the channels reach a state of equilibrium. The characteristics of this depositional tendency will be addressed in more detail in next chapter.

The total sediment yield delivered to the Hubbell Lake inlet for each of the storms and on an average annual basis is summarized in Table 5.6. For existing conditions, due to the potential for debris blockage and channel avulsion, the amount of material that will actually pass through the inlet structure into Hubbell Lake is unclear. For developed conditions, if the inlet structure is modified to insure adequate hydraulic capacity and minimal debris blockage, the quantities in Table 5.4 should represent the amount of sediment that will be delivered to the Hubbell Lake detention area.

## 5.7. Bulking Factors for 100-year Peak Discharge

Based on the total sediment yield calculations, bulking factors and bulked discharges for the 100-year peak discharge were computed. The results are summarized in Table 5.7. The bulking factors vary considerably depending on the location of interest. For example, for existing conditions, the bulking factor in the main arroyo just upstream of the tributary confluence (Hydrograph Number 108.3) is 1.54 increasing the peak discharge from 464 cfs for clear water conditions to 715 cfs when the sediment load is included. Since the sediment yield is significantly less from the tributary channel and the bed material transport capacity of the main arroyo

Table 5.7. Summary of Bulking Factors for 100-year Peak Discharge (see Figure 1.2 for hydrograph locations).

	Existi	ing Condition	ns	Develop	ed Condition	ıs
HYMO Hydrograph II	Clear Water Peak Discharge (cfs)	Peak Bulking Factor	Bulked Peak Discharge (cfs)	Clear Water Peak Discharge (cfs)	Peak Bulking Factor	Bulked Peak Discharge (cfs)
108.3	464	1.54	715	1221	1.06	1294
109.1	103	1.10	113	319	1.05	335
109.3	561	1.20	673	1533	1.03	1578
110.3	642	1.13	725	1 <i>7</i> 33	1.02	1768

### **APPENDIX C - Hydraulics**

**North Borrega Channel HEC-RAS Analysis** 

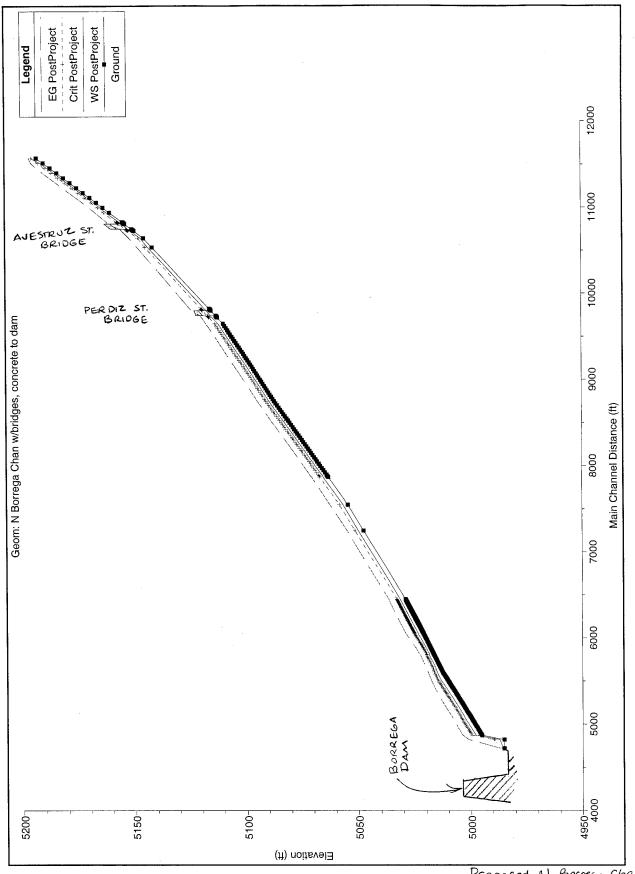
**Exhibit 1. HEC-RAS Cross Section Stations** 

**Freeboard Calculations North Borrega Channel** 

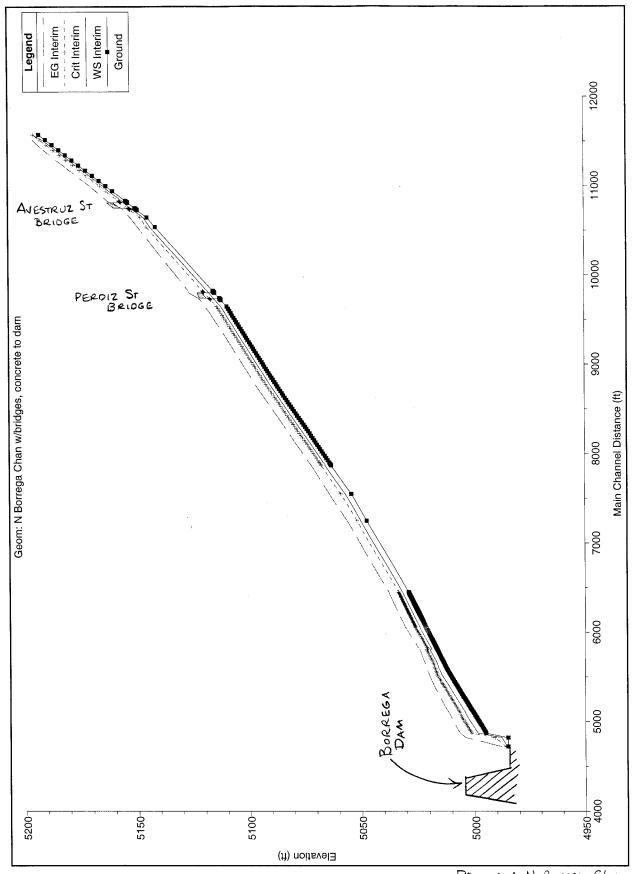
Calculations for 96" RCP Intake for North Borrega Channel

**Borrega Dam Storage-Discharge Calculations** 

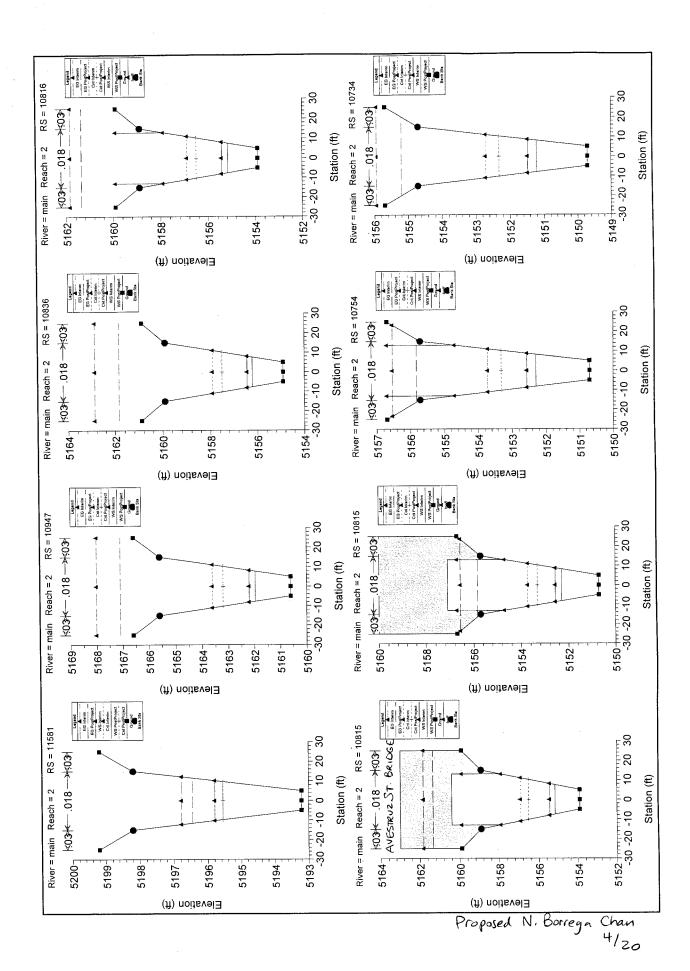
**Principal Spillway Outlet Calculations** 

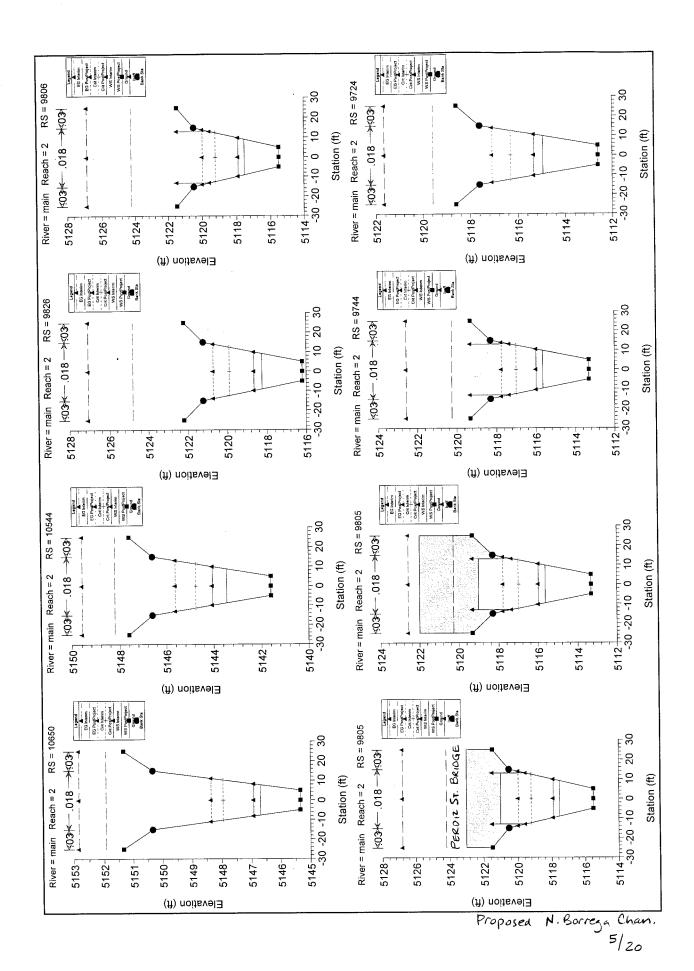


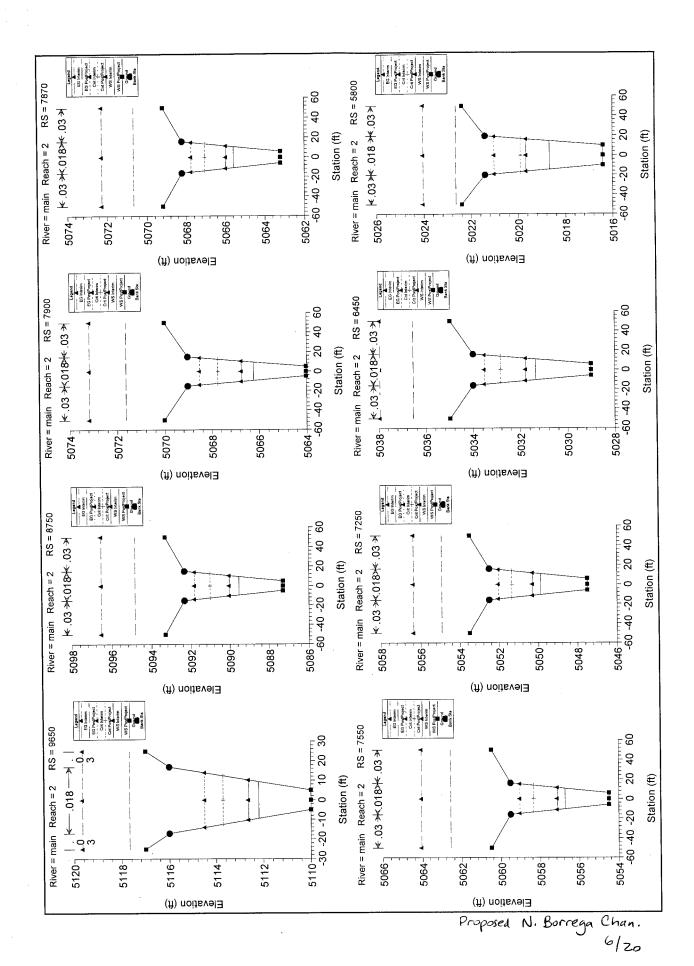
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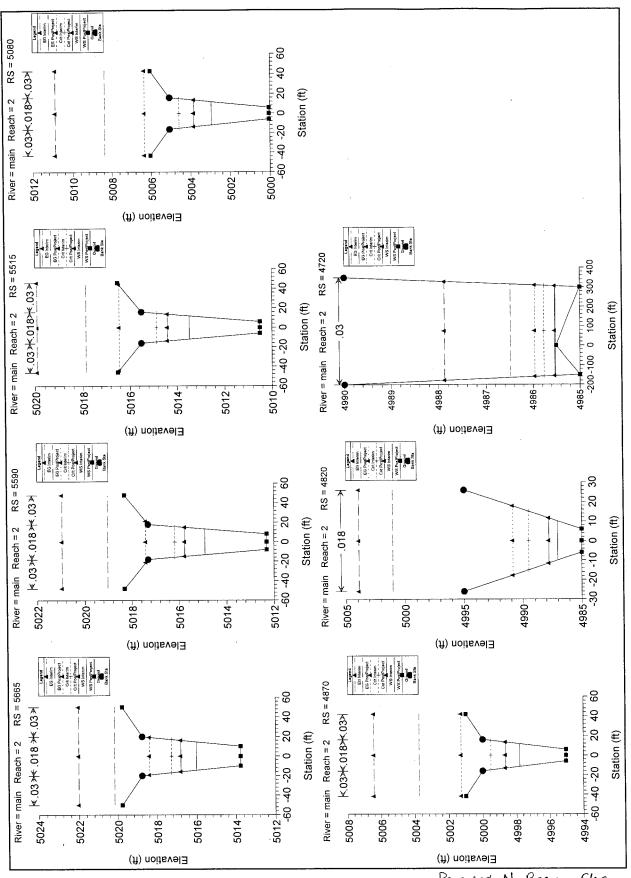


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Keach				1	100 ACM				5					
	NIVEL OLG	Profile	(cfs)		Max CIII Optiii	(1)	£	Œ	(lb/sq ft)	(ft/ft)	(ft/s)	(sd ff)	(tt)	
				7400 00	90.0	K105 56	5105 56	5196 46	0.45	0.00422	7.6	34.7	19.4	1.00
2	11581	PostProject	264	5193.20	2.30	0190.00	0.00	5105.10	0.34	0.03622	16.1		15.2	2.73
2	11523.3*	PostProject	264	5190.24	1.30	5191.54	2192.00	10.0010	4.0.7	220000	17.4		9 77	3.03
2	11465.7*	PostProject	797	5187.27	1.22	5188.49	5189.62	5193.17	2.78	0.04525	t		2 4	00.6
2	11408.0*	PostProject	264	5184.31	1.21	5185.52	5186.67	5190.35	2.88	0.04739	17.6	15.0	α.	ا ان
1 C	11350 4*	DoetDroiect	264	5181.35	1.19	5182.54	5183.70	5187.54	2.99	0.04982	17.9	14.7	14.7	3.17
7 0	1000	Doot Dropost	264	5178 38	1 18	5179.56		5184.63	3.04	0.05084	18.1	14.6	14.7	3.20
7	11292.8	PostProject	204	21.0.30 E47E A3	2 7	5176.61		5181.61	2.99	0.04990	18.0	14.7	14.7	3.17
2	11235.1	PostProject	700	24.0.17		5173 63	517481	5178 68	3.02	0,05055	18.0	14.6	14.7	3.19
2	11177.5*	PostProject	707	5172.45	2 7	27.00		5175 71	3.02	0 05040	18.0	14.7	14.7	3.18
2	11119.9*	PostProject	264	5169.49	<u> </u>	01/0.00		517077	00.6	0.05004	18.0		14.7	3.17
2	11062.2*	PostProject	264	5166.53	1.19	5167.72	5168.89	51/2/3	0.0	0.0000	187		14.7	3.20
2	11004.6*	PostProject	264	5163.56	1.18	5164.74	5165.92	5169.81	3.04	0.03084	- 0		- u	3.02
2	10947	PostProject	316	5160.60	1.37	5161.97	5163.21	5167.09	2.95	0.043/1	18.2		0.00	20.0
2	10836	PostProject	316	5154.90	1.32	5156.22		5161.83	3.26	0.04998	19.0		5.0	o o
0	10834 *	PostProject	316	5154.80	1.31	5156.11	5157.41	5161.83	3.34	0.05141	19.2		15.2	3.25
4 0	10837 *	PostBroient	316	5154 70		5156.00	5157.31	5161.77	3.36	0.05189	19.3		15.2	3.27
4 0	10002.	Doot Project	316	5154 BD		5155 90	5157.21	5161.70	3.39	0.05244	19.3	16.3	15.2	3.28
7	10000.	PostProject	2 4	5154.00		5155 79		5161.65	3.42	0.05314	19.4	16.3	15.2	3.31
7	10828.	PostPloject	2 6	0.00		5155 69		516162	3.47	0.05407	19.5	16.2	15.1	3.33
2	10826.*	PostProject	310	5154.40		10000	i	516160	3.52	0.05525	19.7	16.1	15.1	3.37
2	10824.*	PostProject	316	5154.30	1.28	5155.30		7 101.00	3 55	0.05570	19.7		15.1	3.38
2	10822.*	PostProject	316		1.28	0100.40		2000	0.00	0.05623	19.8		15.1	3.39
2	10820.*	PostProject	316		1.27	5155.37		5161.45	3.57	0.03623	10.0		15.1	3.41
2	10818.*	PostProject	316		1.27	5155.27		5161.41	3.61	7,0000	6.6.		- 0	77.0
2	10816	PostProject	316	5153.90	1.26	5155.16	5156.51	5161.37	3.65	0.05791	20.0	2.0	0.01	'n
2	10815		Bridge											
	10754	PostProject	316	5150.70	1.59	5152.29	5153.31	5155.81	1.94	0.02539	15.1		16.4	2.34
1 0	10752 *	PostProject	316			5152.18	5153.21	5155.76	1.97	0.02589	15.2		16.3	2.37
1 0	10750 *	DostDroject	316			5152.07	5153.11	5155.70	2.01	0.02647	15.3		16.3	2.39
7 (	10778 *	PostProject	316			5151.96	5153.01	5155.65	2.04	0.02703	15.4		16.2	2.41
7 0	10746 *	DoetDroject	3,18			5151.86	5152.91	5155.59	2.07	0.02755	15.5	20.4	16.2	2.44
	40744	PostProject	316			5151.75	5152.81	5155.52	2.10	0.02802	15.6		16.2	2.45
	40740.	DoctBroject	316			5151.64		5155.47	2.13	0.02860	15.7	20.1	16.2	2.48
	10740.	DostBroject	316			5151.53		5155.41	2.16	0.02909	15.8		16.1	2.50
se	10738 *	DostBroject	316			5151.43		5155.34	2.18	0.02949	15.9	ļ	16.1	2.51
	10736 *	Doet Droject	346			5151.32		5155.28	2.21	0.03000	16.0		16.1	2.53
	107.00.	Doct Project	218			5151.21		5155.20	2.23	0.03040	16.0	19.7	16.1	2.55
	10734	Post roject	316			5146.69		5151.94		0.04524	18.4	17.2	15.4	3.07
	10630	DoctDroject	777			5143.45		5148.21		0.02905	17.5	25.4	17.4	2.56
	10344	PostProject	703			5118.25		5124.80	3.37	0.03585	20.5	28.9	18.2	2.87
7 0	3020	nost roject	503			5118 18		5124.73	3.37	0.03585	20.5	28.9	18.2	2.87
	9024.	PostProject	593			5118.11		5124.68	3.38	0.03598	20.6		18.2	2.88
	3022.	Doct Dropod	503			5118.04	5119.70	5124.62	3.39	0.03610	20.6		18.2	2.88
z Ch	9020.	PostProject	200			5117.96		5124.57	3.40	0.03623	20.6	28.8	18.2	2.89
	9818.	PostProject	260			5117.89		5124.51	3.41	0.03639	20.7	28.7	18.2	2.89
7 (	90 0.	PostProject	593			5117.82		5124.46	3.42	0.03655	20.7	28.7	18.1	2.
7	9814.	PostProject	000			2								

Reach						\d_1 / \S	·	2		2	5			
	River Sta	Profile	Q Total	Min Ch El	Max Chi Upin	W.S. Elev	£ (#)	(¥)	(lb/sq ft)	(ft/ft)	(ft/s)	(sq ft)	(£)	
	* 0.00	Door Droiport	503	5115.64	2 03	5117.67	5119.35	5124.38	3.46	0.03703	20.8	28.5	18.1	2.92
7 0	90 IO.	DostBroject	500	5115.57	2.03	5117.60	5119.27	5124.34	3.48	0.03729	20.8	28.5	18.1	2.93
2 6	9806	PostProject	593	5115.50	2.03	5117.53	5119.22	5124.24	3.46	0.03710	20.8	28.5	18.1	2.92
2	9805		Bridge											
	9744	PostProject	593	5113.30	2.34	5115.64	5117.00	5120.26	2.29	0.02183	17.2	34.4	19.4	2.28
,	9742 *	PostProject	593	5113.23	2.35	5115.58	5116.94	5120.18	2.29	0.02178	17.2	34.4	19.4	2.28
7 0	9740 *	DoctDroiect	593	5113.16	2.34	5115.50	5116.87	5120.13	2.30	0.02193	17.3	34.3	19.4	2.28
4 6	0738 *	DostProject	2000	5113.09	2.34	5115.43	5116.80	5120.04	2.29	0.02179	17.2	34.4	19.4	2.28
7 (	9736 *	PostProject	593	5113 02	234	5115.36	5116.73	5119.99	2.30	0.02195	17.3	34.3	19.4	2.29
7 0	9734	Doctorologi	503	5112 95	2.35	5115.30	5116,66	5119.90	2.28	0.02174	17.2	34.4	19.4	2.28
7	97.54.	PostPioject	200	24.00	2 34	5115 22	5116.59	5119.86		0.02198	17.3	34.3	19.3	2.29
2	9/32.*	PostProject	CBC C	5112.00	4.0.4 A 2.0.4	5115.64	5116.52	5119 76		0.02178	17.2	34.4	19.4	2.28
2	9730.*	PostProject	282	3112.01	20.7	1,100	5116 45	511971		0.02193	17.3	34.3	19.4	2.28
2	9728.*	PostProject	293	5112.74	2.34	0110.00	24.0.10	5110.71		0.02179	17.2	34.4	19.4	2.28
2	9726.*	PostProject	283	5112.67	2.34	10.01	10.00	5119.02			17.3		19.4	2.29
2	9724	PostProject	283	5112.60	4.34	0114.94	0.00	5117.67			18.8		18.8	2.55
2	9650	PostProject	593	5110.00	2.19	5112.19	5113.71	10.7110		0.0200	7 0		18.8	2.54
2	9625.*	PostProject	593	5109.37	2.20	5111.57	5113.08	5117.02		0.02763	10.7		2 0 0	2 5.4
2	*.009€	PostProject	593	5108.74	2.20	5110.94	5112.45	5116.37		0.02748	18./		10.0	2.34
2	9575.*	PostProject	593	5108.11	2.21	5110.32	5111.82	5115.73	٠	0.02735	18.7		18.8	2.53
2 0	9550 *	PostProject	593	5107.48	2.21	5109.69	5111.18	5115.07	2.71	0.02711	18.6		18.8	2.52
1 0	0525 *	DostDroject	593	5106.85		5109.06	5110.55	5114.42	2.70	0.02696	18.6	31.9	18.8	2.52
4 6	9500 *	PostProject	593	5106.22		5108.44	5109.92	5113.77	2.69	0.02677	18.5	32.0	18.9	2.51
7 0	90000.	PostProject	593	5105 59	2 22	5107.81	5109.29		2.68	0.02671	18.5	32.0	18.9	2.50
7 (	9470.	Post Project	503	5104 96	2 22	5107.18	5108.66		2.67	0.02659	18.5	32.1	18.9	2.50
7 0	* 2000	PostBroject	593	5104 33	2.23	5106.56	5108.03	5111.84	2.66	0.02642	18.4		18.9	2.49
7	9423.	ייים בייים ביים בייים בייים בייים בייים בייים בייים בייים בייים בייים בי	200	5104:30	2.23	5105 93	5107 40	5111 19		0.02629	18.4	32.2	18.9	2.49
2	9400.	PostProject	090	3103.70	2.77	5105.55	5108 78	5110.59			18.5	32.1	18.9	2.50
2	9375.	PostProject	280	5103.07	27.7	5103.23	5106.14	5109 95			18.4	32.1	18.9	2.49
2	9350.*	PostProject	280	5102.44	2.23	2104.01	5106.14	5100.33			18.4	32.2	18.9	2.49
2	9325.	PostProject	280	3 01.01	6,60	5103.01	5104 88	Ì			18.4		18.9	2.48
2	9300.*	PostProject	260	3101.10		5100.41	5104.26				18.4		18.9	2.49
7 2	9275.*	PostProject	280	5000 00		5102.15	5103 63	5107.41			18.4		18.9	2.49
7	9250.	PostProject	200	50693.32		5101 51	5102.99				18.5	32.1	18.9	2.50
7	9223.	PostProject	000	5098 65		5100.87	5102.35				18.5	32.0	18.9	2.51
7 0	9200.	PostProject	503	5098.02		5100 24					18.5	32.1	18.9	2.50
7	9170.	DootDroject	203	50007.39		5099 61			2.67	0.02654	18.5	32.1	18.9	2.50
7	9150.	PostProject	200	5006 76		5098 99	5100.47	5104.27		0.02643	18.5	32.1	18.9	2.49
2 0	9125.	PostProject	093	5096.73		5098 36	5099.83	5103.63			18.4	32.2	18.9	2.49
7	9100.	Postrioject	200	5000.10		5097 73	5099 21		2.64	0.02618	18.4	32.3	18.9	2.48
7	9070.	Postrioject	000	50000 87		5097 11	5098.57			0.02603	18.4	32.3	18.9	2.47
7	9050.	PusiFioJect	260	10.4.00		5096 47	5097 95				18.4	32.2	18.9	2.48
7	9025.	Posiriojeci	Sec. of	5003 64	23.7	5095.84	5097.31		2		18.4	32.2	18.9	2.49
2	3000.	PostProject	060	00000	27.7	E005.34	5006 68				18.4	32.2	18.9	2.49
2	8975.*	PostProject	583	5092.98		5004 50	5090.00				18	32	18.9	2.48
2	8950.*	PostProject	593	5092.35	7	5034.30	5090.03		4 6				18	2.49
2	8925.*	PostProject	593	5091.72	2.23	2032,32	50,000				;			

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Keann         Kiver Sta           2         8900.*         6           2         8875.*         6           2         8850.*         6           2         8825.*         6           2         8750.*         7           3         8775.*         7           4         8750.*         7           5         8650.*         7           6         8650.*         7           7         8650.*         7           8         8650.*         7           8         8475.*         7           8         8475.*         7           8         8450.*         7           8         8375.*         8           2         8460.*         8           2         8450.*         8           2         8350.*         8           2         8350.*         8           2         8250.*         8           2         8250.*         8           2         8250.*         8           3         8250.*         8           2         8250.*         8           3	PostProject PostPr	(cfs) (cfs) 593 593 593 593 593	(ft) 5091.09	(ft)	(#)	€	<b>(#</b> )	(lh/en ft)	(#/#)	(tt/s)	(sd ft)	(ft)	
8900,* 8875,* 8875,* 8860,* 8775,* 8775,* 8775,* 8775,* 8670,* 8675,* 8775,* 87	PostProject PostPr		5091.09	0		(11)	(11)	(וווופל וול	(101)				
8875.* 8850.* 8850.* 8860.* 8775.* 8775.* 8775.* 8650.* 8750.* 8750.* 8750.* 8750.* 8750.* 8750.* 8750.* 8750.* 8750.*	PostProject PostPr	593		2.23	5093.32	5094.79	5098.58	2.64	0.02624	18.4	32.2		2.48
8850.* 8825.* 8800.* 8775.* 8775.* 8775.* 8775.* 8775.* 8650.* 8750.* 8750.* 8750.* 8750.* 8750.* 8750.* 8750.* 8750.*	PostProject	593	5090.46	2.23	5092.69	5094.16	5097.97	2.66	0.02644	18.5	32.1	18.9	2.49
8825.* 8800.* 8775.* 8775.* 8775.* 8775.* 8775.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8775.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.* 8375.*	PostProject	593	5089.83	2.23	5092.06	5093.53	5097.33	2.65	0.02633	18.4	32.2	18.9	2.49
8800.* 8775.* 8775.* 8775.* 8775.* 8775.* 8675.* 8650.*	PostProject	593	5089.20	2.23	5091.43	5092.90	5096.68	2.64	0.02621	18.4	32.2	18.9	2.48
8775.* 8750.* 8750.* 8760.* 8675.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8650.* 8755.* 8755.* 8350.*	PostProject		5088.57	2.23	5090.80	5092.28	5096.04	2.63	0.02611	18.4	32.3	18.9	2.48
8750 8725. 8725. 8700. 8650. 8650. 8650. 8575. 8550. 8550. 8475. 8475. 8350. 8350. 8350. 8375. 8350. 8375. 8350. 8375. 8350. 8375. 8375. 8375.	PostProject	503	5087 94	2.23	5090.17	5091.65	5095.43	2.65	0.02629	18.4	32.2	18.9	2.49
8725.* 8700.* 8675.* 8650.* 8650.* 8650.* 8550.* 8550.* 8550.* 8450.* 8450.* 8375.*	PostProject	503	5087.31	2 2 2	5089.53	5091.01	5094.82	2.66	0.02648	18.5	32.1	18.9	2.49
8675.* 8650.* 8650.* 8650.* 8650.* 8550.* 8550.* 8550.* 8475.* 8475.* 8375.*	Postrioject Postproject Postproject Postproject Postproject Postproject Postproject Postproject Postproject Postproject	503	5000 E3	2 23	508886	5090.34	5094.10	2.63	0.02610	18.4	32.3	18.9	2.48
8675.* 8650.* 8650.* 8650.* 8650.* 8575.* 8500.* 8475.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.* 8450.*	Postrioject	2001	200000	27.2	5088 17	5089 65	5093.44	2.65	0.02633	18.4	32.2	18.9	2.49
8650.* 8650.* 8650.* 8650.* 8650.* 8575.* 8500.* 8475.* 8475.* 8350.* 8350.* 8350.* 8350.* 8350.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.*	Postrioject Postrioject Postrioject Postrioject Postrioject Postrioject Postrioject Postrioject	200	40.0000	2.23	5087.49	5088 97	5092 74	2.64	0.02616	18.4	32.3	18.9	2.48
8650.* 8625.* 8600.* 8675.* 8575.* 8550.* 8475.* 8440.* 8450.* 8350.* 8350.* 8350.* 8250.* 8250.*	PostProject PostProject PostProject PostProject PostProject PostProject PostProject PostProject	293	5005.20	2.27	5086 70	5088.08	5092 08	2 66	0.02646	18.5	32.1	18.9	2.49
8625.* 8600.* 8600.* 8575.* 8550.* 8525.* 8475.* 84425.* 84425.* 8425.* 8375.* 8350.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.*	PostProject PostProject PostProject PostProject PostProject PostProject PostProject PostProject	583	5084.57	2.23	2000.73	2000.20	5002.38	2 65	0.02629	184	32.2	18.9	2.49
8600.* 8575.* 8550.* 8525.* 8475.* 8425.* 8425.* 8375.* 8350.* 8325.* 8225.* 8225.* 8225.*	PostProject PostProject PostProject PostProject PostProject PostProject	593	5083.89	2.23	2036.12	00.7000	3091.30	20.7	0.03650	187		18.9	2.50
8575.* 850.* 850.* 8475.* 8475.* 8425.* 8480.* 8375.* 8350.* 8325.* 8225.* 8225.* 8225.*	PostProject PostProject PostProject PostProject	593	5083.20	2.22	5085.42	5086.91		2.07	0.0200	200		8 8	2.53
8550.* 8525.* 8500.* 8475.* 8450.* 8425.* 8375.* 8375.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.* 8325.*	PostProject PostProject PostProject PostProject	593	5082.52	2.21	5084.73	5086.23		2.72	0.02720	0.01		0.00	00.4
8525.* 8500.* 8475.* 8450.* 8425.* 8400.* 8375.* 8350.* 8350.* 8350.* 8350.* 8350.* 8325.* 8250.* 8225.* 8225.*	PostProject PostProject PostProject	593	5081.83	2.22	5084.05	5085.54			0.02676	18.5		B. 0.	2.31
8500.* 8475.* 8426.* 8426.* 8400.* 8375.* 8350.* 8326.* 8326.* 8325.* 8250.*	PostProject	593	5081.15	2.21	5083,36	5084.86	5088.76	2.72	0.02725	18.6	į	18.8	2.53
8475.* 8450.* 8425.* 8400.* 8375.* 8350.* 8350.* 8275.* 8250.* 8250.* 8250.*	PostProject	593	5080.46	2.22	5082.68	5084.17	5088.02	2.69	0.02685	18.6		18.9	2.51
8450.* 8450.* 8425.* 8400.* 8375.* 8350.* 8275.* 8275.* 8220.* 8275.* 8250.*	איי יי יי	503	5079 78	2.23	5082 00	5083.49	5087.29	2.66	0.02646	18.5	32.1	18.9	2.49
8425.* 8425.* 8425.* 8375.* 8350.* 8300.* 8275.* 8250.* 8225.* 8275.*		200	5070 00	2 23	508132	5082 80	5086.59	2.65	0.02633	18.4	32.2	18.9	2.49
8425.* 8400.* 8375.* 8325.* 8325.* 8275.* 8250.* 8250.* 8250.*	PostProject	280	5078 44	2.23	5080 64	5082 12	5085 89			18.4		18.9	2.48
8400.* 8375.* 8375.* 8350.* 8326.* 8275.* 8225.* 8225.* 8225.* 8275.*	PostProject	200	3070.41	2.2	10.000	E001 43		2.65		18.4	32.2	18.9	2.49
8350.* 8350.* 8325.* 8275.* 8225.* 8225.* 8225.* 8475.*	PostProject -	293	5077.72	2.23	507070	24.1000		2.53		18.4		18.9	2.48
8350.* 8325.* 8300.* 8275.* 8250.* 8225.* 8225.*	PostProject	283	5077.04	2.23	30/9.27	00000				18.4		18.9	2.49
8325.* 8300.* 8275.* 8250.* 8225.* 8200.*	PostProject	593	5076.35	2.23	5078.58	5080.06	5003.00			184		18.9	2.49
8300.* 8275.* 8250.* 8225.* 8200.*	PostProject	593	5075.67	2.23	907790	5079.38	5003.10			20 0			2.48
8275.* 8250.* 8225.* 8200.* 8175.*	PostProject	593	5074.99	2.23	5077.22	5078.70	5082.45			0.0			2.49
8250.* 8225.* 8200.* 8175.*	PostProject	593	5074.30	2.23	5076.53	5078.01	5081.80			4.01			24.5
8225.* 8200.* 8175.*	PostProject	593	5073.62	2.23	5075.85	5077.33	5081.10			18.4			2.48
8175.*	PostProject	593	5072.93	2.23	5075.16	5076.64	5080.44	2.66		18.4		8.8	2.49
8175.*	PostProject	593	5072.25	2.23	5074.48	5075.96	5079.75		0.02633	18.4		18.9	2.49
* 0	PostProject	593	5071.56	2.22	5073.78	5075.27	5079.08	2.67	0.02652	18.5		18.9	2.50
- C.	PostProject	593	5070.88	2.23	5073.11	5074.59	5078.39	2.66		18.4			2.49
2 8125.*	PostProject	593	5070.19	2.23	5072.42	5073.90	5077.68	2.64	0.02625	18.4			2.48
8100 *	PostProject	593	5069.51	2.24	5071.75	5073.22	5076.97	2.62	0.02599	18.3			2.47
8075 *	PostProject	593	5068.82	2.23	5071.05	5072.53	5076.31	2.65	0.02627	18.4	i		2.49
	PostProject	593	5068.14	2.23	5070.37	5071.85	5075.62	2.64	0.02620	18.4		18	2.48
8025 *	PostProject	593	5067.45	2.23	5069.68	5071.16	5074.96	2.66	0.02640	18.4	32.2	18.9	2.49
* 000	PostProject	593	5066.77	2.23	5069.00	5070.48	5074.26	2.65	0.02629	18.4		18	2.49
7975 *	PostProject	593	5066,08	2.22	5068.30	5069.79	5073.61	2.67	0.02659	18.5		18	2.50
7 0	PostProject	593	5065.40	2.21	5067.61	5069.11	5073.00	2.72	0.02720	18.6		18.8	2.53
2 7925 *	PostProject	593	5064.71	2.22	5066.93	5068.42	5072.26	2.69	0.02676	18.5		18.9	2.51
2 7900	PostProject	593	5064.03	2.21	5066.23	5067.74	5071.64	2.73	0.02731	18.7			2.53
	PostProject	593	5063.76	2.12	5065.88	5067.38	5071.35	2.78	0.02832	18.8			2.57
7880 *	PostProject	593	5063.48	2.04	5065.52	5067.02	5071.04	2.82	0.02941	18.9			
	PostProject	716	5063.21	2.36	5065.57	5067.05	5070.67	2.49	0.02282	18.1			2.35
7550	DostProject	716	5054 50	2.24	5056.74	5058.34	5062.57	2.89	0.02764	19.4	37.0	21.0	2.57

Proposed N. Borrega Chan

Divor Ota	Doodh Diver Sta Drofile O Total Min Ch F	- Total	Min Ch Fi	Max Chi Doth	W.S. Elev	Crit W.S.	E.G. Elev	Shear Chan	E.G. Slope	V C C C C	LIOW AIGS	lop wiath	Lionae # Cil
NACI OID	-	(cfs)		Œ	(#)	€	(¥)	(lþ/sd ft)	(#/#)	(#/s)	(sq ft)	(#)	
7250	PostProject	716	5047.50	2.37	5049.87	5051.34	5054.91	2.46	0.02246	18.0	39.7	21.5	2.34
6450	PostProject	716	5029.00	2.34	5031.34	5032.84	5036.55		0.02349	18.3	39.1	21.4	2.38
6445 *	PostProject	716	5028.90	2.34	5031.24	5032.74	5036.47	2.57	0.02366	18.4	39.0	21.4	2.39
6440 *	PostProject	716	5028.81	2.34	5031.15	5032.65	5036.36	2.56	0.02354	18.3	39.1	21.4	2.39
6435 *	PostProject	716	5028.71	2.34	5031.05	5032.55	5036.28	2.57	0.02366	18.4	39.0	21.4	2.39
6430 *	PostProject	716	5028.61	2.34	5030.95	5032.45	5036.20	2.58	0.02383	18.4	38.9	21.3	2.40
6425 *	PostProject	716	5028.51	2.33	5030.84	5032.35	5036.12	2.60	0.02401	18.4	38.8	21.3	2.41
6420.*	PostProject	716	5028 42	2.33	5030.75	5032.26	5036.02	2.59	0.02393	18.4	38.9	21.3	2.41
0440. 6445 *	DoetDroject	716	5028.32	2.33	5030.65	5032.16	5035.95	2.61	0.02416	18.5	38.7	21.3	2.42
6410 *	PostProject	716	5028,22	2.32	5030.54	5032.06	5035.88	2.62	0.02434	18.5	38.6		2.42
04 10.	DostDroject	716	5028 12	2.32	5030.44	5031.96	5035.80	2.64	0.02455	18.6	38.5		2.43
6400.*	PostProject	716	5028.02		5030.34	5031.86	5035.69	2.63	0.02445	18.6	38.6		2.43
0400	Doct Droject	716	5027 93		5030.25		5035.59	2.63	0.02436	18.5	38.6		2.43
0290.	DoetBroiect	716	5027 83	2 32	5030,15		5035.52	2.64	0.02457	18.6	38.5		2.43
0000.	DoctBroiset	716	5027 73	2 32	5030.05	5031.57	5035.41	2.64	0.02449	18.6	38.5		2.43
* 0000	DootDroject	716	5027 64	2.32	5029.96	5031.48	5035.30	2.63	0.02440	18.5	38.6		2.43
638U.	PostProject	7 7 7	5027 54	2 32	5029 86			2.65	0.02460	18.6	38.5	21.3	2.44
63/5.	PostPioject	7,10	5027 44	2 32	5029 76			2.64	0.02453	18.6	38.5	21.3	2.43
63/0.	PostProject	110	2027.44		90.0209	5031 18			0.02443	18.6	38.6	21.3	2.43
6365.*	PostProject	710	3027.34		5029.50		L			18.5	38.6		2.42
6360.*	PostProject	91.7	5027.45		77.000					18.6	38.5		2.43
6355.*	PostProject	01/2	5027.15		5020 36					18.6	38.4		2.44
6350.*	PostProject	qL/	cu./20c	2.31	00.6200		İ			187	38.3		2.45
6345.*	PostProject	716	5026.95	2.31	5029.26					18.7	38.4		
6340.*	PostProject	716	5026.85	2.31	2029.10					48.6	38.5		
6335.*	PostProject	716	5026.76	2.31	5029.07	5030.60	İ			18.7	38.3		
6330.*	PostProject	716	5026.66	2.31	5028.97					10.7	0.00		
6325.*	PostProject	716	5026.56		5028.86	Ì				10.1	200.2		
6320.*	PostProject	716	5026.46		5028.77					10.7	0.00		
6315.*	PostProject	716	5026.37	2.31	5028.68					18.7	38.3	21.2	2.45
6310.*	PostProject	716	5026.27	2.30	5028.57					18./	38.2		
6305.*	PostProject	716	5026.17	2.30	5028.47	i				18.7	38.2		
6300.*	PostProject	716	5026.08	2.31	5028.39					18.7	38.3		
6295.*	PostProject	716	5025.98	2.31	5028.29					18.7	38.3		
6290.*	PostProject	716	5025.88	2.30	5028.18					18.7			
6285 *	PostProject	716	5025.78		5028.09	5029.62	5033.52			18.7			
6280 *	PostProject	716	5025.69	2.31	5028.00	5029.53	5033.41	2.67		18.7	38.3		
6275 *	PostProject	716	5025.59		5027.89	5029.43	5033.34	1 2.69	0.02508	18.7			
6270 *	PostProject	716	5025.49		5027.79	5029.33	5033.23	3 2.68	0.02502	18.7			
6265 *	PostProject	716	5025.39	2.31	5027.70	5029.23	5033.12	2 2.67	0.02493	18.7			
6260 *	Doet Droject	716	5025 29	2.31	5027.60		5033.01		0.02481	18.7	38.4		
0200 6055	Doct Droject	716	5025 20	231	5027.51		5032.90	2.65	0.02468	18.6	38.4	21.2	
6250.	PostProject	718	5025.20	2.31	5027.42				0.02462	18.6			
0220	PostProject	716	5025.10	2 32	5027.32				0.02455	18.6	38.5		2.43
6240 *	PostProject	718	5022.00		5027.23				0.02447	18.6	38.6		
5240.		2	0.1100			-							

Proposed N. Bornega Chan

Reach	PostProject PostProject	(cfs) (716 716 716 716 716 716 716 716 716 716	(f) 5024.61 5024.62 5024.42 5024.42 5024.32 5024.03 5024.03 5023.93 5023.93 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.65 5023.65 5023.65 5023.65 5023.65	(ff) (7) (2.31) (2.32)	(f) 5027.02 5027.02 5026.93 5026.84 5026.74 5026.74 5026.64 5026.64 5026.25 5026.25 5026.06 5026.06	(f) 5028.55 5028.45 5028.36 5028.26 5028.16	(ft) 5032.41 5032.30 5032.19	(lb/sq ft) 2.65 2.64 2.63	(ft/ft) 0.02464 0.02457 0.02442	(fVs) 18.6 18.6	(sq ft) 38.5 38.5 38.5	(ft) 21.2 21.3	2.43
			5024.61 5024.62 5024.62 5024.42 5024.32 5024.03 5024.03 5023.93 5023.83 5023.74 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.65		5027.02 5026.93 5026.84 5026.73 5026.64 5026.35 5026.25 5026.04 5026.06 5026.06	5028.55 5028.45 5028.36 5028.26 5028.16	5032.41 5032.30 5032.19	2.65	0.02464 0.02457 0.02442	18.6	38.5	21.2	2.43
		716 716 716 716 716 716 716 716 716 716	5024.61 5024.42 5024.42 5024.32 5024.03 5024.03 5023.93 5023.04 5023.64 5023.44 5023.45 5023.45 5023.45 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46 5023.46	2.32 2.32 2.33 2.332 2.32 2.32 2.32 2.3	5026.93 5026.84 5026.73 5026.64 5026.55 5026.35 5026.05 5026.06 5026.06	5028.45 5028.36 5028.26 5028.16	5032.30	2.63	0.02457	18.6	38.5	21.3	2.43
		716 716 716 716 716 716 716 716 716 716	5024.52 5024.32 5024.32 5024.13 5022.13 5023.93 5023.83 5023.84 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.66 5023.66	2.32 2.32 2.32 2.32 2.32 2.32 2.32 2.32	5026.84 5026.73 5026.64 5026.54 5026.35 5026.25 5026.06 5026.06	5028.36 5028.26 5028.16	5032.19	2.63	0.02442	4 4 7	38.6		2.43
		716 716 716 716 716 716 716 716 716 716	5024.42 5024.22 5024.22 5024.13 5024.13 5023.93 5023.83 5023.84 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.65 5023.66	2.32 2.32 2.32 2.32 2.32 2.32 2.32 2.32	5026.73 5026.64 5026.54 5026.45 5026.25 5026.14 5026.06 5026.06	5028.26			-	18.6	2.00	21.3	
		716 716 716 716 716 716 716 716 716 716	5024.32 5024.32 5024.13 5024.03 5023.83 5023.83 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.65 5023.65 5023.16	2.32 2.32 2.32 2.32 2.32 2.32 2.32 2.32	5026.64 5026.54 5026.35 5026.35 5026.14 5026.06 5025.96	5028.16	5032.11	2.65	0.02462	18.6	38.5	21.2	2.44
		716 716 716 716 716 716 716 716 716 716	5023.03 5023.03 5024.03 5024.03 5023.03 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.64 5023.66	2.32 2.32 2.32 2.32 2.32 2.32 2.32 2.32	5026.54 5026.45 5026.35 5026.25 5026.14 5026.06 5026.06		5032.00	2.64	0.02455	18.6	38.5	21.3	2.43
		716 716 716 716 716 716 716 716 716 716	5024.13 5024.13 5024.13 5023.93 5023.83 5023.64 5023.64 5023.44 5023.35 5023.25 5023.15 5023.15 5023.15	2.32 2.32 2.32 2.33 2.33 2.33 2.33 2.33	5026.45 5026.45 5026.25 5026.14 5026.06 5025.96	50.28 OB	5031 89	2 63	0.02447	18.6	38.6	21.3	2.43
		716 716 716 716 716 716 716 716 716 716	5024.13 5024.03 5023.93 5023.83 5023.74 5023.64 5023.64 5023.64 5023.35 5023.15 5023.15 5023.15	2.32 2.33 2.33 2.33 2.33 2.33 2.33 2.33	5026.35 5026.25 5026.14 5026.06 5025.96	2020.00	5031.03	2 63	0.02436	18.5	38.6	21.3	2.43
		716 716 716 716 716 716 716 716 716	5024.03 5023.93 5023.83 5023.74 5023.64 5023.44 5023.25 5023.15 5023.15 5023.15 5023.15	2.32 2.32 2.33 2.33 2.33 2.33 2.33 2.33	5026.35 5026.25 5026.14 5026.06 5025.96	2027.97	5031.73	7.00	0.05	0 0	38.5	21.3	2.43
		716 716 716 716 716 716 716 716 716 716	5023.93 5023.83 5023.74 5023.64 5023.44 5023.35 5023.25 5023.15 5023.05 5023.05	2.32 2.33 2.33 2.32 2.32 2.32 2.32 2.32	5026.25 5026.14 5026.06 5025.96	5027.87	5031.72		0.02457	0.0	0.00	5. 2	2.40
		716 716 716 716 716 716 716 716 716	5023.83 5023.74 5023.64 5023.64 5023.44 5023.35 5023.25 5023.15 5023.05	2.32 2.32 2.32 2.32 2.32 2.32 2.32 2.32	5026.14 5026.06 5025.96	5027.77	5031.61		0.02451	18.6	38.5	21.3	2.43
		716 716 716 716 716 716 716 716	5023.74 5023.64 5023.54 5023.44 5023.35 5023.25 5023.15 5023.05 5023.05	2.32 2.32 2.32 2.32 2.31 2.31 2.32 2.32	5026.06	5027.67	5031.54	2.66	0.02474	18.6	38.4	21.2	2.44
		716 716 716 716 716 716 716	5023.64 5023.44 5023.44 5023.35 5023.25 5023.05 5023.05	2.32 2.33 2.33 2.33 2.33 2.33 2.33 2.33	5025.96	5027.58	5031.43	2.65	0.02460	18.6	38.5	21.3	2.44
		716 716 716 716 716 716	5023.34 5023.34 5023.35 5023.25 5023.05 5022.96	2.32 2.32 2.32 2.32 2.32 2.32 2.32 2.32		5027.48	5031.32	2.64	0.02453	18.6	38.5	21.3	2.43
		716 716 716 716 716 716 716 716	5023.44 5023.35 5023.25 5023.15 5023.05 5022.96	2.32 2.32 2.32 2.32 2.32 2.32 2.32 2.32	5025.86	5027,38	5031.21	2.63	0.02443	18.6	38.6	21.3	2.43
		716 716 716 716 716	5023.35 5023.25 5023.15 5023.05 5023.05	2.32 2.33 2.33 2.33 2.33 2.33 2.33 2.33	E025.25	E027.28	5031 14	2.65	0.02466	18.6	38.5	21.2	2.44
		716 716 716 716 716	5023.25 5023.15 5023.15 5023.05 5022.96	2.32 2.31 2.32 2.32 2.32	5025.73	5027.20	5031.03		0.02453	18.6	38.5	21.3	2.43
		716 716 716 716 716	5023.25 5023.15 5023.05 5022.96	2.32	3023.67	2007	0000		0.00443	28	38.6	21.3	2.43
		716 716 716	5023.15 5023.05 5022.96	2.32	20,52,57	50.7.205	2030.92	20.7	0.02450	48.0	38.5	212	2 44
		716 716 716	5023.05	2.32	5025.46	5026.99		29.7	0.02400	0.00	0.00	1 6	7 7 7
5 6145.		716	5022.96	2.32	5025.37	5026.89		2.65	0.02460	18.6	38.0	0.12	4.7
		716		100	5025.28	5026.80	5030.63	2.63	0.02445	18.6	38.6	21.3	2.43
			5022.86	1.0.7	5025.17	5026.70	5030.56	2.65	0.02468	18.6	38.4	21.2	2.44
	DoetDroioct	716	5022 76	2.31	5025.07	5026.60	5030.45	2.65	0.02462	18.6	38.5	21.2	2.44
		716	5022 66	2 32	5024.98	5026.50	5030.35	2.64	0.02457	18.6	38.5	21.3	2.43
		21.0	5022.33 5022.56	2 32	5024 88	5026.40		2.64	0.02449	18.6	38.5	21.3	2.43
		7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	5022.30	20.7	5024 79	5026.31		2.63	0.02440	18.5	38.6	21.3	2.43
		170	7000	20.7	5024 69	5026 21			0.02460	18.6	38.5	21.3	2.44
		0 (	5022.37	2.32	00.4.00	E006 44	50200		0.02453	18.6	38.5	21.3	2.43
		/16	5022.27	2.32	5024.39	3020.11	50.53.33		0.02445	186			2.43
2 6100.*		716	5022.18	75.7	50.450	3020.02			0.02468	2 0 0	38.4	212	2.44
2 6095.*		716	5022.08	2.31	5024.39	50.25.92			0.02400	2 0 0	38.7	21.2	2 44
2 6090.*	PostProject	716	5021.98	2.31	5024.29	5025.82			0.02402	0.0	0,00	21.3	5.43
2 6085.*	PostProject	716	5021.88	2.32	5024.20	5025.72			0.02455	0.0	0.00	21.0	2.43
2 6080.*	PostProject	716	5021.79	2:32	5024.11	5025.63	5029.46		ļ	0.0		5. 6.	2.44
2 6075.*	PostProject	716	5021.69	2.31	5024.00	5025.53	5029.39			18.0			44.0
2 6070.*	PostProject	716	5021.59	2.31	5023.90	5025.43	5029.29			18.6			7.44
2 6065.*	PostProject	716	5021.49	2.32	5023.81	5025.33				0.81			4.7
2 6060.*	PostProject	716	5021.40	2.32	5023.72	5025.24				18.6	20.0	5.12	24.7
2 6055.*	PostProject	716	5021.30	2.31	5023.61	5025.14				18.6			1.4
2 6050	PostProject	755	5021.20	2.45	5023.65	5025.16				18.3			2.34
		755	5021.01	2.42	5023.43	5024.92	5028.55			18.1	41.6		2.33
		755	5020.82	2.39	5023.21	5024.69	5028.31	2.48	0.02223	18.1	41.7	22.2	2.33
* 6020		755	5020.62	2.36	5022.98	5024.46	5028.07	2.48	0.02242	18.1		22.4	2.34
		755	5020.43	2.34	5022.77	5024.23	5027.80	2.46	0.02227	18.0	41.9	22.6	2.33
		755	5020 24	2.31	5022.55	5024.01	5027.53	2.43	0.02212	17.9			2.32
		755	502005	2 29	5022.34	5023.77	5027.26	2.40	0.02193	17.8	42.4		2.31
		755	50.19 86	2.27	5022.13	5023.55	5026.99	2.38	0.02175	17.7	42.7	23.3	2.30
2 5980.		755	2019.00	2.2	5021 90	5023.32				17.7	42.7	23.5	2.31

Proposed N. Borrega Chan

	Plan: NBorrega	aChan	in Reach: 2 (C	Γ,	44.0	0 /47	0 /W #10	T C II	Shear Chan	F.G. Slope	Vel Chul	Flow Area	Top Width	Froude # Chl
Reach	River Sta	Profile	Q Total	<u> </u>	Max Cni Uptri	(#)	£ 4.5	(E)	(lb/sa ft)	(#Vft)	(fVs)	(sq ft)		
			(CIS)	(11)	(11)	(11) E021 E0	5023 10	5026 49	L	0.02178	17.6	43.0	23.8	2.30
2 .	5960.*	PostProject	755	5019.47	77.7	60.1200	2022.10	5020.43		0.02164			24.0	2.29
2	5950.*	PostProject	755	5019.28	2.21	5021.48	2022.01	3020.22		0.02164			243	2.29
2	5940.*	PostProject	755	5019.09	2.19	5021.28	5022.65	96,6206		0.02131			7 10	2.28
2	5930.*	PostProject	755	5018.90	2.17	5021.07	5022.43	5025.70		0.02130			7.4.0	2.29
2	5920.*	PostProject	755	5018.70	2.14	5020.84	5022.19	5025.47		0.02158			1.47	0000
2	5910 *	PostProject	755	5018.51	2.12	5020.63	5021.97	5025.22		0.02149	17.2		72.0	07.7
1 0	2000 *	PostProject	755	5018.32	2.10	5020.42	5021.75	5024.96	2.25	0.02139	17.1		25.2	2.28
7 (	* 0000	DostBroject	755	5018 13	2.09	5020,22	5021.53	5024.71	2.23	0.02129	17.0	44.4	25.5	2.27
7	2090.	r Usir i Ujeut	7 - 7	5017.10	202	5020 01	5021.31		2.21	0.02122	16.9	44.6	25.7	2.27
2	2880.	PostProject	133	2017.31	10.7	5019 78	5021 08			0.02151	17.0	44.5	25.9	2.28
2	5870.*	PostProject	99/	5017.74	2.04	001001	00.1.200			0.0200	17.0			2.31
2	5860.*	PostProject	755	5017.55	2.01	5019.56	5020.85			0.02200	17.1		263	2.32
2	5850.*	PostProject	755	5017.36	1.98	5019.34	5020.65						2000	2 33
2	5840.*	PostProject	755	5017.17	1.95	5019.12	5020.43						0.02	2.33
ıc	5830 *	DoetDroject	755	5016.98	1.93	5018.91	5020.22	5023.44	2.29	0.02295	17.1		26.8	2.34
7 0	* 0000	PostDroject	755	5016 78	1 90	5018.68	5019.99	5023.24	2.31	0.02336	17.1	44.1	27.0	2.36
7	3020.	רטפורוטופטר	2 1	0.00	88	5018 47	5019 77	5023.01	2.30	0.02346	17.1	44.2	27.2	2.36
2	5810.	PostProject	667	3010.33	0000	00100	5019 90			0.01651	16.0	56.0	29.1	2.03
2	2800	PostProject	886	5016.40	07.7	00.0100	2010.00			0.01679	16.1	55.7	29.1	2.05
2	5785.*	PostProject	968	5016.11	2.27	5018.38	2018.01							2.06
2	5770.*	PostProject	896	5015.82	2.26	5018.08	5019.31							80.6
2	5755.*	PostProject	968	5015.52	2.25	5017.77	5019.02							0.1
2	5740.*	PostProject	896	5015.23	2.24	5017.47	5018.72							2.09
2	5725 *	PostProject	896	5014.94	2.25	5017.19	5018.44	5021.31	1.99	0.01742				2.09
7 0	5740 *	DoctDroiect	898	5014.65	2.25	5016.90	5018.14	5021.01	1.98	0.01732				2.08
7 (	37 -0.	DoetDroiect	968	5014.35	2.24	5016.59	5017.85	5020.74	2.00	0.01755				2.09
7	2000.	rostrioject	900	E014 06	2 24	5016.30	5017.55	5020.43	1.99	0.01743	16.3	54.9	29.0	2.09
2	5680.	PostProject	060	0014.00	77.7	5016.00	5017 26			0.01761	16.4	54.8	29.0	2.10
2	5665	PostProject	989	50.13.77	7.24	20.00	5047.04					54.9	28.4	2.07
2	5650.*	PostProject	968	5013.48	2.31	2013.73	20.7.00						27.9	2.05
2	5635.*	PostProject	896	5013.19	2.38	5015.57	50.10.63							2.03
2	5620.*	PostProject	968	5012.89	2.44	5015.33	5016.60							
2	5605.*	PostProject	968	5012.60	2.52	5015.12	5016.39							
2	5590	PostProject	968	5012.31	2.60	5014.91	5016.18							66.7
100	5575 *	PostProject	968	5011.95	2.65	5014.60	5015.92	5018.82						
10	5560 *	PostProject	896	5011.59	2.73	5014.32	5015.64	5018.58						
4 0	5545 *	PostProject	896	5011.23		5014.03	5015.38	5018.34	2.00		16.7			
1 0	5530 *	DostProject	896	5010.87	2.88	5013.75	5015.12	5018.10	2.01	0.01545	16.7	53.5		
7	0000	PostBrojest	908	5010 51	79.6	5013.48	5014.85	5017.87	7 2.02	0.01535	16.8	53.3	,	
7 0	* 00.0	Post loject	908	5010 15		5013.09	5014.49		1 2.09	0.01600	17.1	52.5		2.02
7	2200.	r Usir Iujeu	900			5012 70	5014.13		5 2.15	0.01664	17.3	51.8	23.6	2.06
7	2483.	יים ביים ביים ביים	0000			501231	5013 77	5017 08		0.01722	17.5	5 51.2	23.5	2.09
2	5470.7	PostProject	000	0009.43		501103	5013.41				17.7	50.6	23.4	2.12
2	5455.	PostProject	080			5011.50	5013 05				17.9	50.1	23.3	2.15
2	5440.*	PostProject	880	5008.71		2.1.00	5010.00				18.0	49.7	23.3	2.18
2	5425.*	PostProject	896		7	2011.17	30.12.02						23	2.20
2	5410.*	PostProject	896	5007.98		5010.78	5012.32						23	
2	5395.*	PostProject	896			5010.40	50.11.96				2 2	48		
2	5380.*	PostProject	968		2.77	5010.03	5011.60	15.31	2.48					

Proposed N. Borreya Chan
12/20

Pro Pro	Profile	Beach River Sta Profile O Total Min Ch 8	īīi	Max Chl Dpth	W.S. Elev	Crit W.S.	E.G. Elev	Shear Chan	E.G. Slope	Vel Chul	Flow Area	l op wiatn	
-		t		€	€	£	(£)	(lb/sq ft)	(ft/ft)	(ft/s)	(sd ft)	(#)	
F365 * DoctDroient	jact	896	5006 90	2.76	5009.66	5011.24	5015.00	2.51	0.02025	18.6	48.3	23.0	2.26
1	1000	900	5006 54	2.75	5009 29	5010.88	5014.69	2.54	0.02059	18.7	48.0	23.0	2.28
	Jeci	000	2000	27.7	5008 92	5010 52	5014.38	2.57	0.02086	18.8	47.8	22.9	2.29
	Jact	900	2000.10	2.73	5008 55	5010 16	5014.05	2.59	0.02110	18.8	47.6	22.9	2.30
Dozfor PostProject	Jacri Sisse	900	5005.02 5005.46	2.72	5008 18	5009,80	5013.72	2.61	0.02131	18.9	47.4	22.9	2.31
	ייסני ל	900	5005 10	2.71	5007.81	5009.44	5013,40	2.63	0.02154	19.0	47.2	22.8	2.32
	Ject	000	5004 74	2.70	5007.44	5009,08	5013.07	2.66	0.02178	19.0	1.74	22.8	2.34
	Jacet Spot	000	5004 38	2 70	5007 08	5008.72	5012.74	2.67	0.02196	19.1	46.9	22.8	2.34
	olect	080	2004:30	07.2	5006 72	5008 36	5012.35	2.66	0.02178	19.0	47.1	22.8	2.34
	oject .	000	20.4.02	2.70	50000	5008 00	5012 02	2.67	0.02197	19.1	46.9	22.8	2.35
Ì	oject	262	2003.90	2.70	00000	5000.00	5011.69	2 69	0.02215	19.2		22.8	2.35
	oject	968	5003.30	2.69	5000.99	2007.04	5011.33	26.2	0.02197	19.1		22.8	2.35
	oject	896	5002.94	2.70	\$0.000°	3000	000	5.7	0.0000	19.2		7.00	2.36
5185.* PostProject	oject	896	5002.57	2.69	5005.26	5006.91	5010.97	2.70	0.02222	7.61		0 00	2 35
5170.* PostProject	oject	968	5002.21	2.69	5004.90	5006.55	5010.59	2.68	0.02207	19.1	8.04	22.0	2.33
	oject	968	5001.85	2.70	5004.55	5006.19	5010.21	2.67	0.02194	19.1	46.9	22.8	2.34
	oiect	968	5001.49	2.69	5004.18	5005.83	5009.88	2.69	0.02212	19.1		22.8	2.35
	Diect	896	5001 13	2.70	5003.83	5005,47	5009.50	2.68	0.02200	19.1	46.9	22.8	2.35
	oject Oject	896	5000 77	2.70	5003.47	5005.11	5009.11	2.66	0.02184	19.1	47.0	22.8	2.34
	to io	908	5000 41	2.71	5003.12	5004.75	5008.73	2.65	0.02169	19.0	47.1	22.8	2.33
	oject oject	296	500005	2.91	5002.96	5004.57	5008.36	2.50	0.01934	18.7		23.6	2.22
	o de co	796	4999 69	2.89	5002.58	5004.21	5008.07	2.54	0.01973	18.8		23.6	2.24
	oject Oject	2967	4999.33	2.88	5002.21	5003.85	5007.76	2.57	0.02004	18.9		23.5	2.26
	piect	2967	4998.97	2.87	5001.84	5003.49	5007.45	2.60	0.02035	19.0		23.5	2.27
	oject	296	4998.61	2.86	5001.47	5003.13	5007.14	2.64	0.02066	19.1		23.4	2.29
	oject	296	4998.25	2.85	5001.10	5002.77	5006.81	2.66	0.02090	19.2		23.4	2.30
	1000	796	4997 89	2.84	5000.73	5002.41	5006.50	2.69	0.02117	19.3		23.3	2.32
	ojeci c	967	4997 52	2 83	5000.35	5002.04	5006.17	2.71	0.02146	19.4	49.9	23.3	2.33
	oject oject	790	4097 16	2 82	499998	5001.68	5005,84	2.73	0.02166	19.4	49.8	23.3	2.34
4960. PosiProject	oject	790	100k PO	281	4999 61	5001.32	5005.52	2.76	0.02187	19.5	49.6	23.2	2.35
	olect	790	7000	282	4999 26	5000 96	5005.14	2.74	0.02176	19.5	49.7	23.3	2.35
4930.* PostProject	oject	706	4990.44	2.02	4998 89	5000.60	5004.81	2.76	0.02194	19.5	49.5	23.2	2.36
	oject oject	790	A005 72		4998 54	5000 24	5004.42	2.75	0.02177	19.5	49.7	23.3	2.35
	ojeci	790	4005.25		4998 17	4999 88	5004.09	2.76	0.02196	19.5	49.5	23.2	2.36
	ojeci	200	4005.00	2.2	4997.80	4999 52	5003.76	2.78	0.02217	19.6	49.4	23.2	2.37
4670 PostProject	oject	790	4985.00	2 01	4987.01	4989.52	5001.02	7.17	0.07483	30.0	32.2	20.0	4.18
	oject	296	4985.00	0.52	4985.52	4985.77	4986.48	2.46	0.14785	7.9	122.6	460.3	2.69

Reach River Sta Profile Q Total	Profile	Q Total	Min Ch El	Max Chi Dpth	W.S. Elev	Crit W.S.	E.G. Elev	Shear Chan	E.G. Slope	Vel Chnl	Flow Area	Top Width	Fronde # Chi
	-	(cfs)	(#)	Œ	(H)	(#)	(#)	(lþ/sd tt)	(#/#)	(t/s)	(sd ft)	Œ	,
11581	Interim	198	5193.20	1.99	5195.19	5195.19	5195.98	0.41	0.00441	7.1		18.0	1.01
11523.3*	Interim	198	5190.24	1.04	5191.28	5192.24	5195.15	2.40	0.04497	15.8		14.1	2.90
11465.7*	Interim	198	5187.27	1.01	5188.28				0.05018	16.4		14.0	0.10
11408.0*	Interim	198	5184.31	1.01	5185.32				0.05043	16.4	ļ	14.0	9 0
11350.4*	Interim	198	5181.35	1.01	5182.36	İ		2.58	0.04926	16.3		14.0	3.08
11292.8*	Interim	198	5178.38		5179.39			2.61	0.05018	16.4		0.41	0.10
11235.1*	Interim	198	5175.42	1.01	5176.43			2.62	0.05043			0.4.0	3.12
11177.5*	Interim	198	5172.45	1.00	5173.45	5174.45			0.05164			14.0	3.15
111100*	Interim	198	5169.49	0.99	5170.48	5171.49	5174.78	2.70	0.05253			14.0	3.18
140803*	Interim	198	5166 53		5167.52		5171.83	2.71	0.05280	16.7	11.9	14.0	3.18
11002.2		000	1 1 1 2 E B		5164.55				0.05307	16.7	11.9	14.0	3.19
11004.6	Interim	190	0100.00		2101.00				0.04018	16.9	16.3	15.2	2.87
10947	interim	2/2	00.0016		00.00				0.04940	18.1		14.9	3.16
10836	Interim	275	5154.90		5156.12				0.010.0	70.0		14.8	3.20
10834.*	Interim	275	5154.80		5156.01				0.05062	0.0		0.1	10.0
10832.*	Interim	275	5154.70	1.21	5155.91				0.05084			24.3	ی ا د
10830 *	Interim	275	5154.60		5155.81	5157.01	5161.03	3.11	0.05106			14.8	3.21
* 90000	Interim	275	5154.50		5155.71	5156.91	5160.95	3.12	0.05135	18.4		14.8	3.22
* 90000 *	Interim	275	5154 40		5155.60	5156.81	5160.87	3.14	0.05171	18.4		14.8	3.23
10000	Interim	275	5154.30		5155.50			3.16	0.05223	18.5	14.9	14.8	3.25
10000#	Interim	27.0	5154.30		5155 40	5156.61	İ	3.19	0.05299	18.6	14.8	14.8	3.27
10822.	Interim	57.0	5154.10		5155.29	5156.52		3.24	0.05391	18.7	14.7	14.8	3.29
10820.	Interim	27.0	5154 00		5155,18	5156.41			0.05517	18.8	14.6	14.7	3.33
10816	Interim	275	5153.90		5155.08	5156.31		3.32	0.05571	18.9	14.6	14.7	3.34
10010		Ochira	200										
10815	1	aro	2160 70	1 50	5150 00	5153 11	5155 23	1.68	0.02291	13.9	19.7	16.1	2.2
10754	interim	2/2	5150.70		100.00				0.02352	14.1	19.6	16.0	2.24
10752.*	Interim	2/2	5150.60		9132.10				0.02410			16.0	2.27
10750.*	Interim	275	5150.50		00.1010				0.02467			15.9	2.29
10748.*	Interim	275	5150.40		00.1010				0.00526	14 4		15.9	2.32
10746.*	Interim	275	5150.30		5151.77	5132.71			0.02589	14.5		15.8	2.34
10744.*	Interim	275	5150.20		0.1010						18.8		2.37
10742.*	Interim	275	5150.10		5151.50								2.39
10740.*	Interim	275	00.0616		04.1010				0.02749				2.41
10738.*	Interim	275	5149.90		9101.04				0.02813				2.44
10736.*	Interim	2/2	5149.80		3131.63							15.7	2.46
10734	Interim	2/2	5149.70		21.16							15.0	3.07
10650	Interim	275	5145.34		5140.30							19.3	2.29
10544	Interim	584	5141.60		5143.92								
9856	Interim	728	5116.20		5118.41								
9824.*	Interim	728	5116.13		5118.34								
9822.*	Interim	728	5116.06		5118.27								
9820.*	Interim	728	5115.99	2.20	5118.19								
* 818	Interim	728	5115.92	2.20	5118.12	5120.06	5126.33	4.14			ļ		
9816 *	Interim	728	5115.85		5118.05	5119.99	5126.29	4.16	0.04181	23.0		18.	
9814 *	Interim	728	5115.78		5117.97	5119.92	5126.25	4.18	0.04205				
9812 *	Interim	728	5115.71		5117.90		5126.21	4.20	0.04233	23.1			
			,										

Interim   Cab	Donoth Diver Sta	Diver Sta Profile O Total Min CF	O Total	Min Ch El	Max Chi Doth	W.S. Elev	Crit W.S.	E.G. Elev	Shear Chan	E.G. Slope	VelChni	LIOW AIGA	וטף איומוו	
District   1709   5115.52   2.15   5117.75   5112.05   2.25   2	t		(cfs)	€	£)	(#)	Œ	(#)	(lb/sq ft)	(ft/ft)	- 1		- 1	
The column   Table   String	* 8086	Interim		5115.57	1	5117.75	5119.71	5126.15	4.25	0.04296	23.3	31.3	18.7	3.17
Friedrich   Frie	9806	Interim	728	5115.50	2.17	5117.67	5119.66	5126.14	4.29	0.04346	23.4	31.2	18.7	3.19
Interior   722   6112.03   2.44   5115.77   5117.20   2.25   0.000000   196   271   196	9805		Bridge											L
Holeston   7228 611422   2.48 611453   6117730   612170   2.29 0   611453   6117730   612170   2.29 0   611453   6117730   612170   2.29 0   611453   61171730   612170   2.29 0   611453   61171730   612172   2.29 0   611453   61171730   612172   2.29 0   611453   61171730   612172   2.29 0   611453   61171730   612172   2.29 0   611453   61171730   612172   2.29 0   611453   61171730   612172   2.29 0   611453   61171730   612172   2.29 0   611453   61171730   612172   2.29 0   612220   61223	9744	Interim	728	5113.30	2.47	5115.77	5117.42		2.95	0.02690	19.7	37.0	19.9	2.55
Holeston   7228 511316   2.49 51116.55 5117.20 5121.51   2.29 0.0026294   19.5 57.2   19.5	9742 *	Interim	728	5113.23	2.48	5115.71	5117.37	5121.70	2.93	0.02667	19.6	37.1	19.9	2.54
Hoteline   722   6112.02   2.40   6116.54   6117.05   612.12   2.84   0.02626   19.5   37.3   19.9	9740.*	Interim	728	5113.16	2.49	5115.65	5117.30	5121.60	2.91	0.02642	19.6	37.2	19.9	2.53
Interior   728   611286   2.40   611454   611710   6151242   2.87   0.02697   1945   37.5   20.0   1.0	9738 *	Interim	728	5113.09	2.49	5115.58	5117.23	5121.51	2.89	0.02628	19.5	37.3	19.9	2.52
The column   Table   ST128   ST25   ST154   ST172   ST212   ST25   ST2	0736 *	Interim	728	5113.02	2.49	5115.51	5117.16	5121.42	2.88	0.02613	19.5	37.3	20.0	2.51
Interior   T228   S112.89   C 2.0   S115.89   S117.00   S118.90   S112.00	97.50.	hatorim	728	5112 95	2.50	5115.45	5117.09		2.87	0.02597	19.5	37.4	20.0	2.51
Interior   722   5112.01   5115.02   5116.02   5116.02   5110.02   5110.02   5120   5120.02	97.34.	Hardinal III	2007	5110 88 6110 88	0.50	5115.38	5117.02		2.85	0.02579	19.4	37.5	20.0	2.50
Humbrin   728   5112.24   2.51   5116.26   5116.26   512.06   2.88   0.002632   19.3   37.7   20.0   20.0   10.0	9732.	Interim	1700	5410 04	C. C.	5115.32	5116 95	5121.13	2.84	0.02560	19.4	37.6	20.0	2.49
Interier         728         5112.67         2.51         5116.297         2.80         0.026243         19.9         58.77         2.00           Interier         728         5112.67         2.51.62.97         2.80         0.026223         19.3         57.8         2.01           Interier         728         5112.60         2.62         511.62.97         512.60         0.026223         19.3         57.8         2.01         2.01           Interior         728         511.00         2.62         511.62         511.62         2.90         0.02723         19.8         50.1         19.8           Interior         728         510.00.81         2.44         511.62         511.62         2.90         0.02723         19.8         3.60         19.8           Interior         728         510.04.81         2.41         510.62         2.44         510.62         511.62         2.90         0.02723         19.7         3.60         19.8         2.91         19.8         2.91         19.8         2.91         19.8         2.91         19.8         2.91         19.8         2.91         19.8         2.91         19.8         2.91         19.8         2.92         19.8         2.92	9730.*	Interim	87/	5112.81	2.01	20.01	11.00	510105	283	0.02552	19.3	37.7	20.0	2.49
Interim   728   5112.80   2.42   5112.41   5114.81   5114.81   512.82   520   0.02222   520	9728.*	Interim	728	5112.74	2.51	5115.25	0110.00	3121.00	20.7	0.05643	19.3	37.7	20.0	2.48
Insertion         728         5112.00         2.62         5116.31         5112.03         5.63         7.7           Interion         728         5110.00         2.44         5111.22         5114.13         512.03         5.0	9726.*	Interim	728	5112.67	2.51	5115.18	5116.81	5120.97	7.07	0.02040	200	97.0	201	2 47
Interim         778         \$110.00         24.2         \$111.28         \$114.18         \$118.81         \$14.40         \$10.00         \$1.20         \$1.50	9724	Interim	728	5112.60	2.52	5115.12	5116.75	5120.87	2.80	0.02523	19.3	0.75	20.1	1.4
Interim         728         5108.24         5111.81         5111.85         5118.64         3.06         0.02248         9.20         98.3         19.8           Interim         728         5108.74         2.46         5111.26         5112.87         511.86         2.80         0.02736         19.8         80.7         19.8           Interim         728         5108.14         2.46         511.02.5         511.22.6         511.66.7         2.89         0.02737         19.8         80.7         19.8           Interim         728         5106.82         2.47         510.82         511.02.2         511.02.2         510.82         511.02.2         511.02.2         510.82         511.02.2         511.02.2         510.82         511.02.2         511.02.2         510.82         511.02.2         511.02.2         510.82         511.02.2	9650	Interim	728	5110.00	2.42	5112.42	5114.13	5118.81	3.14	0.02922	20.3	35.9	19.7	2.65
Interim         728         510874         2.46         5111.25         5112.26         5112.26         5112.26         5114.62         2.89         0.02724         19.8         85.7         19.8           Interim         728         5106.41         2.46         5110.25         5114.62         2.89         0.02724         19.8         85.7         19.8           Interim         728         5106.48         2.47         510.83         5114.62         2.89         0.02724         19.7         36.9         19.9           Interim         728         5106.88         2.47         510.83         511.62         2.89         0.0272         19.7         36.9         19.9           Interim         728         510.68         2.48         510.80         511.42         2.89         0.0285         19.7         19.9           Interim         728         510.43         2.48         510.81         510.44         2.89         0.0285         19.6         37.1         19.9           Interim         728         510.43         2.49         510.44         510.44         2.89         0.0285         19.6         37.1         19.9           Interim         728         510.43	19626 *	Interim	728	5109.37	2.44	5111.81	5113.51	5118.04	3.06	0.02819	20.0	36.3	19.8	2.60
Interim         7728         5100.54         2.44         5110.57         5110.52         5110.57         2.98         0.02723         19.8         9.97         19.8           Interim         7728         5100.58         2.47         5100.83         5110.52         5110.52         510.52         2.98         0.02727         19.7         59.9         19.9           Interim         7728         5100.58         2.47         5100.83         5110.72         2.48         0.02777         19.7         59.9         19.9           Interim         7728         5100.58         2.48         5100.40         510.74         510.10         511.27         2.48         0.02660         19.7         59.9         19.9         19.9           Interim         7728         510.430         2.700.4         510.10         511.24         2.89         0.02660         19.7         59.0         19.9         19.9         19.9           Interim         7728         510.24         510.04         510.04         510.14         510.14         2.90         0.02662         19.8         19.9           Interim         7728         510.13         2.48         510.04         510.24         510.24         510.24	* 0000	laterim	728	5108 74	2.46	5111.20	5112.87	5117.32	3.00	0.02748	19.8	36.7	19.8	2.57
Interim   728   5107.48   2.47   5109.36   5111.62   516.02   2.56   0.00283   19.9   9.	9000.	Interim	802	5108 11	2 46	5110.57	5112.25	5116.67	2.99	0.02736	19.8	36.7	19.8	2.57
Inherim         728         5107.54         2.47         5109.32         5110.59         5116.57         2.96         0.02693         19.7         36.9         19.9           Inherim         728         5106.85         2.47         5109.32         5110.93         5114.72         2.96         0.02693         19.7         36.9         19.9           Inherim         728         5106.36         2.48         5106.47         5108.70         5111.47         2.94         0.02693         19.6         37.1         19.9           Inherim         728         5104.36         2.48         5106.17         5108.10         5111.49         2.92         0.02693         19.6         37.1         19.9           Inherim         728         5104.30         5106.17         5111.49         2.90         0.02693         19.6         37.1         19.9           Inherim         728         5104.30         5106.57         510.10.61         510.10.62         510.02.62         19.0         19.9         19.9           Inherim         728         5104.30         510.65.7         510.02.69         510.02.69         19.9         37.2         19.9           Inherim         728         510.02.69 <td< td=""><td>99/3.</td><td></td><td>120</td><td>100.0</td><td>170</td><td>5100 05</td><td>5111 62</td><td></td><td>2.98</td><td>0.02723</td><td>19.8</td><td>36.8</td><td>19.9</td><td>2.56</td></td<>	99/3.		120	100.0	170	5100 05	5111 62		2.98	0.02723	19.8	36.8	19.9	2.56
Inherim         726         5110.02         2.41         510.66         511.472         2.96         0.02696         19.7         35.9         19.9         19.9           Inherim         728         510.65         2.46         510.60         510.430         511.470         2.94         0.02696         19.7         37.0         19.9           Inherim         728         510.436         2.46         510.64         510.74         510.24         2.94         0.02696         19.7         37.1         19.9           Inherim         728         510.430         2.46         510.64         510.74         511.24         2.94         0.02642         19.6         37.1         19.9           Inherim         728         510.837         2.49         510.64         510.74         511.24         2.94         0.02642         19.6         37.2         19.9           Inherim         728         510.18         2.49         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24         510.24	9550.*	Interim	128	5107.40	0.47	5109.32	5110 99		2.96	0.02707	19.7	36.9	19.9	2.55
Interim         728         5106.22         2.41         5106.23         511.07.24         511.07.24         511.07.24         511.07.24         511.07.24         511.07.24         511.07.24         510.02.63         18.6         37.1         18.9           Interim         728         510.04.39         2.48         510.06.41         511.02.42         2.89         0.02665         18.6         37.1         18.9           Interim         728         510.04.39         2.48         510.06.41         510.06.41         510.06.41         510.06.42         18.6         37.2         18.9           Interim         728         510.06.41         2.49         510.06.41         510.06.41         2.89         0.02645         18.6         37.2         18.9           Interim         728         510.0.81         2.49         510.0.87         510.0.87         19.6         37.2         18.9           Interim         728         510.0.81         2.49         510.0.87         510.0.86         510.0.86         510.0.86         37.2         19.9           Interim         728         510.0.81         510.0.87         510.0.86         510.0.86         2.89         0.02642         37.2         19.9           In	9525.	Interim	07/	5100.03	1.1	0100.0	E110 36	5114 72	2 95	0.02693	19.7	36.9	19.9	2.55
Interim         728         5104.36         2.48         5106.04         5108.04         5114.20         2.89         0.02665         19.6         37.1         19.9           Interim         728         5104.36         2.48         5106.04         5108.04         5112.78         2.89         0.02665         19.6         37.1         19.9           Interim         728         5104.36         2.48         5106.84         510.84         5112.74         2.99         0.02665         19.6         37.1         19.9           Interim         728         5104.30         2.49         5106.81         510.84         511.274         2.99         0.02665         19.6         37.2         19.9           Interim         728         510.84         510.85         511.02.1         2.89         0.02665         19.6         37.2         19.9           Interim         728         510.18         2.49         510.64         510.86         2.89         0.02665         19.6         37.2         19.9           Interim         728         510.05         2.49         510.46         510.86         2.89         0.02665         19.6         37.2         19.9           Interim         728<	9500.*	Interim	128	51.06.22	2.47	5100.03	01-0-00	5114 07	2004	0.02680	19.7	37.0	19.9	2.54
Interim         728         5104,39         2.44         5107,44         510,74         511,274         2.82         0.02842         19.6         37.1         19.9           Interim         728         5104,30         2.49         5106,56         510,724         511,274         2.97         0.02842         19.6         37.2         19.9           Interim         728         510,430         2.49         5106,56         510,721         511,449         2.99         0.02842         19.6         37.2         19.9           Interim         728         510,181         2.49         5106,57         5110,681         2.89         0.02842         19.6         37.3         2.00           Interim         728         510,181         2.49         5106,57         5110,681         2.89         0.02842         19.5         37.3         2.00           Interim         728         5101,181         2.49         5106,37         5106,36         510,37         2.89         0.02842         19.5         37.3         2.00           Interim         728         5098,29         2.49         510,34         510,49         510,49         510,49         510,49         510,49         510,49         510,49	9475.*	Interim	. 728	5105.59	2,48	2000.07	0.00.7	1110 40		0.02665			19.9	2.54
Interir         728         5104.33         2.48         5106.81         510.84         5112.14         2.91         0.02642         19.6         57.2         19.9           Interir         728         5102.44         5106.87         510.784         510.244         510.483         510.687         510.244         510.483         510.285         19.6         57.2         19.9           Interir         728         510.244         510.483         510.687         510.687         510.886         2.89         0.02685         19.5         37.3         20.0           Interir         728         510.118         2.49         510.635         510.861         2.89         0.02685         19.5         37.3         20.0           Interir         728         510.018         510.486         510.861         2.89         0.02685         19.5         37.3         20.0           Interir         728         50.908.52         2.49         510.046         510.846         2.89         0.02685         19.5         37.3         19.9           Interir         728         50.986.52         2.49         510.046         510.845         2.89         0.02685         19.5         37.2         19.9	9450.*	Interim	728	5104.96	2.48	5107.44	5109.10	0.10		0.02652			19.9	2.53
Interim         728         5103.70         2.49         5107.84         5107.84         5107.14         2.50         60.02636         19.5         37.2         19.5           Interim         728         5103.04         2.49         5104.59         5104.83         510.241         2.89         0.02636         19.5         37.2         19.5           Interim         728         5101.81         2.49         5104.30         5106.55         510.241         2.89         0.02636         19.5         37.2         19.5           Interim         728         5100.18         2.49         5104.30         5106.63         2.89         0.02636         19.5         37.3         20.0           Interim         728         5100.18         2.49         5104.30         5108.61         2.89         0.02637         19.5         37.3         20.0           Interim         728         5098.02         2.49         5104.30         5104.30         2.89         0.02637         19.5         37.3         19.9           Interim         728         5098.02         2.49         5104.30         5104.30         5107.70         2.89         0.02637         19.9         37.2         19.9           <	9425.*	Interim	728	5104.33	2.48	5106.81	5108.47			0.02033			19.9	2.53
Interim         728         5103.07         2.49         5105.56         5107.21         5111.49         2.90         0.02625         19.5         37.3         20.0           Interim         728         510.244         2.49         5104.30         5104.30         5104.31         2.80         0.02625         19.5         37.3         20.0           Interim         728         510.18         2.49         5103.67         5106.87         510.84         2.80         0.02623         19.5         37.3         20.0           Interim         728         5100.55         2.49         5103.42         5104.86         5108.81         2.80         0.02623         19.5         37.3         20.0           Interim         728         5096.62         2.49         5102.41         5104.86         5107.70         2.89         0.02627         19.5         37.3         20.0           Interim         728         5098.62         2.49         5100.14         5102.70         2.89         0.02627         19.5         37.3         19.9           Interim         728         5098.02         2.49         510.14         510.27         2.89         0.02623         19.5         37.2         19.9 <td>9400.*</td> <td>Interim</td> <td>728</td> <td>5103.70</td> <td>2.49</td> <td>5106.19</td> <td>5107.84</td> <td></td> <td></td> <td>0.02542</td> <td></td> <td></td> <td>0.01</td> <td>0 50</td>	9400.*	Interim	728	5103.70	2.49	5106.19	5107.84			0.02542			0.01	0 50
Interim         728         6102.44         2.49         6104.89         6106.87         110.85         2.89         0.026263         19.5         37.3         20.0           Interim         728         6101.81         2.49         6104.89         6106.89         6100.668         19.6         37.2         20.0           Interim         728         6101.18         2.49         6104.30         6104.88         6106.86         2.89         0.02663         19.5         37.2         20.0           Interim         728         6101.18         2.49         6104.86         6108.86         2.89         0.02663         19.5         37.3         20.0           Interim         728         6509.82         2.49         6104.78         6104.86         6104.86         6104.89         6104.89         6104.89         6104.89         6104.89         6104.89         6104.89         6104.89         6104.89         6106.84         6106.84         6104.89         6104.89         6106.84         6104.89         6104.89         6106.84         6104.89         6106.84         6106.84         6106.84         6106.84         6106.84         6106.84         6106.84         6106.84         6106.84         6106.84         6106.84         6	9375.*	Interim	728	5103.07	2.49	5105.56	5107.21			0.02635			6.61	20.7
Interim         728         5101.81         2.49         5104.30         5105.85         5100.21         2.88         0.02636         19.5         37.3         20.0           Interim         728         5101.18         2.49         5105.87         5106.82         5100.63         19.5         37.3         20.0           Interim         728         5100.55         2.49         5103.44         5104.88         5108.22         2.88         0.026413         19.5         37.3         20.0           Interim         728         5098.02         2.49         5103.42         5103.42         5107.70         2.89         0.02642         19.5         37.3         20.0           Interim         728         5098.02         2.49         5103.42         5106.70         2.89         0.02642         19.5         37.2         19.9           Interim         728         5098.02         2.49         5103.40         5102.70         2.89         0.02642         19.5         37.2         19.9           Interim         728         5098.02         2.49         5100.20         5105.80         2.90         0.02642         19.5         37.2         19.9           Interim         728 <t< td=""><td>9350.*</td><td>Interim</td><td>728</td><td>5102.44</td><td>2.49</td><td>5104.93</td><td>5106.57</td><td></td><td>2.89</td><td>0.02625</td><td></td><td></td><td>20.0</td><td>70.7</td></t<>	9350.*	Interim	728	5102.44	2.49	5104.93	5106.57		2.89	0.02625			20.0	70.7
Interim         728         5101.18         2.49         5103.67         5106.52         5109.61         2.90         0.02853         19.6         37.2         19.9           Interim         728         5100.55         2.49         5103.04         5104.06         5104.06         2.89         0.02853         19.5         37.3         20.0           Interim         728         5099.29         2.49         5107.44         5104.06         5107.08         2.89         0.02842         19.5         37.3         20.0           Interim         728         5098.02         2.49         5107.14         5107.08         2.89         0.02842         19.5         37.2         19.9           Interim         728         5098.02         2.49         5107.14         5107.08         2.91         0.02842         19.5         37.2         19.9           Interim         728         5098.02         2.49         5100.51         510.70         2.89         0.02842         19.5         37.2         19.9           Interim         728         5096.13         2.49         509.24         510.27         510.20         2.89         0.02842         19.5         37.2         19.9           In	9325 *	Interim	728	5101.81	2.49	5104.30	5105.95		2.88	0.02617	19.5		20.0	7.5
Interim         728         5100.55         2.49         5103.40         5104.66         5108.96         2.89         0.02623         19.5         37.3         20.0           Interim         728         5.099.29         2.49         5102.41         5104.06         5106.32         2.86         0.02643         19.5         37.3         20.0           Interim         728         5.098.29         2.49         5101.14         5102.19         5100.44         5100.74         5100.76         2.89         0.02642         19.6         37.2         19.9           Interim         728         5098.02         2.49         5101.14         5102.16         5106.45         2.89         0.02642         19.6         37.2         19.9           Interim         728         5098.02         2.49         5100.14         5106.45         2.89         0.02627         19.6         37.2         19.9           Interim         728         5096.78         2.49         5100.29         510.64         2.89         0.02627         19.5         37.2         19.9           Interim         728         5096.13         2.49         5098.25         5100.29         5104.56         2.89         0.02629         19.5 <td>* 0300</td> <td>Interim</td> <td>728</td> <td>5101.18</td> <td>2.49</td> <td>5103.67</td> <td>5105.32</td> <td>İ</td> <td>2.90</td> <td>0.02636</td> <td>19.6</td> <td></td> <td>19.9</td> <td>2.52</td>	* 0300	Interim	728	5101.18	2.49	5103.67	5105.32	İ	2.90	0.02636	19.6		19.9	2.52
Interim         728         5099.22         2.49         5102.41         5108.42         5108.32         2.88         0.02627         195         37.3         20.0           Interim         728         5099.29         2.49         5101.74         5102.79         5.99         0.02627         195         37.2         19.0           Interim         728         5098.02         2.49         5101.14         5102.79         5107.08         2.91         0.02642         19.6         37.2         19.9           Interim         728         5098.02         2.49         5100.51         5102.76         2.89         0.02620         19.6         37.2         19.9           Interim         728         5097.39         2.49         5106.51         510.56         2.89         0.02620         19.5         37.2         19.9           Interim         728         5096.73         510.00         510.54         2.90         0.02620         19.5         37.2         19.9           Interim         728         5096.13         2.49         5097.39         5098.24         510.35         2.90         0.02620         19.5         37.2         19.9           Interim         728         5094.	* 2000	Interim	728	5100.55	2.49	5103.04	5104.68			0.02623			20.0	2.52
Interim         728         5098.52         2.49         5103.78         5103.70         2.89         0.02627         19.5         37.2         19.9           Interim         728         5098.65         2.49         5101.78         5107.09         2.91         0.02642         19.6         37.2         19.9           Interim         728         5098.62         2.49         5101.14         5102.16         5106.81         2.90         0.02637         19.6         37.2         19.9           Interim         728         5097.39         2.49         510.51         510.581         2.89         0.02627         19.5         37.2         19.9           Interim         728         5096.13         2.49         510.50         510.581         2.89         0.02620         19.5         37.3         19.9           Interim         728         5096.13         2.49         5098.62         5100.30         510.52         2.89         0.02646         19.5         37.2         19.9           Interim         728         5094.24         2.49         5097.39         5100.30         2.90         0.02649         19.5         37.3         19.9           Interim         728         5094.	9270.	11101111	007	50000	2 40	5102 41	5104.06			0.02613			20.0	2.51
Interim         728         5093.29         2.49         5107.08         5107.08         2.91         0.02642         19.6         37.2         19.9           Interim         728         5098.65         2.49         5100.51         5102.76         5106.45         2.90         0.02627         19.6         37.2         19.9           Interim         728         5098.76         2.49         5100.51         5102.76         5106.81         2.89         0.02627         19.5         37.3         19.9           Interim         728         5096.76         2.49         5098.25         5100.50         5106.81         2.89         0.02620         19.5         37.2         19.9           Interim         728         5096.73         2.49         5098.62         5100.27         5104.56         2.90         0.02620         19.5         37.2         19.9           Interim         728         5098.13         2.49         5098.04         5102.64         5102.64         2.90         0.02620         19.5         37.2         19.9           Interim         728         5094.24         2.49         5096.73         5098.04         5102.64         2.89         0.02620         19.5         37.2	9250.	Interim	07/	2039.92	07.0	5101 78	5103.42			0.02627			20.0	2.52
Interim         728         5096.02         2.49         5100.51         5100.16         5100.	9225.	Interim	120	20093.69	0 40	5101114	5102 79			0.02642			19.9	2.53
Interim         728         5095.26         2.49         5099.88         5105.81         5105.81         2.89         0.02627         19.5         37.3         19.9           Interim         728         5099.76         2.49         5099.86         5100.30         5105.17         2.89         0.02620         19.5         37.2         19.9           Interim         728         5099.75         2.49         5099.64         5100.27         5104.56         2.90         0.02624         19.6         37.2         19.9           Interim         728         5094.87         2.49         5099.64         5102.92         2.90         0.02626         19.6         37.2         19.9           Interim         728         5094.24         2.49         5096.73         5099.04         5102.64         2.89         0.02626         19.5         37.3         19.9           Interim         728         5094.24         2.49         5096.73         5096.73         5096.73         5096.73         5096.73         5096.74         5097.75         5102.03         2.89         0.02626         19.5         37.2         19.9           Interim         728         5092.98         2.49         5096.73         5096.	9200.	Interim	120	5080.65	07.0	5100 51	5102 16		2.90	0.02633			19.9	2.52
Interim         728         5097.39         2.49         5098.25         5100.27         5100.37         2.90         0.02620         19.5         37.3         19.9           Interim         728         5096.76         2.49         5099.84         5100.27         5104.07         2.90         0.02640         19.6         37.2         19.9           Interim         728         5094.87         2.49         5099.84         5100.27         5104.62         2.90         0.02634         19.6         37.2         19.9           Interim         728         5094.87         2.49         5099.01         5102.64         2.89         0.02634         19.5         37.2         19.9           Interim         728         5094.24         2.49         5096.73         5098.38         5102.64         2.89         0.02632         19.5         37.2         19.9           Interim         728         5092.98         2.49         5096.73         5090.71         5101.38         2.90         0.02649         19.5         37.2         19.9           Interim         728         5092.98         2.49         5096.73         5090.71         5101.38         2.89         0.02649         19.5         37.2	9175.	Interim	97/	2030.02	64.0	0000	51015		2 89	0.02627			19.9	2.52
Interim         728         5096.76         2.49         5099.22         5100.27         5100.	9150.*	Interim	87/	5087.38	2.49	2039.00	00.001			0.0960			19.9	2.52
Interim         728         5096.13         2.49         5098.62         5104.50         2.50         0.02634         19.6         37.2         19.9           Interim         728         5094.87         2.49         5097.99         5099.04         5103.20         2.90         0.02634         19.5         37.3         19.9           Interim         728         5094.87         2.49         5099.04         5102.64         2.89         0.02626         19.5         37.3         19.9           Interim         728         5094.24         2.49         5096.73         5099.73         5102.64         2.89         0.02632         19.5         37.2         19.9           Interim         728         5092.98         2.49         5096.73         5102.03         2.90         0.02632         19.5         37.2         19.9           Interim         728         5092.98         2.49         5096.73         5101.38         2.89         0.02640         19.5         37.2         19.9           Interim         728         5092.36         2.49         5096.49         5100.78         2.90         0.02649         19.5         37.2         19.9           Interim         728         50	9125.*	Interim	728	5096.76	2.43	2088.22	5100.90	ļ		0.02040			19.9	2.52
Interim         728         5095.50         2.49         5097.89         5099.64         5103.92         2.90         0.02654         19.0         37.2         19.0           Interim         728         5094.87         2.49         5099.01         -5103.29         2.89         0.02626         19.5         37.3         19.9           Interim         728         5094.24         2.49         5096.73         5098.73         5102.64         2.89         0.02626         19.5         37.3         20.0           Interim         728         5092.98         2.49         5096.73         5102.03         2.90         0.02632         19.5         37.2         19.9           Interim         728         5092.36         2.49         5096.40         5097.12         5101.38         2.89         0.02642         19.5         37.2         19.9           Interim         728         5092.36         2.49         5094.84         5096.49         5100.14         2.90         0.02640         19.6         37.2         19.9           Interim         728         5091.72         2.90         0.02629         19.5         37.2         19.9           Interim         728         5091.09 <t< td=""><td>9100.*</td><td>Interim</td><td>728</td><td>5096.13</td><td></td><td>5098.62</td><td>5100.27</td><td></td><td></td><td>0.02040</td><td></td><td></td><td>10.01</td><td>9 59</td></t<>	9100.*	Interim	728	5096.13		5098.62	5100.27			0.02040			10.01	9 59
Interim         728         5094.87         2.49         5097.36         5099.01         -5103.29         2.89         0.02628         19.5         37.3         19.5           Interim         728         5094.24         2.49         5096.73         5098.38         5102.64         2.88         0.02616         19.5         37.3         20.0           Interim         728         5093.61         2.49         5096.70         5097.75         5102.03         2.90         0.02632         19.5         37.2         19.9           Interim         728         5092.36         2.49         5095.47         5097.12         5101.38         2.89         0.02649         19.5         37.2         19.9           Interim         728         5091.72         2.49         5095.48         5095.48         5095.48         5095.69         19.6         37.2         19.9           Interim         728         5091.72         2.90         0.02649         19.5         37.2         19.9           Interim         728         5091.09         2.90         0.02629         19.5         37.2         19.9           Interim         728         5091.09         2.90         0.02629         19.5 <t< td=""><td>9075.*</td><td>Interim</td><td>728</td><td>5095.50</td><td></td><td>5097.99</td><td>5099.64</td><td></td><td></td><td>0.02634</td><td></td><td></td><td>19.9</td><td></td></t<>	9075.*	Interim	728	5095.50		5097.99	5099.64			0.02634			19.9	
Interim         728         5094.24         2.49         5096.73         5098.38         5102.64         2.88         0.02616         19.5         37.3         20.0           Interim         728         5093.61         2.49         5096.10         5097.75         5102.03         2.90         0.02632         19.5         37.2         19.9           Interim         728         5092.36         2.49         5096.47         5097.12         5101.38         2.89         0.02648         19.5         37.2         19.9           Interim         728         5092.36         2.49         5094.84         5096.49         5100.14         2.90         0.02640         19.5         37.2         19.9           Interim         728         5091.72         2.90         0.02640         19.6         37.2         19.9           Interim         728         5091.72         2.90         0.02622         19.5         37.2         19.9           Interim         728         5091.09         2.90         0.02622         19.5         37.2         19.9           Interim         728         5091.09         2.90         0.02622         19.5         37.2         19.9	\$050.*	Interim	728	5094.87	2.49	5097.36	5099.01			0.02626			5.0	
Interim         728         5093.61         2.49         5096.10         5097.75         5102.03         2.90         0.02632         19.5         37.2         19.9           Interim         728         5092.38         2.49         5096.47         5097.12         5101.38         2.89         0.02648         19.5         37.2         19.9           Interim         728         5092.35         2.49         5094.84         5096.49         5100.78         2.90         0.02640         19.6         37.2         19.9           Interim         728         5091.72         2.49         5094.21         5095.84         5100.14         2.90         0.02629         19.5         37.2         19.9           Interim         728         5091.09         2.90         0.02622         19.5         37.2         19.9           Interim         728         5091.09         2.90         0.02622         19.5         37.2         19.9	9025.*	Interim	728	5094.24	2.49	5096.73	5098.38			0.02616				
Interim         728         6092.38         2.49         6096.47         6096.48         6006.48         6006.48         6006.48         6006.	* 0000	Interim	728	5093.61	2.49	5096.10	5097.75			0.02632				
Interim         728         5092.35         2.49         5094.21         5096.48         5096.49         5100.78         2.90         0.02640         19.6         37.2         19.9           Interim         728         5091.72         2.49         5094.21         5095.85         5100.14         2.90         0.02629         19.5         37.2         19.9           Interim         728         5091.09         2.49         5095.54         5095.50         2.89         0.02622         19.5         37.3         19.9	0075	Interim	728	5092 98		5095.47	5097.12			0.02618				
Interim         728         5091.72         2.49         5094.21         5095.85         5100.14         2.90         0.02629         19.5         37.2         19.9           Interim         728         5091.09         2.49         5095.24         5099.50         2.89         0.02622         19.5         37.3         19.9	9970.	Interim	862	5005.35		5094.84	5096.49			0.02640				
Interim   728   5091.09   2.49   5095.68   5099.50   2.89   0.02632   19.5   37.3   19.9   19.5   19.9   19.5   19.9   19.5   19.9   19.5   19.9   19.5   19.9   19.5	8820.		120	0006.30	0 40	5094 21	5095 85			0.02629		37	19.9	
Nierim   726 0091,09 2.45 0000.00 0000.00 0000.00 19.9	8925.*	interim	128	5091.72	24.7	2.4500 82 5003	5095.03			0.02622				
	\$900°	Interim	728	5091.09		3033.30	42.080.2			0.02644				

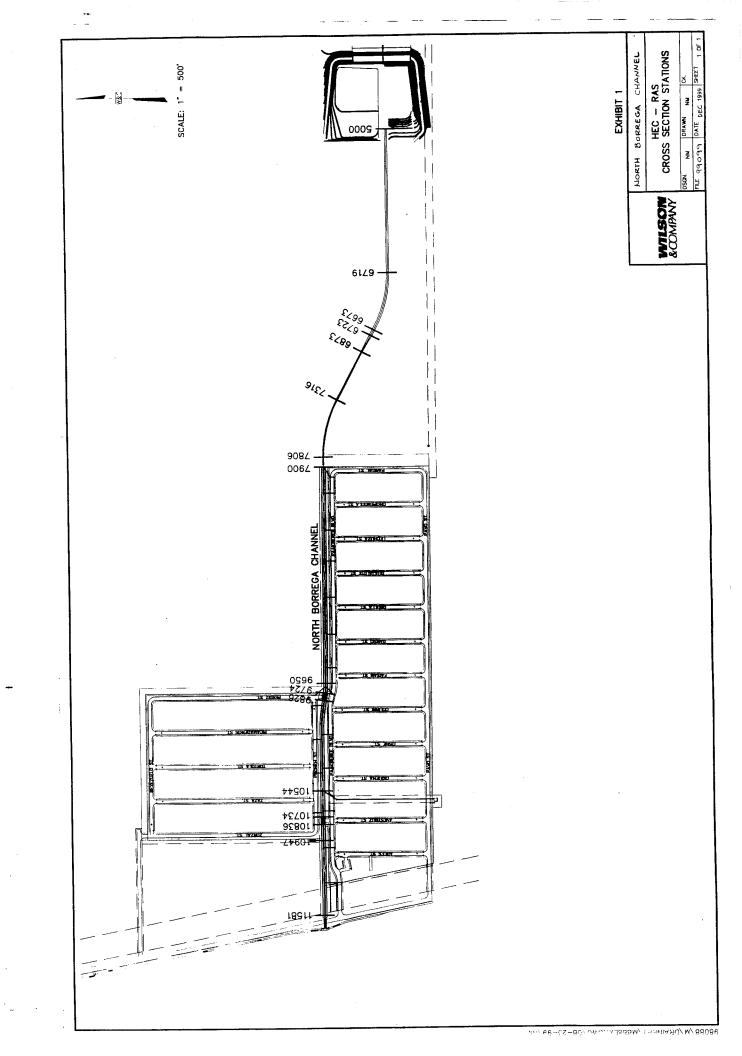
12 48 21 88 89 17 18 18 18 18 18 18 18 18 18 18 18 18 18		2.49     5092.32       2.48     5091.06       2.49     5091.06       2.49     5080.43       2.48     5088.11       2.48     5087.73       2.48     5087.73       2.45     5087.73       2.45     5087.73       2.45     5087.87       2.45     5086.97       2.45     5086.35       2.45     5086.37       2.43     5082.21       2.43     5082.81       2.43     5082.81       2.43     5081.52       2.43     5081.52       2.43     5087.81       2.43     5087.81       2.44     5080.15       2.43     5078.47       2.44     5078.66       2.44     5076.66       2.44     5076.66       2.44     5076.66       2.44     5076.66       2.44     5076.66       2.43     5075.36       2.44     5076.66       2.43     5075.36       2.44     5076.66       2.43     5076.66       2.44     5076.66       2.43     5076.68	2.49 5092.32 2.48 5091.68 2.49 5091.06 2.49 5090.43 2.48 5089.79 2.48 5088.42 2.45 5087.73 2.45 5086.34 2.45 5086.34 2.45 5086.34 2.45 5086.21 2.43 5082.89 2.43 5083.59 2.43 5082.89 2.43 5082.89 2.44 5083.59 2.43 5082.89 2.44 5083.59 2.44 5083.59 2.44 5080.85 2.44 5080.47 2.44 5078.78	5089.83         2.49         5092.32           5089.20         2.48         5091.68           5088.57         2.49         5091.06           5087.34         2.49         5091.06           5087.31         2.48         5080.43           5086.63         2.48         5089.79           5085.94         2.48         5089.71           5085.26         2.47         5087.03           5084.57         2.45         5087.03           5083.20         2.45         5086.34           5083.20         2.45         5086.34           5083.20         2.45         5086.35           5081.83         2.45         5086.35           5081.83         2.45         5086.36           5081.83         2.45         5086.36           5081.81         2.43         5082.81           5079.78         2.43         5082.81           5079.79         2.43         5080.45           5077.04         2.43         5080.85           5077.04         2.43         5080.85           5077.04         2.43         5080.85           5077.04         2.43         5080.85           5076.35	728         5089.83         2.49         5092.32           728         5089.20         2.48         5091.06           728         5087.34         2.49         5091.06           728         5087.34         2.48         5089.11           728         5086.63         2.48         5089.11           728         5085.94         2.48         5089.11           728         5085.84         2.45         5089.12           728         5085.80         2.45         5087.73           728         5083.80         2.45         5087.34           728         5083.80         2.45         5087.95           728         5083.80         2.45         5084.97           728         5081.83         2.45         5084.97           728         5081.83         2.45         5084.97           728         5081.83         2.45         5084.97           728         5081.83         2.44         5084.97           728         5080.46         2.43         5082.89           728         5079.49         2.43         5080.85           728         5078.41         2.43         5080.85           728
				5089.20 5088.57 5087.34 5087.34 5086.63 5086.63 5086.26 5083.20 5083.20 5083.20 5083.20 5083.20 5083.40 5083.40 5083.40 5078.41 5077.72 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04	728 5089.20 728 5088.57 728 5087.31 728 5087.34 728 5087.34 728 5087.34 728 5083.20 728 5083.20 728 5083.20 728 5083.20 728 5083.20 728 5083.20 728 5087.52 728 5087.43 728 5075.67 728 5074.30 728 5074.30 728 5074.30 728 5072.25
				5088.57 5087.34 5087.34 5086.63 5086.26 5085.26 5083.20 5083.20 5083.20 5083.20 5083.20 5083.46 5083.46 5089.46 5079.78 5079.09 5078.41 5077.72 5077.04 5074.30 5074.30	728 5088.57 728 5087.34 728 5087.34 728 5086.63 728 5086.26 728 5083.20 728 5083.20 728 5083.20 728 5083.20 728 5081.83 728 5081.83 728 5081.45 728 5079.78 728 5079.78 728 5079.72 728 5079.72 728 5079.39 728 5074.39 728 5074.39 728 5074.39
				5087.94 5087.31 5086.63 5086.26 5084.57 5083.89 5083.20 5083.20 5083.20 5083.20 5083.46 5081.15 5080.46 5078.41 5078.41 5077.72 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04	728 5087.94 728 5087.31 728 5086.63 728 5086.26 728 5083.20 728 5083.20 728 5083.20 728 5083.20 728 5083.20 728 5081.83 728 5087.72 728 5070.09 728 5070.09 728 5077.72 728 5077.04 728 5077.04 728 5077.04 728 5077.04 728 5077.04 728 5077.04 728 5077.04 728 5072.93 728 5072.93
				5087.31 5086.63 5088.94 5088.26 5084.57 5083.20 5083.20 5081.15 5081.15 5079.09 5078.41 5077.72 5077.04 5077.04 5077.04 5077.04 5077.03 5074.30	728 5087.31 728 5086.63 728 5085.26 728 5085.26 728 5083.89 728 5083.20 728 5083.20 728 5081.83 728 5081.83 728 5081.83 728 5087.72 728 5079.72 728 5079.72 728 5074.30 728 5074.30 728 5074.30 728 5074.30 728 5072.25
				5086.83 5085.26 5085.26 5084.57 5083.89 5083.20 5083.20 5081.83 5081.15 5081.15 5079.09 5077.72 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04	728 5085.94 728 5085.94 728 5085.26 728 5083.89 728 5083.89 728 5083.89 728 5081.83 728 5081.83 728 5081.45 728 5089.46 728 5089.46 728 5079.72 728 5079.72 728 5079.93 728 5074.99 728 5074.99 728 5072.53
	1   1   1   1   1   1   1   1   1   1			5085.26 5084.57 5083.20 5083.20 5082.52 5081.15 5081.15 5080.46 5080.46 5079.78 5077.72 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04	728 5085.26 728 5084.57 728 5083.20 728 5083.20 728 5081.83 728 5081.15 728 5081.45 728 5081.46 728 5079.72 728 5079.72 728 5079.72 728 5079.72 728 5074.30 728 5074.30 728 5072.52
				5084.57 5083.20 5083.20 5082.52 5081.15 5081.15 5080.46 5080.46 5079.78 5077.72 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04	728 5084.57 728 5083.89 728 5083.20 728 5082.52 728 5081.15 728 5081.15 728 5081.46 728 5079.78 728 5079.09 728 5079.09 728 5074.30 728 5074.30 728 5074.30 728 5074.30 728 5072.53
				5083.89 5083.20 5083.20 5081.83 5081.15 5080.46 5079.09 5077.72 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04	728 5083.89 728 5083.89 728 5082.52 728 5081.83 728 5081.45 728 5080.46 728 5079.72 728 5079.72 728 5077.72 728 5077.72 728 5077.04 728 5074.99 728 5074.99 728 5072.53
				5083.20 5082.52 5081.83 5081.15 5080.46 5079.09 5077.72 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04 5077.04	728 5083.20 728 5081.83 728 5081.15 728 5080.46 728 5079.09 728 5079.09 728 5077.72 728 5077.72 728 5077.72 728 5077.64 728 5077.04 728 5077.04 728 5077.04 728 5077.04 728 5072.52
				5082.52 5081.83 5081.15 5080.46 5079.09 5077.72 5077.04 5077.64 5075.67 5074.39 5073.62	728 5082.52 728 5081.83 728 5081.15 728 5080.46 728 5079.09 728 5078.41 728 5077.72 728 5077.72 728 5077.72 728 5077.64 728 5077.64 728 5077.67 728 5072.93 728 5072.93
				5081.83 5081.15 5080.46 5079.09 5077.72 5077.04 5077.04 5075.67 5074.39 5073.62 5073.62	728 5081.83 728 5081.15 728 5080.46 728 5079.09 728 5077.72 728 5077.72 728 5077.72 728 5077.72 728 5077.64 728 5077.67 728 5077.93 728 5074.99 728 5074.99 728 5072.93
				5081.15 5080.46 5079.09 5078.41 5077.72 5077.04 5075.67 5074.39 5073.62 5073.62	728 5081.15 728 5080.46 728 5079.09 728 5079.09 728 5077.72 728 5077.72 728 5077.72 728 5077.94 728 5077.94 728 5074.99 728 5074.99 728 5072.93
				5080.46 5079.78 5079.09 5077.72 5077.04 5075.67 5075.67 5074.39 5073.62	728 5080.46 728 5079.09 728 5079.09 728 5077.72 728 5077.72 728 5077.04 728 5077.67 728 5074.99 728 5074.99 728 5072.93
				5079.78 5079.09 5078.41 5077.72 5077.04 5076.35 5076.35 5074.99 5074.99 5073.62	728 5079.78 728 5079.09 728 5077.72 728 5077.72 728 5077.04 728 5077.67 728 5076.35 728 5074.99 728 5074.99 728 5072.93
5082.21 5083.92				5079.09 5078.41 5077.72 5077.04 5076.35 5076.67 5074.99 5074.30 5073.62	728 5079.09 728 5078.41 728 5077.72 728 5077.04 728 5077.65 728 5075.67 728 5074.99 728 5074.99 728 5072.93
				5078.41 5077.72 5077.04 5076.35 5076.35 5074.99 5074.30 5073.62	728 5078.41 728 5077.72 728 5077.04 728 5077.04 728 5076.35 728 5074.99 728 5074.99 728 5072.93
5080.85 5082.55				5077.72 5077.04 5076.35 5076.87 5074.99 5074.30 5072.93	728 5077.72 728 5077.04 728 5076.35 728 5076.35 728 5074.99 728 5074.99 728 5074.99 728 5072.93
5080.15 5081.86				5077.04 5076.35 5075.67 5074.39 5073.62 5073.63	728 5077.04 728 5076.35 728 5076.35 728 5074.99 728 5074.30 728 5072.93 728 5072.25
5079.47 5081.18				5076.35 5075.67 5074.39 5073.62 5073.63	728 5076.35 728 5075.67 728 5074.99 728 5074.30 728 5073.62 728 5072.53
5078.78 5080.49				5075.67 5074.39 5073.62 5072.93	728 5075.67 728 5074.99 728 5074.30 728 5073.62 728 5072.93
5078.11 5079.81	1 1 1 1			5074.99 5074.30 5073.62 5072.93	728 5074.99 728 5074.30 728 5073.62 728 5072.93
5077.43 5079.13				5074.30	728 5074.30 728 5073.62 728 5072.93 728 5072.25
5076.73 5078.44				5073.62 5072.93	728 5073.62 728 5072.93 728 5072.25
		2.43		5072.93	728 5072.25 728 5072.25
	Į.	2.43		20 020	728 5072.25
	1			907.7.29	1001
50/3:99 50/5:70				5071.56	00.1700
5073 69 5074 33		2.44	5070.88 2.44	5070.88	728 5070.88
					1.00/00 2007
				5008.31 F068.82	10.8000 027
				5068 14	705 GOC 2000.02
	ı			5067.45	5067.45
				5066.77	728 5066 77
5068.51 5070.22				5066.08	728 5066.08
	ŀ			5065 40	728 5065 40
				5064 71	708 5064 71
	1			5064.03	7.000 0000
				0001	CO. 400C
	- 1			5063.76	7.28 5003.70
				5063.48	5063.48
	++			5063.21	5063.21
	<u>ھ</u>				5054.50
	=			5047.50	5047.50
	80			5029.00	5029.00
5031.48 5033.14	-	2.58	5028.90 2.58		5028.90

Togo!	HIVET STA	(ofs)	j €	(#)	€	€	(£)	(lp/sd ft)	(#/#)	(ft/s)	(sq ft)		
6440,	* c	(CIS) 854	5028.81	2.58	5031.39	5033.05		2.76	0.02345	19.3	44.3	22.3	2.41
0440.		854	5028 71		5031.29	5032.95	5037.08	2.77	0.02361	19.3	44.2	22.3	2.42
0450.		854	5028 61		5031.18	5032.85	5037.00	2.78	0.02373	19.4	44.1	22.3	2.42
040		00 S	5028 F1		5031 08	5032.75	5036.92	2.79	0.02388	19.4	44.0	22.3	2.43
6425.		400	3020.31		503030			2.78	0.02376	19.4	44.1	22.3	2.43
6420.*		824	5026.42		0000				0.02391	19.4	44.0	22.3	2.43
6415.*		854	5028.32		3030.89				0.02411	19.5	43.9	22.2	2.44
6410.*	0.* Interim	854	5028.22		5030.78				0.00400	0.00	43.7	22.2	2.45
6405.*	5.* Interim	854	5028.12		5030.68				0.02432	0.00	200	0.00	2 46
.000*	D.* Interim	854	5028.02	2.55	5030.57		i		0.02449	19.0	0.54	7.77	1 4
* 3953		854	5027.93	2.56	5030.49	5032.17	5036.41	2.84	0.02439	19.5	43.7	22.22	2.43
* 0000		854	5027.83		5030.38	5032.07	5036.34	2.86	0.02456	19.6	43.6	22.2	2.46
1000		854	5027 73		5030.27		5036.27	2.88	0.02477	19.6	43.5	22.2	2.47
0380.		1 200	5027.64		5030 19			2.87	0.02470	19.6	43.5	22.2	2.47
6380.*		400	#0.120G		5030.00				0.02463	19.6	43.6	22.2	2.47
6375.*	5.* Interim	854	5027.54		50.050.03				0.02484	19.7	43.4	22.2	2.48
6370.*	0.* Interim	854	5027.44		2029.98				0.02434	10.7	43.5	200	2.47
6365.*	5.* Interim	854	5027.34		5029.88				0.02470	7.61	5 6	0 00	2 47
6360.*	0.* Interim	854	5027.25	2.55	5029.80	5031.49			0.02464	19.0	43.0	7.77	1 0
6355		854	5027.15	2.54	5029.69	5031.39	5035.70		0.02485	19.7	43.4	22.2	2.40
* 0350		854	5027.05	2.54	5029.59	5031.29	5035.59	2.88	0.02480	19.7	43.4	22.2	2.47
6000		854	5026.95		5029.50	5031.19	5035.49	2.88	0.02477	19.6		22.2	2.47
400		000	5026 RF		5029.40		5035.38	2.87	0.02470	19.6		22.2	2.47
0340.	T.	200	5026 76		5029.31		5035.27	2.86	0.02459			22.2	2.46
0333.		200	5026 86		5029.21			2.85	0.02452	19.6	43.6	22.2	2.46
6330.		1 20	50205		5029 11				0.02473	19.6	43.5	22.2	2.47
6325		100	5050.30		5029 01				0.02466	19.6	43.5	22.2	2.47
6320.		400	5020.40		5028 92				0.02457	19.6	43.6	22.2	2.46
6315.		400	2020.37		5028.81				0.02478	19.7	43.5	22.2	2.47
6310.	Ī	900	5020.27		5028 72				0.02473	19.6	43.5	22.2	2.47
6305.		824	2020.17		2020.0				0.02466	19.6	43.5	22.2	2.47
6300.		854	5026.08		5020.03						43.4	22.2	2.48
6295.		824	90Z27.88		2020.32					19.7	43.4	22.2	2.48
6290.*		854	5025.88		5028.42						43.5		2.47
6285.	5.* Interim	854	5025.78		5028.32								2.47
6280.	10.* Interim	854	5025.69		5028.24							22.2	
6275.	5.* Interim	854	5025.59		5028.13								
6270.*	'0.* Interim	854	5025.49										
6265.*	5.* Interim	854	5025.39										
6260.*	i0.* Interim	854	5025.29	9 2.55	5027.84								
6255.*		854	5025.20	2.55	5027.75								
£250.*		854	5025.10	2.55	5027.65	5029.34							
6245 *		854	5025.00	2.55	5027.55	5029.24	5033.53						
, es		854	5024.91	1 2.55	5027.46	5029.15	5 5033.43						
* 9005		854	5024 81	2.54	5027.35	5029.05	5 5033.36	2.89	0.02487	19.7			
, 02230.		854				5028.95	5033.26	2.88	0.02484	19.7			
SOSE.		854				5028.85	5 5033.15	2.88	0.02478	19.7			
6220		854							0.02464	19.6	43.5	22.2	2.47
770		5											

2000				•	Later In No.				5		-			
Deac	Hiver Sta	Profile	(cfe)	ii €	(#)	(#)	€	Œ	(lb/sq ft)	(#/#)	(tt/s)	(sd ft)	(ft)	
	6240 *	Interim	854	5024.32	2.54	5026.86	5028.56	5032.86	2.88	0.02480	19.7	43.4	22.2	2.47
7 0	620E *	Interim	854	5024 22	2.54	5026.77	5028.46	5032.76	2.88	0.02477	19.6	43.5	22.2	2.47
N C	6203.	Interim	854	5024 13	2.55	5026.68	5028.37	5032.66	2.87	0.02468	19.6	43.5	22.2	2.47
4 0	640E *	Interim	854	5024.03		5026.58	5028.27	5032.54	2.86	0.02459	19.6	43.6	22.2	2.46
7 0	6190.*	Interim	854	5023.93		5026.48	5028.17	5032.43	2.85	0.02452	19.6	43.6		2.46
7 0	6180.	Interim	854	5023,83	2.55	5026.38	5028.07	5032.36	2.87	0.02473	19.6	43.5		2.47
4 0	6180 *	Interim	854	5023.74	2.55	5026.29	5027.98	5032.26	2.87	0.02466	19.6	43.5	22.2	2.47
y 0	6175 *	Interim	854	5023 64	2.54	5026.18	5027.88	5032.19	2.89	0.02487	19.7	43.4		2.48
7 0	6170	Interim	854	5023.54	2.54	5026.08	5027.78	5032.09	2.88	0.02484	19.7	43.4		2.48
7 0	6165 *	Interim	854	5023 44	2.54	5025.98	5027.68		2.88	0.02478	19.7	43.5		2.47
7	6165.	Interim	200	50020.44	2 55	5025 90	5027.59	5031.87		0.02464	19.6	43.5	22.2	2.47
2	6160.*	interim	900	3023.33		5025.79	5027 49	5031.80		0.02485	19.7	43.4	22.2	2.48
2	6155.	interim	824	5023.23		5025.02	5027.39			0.02480	19.7	43.4	22.2	2.47
2	6150.*	Interim	854	5023.15		5052.03	5027 29			0.02475	19.6	43.5	22.2	2.47
2	6145.*	Interim	854	5023.05		3023.00	00.7203			0.02468	19.6	43.5	22.2	2.47
2	6140.*	Interim	854	5022.96		9020-91	02.1200			0.02150	19.6	43.6		2.46
23	6135.*	Interim	854	5022.86	2.55	5025.41	5027.10	Ì		0.02453	900	43.6		2.46
2	6130.*	Interim	854	5022.76		5025.31	5027.00			0.02431		7.87	22.2	2 46
2	6125.*	Interim	854	5022.66	2.55	5025.21				0.02444		1.0.1		74.0
0	6120.*	Interim	854	5022.56	2.55	5025.11				0.02463		43.6		2.47
1 0	6115.*	Interim	854	5022.47	2.55	5025.02	5026.71			0.02454	19.6	43.6		2.40
1 0	6110 *	Interim	854	5022.37		5024.92	5026.61	5030.91		0.02475	19.6	43.5	22.2	2.47
<b>1</b> c	* 40.0	Interim	854	5022.27		5024.82	5026.51	5030.80	2.87	0.02468	19.6	43.5		2.47
7	400.	Interim	854	5022 18		5024.73	5026.42	5030.69	2.86	0.02459	19.6	43.6		2.46
7 0	9100°.	Interim	95.4	5022 08		5024.63	5026.32			0.02451	19.6	43.6		2.46
<b>y</b> (	* 0009	Interim	854	5021.98		5024.53	5026.22	5030.51	2.87	0.02471	19.6			2.47
7 0	4 900	Interim	854	5021 BB		5024.43	5026.12	5030.40	2.86	0.02464	19.6	43.5	22.2	2.47
7 (	* 0000	Interim	200	5021 79		5024.34				0.02456	19.6	43.6		2.46
7 0	9030.	Interim	100	5021.69		5024.23				0.02477	19.6	43.5		2.47
21	60/5	ILIERIIII	100	2021.03		5024 14				0.02470	19.6	43.5		2.47
2	6070.*	Interim	854	5021.39		5024.14	5025.73			0.02464	19.6	43.5		2.47
2	6065.	interim	400	3021.43		5024:04	5025 64			0.02454	19.6	43.6		2.46
2	*.0909	Interim	854	5021.40		5023.85	5025.54			0.02475	19.6	43.5		2.47
2	6095	medin	400	3021.30		5024.03	5025 67			0.02061	19.0	49.9		
2	6050	Interim	940	5021.20		5024.00	5025 43			0.02082	19.0	49.8		2.30
2	6040.	Interim	040	3021.01		5023.52	5025.73			0.02096	19.0	49.9		2.30
2	6030.*	Interim	940	5020.82		50500	5024 97			0.02120	19.0	49.8	23.8	2.31
2	6020.	Interim	040	2020.02		5022.33	5024 74			0.02135		49.8	24.0	2.32
2	6010.*	Interim	940	5020.43		5000 88				0.02155		49.8	24.2	2.33
2	.0009	Interim	946			5000 86				0.02166		49.9	24.3	2.33
2	5990.*	Interim	940			5000 44				0.02180		49.9	24.5	2.34
2	5980.	Interim	940	5019.80		5022 20				0.02202		49.9	24.7	2.35
2	5970.*	Interim	940			2005.20		İ		0.00188		50.2	24.9	2.34
2	. 5960.*	Interim	946			5021.99				0.02197			25.2	2.35
2	5950.*	Interim	946			5021.77				0.02197		ļ		
2	5940.*	Interim	946			5021.56						50.5		
2	5930.*	Interim	946			5021.35			2.50					
0	5920 *	Interim	946	5018.70	2.42	5021.12	5022.68	5026.50		0.02184				

		Total C	20.5	May Children	70	2	2	2	9	5		_	
Heach Hiver Sta	Prolife	(cfs)	<u></u>	(#)	(E)	€	£	(lb/sq ft)	(#/#)	(ft/s)	(sd ft)	(#)	
5910 *	Interim	946	5018.51	2.40	5020.91	5022.45	5026.24	2.55	0.02178	18.5	51.0	26.1	2.33
5900		946	5018.32	2.38	5020.70	5022.23	5025.99	2.54	0.02174	18.5	51.2		2.33
5890 *		946	5018.13	2.36	5020.49	5022.01	5025.73	2.51	0.02163	18.4	51.5		2.32
5880 *		946	5017.94	2.34	5020.28	5021.79	5025.48	2.50	0.02157	18.3	51.7	26.8	2.32
5870 *		946	5017.74	2.31	5020.05	5021.56	5025.25	2.50	0.02174	18.3	51.7	27.0	2.33
5860 *		946	5017.55	2.29	5019.84	5021.34		2.48	0.02167	18.2	51.9	27.2	2.32
5850 *		946	5017.36	2.26	5019.62	5021.11		2.52	0.02225	18.3	51.6		2.35
5840 *		946	5017.17	2.22	5019.39	5020.90	5024.63	2.54	0.02263	18.4	51.5		2.37
5830 *		946	5016.98	2.20	5019.18	5020.68	5024.42	2.55	0.02290	18.4	51.5	27.8	2.38
5820 *		946	5016.78	2.17	5018.95	5020.45	5024.22	2.57	0.02328	18.4	51.4	28.0	2.40
5810 *		946	5016.59	2.15	5018.74		5023.99	2.57	0.02344	18.4	51.4		2.40
5800		1332	5016.40	3.21	5019.61	5020.81		1.67	0.01084	15.7	84.8		1.72
5000 * 878		1332	5016.11	3.16	5019.27	5020.52		1.74	0.01144	16.0	83.3		1.76
5770 *		1332	5015.82	3.12	5018.94	5020.23	5023.05	1.81	0.01199	16.3	81.9		1.80
5755 *		1332	5015.52	3.08	5018.60	5019.93	5022.84	1.87	0.01256	16.5	80.6		1.84
5740 *		1332	5015.23	3.05	5018.28	5019.64	5022.64	1.93	0.01307	16.8	79.5		1.88
57.05 * A795		1332	5014.94	3.02	5017.96	5019.35	5022.42	1.98	0.01352	16.9	78.6		1.91
5710 *	Interim	1332	5014.65	2.99	5017.64	5019.06	5022.20	2.03	0.01396	17.1	7.77		1.94
5695 *		1332	5014.35	2.97	5017.32	5018.76	5021.97	2.08	0.01439	17.3	76.9		1.96
5680.*		1332	5014.06	2.95	5017.01	5018.47	5021.75	2.12	0.01476	17.5	76.2		1.99
5665	Interim	1332	5013.77		5016.70	5018.18	5021.51	2.16	0.01511	17.6	75.6		2.01
5650.*		1332	5013.48		5016.48	5017.97	5021.30	2.15	0.01486	17.6	75.6		1.99
5635.*		1332	5013.19	3.07	5016.26	5017.76	5021.12	2.16	0.01474	17.71	75.3		1.99
5620.*		1332	5012.89	3.14	5016.03	5017.55	5020.93	2.17	0.01465	17.8	75.0		1.99
5605.*	Interim	1332	5012.60	3.22	5015.82	5017.39	5020.73	2.16	0.01443	17.8	74.9		1.97
5590	Interim	1332	5012.31	3.31	5015.62	5017.16	5020.53	2.16	0.01421	17.8	74.9		1.96
5575.*	Interim	1332	5011.95	3.38	5015.33	5016.94	5020.34	2.19	0.01436	18.0	74.1		1.97
5560 *	Interim	1332	5011.59		5015.04	5016.66	5020.15	2.23	0.01453	18.1	73.4		1.98
5545 *	Interim	1332	5011.23		5014.75	5016.44	5019.96	2.27	0.01469	18.3	72.7		1.99
\$530 *	Interim	1332	5010.87		5014.49	5016.24	5019.74	2.28	0.01463	18.4	72.4		1.99
5515	Interim	1332	5010.51	3.71	5014.22	5016.07	5019.52	2.30	0.01458	18.5	72.1		1.99
* 0088		1332	5010.15		5013.83	5015.71		2.37	0.01515	18.7	71.1		2.02
5485 x		1332	5009.79		5013.43	5015.31	5019.02	2.44	0.01572	19.0	70.2		2.06
5470 *		1332	5009.43		5013.04	5015.01	5018.76	2.50	0.01622	19.2	69.4		2.09
5455 *		1332	5009.07		5012.65	5014.64	5018.50	2.56	0.01673	19.4	68.6		2.12
5440 *		1332	5008.71		5012.27	5014.23	5018.23	2.61	0.01717	19.6	0.89		2.14
5440. *		1332	5008.35		5011.89	5013.87		2.66	0.01760	19.8	67.4		2.17
5410 *		1332	5007.98		5011.49		5017.67	2.72	0.01804	19.9	66.8		2.19
5395 *		1332	5007.62		5011.12	5013.19	5017.37	2.76	0.01838	20.1	66.4		2.21
5380 *		1332	5007.26		5010.74	5012.77	5017.09	2.80	0.01877	20.2	62.9		2.24
5365 *		1332	5006.90	3.46	5010.36	5012.41	5016.79	2.84	0.01910	20.4			2.25
5350 *		1332	5006.54		5009.99	5012.11	5016.49	2.88	0.01941	20.5			2.27
5335 *		1332	5006.18		5009.61	5011.74	5016.20	2.92	0.01973	20.6	64.7		2.29
5320 *		1332	5005.82		5009.24	5011.37	5015.90	2.95	0.02004	20.7	64.3		2.30
5305 *		1332	5005.46		5008.87	5010.97	5015.59	2.98	0.02031	20.8	64.0	25.6	2.32

HEC-RAS P	lan: NBorregaCl	HEC-RAS Plan: NBorregaChan River: main Reach: 2 (Continued)	n Reach: 2 (Cor						i	0 0 1	LadO Late	A	Ton Width	Frouds # Chl
Reach	River Sta	Profile	Q Total	Min Ch El	Max Chi Dpth	W.S. Elev	Crit W.S.	E.G. Elev	Shear Chan	E.G. Slope	Vel Curi	Flow Area	וחף אאומיוו	TO # ppnor t
			(cfs)	£	€	(£)	(£)	Œ	(lþ/sd ft)	(tt/tt)	(tt/s)	(sd ft)	Œ	
	E0.7E *	Interim	1330	5004 74	3.39	5008.13	5010.30	5014.95	3.03	0.02073	21.0	63.5	25.5	2.34
y c	3273.	Interim	1330	5004 3B	3.38	5007.76	5009.93	5014.63	3.05	0.02094	21.0	63.3	25.5	2.35
N	5260.	li lietili i	2002	5004.00		5007.39	5009.52	5014.31	3.08	0.02116	21.1	63.1	25.5	2.36
7	5245.	Interim	1992	5004.02		5007.02	5009.17	5013.98	3.10	0.02133	21.2	62.9	25.4	2.37
N C	5230.	Interim	1332	5003.30	3 35	5006.65	5008.86	5013.66	3.12	0.02150	21.2	62.7	25.4	2.38
7 0	5000 *	Interim	1330	5000.00	3.35	5006.29	5008.49	5013.33	3.14	0.02166	21.3	62.6	25.4	2.39
N	3200.	line iiii	1002	5000 57	3 34	5005 91	5008.07	5013.00	3.16	0.02188	21.4	62.3	25.3	2.40
7.	5185.	merall	1330	5002.37	3 33	5005.54	5007.71	5012.67	3.18	0.02204	21.4	62.2	25.3	2.41
7 0	31/0.	Interim	1330	5001 85	3.33	5005.18	5007.36	5012.34	3.20	0.02220	21.5	62.0	25.3	2.42
NI C	5133.	mitaria	1335	5001 49		5004.82	5007.04	5011.96	3.19	0.02209	21.4	62.1	25.3	2.41
N C	5140.	Interim	1332	5001 13		5004.46	5006.63	5011.59	3.18	0.02201	21.4	62.2	25.3	2.41
N C	5110 +	Interim	1332	5000 77		5004.10	5006.27	5011.25	3.19	0.02216	21.5	62.0	25.3	2.42
N C	* 100	Interim	1332	5000 41	3.33	5003.74	5005.91	5010.87	3.18	0.02204	21.4	62.2	25.3	2.41
V C	0000	Interim	1473	5000 05		5003.71	5006.13	5010.45	2.94	0.01887	20.8	70.7	26.6	2.25
71 0	3000	Interim	1473	4999 69		5003.34	5005.77	5010.15	2.97	0.01915	21.0	70.3	26.6	2.27
7 0	5050.	Interim	1473	4999.33		5002.96	5005.44	5009.86	3.01	0.01948	21.1	6.69	26.5	2.29
1 0	5035 *	Interim	1473	4998.97		5002.59	5005.08	5009.56	3.05	0.01977	21.2	69.5	26.5	2.30
4 0	5050.*	Interim	1473	4998.61	3.60	5002.21	5004.69	5009.26	3.08	0.02004	21.3	69.2	26.4	2.32
7 0	5005 *	Interim	1473	4998.25		5001.84	5004.35	5008.95	3.11	0.02030	21.4	68.8	26.4	2.33
2 0	4090 *	Interim	1473	4997.89		5001.47	5003.99	5008.64	3.14	0.02054	21.5	68.5	26.3	2.35
1 C	4075 *	Interim	1473	4997.52	3.57	5001.09	5003.63	5008.32	3.17	0.02078	21.6	68.3	26.3	2.36
7 0	4080 *	Interim	1473	4997.16		5000.72	5003.27	5008.01	3.20	0.02101	21.7	0.89		2.37
10	4945 *	Interim	1473	4996.80	3.55	5000.35	5002.89	5007.68	3.22	0.02119	21.7	87.9		2.38
1 0	4930 *	Interim	1473	4996.44	3.54	4999.98	5002.54	5007.36	3.24	0.02138	21.8	9.79		2.39
10	4915 *	Interim	1473	4996.08	3.53	4999.61	5002.18	5007.04	3.26	0.02157	21.9	67.3		2.40
2 0	4900 *	Interim	1473	4995.72	3.53	4999.25	5001.82	5006.71	3.28	0.02170	21.9	67.2		2.41
0	4885 *	Interim	1473	4995.36	3.52	4998.88	5001.46	5006.38	3.30	0.02186	22.0	67.0		2.42
20	4870	Interim	1473	4995.00	3.51	4998.51	5000.96	5006.05	3.32	0.02202	22.0	6.99		2.42
10	4820	Interim	1473	4985.00	2.66	4987.66	4990.67	5003.57	7.55	0.06275	32.0			
1 0	4720	Interim	1473	4985.00	0.52	4985.52	4985.93	4987.70	5.52	0.32690	11.8	124.4	460.4	4.01
7	<b>&gt;1:</b>													



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	Free board (ABQ_DPM)	( <del>t</del> )	1.56	1.68	1.69	1.69	1.69	1.69	1.69	1.69	60.	1.69	03 7	771	47.1	1.74	1./4	1.74	1./4	1./4	1./4	1./5	1.75	1./5	1.75	3	8 8 8	99.	89.	1.69	1.69	1.69	1.69	1.69	1.69 -	1.70	1.70	1.73
			7.1	15.8	16.4	16.4	16.3	16.4	16.4	16.5	0.0	16.7	7.0.7	0.0	- œ	18.3	18.3	18.3	18.4	18.4	18.5	9.6	18.7	18.8	18.9		3.5	4.	14.2	14.3	14.4	14.5	14.6	14.7	14.8	15	15.1	17.7
	Chl Dpth Ve	(tt/s)	1.99	1.04	1.01	1.01	1.01	1.01	1.01	- 0	0.99	0.99	0.39	1.29	1.22	1.21	1.21	1.21	1.21	1.2	1.2	1.2	1.19	1.18	1.18		1.52	رد. د	1.49	1.48	1.48	1.46	1.46	1.45	1.44	1.43	1.42	1.24
	Q Total Max Chi Dpth Vel Chnl	(cfs) (ft)	198	198	198	198	198	198	198	198	198	198	198	275	2/5	275	275	275	275	275	275	275	275	275	275	Bridge	275	2/5	275	275	275	275	275	275	275	275	275	275
	Profile		Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim				Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim		10754 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	10650 Interim
	River Sta		11581	11523.3*	11465.7*	11408.0*	11350.4*	11292.8*	11235.1*	11177.5*	11119.9*	11062.2*	11004.6*	10947	10836	10834.*	10832.*	10830.*	10828.*	10826.*	10824.*	10822.*	10820.*	10818.*	10816	10815	10754	10752.*	10750.*	10748.*	10746.*	10744.*	10742.*	10740.*	10738.*	10736.*	10734	10650
٠, براج	Free board (ABQ_DPM)		1.58	1.71	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.75	1.76	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.78	1.78	1.78		1.71	1.71	1.71	1.71	1.71	1.72	1.72	1.72	1.72	1.72	1.72	1.76
recboard			7 6	16.1	17.4	17.6	17.9	18.1	18	18	18	18	18.1	18.2	19	19.2	19.3	19.3	19.4	19.5	19.7	19.7	19.8	19.9	20		15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	16	16	18.4
16C-1725 \	ıl Dpth Vel	(#/s)	2.36	13	1.22	1.21	1.19	1.18	1.19	1.18	1.19	1.19	1.18	1.37	1.32	1.31	1.3	1.3	1.29	1.29	1.28	1.28	1.27	1.27	1.26		1.59	1.58	1.57	1.56	1.56	1.55	1.54	1.53	1.53	1.52	1.51	1.35
x:/public/projects/99099/hec-125/freeboard.xls	Q Total Max Chl Dpth Vel Chnl	(cfs) (ft)	264						264	264	264		264	316	316		316					316		316		Bridge		t 316	t 316	t 316	t 316				t 316			
x:/bablic/pr	River Sta Profile		11581 DoctDroipot					_			11119.9* PostProject	11062.2* PostProject	11004.6* PostProject	10947 PostProject	10836 PostProject	10834.* PostProject	10832.* PostProject	10830.* PostProject		10826.* PostProject	10824.* PostProject	10822.* PostProject	*		9	10815	10754 PostProject	10752.* PostProject	10750.* PostProject			\$ 10744.* PostProject			<10738.* PostProject		4	10650 PostProject

1.80	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.93	1.93	1.93	1.40	1.8/	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.88	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86
17.2	22.8	22.9	22.9	23	23	23	23.1	23.1	23.2	23.3	23.4		19.7	19.6	19.6	19.5	19.5	19.5	19.4	19.4	19.3	19.3	19.3	20.3	20	19.8	19.8	19.8	19.7	19.7	19.7	19.6	19.6	19.6	19.6	19.5	19.5	19.6	19.5
2.32	2.21	2.21	2.21	2.2	2.2	2.2	2.19	2.19	2.19	2.18	2.17		2.47	2.48	2.49	2.49	2.49	2.5	2.5	2.51	2.51	2.51	2.52	2.42	2.44	2.46	2.46	2.47	2.47	2.47	2.48	2.48	2.48	2.49	2.49	2.49	2.49	2.49	2.49
584	728	728	728	728	728	728	728	728	728	728	728	Bridge	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728
10544 Interim	9826 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	6 Interim	5	9744 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	4 Interim	0 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim
1054	982	9824.*	9822.*	9820.*	9818.*	9816.*	9814.*	9812.*	9810.*	*.8086	986	9805	974	9742.*	9740.*	9738.*	9736.*	9734.*	9732.*	9730.*	9728.*	9726.*	9724	9650	9625.*	*.0096	9575.*	9550.*	9525.*	*.0056	9475.*	9450.*	9425.*	9400.*	9375.*	9350.*	9325.*	\$300.*	9275.*
1.78	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.40	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.83	1.83	1.83	1.83	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
17.5	20.5	20.5	20.6	20.6	20.6	20.7	20.7	20.7	20.8	20.8	20.8		17.2	17.2	17.3	17.2	17.3	17.2	17.3	17.2	17.3	17.2	17.3	18.8	18.7	18.7	18.7	18.6	18.6	18.5	18.5	18.5	18.4	18.4	18.5	18.4	18.4	18.4	18.4
1.85	2.05	2.05	2.05	2 04	40.9	2.04	2.04	2.03	2.03	2.03	2.03		2.34	2.35	2.34	2.34	2.34	2.35	2.34	2.35	2.34	2.34	2.34	2.19	2.2	2.2	2.21	2.21	2.21	2.22	2.22	2.22	2.23	2.23	2.22	2.23	2.23	2.23	2.23
444	593	593	593	593	593	593	593	593	593	593	593	Bridge	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593
10544 PoetProject	PostProject		PostProject	PoetProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject			PostProject		PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject		PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject
10544	9826	9824.*	9822 *	9820 *	9020.	9816.	9814 *	9812 *	9810 *	9808	9806	9805	9744	9742.*	9740.*	9738.*	9736.*	9734.*	9732.*	9730.*	9728.*	* 9226	9724	9650	9625 *	9600 *	9575 *	9550.*	9525.*	\$200.	T. 9475.*	ই 9450.*	9425 *	£ 9400 *		× 0320 ×	/ q325 *	.00226 0-	9275.*

1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.87	1.86	1.87	1.87	1.87	1.87	1.87	1.07	1.0/	00 	1.87	7.87	1.87	1.88	1.87	1.87	1.87	1.87	1.87
19.5			19.6		19.5	19.6		19.5	19.5		19.5	19.6	19.5	19.5	19.6	19.5	19.6	19.6	19.5	19.6	19.7	19.6	19.7	19.9	19.9	50	20	7 70	20.1	Z0.Z	20.1	20.1	20.1	20.2	20.1	20.1	20.1	20.1	20.1
2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.49	2.48	2.49	2.49	2.48	2.48	2.48	2.47	2.46	2.45	2.45	24.2 44.5	7.7.0	2.44 44.64	2.43	2.43	2.43	2.44	2.43	2.43	2.43	2.44	2.44	2.44
728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	/28	728	728	728	728	728	728	728	728	728
Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	8750 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim
9250.*	9225.*	\$200.*	9175.*	9150.*	9125.*	9100.*	9075.*	9050.*	9025.*	*.000e	8975.*	*.0568	8925.*	*.0068	8875.*	8850.*	8825.*	*800.	8775.*	875	8725.*	8700.*	8675.*	8650.*	8625.*	8600.*	8575.*	8550.	8525.*	8500.*	8475.*	8450.*	8425.*	8400.*	8375.*	8350.*	8325.*	8300.*	8275.*
1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
18.4		18.5	18.5				18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.5	18.4	18.4	18.4	18.4	18.5	18.4	18.4	18.4	18.5	18.4	18.5	18.6	18.5	18.6	18.6	18.5	18.4	18.4	18.4	18.4	18.4	18.4	18.4	
2.23	2.22	2.22	2.22	2.22	2.23	2.23	2.23	2.24	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.22	2.23	2.23	2.23	2.23	2.23	2.22	2.21	2.22	2.21	2.22	2.23	2.23	2.23	2.23	2.23	2.23	2.23		2.23
593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593
PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject			PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject
4 O2CO	9225.*	* 0000	9175.*	9150 *	9125.*	9100 *	9075 *	9050 *	9025.*	*:0006	8975.*	*.0568	8925.*	*.0068	8875.*	8850.*	8825.*	8800.*	8775.*	8750	8725.*	8700.*	8675.*	8650.*	8625.*	*.0098	8575.*	8550.*	8525.*	8500.*	8475.*	8450.*	7,8425.*	* 8400 *	8375 *	7 8350 *	8325.*	* 8300 * 7	8275.*

1.87	1.87	1.87	1.87	1.87	78.	1.87	1.87	1.87	1.88	1.8/	1.87	1.87	1.88	1.87	1.87	1.87	1.87	1.88	1.87	1.87	1.87	1.87	1.87	1.86	1.87	1.87	1.86	1.86	1.8/	1.87	1.87	1.86	1.87	1.87	1.86	1.86	1.86	1.87	1.87
20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.2	20.1	20.1	20.1	20.2	20.1	20.2	20.3	19.7	20.3	19.9	19.6	19.5	19.5	19.5	19.4	19.4	19.4	19.3	19.3	19.4	19.4	19.4	19.3	19.4	19.4	19.3	19.3	19.3	19.4	19.4
2.44	2.43	2.43	2.43	2.44	2.43	2.43	2.43	2.44	2.43	2.43	2.43	2.44	2.43	2.43	2.35	2.26	2.54	2.48	2.52	2.55	2.55	2.56	2.56	2.56	2.57	2.57	2.58	2.58	2.57	2.57	2.57	2.58	2.57	2.57	2.58	2.58	2.58	2.57	2.57
728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	728	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854
Interim	Interim	Interim	Interim	Interim ·	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	0 Interim	Interim	Interim	0 Interim	0 Interim	Interim	Interim	Interim	Interim	Interim	0 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim
8250.*	8225.*	8200.*	8175.*	8150.*	8125.*	8100.*	8075.*	8050.*	8025.*	*.0008	7975.*	7950.*	7925.*	7900	7890.*	7880.*	7870	7550	7500.*	7450.*	7400.*	7350.*	7300.*	7250	7200.*	7150.*	7100.*	7050.*	<b>,</b> 0002	£820.*	*.0069	6850.*	.0089	6750.*	£200.*	.0599	*.0099	6550.*	6500.*
1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.83	1.82	1.82	1.82	1.84	1.84	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
18.4	18.4	18.4	18.5	18.4	18.4	18.3	18.4	18.4	18.4	18.4	18.5	18.6	18.5	18.7	18.8	18.9	18.1	19.4	18.9	18.6	18.6	18.5	18.5	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.4	18.3	18.4	18.4	18.4	18.4	18.4	18.4	18.4
2.23	2.23	2.23	2.22	2.23	2.23	2.24	2.23	2.23	2.23	2.23	2.22	2.21	2.22	2.21	2.12	2.04	2.36	2.24	2.29	2.32	2.32	2.32	2.33	2.33	2.34	2.34	2.33	2.34	2.34	2.34	2.34	2.34	2.34	2.34	2.33	2.34	2.34	2.34	2.34
593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	593	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716
PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject			PostProject			PostProject	PostProject	PostProject	PostProject	PostProject			PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject
8250.*	8225.*	8200.*	8175.*	8150.*	8125.*	8100.*	8075.*	8050.*	8025.*	8000.*	7975.*	7950.*	7925.*	7900	7890.*	7880.*	7870	7550	7500 *	7450.*	7400.*	7350.*	7300.*	7250	7200.*	7150.*	7100.*	7050.*	<b>,</b> 0002	.0269	*.0069	+ 6850.*	, 6800.*	9 6750.*	£ 6700.*	* 6650.*	, 1	6550.*	6500.*

1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	
19.4	19.4	19.4	19.4	19.5	19.6	19.5	19.6	19.6	19.6	19.7	19.6	19.6	19.7	19.6	19.6	19.7	19.7	19.6	19.7	19.7	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.7	19.6	19.6	19.7	19.7	19.7	19.6	19.7	19.7	19.6	19.6	19.6	
2.57	2.57	2.57	2.57	2.56	2.55	2.56	2.55	2.55	2.55	2.54	2.55	2.55	2.54	2.55	2.55	2.54	2.54	2.55	2.54	2.54	2.54	2.55	2.55	2.55	2.55	2.55	2.55	2.54	2.55	2.55	2.54	2.54	2.54	2.55	2.54	2.54	2.54	2.55	2.55	
854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	
6450 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	
6450	6445.*	6440.*	6435.*	6430.*	6425.*	6420.*	6415.*	6410.*	6405.*	6400.*	6395.*	6390.*	6385.*	6380.*	6375.*	6370.*	6365.*	6360.*	6355.*	6350.*	6345.*	6340.*	6335.*	6330.*	6325.*	6320.*	6315.*	6310.*	6305.*	6300.*	6295.*	6290.*	6285.*	6280.*	6275.*	6270.*	6265.*	6260.*	6255.*	
1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	
18.4		18.4	18.5	18.5	18.6	18.5	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.5	18.6	18.6	18.6	18.5	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.5	18.6	18.6	18.5	
2 3.d	6.5 4 8.8	233	2.33	2.32	2.32	2.32	2.32	2.32	2.32	2.31	2.32	2.32	2.31	2.32	2.32	2.31	2.32	2.32	2.31	2.31	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.32	2.31	2.32	2.32	2.32	2.31	2.32	2.32	2.32	232	2.32	2.32	
716	716	716	716	716		716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	
tocica0+000	PostProject PostProject	r ostrioject PostProject	r ostr roject PostProject	PostProject																																				
0170	0450 644E *	6445. 8440.	6435 *	6430.	6425.	6420 *	6415 *	6410 *	6405.*	6400 *	6395 *	6390.*	6385 *	6380.*	6375 *	6370.*	6365 *	6360.*	6355 *	6350.*	6345.*	6340 *	6335.*	6330.*	6325 *	6320 *	6315 *	6310.*	6305 *	6300.*	6295.*	* 0629	3,6285 *	* 6280 t	* 6275 a	£ 6270 *	, 6265 *	0, 0203.		

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1.87	1.87	1.8/	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87	1.87
19.6	19.6	19.6	19.7	19.7	19.7	19.6	19.7	19.7	19.6	19.6	19.6	19.6	19.6	19.6	19.7	19.7	19.7	19.6	19.7	19.7	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	0.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
2.55	2.55	2.55	2.54	2.54	2.54	2.55	2.54	2.54	2.54	2.55	2.55	2.55	2.55	2.55	2.54	2.54	2.54	2.55	2.54	2.54	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.54	2.55	2.55		2.55
854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854	854
Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Inteřím	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim
6250.*	6245.*	6240.*	6235.*	6230.*	6225.*	6220.*	6215.*	6210.*	6205.*	6200.*	6195.*	6190.*	6185.*	6180.*	6175.*	6170.*	6165.*	6160.*	6155.*	6150.*	6145.*	6140.*	6135.*	6130.*	6125.*	6120.*	6115.*	6110.*	6105.*	6100.*	6095.*	*.0609	6085.*	*.0809	£075.*	*.0709	6065.*	*.0909	6055.*
1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83	1.83
18.6	18.6		18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.7	18.7	18.6	18.6	18.6	18.6	18.5	18.6	18.6	18.6	18.6	18.6	18.6	18.7	18.7	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.6	18.5	18.6
2.32	2.32	2.32	2.31	2.31	2.32	2.32	2.31	2.31	2.32	2.32	2.31	2.31	2.31	2.31	2.31	2.32	2.32	2.32	2.32	2.32	2.31	2.32	2.32	2.31	2.31	2.31	2.31	2.31	2.32	2.32	2.31	2.31	2.32	2.32	2.31	2.32	2.32	2.32	2.32
716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716	716		716	716	716	716	716	716	716	716	716
PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject
6250.*	6245.*	6240 *	6235.*	6230 *	6225.*	6220.*	6215.*	6210.*	6205.*	6200.*	6195.*	6190.*	6185.*	6180.*	6175.*	6170.*	6165.*	6160.*	6155.*	6150.*	6145.*	6140.*	6135.*	6130.*	6125.*	6120.*	6115.*	6110.*	6105.*	6100.*	*.609	*.0609	₹1,6085.*	£ 6080.*	8 6075.*	* 0209	£ 6065.*	, 6060.*	

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1.87	1.87	1.87	1.86	1.86	1.86	1.86	1.86	1.85	1.85	1.85	1.84	1.84	1.84	1.83	1.83	1.83	1.83	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.81	1.81	1.82	1.82	1.83	1.83	1.83	1.84	1.84	1.84	1.84	1.85	1.86	1.86	1.86
19	19	19	19	19	19	19	19	19	18.9	18.8	18.7	18.6	18.6	18.5	18.5	18.4	18.3	18.3	18.2	18.3	18.4	18.4	18.4	18.4	15.7	16	16.3	16.5	16.8	16.9	17.1	17.3	17.5	17.6	17.6	17.7	17.8	17.8	17.8
2.83	2.79	2.75	2.71	2.68	2.64	2.61	2.58	2.54	2.52	2.49	2.47	2.45	2.42	2.4	2.38	2.36	2.34	2.31	2.29	2.26	2.22	2.2	2.17	2.15	3.21	3.16	3.12	3.08	3.05	3.02	2.99	2.97	2.95	2.93	က	3.07	3.14	3.22	3.31
946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	946	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332
6050 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	0 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	5 Interim	Interim	Interim	Interim	Interim	5590 Interim
902(	6040.*	6030.*	6020.*	6010.*	.0009	5990.*	5980.*	5970.*	5960.*	5950.*	5940.*	5930.*	5920.*	5910.*	5900.*	5890.*	5880.*	5870.*	5860.*	5850.*	5840.*	5830.*	5820.*	5810.*	5800	5785.*	5770.*	5755.*	5740.*	5725.*	5710.*	5695.*	5680.*	5665	5650.*	5635.*	5620.*	5605.*	559
1.83	1.83	1.82	1.82	1.82	1.81	1.81	1.81	1.81	1.80	1.80	1.79	1.79	1.79	1.79	1.79	1.79	1.79	1.78	1.78	1.78	1.78	1.78	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.77	1.78	1.77	1.78	1.78	1.78	1.79	1.79
18.2	18.1			17.9	17.9		17.7		17.6	17.5		17.4	17.4	17.5	17.5	17.5	17.5	17.5			17.4	17.3	17.3	17.2	16.2	16.2	16.3	16.3	16.3	16.3	16.3	16.4	16.4	16.3			16.3		
2.45	2.43	2.4	2.37	2.35	2.32	2.3	2.27	2.24	2.22	2.2	2.18	2.16	2.13	2.09	2.06	2.04	2.01	1.98	1.96	1.94	1.92	1.91	1.88	1.87	2.26	2.26	2.25	2.24	2.24	2.25	2.24	2.23	2.24	2.24	2.31	238	2.45	2.52	2.6
755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	755	896	968	896	968	968	968	896	896	896	896	896	896	968 968	968 896	968
0 PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject			PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject			PostProject	PostProject	PostProject	
6050	* 0709	6030 *	6020. 6020.*	6010 *	* 0000 *	5990. *	5000. 5080.	5920.	5960 *	5050.	2550. 7040.	5930 *	5000. 5000.*	5910 *	5900.*	5890 *	5880 *	5870 *	5860 *	5850.	5840 *	5830 *	5820 *	5810 *	5800	5785	5770 *	5755.*	5740.*	5725 *	5710 *	5695 *	∏5680 *	A 5665	00 5650 *	* 2000 2000 2000 2000 2000 2000 2000 200	. 5630. * 5690.	, 2020. 7, 5605 *	5590

1.87	1.88	1.89	1.89	1.90	.9. 1.9.	1.97	7.92 7.00	1.92	28.L	. 93 90 90		. 93 . 6	1.94	1.94	1.94	1.94	1.95	1.95	1.95	1.95	C 6.	1.95	1.90	06.1	06.1	95.		1.90	1.90	9.00	96.1	1.96	1.96	1.97	1.97	1.97	1.97	1.97	1.98
18	18.1	18.3	18.4	18.5	18.7	<u>6</u>	19.2	19.4	19.6	19.8	19.9	20.1	20.2	20.4	20.5	20.6	20.7	20.8	20.9	2 2	17.7	L.12	27.72	2: 12	21.3	4.12	21.4 7	U. 12	4. FC	1. T	5.1.5	21.4	20.8	21	21.1	21.2	21.3	21.4	21.5
3.38	3.45	3.52	3.62	3.71	3.68	3.64	3.61	3.58	3.56	3.54	3.51	3.5	3.48	3.46	3.45	3.43	3.45	3.41	3.4	3.39	3.38	3.37	3.36	3.35	3.35	3.34	3.33	3.33 5.03	0.00	0.00	3.33	3.33	3.66	3.65	3.63	3.62	3.6	3.59	3.58
1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1332	1473	1473	1473	1473	1473	1473	1473
Interim	Interim	Interim	Interim	5515 Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	Interim	) Interim	Interim	Interim	Interim	Interim	Interim	Interim
5575.*	5560.*	5545.*	5530.*	5515	5500.*	5485.*	5470.*	5455.*	5440.*	5425.*	5410.*	5395.*	5380.*	5365.*	5350.*	5335.*	5320.*	5305.*	5290.*	5275.*	5260.*	5245.*	5230.*	5215.*	5200.*	5185.*	5170.*	5155.*	5140.	5125.	5110.*	5095.*	2080	5065.*	5050.*	5035.*	5020.*	5005.*	4990.*
1.80	1.81	1.81	1.82	1.82	1.83	1.83	1.84	1.84	1.84	1.85	1.85	1.85	1.85	1.86	1.86	1.86	1.86	1.86	1.86	1.87	1.86	1.87	1.87	1.87	1.87	1.87	1.86	1.87	1.86	1.87	1.86	1.87	1.87	1.87	1.87	1.87	1.87	88	1.88
16.4	16.6	16.7	16.8	16.9	17.1	17.4	17.6	17.8	17.9	18.1	18.2	18.4	18.5	18.6	18.7	18.8	18.9	18.9	19	19.1	19	19.1	19.1	19.1	19.1	19.2	19.1	19.1	19.1	19.1	19	19.1	18.7	18.9	19	6	16.1	19.0	19.3
2.66	2.72	2.79	2.88	2.96	2.93	2.9	2.88	2.85	2.83	2.81	2.79	2.78	2.77	2.75	2.74	2.73	2.72	2.72	2.71	2.7	2.71	2.7	2.7	2.7	2.7	2.69	2.69	2.7	5.69	2.7	2.7	2.7	2.9	2.89	2.87	2.86	2 i.c	2 85 2 85	2.84
896	968	968	968	968	896	896	968	968	968	968	896	968	968	968	896	896	968	896	896	896	968	968	968	968	968	968	968	968	968	968	968	968	296	296	967	967	967	067	296
PostProject	PostProject	PostProject	PostProject			PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject	PostProject			PostProject	PostProject	PostProject	Lost Droioot	PostProject
5575.*	5560 *	5545.*	5530.*	5515	5500.*	5485.*	5470.*	5455.*	5440.*	5425.*	5410.*	5395.*	5380.*	5365.*	5350.*	5335 *	5320.*	5305.*	5290.*	5275.*	5260.*	5245.*	5230.*	5215.*	5200.*	5185.*	5170.*	5155.*	5140.*	5125.*	5110.*	5095.*	T1 5080	506	* 5050 5050 *	25 5036. F035.	. 2000 A	* 2020. * 2020.	، 2003. مے 4990.*

1.98	1.98	000	08	1.98	1 98	9 6	1.98	66	9 6	1.99	0.16	0.1	1 54	<u>-</u>
21.6	21.7	1	7.17	21.8	21.0	5 (	21.9	66	1 ;	22	50	5	101	
3.57	3.56	) L	3.55	3.54	2 52	0.0	3.53	2 50	7.0	3.51	0 40	71.7	700	73.0
1473	1473		14/3	1473	4 470	0/4	1473	4 4 7 2	2,4	1473	710	14/3	4.77	6/4/
Interim	Interim		Interim	Interim			Interim	latorim		70 Interim		20 Interim	O Latering	interim
4975.*	* 1961	1200	4945.*	4930.*	* 1. 7.	4915.	4900.*	* L	4885.	4870 In		482	747	4/4
1.88	1 00	00.1	1.88	1 88	) (	7.88	1.88	0	1.88	1.88	+ 1 + · ·	2.05		1.49
19.4		4.6	19.5	19.5	2 !	19.5	19.5	) (	19.5	19.6	)	53	,	8.3
2 83	0000	7.97	2.81	0 80	10.7	2.81	2 82	] ·	2.81	00	i	2.06	,	0.26
067	1 6	708	2967	967	200	296	967	ò	296	467		296		296
DoctDroigot		PostProject	PostProject	PostBroiost	LOSILIOJEGI	PostProject	DoctDroject	l oan rojeer	PostProject	DoctDroject	Losti loject	PostProject		PostProject
* 3007	4070.	4960.*	* 40/0	4000 ×	4950.	4915.*	* 0001	4000	4885.*	4970	5,0	4820		4720

COMP. JJA

**WILSON** & COMPANY

LOC. N. Borrega Channel FILE 99000

PROJ.

SHEET

V= 25.3 f/s

DATE 2-14-2000

SUBJ. FREEBOAR O - OF  $\overline{\alpha}$ 

1st curve

$$S = 1.3 V^{2}(b+270)$$

$$Q = 32.2^{4}/ce^{2}$$

$$Q = 32.2^{4}/ce^{2}$$

$$Q = 2.47$$

$$Q = 2.47$$

$$Q = 2.47$$

$$L_{E} = .32(E + 22D) \frac{V}{\sqrt{D}} = .32(10 + 2/2)(5.45 - 25.3) \sqrt{248}$$

$$= 102.42 \frac{W}{c} = 1000'$$

2nd curve

mid

$$S = \frac{1.3(24.2)^{2}(20.44(2.42))}{2(32.2)(375)}$$

$$= .936$$

PT 
$$S = \frac{1.3(24.4)^2(16+4(2.68))}{2(32.2)(370)}$$

$$f = 370'$$
  $0 = 2.68$   
 $g = 32.2$   $b = 16'$   
 $Z = 2$   $V = 24.4'$ 

LE = , 32(16+4(2.62)) 24.41

COMP.	

&COMPANY

LOC. IV. BORREGA CHANNEL FILE 99 099

2 SHEET

PROJ. SUBJ. FREEBOARD-

2 OF SUPERELEVATION

3rd curve

DATE

$$\leq = 1.3 (26.8)^{2} (12 + 4(3))$$

$$= .580'$$

## **Culvert Designer/Analyzer Report** 96" under 118th St

96" RCP INTAKE CULVERT FOR N. BORREGA CHAN

Peak Discharge Met	thod: User-Specified			
Design Discharge	264.	00 cfs	Check Discharge	198.00 cfs
Grades Model: Inve	rts			,
Invert Upstream	5,192.	40 ft	Invert Downstream	5,191.72 ft
Length	94.	60 ft	Slope	0.007188 ft/ft
Drop	0.	68 ft		
Headwater Model: N	Maximum Allowable HW			
Headwater Elevatio	n 5,199.	90 ft		
Tailwater properties	: Trapezoidal Channel			
Slope	0.0500	OO ft/ft	Mannings Coefficient	0.018
Depth	1.	19 ft	Left Side Slope	2 H:V
Right Side Slope		2 H:V	Bottom Width	10.00 ft
Tailwater conditions	for Design Storm.			
Discharge	264.	00 cfs	Bottom Elevation	5,191.70 ft
Depth	1.	19 ft	Velocity	17.96 ft/s
Tailwater conditions	for Check Storm.			
Discharge	198.	00 cfs	Bottom Elevation	5 191.70 ft
Depth	1.	01 ft	Velocity	16.36 ft/s
Name	Desc	Disch	arge HW Elev Velocity	
x Trial-1	1-96 inch Circular	264.0	Ocfs 5,198.92 ft 12.62 ft/s	<del></del>

# Culvert Designer/Analyzer Report 96" under 118th St

96" RCP INTAKE CULVELT FOR N. BORRELA CHAN.

Design:Trial-1

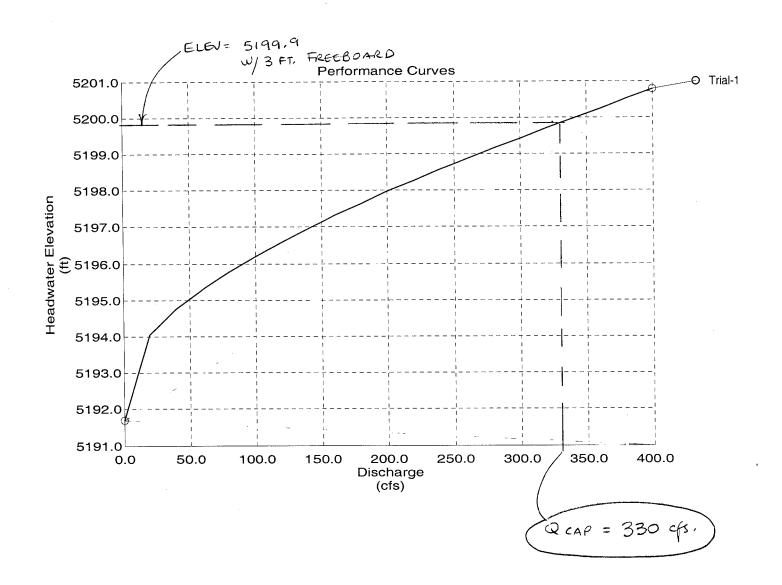
Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	5,199.90	ft	Storm Event	Design	
Computed Headwater Elev	ation 5,198.92	ft	Discharge	264.00	cfs
Headwater Depth/ Height	0.81		Tailwater Elevation	5,192.89	
Inlet Control HW Elev	5,198.35	ft	Control Type	Outlet Control	
Outlet Control HW Elev	5,198.92	ft			
Grades					
Upstream Invert	5,192.40	ft	Downstream Invert	5,191.72	ft
Length	94.60	ft	Constructed Slope	0.007188	
Hydraulic Profile					
Profile	S2		Depth, Downstream	3.47	ft
Slope Type	Steep		Normal Depth	3.22	
Flow Regime	Supercritical		Critical Depth	4.09	
Velocity Downstream	12.62	ft/s	Critical Slope	0.003102	
Section					
Section Shape	Circular		Mannings Coefficient	0.013	
Section Material	Concrete		Span	8.00	ft
Section Size	96 inch		Rise	8.00	
Number Sections	. 1				
Outlet Control Properties				1	
Outlet Control HW Elev	5,198.92	ft	Upstream Velocity Head	1.62	ft
Ke	0.50		Entrance Loss	0.81	
Inlet Control Properties					
Inlet Control HW Elev	5,198.35	ft	Flow Control	Unsubmerged	
Inlet Type So	quare edge w/headwail		Area Full	50.3	ft2
K	0.00980		HDS 5 Chart	1	,,
M	2.00000		HDS 5 Scale	1.	
С	0.03980		Equation Form	1	
Υ	0.67000		•	,	

### Performance Curves Report 96" RCP Intake Culv for N Borrega Chan

Range Data:				
	Minimum	Maximum	Increment	
Discharge	0.00	400.00	20.00	cfs

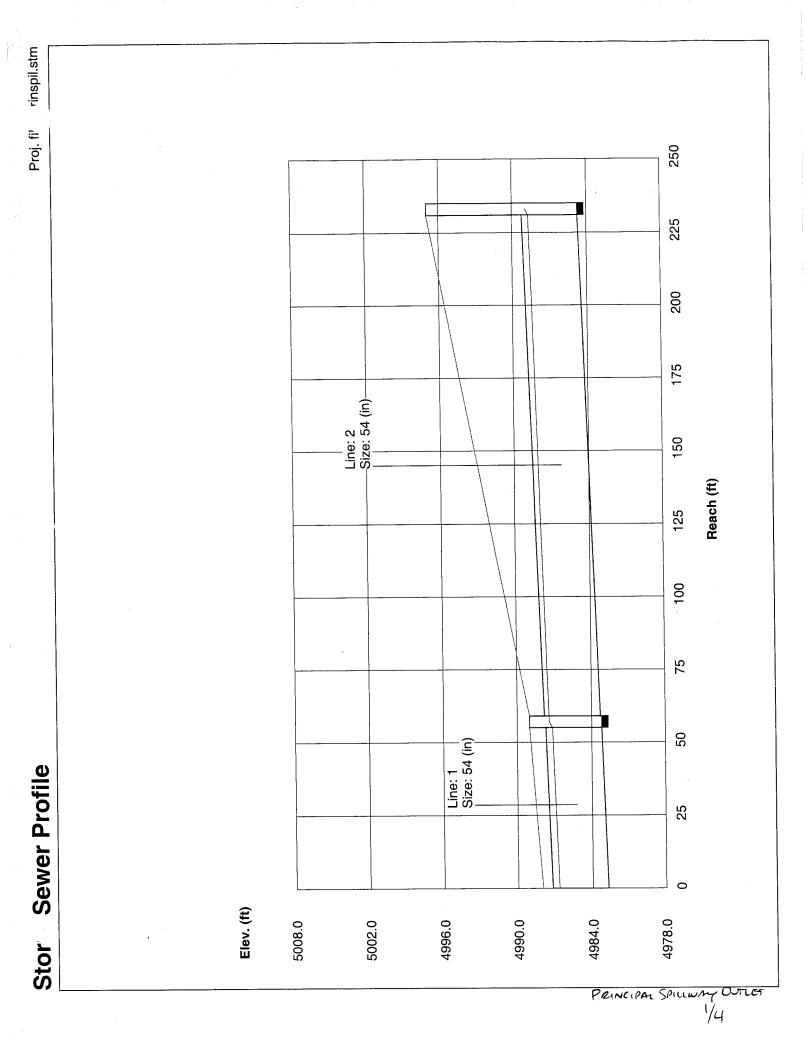
CAPACITY BASED ON ROAD OVERFLOW POINT 118th ST, LOW PT STA 9+01 ELEV = 5202.9



INITIAL D	INITIAL DAM - TO BE BUILT WITH NORTH POOL NOT FULLY EXCAVATED	<b>BUILT WIT</b>	H NORTH F	ON TOO	T FULLY E	XCAVATE	Ω	
TOTAL	STORAGE			ELEV	AREA	AREA	INCR. VOL	CUMUL
g	(ac-ft)	ELEV			(sq ft)	(acre)	(ac-ft)	VOL
		1		1004	00	100	0	000
0	0.00	4985		4985		200	3 8	5 6
0.4	2.02	4986		4986	253025.3	5.81	Ì	2.02
4	7.94	4987		4987	262909.7	6.04	5.92	7.94
· 00	14.10	4988		4988	273525	6.28	6.16	14.10
4	20.51	4989		4989	284870.6	6.54	6.41	20.51
24	27.17	4990		4990	295499.7	6.78	99.9	27.17
36	34.08	4991		4991	306205	7.03	6.91.	34.08
49	41.36	4992		4992	328452.7	7.54	7.28	41.36
69	49.21	4993		4993	355786.5	8.17	7.85	49.21
163	57.72	4994		4994	385667.4	8.85	8.51	57.72
174	67.03	4995		4995	426041.7	9.78	9.31	67.03
184	77.26	4996		4996	464974.3	10.67	10.22	77.26
191	88.36	4997		4997	502367	11.53	11.10	88.36
225	89.51	4997.1		4997.1	505327	11.60	1.16	89,51
1252	100.23	4998		4998	531972.5	12.21	10.71	100.23
3176	112.77	4999		4999	560346.9	12.86	12.54	'
5667	125.94	5000		2000	587772.7	13.49	13.18	125.94
8620	139.90	5001		5001	628296.4	14.42	13.96	139.90
11966	154.34	5002		5005	630000	14.46	14.44	
45557	160 28	5003		5003	680000	15.61	15.03	169.38

	Carculations												
ā													
PRINC SPILLWAY P	PRINCIPAL SPILLWAY		PMF SPILLWAY	WAY									
8" ORIFICES													
0	ORIFICE = 47.5	47.5 inches											
	C= 0.67												
	g= 32.2	32.2 ft/sec^2											
	ORIF R= 1.979167 ft	Ħ											
	AREA= 12.31 sq ft	sq ft											
	, C	g * H)^.5	WEIR Q=	CLH/3/2									
I.A.				C=3.0									
	VAW LIGO IAGIONIGO		PME SPILL WAY	WAY									
BISEB OBIEIOES	5	ORIF	5			TOTAL	STORAGE		ELEV	AHEA		NCR. VOL	CUMUL
O O O		Ø	_	Н	Ø	O	(ac-ft)	ELEV		(sd tt)	(acre)	(ac-ft)	VOL V
					The control of the co		000	4005	4085	100	0.01	00.00	0.00
0		0				2 2	0.00	4965	4986	2530	5.81	2.02	2.02
0.4		0.4				5	7 04	4987	4987		6.04	5.92	7.94
4		4				t o	10.7	4988	4988	1	6.28	6.16	14.10
ω ;		ς α		-		14	20.51	4989	4989	N	6.54	6.41	20.51
4- 2		4-				24	27.17	4990	4990		6.78	99.9	27.17
24		36				36	34.08	4991	4991	306205	7.03	6.91	34.08
00 00		67				49	41.78	4992	4992		8.39	7.70	41.78
6		69				69	50.84	4993	4993		9.75	90.6	50.84
		163				163	61.26	4994	4994	- 1	11.11	10.42	61.26
16 19811 10 001		174				174	73.20	4995	4995		12.78	11.94	73.20
		187				184	86.10	4996	4996	ū	13.01	12.90	86.10
tooro monifico		191	350	0	0.0	191	99.30	4997	4997		13.38	13.20	99.30
Spillway cless		192	350	0.1	33.2	225	100.64	4997.1	4997.1		13.41	1.34	100.64
		202	350	-	1050.0	1252	112.80	4998	4998	593724.7	13.63	12.17	112.80
		206	350	2	2969.8	3176	126.55	4999	4999	604403.7	13.88	13.75	126.55
		211	350	က	5456.0	2995	140.56	2000	2000	- 1	14.14	14.01	140.56
		220	350	4	8400.0	8620	154.85	5001	5001	9	14.42	14.28	154.85
		227	350	-C	11739.4	11966	169.29	5002	5005		14.46	14.44	169.29
	LLANG.			-				0000	0001	00000	100	00 4	707

4985         Inv=         4985 0         9 linv=         4985 0         12 linv=           4986         0.5         1.575 0.4         0.0         0         0.0         4405         1.575 0.4         4405 <th>9 inv= 4985.0 9 inv= 4988.0 12 inv= 4991.0  4985</th> <th>4985         Atol=         3.15         O 4         Atol=         49810         12 Atol=         0.4           4986         0.5         1.5         0.0         Atol=         3.15         0.4         0.4           4986         0.5         1.5         3.15         3.3         0.5         1.5         0.4         4.4         4.5         1.5         3.15         0.4         0.4         4.5         3.15</th> <th></th> <th>_ ⊏ #</th> <th>Z</th> <th>5</th> <th>#</th> <th>- 1</th> <th>AZ</th> <th>ζZ</th> <th># (</th> <th>ָלְ כְּ</th> <th>3</th> <th>KIOIGI</th> <th>2</th>	9 inv= 4985.0 9 inv= 4988.0 12 inv= 4991.0  4985	4985         Atol=         3.15         O 4         Atol=         49810         12 Atol=         0.4           4986         0.5         1.5         0.0         Atol=         3.15         0.4         0.4           4986         0.5         1.5         3.15         3.3         0.5         1.5         0.4         4.4         4.5         1.5         3.15         0.4         0.4         4.5         3.15		_ ⊏ #	Z	5	#	- 1	AZ	ζZ	# (	ָלְ כְּ	3	KIOIGI	2
4985	4985 A01e	4985   Atole   315   Atole   315   Atole   4.2   0.4   4986   15.5   3.16   3.15   3.15   3.15   3.15   3.15   3.15   3.15   4989   2.5   3.16   3.15   3.1		=vui	4985.0		တ		4988.0			499	) )		
4985 0 0 0.0  4986 0 0 0.0  4987 1.55 3.9  4988 2.5 3.15 8.3  4989 3.5 3.15 3.8  4990 4.5 3.15 20.1  4991 5.5 3.15 20.1  4991 5.5 3.15 20.1  4992 7.5 3.15 20.1  4994 8.5 3.15 5.2  4994 8.5 3.15 5.2  4994 8.5 3.15 5.2  4994 8.5 3.15 5.2  4995 7.5 3.15 4.2 11.1  Collice Dia 47.5 3.96 6.00 4993 96 184  Collice Dia 47.5 3.00 4993 96 184  Collice Dia 488.26 7.73 4.992.04 4997 191  184 3.56 4.998.69 8.33 4.995.09 4.998 202  202 4.998.80 10.16 4.993.96 5000 211  220 4.998.80 10.16 4.993.96 5000 211  220 4.998.80 11.05 5001.07 5001 220	4985 0.6 1.575 0.0 4 4986 0.5 3.15 3.9 4 4987 1.5 3.15 3.9 4 4988 2.5 3.15 20.1 1.575 0.4 4 4989 2.5 3.15 20.1 1.5 3.15 3.9 4 4990 2.5 3.15 20.1 2.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 3.15 20.1 1.5 20.1 1	4985 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		Atot=	3.15		7		3.15		Atot=		Ņ		
4986 0.5 1575 0.4 4988 2.5 3.15 8.3 4989 3.5 3.15 13.8 0.5 1.575 0.4 4980 3.5 3.15 2.72 2.5 3.15 8.3 4991 5.5 3.15 2.72 2.5 3.15 8.3 4992 6.5 3.15 2.72 2.5 3.15 13.8 4993 7.5 3.15 2.72 2.5 3.15 2.0.1 4993 8.5 3.15 5.23 5.5 3.15 2.72 2.5 4.2 11.1  OUIFLOW PIPE 8.5 3.15 5.23 5.5 3.15 2.72 2.5 4.2 11.1  OUIGE IN 4984.70 3.96 Fam or fee Fam Or	4986 0.5 1.575 0.4  4987 2.5 3.15 3.9  4989 2.5 3.15 3.9  4990 4.5 3.15 2.0  4991 5.5 3.15 3.9  4993 7.5 3.15 5.2  OUTHOW PIPE  OUTHOW	4986 15.5 0.4 1488	4985	0	0	0.0									
4987 15 3.15 3.9 4988 2.5 3.15 3.9 4988 3.5 3.15 13.8 4990 4.5 3.15 20.1 4991 5.5 3.15 20.1 4992 6.5 3.15 20.1 4993 7.5 3.15 20.1 4993 7.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4994 8.5 3.15 20.1 4995 6.5 3.15 20.1 4995 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4996 8.5 3.15 20.1 4997 9.1 4998 8.5 3.15 20.1 4998 8.5 3.15 20.1 4997 9.1 4998 8.5 3.15 20.1 4997 9.1 4998 8.5 3.15 20.1 4998 8.5 3.15 20.1 4997 9.1 4998 8.5 3.15 20.1 4008 8.5 3.15 20.1 4008 8.5 3.15 20.1 4008 8.5 3.15 20.1 4008 8.5 3.15 20.1 4008 8.5 3.15 20.	4987 1.5 3.15 8.3 9 1.5 1.5 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	4987 1.5 3.15 3.9 4887 4.88 4.89 4.89 4.89 4.89 4.89 4.89 4.89	4986	0.5	1.575	0.4								7.5	
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4991 5.5 3.15 27.2 2.5 3.15 8.3 0.5 2.1 0.5 4993 4993 3.15 3.15 3.15 20.1 1.1 1.1 1.2 20.1 1.5 4.2 5.2 4.2 11.1 1.1 1.1 1.1 2.2 20.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1	4991 55 3.15 27.2 2.5 3.15 8.3 0.5 2.1 0.5 30 499 4992 7.5 3.15 4.3 3.15 8.3 1.5 8.3 1	4991 55 315 272 2.5 315 138  4993 7.5 315 43.3 4.5 11.1 91  4994 8.5 315 43.3 4.5 315 272 2.5 4.2 10.5 491  4994 8.5 315 43.3 4.5 315 272 2.5 4.2 11.1 91  OUTFOW PIPE  S = U8% 37  Orlice In 4384.70  Orlice In 4387.90  Orlice In 4387.90  Orlice In 4387.90  Orlice In 4387.90  Orlice In 4387.80  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4388.78  Orlice In 4389.02  Orlice In 4389.02  Orlice In 4389.03  Orli	4990	4.5	3.15	20.1		ر. ت	3.15	ი. ი.				470	
4992 6.5 3.15 35.0 3.5 3.15 13.8 0.5 2.1 0.5 4.2 5.2 4.2 11.1 4.993 8.5 3.15 5.3 5.3 5.3 5.5 3.15 2.0.1 1.5 4.2 5.2 4.2 11.1 5.2 5.3 5.3 5.3 5.3 5.3 5.3 5.3 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2 5.2	4992 65 315 315 13.8 0.5 2.7 49 49 49 49 49 49 49 49 49 49 49 49 49	4992 65 315 315 35.0 3.5 13.8 49.8 49.8 49.8 49.8 3.15 20.1 15. 42. 11.1 91 499.8 49.8 49.8 49.8 49.8 49.8 49.8 49.	4991	5.5	3.15	27.2		2.5	3.15	დ.			1	000	
4993 7.5 3.15 43.3 4.5 20.1 1.5 4.2 3.2 4994 99 10.0 Feb. or citize Fig. or cit	4993 7.5 3.15 4.3 4.5 3.15 20.1 1.5 4.2 5.2 000 UDITION PIPE S = 0.8% 3 4 5 3.15 5.2 3.15 2.0 4.2 11.1 91 000 UDITION PIPE S = 0.8% 3 4 498.70	4993   7,5   3,15   5,23   5,5   3,15   2,01   1,5   4,2   3,2   4,5   3,15   2,01   1,5   4,2   3,1	4992	6.5	3.15	35.0		3.5	3.15	13.8	Ö	-		94 C	
OUTFLOW PIPE S = 0.8% S = 0.8% S = 0.8% Office Inv 4984.70 Office Dia 47.5 3.96 Form on (i.e. E*) Office Area 12.31 Office Area 12.31 Office Area 12.31 Office Area 12.31 Office Area 12.31 Office Area 12.31 Office Area 12.31 Office Area 12.31 Office Area 12.31 Office Inv 4984.70 Office Area 12.31 Office Inv 4984.70 Office Area 12.31 Office Inv 4984.70 Office Inv 4984.70 Office Inv 4984.70 Office Inv 4984.70 Office Inv 4984.70 Office Inv 4984.70 Office Inv 4984.70 Office Inv 4988.78 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 4988.80 Office Inv 60.80 Office Inv 6	OUTFLOW PIPE S = 0.8% S = 0.8% Office Nor Pressure flow Office Size (1.5) Office Si	A994   8.5 3.15 52.3 5.5 3.15 27.2 2.5 4.2 11.1 31   OUTIFLOW PIPE   S.	4993	7.5	3.15	43.3		4.5	3.15	20.1	(			000	
OUTFLOW PIPE $S = 0.8\%$ $S = 0.8\%$ Orfice Inv 4984.70 Orfice Dia 47.5 3.96 OrficeArea 12.31 $Q<190, \text{ Non-pressure flow}$ Q d normal HGL @ orif delta h WSEL 140 $2.87 + 4987.57 + 4.47 + 4992.04 + 4992$ 152 $3.04 + 4987.57 + 4.47 + 4993.01 + 4993$ 163 $3.20 + 4987.90 + 6.06 + 4993.96 + 4995$ 174 $3.38 + 4988.08 + 6.91 + 4994.99 + 4995$ 174 $3.38 + 4988.08 + 6.91 + 4994.99 + 4995$ 174 $3.38 + 4988.08 + 6.91 + 4994.99 + 4996$ Q>190 $202 + 4988.08 + 9.31 + 4998.09 + 4998$ 202 $4989.09 + 10.16 + 4999.96 + 5000$ 211 $4989.00 + 11.05 + 5001$	OUTFLOW PIPE  S = 0.8%  3  Orlice Inv 4984.70  Orlice Dia 47.5 3.96  Orlice Dia 47.5 3.96  Orlice Area 12.31  Q d normal HGL @ orlit delta h WSEL Q d normal HGL @ orlit delta h WSEL 140 2.87 4987.57 4.47 4992.04 4993 152 3.04 4987.57 4.47 4992.04 4995 153 3.20 4988.08 6.91 4994.99 4996 174 3.38 4988.08 6.91 4994.99 4996 174 3.38 4988.08 6.91 4994.99 4996 191 4988.78 9.31 4998.09 4998 202 4989.09 9.69 4998.78 4999 211 4989.80 10.16 4999.96 5000 220 4999.02 11.05 5001.97 5001 235 4990.21 11.76 5001.97 5003	Ordice Inv 4984.70 Ordice Inv 4984.70 Ordice Inv 4987.40 Ordice Inv 4988.70 Ordice Inv 4987.40 Ordice Inv 4	4994	8.5	3.15	52.3		5.5	3.15	27.2	,	+	+	50	
S = 0.8% 3 Orfice Inv 4984.70 Orfice Dia 47.5 3.96 Form or fice Eq. 12.31 Orfice Dia 47.5 3.96 Form or fice Eq. 12.31 Oction Dia 47.5 3.96 Form or fice Eq. 140 Oction Non-pressure flow 0.2.87 4987.57 4.47 4992.04 4992 152 3.04 4987.57 4.47 4993.01 4993 153 3.20 4987.74 5.27 4993.96 4995 174 3.38 4988.08 6.91 4994.99 4996 0>190, Pressure flow 4988.69 8.33 4997.02 4997 191 4988.69 8.33 4997.02 4997 202 4989.09 9.69 4998.78 4999 211 4989.00 10.16 4999.96 5000	S = 0.8% 3.96 Form or fice Eq. 12.31  Orfice Dia 47.5 3.96 Form or fice Eq. 2.1	S = 0.8% 3  Ordice Inv 4984.70  Ordice Dia 47.5 3.96 Fr.h. or (24 E4)  Ordice Dia 47.5 3.96 Fr.h. or (24 E4)  Ordice Dia 47.5 3.96 Fr.h. or (24 E4)  Ordice Dia 47.5 3.96 Fr.h. or (24 E4)  Ordice Dia 47.5 49.2 49.2 49.2  Ordice Dia 47.5 49.2 49.2 49.2 49.2 49.2 49.2 49.2 49.2	TELOW												
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Orlice Dia $47.5$ $3.96$ $6 \times 10^{-10} \text{ Ce} = \frac{1}{2} \frac{1}{$	Orfice Dia 17.5 3.96 Form or fice Ethn Orfice Dia 17.5 3.96 Form or fice Ethn Orfice Dia 12.31  Q<190, Non-pressure flow Q d normal HGL @ orif delta h WSEL 140 2.87 4.987.57 4.47 4992.04 4993 152 3.04 4987.57 4.47 4993.01 4993 174 3.38 4988.08 6.91 4994.99 4996 174 3.38 4988.08 6.91 4994.99 4996 191 4998.09 9.69 4996.09 4996 202 4988.78 9.31 4998.09 4998 202 4999.00 10.16 4999.96 5000 211 4989.09 10.16 4999.96 5001.07 5001 220 4999.02 11.05 5001.97 5002	Orlice Div 17.75 3.96 Famorita Eta. (A) 430 Orlice Div 17.75 (A) 430 Or	20.01	70											
OrliceArea 12.31  OrliceArea 12.31  Q<190, Non-pressure flow  Q d normal HGL @orif delta h WSEL  140 2.87 4987.57 4.47 4992.04 4992 152 3.04 4987.74 5.27 4993.01 4993 163 3.20 4987.90 6.06 4993.96 4995 174 3.38 4988.08 6.91 4994.99 4996 0>190, Pressure flow 191 4988.69 8.33 4997.02 4997 191 4988.09 9.69 4998.78 4999 202 4989.09 9.69 4998.78 4999 211 4989.80 10.16 4999.96 5000	OrficeArea 12.31  OrficeArea 12.31  OrficeArea 12.31  OrficeArea 12.31  Octool	Octobarbea 12.31  Octobarbea 12.32  Octobarbea 12.31  Octobarbea 12.31  Octobarbea 12.32  Octobarbea 1	4304			On fee	5								
Q<190, Non-pressure flow       A       A       A       A       A       A       A       A       A       A       A       A       A       A       B       A       B       A       B       A       B       A       B       A       B       A       B </td <td>Octobarrea 12.31  Octobarrea 10w  Octobarrea 10w  152 3.04 4987.57 4.47 4992.04 4992  163 3.20 4987.90 6.06 4993.96 4995  174 3.38 4988.08 6.91 4994.99 4995  174 3.38 4988.08 6.91 4995.99 4996  Octobarrea 10w  191 4988.78 9.31 4998.09 4998  202 4999.09 9.69 4998.78 4999  220 4999.02 11.05 5001.07 5001  220 4990.21 11.76 5001.97 5002</td> <td>Q&lt;190, Non-pressure flow</td> Q<190, Non-pressure flow	Octobarrea 12.31  Octobarrea 12.31  Octobarrea 12.31  Octobarrea 12.31  Octobarrea 12.31  Octobarrea 12.31  Octobarrea 12.31  Octobarrea 10w  Octobarrea 10w  152 3.04 4987.57 4.47 4992.04 4992  163 3.20 4987.90 6.06 4993.96 4995  174 3.38 4988.08 6.91 4994.99 4995  174 3.38 4988.08 6.91 4995.99 4996  Octobarrea 10w  191 4988.78 9.31 4998.09 4998  202 4999.09 9.69 4998.78 4999  220 4999.02 11.05 5001.07 5001  220 4990.21 11.76 5001.97 5002	Q<190, Non-pressure flow	r c	j _		2,0									
Q<190, Non-pressure flow Q d normal HGL @orif delta h WSEL 140 2.87 4987.57 4.47 4992.04 4992 152 3.04 4987.57 4.47 4993.01 4993 153 3.20 4987.90 6.06 4993.96 4994 174 3.38 4988.08 6.91 4994.99 4996 0>190, Pressure flow 191 4988.69 8.33 4997.02 4997 202 4989.09 9.69 4998.78 4999 206 4989.09 9.69 4999.96 5000 211 4989.02 11.05 5001.07 5001	Q<190, Non-pressure flow	Q<190, Non-pressure flow			m	) (생 )	6.								
Q d normal HGL @ orif delta h WSEL 140 2.87 4987.57 4.47 4992.04 4992 152 3.04 4987.74 5.27 4993.01 4993 163 3.20 4987.90 6.06 4993.96 4994 174 3.38 4988.08 6.91 4994.99 4995 184 3.56 4988.26 7.73 4995.99 4996 Q>190, Pressure flow 191 4988.69 8.33 4997.02 4997 202 4988.78 9.31 4998.09 4998 206 4989.09 9.69 4998.78 4999 211 4989.00 10.16 4999.96 5000	O d normal HGL @ orif delta h WSEL 140 2.87 4987.57 4.47 4992.04 4992 152 3.04 4987.74 5.27 4993.01 4993 163 3.20 4987.90 6.06 4993.96 4996 174 3.38 4988.08 6.91 4994.99 4996 O>190, Pressure flow 191 4988.69 8.33 4997.02 4997 202 4988.78 9.31 4998.09 4998 204 4989.09 9.69 4998.78 4999 211 4989.80 10.16 4999.96 5000 227 4990.21 11.76 5001.97 5001 235 4990.42 12.60 5003.02 5003	Q d'normal HGL @orif delta h       WSEL         140       2.87       4987.57       4.47       4992.04       4993       140         152       3.04       4987.74       5.27       4993.36       14994       162         163       3.20       4987.90       6.06       4993.36       4994       163         163       3.20       4988.08       6.91       4994.99       4995       174         174       3.38       4988.08       6.91       4994.99       4995       174         184       3.56       4988.08       6.91       4996.99       184       184         191       4988.78       9.31       4996.09       4998.78       202         206       4989.09       9.69       4998.78       4999       206         211       4989.80       10.16       4999.96       5000       211         227       4990.02       11.05       5001.07       5002       227         4990.42       12.60       5003.02       5003       235	<190.	sure flow	_										
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163 3.20 4987.90 6.06 4993.96 4994 174 3.38 4988.08 6.91 4994.99 4995 184 3.56 4988.26 7.73 4995.99 4996 0>190, Pressure flow 191 4988.69 8.33 4997.02 4997 202 4989.09 9.69 4998.78 4999 211 4989.80 10.16 4999.96 5000	163 3.20 4987.90 6.06 4993.96 4994 174 3.38 4988.08 6.91 4994.99 4995 184 3.56 4988.08 6.91 4994.99 4995 Q>190, Pressure flow 202 4988.78 9.31 4998.09 4998 206 4989.09 9.69 4998.78 4999 211 4989.80 10.16 4999.96 5000 227 4990.02 11.05 5001.97 5001 235 4990.42 12.60 5003.02 5003	163 3.20 4987.90 6.06 4993.96 4994 163  174 3.38 4988.08 6.91 4994.99 4995 174  184 3.56 4988.26 7.73 4995.99 4996 184  C> 190, Pressure flow 191 4988.78 9.31 4998.09 206  202 4988.09 9.69 4998.78 4999 206  211 4989.09 9.69 4998.78 4999 206  220 4999.02 11.05 5001.07 5001 220  227 4990.21 11.76 5001.97 5003 235		1	5.27	4993.01		152							
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Q>190, Pressure flow     4988.69     8.33     4997.02     4997       191     4988.78     9.31     4998.09     4998       202     4989.09     9.69     4998.78     4999       211     4989.00     10.16     4999.96     5000       220     4990.02     11.05     5001.07     5001	Q>190, Pressure flow       4988.69       8.33       4997.02       4997         191       4988.78       9.31       4998.09       4998         202       4988.78       9.31       4998.09       4998         206       4989.09       9.69       4998.78       4999         211       4989.09       10.16       4999       5001         220       4990.21       11.76       5001.07       5002         235       4990.42       12.60       5003.02       5003	Q>190, Pressure flow       191     4988.69     8.33     4997.02     4997     191       202     4988.78     9.31     4998.09     4998     202       206     4989.09     9.69     4998.78     4999     206       206     4989.80     10.16     4999.96     5000     211       220     4990.02     11.05     5001.07     5001     227       235     4990.42     12.60     5003.02     5003     235		<u> </u>	7.73	4995.99	_	184						a Live	
191     4988.69     8.33     4997.02     4997       202     4988.78     9.31     4998.09     4998       206     4989.09     9.69     4998.78     4999       211     4989.80     10.16     4999.96     5000       220     4990.02     11.05     5001.07     5001	191 4988.69 8.33 4997.02 4997 202 4988.78 9.31 4998.09 4998 206 4989.09 9.69 4998.78 4999 211 4998.02 11.05 5001.07 5001 227 4990.21 11.76 5001.97 5002 235 4990.42 12.60 5003.02 5003	191     4988.69     8.33     4997.02     4997     191       202     4988.78     9.31     4998.09     4998     202       206     4988.78     9.69     4998.09     206       206     4989.09     9.69     4998.78     4999       211     4989.80     10.16     4999.96     5001     211       220     4990.02     11.05     5001.07     5001     227       235     4990.42     12.60     5003.02     5003     235	90, Pressure	100											
202     4988.78     9.31     4998.09     4998       206     4989.09     9.69     4998.78     4999       211     4989.80     10.16     4999.96     5001       220     4990.02     11.05     5001.07     5001	202 4988.78 9.31 4998.09 4998 206 4989.09 9.69 4998.78 4999 211 4990.02 11.05 5001.07 5001 227 4990.21 11.76 5001.97 5002 235 4990.42 12.60 5003.02 5003	202     4988.78     9.31     4998.09     4998     202       206     4989.09     9.69     4998.78     4999     206       211     4989.80     10.16     4999.96     5000     211       220     4990.02     11.05     5001.07     5001     227       235     4990.42     12.60     5003.02     5003     235	91			4997.02		191							
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211 4989.80 10.16 4999.96 5000 220 4990.02 11.05 5001.07 5001	211 4989.80 10.16 4999.96 5000 220 4990.02 11.05 5001.07 5001 227 4990.21 11.76 5001.97 5002 4990.42 12.60 5003.02 5003	211 4989.80 10.16 4999.96 5000 2111  220 4990.02 11.05 5001.07 5001 220  227 4990.21 11.76 5001.97 5003 227  P. P. P. P. P. P. P. P. P. P. P. P. P. P	206	4989.09	ļ	4998.78		206							
7 220 4990.02 11.05 5001.07 5001	220 4990.02 11.05 5001.07 5001 227 4990.21 11.76 5001.97 5002 235 4990.42 12.60 5003.02 5003	220 4990.02 11.05 5001.07 5001 220 227 4990.21 11.76 5001.97 5002 227 235 4990.42 12.60 5003.02 5003 235	211	4989.80	1	4999.96		211							
1000 04 14 76 E004 07 E000	227 4990.21 11.76 5001.97 5002	227 4990.21 11.76 5001.97 5002 227 235 4990.42 12.60 5003.02 5003 235	F	4990.02	ļ.,	5001.07		220							
4830.2   11.70   3001.37   3002	7 235 4990.42 12.60 5003.02 5003	235 4990.42 12.60 5003.02 5003 235	301	4990.21	<u> </u>	5001.97		227							
g 235 4990.42 12.60 5003.02 5003	GA DAM	& A DAM	2 2 2	4990.42	-	5003.02		235							



ine lo.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	Dns line No.
		190.0	54 c	57.0	4982.74	4983.20	0.807	4986.72	4987.18	0.25	End
		190.0	54 c	176.0	4983.30	4984.71	0.801	4987.43	4988.69	0.25	1
								2	ON for starts see sh Bonned Stored	onfre	fion
									starts	here.	3/3
									Bonne	A DAM	IIMC
									5000	L VIV	
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					-						
										l.	
	nat Filor, make !! - to		10"	File: SAM	DI E IDE	Total	No. Lines:	2	Run Da	te: 04-0	7-2000
Proje	ect File: prinspil.str		1-D-F	THE. SAIVI	r LE.IDF	Total	140. LINGS.	-	Downer		

NOTES: c = circular; e = elliptical; b = box; Return period = 100 Yrs.; \* Indicates surcharge condition.

WITER ZI

# Hydı Iow Storm Sewer Inventory Repor

Line ID				
Ē				
	Inlet/ Rim El (ft)	4989.00		
	J-loss coeff (K)	0.10		
	N value (n)	0.012		
Data	Line	ਨੂੰ ਨੂੰ		
Physical Data	Line size (in)	54		
	Invert El Up (ft)	4983.20		
	Line slope (%)	0.81		
	Invert El Dn (ft)	4982.74		
	Inlet time (min)	0.0		
ata	Runoff coeff (C)	0.00		
Flow Data	Drng area (ac)	0.00		
	Known Q (cfs)	190.00		
	Junc type	H Z	I S	
Alignment	Defl angle (deg)	180.0	0.00	
Ali	Line length (ft)	57.0	176.0	
	Dnstr line No.	End		
Line	Ö	•	α	

PRINCIPAL SPILWAY OUTER
3/4

suc
Comput
Line
Grade
Hydraulic
<b>M</b> C
Hydra

HGL Depth Area Vel elev (ft) (ft) (sqft) (ft/s)					Ų			4+400	
(m) (sqn)	Invert	EGL elev	Vel Vel	a	pth Area	HGL Depth Are	HGL Depth elev	HGL Depth	Depth
	(#) (#)	(#)	(ft/s) (ft)	<b>₽</b>	t) (sqft)	(E)	(#) (#)	(tt) (tt)	(#) (#)
4987.18 3.98** 14.87 12.78	3 57.0 4983.20	4989.25 0.713	12.78 2.54		14.87	3.98	4986.72 3.98	4982.74 4986.72 3.98	4986.72 3.98
4988.69 3.98** 14.87 12.78	176 4984.71	4989.83 0.691	12.43 2.40		15.28	4.13		4983.30 4987.43 4.13	4987.43 4.13
Total number of lines:			I-D-F File:					ato lice	Drojost Eile: princail etm
	** Critical denth assumed.		nissa daga		* (1)	1006 716 (#) * Critic	(III)		Froject File: prinspir.sum

# APPENDIX D

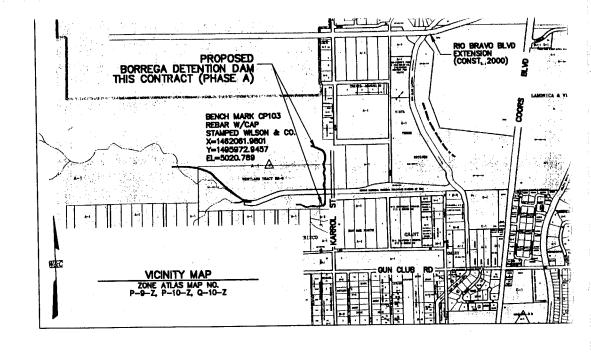
**Sheets from Construction Plans, including Dam Filing Sheet** 

# ALBUQUERQUE METROPOLITAN AHHOYO FLOOD CONTROL AUTHORITY

CONSTRUCTION PLANS FOR

# BORREGA DETENTION DAM





### REFERENCE DOCUMENTS

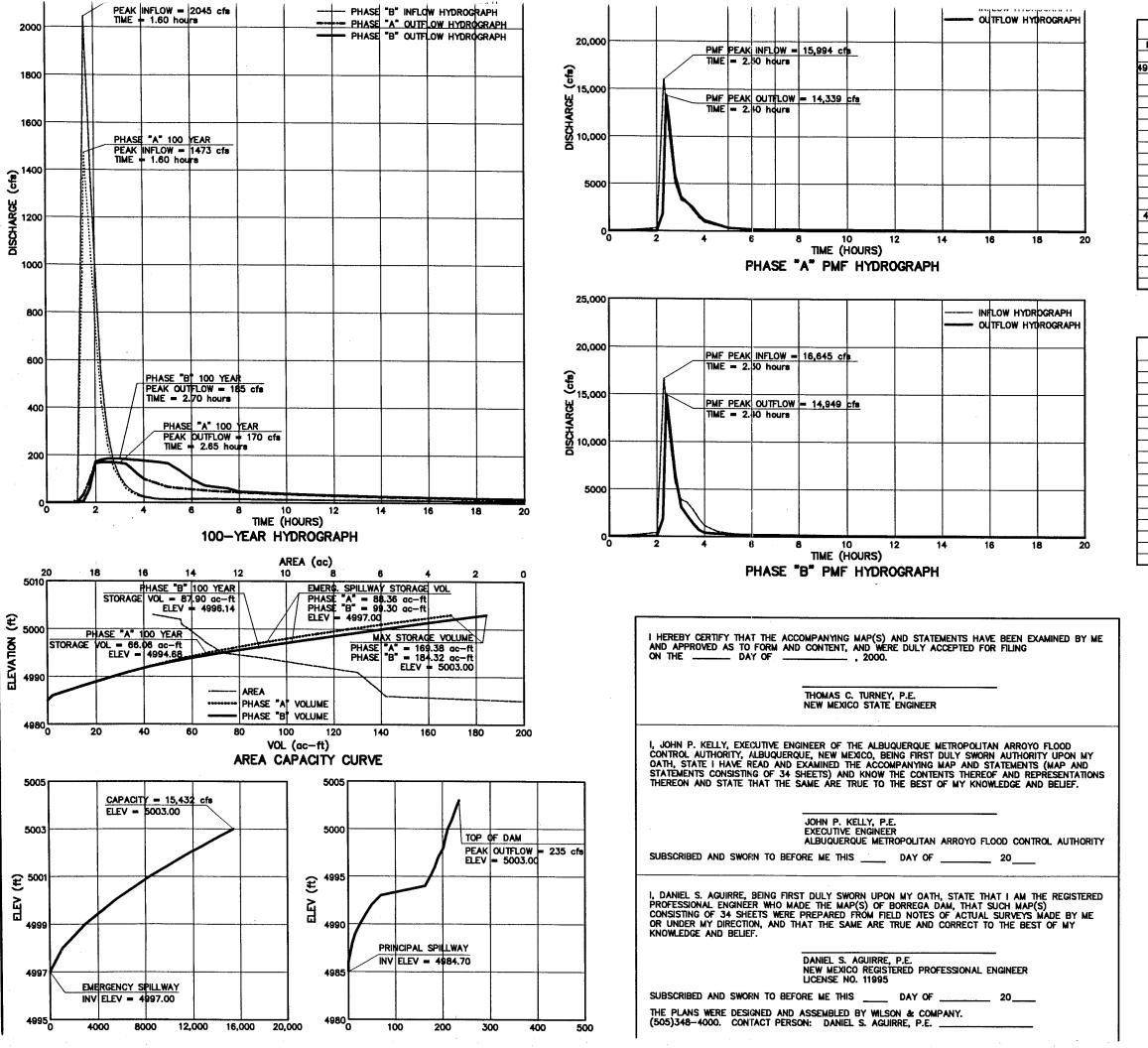
n Analysis Report for Borrega Detention Dam and North Borrega Chann AMAFCA by Wilson & Company, March 2000.

# INDEX

DESCRIPTION	SHEET NO.	DESCRIPTION	SHEET NO.
DESCRIPTION  COVER SHEET  DAM FILING SHEET  BASIN MAP  GENERAL NOTES & SUMMARY OF QUANTITIES  DAM LAYOUT - PHASE "A" GRADING  DAM LAYOUT - PHASE "B" GRADING  DAM CENTERLINE PROFILE  PRINCIPAL SPILLWAY OUTLET PIPE - PLAN & PROFILE  CHANNEL CHUTE - PLAN & PROFILE  ANTI-SEEP COLLAR DETAILS  RISER DETAILS  MERGENCY SPILLWAY LIFTS 1-4  EMERGENCY SPILLWAY LIFTS 5-10  EMERGENCY SPILLWAY LIFTS 11-13	1 2 3 4 5 6 7 8 9 10 11 12 13 14	DAM CROSS SECTIONS STA 1+50 TO STA 6+50 DAM CROSS SECTIONS STA 7+00 TO STA 11+50 DAM CROSS SECTIONS STA 11+80.62 TO STA 19+06.10 DAM CROSS SECTIONS STA 19+50 TO STA 24+00  **BORREGA DIVERSION STORM DRAIN — PLAN & PROFILE STORM DRAIN DETAILS 72" RCP HEADWALL & RIP RAP DETAILS ACCESS ROAD PLAN & PROFILE KARROL STREET PLAN & PROFILE FENCING & REVEGETATION PLAN FENCING DETAILS RUNDOWN AND CHANNEL DETAILS PRINCIPAL SPILLWAY OUTLET STRUCTURE DETAILS 36" STORM DRAIN PLAN & PROFILE SLOPE STABILITY AND SEIPAGE ANALYSIS	16 17 18 19 20 21 22 23 24 25 26 27 28–32 33

APPROVED FOR CONSTRUCTION

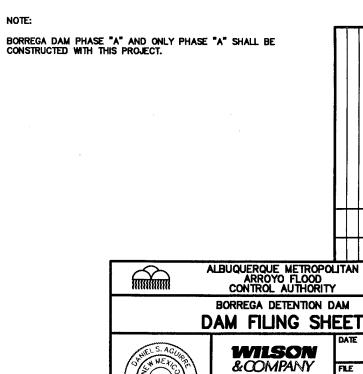
DATE JOHN P. KELLY, P.E. EXECUTIVE ENGINEER ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY BORREGA DETENTION DAM **COVER SHEET** WILSON &COMPANY 4900 LANG AVENUE N.E. ALBUQUERQUE, NM



E.E.

BORRE	GA DAM CI	HARACTERIS	STICS	
ELEVATION (ft)	OUTFLOW (cfe)	STORAGE	(ac-ft)	AREA (ac)
		PHASE "A"	PHASE "B"	
4984.7 - PRINCIPAL SPILLWAY INV	0	0	0	0
4985	0	0	0	0
4986	0.4	2.02	2.02	5.81
4987	4	7.94	7.94	6.04
4988	8	14.10	14.10	6.28
4989	14	20.51	20.51	6.54
4990	24	27.17	27.17	6.78
4991	36	34.08	34.08	7.03
4992	49	41.36	41.78	8.39
4993	69	49.21	50.84	9.75
4994	163	57.72	61.26	11.07
4995	174	67.03	73.20	12.78
4996	184	77.26	86.10	13.01
499? - EMERG. SPILLWAY INV	191	88.36	99.30	13.38
4998	1252	100.23	112.80	13.63
4999	3176	112.77	126.55	13.88
5000	5667	125.94	140.56	14.14
5001	8620	139.90	154.85	14.42
5002	11,966	154.34	169.29	14.46
5003	15,667	169.38	184.32	15.61

BORREGA DAM PROPERTIES	
MAXIMUM GRADE ABOVE EXISTING GRADE AT CENTERLINE	13 FT
LENGTH	2300 FT
MAXIMUM WIDTH AT BASE	150 FT
CREST WIDTH	20 FT
SLOPE UPSTREAM FACE	3:1
SLOPE DOWNSTREAM FACE VARIES	2.5:1 TO 6:1
ELEVATION AT TOP OF DAM	5003
FLOWLINE ELEVATION OF PRINCIPAL SPILLWAY OUTLET AT INTAKE	4984.70
ELEVATION OF EMERGENCY SPILLWAY CREST	4997
WIDTH OF EMERGENCY SPILLWAY PERPENDICULAR TO FLOW	350 FT
DISCHARGE CAPACITY OF EMERG. SPILLWAY AT TOP OF DAM ELEV 5003	15,432 cfe
OUTLET CONDUIT SIZE AND TYPE 47 1/2" ORIFICE PLATE	ON 54" PCCP
OUTLET CONDUIT CAPACITY AT ELEVATION 4997	191 cfs
EVACUATION TIME FOR 100-YR EVENT (PHASE "A", Qout < 2 cfs)	57 hours
DRAINAGE AREA PHASE "A"/ PHASE "B" 1.246/	1.748 sq. mi.
100-YEAR 24 HOUR DESIGN RAINFALL	2.66 inches
HAZARD CLASSIFICATION (NCRS DEFINITION)	HIGH
PMF 6 HOUR LOCAL STORM DESIGN RAINFALL	16.0 inches

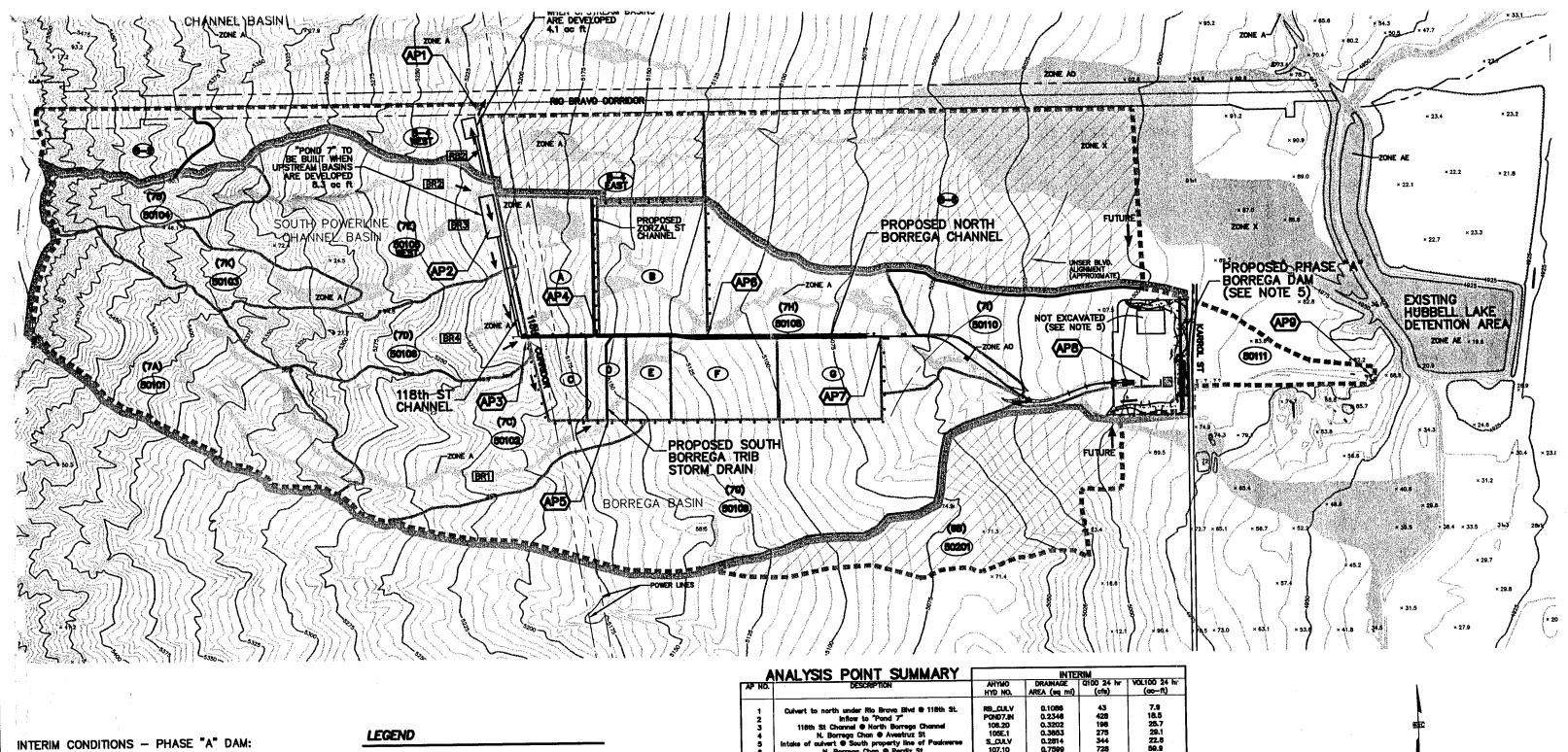


(11955)

MARC

SHEET

4900 LANG AVENUE N.E. ALBUQUERQUE, NM



ALL BASINS DISCHARGING TO THE DAM ARE ANALYZED AS DEVELOPED WITH NO BULKING.

BASINS 50103, 50104, & 50105 WEST ARE ANALYZED AS DEVELOPED WITH NO BULKING, AND ARE ROUTED THROUGH "POND 7" PER THE AMOLE-HUBBELL DMP (A-H DMP). DISCHARGE FROM "POND 7" IS ROUTED SOUTH TO THE CULLYERT UNDER 118TH ST (AP3).

BASINS B-2 AND B-4 WEST ARE ANALYZED AS DEVELOPED WITH NO BULKING, ROUTED TO "POND 8" PER THE A-H DMP, THEN DISCHARGED THROUGH A CULVERT TO THE CHANNEL ON THE NORTH SIDE OF RIO BRAVO BLVD.

PONDS ALONG WEST SIDE OF 118TH ST PER THE A-H DMP.
POND 7 IS TO BE LOCATED IN BASIN 50105 WEST.
STORAGE VOLUME = 8.3 AC-FT.
POND 8 IS TO BE LOCATED IN BASIN B-4 WEST.
STORAGE VOLUME = 4.1 AC-FT.

THE BORREGA DAM IS TO BE BUILT IN 2 PHASES: PHASE "A" & PHASE "B". THE FIRST PHASE (NOT-FULLY EXCAVATED) IS CALLED "PHASE "A". WHEN BASINS B-4 EAST AND B-6 ARE DEVELOPED, THEY WILL BE DIVERTED TO THE BORREGA DAM. WHEN BASIN 50201 IS DEVELOPED, IT WILL BE DIVERTED TO THE BORREGA DAM. THE DAM WILL THEN BE FULLY EXCAVATED. THE FULLY EXCAVATED BORREGA DAM IS CALLED PHASE "B".

EXISTING INTERMEDIATE CONTOUR ~ 5070 EXISTING INDEX CONTOUR

DRAINAGE STUDY AREA BOUNDARY

BASIN BOUNDARY AREA DISCHARGING TO DAM

**(E2)** 

PAAKWEREE DEVELOPMENT BOUNDARY

ANALYSIS POINT ARROYO CHANNEL NUMBER FROM FIGURE SH-4 AMOLE-HUBBELL DMP





FEMA FLOOD PLAIN

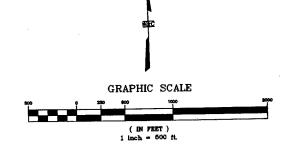


BASINS TO BE DIVERTED TO THE DAM IN THE FUTURE. THE DAM WILL BE THEN BE FULLY EXCAVATED PER PHASE "B" DAM



A	NALYSIS POINT SUMMARY	INTERIM			
AP NO.	DESCRIPTION	AHYMO HYD NO.	DRAINAGE AREA (sq mi)	Q100 24 hr (cfs)	VOL100 24 hr (ac-ft)
1 2 3 4 5 6 7	Culvert to north under Rio Bravo Bivd • 118th St. Inflow to "Pond 7"  118th St Channel • North Borrega Channel N. Borrega Chan • Avestruz St Intake of culvert • South property line of Paakwerse N. Borrega Chan • Perdix St N. Borrega Chan • Pardix St Borrega Dam Borrega Inlet to Hubbell Lake	RB_CULV POND7.IN 108.20 105E.1 S_CULV 107.10 107.50 110.20 BR_DMP1.HYD	0.1088 0.2348 0.3202 0.3853 0.2814 0.7599 0.8287 1.2462 1.2841	43 428 198 275 344 728 854 1473	7.9 18.5 25.7 29.1 22.8 59.9 65.7 99.1

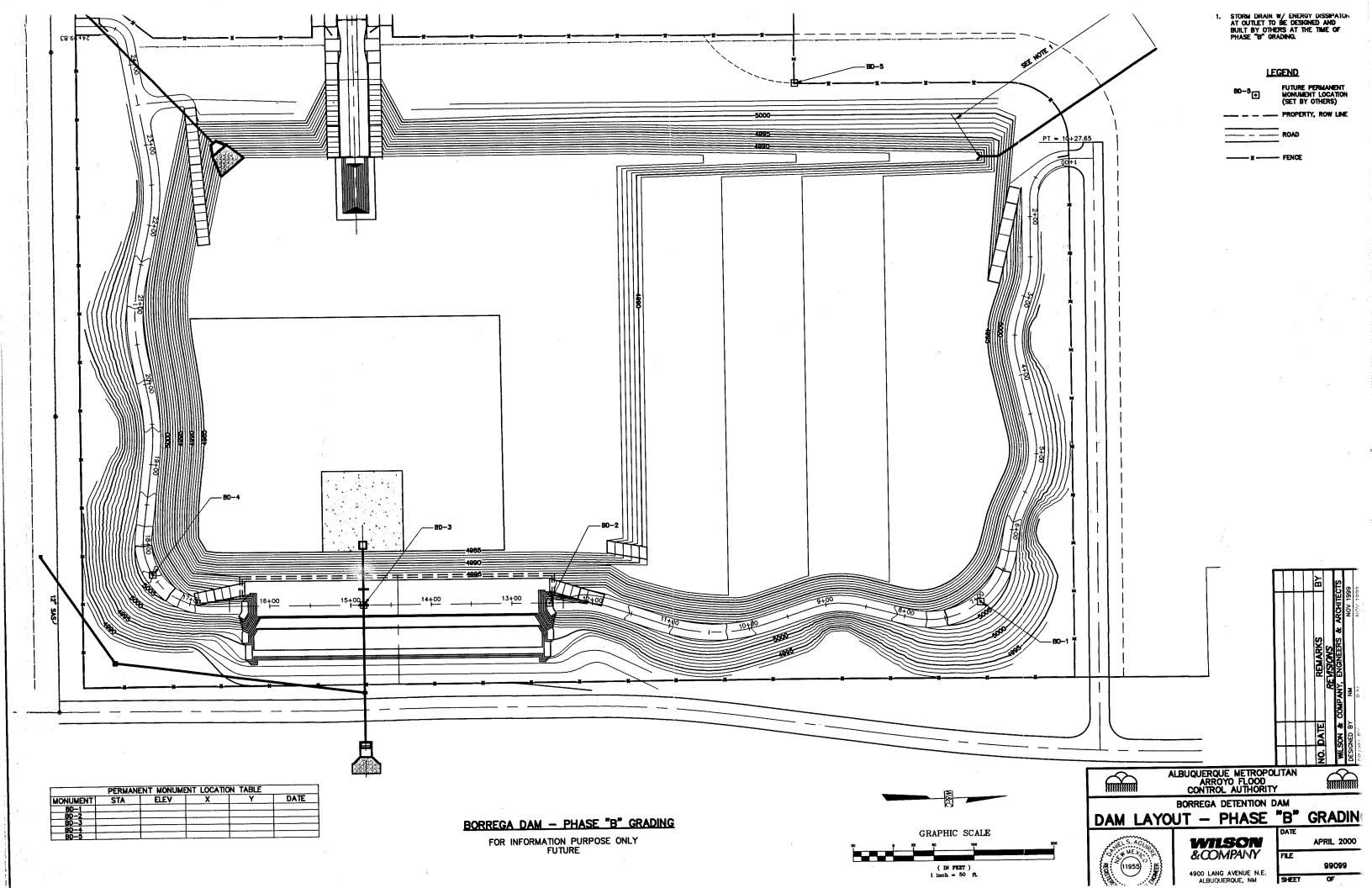
BASIN	SUMM	ARY				NTERIM		
BASIN	AREA (sq mi)	AREA (oc)	XA	XB	XXC	70	Q100 24 hr (cfs)	VOL100 24 hr (ac-ft)
B-2	0.0445	28.5	0	33	33	34	87	3.2
B-4 West	0.0641	41.0	اة	33	33	34	126	4.7
50101	0.1540	98.6	ŏ	38	20	42	271	12.0
50102	0.1277	81.7	l ŏ	28	23	49	272	10.9
50103	0.0540	34.5	ة ا	48	17	35	102	3.8
50104	0.0393	25.2	١٥	53	15	32	72	2.7
50105West	0.1413	90.4	١٠	28	23	48	271	12.0
	0.0656	54.8	اةا	28	23	49	171	7.3
50106	0.0813	52.0	l ŏ	60	15	25	100	5.0
50106		150.0	١،	26	23	49	391	20.0
50109	0.2344	65.2	1 7	26	22	48	212	8.5
50110	0.1018		1 6	45	10	45	76	3.0
50111	0.0379	24.3	1 *	40	55	5	85	2.5
Ā	0.0513	32.8	l º	28	23	49	137	5.5
9	0.0641	41.0	0			28	27	0.9
C	0.0138	8.8	0	30	42	40	31	1.2
D	0.0144	9.2	0	28	23		31	1.2
E	0.0144	9.2	0	28	23	49		
F	0.0336	21.5	0	28	23	49	72	2.9
G	0.0352	22.5	0	28	23	40	75	3.0

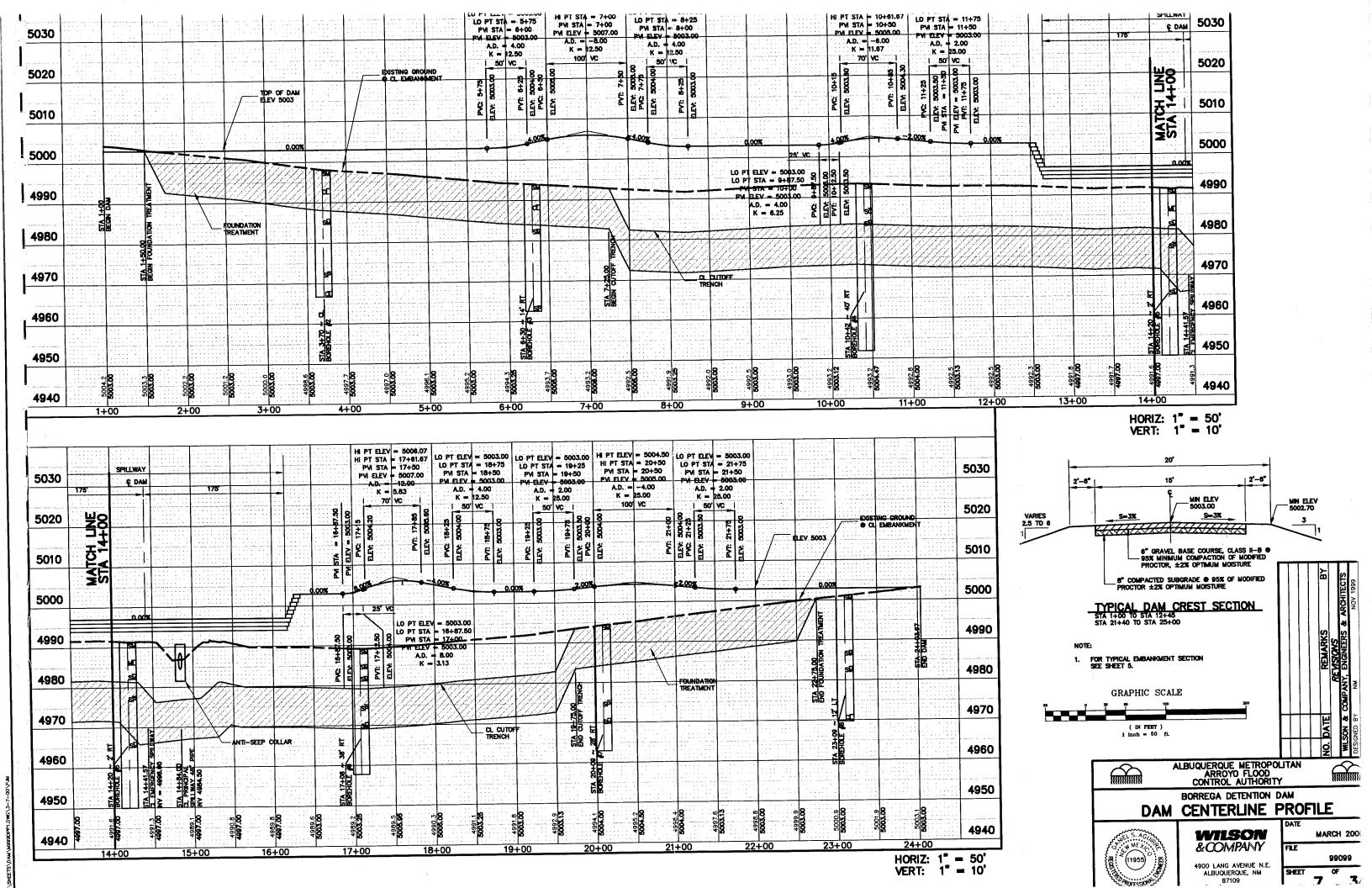


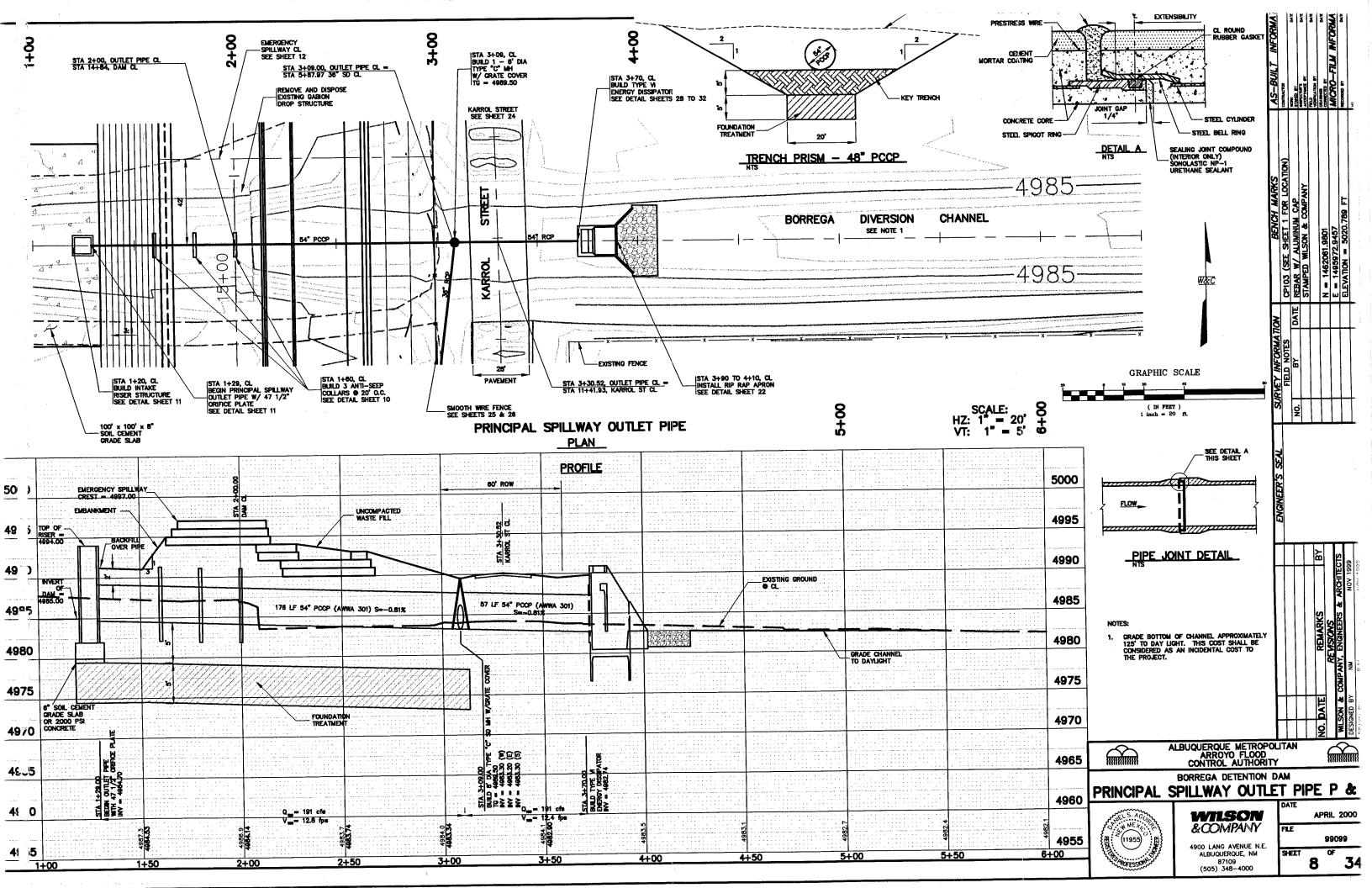
	ALBUQUERQUE METROPO ARROYO FLOOD CONTROL AUTHORIT	LITAN Y	
	BORREGA DETENTION I	MAC	NSE "A" D
JIEL S. AGO	WILSON	DATE	APRIL 2000
(大い ME x で か) (計) (11955) (計)	&COMPANY	FILE	99099
	4900 LANG AVENUE N.E. ALBUQUERQUE, NM	SHEET	OF

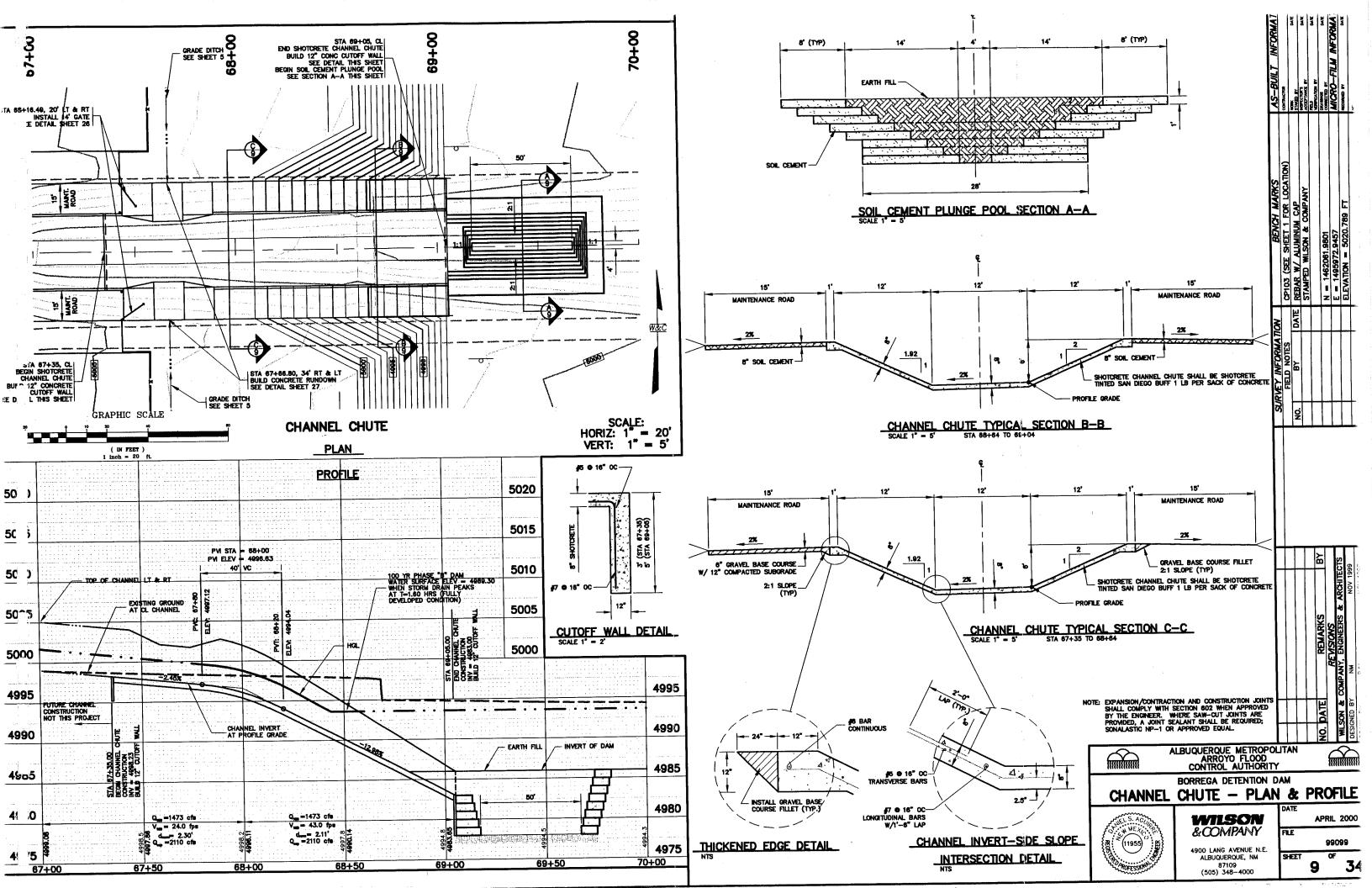
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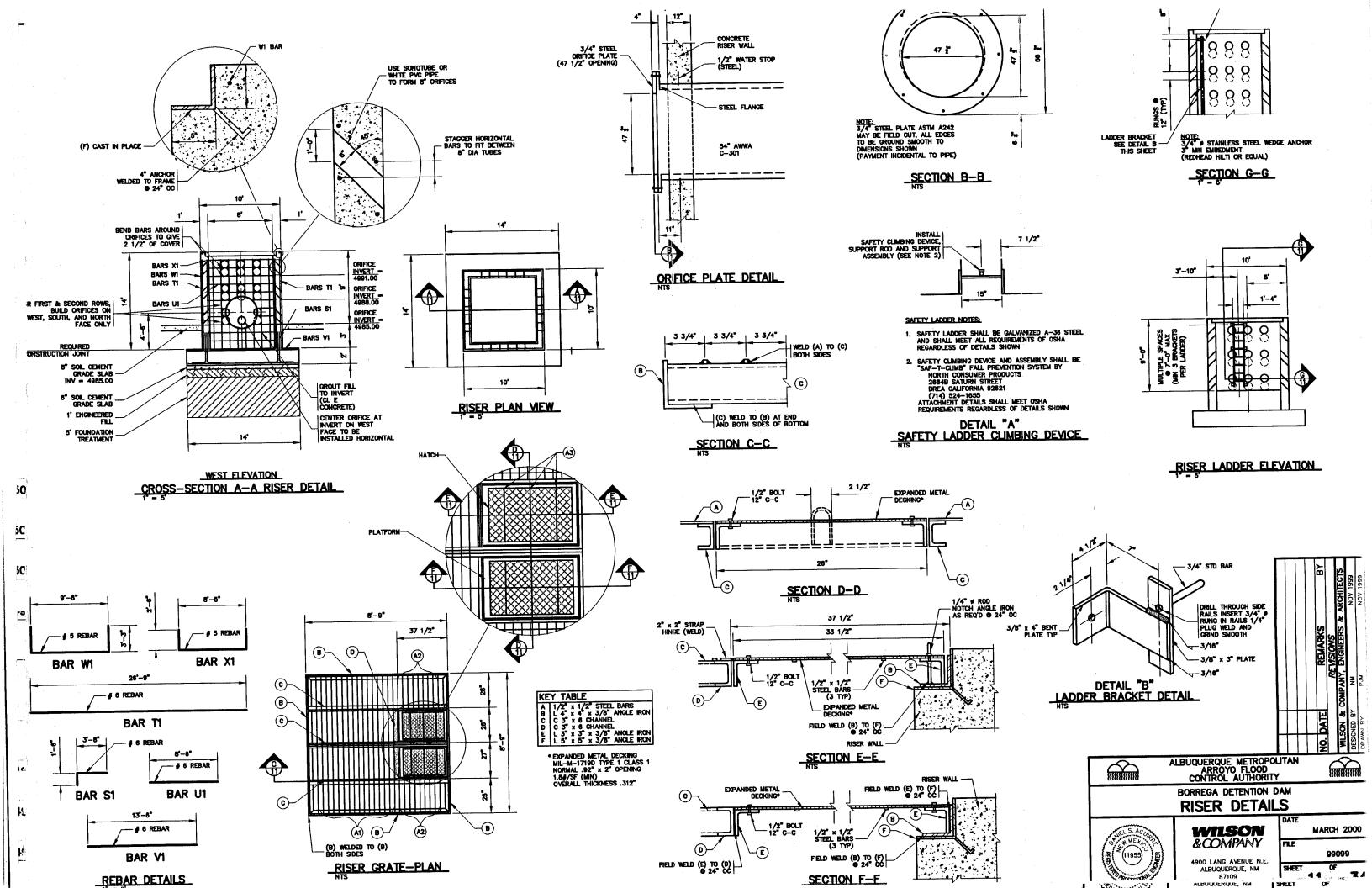
XX











## APPENDIX E

## **Basin Maps (pockets):**

**Exhibit 3. Existing Conditions** 

**Exhibit 4. Revised (Post-Project) Conditions** 

Exhibit 4a. Interim – Phase "A" Dam

Exhibit 5. Future – Phase "B" Dam

## APPENDIX F

**AMAFCA Agreements** 

# AGREEMENT BORREGA DETENTION DAM AND UPSTREAM BORREGA ARROYO CHANNEL

$\Lambda$
This Agreement is entered into this 10th day of August, 1999, by and among the
Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), a political subdivision of
the State of New Mexico, Paakweree Development Corporation (PAAKWEREE), a New Mexico
Corporation and Westland Development Corporation (WESTLAND), a New Mexico Corporation.

#### **RECITALS:**

- 1. Whereas, AMAFCA's Amole Hubbell Drainage Management Plan, adopted by the AMAFCA Board of Directors on June 24, 1999, has established the need to restrict flow rates in the Borrega Diversion Channel, in order not to exceed the capacity of AMAFCA's existing Borrega Inlet to the Hubbell Lake Detention Dam; and
- 2. Whereas, the recommended solution in the Amole Hubbell Drainage Management Plan is to construct a storm water detention facility just upstream of Karrol Road; and
- 3. Whereas, recognizing the need for some upgrade of the existing Borrega Diversion Channel, AMAFCA has programmed funds for such an upgrade on its annual Project Schedule since 1994; and
- 4. Whereas, it was anticipated that AMAFCA would construct the recommended detention dam and upgrade the existing Borrega Channel at an estimated cost of \$1.52 million; and
- 5. Whereas, construction of the detention dam and upgrade of the Borrega Channel is appropriate for AMAFCA, in that:
  - a. It is consistent with AMAFCA's mission; and
  - b. It limits flow rates to the capacity of AMAFCA's Borrega Inlet to Hubbell Lake; and
  - c. It provides flood protection to existing development in the Southwest Valley; and
  - d. It provides a major regional drainage facility which can be utilized for optimum storm water management, including (1) control of the entire Borrega Arroyo Watershed; (2) potential reduction of future downstream storm drainage facilities; (3) the consolidation of public operations and maintenance operations into one single large facility, rather than several small ones; and (4) provides the means to obtain a FEMA Letter of Map Revision for removal of 45 acres of floodplain below the detention dam.

- 1) A detention dam storing approximately 55 acre feet, with an outfall pipe to the existing Borrega Arroyo on the east side of the projected Karrol Road right of way (Borrega Detention Dam).
- 2) A tinted concrete lined channel from the end of the existing Borrega Diversion Channel to the future Unser Blvd alignment Borrega Arroyo (Reach 1).
- A tinted concrete lined channel from Unser to the confluence with the north Branch of the Borrega Arroyo (Reach 2).
- 4) Extension and backfill of the principal spillway pipe across the extension of the Karrol Road right of way. Completion of Karrol Road paving within the current AMAFCA Borrega Channel right of way to match the existing Karrol Road section will be the addressed via a separate agreement between AMAFCA and Bernalillo County.
- 5) Upgrade, at a time AMAFCA deems to be appropriate, the existing Borrega Diversion Channel above the detention dam (Reach 0).
- AMAFCA has the option to allow the disposal of excess material from the Dam construction on lands currently owned by TVI along Reach 0 or Reach 1. AMAFCA and WESTLAND shall coordinate such disposal site. The excess material will be placed with moisture suitable for dust control and with no other compaction requirements.
- 7) Document financial and right of way dedications by PAAKWEREE and WESTLAND, and provide such to Bernalillo County for PAAKWEREE and WESTLAND's use in applying for impact fee credits for such contributions.
- b. Review, and if appropriate, approve all of the facilities as shown on Facilities Sketch Map at Exhibit A. All drainage facilities will be designed to accommodate fully developed conditions flows from the Borrega watershed.
- c. Advertise for construction bids for the Borrega Detention Dam, Borrega Arroyo Reach 1 and Borrega Arroyo Reach 2, collectively the (PROJECT), upon:
  - 1) Receipt of project rights of way from WESTLAND,
  - 2) Receipt of contract documents approved by AMAFCA, the State Engineer Office and Bernalillo County for the PROJECT from PAAKWEREE.

5)

- Construct, provide construction inspection and geotechnical engineering testing services, at its expense and in accordance with the contract documents; and subject to AMAFCA and Bernalillo County (with regard to issuance of a Certificate of Occupancy) inspection and acceptance of the completed facility; the following facilities:
  - a) Borrega Arroyo Reach 3
  - b) South Branch of Borrega Arroyo Reach 4
- 4. Subject to reconveyance of Tract A by TVI to WESTLAND, WESTLAND agrees to:
  - a. Provide to AMAFCA the following rights of way (except that right of way previously dedicated by WESTLAND with the PAAKWEREE Plat) by Warranty Deed conveying merchantable title to AMAFCA free and clear of all liens and encumbrances, except those set out herein, ad valorem taxes for the current year, and restrictions, reservations and easements shown of record, prior to October 1, 1999: the following:
    - 1) Borrega Detention Dam (approximately 14.5 acres)
    - 2) Borrega Arroyo Reach 1 (approximately 3.3 acres)
    - 3) Borrega Arroyo Reach 2 (approximately 3.3 acres)
    - 4) Borrega Arroyo Reach 3 (approximately 3.4 acres)
    - 5) Borrega Arroyo Reach 4, if open channel construction (approximately 1.2 acres)
    - Temporary construction easements as may be necessary for construction of the PROJECT.

Provided that if AMAFCA requires less than 14.5 acres for the Borrega Detention Dam it shall be deeded back to WESTLAND.

- b. Provide a commitment of title insurance to AMAFCA, issued by Albuquerque Title Company, as soon as practical after the execution of this agreement for the rights of way described in Paragraph 3.a.1-5 above.
  - The title commitment shall be used for the purpose of insuring title to said right of way in AMAFCA's name through an owners policy of title insurance in the face amount of \$642,500 (25.7 +/- acres at \$25,000/acre). If AMAFCA chooses to buy title insurance, said title insurance premium will be paid by AMAFCA.

f. Provide to AMAFCA any environmental site assessments previously prepared for the right of way being dedicated to AMAFCA. AMAFCA shall have the right to obtain further site assessments at AMAFCA's expense, and should any such investigations show contamination of the site, the Parties will negotiate in good faith for cleanup of the site, an alternate site, other action as negotiated at that time, or may elect to terminate this Agreement.

#### 4. PAAKWEREE, WESTLAND and AMAFCA all agree as follows:

- a. AMAFCA's commitment to provide funding and construct the facilities identified in this Agreement is contingent upon the timely receipt of rights of way, designs, and construction funding from PAAKWEREE and WESTLAND.
- b. All cost estimates herein are approximate. The PAAKWEREE cash contributions are fixed and are not adjustable for any reason. AMAFCA shall bear any increased costs in the construction of the PROJECT and likewise, shall benefit from any cost savings identified during the design and construction of the PROJECT.
- c. The facilities and right of way described herein have the primary purpose of conveying and managing storm flows, and all other interest granted by any party shall be subservient to that purpose, and shall be mutually agreed to, in advance of the granting.
- d. This Agreement does not relieve PAAKWEREE of the requirement to construct or financially guarantee the construction of such related drainage facilities that Bernalillo County may deem necessary.
- e. Disputes under the Agreement will be referred to binding arbitration under the provisions of the New Mexico Uniform Arbitration Act.
- f. This Agreement may not be assigned by any party without the written consent of the other parties, which consent shall not be unreasonably withheld.
- g. Except as otherwise specifically provided herein, the Agreement shall be governed by, construed and enforced in accordance with the laws of the State of New Mexico.
- h. All notices with respect to this Agreement shall be in writing and shall be delivered personally, sent via confirmed telefax, or sent postage prepaid by United States Mail, certified mail, return receipt requested, to the addresses set forth below or other such addresses as hereafter specified in writing by one party to the others:

o. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, and said counterparts shall constitute but one and the same instrument which may sufficiently be evidenced by one counterpart.

Executed the day and year first set out above.

ALBUQUEROUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY, a political subdivision of

the State of New Mexico

Ronald D. Brown, Chair Board of Directors

ATTEST:

Clifford E. Anderson Secretary Treasurer

PAAKWEREE DEVELOPMENT CORP, a

**New Mexico Corporation** 

Boleslo Romero, President

WESTLAND DEVELOPMENT CO. INC., a

New Mexico Corporation

Barbara Page, President and CEO

# FIRST AMENDMENT TO AGREEMENT BORREGA DETENTION DAM AND UPSTREAM BORREGA ARROYO CHANNEL

This First Amendment to that Agreement dated August 10, 1999, by and among the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), a political subdivision of the State of New Mexico, Paakweree Development Corporation (PAAKWEREE), a New Mexico Corporation and Westland Development Corporation (WESTLAND), a New Mexico Corporation, ("Original Agreement") is entered into this day of Doubles, 1999, by and among the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA), a political subdivision of the State of New Mexico. Paakweree Development Corporation (PAAKWEREE), a New Mexico Corporation, Westland Development Corporation (WESTLAND), a New Mexico Corporation, and American Southwest Homes, Ltd. Co. (SOUTHWEST HOMES), a Nevada LLC registered in New Mexico ("First Amendment").

#### **RECITALS:**

- 1. Whereas, AMAFCA, PAAKWEREE and WESTLAND have entered into the Original Agreement on August 10, 1999 to cost share the construction of flood control facilities to include a detention dam and upstream channels; and
- 2. Whereas, the recommended solution in the AMAFCA adopted Amole Hubbell Drainage Management Plan is to construct a storm water detention facility just upstream of Karrol Road (Borrega Detention Dam); and
- 3. Whereas, certain properties north of the Borrega Detention Dam site were intended to drain east to the South Rio Bravo Arroyo; and
- 4. Whereas, SOUTHWEST HOMES, the owner of certain property north of the Borrega Detention Dam site, desires to direct drainage emanating from these properties south to the facility and is willing to provide additional lands and to provide financial contribution for the design and construction of the Borrega Detention Dam facility; and
- 5. Whereas, the AMAFCA Board of Directors has determined that construction of an expanded Borrega Detention Dam to accept these storm flows is appropriate for AMAFCA, in that:
  - a. It is consistent with AMAFCA's mission; and
  - b. Reduces future cost associated with improvements to the South Rio Bravo Arroyo and inlet to the Hubbell Lake Detention Dam; and

Sum of Twenty Thousand Dollars (\$20,000) as the total cost of modifications to the existing design.

- 3. The following paragraph is added to section 3 of the Original Agreement, "WESTLAND Agrees to":
  - g. Accept the relocation of the reserved 60' wide access and utility easement along the northern boundary of the Borrega Dam parcel to the north of and west of the northern and western boundaries of the parcel to be conveyed from SOUTHWEST HOMES to AMAFCA for the benefit of properties west of the Borrega Detention Dam parcel, AMAFCA, WESTLAND, and their successors and assigns. SOUTHWEST HOMES agrees to dedicate said 60' as right of way if required by any Governmental entity.
- 4. Section 4 of the Original Agreement is deleted and replaced in its entirety with the following:
  - 4. PAAKWEREE, WESTLAND, AMAFCA, and SOUTHWEST HOMES all agree as follows:
    - a. AMAFCA's commitment to provide funding and construct the facilities identified in this First Amendment is contingent upon the timely receipt of rights of way, designs, and construction funding from PAAKWEREE, WESTLAND and SOUTHWEST HOMES.
    - b. All cost estimates herein are approximate. The PAAKWEREE and SOUTHWEST HOMES cash contributions are fixed and are not adjustable for any reason. AMAFCA shall bear any increased costs in the construction of the PROJECT and likewise, shall benefit from any cost savings identified during the design and construction of the PROJECT.
    - c. The facilities and right of way described herein have the primary purpose of conveying and managing storm flows, and all other interest granted by any party shall be subservient to that purpose, and shall be mutually agreed to, in advance of the granting.
    - d. This First Amendment does not relieve PAAKWEREE or SOUTHWEST HOMES of the requirement to construct or financially guarantee the construction of such related drainage facilities that Bernalillo County or the City of Albuquerque may deem necessary.
    - e. Disputes under this First Amendment will be referred to binding arbitration under the provisions of the New Mexico Uniform Arbitration Act.

such party. All of the terms and conditions of the Original Agreement shall remain in full force and effect except as amended herein.

- j. If any provision of this First Amendment, or the application thereof to a person or circumstance, shall be determined to be invalid or unenforceable to any extent, the remainder of this First Amendment and the application of such provisions to other persons or circumstances shall not be affected thereby and such provisions shall be enforced to the greatest extent permitted by law.
- k. In the event any action is instituted by any party for the purpose of enforcing or interpreting any provision of this First Amendment, the prevailing party in such action shall be entitled to its reasonable attorney's fees and costs.
- 1. This First Amendment shall inure to the benefit of and shall be binding upon the undersigned parties and their respective successor and assigns. Whenever in this First Amendment a reference to PAAKWEREE, WESTLAND or SOUTHWEST HOMES is made, such reference shall be deemed to include a reference to successors of each party.
- m. Each individual signing for each of the parties hereunder, warrants and represents that he/she is an authorized agent of such party, on whose benefit he/she is executing this First Amendment, and is authorized to execute the same.
- n. Each party agrees to execute such other and further instruments and documents as may be necessary or proper in order to complete the transactions contemplated by this Agreement.
- o. This First Amendment may be executed in one or more counterparts, each of which shall be deemed an original, and said counterparts shall constitute but one and the same instrument which may sufficiently be evidenced by one counterpart.

The following Section 5 is added to the Original Agreement:

### 5. SOUTHWEST HOMES agrees to:

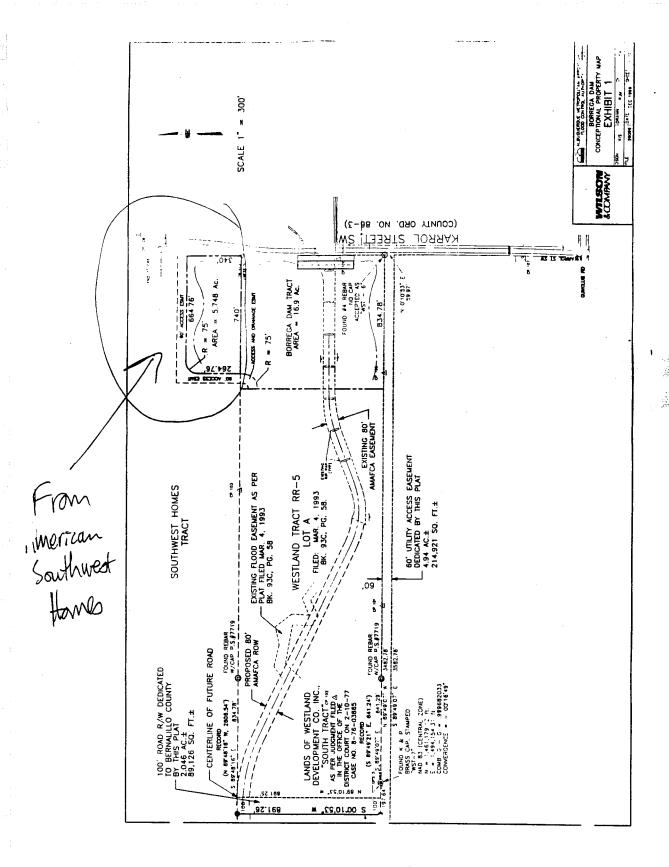
a. Provide to AMAFCA an approximately 5.75 acre parcel adjacent to the existing Borrega Detention Dam Parcel measuring approximately 340 feet' from north to south and 740 feet from east to west, as shown on Exhibit A attached hereto. Conveyance shall be by Warranty Deed conveying merchantable title to AMAFCA free and clear of all liens and encumbrances, except those set out herein, ad valorem

which would be disclosed by an accurate survey and inspections of the premises; and (iv) any lien, claim or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the public records.

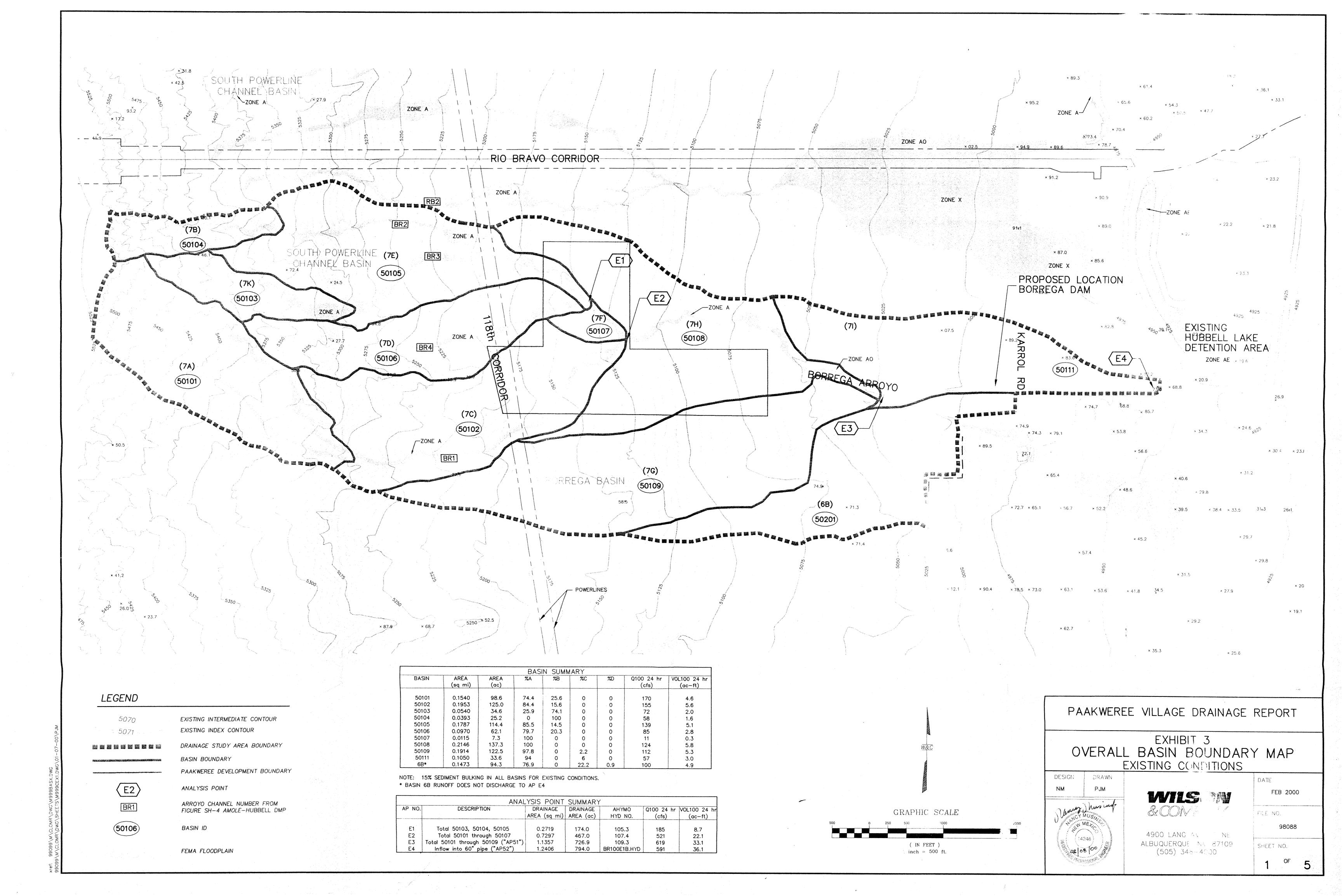
- f. Reserve a 60' wide access and utility easement to north of and west of the northern and western boundaries of the SOUTHWEST HOMES' parcel to be conveyed to to AMAFCA for the benefit of properties west of the Borrega Detention Dam parcel, AMAFCA, WESTLAND, and their successors and assigns. SOUTHWEST HOMES agrees to dedicate said 60' as right of way if required by any Governmental entity.
  - g. Provide to AMAFCA any environmental site assessments previously prepared for the right of way being dedicated to AMAFCA. AMAFCA shall have the right to obtain further site assessments at AMAFCA's expense, and should any such investigations show contamination of the site, the Parties will negotiate in good faith for cleanup of the site, an alternate site, other action as negotiated at that time, or may elect to terminate this Amendment to the Original Agreement and proceed with the Original Agreement without SOUTHWEST HOMES participation. Should this First Amendment be terminated, SOUTHWEST HOMES' financial contribution to AMAFCA and the SOUTHWEST HOMES parcel, if already deeded to AMAFCA, shall be returned to SOUTHWEST HOMES.
  - h. Provide a grading and drainage plan for the site to meet the discharge restrictions in Paragraph 1.j. and provide that the terrain is not altered such that flows greater than the 100 year event are directed towards the dam, not including the 60 acres on the southern boundary of the site that are currently within the Borrega Detention Dam watershed. Should the volume or peak flow rate assumed in Paragraph 1.j. for the SOUTHWEST HOMES' site be exceed when SOUTHWEST HOMES' final grading and drainage plans are prepared, SOUTHWEST HOMES will be required to provide mitigation as necessary to demonstrate no adverse impact on either the 100 year water surface elevation or peak discharge rate at the Borrega Detention Dam.
  - i. Construct, at SOUTHWEST HOMES' expense, a storm sewer connection to the dam, including necessary manholes and energy dissipater, excavation of approximately 12 acre feet of material to obtain the required storage volume in the detention dam, revegetation of disturbed areas, and all other on site drainage improvements necessary for the planned development.
  - j. By executing this Amendment SOUTHWEST HOMES agrees to and shall be bound by all of the terms and conditions of the Original Agreement which shall remain in full force and effect except as amended herein.

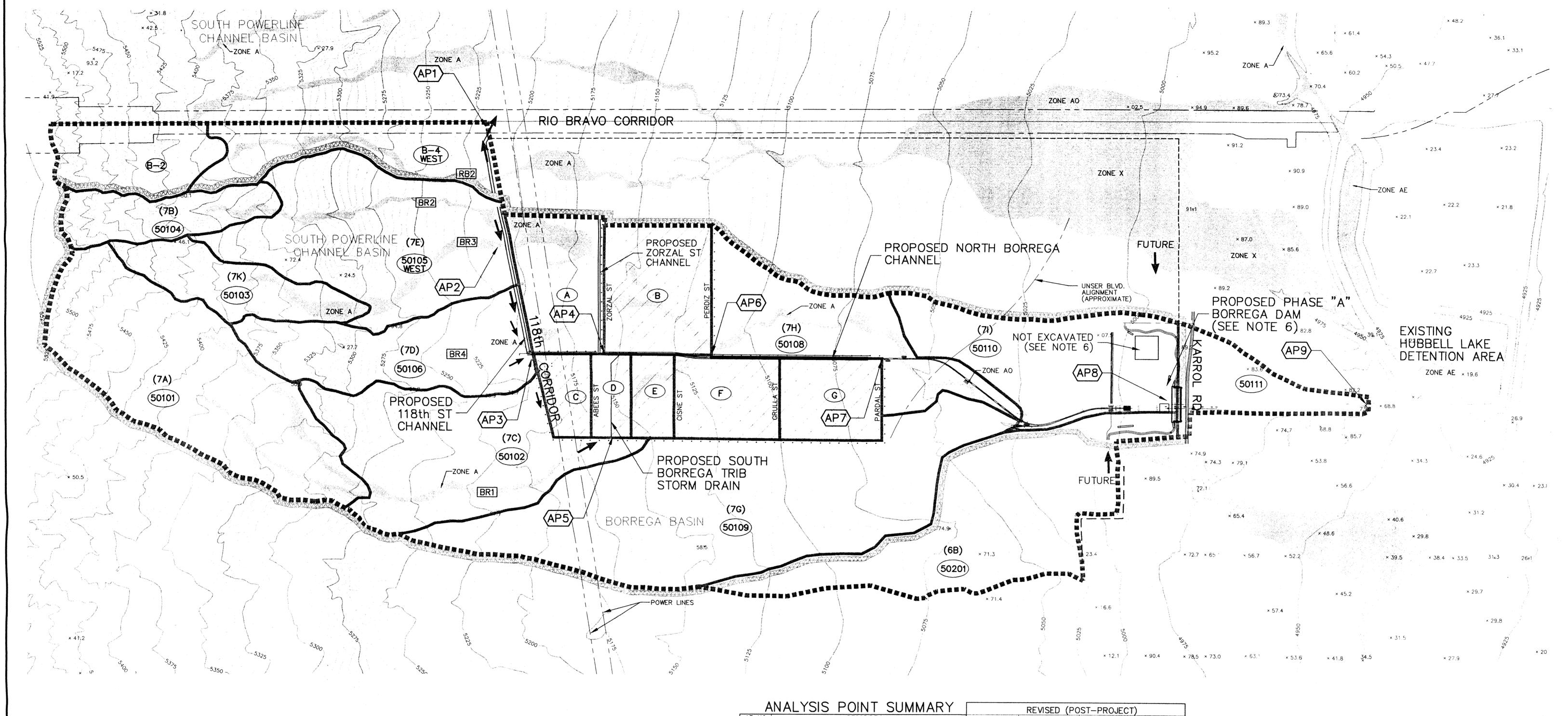
## ACKNOWLEDGMENTS

	STATE OF NEW MEXICO )
	)s.s COUNTY OF BERNALILLO )
<u></u>	This instrument was acknowledged before me on DLC. LLC., 1999, by Ronald Brown, as Chair of the Albuquerque Metropolitan Arroyo Flood Control Authority, a political subdivision of the State of New Mexico, on behalf of said political subdivision.  My Commission Expires:    March 29, 2003   3:29.03   Notary Public   3:29.03   Nota
	. 보고 있는 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은 사람들은
	STATE OF NEW MEXICO ) )s.s.
	COUNTY OF BERNALILLO )
	This instrument was acknowledged before me on Corporation, 1999, by Boleslo Romero, as President of the Paakweree Development Corporation, a New Mexico Corporation, on behalf of said corporation.  My Commission Expires:  State Of Corporation And One Of Corporation and One Of Corporation And One Of
	(SEAL) Notary Rublic
	STATE OF NEW MEXICO ) )s.s. COUNTY OF BERNALILLO )
	Trod Anybroa i Ar
	This instrument was acknowledged before me on Live 100, 1999, by Barbara Page, as President and CEO of the Westland Development Co. Inc., a New Mexico Corporation, on behalf
	of said corporation.
	My Commission Expires:  March 29, 2003  (SEAL)  Notary Public
	229.05



" Exhit A





# REVISED (POST-PROJECT) CONDITIONS:

- 1. PAAKWEREE BASINS (B THROUGH G) ARE ANALYZED AS DEVELOPED WITH NO BULKING. THESE ARE THE ONLY FULLY DEVELOPED BASINS IN THE WATERSHED.
- 2. BASINS 50103, 50104, & 50105 WEST ARE ANALYZED AS EXISTING WITH 15% BULKING, AND ARE ROUTED SOUTH VIA 118TH ST CHANNEL TO BE DISCHARGED TO THE NORTH BORREGA CHANNEL.
- 3. BASINS B-2 AND B-4 WEST ARE ANALYZED AS EXISTING WITH 15% BULKING, ARE ROUTED TO THE SW COR OF 118TH ST AND RIO BRAVO, AND THEN DISCHARGED THROUGH A CULVERT TO A CHANNEL ON THE NORTH SIDE OF RIO BRAVO BLVD.
- 4. BASIN 50201 (6B) RUNOFF DOES NOT DISCHARGE TO BORREGA DAM UNTIL THE BORREGA DIVERSION STORM DRAIN IS BUILT IN THE FUTURE CONDITIONS.
- 5. THE BASIN BETWEEN RIO BRAVO BLVD AND THE BORREGA WATERSHED BOUNDARY DOES NOT DISCHARGE TO BORREGA DAM UNTIL FUTURE CONDITIONS.
- 6. THE BORREGA DAM IS TO BE BUILT IN 2 PHASES: PHASE "A" AND PHASE "B". THE FIRST PHASE (NOT-FULLY EXCAVATED) IS CALLED PHASE "A". WHEN THE BASINS DISCUSSED IN NOTES 4 AND 5 ARE DEVELOPED, THEY WILL BE DIVERTED TO THE BORREGA DAM. THE DAM WILL THEN BE FULLY EXCAVATED. THE FULLY EXCAVATED BORREGA DAM IS CALLED PHASE "B".

# LEGEND

5070 EXISTING INTERMEDIATE CONTOUR 

EXISTING INDEX CONTOUR

AREA DISCHARGING TO DAM

DRAINAGE STUDY AREA BOUNDARY BASIN BOUNDARY

· · · · · · · · · · ·

PAAKWEREE DEVELOPMENT BOUNDARY

ANALYSIS POINT

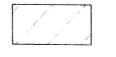
 $\langle E2 \rangle$ 

ARROYO CHANNEL NUMBER FROM FIGURE SH-4 AMOLE-HUBBELL DMP

(50106)

BASIN ID

FEMA FLOOD PLAIN



FULLY DEVELOPED BASINS

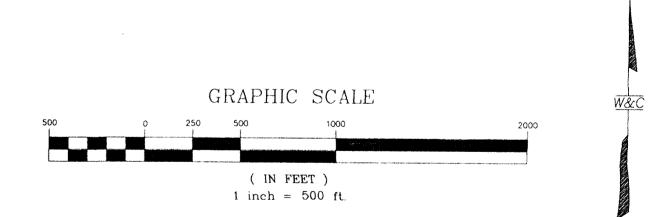


DIRECTION OF FLOW

		11211020 11001				
AP NO.	DESCRIPTION	AHYMO	DRAINAGE	Q100 24 hr	VOL100 24 hr	
		HYD NO.	AREA (sq mi)	(cfs)	(ac-ft)	
1	Culvert to north under Rio Bravo Blvd @ 118th St.	RB_CULV	0.1086	65	2.9	
2	118th St Channel @ Arroyo "BR3"	105.10	0.2346	213	7.6	
3	118th St Channel @ North Borrega Channel	106.20	0.3202	264	10.1	
4	N. Borrega Chan 👁 Avestruz St	105E.1	0.3853	316	13.6	
5	Intake of culvert © South property line of Paakweree	S_CULV	0.2814	161	8.3	
6	N. Borrega Chan @ Perdiz St	107.10	0.7599	593	29.8	
7 {	N. Borrega Chan @ Pardal St	107.50	0.8287	716	35.6	
8	Borrega Dam	110.20	1.2462	967	45.9	
9	Borrega Arroyo @ Outfall	BR_DMP1.HYD	1.2841	52	40.5	

BASIN	SUMMARY	

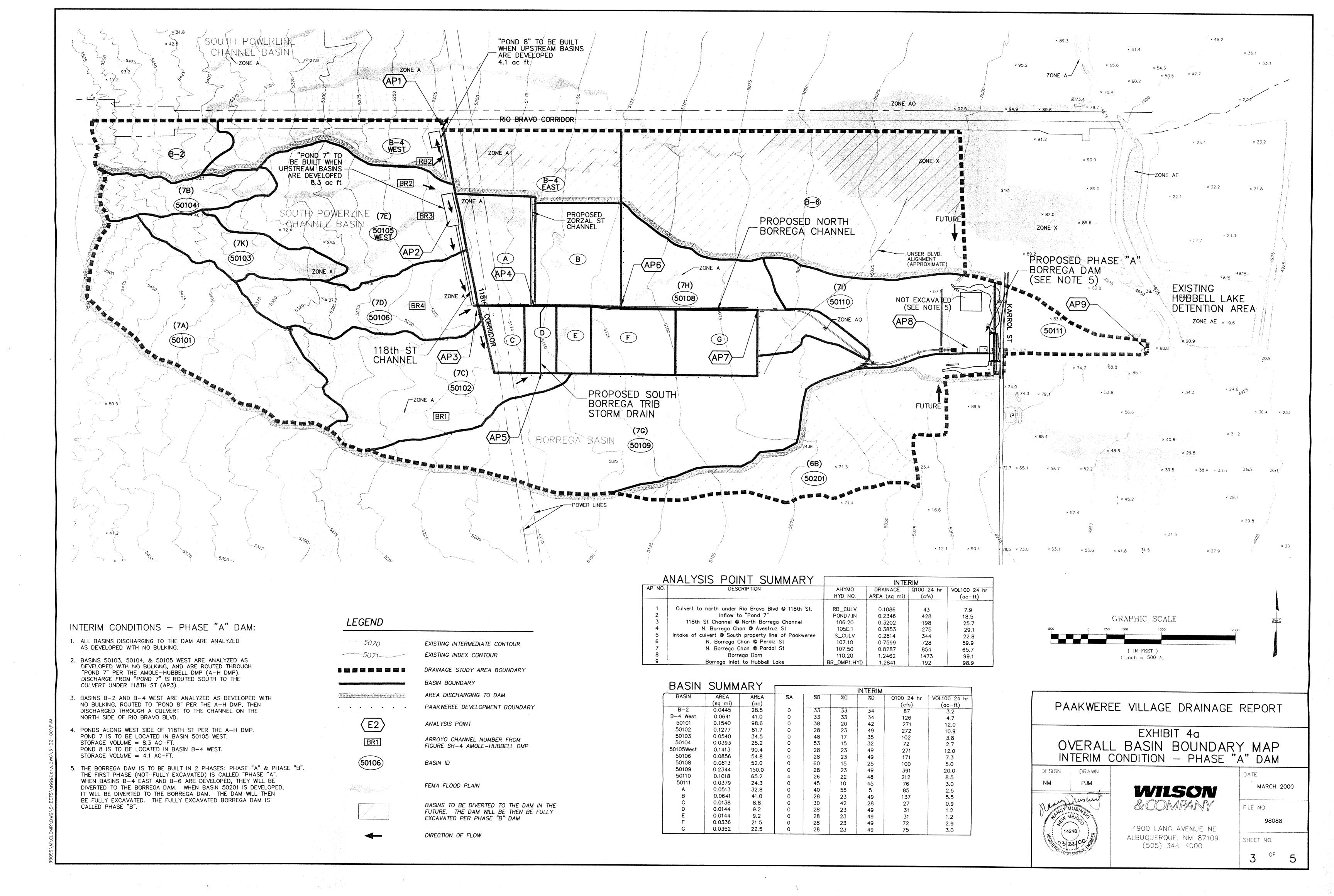
RAZIN	I SUMMART			R	EVISED	(POST-I	PROJECT	)	
BASIN	AREA	AREA	%A	<b>%</b> B	%C	<b>%</b> D	%SED	Q100 24 hr	V0L100 24 hr
	(sq mi)	(ac)					BULK	(cfs)	(ac-ft)
B-2	0.0445	28.5	100	0	0	0	15	42	1.2
B-4 West	0.0641	41.0	100	0	0	0	15	41	1.7
50101	0.1540	98.6	74.4	25.6	0	0	15	142	4.6
50102	0.1277	81.7	84.4	15.6	0	0	15	134	3.7
50103	0.0540	34.6	25.9	74.1	0	0	15	72	2.0
50104	0.0393	25.2	0	100	0	0	15	58	1.6
50105West	0.1413	90.4	85.5	14.5	0	0	15	131	4.0
50106	0.0856	54.8	79.7	20.3	0	0	15	82	2.5
50108	0.0813	70.7	100	0	0	0	0	42	1.9
50109	0.2344	150.0	97.8	0	2.2	0	0	151	5.6
50110	0.1018	65.2	94	0	6	0	0	97	6.9
50111	0.0379	24.3	94	0	6	0	0	33	0.9
50201	0.1473	94.3	76	0	23	0	0	98	4.3
Α	0.0513	32.8	0	40	55	5	0	85	2.5
В	0.0641	41.0	0	28	23	49	0	137	5.5
С	0.0138	8.8	0	30	42	28	0	27	0.9
D	0.0144	9.2	0	28	23	49	0	31	1.2
Ε	0.0144	9.2	0	28	23	49	0	31	1.2
F	0.0336	21.5	0	28	23	49	0	72	2.9
G	0.0352	22.5	0	28	23	49	0	75	3.0

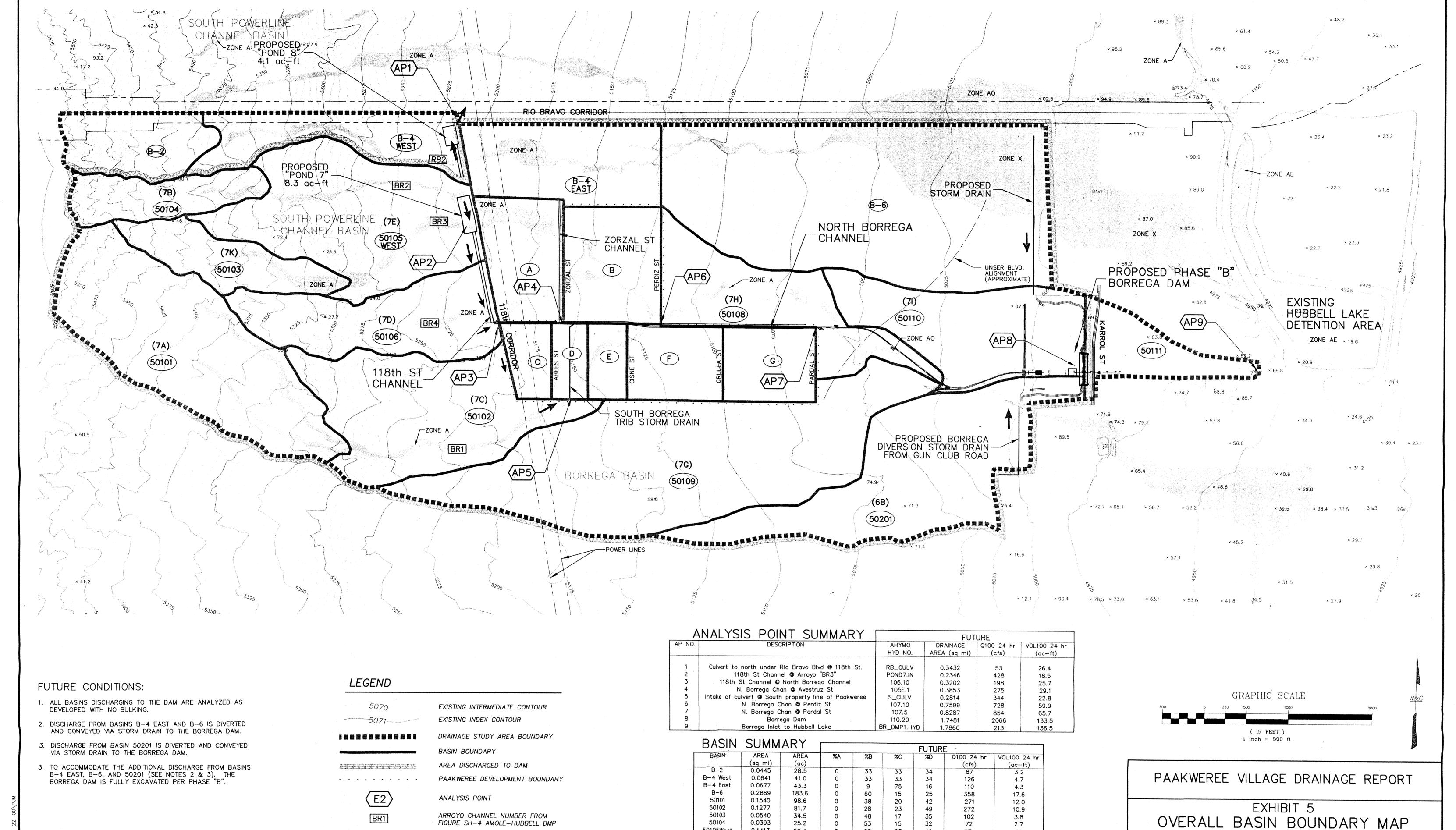


PAAKWEREE VILLAGE DRAINAGE REPORT

# EXHIBIT 4 OVERALL BASIN BOUNDARY MAP REVISED (POST-PROJECT) CONDITION

DESIGN	DRAWN			DATE
NM	PJM	WILS	ON	MARCH 2000
DANCY ME	SING MINING	& CO		FILE NO.
14248		4900 LANC 1E		98088
9,03 22	100	ALBUQUERQUE (505) 348	09 < 00	SHEET NO.
				2 OF5





50105West

50106

50108

50109

50110

50111

50201

(50106)

BASIN ID

FEMA FLOOD PLAIN

DIRECTION OF FLOW

0.1413

0.0856

0.0813

0.2344

0.1018

0.0379

0.1473

0.0513

0.0641

0.0138

0.0144

0.0144

0.0336

0.0352

90.4

54.8

52.0

150.0

65.2

24.3

94.3

32.8

41.0

8.8

9.2

9.2

21.5

28

28

28

40

28

30

28

28

28

0

0

23

23

15

23

22

10

23

55

23

42

23

23

23

49

49

25

48

45

49

49

28

49

49

49

271

171

100

212

230

137

12.0

7.3

5.0

20.0

8.5

3.0

12.5

2.5

5.5

0.9

1.2

1.2

2.9

DESIGN

DRAWN

PJM

nous musing

14248

03 22 00

FUTURE CONDITIONS - PHASE "B" DAM

WILSON

& COMPANY

4900 LANG AVENUE NE

ALBUQUERQUE, NM 87109

(505) 348-4000

DATE

FILE NO.

SHEET NO.

MARCH 2000

98088

OF